ACFN–MCFN TÂDZIÉ-SAGOW ATIHK STEWARDSHIP PLAN

for the Richardson, Red Earth, East Side of the Athabasca River and West Side of the Athabasca River Boreal Caribou Ranges

Athabasca Chipewyan First Nation and Mikisew Cree First Nation

DECEMBER 2022

ACFN
ATHABASCA CHIPEWYAN FIRST NATION

MIKISEW CREE
FIRST NATION

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Acknowledgements: Thanks and acknowledgements go to the ACFN and MCFN Elders, knowledge holders, staff and leadership who worked towards developing this Stewardship Plan. In particular, we thank the four ACFN-MCFN Indigenous knowledge advisors, who guided the development of the plan over the last several months and the ACFN-MCFN Elders and youth, who developed the Elders Declaration and provided valuable input into the Stewardship Plan. This plan was prepared by the technical teams from ACFN and MCFN, with support from Firelight Research Inc. We thank our funders who supported this important work, in particular Environment and Climate Change Canada and the David Suzuki Foundation. We thank the Government of Alberta for providing boreal caribou telemetry data, as well as Ducks Unlimited Canada and its partners (Ducks Unlimited Inc., Government of Alberta, Alberta Pacific [Al-Pac], the Pew Charitable Trusts, Imperial Oil Resources, Shell Canada, Environment and Climate Change Canada, Canadian Space Agency, United States Fish and Wildlife Service [NAWCA], and the United States Forest Service) for the use of their enhanced wetland dataset to produce maps of boreal caribou habitat suitability.

the firelight group

Disclaimer: The ACFN-MCFN Tâdzié-Sagow Atihk Stewardship Plan is a living document, which is intended to be used in processes that will advance the protection of woodland (boreal) caribou in northeastern Alberta. The plan will continue to evolve as management actions are taken to recover caribou in the Richardson, Red Earth, East Side of the Athabasca River and West Side of the Athabasca River boreal caribou ranges. The plan will also guide and support regulatory and wildlife management decision-making processes for the recovery of the boreal caribou populations in these four ranges.

The information contained in this report is based on research conducted by Firelight Research Inc., as well as published works and archival research, in collaboration with the ACFN-MCFN technical team. The statements in this plan have been verified by ACFN and MCFN knowledge holders. The document reflects the understandings of the lead authors and is not intended to be a complete depiction of the dynamic and living system of use and knowledge maintained by ACFN and MCFN members. It may be updated, refined, or changed as new information becomes available. All community-based mapped information is derived from interviews with ACFN and MCFN knowledge holders conducted within constraints of time, budget, and scope. Base map data originate from the National Topographic System and Natural Resources Canada. The information contained herein should not be construed as to define, limit, or otherwise constrain the Treaty or Aboriginal rights of the Athabasca Chipewyan First Nation, the Mikisew Cree First Nation, or any other First Nations or Aboriginal peoples.

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MIKISEW CREE FIRST NATION

ACFN ATHABASCA CHIPEWYAN FIRST NATION

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MESSAGE FROM THE DIRECTORS

Historically the Dené are a nomadic people, and we've travelled with the caribou. We have a really deep respect and spiritual understanding for the caribou because we relied on them for so many generations for our food and our culture. Now with Canada and Alberta, the relationship between the Dené people and caribou is not as strong; we are failing them, and we need to protect them. We need to co-exist with industry in our region. We have done our part and don't oppose development, but industry and government need to do a better job understanding our relationship with the caribou, and why we are pushing so hard to protect them. This report is a good first step, but industry, government, and we as Dené need to do far better. There's no reason we can't repair and maintain our close relationship with the caribou. It's a fundamental spiritual and sustenance based connection that stretches deep into our history, and ties our present and future tightly to our past.

— Lisa Tssessaze, ACFN DLRM Director

Woodland caribou have walked our region along with our ancestors since time immemorial. This cultural keystone species is dependent on us for their survival. We look to the health of the population as an indicator of our cultural well-being. When the caribou leave so does a part of our way of life, a way of life that we fight to protect so this plan is to prevent them from leaving. Our caribou stewardship plan is about us taking active steps in our region to protect the caribou, it is about us making every effort possible to achieve reconciliation by preventing the further loss of our culture, rights and way of life. I invite government, industry and others to join us while we take these steps. Collaboration is key to protecting this sacred species. The collaboration work of our staff, scientists, Elders and knowledge holders made this plan possible. I thank you for your hard work, contributions and trust.

— Melody Lepine, MCFN GIR Director

Executive Summary

FOR GENERATIONS UPON GENERATIONS, people from the Athabasca Chipewyan First Nation (ACFN) and Mikisew Cree First Nation (MCFN) have been responsible for stewarding the lands and waters of their homelands in northeastern Alberta, taking care of the values that are critical to their culture and way of life. Boreal woodland caribou — tâdzié in Dené; sagow atihk in Cree — are an integral part of the boreal ecosystem that is so important for sustaining these values. tâdzié/sagow atihk are highly valued in both Dené and Cree cultures for their meat, clothing, shelter, tools, thread, and drum skins, among other cultural and spiritual values.

Historically, tâdzié/sagow atihk were plentiful in ACFN and MCFN homelands, found throughout the area in their preferred habitats and seeking refuge from predators deep in the wetlands and forests. Over the last several decades, industrial development in northeastern Alberta has pushed tâdzié/sagow atihk populations to the brink of extirpation. Now, tâdzié/sagow atihk in ACFN and MCFN territories are found primarily within four disconnected ranges called Richardson, Red Earth, East Side of the Athabasca River, and West Side of the Athabasca River. All four ranges have very low levels of undisturbed habitat within them, and the Red Earth, East Side of the Athabasca River, and West Side of the Athabasca River local populations have shown precipitous declines year over year since 2000 (Government of Alberta 2017).

The disappearance of these sensitive animals is a sign to Elders and knowledge holders from both nations that the boreal ecosystem, which is essential to the continued practice of ACFN and MCFN rights, is highly stressed. Protecting and recovering these ecosystems is critical to recover tâdzié/sagow atihk and restore ACFN and MCFN rights within their territories.

Boreal woodland caribou in Canada are protected as a threatened species under the federal Species at Risk Act. In 2012, Canada released a Recovery Strategy for the boreal population of woodland caribou (Environment Canada 2012[1]), which identified critical habitat for boreal caribou, and delegated the requirement to develop range plans to protect critical habitat to the seven provinces and two territories where boreal caribou are found. Most jurisdictions have not yet finalized effective range plans to protect critical habitat.

1 The federal government posted an Amended Recovery Strategy for boreal caribou on the Species at Risk Public Registry in 2020. The Amended Recovery Strategy identifies critical habitat in northern Saskatchewan's Boreal Shield range (SK1); updates population and habitat condition information, based on information previously published in the 5-Year Progress Report (Environment and Climate Change Canada, 2017); and makes other minor edits to update factual information and/or to improve internal consistency within the document. The Amended Recovery Strategy replaces the 2012 Recovery Strategy. Hereafter, this stewardship plan refers to the 2020 Recovery Strategy (Environment and Climate Change Canada 2020) as the current version.

Out of concern for the ongoing declines of tâdzié/sagow atihk populations in their homelands and continued degradation of habitat through industrial development, ACFN and MCFN have developed the Tâdzié-Sagow Atihk Stewardship Plan.[2] The Tâdzié-Sagow Atihk Stewardship Plan upholds and respects the inherent rights of ACFN and MCFN to steward values and resources within their homelands in northeastern Alberta and meets federal range planning requirements[3] (ECCC 2016a, ECCC 2016b), thereby adhering to both Indigenous and Canadian law. The Tâdzié-Sagow Atihk Stewardship Plan applies within the study area identified in the map on the following page.

The goal of the stewardship plan is as follows:[4]

TÂDZIÉ/SAGOW ATIHK STEWARDSHIP PLAN GOAL

Recover tâdzié/sagow atihk populations to the extent that ACFN and MCFN can once again rely on tâdzié/sagow atihk for subsistence and cultural practices. This full goal must be met in no longer than 40 years, with measurable and verified progress being achieved in set periods within that timeline. To meet this goal, knowledge holders identified a target of 80% undisturbed habitat within tâdzié/sagow atihk ranges by 2061, with calving habitats targeted at 100% disturbance free. In addition to being disturbance free, this habitat must contain all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season.

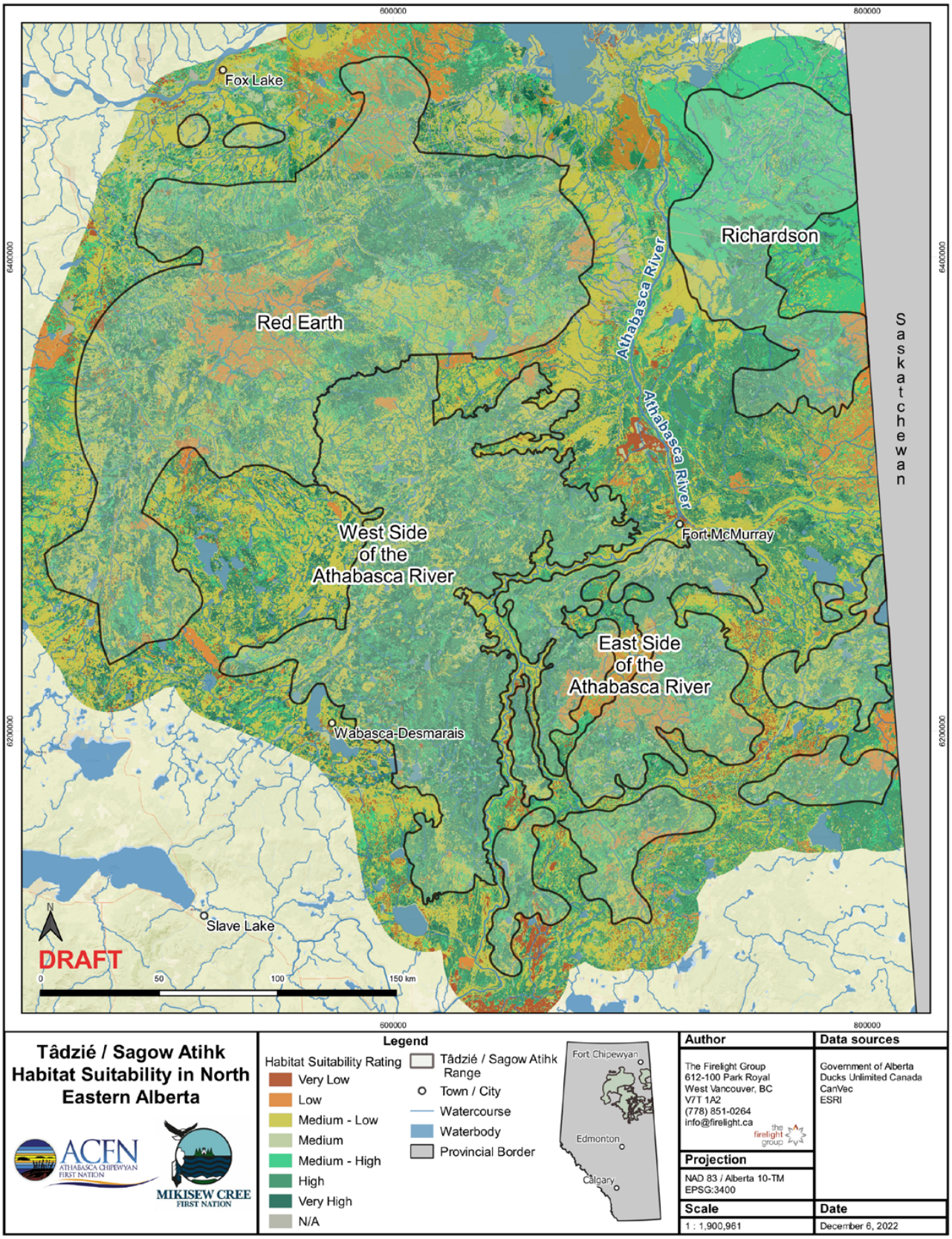
Knowledge holders identify that tâdzié/sagow atihk populations and habitat need to be replenished, meaning returned to their original state. Determining when populations and habitats are replenished will be guided by Dené and Cree laws, which consider the interconnectedness of the system, not simply one resource in isolation. This definition means that all of the currently isolated local populations within each range will need to be maintained and restored. The decision regarding when tâdzié/sagow atihk populations and habitat are replenished will be made by the Elders and knowledge holders from ACFN and MCFN.

2 ACFN and MCFN signed a Section 11 agreement with the federal government in 2021 that outlines the Conservation Measures that the Parties have agreed to take in order to support the achievement of a self-sustaining population, consistent with the population and distribution objectives in the Recovery Strategy, in the Red Earth Range, West Side of the Athabasca River Range, Richardson Range, and East Side of the Athabasca River Range (Environment and Climate Change Canada, Athabasca Chipewyan First Nation, and Mikisew Cree First Nation 2021).

3 The ACFN-MCFN team who prepared this plan made the decision to use the title of Stewardship Plan to avoid confusion with range plans, which Alberta is responsible for preparing for each boreal woodland caribou range. However, the contents of this Stewardship Plan align with federal range planning guidance as outlined in Environment and Climate Change Canada 2016. As such, with multi-jurisdictional support, this Stewardship Plan could be adopted as the official range plan for the four caribou ranges it covers.

4 The final statement in the goal is equivalent to biophysical habitat attributes as discussed in the 2020 Amended Recovery Strategy, Appendix H. Seasonal habitat needs include habitat required at the broad scale, as well as specific habitat needs for calving, post-calving, rutting, winter, and travel (Environment and Climate Change Canada 2020). Section 3 describes seasonal biophysical habitat needs for tâdzié/sagow atihk in the four ranges addressed by this stewardship plan.

Map of the potentially suitable tâdzié/sagow atihk habitat within the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River herd ranges, and the immediate surrounding area. See notes page 53.



The plan is founded on the following principles:

- ACFN and MCFN inherent rights and oral Treaty signing must be included in any actions to recover tâdzié/sagow atihk populations and habitat. Ongoing planning for tâdzié/sagow atihk recovery needs to be guided by the knowledge of the two nations.
- Indigenous knowledge must be held at an equal weight to western science within the range planning process.
- There needs to be enough habitat protected to support healthy tâdzié/sagow atihk populations and a healthy environment.[5] This includes restoring disturbed habitat and protecting intact habitat — particularly habitat that contains the qualities required by tâdzié/sagow atihk to meet their needs throughout each season.
- Tâdzié/sagow atihk are a migratory[6] species and all of the local populations were historically interconnected. There should be equal priority / protection for all caribou ranges in Alberta.[7]
- Tâdzié/sagow atihk population numbers cycle over time with habitat availability; this cycle should be maintained by ensuring sufficient, appropriate and connected habitat is available to support healthy tâdzié/sagow atihk populations.

To fulfill these principles and achieve the goal, the Tâdzié-Sagow Atihk Stewardship Plan uses Indigenous knowledge, supported by western science, to identify and map three stewardship zones within the study area.

- **PROTECTION ZONES** encompass areas of biophysically suitable tâdzié/sagow atihk habitat that are highly used by tâdzié/sagow atihk based on both Indigenous knowledge and recent telemetry data, and in relatively good (undisturbed) condition. These zones contain the best remaining habitat within the study area, with all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season. They need to be protected now to provide a strong foundation from which to move towards attaining the target of 65-80% undisturbed habitat in each of the tâdzié/sagow atihk population ranges. In protection zones, ACFN and MCFN require that any remaining industrial leases and other encumbrances are removed over time, so they gradually can be fully protected. The target is to have these areas fully protected within 10 years.
- **RESTORATION ZONES** identify areas that are important for tâdzié/sagow atihk survival, despite relatively high levels of disturbance contained within them. They largely consist of habitat with all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season but are more disturbed than areas delineated as protection zones within the same ranges. They tend to be

5 The concepts of “healthy caribou populations” and a “healthy environment” will be determined by Dené and Cree laws and include the concept of replenishing populations and habitats.

6 The Tâdzié-Atihk Stewardship Plan highlights tâdzié/sagow atihk movement and movement patterns as a critical aspect of their life history. Knowledge holders have made it clear that tâdzié/sagow atihk are not a sedentary species, and that they move across the landscape throughout the year to access different habitat and the associated services that these habitats provide. Community members used the term migratory to capture this idea; however the term has a very specific definition in western science, so this plan refers to this aspect of tâdzié/sagow atihk behaviour using the terms “non-sedentary”, “movement patterns” and “travel routes”.

7 This statement includes all subpopulations within the ranges; i.e., all of the currently isolated subpopulations must be maintained and reconnected into one population over time.

highly encumbered, so full protection of these areas is not possible at this time. Any development that occurs in these zones must drive restoration in another part of the same range, ideally within the area inhabited by the impacted local population.[8] Management of these areas must achieve a net positive habitat trend, primarily through active restoration that is protected over the long term to ensure that the goal of the Tâdzié-Sagow Atihk Stewardship Plan can be met. ACFN and MCFN require restoration to be prioritized within areas that most efficiently contribute to meeting undisturbed habitat targets and will work with external governments and organizations to identify these areas. Over time, as areas within restoration zones are restored, some of the restored areas must be moved into protection zones to fully protect these areas from disturbance until tâdzié/sagow atihk populations and habitats are replenished.

- **ACTIVE MANAGEMENT ZONES** encompass areas that have high densities of active industry. These areas are almost entirely leased to industry and are highly disturbed. Although these areas likely had biophysical habitat needed to support tâdzié/sagow atihk before they were disturbed, they are currently of lower value due to the amount of habitat disturbance. In these areas, new industrial disturbance may be permitted within limits (i.e., maximum levels of linear and area based disturbances) that must be maintained to ensure that these areas can continue to support tâdzié/sagow atihk. Development must also meet appropriate standards and drive net habitat improvements elsewhere through offsetting and restoration that is protected over the long term.

These three stewardship zones, shown in the map on the following page, are the building blocks for tâdzié/sagow atihk population recovery in ACFN and MCFN homelands. Lands within the study area are currently allocated approximately equally to each zone (i.e., 1/3 protection zone; 1/3 restoration zone; 1/3 active management zone), with at least 65% of the landscape within each range included in a protection or restoration zone. Because the more southern ranges are more highly disturbed and have much higher levels of industrial disturbance and encumbrances, most of the 65% in these two ranges has been assigned to the restoration zone. Over time, portions of these areas will be restored and moved to protection zones, so that a minimum of one third of each range is fully protected within 20 years. This distribution must be maintained until tâdzié/sagow atihk populations and habitats are replenished, and the target of 65% undisturbed habitat at the range level is achieved.[9] Based on modelling conducted by the team, the current arrangement of zones across the study area generally achieves the 65% undisturbed threshold within the four ranges in 40 years.[10] Achieving 80% undisturbed will require additional management actions to consolidate development, manage access and reduce the industrial footprint within the restoration and active management zones.

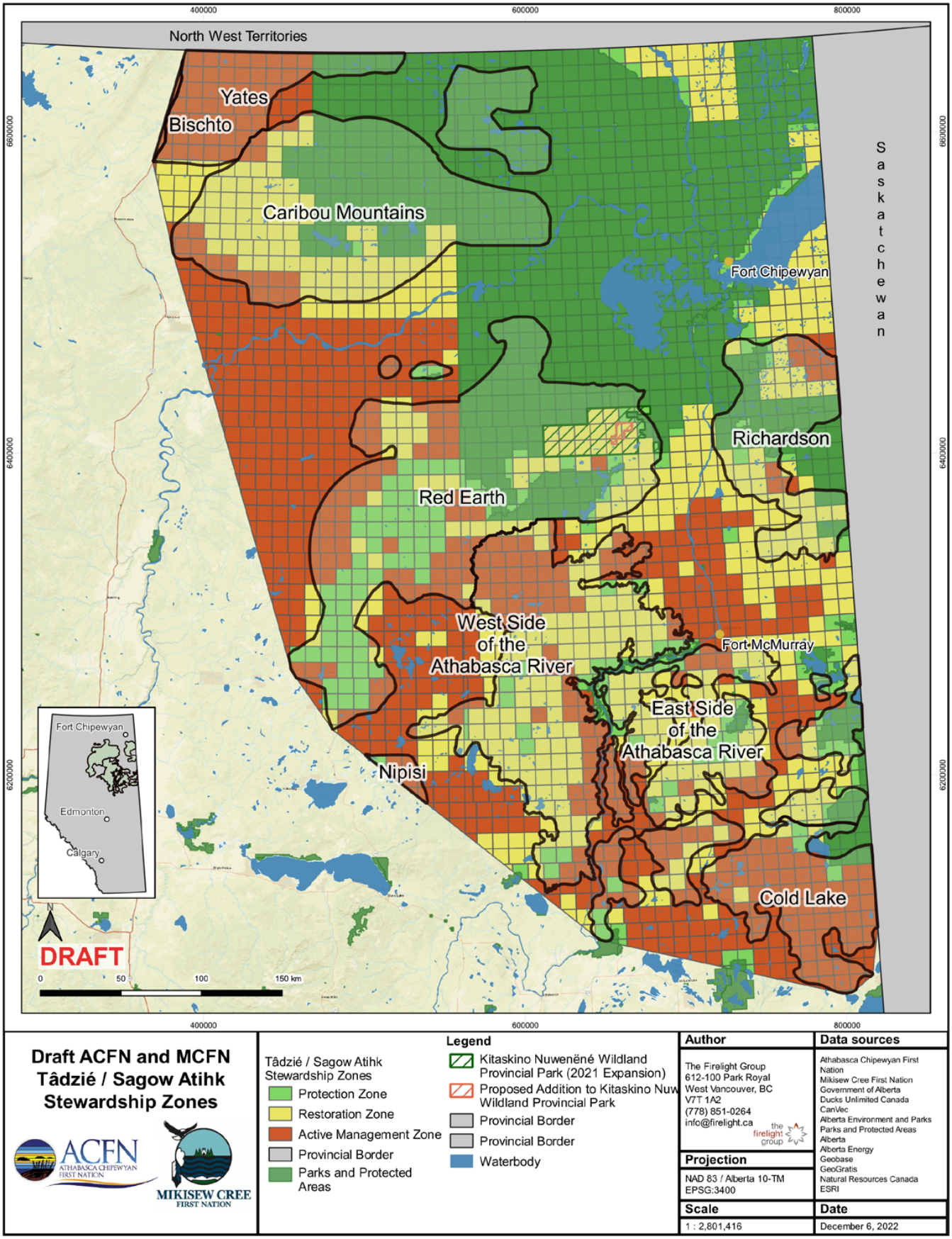
Management guidance for external governments and organizations working in each of the zones is under development, and will be encompassed within ACFN and MCFN stewardship protocols, based on Dené

8 ACFN and MCFN are developing stewardship protocols, which will include guidance on how restoration zones will be managed to achieve a net positive habitat trend.

9 The target of 65% undisturbed habitat refers to the definition of critical habitat in the 2012 Federal Recovery Strategy for Woodland Caribou boreal population (Environment Canada 2012), which applies to all ranges but the SK1 range (Environment and Climate Change Canada 2020). The recovery strategy defines critical habitat for boreal caribou as: i) the area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for a minimum of 65% of the area as undisturbed habitat; and ii) biophysical attributes required by boreal caribou to carry out life processes. The 65% undisturbed habitat threshold provides a 60% probability for a local population to be self-sustaining and is considered a minimum threshold because at 65% undisturbed habitat, there remains a significant risk (40%) that local populations will not be self-sustaining.

10 See Appendix 1.

Map showing the proposed ACFN and MCFN tâdzié/sagow atihk stewardship zones. See notes page 53.



and Cree laws.[11] The management guidance provided in the table below represents initial input from ACFN and MCFN on the content of these stewardship protocols. The next steps for implementation of the Tâdzié-Sagow Atihk Stewardship Plan include developing the stewardship protocols, piloting them with external government and organizations, and summarizing them in a separate document that provides management direction to all parties working in the identified zones.

ACFN and MCFN Elders and knowledge holders have identified the following elements of Dené and Cree stewardship protocols, which must be followed by external governments and organizations working in tâdzié/sagow atihk habitat in their homelands

Management Action	Applicable Zones	Additional Guidance
Monitoring through boots-on-the-ground guardian program to actively steward habitat and support intergenerational knowledge transmission	All zones	ACFN and MCFN guardians must take the lead in all aspects of monitoring and compliance in tâdzié/sagow atihk habitat.
Cultural training for all external governments and organizations working in the homelands	All zones	Cultural training will ensure that all parties working on ACFN and MCFN homelands follow appropriate protocols. Appropriate training to be developed and delivered by ACFN and MCFN.
Habitat restoration that meets ACFN and MCFN restoration standards	Protection Restoration	These standards are under development. They will be shared in a stand-alone document that provides direction to external governments and organizations.
Habitat offsetting calculator	Restoration Active Management	The offsetting calculator is under development and will be shared in stand-alone direction to external governments and organizations. It will primarily be used in the restoration and active management zones. Offsetting is a last resort option and cannot be used to facilitate development beyond disturbance thresholds in the active management zone. Offsetting will ideally drive restoration within the area occupied by the impacted local population.
Tenure buy-back program to remove encumbrances from protection zones and portions of restoration zones	Protection Restoration	Some areas of the protection zones and most of the restoration zones contain industrial leases, permits and tenures that allow development to occur. These tenures must be removed from the landscape within 10 years in protection zones. Some restoration zones will also be targeted for tenure removal.

11 The stewardship protocols flow directly from the ACFN and MCFN Tâdzié-Sagow Atihk Elders Declaration, a legal document that describes the authority, jurisdiction, rights and responsibilities of ACFN and MCFN in regards to the stewardship of Tâdzié/Sagow Atihk. The Tâdzié-Sagow Atihk Elders Declaration is undergoing final verification as of the date of this stewardship plan.

continued

Management Action	Applicable Zones	Additional Guidance
Coordinated access plan to reduce industrial footprint (including for PNG and forestry)	Active Management	In the active management zone, development is permitted as long as the amount, location and rate of development is wisely managed to support tâdzié/sagow atihk. Coordinated access planning will help contain development within primary areas, allowing other areas to remain disturbance free. Aggregated forestry and appended development are strategies that can help concentrate development, similarly, allowing other areas to remain disturbance free. Neither of these methods is sufficient without limiting the total amount of development that is permitted within the active management zones. Adhering to strict disturbance thresholds for both linear and areal disturbance will ensure that the rate of disturbance remains at levels that can support tâdzié/sagow atihk. Along with habitat recovery in the protection and restoration zones, these measures are critical for achieving the 80% disturbance-free target across ranges, with 100% of calving habitat disturbance free, and for meeting the goal of replenishing tâdzié/sagow atihk populations and habitat.
Reduce extent of development footprint (aggregated forestry; appended development)	Active Management	
Disturbance thresholds (linear and areal targets)	Active Management	
Wildfire management to ensure that highly valued areas of currently intact tâdzié/sagow atihk habitat are protected until other areas recover	Protection	ACFN and MCFN have identified that no disturbance should occur within protection zones until the habitat recovers throughout all four ranges covered by this Stewardship Plan. Wildfire management in protection zones will help prevent additional habitat loss; this is an interim measure until habitat recovers to support natural disturbance.
Culturally appropriate trapping program to support reductions in wolf populations in key areas, where deemed appropriate by ACFN and MCFN knowledge holders	Restoration Active Management	Wolf control measures are only supported as a last resort and only where identified as necessary by ACFN and MCFN knowledge holders to keep tâdzié/sagow atihk local populations in place until habitat recovers.

ACFN and MCFN assert their right to steward tâdzié/sagow atihk in their shared homelands through the Tâdzié-Sagow Atihk Elders Declaration. The Elders Declaration is a legal document and must be adhered to by all external governments and organizations working on ACFN and MCFN homelands.

While ACFN and MCFN will lead the implementation of this Stewardship Plan, the two Nations recognize that many parties must also be involved in implementation, including other Indigenous governments and organizations, the federal government, the provincial government, municipal governments, industry, and other interest groups. Key actions and steps required to implement the plan are provided within Section 5.

The nations look forward to collaborating with all groups who will be involved in the implementation of the Tâdzié-Sagow Atihk Stewardship Plan, to ensure that the knowledge upon which this plan is built can be the basis for the stewardship and recovery of tâdzié/sagow atihk in ACFN and MCFN homelands.

SECTION 1

Introduction to the Stewardship Plan

Study Area

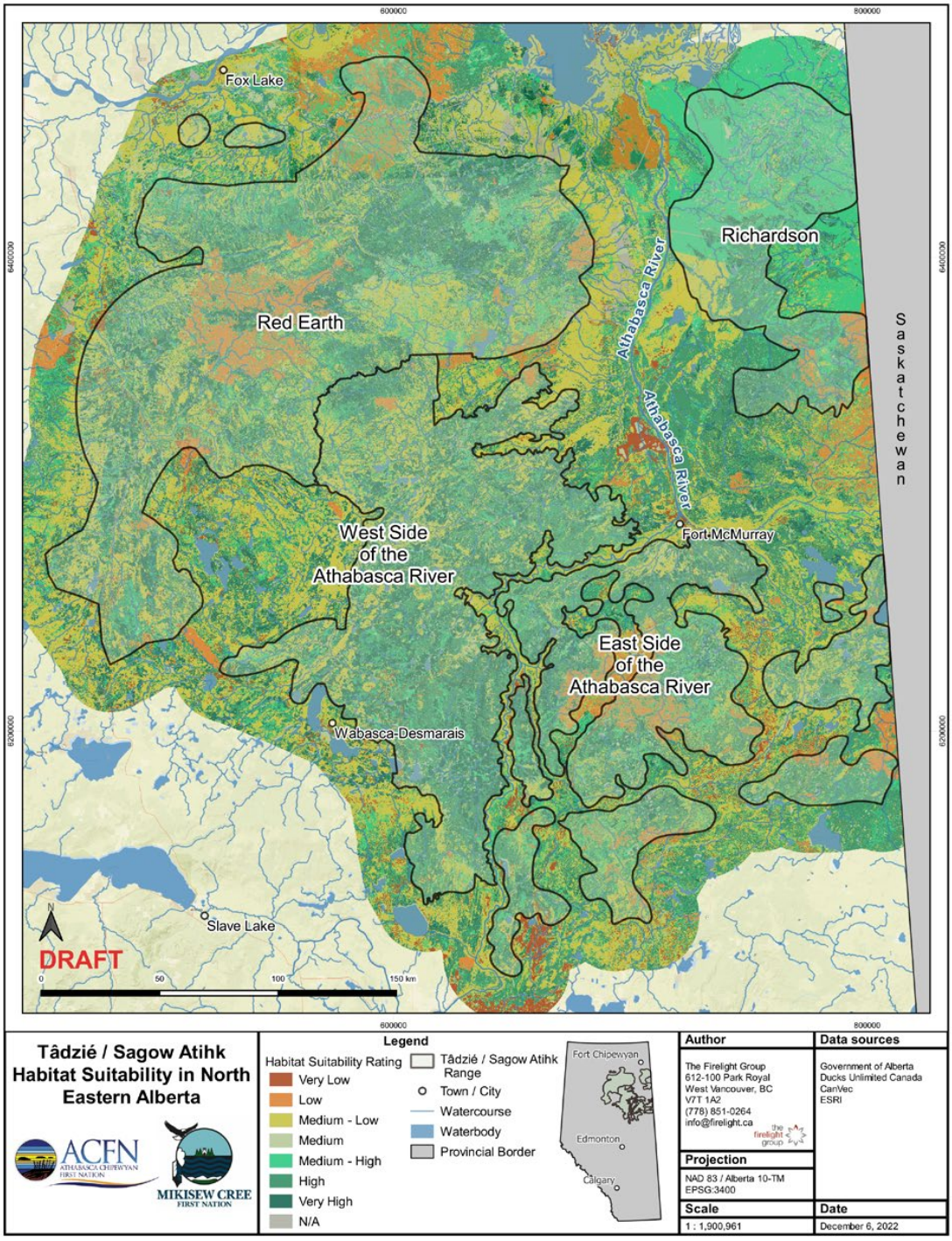
This document describes an Indigenous knowledge-based stewardship plan for the four ranges of the boreal population of woodland caribou (tâdzié in Dené; sagow atihk in Cree; *Rangifer tarandus caribou* in Latin) that overlap with the homelands of the Athabasca Chipewyan First Nation (ACFN) and the Mikisew Cree First Nation (MCFN) in northeastern Alberta.

The ranges included in this stewardship plan are: Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River (the study area; see Figure 1). All four ranges overlap with ACFN and MCFN's homelands, which extend around Lake Athabasca, over the Peace-Athabasca Delta, and south to Fort McMurray and the Clearwater River.

WHY THIS STUDY AREA?

The study area covered by this stewardship plan overlaps with ACFN's and MCFN's homelands, which have been under the stewardship of the two nations since time immemorial. While this stewardship plan references the four ranges identified by western science in the 2020 Amended Woodland Caribou Recovery Strategy (ECCC 2020), ACFN and MCFN knowledge holders know that this area supported a vast mosaic of boreal wetland and forest habitat and was home to an interconnected population of tâdzié/sagow atihk before industrial development. The importance of re-establishing and facilitating movement between areas of habitat containing the qualities required by tâdzié/sagow atihk to meet their needs throughout each season is a fundamental tenet of this stewardship plan.

FIGURE 1. Map of the potentially suitable tâdzié / sagow atihk habitat within the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River herd ranges, and the immediate surrounding area. Habitat suitability is based on a rating system of the Ducks Unlimited Canada's Enhanced Wetland Classification (Smith et al. 2007) developed by Arsenault (2014). The darkest green (Very High) indicates regions where the habitat cover type is most desirable for tâdzié / sagow atihk, and these consist of upland pine forests and treed bogs. The middle green (High) indicates regions of shrubby bogs, tree rich fens, tree poor fens, tamarack swamps and conifer swamps. The cover types identified by light green (Medium – High) are upland conifers, graminoid bogs, shrubby rich fens and shrubby poor fens. The tâdzié / sagow atihk herd ranges are delineated with black outlines.[12]



12 The habitat identified as most suitable for tâdzié / sagow atihk (Very High, High, Medium – High) coincides with habitat types identified by knowledge holders as quality habitat. (For more information on the specifics of the tâdzié / sagow atihk preference ratings, see Arsenault 2014).

Urgent Need for Action

ACFN and MCFN leadership have taken the initiative to develop this stewardship plan because of the urgent need to reverse the swift decline of tâdzié/sagow atihk in the nations' shared homelands. The decline has been well documented by both communities over the last several years, in planning documents and submissions to government and regulatory agencies, and through the observations of community knowledge holders shared in numerous traditional use studies.[13] ACFN and MCFN leadership have identified that it is critical at this time to move forward with a strong, legally enforceable plan for protecting and recovering tâdzié/sagow atihk in both traditional territories.[14]

To advance this directive, ACFN and MCFN recently negotiated a conservation agreement with the federal government with respect to the boreal population of woodland caribou, under Section 11 of the Species at Risk Act.[15] The conservation agreement sets out the measures needed for recovery of tâdzié/sagow atihk in the same area covered by this stewardship plan. Finalizing the stewardship plan and, to the extent possible, working with the Government of Alberta to facilitate its implementation within the current provincial planning process, are key initial actions identified within Appendix B of the Section 11 agreement.

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13 ACFN and MCFN 2011, Candler et al. 2012, Candler et al. 2013a, Candler et al. 2013b, Candler et al. 2015, MCFN et al. 2016, MCFN 2018, Candler and The Firelight Group 2018, and Candler et al. 2019. Refer to bibliography for full citations. Concerns about boreal caribou declines and habitat degradation led to the nations' support for a lawsuit against the federal Minister for Environment and Climate Change Canada for failing to protect critical habitat for northern boreal caribou herds in Alberta (Ecojustice 2019); further context for this lawsuit is provided in an earlier briefing note that describes why an Indigenous knowledge-based approach to caribou range planning is needed (MCFN and ACFN 2020).

14 In this context, legally enforceable plan refers to the need to ensure that provincial laws adequately protect boreal caribou critical habitat on non-federal lands, as laid out in sections 61 and 63 of the Species at Risk Act and Environment and Climate Change Canada's 2016 policy document describing the requirements for protecting critical habitat on non-federal lands (ECCC 2017).

15 Under Section 11 of the Species at Risk Act (SARA) (Government of Canada 2002) the Minister of Environment and Climate Change Canada (ECCC) can enter into conservation agreements to benefit a species at risk or enhance its survival in the wild. The agreements commit the signing parties to undertake conservation measures towards achieving population and habitat objectives, and may include measures with respect to protecting the species' habitat, including its critical habitat. Sections 58 and 61 of the Act indicate that a section 11 agreement can serve as a mechanism to protect critical habitat (ECCC2016a).

Cultural Importance and Knowledge of Tâdzié/Sagow Atihk

Tâdzié/sagow atihk are an integral part of MCFN's and ACFN's food and cultural systems, and have a central role in both Dené and Cree ways of life as a cultural keystone species.[16] The significance of the tâdzié/sagow atihk — culturally, spiritually, and from a subsistence perspective — cannot be overstated. Both nations have used tâdzié/sagow atihk for meat, clothing, shelter, tools, thread, drum skins, and many other products (e.g., see ACFN 2003; Marcel et al. 2012; Candler et al. 2015). Hunting and preparing wildlife such as tâdzié/sagow atihk is how generations of Dené and Cree have expressed and passed down important values, laws, and life skills.

Tâdzié/sagow atihk live in small groups in the boreal forest. Knowledge holders from both nations report that unlike barren ground caribou, woodland caribou are usually hard to find and difficult to hunt, but when they were plentiful, they were harvested by Dené and Cree hunters. Today, tâdzié/sagow atihk are at very low population levels, and many people from both nations voluntarily avoid harvesting these animals because their numbers are so low. For both nations to continue their ways of life, they need sustainable access to tâdzié/sagow atihk.

ECOLOGICAL IMPORTANCE OF TÂDZIÉ/SAGOW ATIHK

Tâdzié/sagow atihk are important for ACFN and MCFN subsistence, cultural and spiritual systems, and way of life. Hunting of tâdzié/sagow atihk is part of ACFN and MCFN Treaty and inherent rights; however, harvesting opportunities have been reduced due to the low tâdzié/sagow atihk populations.

Tâdzié/sagow atihku are part of the larger ecosystem. Declining populations are an indicator of the loss of integrity and health[17] of the whole system.

Knowledge holders from ACFN and MCFN base their understanding of tâdzié/sagow atihk on generations of observation and experience, including recognition of biophysical habitat, tâdzié/sagow atihk travel routes, natural population cycles, and relationships with predators. The importance of movement, both seasonally and otherwise, is a key principle that must be integrated into management actions to restore tâdzié/sagow atihk: maintaining movement corridors and ensuring that these animals can easily move around the landscape, especially for accessing safe and secure calving habitat, is a critical component of the nations' shared approach for tâdzié/sagow atihk recovery.

Tâdzié/sagow atihk are known to be very sensitive to habitat change and loss from oil and gas and forestry land use and require immediate habitat protection. Knowledge holders from both nations recognize that

16 Garabaldi and Turner (2004) define cultural keystone species as "culturally salient species that shape in a major way the cultural identify of a people, as reflected in the fundamental roles these species have in diet materials, medicine and/or spiritual practices." The concept of "cultural keystone species" builds from the concept of ecological keystone species, a useful but also controversial ecological concept. It is worth noting that woodland caribou are not considered to be an ecological keystone species.

17 The health of the system is determined based on Dené and Cree laws.

there are cyclical patterns to tâdzié/sagow atihk populations, with numbers increasing and decreasing in areas depending on the availability of food. However, widespread change and loss of their habitat continues to create conditions from which tâdzié/sagow atihk will not be able to recover; without immediate actions to recover their habitat, tâdzié/sagow atihk will be lost completely.

Tâdzié-Sagow Atihk Stewardship Plan Guidance

To develop this stewardship plan in accordance with the Section 11 agreement between ACFN, MCFN and the federal government, a technical team was established in late 2019, consisting of two staff members from MCFN's Government Industry Relations (GIR) department, two staff members from ACFN's Dené Lands and Resource Management (DLRM), and technical advisors from Firelight Research Inc. Two Indigenous Knowledge Advisors from each nation provided ongoing guidance to the technical team throughout the development of this stewardship plan.

From November 2019 to June 2021, the technical team worked with Elders and knowledge holders from ACFN and MCFN through a series of meetings, focus groups, and on-the-land workshops to develop this stewardship plan. This planning process, which is described in detail in Appendix 1, involved 22 knowledge holders from both communities and included more than 55 hours of meetings, held in person, in the field, and over remote conferencing software and conference calls. The knowledge shared in this stewardship plan aligns with and builds from previous efforts from both ACFN and MCFN, notably ACFN's 2012 tâdzié/sagow atihk stewardship report entitled *Níh boghodi: We are the stewards of our land* (Marcel et al. 2012) as well as numerous submissions to regulators regarding major projects that have been proposed in ACFN and MCFN territories.[18]

This work has resulted in the guidance contained within this stewardship plan, which must be used as the basis for recovering tâdzié/sagow atihk in ACFN and MCFN territories. The stewardship plan identifies a measurable goal for tâdzié/sagow atihk recovery, a series of principles that must be followed to achieve population recovery, and a set of management actions that must be taken to achieve the recovery goal. All of the information included in this plan has been verified by ACFN and MCFN knowledge holders. Where possible, quotes from knowledge holders are included to provide direct guidance. Statements pulled into text boxes have been subject to a rigorous joint verification process with knowledge holders from both communities.

During a four-day camp held on the land in August 2022, ACFN and MCFN Elders and knowledge holders affirmed the guidance and management actions contained in this stewardship plan and prepared the Tâdzié-Sagow Atihk Elders Declaration, a legal document that describes the authority, jurisdiction, rights and responsibilities of ACFN and MCFN in regard to the stewardship of Tâdzié/Sagow Atihk. ACFN and MCFN Elders and knowledge holders provided clear direction that the Tâdzié-Sagow Atihk Stewardship Plan must adhere to ACFN and MCFN Dené and Cree laws, while also ensuring that requirements of federal range planning for boreal caribou are met. These two principles are explored in more detail below.

18 ACFN and MCFN 2011, Candler et al. 2012, Candler et al. 2013a, Candler et al. 2013b Candler et al. 2015, MCFN et al. 2016, MCFN 2018, Candler and The Firelight Group 2018, and Candler et al. 2019.

Adherence to Dené and Cree Laws

> *The laws that have governed us to come this far and still survive, you really have to look at what did we do to survive that long and carry on. Look in declarations. We adapt to constant change; it's one of the things that we live by.* – ACFN 2019 Workshop

ACFN and MCFN assert their right to steward tâdzié/sagow atihk in their shared homelands through the Tâdzié-Sagow Atihk Elders Declaration. The Elders Declaration is a legal document and must be adhered to by all external governments and organizations working on ACFN and MCFN homelands.[19] Knowledge holders from both nations affirm the importance of adhering to Dené and Cree laws in identifying appropriate management actions to support tâdzié/sagow atihk stewardship and recovery. The articulation of those laws is different across the two nations; however, knowledge holders who came together to develop this plan and the Elders Declaration agree that many legal principles are shared by both nations.

SHARED LEGAL PRINCIPLES

Both nations are legal stewards of their territories. In signing Treaty 8, they agreed to share their lands, but the lands are still considered to be each nations' and traditional laws apply.

ACFN and MCFN have a responsibility to protect, care for, and manage the air, land, and water for future generations to continue to practice their way of life freely.

Indigenous knowledge must form the backbone of the stewardship planning process, because this knowledge respects MCFN's and ACFN's inherent rights to govern their territories using Cree and Dené laws and values.

Cree and Dené oral and written laws that must be adhered to in the development of the stewardship plan and management actions include the seven traditions, respecting family group areas, protecting cultural keystone areas, sharing resources, and taking only what you need.

Meeting Federal Range Planning Guidance

The 2020 Woodland Caribou Recovery Strategy identifies critical habitat for woodland caribou (boreal population) as: i) the area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for an ongoing recruitment and retirement cycle of habitat, which maintains a perpetual state of a minimum of 65% of the area as undisturbed habitat; and ii) the biophysical attributes required by boreal caribou to carry out life processes.[20] Achieving this level of undisturbed habitat across each range while maintaining important biophysical attributes for caribou necessitates a spatially

19 As of the finalization of this Stewardship plan, the Tâdzié-Sagow Atihk Elders Declaration is undergoing final verification with ACFN and MCFN Elders.

20 The 65% undisturbed habitat threshold provides a 60% probability for a local population to be self-sustaining and is considered a minimum threshold because at 65% undisturbed habitat, there remains a significant risk (40%) that local populations will not be self-sustaining.

explicit action plan, usually referred to as a range plan. Across Canada, provinces and territories have been delegated the opportunity to develop range plans for each range that falls within their jurisdiction.

This stewardship plan meets the requirements of a boreal caribou range plan, as described in the federal range planning guidance document (ECCC 2016b). According to that document, the main purpose of a range plan is to outline how range-specific land and/or resource activities will be managed over time and space to ensure that critical habitat for boreal caribou is protected from destruction. The Tâdzié-Sagow Atihk Stewardship Plan provides this spatially explicit guidance using an approach that was guided by the Indigenous knowledge of land users from ACFN and MCFN. Unlike many other boreal caribou range planning processes, which rely predominantly on scientific information, the Tâdzié-Sagow Atihk Stewardship Plan puts Indigenous knowledge first, relying fundamentally on the knowledge shared by community knowledge holders from both ACFN and MCFN to identify high value tâdzié/sagow atihk habitat. Where scientific information added value, it was also brought into the planning process and used to make the land use and trade-off decisions necessary to delineate areas that must be off-limits to further development.

Tâdzié-Sagow Atihk Stewardship Plan Goals and Principles

> *Guardianship by the First Nations people needs to be at the forefront of what we do for caribou. There are five key principles that we need to follow. First and foremost, we are the First Nations, and we are on treaty land. Second, this is our backyard — we have full authority. Third, we have firsthand knowledge of our land. Fourth, we are the scientists of the land, the scientists of nature, and that comes first. Finally, we believe in doing the work compassionately.* – ACFN member, 2019 Workshop

In keeping with shared Dené and Cree laws, knowledge holders from the two nations identified a clear goal and set of principles to guide stewardship and recovery of tâdzié/sagow atihk in the study area.

TÂDZIÉ-SAGOW ATIHK STEWARDSHIP PLAN GOAL

Recover tâdzié/sagow atihk populations to the extent that ACFN and MCFN can once again rely on tâdzié/sagow atihk for subsistence and cultural practices. This goal must be met in no longer than 40 years, with measurable and verified progress being achieved in set periods within that timeline. To meet this goal, knowledge holders identified a target of 80% undisturbed habitat within tâdzié/sagow atihk ranges by 2061, with calving habitats targeted at 100% disturbance free. In addition to being disturbance free, this habitat must contain all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season.[21]

21 The final statement in the goal is equivalent to biophysical habitat attributes as discussed in the 2020 Amended Recovery Strategy, Appendix H. Biophysical habitat needs include habitat required at the broad scale, as well as specific habitat needs for calving, post-calving, rutting, winter, and travel (Environment and Climate Change Canada 2020). Section 3 describes seasonal biophysical habitat needs for tâdzié/sagow atihk in the four ranges addressed by this stewardship plan.

TÂDZIÉ-SAGOW ATIHK STEWARDSHIP PLAN PRINCIPLES

- ACFN and MCFN inherent rights and oral Treaty signing must be included in any actions to recover tâdzié/sagow atihk populations and habitat. Ongoing planning for tâdzié/sagow atihk recovery needs to be guided by the knowledge of the two nations.
- Indigenous knowledge must be held at an equal weight to western science within the range planning process.
- There needs to be enough habitat protected to support healthy tâdzié/sagow atihk populations and a healthy environment.[22] This includes restoring disturbed habitat and protecting intact habitat — particularly habitat that contains the qualities required by tâdzié/sagow atihk to meet their needs throughout each season.
- Tâdzié/sagow atihk are a migratory[23] species and all the local populations were historically interconnected. There should be equal priority / protection for all caribou ranges in Alberta.[24]
- Tâdzié/sagow atihk population numbers cycle over time with habitat availability; this cycle should be maintained by ensuring sufficient, appropriate, and connected habitat is available to support healthy tâdzié/sagow atihk populations.

22 The concepts of "healthy caribou populations" and a "healthy environment" will be determined by Dené and Cree laws and include the concept of replenishing populations and habitats.

23 The Tâdzié-Sagow Atihk Stewardship Plan highlights tâdzié/sagow atihk movement and movement patterns as a critical aspect of their life history. Knowledge holders have made it clear that tâdzié/sagow atihk are not a sedentary species, and that they move across the landscape throughout the year to access different habitat and the associated services that these habitats provide. Community members used the term migratory to capture this idea; however, the term has a very specific definition in western science, so this plan refers to this aspect of tâdzié/sagow atihk behaviour using the terms "non-sedentary", "movement patterns" and "travel routes".

24 This statement includes all subpopulations within the ranges, i.e., all the currently isolated subpopulations must be maintained and reconnected into one population over time.

Stewardship Plan Overview

The remainder of this stewardship plan provides additional context for the decisions that must be made now to ensure that tâdzié/sagow atihk can once again thrive in the boreal forests and wetlands that are integral to their survival.

- **Section 2** of the report describes the state of tâdzié/sagow atihk habitat in the study area, providing information on habitat types and the current condition of habitat within the area that is encompassed by this stewardship plan, as well as the jurisdictional issues at play.
- **Section 3** of the report provides a detailed overview of the Indigenous knowledge that was shared and used to guide development of the management actions contained within this report, including key habitats and places, seasonal movement corridors, population trends, and pressures and threats to tâdzié/sagow atihk.
- **Section 4** draws on the knowledge and information shared in Sections 2 and 3 to define management actions for recovery of tâdzié/sagow atihk within spatially explicit zones. The three zones (Protection, Restoration, and Active Management) form the spatial basis for management actions included in the stewardship plan.
- Finally, **Section 5** describes the proposed approach that ACFN and MCFN are putting forward to implement this plan, including the invitation for close collaboration with the governments of Alberta and Canada, industry, and other potential partners.

SECTION 2

Tâdzié/Sagow Atihk Habitat in ACFN and MCFN Territories

TÂDZIÉ/SAGOW ATIHK HABITAT IN ACFN AND MCFN HOMELANDS primarily falls within the boreal forest ecozone (Downing and Pettapiece 2006). This habitat is characterised by deciduous, mixed wood, and coniferous forests, interspersed with extensive wetlands, streams, and lakes. The dominant coniferous species are white spruce, black spruce, and jack pine, and the dominant deciduous species are aspen and balsam poplar. Black spruce, tamarack, shrub, and sedge fens are the predominant wetlands of the region. Long, cold winters and short, productive summers describe the local climate. Wildfires are the main source of natural disturbance in the area, and these, as well as the abundance of water, drive vegetation patterns across the landscape.

Many species of plants and animals live in the area. Moose (Alces alces) wolves (Canis lupus), black bears (Ursus americanus), and tâdzié/sagow atihk are among the resident mammals; owls, grouse, and a number of passerine species are also native to the region. Along with the resident species, a rich and diverse collection of songbird and waterfowl species migrate to the area to stopover or breed each summer. As the largest inland boreal delta in the world, the Peace-Athabasca Delta, which is contained within the study area for the stewardship plan, is central to ACFN and MCFN culture and way of life (Candler et al. 2010).

Tâdzié/Sagow Atihk Habitat

> *It's hard these herds are classified as four different herds; at one time they were all one herd. They are getting divided, [from] loss of habitat and loss of vegetation.* – MCFN member, 2019 Workshop

The boreal's black spruce / tamarack-dominated wetlands interspersed with areas of higher ground are ideal tâdzié/sagow atihk habitat. Tâdzié/sagow atihk rely on large contiguous tracts of undisturbed mature and old boreal forests and wetlands for sustenance and protection. Tâdzié/sagow atihk have large ranges and low population densities, and by avoiding areas with high predation risk they are better able to evade predators (Hins et al. 2009; Pinard et al. 2012). Predator evasion is particularly important for the successful

raising of calves (Hins et al. 2009; Pinard et al. 2012). Due to their need for large tracts of undisturbed old forest, tâdzié/sagow atihk are sensitive to natural and anthropogenic forest loss and change (Fortin et al. 2017; Hins et al. 2009). Additionally, the population dynamics of predators (grey wolves and black bears) are also altered by the fragmentation of habitat (Leblond et al. 2016; Pinard et al. 2012). As the boreal forest becomes younger and more fragmented, more areas become accessible to deer, expanding their range deeper into northern forests (Latham et al. 2011a). With the increase in available prey, predator populations grow, and their encounter rate with tâdzié/sagow atihk — and thus predation pressure — increases (Latham et al. 2011a; Hervieux et al. 2014; Pinard et al. 2012).

Tâdzié/sagow atihk habitat in Alberta is fragmented by industrial development. The Red Earth, East Side of the Athabasca River, and West Side of the Athabasca River tâdzié/sagow atihk ranges have been particularly impacted by the industrial footprint, with less impact in the Richardson range. These ranges overlap with ACFN and MCFN's homelands, which extend around Lake Athabasca, over the Peace-Athabasca Delta, and south to Fort McMurray and the Clearwater River. Indigenous knowledge indicates that these four separate ranges were once all part of one large, interconnected population that has been fragmented by industrial development. Habitat mapping across the four ranges and the surrounding areas reveals a substantial array of boreal forests and wetlands that could have supported one large, continuous population residing within suitable habitat contained in this area (Figure 1). ACFN and MCFN knowledge holders recognize that, although the local population units recognized today in the study area have been designated into distinct ranges, tâdzié/sagow atihk in this area continue to be linked through movement patterns where connectivity exists. While the immediate priority is to ensure that each local population unit is supported to become healthy and self-sustaining, over the longer term it is critical to re-establish connectivity and movement patterns between these currently disconnected population units (ACFN 2020; MCFN 2020).

ACFN and MCFN knowledge holders recognize that, although the local population units recognized today in the study area have been designated into distinct ranges, tâdzié/sagow atihk in this area continue to be linked through movement patterns where connectivity exists.

Much of the tâdzié/sagow atihk habitat in northeastern Alberta has been lost or functionally disrupted by industrial development (Government of Alberta 2017). Industrial exploration in the form of seismic lines makes up a large part of the functional disruption of tâdzié/sagow atihk habitat in Alberta (Pickell et al. 2015; van Rensen et al. 2015). Many seismic lines persist in the boreal forest even after 35 years of non-use (Lee and Boutin 2006), meaning that the impact of the industrial footprint on tâdzié/sagow atihk lasts long past the collection of seismic information.

Within the current delineations of the Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River tâdzié/sagow atihk ranges, there is very little undisturbed habitat remaining (Table 1, Range Condition). Based on the targets set by the 2020 Amended Federal Recovery Strategy for Woodland Caribou boreal population (ECCC 2020), **65% of each range needs to be maintained in an undisturbed condition at all times so that populations have a 60% likelihood of maintaining self-sustaining levels.** However, the Richardson, East Side of the Athabasca River, West Side of the Athabasca

River, and Red Earth ranges have only between 10% and 16% of their ranges in an undisturbed state (Table 1, Land Status). All four ranges have perilously low levels of intact habitat (Figure 2).

TABLE 1. Habitat status of the Richardson, East Side of the Athabasca River (ESAR), West Side of the Athabasca River (WSAR), and Red Earth tâdzié/sagow atihk herd ranges (Government of Alberta 2017), including details on the levels and types of disturbances, and general land status and tenures of the ranges.[25]

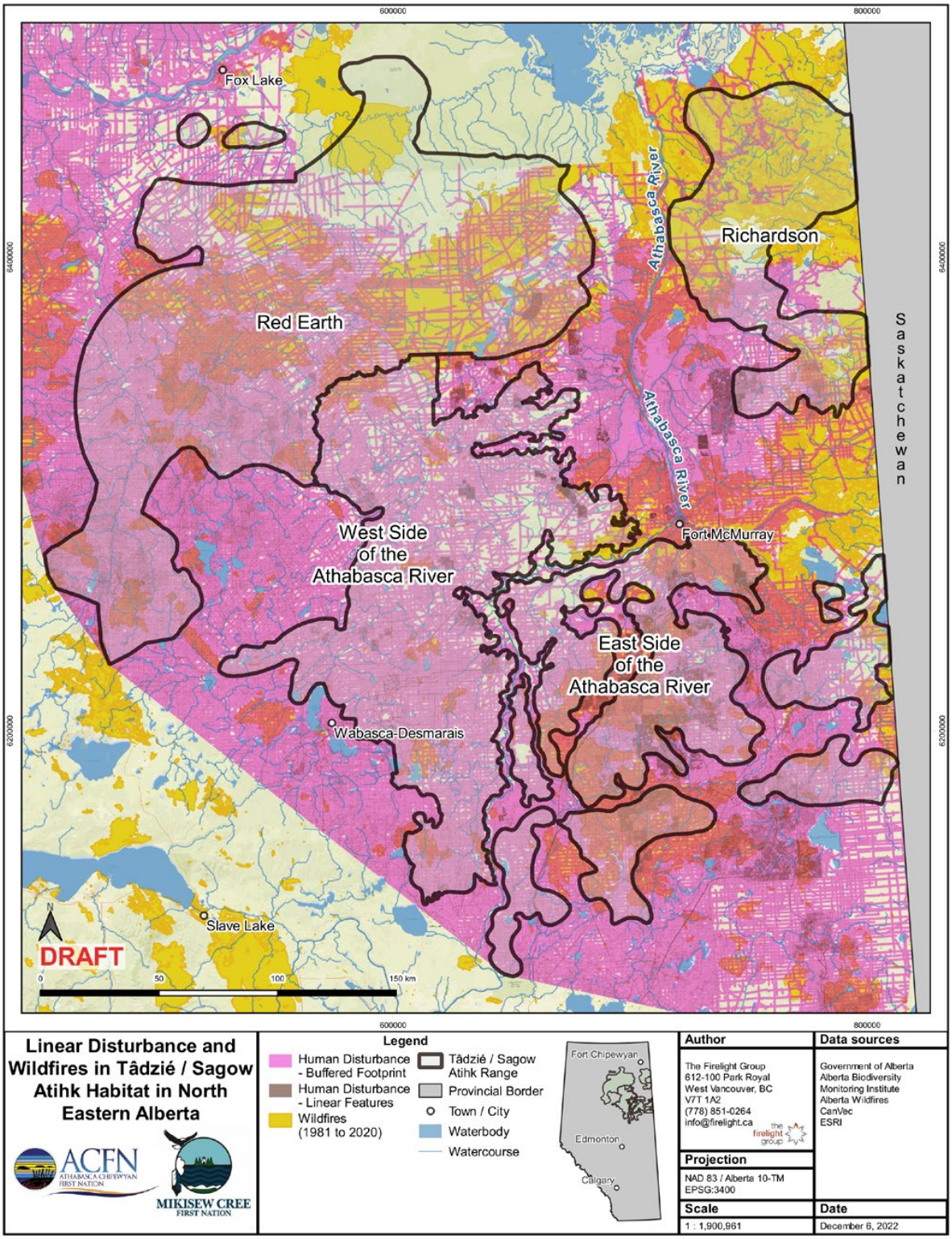
	Richardson	ESAR	WSAR	Red Earth
Range Condition				
Range size (ha)	707,350	1,315,980	1,572,652	2,473,729
% of undisturbed habitat	16%	10%	14%	16%
Types of Disturbances				
% of range disturbed by seismic lines	34%	84%	79%	68%
% of range disturbed by pipelines	1%	25%	18%	8%
% of range disturbed by forestry	<1%	13%	5%	7%
% of range disturbed by wildfire	65%	32%	6%	38%
Land Status				
% of range protected*	14%	2%	0%	14%**
% of range tenured – forestry	6%	87%	98%	35%
% of range tenured – oilsands	39%	73%	87%	34%
% of range tenured – petroleum natural gas	1%	49%	34%	15%
% of range tenured – metallic and industrial minerals	40%	0%	0%	1%

* Including Wilderness Areas, Ecological Reserves, Wildland Provincial Parks, Natural Areas, Heritage Rangelands, and Public Land Use Zones.

** When the anticipated western expansion of the Kitaskino Nuwenëné Wildland Provincial Park is finalized, that will increase the amount of range protected for the Red Earth herd.

25 Government of Alberta staff have indicated that they are updating these numbers to reflect current conditions. Once updated data are received, the numbers in these tables will be revised.

FIGURE 2. Map of the current disturbance footprint and impacted area within the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River tâdzié/sagow atihk ranges, and the immediate surrounding area. The brown lines are the linear features in the human disturbance footprint from ABMI (2017). The pink represents these linear features buffered by 500m to better reflect the remaining usable habitat for tâdzié/sagow atihk. This buffering method employs the approach developed by Environment and Climate Change Canada (Environment Canada 2011). Wildfires include the wildfire footprint from the last 40 years to more accurately reflect the areas in which the fire disturbances continue to impact tâdzié/sagow atihk habitat use. The 40 year cut-off is consistent with the approach developed by Environment and Climate Change Canada (Environment Canada 2011).



The lack of available undisturbed habitat impacts the ability of tâdzié/sagow atihk populations to be self-sustaining. A paper published in the Canadian Journal of Zoology by Hervieux et al. (2013) concluded that by 2013, the Alberta population was declining by about 50% every eight years. Table 2 summarizes the size, status, and trends of the Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River local population units, based on data from Environment and Climate Change Canada (Environment Canada 2011; ECCC 2017). This information shows that all but the Richardson local population unit are in decline and are very unlikely to be self-sustaining. The Ecojustice Petition for Critical Habitat Protection (Ecojustice 2017) summarises the population trends of Alberta's northeastern tâdzié/sagow atihk populations (Figure 3), and the trends clearly show dramatically declining herd populations in all but the Richardson range (which shows a slightly declining trend). Together, the data presented in Table 2 (particularly disturbance levels and levels of intact habitat) along with Table 2 (population trends) and Figure 3 (cumulative population changes) illustrate the apparent relationship between levels of habitat disturbance and population trends for tâdzié/sagow atihk in northeastern Alberta. These data point to the importance of **protecting intact habitat, focused on areas with the biophysical characteristics needed to support tâdzié/sagow atihk**, and **restoring impacted habitat** within ranges to help recover tâdzié/sagow atihk populations.

TABLE 2. Population status of the Richardson, East Side Athabasca River, West Side Athabasca River and Red Earth tâdzié/sagow atihk herds (data accessed from Government of Alberta 2017).[26]

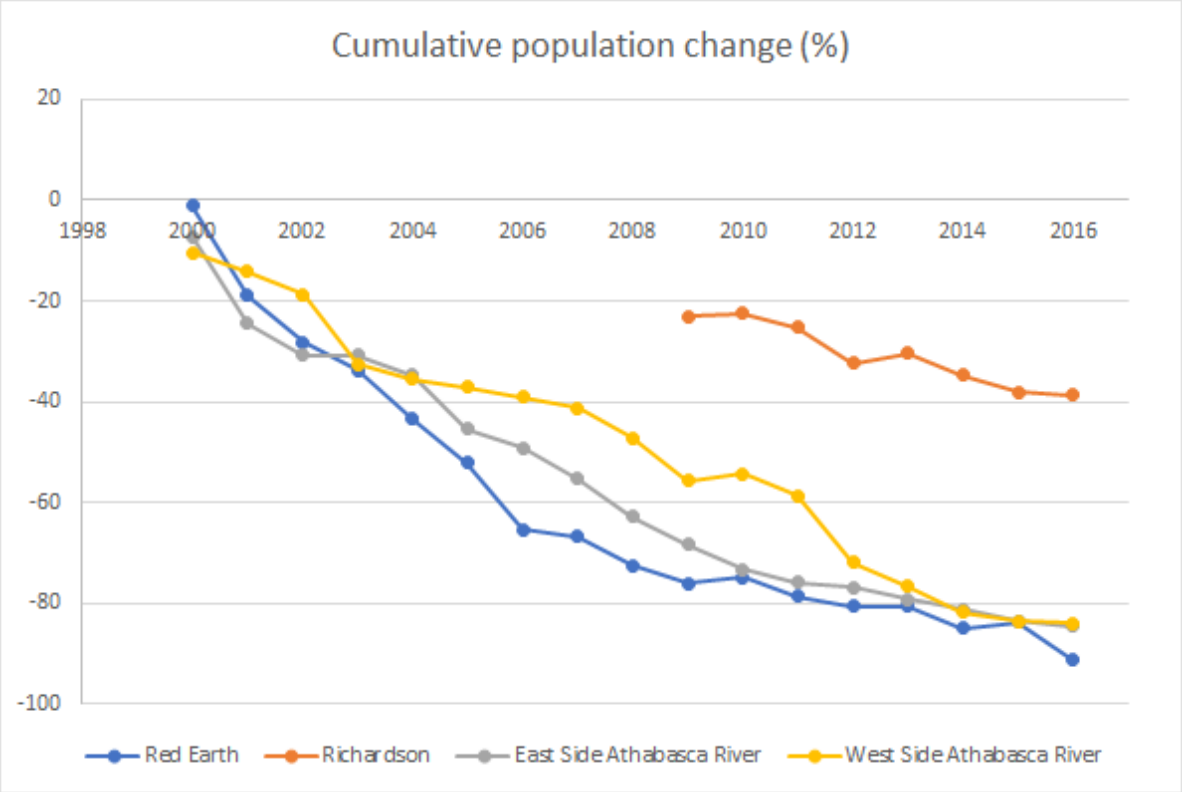
	Richardson	ESAR	WSAR	Red Earth
Size and Status				
Population size (# of individuals in minimum count)	125	227	133	~78
Population self-sustainability status (ECCC 2011)	N/A (insufficient data)	Very unlikely to be self-sustaining	Very unlikely to be self-sustaining	Very unlikely to be self-sustaining
Population Trends				
Population trend (ECCC 2017)	Stable	Continuing to decline	Continuing to decline	Continuing to decline
Population trend – 3-year mean population growth*	0.99	0.93	0.93	0.85
Population trend – 10-year mean population growth*	0.96**	0.90	0.88	0.88

* Growth rate of 1 indicates stable population (i.e. population size unchanged), a rate of >1 indicates positive growth (i.e. population increase), <1 indicates negative population growth (i.e. population decline).

**Represents the nine-year mean population growth (from 2009-2017).

26 Government of Alberta staff have indicated they are updating population numbers for the four ranges covered by this stewardship plan. Once these numbers are publicly available, this table will be updated to reflect current population estimates across each of the four ranges.

FIGURE 3. Tâdzié/sagow atihk cumulative population change from 2000 to 2016 for the Richardson, East Side Athabasca River, West Side Athabasca River, and Red tâdzié/sagow atihk ranges (Ecojustice 2017).[27]



The decline in the tâdzié/sagow atihk population has been particularly dramatic in the ranges in the southern part of the study area (Table 2; Figure 3), where habitat has been subject to tremendous amounts of industrial development (Figure 2). In response to development, knowledge holders have noted changes in tâdzié/sagow atihk movement patterns: tâdzié/sagow atihk are moving north, away from disturbance in the south (MCFN and ACFN 2020). Of the four herd ranges, only the Richardson range is considered to have a stable population at this time (Table 2). While only 16% of the habitat in the Richardson range is undisturbed, much of that area is disturbed by wildfire (65%) rather than industrial disturbance (~35%; Table 1). Recent studies from the SK1 range suggest that where disturbance is primarily wildfire, tâdzié/sagow atihk may be able to withstand higher levels of disturbance (ECCC 2020). However, this does not mean that the Richardson range is not under threat, as 39% of the range is tenured to oil sands, and 40% to mineral extraction (Table 1, Land Status).

27 For Figure 3, the original figure included data on the Cold Lake range, which has been removed from this image as the Cold Lake range is outside of the study area for this stewardship plan. Population estimates and trends are based on data from Alberta Environment and Parks and demonstrated using lambda values to represent average population growth. A lambda value of one indicates a stable population, while a number less than one indicates population decline. Government of Alberta staff have indicated that they are updating population numbers for the four ranges covered by this stewardship plan. Once these numbers are publicly available, this figure will be updated to reflect current population estimates across each of the four ranges.

Governance and Land Jurisdiction

> *…For thousands and thousands of years the Dené people have lived in this area and survived in this area. We didn't – we didn't live over ten thousand years on this land with not knowing how to manage this land. And I think that's important for people to understand that, when I say – when I say Dené laws, if you overharvest, there's a penalty to pay for that. It's just like any other crime you committed.* – ACFN member, October 2020

> *The land is the land. We protect the area that we love, we use the resources that are out there. Our resources happen to be birds, plants, buffalo, moose. [It is the] same with Alberta, but their resources happen to be minerals, oil, and they are using their resources as well. We should be able to manage those resources.* – MCFN member, 2019 Workshop

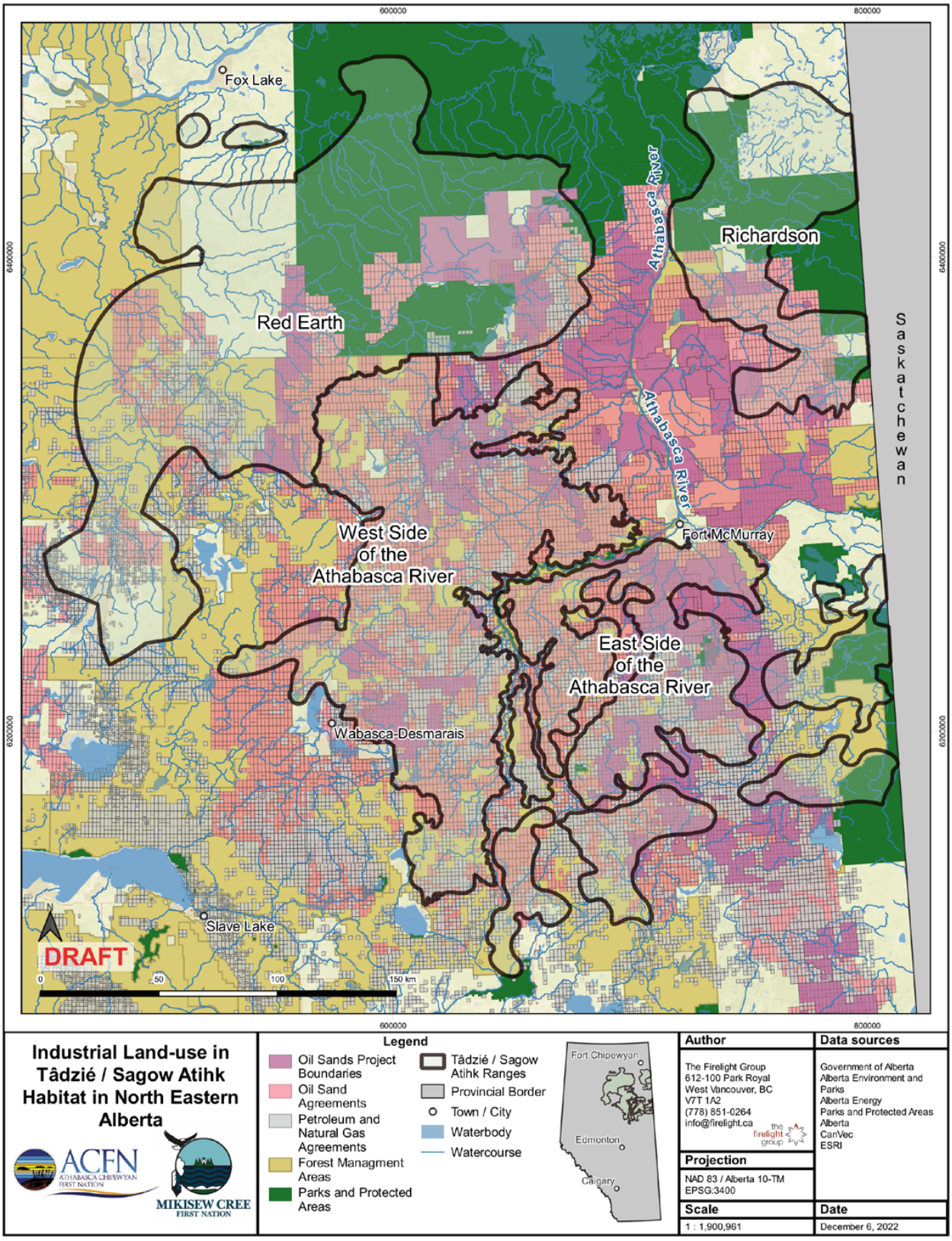
Though ACFN and MCFN hold the rights, responsibilities, and jurisdiction for stewardship within their homelands under Dené and Cree oral and written law, under Canadian law the Government of Alberta holds jurisdiction throughout much of the area (apart from areas designated as Federal Parks, i.e., Wood Buffalo National Park). Given this jurisdiction, the federal Recovery Strategy delegates responsibility for the recovery of boreal caribou in Alberta to the province (E 2020).

Alberta's responsibility to protect and recover boreal caribou conflicts with their efforts to support industrial development. Boreal caribou habitat overlaps with some of richest oil holdings in Alberta, and industrial leases cover high percentages of the Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River ranges (Table 1, Land status; Figure 3). The West Side of the Athabasca River range is particularly encumbered, with 98% of the area tenured to forestry, 87% tenured to oil sands development, and 49% tenured to petroleum and natural gas interests. The East Side of the Athabasca River range is similarly encumbered, and both ranges have low levels of habitat protection. Of the four ranges, Red Earth and Richardson are the least encumbered but remain at high risk of future land disturbance.

These numbers call for important shifts to be made in decision-making about industrial leases on provincial lands, with stronger efforts needed to ensure some areas can remain free of disturbance over the long term. As ACFN and MCFN knowledge holders have identified that tâdzié/sagow atihk must be maintained within all the areas included in this stewardship plan, collaboration is needed between industry, the provincial government, and the two nations' governments to ensure that high priority areas can be protected and allowed to recover.

In earlier planning documents (including ACFN and MCFN, 2020), the two nations have been critical of the Lower Athabasca Regional Planning Process (LARP) for its failure to adequately provide meaningful protection for the continued exercise of Treaty rights. There must be opportunities identified to revisit the LARP and reduce industrial encumbrances in boreal caribou ranges, to allow tâdzié/sagow atihk populations to recover.

FIGURE 4. Map of the current land use designations within the study area: in and around the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River tâdzié / sagow atihk ranges. In this figure, orange indicates the active petroleum and natural gas agreements, lime green indicates the active oil sands agreements, grey indicates the current oil sands project boundaries, and yellow indicates the forest management areas. The tâdzié / sagow atihk herd ranges are delineated in translucent white with black borders. All of the land use data comes from the Government of Alberta.



SECTION 3

Knowledge Summary

Key Habitats and Places

Important habitat requirements for tâdzié/sagow atihk include muskeg, moss, and a clean water source. Muskeg, islands of higher ground in the muskeg, jack pine forests, sand dunes, and highland plateaus with abundant muskeg are important environmental features that tâdzié/sagow atihk need.

Tâdzié/sagow atihk require habitats that provide clean water, food, and protection from predators. Muskeg habitat is particularly important, as these areas provide an abundance of lichen for tâdzié/sagow atihk to eat, as well as protection from predators that have a difficult time moving through the muskeg.

> *So, where there's muskeg, that's where you're going to find the caribou … They would bed down on the lake [ice in wintertime], and then if they were disturbed, they would go into the pines. And through the pine and into the muskeg. As soon as they hit the muskeg, they know they're safe. So, it's kind of their safe haven for them.* – ACFN member, October 5, 2020

> *...Where we've found them [tâdzié/sagow atihk], or seen them, is in muskeg, higher areas, top of the mountain plateaus where there's a lot of bog and moss and stuff like that. They eat the caribou moss — I imagine they eat it if they're hungry. They eat other willows and other plants, I guess. Yeah, generally just mostly moss and something [...] That's where we've seen them, and seen them eating in wintertime. Pawing at the snow and stuff. Scraping, I guess trying to get food.* – MCFN member, October 6, 2020

The Richardson Backcountry provides remote and relatively undisturbed areas of jack pine and muskeg habitat. ACFN and MCFN knowledge holders report that this region is used extensively by tâdzié/sagow atihk.

That whole area, like south of Richardson, is all the same, it's all jack pine and caribou moss and muskeg, right? And that's the prime area, caribou like it. 'Cause you know you hardly see woodland caribou in like boreal forest where it's thick and everything. – MCFN member, October 7, 2020

And [the Richardson Backcountry] is a quiet area here. Why the caribou are moving North... Because that's all watershed, open country, muskeg, and white moss country. And that's their habitat, and that's remote. That's more remote up there because there is not many human beings that go up there. – ACFN member, October 5, 2020

High elevation areas are also important for tâdzié/sagow atihk, particularly for calving and insect avoidance. The Birch Mountains offer particularly good calving habitat because of the unique combination of high elevation and muskeg habitat found here.

Birch Mountain, when you start climb it, there's all kinds of muskegs up there. Huge, huge muskegs. And that's where those caribou go and have their calves. – ACFN member, October 5, 2020

"Why the caribou are moving North... Because that's all watershed open country, muskeg, and white moss country. And that's their habitat, and that's remote. That's more remote up there because there is not many human beings that go up there."

Sand dunes were also noted by knowledge holders as habitats in which tâdzié/sagow atihk are often seen, including the dunes near Firebag and Beaver Point. Knowledge holders reported that these dunes provide a host of unique plants that are not found elsewhere in the territory (ACFN Member, October 4, 2010).

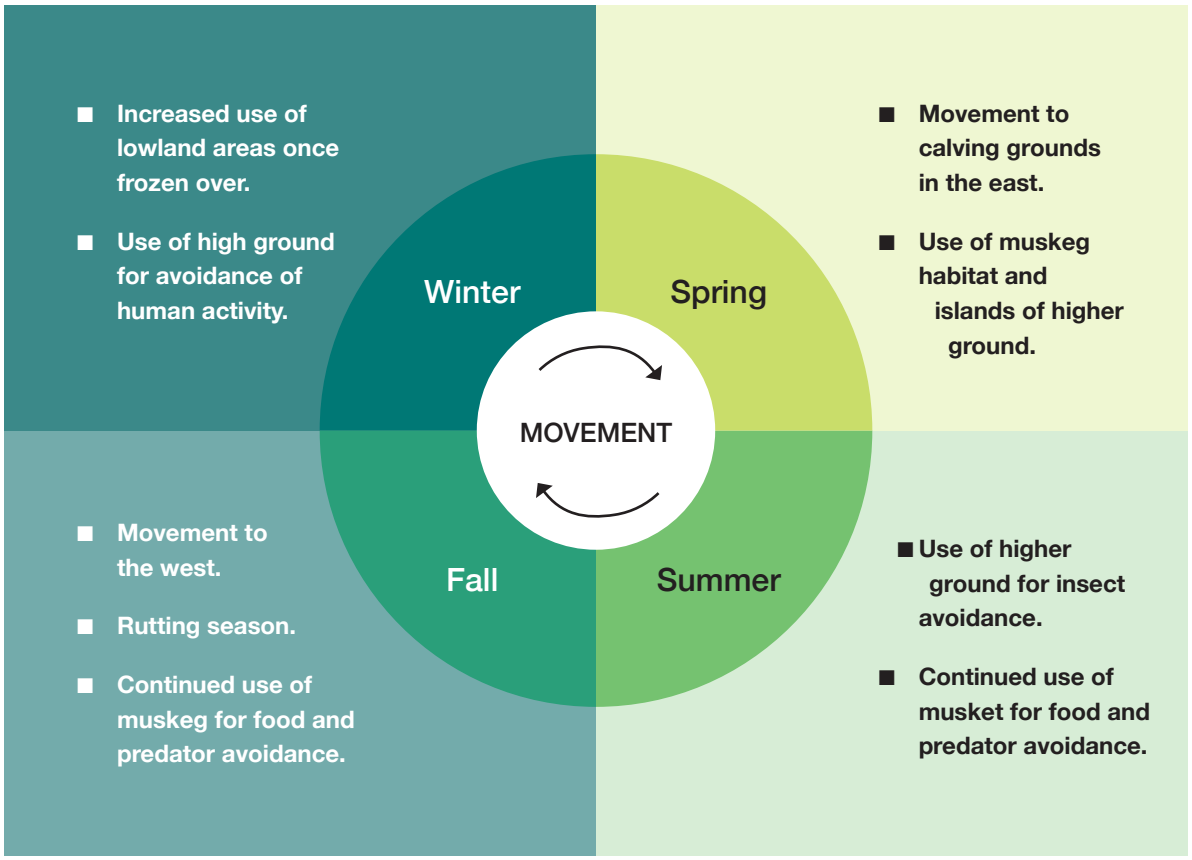
Seasonal Habitat Use and Movements

Seasonal movement is important to tâdzié/sagow atihk, especially between the Richardson backcountry and Birch Mountains. Protecting movement corridors is important for tâdzié/sagow atihk recovery.

Over the course of a seasonal round, tâdzié/sagow atihk move extensively between key habitats and places, especially in the spring and in the fall (Figure 4). For some tâdzié/sagow atihk, movement is eastward in the spring, to the Richardson backcountry. During the fall, these tâdzié/sagow atihk will return west to the foothills of the Birch Mountains.

> *Migration routes that happen twice a year. Right now, that's happening into the west. And the spring coming back out [to the east].* – ACFN member, October 3, 2020

FIGURE 5. Seasonal habitat use and movements of tâdzié/sagow atihk



During the spring, tâdzié/sagow atihk seek out muskeg habitat with plenty of food, where they can raise their calves. Islands of higher ground in the muskeg provide protection for young calves from predation by animals such as wolves and bears.

> *If they [tâdzié/sagow atihk] were to have young ones and they go and have it out in those islands in the muskeg. While the water protection is there right. Yeah, the watershed protects them there. Make it that, that hard for like the wolves. Or the bear, or anything that can get at the woodland caribou.* – ACFN member, October 5, 2020

> *Where they calve is the higher ground. Caribous are very smart. You never hear of caribou drown.* – MCFN member, October 4, 2020

In the summer, tâdzié/sagow atihk tend to remain in areas of higher ground, which provide relief from insects.

> *They [tâdzié/sagow atihk] stay in the higher ground where there's winds so [they] keep away from mosquitoes and stuff like that, because there's a lot of mosquitoes in the swamp…* – MCFN member, October 6, 2020

In the fall, tâdzié/sagow atihk undertake extensive movements once again, with some traveling west to the foothills of Birch Mountain, for example. These tâdzié/sagow atihk are often seen in small bands of two to ten tâdzié/sagow atihk, dispersed throughout the area. Here they continue to use muskeg habitats, which provide food and help them avoid predators, such as wolves.

> *Well right now the migration, this is the fall migration. They [tâdzié/sagow atihk] go to the foothills of Birch Mountain … That's in the fall when they come to the west, in the spring they go back to the east. But these bands that are in these small numbers and these bands where they're at, right now where they going to be for a while. And these small bands, two to five, four, ten, they're all over the place inside there.* – ACFN member, October 2, 2020

"...They're only there in the wintertime because the water is really deep there. So in the summer time they're up by my cabin there in that big dark area? It's an old burn ... It burnt years and years and years ago. So they hang out in there until it freezes, and then they go walk around those lakes..."

> *All the caribou are in the muskeg right now. They're away from the wolf and all their habitat's right in that muskeg.* – ACFN member, October 5, 2020

During the rut, males from neighbouring herds may also travel across ranges to mate.

> *The males could come and visit this herd here and breed. So, this herd here instead of crossbreeding. They could come over and visit these guys and mate.* – ACFN member, October 5, 2020

In the winter, tâdzié/sagow atihk move into lowland areas, where the water of lakes and large muskegs has frozen over. Lowland winter habitat includes areas such as Herb Lake (ACFN Member, October 3, 2020), Brander Lake (ACFN Member, October 5, 2020), and French Lake (MCFN Member, October 6, 2020).

> *Down at the bottom where these lakes are is all big muskegs and stuff like that. But [the tâdzié/sagow atihk], they're only there in the wintertime because the water is really deep there. So, in the summertime they're up by my cabin [southwest of Anzac, on higher ground] there in that big dark area? It's an old burn ... It burnt years and years and years ago. So, they hang out in there until it freezes, and then they go walk around those lakes...* – MCFN member, October 6, 2020

Depending on snow depths and weather conditions, some tâdzié/sagow atihk remain in areas of high ground during the winter, likely due to the lack of disturbance in these remote locations. High elevation areas in the foothills of Birch Mountain, for example, provide relatively undisturbed habitat where calves learn to survive on the land.

> *In the foothills of Birch Mountain, there's three main corridors... That would be the spots, and in the winter months... some [of the tâdzié/sagow atihk] are on top. Because there is no wildfire, no activity up there. Where the young ones have got a chance of growing up and they're being taught and trained. Survival of the land, that's why they're up there. But that depends, I guess too, the amount of snow, and the weather, everything balances on the weather pattern.* – ACFN member, October 5, 2020

In late February, tâdzié/sagow atihk begin moving back towards their calving habitats for the spring. In some areas, such as the foothills of Birch Mountain, there are specific movement corridors that provide pathways for animal activity year after year. Tâdzié/sagow atihk movement corridors follow the valleys and tributaries between the Athabasca River and Birch Plateau, overlapping with the area known as Caribou Corner (ACFN Member, October 5, 2020), as well as the Firebag River (at the 26th parallel), Athabasca River (ACFN Member, October 5, 2020), and Moose Lake (ACFN Member, October 5, 2020).

> *Now they're migrating to the west […] Whether it be down on the slope of those three, three main corridors that go on the west foothills of Birch Mountain. That's the pathway for all animal activity. In the spring ... they do the same action route going to the east.* – ACFN member, October 5, 2020

While undertaking seasonal movements, tâdzié/sagow atihk tend to move from muskeg to muskeg, staying in the areas that are safe for them.

> *It's all boreal forest so, you have a lot of pine in this area and a lot of sand. So what the caribou do, in between the foothills there'll be muskeg. Then 'til you get up on the foot hill on the other side, again it will be all sand and pine. So that's what they do, they kind of follow those corridors, staying in the muskeg. I think that's where they feel the safest. All able to get around, they're able to get away from wolves cause wolves can't go through the muskeg very well.* – ACFN member, October 5, 2020

River crossings are an important part of tâdzié/sagow atihk travel routes. Ideal areas for crossing include islands where tâdzié/sagow atihk, especially calves, can stop to rest.

> *They'll make a choice where they gonna cross … They'll pick out the specific spot, I guess. Just like human beings, we always looking for an easy way or an easy spot. They do the same thing ... The more islands for them to cross in between, is better for them because they can, especially for the young ones, 'cause you can stop and rest. You go to the next island and cross the other side ...* – ACFN member, October 3, 2020

Indigenous Knowledge-based Tâdzié/Sagow Atihk Habitat Model and Key Habitat Features

ACFN and MCFN Indigenous knowledge of important habitat for tâdzié/sagow atihk is consistent with the scientific understanding of tâdzié/sagow atihk habitat suitability. The tâdzié/sagow atihk habitat classifications laid out in the Enhanced Wetland Classification dataset from Ducks Unlimited Canada and the biophysical critical habitat mapped by the Government of Alberta both reflect what knowledge holders reported as quality tâdzié/sagow atihk habitat. Specifically, in Arsenault's cover type preference rating of the Ducks Unlimited Enhanced Wetland Classification dataset (Arsenault 2014; Smith et al. 2007), the habitats identified as most preferred by tâdzié/sagow atihk are regions where the habitat cover type consist of: upland pine forests, treed bogs, shrubby bogs, tree rich fens, tree poor fens, tamarack swamps, conifer swamps, upland conifers, graminoid bogs, shrubby rich fens, and shrubby poor fens (Figure 1; for more information on the specifics of the tâdzié/sagow atihk preference ratings, see Arsenault 2014). The Government of Alberta identified tâdzié/sagow atihk biophysical critical habitat by using telemetry data to identify the vegetation stratum that tâdzié/sagow atihk select.[28] Through their analysis, the Government of Alberta identified the vegetation stratum outlined in Table 3 on the following page as biophysical habitat for the boreal plains ecozone[29] in Alberta.

In addition to describing seasonally important habitat, ACFN and MCFN knowledge holders identified key habitat locations for tâdzié/sagow atihk, were identified by knowledge holders. These included areas in and around the Richardson backcountry, Birch Mountains, Firebag River, and Twin Lakes.

While habitat mapping developed by Arsenault and the Government of Alberta is consistent with ACFN and MCFN Indigenous knowledge of key habitat types, the movement patterns and movement corridors that

28 Specifically, this was done by comparing the radio-telemetry locations of collared tâdzié/sagow atihk to randomly generated locations within the same area. The vegetation across this area was classified into vegetation strata using the Alberta Vegetation Inventory (where possible), and the Enhanced Wetland Classification dataset (where no Alberta Vegetation Inventory data exists). The vegetation strata at the locations of the true and randomly generated telemetry data were then compared with each other to identify tâdzié/sagow atihk vegetation strata use and selection (for more information see Alberta Government 2018).

29 The majority of the tâdzié/sagow atihk ranges within the Boreal Plains ecozone (including the Red Earth, West Side of the Athabasca River, East Side of the Athabasca River and Richardson ranges) selected for the same vegetation strata, however not all did. This section identifies specifically the vegetation strata that fall within the Boreal Plains ecozone grouping that includes the ranges within the study area.

knowledge holders identified are not well reflected in these datasets. The Government of Alberta telemetry-based movement data shows movement patterns within ranges but suggests very little movement between ranges. Therefore, the technical team drew heavily on descriptions provided by ACFN and MCFN knowledge holders to delineated tâdzié/sagow atihk movement corridors. For example, ACFN and MCFN knowledge holders identified movement corridors following the tributaries and valleys between the Athabasca River and Birch Islands / Birch Plateau (Figures 7 through 9).

TABLE 3. Names of the vegetation strata outlined as biophysical habitat for tâdzié/sagow atihk in the Red Earth, West Side of the Athabasca River, East Side of the Athabasca River and Richardson ranges by the Government of Alberta.

Broader Vegetation Categories	Vegetation Stratum Name
Deciduous Aspen	Aspen leading, no Poplar
Mixed wood Poplar	Poplar / Black Spruce
Mixedwood Black Spruce	Black Spruce / Aspen
	Black Spruce / Poplar
	Black Spruce / Birch
Mixed wood Fir	Fir / Aspen
	Fir / Poplar
	Fir / Birch
Conifer Pine	Pure Pine
	Pine leading with White Spruce
	Pine leading with Black Spruce
	Pine leading with Fir
	Pine leading, no Spruce and Fir
Conifer Black Spruce	Pure Black Spruce
	Black Spruce leading with Pine
	Black Spruce leading, no Pine
Conifer Larch	Larch leading
Conifer Fir	Pure Balsam Fir
	Balsam Fir leading with Pine
	Balsam Fir leading, no Pine
Wet Areas	Wet / wetland component

FIGURE 6. Tâdzié / sagow atihk movement corridor from the Red Earth range boundary to Lake Claire. The movement corridor (displayed in yellow) and was identified by ACFN and MCFN knowledge holders. Waterbodies and watercourses are displayed in blue, and the Red Earth tâdzié / sagow atihk range is a translucent white with a black border. The map is overlain on satellite imagery from Google.

FIGURE 7. Tâdzié / sagow atihk movement corridors between the Red Earth – Richardson range boundaries. The movement corridors (displayed in yellow) and were identified by ACFN and MCFN knowledge holders. Waterbodies and watercourses are displayed in blue, and the Red Earth and Richardson tâdzié / sagow atihk ranges are a translucent white with black borders. The map is overlain on satellite imagery from Google.

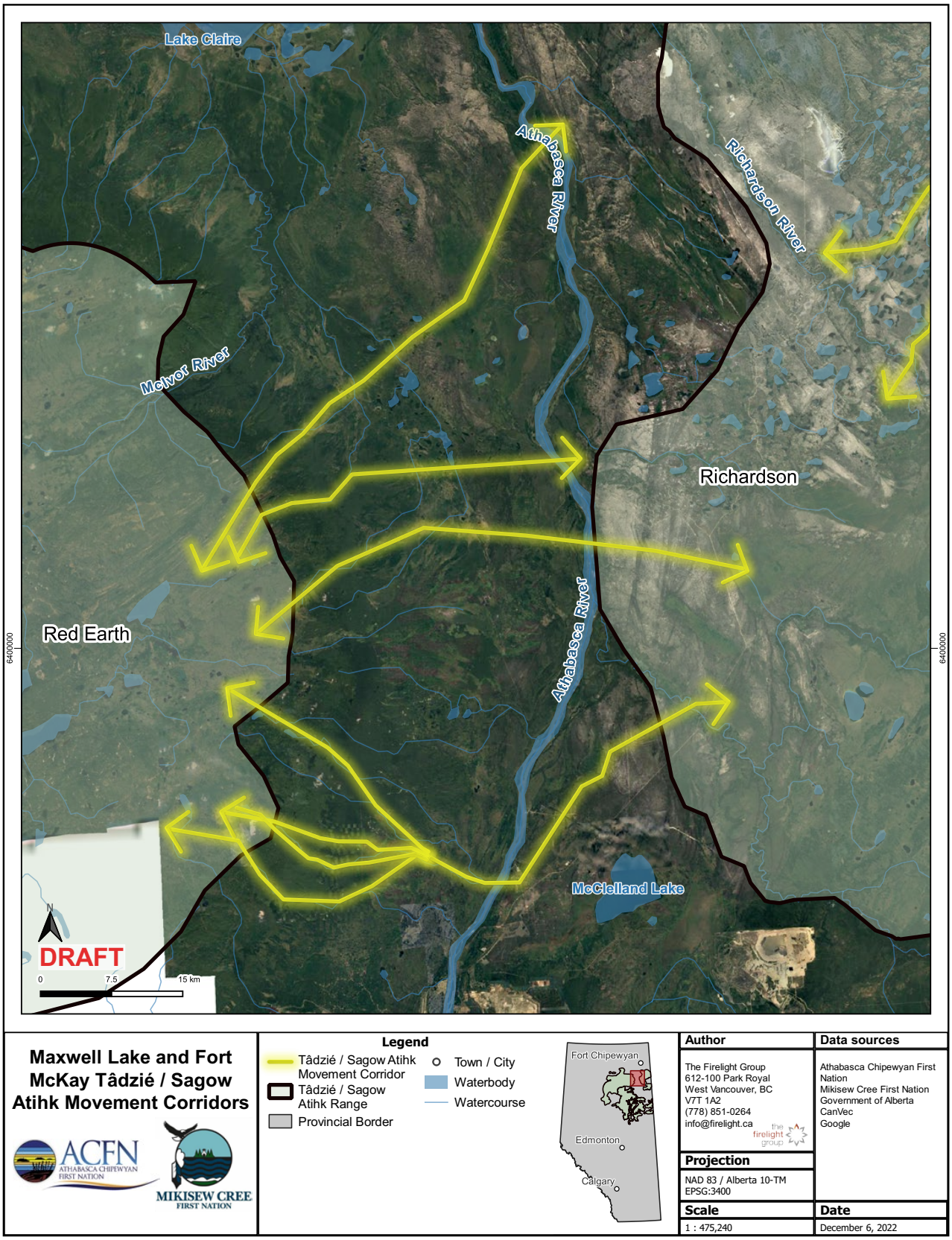
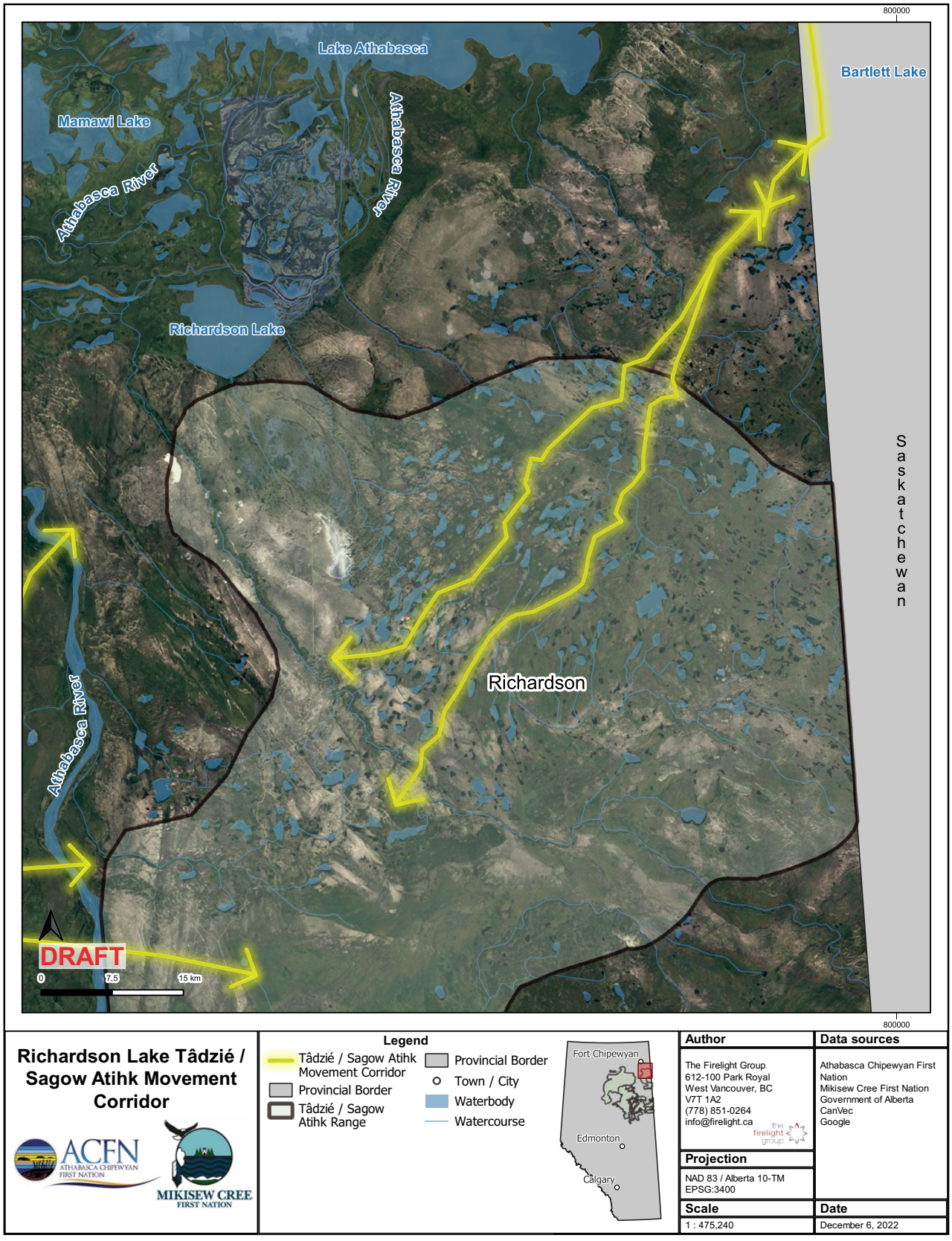


FIGURE 8. Tâdzié / sagow atihk movement corridors along Richardson Lake in the Richardson range and northeast towards Saskatchewan. The movement corridors (displayed in yellow) and were identified by ACFN and MCFN knowledge holders. Waterbodies and watercourses are displayed in blue, and the Richardson tâdzié / sagow atihk range is a translucent white with a black border. The map is overlain on satellite imagery from Google.



In addition to describing important habitat, identifying key tâdzié/sagow atihk areas and delineating movement corridors, the technical team identified areas of high tâdzié/sagow atihk cultural importance, including areas mapped by both nations specifically for this study, and areas compiled from earlier studies. This additional information identifies the locations of direct interactions by community members with tâdzié/sagow atihk (i.e., visual sightings or historical kill sites from before the nations imposed a moratorium on harvesting) , as well as locations that are important for access to tâdzié/sagow atihk. Based on these data, the technical team identified 116 locations of direct tâdzié/sagow atihk interactions and 2332 access locations.

Population Trends

Tâdzié/sagow atihk are in critical, steady decline that is well documented by ACFN and MCFN knowledge holders. There has been a noticeable decline in calf survival and tâdzié/sagow atihk continue to move away from industry and noise.

Tâdzié/sagow atihk population declines documented in the scientific literature are well supported by ACFN and MCFN knowledge. Compared to years past, ACFN and MCFN knowledge holders reported that tâdzié/sagow atihk are no longer seen as often or in as large of numbers.

> *I see them now… In the moss, like muskeg… Yeah, a lot of caribou. Yeah. A lot of caribou. But they're not as much as before. Not very often… And now I think you only see one or two at a time.* – MCFN member, November 7, 2018

> *There was lots of caribou before, lots. All around Anzac where I live there was caribou all over the place, now there's nothing…* – MCFN member, 2012

Calf survival has noticeably declined, and knowledge holders expressed concern that increasing industrial development and activity have placed tâdzié/sagow atihk under greater stress, affecting their ability to feed, calve, and move through the landscape successfully.

> *The calves are not surviving like they should. But that's probably – well you know the other thing I was thinking too; don't you think all these caribous in these areas are all stressed out? You know like we get, you know we get a lot of commotion around us, we get all stressed out naturally. I'm just thinking, I wonder if that does that to animals. They get all stressed out now they're all lost, they don't know where to go, everywhere they go there's either people or roads or you know it puts an animal, you know I don't know the affects the animal in the long run being stressed out all the time. Never a quiet area where they could do their feeding or calving or now they probably don't even know how to migrate.* – MCFN member, October 7, 2020

Tâdzié/sagow atihk are part of the larger ecosystem and declining populations are an indicator of the loss of integrity and health of the whole ecosystem.

Pressures, Threats, and Impacts

Tâdzié/sagow atihk are smart, sensitive, and shy so they are heavily impacted by noise and smells. They move away from areas of high industry and recreational activities where there is habitat disturbance.

ACFN and MCFN knowledge holders attributed declines in tâdzié/sagow atihk populations to a variety of pressures, threats, and impacts, including: habitat change, loss and disturbance; predation pressure; disease; and climate change. The cumulative effects of these pressures impact tâdzié/sagow atihk distribution, movement, condition, and survival.

Habitat Change, Loss, and Disturbance

Tâdzié/sagow atihk rely on large tracts of undisturbed land, and as a result, they are particularly sensitive to the effects of habitat change, loss and disturbance. As industrial development increases, ACFN and MCFN knowledge holders have noted that tâdzié/sagow atihk are moving further away to avoid these areas.

> *We destroy the habitat, we destroy the caribou.* – ACFN member, October 4, 2010

> *The industry has a big part in how they [tâdzié/sagow atihk] move, and where they going to move too, and what they are going to, day to day activity…* – MCFN member, October 2, 2020

> *They [industry] are taking more land and taking more of the habitat that the caribou need ... They get away from that industry and they're going farther west and they are going farther east. Where it is quiet, where they can raise their kids actually. And have that freedom again. And if we don't do something about them, we are going to have nothing again.* – ACFN member, October 2, 2020

Key industry pressures raised by ACFN and MCFN knowledge holders include mining, oil and gas exploration and development, and forestry. Knowledge holders noted seismic lines associated with oil and gas exploration as a source of habitat loss in boreal forests, driving tâdzié/sagow atihk out of these areas. Air and soil pollution as a result of industrial activities were also reported as a source of habitat degradation, resulting in the contamination of vegetation in tâdzié/sagow atihk habitat.

> *We are losing them at a fast rate right now, as we speak. Wherever you put cutlines…you think caribou will stay there? Never, they are gone in all directions…they need the boreal forest and that is where the oil and gas development is happening.* – ACFN member, October 4, 2010

> *With their vegetation, there's so much stuff in the air, so much pollution, maybe it changed the vegetation for them that they have to move … You know like there's so much pollution in the air that you know like it's even driving the moose away.* – MCFN member, October 2, 2020

Habitat degradation is also caused by increased traffic associated with industrial activity, particularly where roads interact with the seasonal movement corridors of tâdzié/sagow atihk. Knowledge holders identified increased recreational traffic on the Fort Chipewyan Winter Road, for example, as a concern for blocking the seasonal movement of tâdzié/sagow atihk.

The activity on that [Fort Chipewyan winter] roadway, it might as well be like out in that mine pit, that mine site. All heavy machinery, equipment going. That's how traffic is going to be. This is something the caribou, being very sensitive animal, very shy animal. Yes, it can cover a lot of ground because caribou can migrate long distances. But this is one stopping, one stopping block for them. – ACFN member, October 5, 2020

The increasing frequency of forest fires compounds the effects of industrial development, which impact tâdzié/sagow atihk habitat and food availability. Lichen is slow to recover following a forest fire, decreasing the amount of forage available to tâdzié/sagow atihk. It may take several decades for lichen loads to recover and for tâdzié/sagow atihk to return to these areas following a forest fire.

Because even here [at Kathy McGuiness'], you can see, what would caribou eat after the burn here? They're not going to be here another fifty years, even more, 100 years maybe before the moss come back. – MCFN member, October 4, 2020

Once the moss is burnt, it's not coming back for maybe 50 years or more. I used to do a study about the moss... bunch of cranberries and everything on those things and they're not coming back. So that's why, that's why you see all these caribou right now, they're trying to looking for their foods. They mostly find their food with a little bit of water or where it hasn't been burned… – MCFN member, October 2, 2020

"They get away from that industry and they're going farther west and they are going farther east. Where it is quiet, where they can raise their kids actually. And have that freedom again. And if we don't do something about them, we are going to have nothing again."

Sensory disturbance from industry and recreational activities also creates areas of avoidance that limit tâdzié/sagow atihk movement and habitat use.

[Tâdzié/sagow atihk are a] very elusive animal. Really shy, doesn't like to be encountered. As soon as they see people, they're gone. As soon as they hear things, they're gone… – ACFN member, October 5, 2020

Predation Pressure

Habitat change (such as from forest harvesting), habitat loss (such as from development of industrial facilities) and linear disturbances (such as roads, pipelines and seismic lines) have increased predator abundance and access to tâdzié/sagow atihk. Knowledge holders reported that industrial activities and development influence tâdzié/sagow atihk distribution and habitat use, driving them into smaller areas where they are more susceptible to predation.

Because all the cut lines and stuff that industry makes and stuff like that, it really doesn't give the caribou much of a chance to ... When they build leases and stuff and they push caribou in these little pockets – the wolves find them. And any animals – the moose and all that kind of stuff, really

take a toll on everything because industry kind of forces them into areas and the wolves go there and they kind of clean them out of there... – MCFN member, October 6, 2020

Decreased trapping by ACFN and MCFN members has also increased wolf populations in the region. This has, in turn, increased predation pressure on tâdzié/sagow atihk, contributing to tâdzié/sagow atihk population declines.

You know, when people are saying there's lot of caribou, but you got to – you better think back like, say 50 years ago. Or any time after that, 40 years ago, 50 years ago, there [were] a lot of trappers in the area [Richardson and Athabasca area] ... And so, so those people you know, knew more about [tâdzié/sagow atihk than] anyone of us ... They could be a handful of trappers now, maybe five. In the Athabasca River I think there is only one, one beside... Like I said, years ago there's people trapping all over. You're talking about predators, there was less predators at the time because of all of the trappers ... 40 years ago there would be nothing running around here. They'd all be on a stretcher. – MCFN member, October 6, 2020

The predators do take their toll there on the species. There has to be some sort of control on them to bring back the caribou. – MCFN member, October 6, 2020

Knowledge holders attributed the decrease in trapping to increasing expenses, such as the cost of gasoline, and the reduced value of pelts compared to decades past. Wolves are difficult animals to trap, and without adequate payment trappers cannot offset the costs of their efforts.

When we're out there we trapping, we trying to catch any kind, wolves, foxes. So that, nobody's doing that [trapping] now. When I'm out there, I don't hunt and trap any more foxes or wolves. It's too much work for wolves anyway. The price of them are not what they used to be. I remember when trapping foxes you'd be getting hundred dollars for pelts. And now you're lucky to get five dollars ... We're spending more than you can earn for trapping now these days. Plus the youth is not into it. All the trappers landing stuff are all elderly now. – MCFN Member, October 6, 2020

It's super hard to trap wolves. They're the smartest animal in the bush – yeah, they're really hard to trap. But if they pay you to do it makes – you put a bit more effort in and it helps out… – MCFN member, October 6, 2020

Some knowledge holders noted that there have been notable increases in local tâdzié/sagow atihk numbers in areas where predator management has been undertaken. These activities have included government-led wolf culling programs, as well as trapper programs that provide payment for the trapping of wolves.

And the government also had a wolf [program], where the government went out in a helicopter and they shot a whole bunch of wolves, in between Saskatchewan border, from there all the way to the Athabasca River and they shot like 500 wolves or something like that. And it made a huge impact on the caribou ... there's more of them [tâdzié/sagow atihk] though. I'm surprised, in the past few years they did that and then the government started a trapping program for the trappers in the areas where the caribou are ... and they paid us to trap wolves. So more people trapped wolves and now there's more caribou. – MCFN member, October 6, 2020

Parasites

Parasites or “worming” have been observed more in tâdzié/sagow atihk meat. This affects the quality of tâdzié/sagow atihk meat.

> *Hardly anybody would eat caribou right now because of the worming. Everybody says that. I see it myself. My auntie wanted to eat one time and I told her about it, ‘you still want to eat it?’ … Sure they [the tâdzié/sagow atihk] look fat and everything, but ... my auntie was going to make some dry meat and I was showing them like on the side when I cut it off ... There’s little white little – little worms.* – MCFN member, October 6, 2020

Climate Change

Climate change has impacted tâdzié/sagow atihk movement cycles and access to their winter-feeding grounds. Knowledge holders have noted that tâdzié/sagow atihk and other animals are moving differently on the landscape as climatic patterns change. Warmer winter temperatures are also changing the conditions of the snow, making it more difficult for tâdzié/sagow atihk to forage through a thicker frozen crust.

> *Animals [are] getting disturbed by the world, it means that they miss their way. They’re mixed up. They are popping up all over. They are travelling. Long time ago, never used to have this summer weather here. We just barely have winter here now. Something is happening, and they’re moving all over ... I think it’s just the warming* – MCFN member, October 4, 2020

> *About two years ago he [a friend from up north] said, ‘Hey buddy’ he said, ‘we never had warm weather years and years and years back up north, all of a sudden it’s just warm,’ he said, ‘middle of winter, and the crust is about 3-4 inches thick frozen snow,’ so he said, ‘the caribous are having a hard time, they’re starving. To feed themselves, they dig on that crust. Before it never used to be like that,’ he said.* – MCFN member, October 4, 2020

SECTION 4

Stewardship Plan Management Actions

RECOVERY OF TÂDZIÉ/SAGOW ATIHK in ACFN and MCFN homelands requires immediate action, which has not been adequately taken to date by the provincial government. To meet the goal of this stewardship plan, knowledge holders identified four core management actions:

- Develop an **ELDERS DECLARATION** to guide the recovery of tâdzié/sagow atihk using Dené and Cree laws;
- Identify **STEWARDSHIP ZONES** in the study area, to ensure that the habitat targets outlined in the stewardship plan goal can be met;
- Establish a **TÂDZIÉ-SAGOW ATIHK GUARDIANSHIP PROGRAM**, to support knowledge gathering, intergenerational knowledge transmission, and stewardship of tâdzié/sagow atihk in ACFN and MCFN homelands;
- Develop **STEWARDSHIP PROTOCOLS** based on Dené and Cree knowledge, to guide all governments, industry and other organizations working in tâdzié/sagow atihk in ACFN and MCFN homelands.

The sections below describe these core management actions, including next steps envisioned by ACFN and MCFN to finalize and implement these management actions.

Elders Declaration

Knowledge of tâdzié/sagow atihk is held primarily by Elders. This knowledge has been brought into an Elders Declaration and will be shared with youth in the communities. The Elders Declaration is based in both shared and distinct ACFN and MCFN Indigenous laws and values.

ACFN and MCFN have fundamental rights and responsibilities in relation to stewardship of their homelands. Management approaches to support the recovery of tâdzié/sagow atihk must respect ACFN-MCFN Treaty and inherent rights, including the right to harvest tâdzié/sagow atihk, and must be based on Dené and Cree laws.

To support the recovery of tâdzié/sagow atihk, ACFN and MCFN knowledge holders identified the need for broad community support for stewardship actions, rooted in the knowledge of Elders. Based on this direction, Elders, knowledge holders and youth from ACFN and MCFN gathered in August 2022 for a three-day tâdzié/sagow atihk camp to develop the **Tâdzié/Sagow Atihk Elders Declaration**, a legal document that describes the authority, jurisdiction, rights and responsibilities of ACFN and MCFN in regards to the stewardship of Tâdzié/Sagow Atihk. This declaration is the legal basis for the implementation of the Tâdzié-Sagow Atihk Stewardship Plan. The Elders Declaration is undergoing final verification as of the release date of this stewardship plan.

The gathering of ACFN and MCFN knowledge holders on the land together included observing what is happening within tâdzié/sagow atihk habitat with intention and making decisions about how to recover and heal the land based on their shared knowledge. This knowledge is being summarized in the stewardship protocols, which will be piloted and refined with industry and government working in tâdzié/sagow atihk habitat.

Stewardship Zones for the Protection of Critical Habitat

Prioritize habitat protection of important and undisturbed tâdzié/sagow atihk habitat. Habitat protection must include strong measures to protect intact muskeg and forested wetlands, as well as active wildfire management in these areas until habitat at the range level has recovered.

> *You have no control over...how the food chain goes around, and around, and around ... As cruel as it sounds, what happens and takes place — — that's the way it is. We know now that we have no control over that. But if we do have control, then the main impact ... is the protection of the whole environment. We can protect the environment as it is and try to re-establish in a way, to what it's going to turn out to be. Then what's left of the wildlife, will either come back or disappear. I always stay positive ... I am sure it will come back. It will all come back. But nature needs that space and time, to establish itself to what it's doing, and the process of what it's doing.* – ACFN member, October 2, 2020

> *I was looking at one [industry] map there, that shows you all the plants and all the roads, all the seismic lines, and you got to remember [that] was opened up by people. Where are the [woodland] caribou supposed to go when they have to go through all this construction and all this disturbance of the land? So, I think it's really important that I kind of figure, kind of ... late, but still might be able to save what habitat they have. That stuff [that] hasn't been touched.* – MCFN member, October 2, 2020

In discussions about how to protect and restore tâdzié/sagow atihk populations in the study area, ACFN and MCFN knowledge holders identified that some of the landscape must remain free of disturbance, allowing tâdzié/sagow atihk to move around the landscape as they always have. These disturbance-free areas must protect habitat that has the qualities required by tâdzié/sagow atihk to meet their needs throughout each season. Using this guidance, the technical team identified spatially explicit **stewardship zones** within the study area that delineate where and how habitat should be protected and restored in order to conserve and recover tâdzié/sagow atihk in the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River ranges.

ACFN and MCFN knowledge holders understand that tâdzié/sagow atihk continue to be linked through landscape level movement patterns. To ensure connectivity between ranges, movement corridors need to be protected between all the local population units and surrounding ranges. As such, the study area includes not only the four tâdzié/sagow atihk herds, but also the Caribou Mountains, Yates, and the Cold Lake[30] ranges, up to the provincial and territorial borders. Throughout this planning process, knowledge holders also emphasized the importance of connectivity across jurisdictional boundaries, with caribou moving both

30 Although the Cold Lake, Yates and Caribou Mountains herd ranges are included in the study area, the technical team did not include management directions for these ranges in the Tâdzié-Sagow Atihk Stewardship Plan. The Cold Lake First Nations is working on an Indigenous-led plan for caribou in their Territory under a Section 11 agreement with the federal government and the province.

east to Saskatchewan and north to the Northwest Territories. Effort needs to be made to ensure cross-governmental and cross-agency collaboration to protect caribou movement across jurisdictional boundaries, regardless of where range boundaries have been delineated.

Description of Management Zones

The stewardship plan identifies three different stewardship zones: protection zones, restoration zones, and active management zones.[31] The stewardship zones identify management actions that are needed to recover tâdzié/sagow atihk populations in ACFN and MCFN homelands. They have been delineated through considering the management actions that could be taken to achieve the goal of the Tâdzié/Sagow Atihk Stewardship Plan, in particular:

- Achieving 65% undisturbed habitat at the range level and working towards 80% undisturbed habitat at the range level with 100% of calving habitat free from disturbance, through management actions that ensure the protection and restoration of habitat at the range level, focused on habitat that has the qualities required by tâdzié/sagow atihk to meet their needs throughout each season;
- Reducing disturbances as much as possible in the remaining suitable habitat for tâdzié/sagow atihk within the study area, by placing as much of that area as possible into protection to prevent further incursions, and fighting fires in those areas until the range reaches 65% undisturbed habitat;
- Driving a reduction in the industrial footprint through high offsetting ratios and restoration efforts that replace habitat for tâdzié/sagow atihk; restored areas must be protected until habitat disturbance and biophysical habitat requirement targets are met;
- Ensuring new development in active management zones is "caribou-friendly" through access management planning, consolidated development, limitations on total disturbance, and operational requirements that incorporate proven mitigation measures;
- Monitoring by ACFN and MCFN guardians to oversee the implementation of these zones and the management measures contained within them and support adaptive management over time.

The section below describes the three stewardship ones:

- **PROTECTION ZONES** encompass areas of biophysically suitable tâdzié/sagow atihk habitat that are highly used by tâdzié/sagow atihk based on both Indigenous knowledge and recent telemetry data, and in relatively good (undisturbed) condition. These zones contain the best remaining habitat within the study area, with all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season. They need to be protected now to provide a strong foundation from which to move towards attaining the target of 65-80% undisturbed habitat in each of the tâdzié/sagow atihk population ranges. In protection zones, ACFN and MCFN require that any remaining industrial leases and other encumbrances are removed over time, so they gradually can be fully protected. The target is to have these areas fully protected within 10 years.

31 Section 4.12 provides a high-level summary of the methods for delineating these zones; the detailed methods are provided in Appendix 1.

- **RESTORATION ZONES** identify areas that are important for tâdzié/sagow atihk survival, despite relatively high levels of disturbance contained within them. They largely consist of habitat with all of the qualities required by tâdzié/sagow atihk to meet their needs throughout each season, but are more disturbed than areas delineated as protection zones within the same ranges. They tend to be highly encumbered, so full protection of these areas is not possible at this time. Any development that occurs in these zones must drive restoration in another part of the same range, ideally within the area inhabited by the impacted local population.[32] Management of these areas must achieve a net positive habitat trend, primarily through active restoration that is protected over the long term to ensure that the goal of the Tâdzié-Sagow Atihk Stewardship Plan can be met. ACFN and MCFN require restoration to be prioritized within areas that most efficiently contribute to meeting undisturbed habitat targets, and will work with external governments and organizations to identify these areas. Over time, as areas within restoration zones are restored, some of the restored areas must be moved into protection zones to fully protect these areas from disturbance until tâdzié/sagow atihk populations and habitats are replenished.

- **ACTIVE MANAGEMENT ZONES** encompass areas that have high densities of active industry. These areas are almost entirely leased to industry and are highly disturbed. Although these areas likely had biophysical habitat needed to support tâdzié/sagow atihk before they were disturbed, they are currently of lower value due to the amount of habitat disturbance. In these areas, new industrial disturbance may be permitted within limits (i.e., disturbance thresholds based on linear and areal targets) that must be maintained to ensure that these areas can continue to support tâdzié/sagow atihk. Development must also meet appropriate standards and drive net habitat improvements elsewhere through offsetting and restoration that is protected over the long term.

Data Sources Used to Delineate Stewardship Zones

To delineate these three zones, the technical team incorporated information from a number of different sources:

- Knowledge shared by ACFN and MCFN community members regarding where tâdzié/sagow atihk are on the land, and which regions are important for connectivity, calving, and survival (see Section 3, above).

- The Government of Alberta's telemetry data for the Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River ranges.

- Tâdzié/sagow atihk biophysical critical habitat identified by the Government of Alberta in the Red Earth, Richardson, East Side of the Athabasca River, and West Side of the Athabasca River ranges (Alberta Government 2018).

- The anthropogenic disturbance data from ABMI's 2018 Human Disturbance Footprint (2018). This was buffered by 500 m to reflect the impact of these disturbance types on tâdzié/sagow atihk habitat beyond the boundary of the human activity (Figure 9).

32 ACFN and MCFN are developing stewardship protocols, which will include guidance on how restoration zones will be managed to achieve a net positive habitat trend.

- Habitat preference classifications based on the modified Enhanced Wetland Classification data from Ducks Unlimited Canada (Arsenault 2014).[33]
- Wildfire disturbance data from Alberta Wildfire from the last 40 years (1981–2020).
- The petroleum and natural gas agreements, oil sands agreements, oil sands project boundaries, and forest management areas (these were incorporated as a means of understanding the potential future industrial demands on the landscape; Figure 4).
- The parks and protected areas of Alberta, and the national parks.

To provide a systematic approach to spatial planning, the technical team used the conservation planning software Marxan with zones (Ball et al. 2009) to compile all the information and apply rules to optimize the distribution of stewardship zones across the landscape. The technical team summarised the data by township and used these 10 km^2 "planning units" as the building blocks for the three zones.[34] Once the data was summarised by township, the team used Marxan to systematically identify stewardship zones based on rules that were identified by the technical team in collaboration with the Indigenous knowledge advisors, following the information provided to the team through community engagement.

Appendix 1 provides a detailed summary of the methods and rules used to identify each of the zones. Notably, the rules included:

- Ensuring that at least 65% of the landscape within each range was included in a protection or restoration zone;
- Prioritizing areas that contain high numbers of tâdzié/sagow atihk based on both Indigenous knowledge and telemetry data, as well as habitat with the qualities required by tâdzié/sagow atihk to meet their needs throughout each season, the lowest current levels of disturbance, and the least industrial encumbrances as protection zones;
- Placing areas that, similar to the above, contain high numbers of tâdzié/sagow atihk based on both Indigenous knowledge and telemetry data and habitat with the qualities required by tâdzié/sagow atihk to meet their needs throughout each season, but have higher levels of disturbance at this time and some active industrial encumbrances as restoration zones;
- Identifying areas that are highly disturbed and encumbered, particularly those areas with active oil sands projects, as part of the active management zone.

In addition, the technical team specifically required movement corridors and key places identified by Indigenous knowledge (see Section 3) to be included in the Protection and Restoration Zones.

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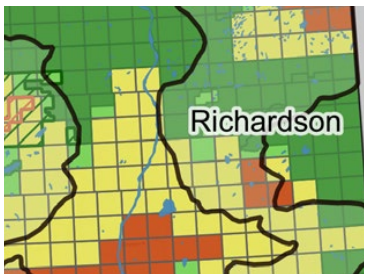
33 Habitat and vegetation knowledge shared by the nations coincides with what the Alberta Government identified as critical habitat for tâdzié/sagow atihk and aligns well with the classification system used to identify habitat suitability based on the vegetation classifications in the enhanced wetland classification data from Ducks Unlimited (Arsenault 2014). With this verification in place, the technical team felt justified in using the biophysical critical habitat data from the Alberta Government to identify critical habitat, and the classification proposed by Arsenault to represent habitat suitability for tâdzié/sagow atihk across the study area.

34 Planning was conducted on the township scale to correspond with other planning processes in this area, notably the ABMI's approach to prioritizing zones for caribou habitat restoration in the Canada's Oil Sands Innovation Alliance (COSIA) area (ABMI 2016; ABMI 2017).

Summary of Stewardship Zones

The three stewardship zones, shown in Figure 9, are the building blocks for tâdzié/sagow atihk population recovery in ACFN and MCFN homelands. Lands within the study area are currently allocated approximately equally to each zone (i.e., 1/3 protection zone; 1/3 restoration zone; 1/3 active management zone), with at least 65% of the landscape within each range designated as a Protection or restoration zone. Because the more southern ranges are more highly disturbed and have much higher levels of industrial disturbance and encumbrances, most of the 65% in these two ranges has been assigned to restoration zone. Over time, portions of these areas will be restored and moved to protection zones, so that a minimum of one third of each range is fully protected within 20 years. This distribution must be maintained until tâdzié/sagow atihk populations and habitats are replenished, and the target of 65% undisturbed habitat at the range level is achieved.

Figure 9 shows the current arrangement of management zones across the study area, which reflects the rules identified by the technical team based on guidance from ACFN and MCFN knowledge holders. As currently arranged, the map in Figure 9 places 65% of tâdzié/sagow atihk ranges into protection and restoration zones, and includes all of the areas identified as priorities by the ACFN and MCFN knowledge holders. Additionally, the zones were arranged to provide connectivity between ranges through the identification of restoration and protection zones between herds — a feature that community members identified as critically important for tâdzié/sagow atihk population recovery. While the data used to develop this map are robust and inclusive of available Indigenous knowledge, the technical team acknowledges that the spatial arrangement of these zones may be refined based on new information, particularly in collaboration with other Indigenous organizations, as well as the provincial government, non-governmental organizations, industry, and any other relevant organizations. This map is intended as a living document that will be continually updated and improved upon.



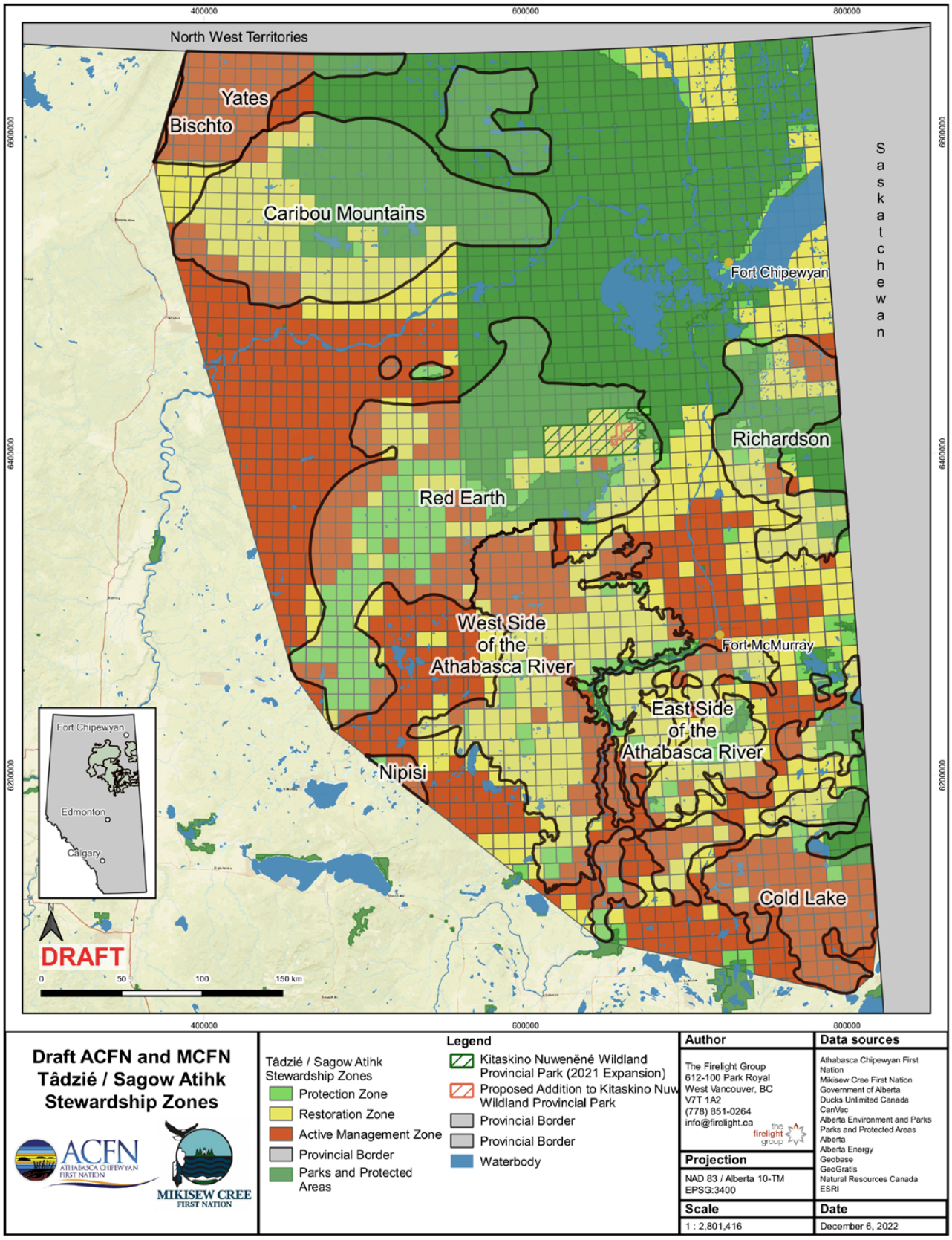
The zones were arranged to provide connectivity between ranges through the identification of restoration and protection zones between herds — a feature that community members identified as critically important for tâdzié/atihk population recovery.

Based on modelling conducted by the team, the current arrangement of zones across the study area generally achieves the 65% undisturbed threshold within the four ranges in 40 years.[35] **ACFN and MCFN knowledge holders have agreed that the preferred target for intact habitat over time within these tâdzié/sagow atihk ranges is in fact closer to 80% undisturbed habitat, as identified in the goal of this stewardship plan.** Achieving this target will require additional measures, including management actions within the active management ones to ensure that industrial development is conducted in ways that respect tâdzié/sagow atihk habitat requirements.

Management guidance for external governments and organizations working in each of the Zones is under development and will be encompassed within ACFN and MCFN stewardship protocols, based on Dené and

35 See Appendix 2.

FIGURE 9. Map showing the proposed ACFN and MCFN tâdzié / sagow atihk stewardship zones. Protection zones are green, restoration zones are yellow and active management zones are red. The current parks and protected areas are visible in dark green, and the Kitaskino Nuwenëné Wildland Provincial Park 2021 expansion and the additional proposed expansion are green-hatched and orange-hatched respectively. The herd ranges are translucent white with black boundaries.



Cree laws.[36] The management guidance provided below represents initial input from ACFN and MCFN on the content of these stewardship protocols.

Tâdzié/Sagow Atihk Guardianship Program

Tâdzié/sagow atihk populations in ACFN and MCFN territories have declined over the last 40 years, and more than one generation within the community has experienced this decline firsthand. As noted earlier in this document, members of both communities voluntarily stopped hunting tâdzié/sagow atihk when it was clear that a hunt was no longer sustainable due to low population numbers. This management action is aligned with Dené and Cree laws, as described in Section 1 of this document and referenced in the Elders Declaration.

Stewardship and monitoring are the most important management actions to take right now in ACFN and MCFN territories. These actions must occur within the zones identified for Protection and Restoration, to build community support and obtain guidance for further management actions within these areas.

Monitoring must be guided by ACFN and MCFN stewardship values and led by ACFN/MCFN knowledge holders. Community members must be involved as guardians to see where tâdzié/sagow atihk are and how to protect / recover their populations. Youth need to be involved, and opportunities should also be provided for the larger community to learn and provide input. Monitoring could include getting people out on the land to observe the tâdzié/sagow atihk, putting up wildlife cameras, monitoring habitat recovery, and protecting or restoring ACFN/MCFN cabins in important areas for continued monitoring use.

Making additional management decisions about the recovery of tâdzié/sagow atihk must be based on active knowledge of tâdzié/sagow atihk and where they are now, rooted in the knowledge of Elders and current knowledge collected through boots-on-the-ground monitoring programs. Connections to other communities in the north should be made to provide guidance to the two Nations in the development of their boots-on-the-ground monitoring program for tâdzié/sagow atihk.

36 The stewardship protocols flow directly from the ACFN and MCFN Tâdzié-Sagow Atihk Elders Declaration, a legal document that describes the authority, jurisdiction, rights and responsibilities of ACFN and MCFN in regards to the stewardship of Tâdzié/Sagow Atihk. The Tâdzié-Sagow Atihk Elders Declaration is undergoing final verification as of the date of this stewardship plan.

With two generations now impacted by the decline of tâdzié/sagow atihk in the study area, the communities have expressed an urgent need to recover and sustain the transmission of knowledge specific to hunting and cultural uses of this cultural keystone species. The urgency of this need is difficult to overstate: while the values of both nations are fundamentally based on the integrity of the boreal ecosystem, the loss of a specific use leads over time to a decline in knowledge surrounding that value. Reconnecting the community, and particularly youth from the two nations, to the cultural value of tâdzié/sagow atihk is a critical component of maintaining the integrity of the boreal ecosystem.

It is for this reason that Elders and knowledge holders involved in developing this stewardship plan identified that the highest priority management actions to be taken at this time within their communities involve reconnecting youth to the land and re-establishing the collection and transmission of knowledge specific to tâdzié/sagow atihk within the shared homelands. Unlike science-based range plans, which would typically identify monitoring as a follow-up action within the adaptive management cycle to ensure that management is effective, active monitoring is identified as one of the first actions to take at this time to ensure that the opportunity to pass Indigenous knowledge from Elders to youth is not lost.

It is important to note that, while knowledge holders involved in developing this stewardship plan agreed that monitoring tâdzié/sagow atihk populations through the use of radio collars can provide important information to assist with making immediate management decisions, it is not the preferred means of monitoring. As one knowledge holder stated, "It's cruelty to the animal, top and bottom line. You don't treat wildlife like that" (ACFN 2019 Workshop). The strong preference is to use community guardians to gather information about tâdzié/sagow atihk through a boots-on-the-ground monitoring programs and use their knowledge to further refine management actions within the stewardship zones. Other types of monitoring (for example, compliance with the management actions identified in each Stewardship Zone, tracking recovery of habitat through remote sensing), should be an integral part of shared management actions moving forward.

APPLICABLE ZONE: Monitoring should occur across all of the zones, and include monitoring of tâdzié/sagow atihk, monitoring of recreational pressure, monitoring for compliance with standards and rules across each zone, and habitat recovery monitoring.

Stewardship Protocols

The Elders Declaration identifies the requirement for all governments, industry and organizations working in tâdzié/sagow atihk habitat in ACFN and MCFN homelands to follow stewardship protocols based on Dené and Cree laws. To ensure that external governments and organizations[37] understand Dené and Cree culture and follow protocols, all parties working in the homelands will be required to take appropriate cultural training developed and delivered by ACFN and MCFN Elders and knowledge holders.

The stewardship protocols are under development by the Technical Team with guidance from ACFN and MCFN Elders; initial guidance from ACFN and MCFN knowledge holders is provided below.

37 This terminology has been used in the Elders' Declaration to refer to all governments that are not ACFN and MCFN, as well as all organizations (including proponents and other stakeholder groups) that are working in ACFN and MCFN homelands.

Habitat Restoration

Set habitat restoration standards for the province and industry based on Indigenous knowledge. Take immediate action to restore all non-permanent industrial features using ACFN and MCFN Indigenous knowledge-based restoration standards, which will be included in a separate document that provides management direction to industry working in tâdzié/sagow atihk habitat in ACFN and MCFN homelands.

Require industry to initiate habitat restoration of impacted areas immediately following disturbance, before they are permitted to disturb another area. Set measurable and enforceable targets (i.e., amount, area, time requirements) for restoration of impacted areas. Ensure that restored areas are protected from further development.

> *...But it [the muskeg] won't be the same as what it was before mind you but, like I say, nature has a power. It decides if it's going to grow this and that, but it won't be the same ... because all life depends on that muskeg. It's going to be totally different, that's very sensitive. Just like the caribou is being sensitive to human activity, or any noise ... That's a very sensitive piece of ground there [pointing to muskeg]. I would refer to it as the sustainer of all lifeforms on the planet. That's what it is.* – ACFN member, October 2020

> *Well I don't know because, it's pretty hard. Some plants will grow [back], not everything. Especially like herbs, some of them, once they are destroyed, it will never grow back again. That's what I've been telling a lot of times in the meeting. Once you destroy herbs, some herbs, they'll never come back again.* – MCFN member, October 2020

Habitat restoration is one of the primary tools being put forward by western science and government decision-makers to speed up the recovery of tâdzié/sagow atihk habitat. In discussing this option with knowledge holders and Elders from ACFN and MCFN, many knowledge holders expressed concern about the sensitivity of muskeg habitat, noting that it may never be possible to fully restore these areas. Knowledge holders emphasized the importance of prioritizing intact muskeg for protection and exercising extreme care in land use decision-making prior to disturbance, because it will take a long time for some habitat to return to a fully natural state.

With those caveats in mind, community knowledge holders emphasized that restoration could be used as an effective tool, particularly within areas that are highly impacted and are still leased out to industry. While knowledge holders much preferred protecting intact habitat to restoring impacted habitat, it was generally recognized that habitat restoration is important given the current levels of disturbance in key areas of importance for tâdzié/sagow atihk. Jumpstarting restoration in key disturbed areas, blocking access points, and reducing ease of movement for predators are important actions to take to ensure that tâdzié/sagow atihk can safely use these areas while habitat is recovering to a more natural state. Knowledge holders also emphasized that industry must be required to initiate restoration of impacted areas immediately following disturbance, and that areas where restoration has occurred must be protected over the long term. Furthermore, knowledge holders identified that restoration standards must be informed by their knowledge of

the land, and that the ACFN-MCFN Indigenous knowledge-based restoration standard should be developed together as soon as possible.[38]

In areas that are currently leased by industry, high levels of offsetting for new development could be used to drive restoration in other areas, but this approach must consider many factors (e.g., the time-lag before habitat becomes useable again for tâdzié/sagow atihk ; the uncertainty of restoration; the location of restoration relative to where the disturbance will occur; the importance of the area culturally and ecologically) before it can be considered acceptable. Offsetting is a last resort option and cannot be used to facilitate development beyond disturbance thresholds in the active management zone. Furthermore, offsetting is not appropriate in all situations and ACFN and MCFN will identify when offsetting is not acceptable. An offsetting policy is under development for the study area based on the laws and stewardship responsibilities of the two nations.

APPLICABLE ZONE: Restoration should be prioritized within areas that result in the most intact habitat, starting with areas that most efficiently contribute to meeting undisturbed habitat targets. Initially these areas may be in the protection zones but as quickly as possible, this work should occur in restoration zones. Areas that are restored should be moved to protection zones to fully protect these areas from disturbance until tâdzié/sagow atihk populations and habitats are replenished.

Tenure Management

Work with government to identify priority areas for tenure buy-back or relinquishment, based on availability of the resource.

As identified earlier in this report, one important impediment to tâdzié/sagow atihk habitat and population recovery is the amount of each tâdzié/sagow atihk range that is currently under tenure by industry. Existing industrial tenures make it difficult to fully protect the land and allow it to recover. Working with government to selectively buy-back tenure in high value tâdzié/sagow atihk habitat is an important management action that will help avoid further impacts from industrial development, particularly in areas with lower resource values or in places that are hard to access from existing and/or planning access routes.

APPLICABLE ZONE: Tenure buy-back and/or voluntary relinquishment of tenure must be considered within the Protection and restoration zones.

38 As of the release of this stewardship plan, a draft ACFN-MCFN Restoration Standard has been developed and is undergoing verification with knowledge holders; it will be included in a separate document that provides management direction to all parties working in the identified zones.

Industrial Guidance to Reduce Development Footprint

Manage industrial and recreational activity within tâdzié/sagow atihk habitat to reduce the impact as much as possible. Focus guardian presence in areas with high recreational use, to reduce activity over time. Develop hard limits to the amount of development that can happen in the active management zones.

> *Let's say if I was a part of that decision-making process, I would say, your [industry] lease consists of 30 townships ... Before you proceed to go and develop this mine. We want, every area of that lease tested for the richest deposit of oil sand. Then from there we deem what's feasible and what's not ... why disturb what doesn't need to be disturbed? So you got an area that only has 30 percent oilsands it's not even worth recovering, don't touch it.* – ACFN member, October 2020

To achieve the goal outlined in this stewardship plan and follow stewardship principles based in Dené and Cree knowledge, it is important that the location and rate of development in the active management zone is wisely managed to support tâdzié/sagow atihk. Aggregated forestry and appended development

While knowledge holders much preferred protecting intact habitat to restoring impacted habitat, it was generally recognized that habitat restoration is important given the current levels of disturbance in key areas of importance for tâdzié/sagow atihk.

are strategies that can help concentrate development, allowing other areas to remain disturbance free. In addition, the total amount of development that is permitted within the active management zones must be subject to hard limits. Adhering to strict disturbance thresholds for both linear and areal disturbance will ensure that the rate of disturbance remains at levels that can support tâdzié/sagow atihk. Along with habitat recovery in the Protection and restoration zones, these measures are critical for achieving the 80% disturbance-free target across ranges, with 100% of calving habitat disturbance free, and for meeting the goal of replenishing tâdzié/sagow atihk populations and habitat.

Tâdzié/sagow atihk are known to demonstrate reduced use in relation to roads and other industrial features. Given the high impact of roads on tâdzié/sagow atihk habitat suitability, new road development should be managed carefully within tâdzié/sagow atihk habitat. Having an active guardian presence in areas with high recreational use may serve as a deterrent to recreational users. Overall, there is a need to ensure that access is planned within tâdzié/sagow atihk habitat to reduce its effects on habitat suitability. Developing an Access Management Plan that considers current and future access development and retirement, and identifies limits to linear development, including for short-term access (linear disturbance targets within subunits of Restoration and active management zones) is an immediate requirement.

Identifying hard limits to area-based development within the Restoration and active management zones will help prioritize areas where tenure buy-back and restoration of existing area-based disturbances should be undertaken immediately.

APPLICABLE ZONE: Limits to linear and area-based disturbance, access management planning, and management to reduce the development footprint must be applied within the active management zones to ensure these areas can support viable populations of tâdzié/sagow atihk.

Wildfire Management

Require government to prioritize firefighting within intact tâdzié/sagow atihk habitat, at least until more areas of tâdzié/sagow atihk habitat recover to support population growth within each range.

> *Have full attack on wildfires, [they] shouldn't be burning freely. It gives the land a chance to regrow, looking at 1980, the east side of Athabasca, that herd was impacted by 1980 and 1981 fires, just as vegetation is coming back, had another fire in 2010, lost all their food again. Will need to be full suppression of fires to see if it helps caribou numbers.* – MCFN 2019 Workshop

Fire has important renewal value for the landscape, but it takes a very long time for tâdzié/sagow atihk to return to areas that have been burned. With the high level of industrial pressure on tâdzié/sagow atihk habitat and the current habitat deficit, knowledge holders identified that firefighting is a priority within tâdzié/sagow atihk habitat, particularly the remaining intact habitat that is supporting the animals at this time. Firefighting should at least be a short time priority until other areas of habitat recover.

APPLICABLE ZONE: Firefighting should be prioritized within the protection zone and areas that are starting to recover in the restoration zone.

Predator Control Through Culturally Appropriate Wolf Trapping Program

Consider predator control through a wolf trapping program for ACFN / MCFN community members that follows traditional cultural practices.

> *What was it they said about wolves? They were going to kill off all the wolves at the same time of fencing all the caribou … that's crazy. You look at what happens with animals, [if there is] an explosion of caribou, there is sickness of caribou. Wolves control the population, and you can't bother with them.* – ACFN member, ACFN 2019 Workshop

> *Bears and wolves lived with caribou from the start, lived with each other long before … Need to rule out bears and wolves threatening the caribou; the main threat is human caused, which is development.* – MCFN member, MCFN 2019 Workshop

Wolves are an important part of the ecosystem and managing wolf populations to recover tâdzié/sagow atihk populations is not a recommended management action. There was strong opposition to the approach currently used to cull wolf populations in Alberta through aerial gunning and poisoning programs.[39] Knowledge holders identified that predator management through a culturally appropriate wolf trapping program may be necessary in the study area to give tâdzié/sagow atihk the time and space needed to recover. However, predator control is not a recommended management action at this time and other recovery techniques for tâdzié/sagow atihk are being prioritized.

APPLICABLE ZONE: Trapping must be directed by ACFN / MCFN members and may occur within any of the zones, but will likely be applied within the restoration and active management zones.

39 Note that poisoning programs have not been employed within northeastern Alberta.

SECTION 5

Stewardship Plan Implementation

Benefits of the Tâdzié-Sagow Atihk Stewardship Plan

ACFN and MCFN have developed a concrete and achievable approach for recovering tâdzié/sagow atihk within their homelands. The Tâdzié-Sagow Atihk Stewardship Plan fulfills the first conservation measure for boreal caribou committed to in Appendix B of the Section 11 agreement between ACFN, MCFN and the federal government: developing range-specific Indigenous caribou stewardship plans. Implementing the Tâdzié-Sagow Atihk Stewardship Plan will meet federal range planning requirements for boreal caribou, and help Canada meet international obligations related to biodiversity conservation, climate change, and implementation of the UN Declaration on the Rights of Indigenous Peoples.

Meeting Range Planning Requirements

The Government of Alberta has signed a Section 11 agreement with the federal government that binds them to a timeline for developing spatially explicit range plans within each of the boreal caribou ranges in Alberta. Alberta is proceeding with sub-regional planning tables to develop range plans in each area. ACFN and MCFN have critiqued the approach that Alberta is using to develop range plans through the sub-regional planning tables, particularly with respect to Indigenous participation in these tables. Key concerns with the current sub-regional planning process for woodland caribou include:

- The sub-regional planning tables give equal voice to industry, government, recreational users, regional districts, and Indigenous communities. This approach relegates Indigenous communities to the level of stakeholders, and fails to recognize the unique rights and interests held by Indigenous communities. In doing so, the sub-regional planning tables perpetuate and further entrench Alberta's deficient approach to land use planning. As ACFN and MCFN have clearly stated in previous

submissions related to land use planning processes,[40] government-to-government negotiations between Alberta and Indigenous nations (either together or in parallel) must occur prior to engaging with stakeholders.

- Thus far, the products developed by sub-regional planning tables have not identified an immediate means to protect currently intact habitat and prevent further degradation. While the approach identified to manage access in caribou habitat is an important step forward, relying on appended development, restoration, and offsetting while allowing habitat degradation to continue translates into a very long time-lag before habitat starts to recover in caribou ranges. Based on the modelling contained in Appendix A of the draft Cold Lake Subregional Plan (SRP), the areas included in this SRP do not reach the minimum 65% undisturbed target for 100 years — and that is assuming no wildfire disturbance in these ranges.[41] In contrast, the landscape zoning approach used in the ACFN-MCFN Tâdzié-Sagow Atihk Stewardship Plan, which designates some areas of the landscape off-limits to development and prioritizes restoration in other areas, allows caribou habitat to recover to more than 65% undisturbed within 40 years, even while assuming some levels of disturbance from wildfire (see Appendix 2).
- The subregional planning tables do not provide a mechanism to ensure that the strengths of Indigenous knowledge and western science can be used together to make management decisions about the land. While the Wandering River sub-regional planning process has committed to striking a parallel Indigenous knowledge table, it is not clear how the two tables will come together to develop one plan for the area encompassed by that process.

The Tâdzié-Sagow Atihk Stewardship Plan has been developed to meet federal range planning requirements for boreal caribou. Working with ACFN and MCFN to implement the plan provides an important alternative path forward for the Government of Alberta to meet their range planning obligations for the Red Earth, Richardson, East Side of the Athabasca River and West Side of the Athabasca River ranges.

Meeting Canada's International Commitments Related to Biodiversity and Climate Change

Implementation of the Tâdzié-Sagow Atihk Stewardship Plan will help the Canadian government meet their international commitments for the protection of biodiversity and for meeting climate change targets. Canada is a signatory to two related United Nations agreements: the UN Convention on Biological Diversity (CBD), and the UN Framework Convention on Climate Change. As climate change is a key driver of biodiversity loss, and nature-based climate solutions are increasingly recognized as critical elements of meeting targets to limit

40 For example, comments submitted by six First Nations (including ACFN and MCFN) as well as one Métis group on the Lower Athabasca Regional Plan (LARP) in 2013, and subsequent efforts to work with the Government of Alberta to improve amend this plan.

41 The draft Cold Lake SRP acknowledges that not including wildfire in their modelling means that the availability of caribou biophysical habitat is likely overestimated (Appendix A, p. 17). It seems likely that achieving the 65% undisturbed target at the range level will take longer than 100 years, since some areas will almost certainly be disturbed by wildfire (particularly considering the increased risk of wildfire with climate change). Wildfire should be included in the modelling and accounted for in setting thresholds for areal disturbance, to ensure that the full array of disturbance factors is realistically considered.

global warming, negotiators for both of the agreements are being encouraged to recognize the important role of nature-based solutions for meeting targets to limit global warming and achieve biodiversity conservation objectives.

Canada has specific targets that they have committed to meeting under both agreements. Related to the Convention on Biological Diversity, Canada adopted the 2020 Biodiversity goals and targets in 2015. These targets include protecting at least 17% of terrestrial areas and inland water (Target 1); ensuring species that are secure remain secure and populations of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans (Target 2); conservation and enhancement of Canada's wetlands through retention, restoration and management activities (Target 3); and ensuring Aboriginal traditional knowledge is respected, promoted, and, where made available, regularly, meaningfully, and effectively informing biodiversity conservation and management decision-making (Target 15). In 2015, as part of the United Nations Framework Convention on Climate Change, Canada signed the Paris Agreement, a legally binding international treaty on climate change, with the goal of limiting global warming to well below 2, preferably 1.5 degrees Celsius, compared to pre-industrial levels. To meet their international climate change commitments, the federal government has released its 2030 Emissions Reduction Plan, which includes investing in nature and natural climate solutions. In particular, this plan prioritizes support for projects that conserve, restore and enhanced Canada's vast and globally significant endowment of wetlands, peatlands and grasslands to store and capture carbon.[42]

Implementation of the Tâdzié-Sagow Atihk Stewardship Plan will ensure protection for large areas of boreal wetlands and peatlands and prioritize restoration of impacted areas to increase their carbon sequestration potential. Fundamentally, implementing the Tâdzié-Sagow Atihk Stewardship Plan is an investment in natural climate solutions, and meets many of the specific targets outlined in the 2020 Biodiversity goals and targets.

Implementation of the Tâdzié-Sagow Atihk Stewardship Plan will ensure protection for large areas of boreal wetlands and peatlands and prioritize restoration of impacted areas to increase their carbon sequestration potential. Fundamentally, implementing the Tâdzié-Sagow Atihk Stewardship Plan is an investment in natural climate solutions, and meets many of the specific targets outlined in the 2020 Biodiversity goals and targets.

Meeting Canada's Commitment to Implement the United Nations Declaration on the Rights of Indigenous Peoples

Canada officially adopted the UN Declaration on the Rights of Indigenous Peoples in 2016, and on June 21, 2021, the United Nations Declaration on the Rights of Indigenous Peoples Act came into force. Canada is committed to implementing UNDRIP and the articles contained within it. Adherence to the Elders Declaration for Tâdzié-Sagow Atihk and implementation of this stewardship plan are fundamental components of reconciliation between the Crown and ACFN and MCFN.

42 See Environment and Climate Change Canada 2022

Considerations for Implementation

Implementation of the Tâdzié-Sagow Atihk Stewardship Plan has been carefully considered by both ACFN and MCFN Elders and knowledge holders, as well as the technical team who worked to develop this plan. A number of key groups must be involved to ensure implementation proceeds and the goal of the stewardship plan can be achieved, including all levels of government, industry partners, and funding organizations. The following actions have been identified as critical for implementation of this plan within the next two years:

- Refine the zones identified in this stewardship plan to ensure that protection and restoration zones are achievable from an implementation perspective and meet the priorities of other nations with overlapping rights and interests, while still meeting the goal and objectives of the stewardship plan. Zone refinement would be best approached through initial government-to-government meetings, including with the provincial government and other Indigenous governments who have overlapping rights and interests within the study area. Zone refinement must meet the requirement for equal distribution of the three zones in the study area and a minimum of 65% of each range designated in protection or restoration zones.

- With the federal and provincial governments, identify meaningful and viable approaches for implementing the protection, restoration, and active management zones identified in the stewardship plan. Opportunities for implementation may occur through the revisions to the Lower Athabasca Regional Plan (LARP) or through measures to be developed jointly with the federal and provincial governments. The approach must include implementing meaningful and strong habitat protection within the protection zones, drawing on tools that already exist within Alberta.[43] Given the extent of cumulative effects within the area encompassed by the Tâdzié-Sagow Atihk Stewardship Plan, this action is critical to support reconciliation, tâdzié/sagow atihk recovery, and the protection of ACFN and MCFN rights and interests in their territories. Implementation of the stewardship plan will also contribute to meeting Canada's international commitments for protecting biodiversity and reducing greenhouse gas emissions.

43 A list of available habitat protection tools in Alberta was compiled in 2019 by the Environmental Law Centre (Environmental Law Centre 2019).

- Rebuild and refine ACFN and MCFN guardianship and monitoring programs to actively monitor management outcomes, changes, and additional needs within ACFN and MCFN territories related to the recovery of tâdzié/sagow atihk, including youth involvement and learning opportunities.
- Work with the province and industry to implement the identified measures within the restoration zones, particularly to ensure that restoration is prioritized in areas that will contribute meaningfully to tâdzié/sagow atihk recovery and that these investments are protected over the long term.
- Finalize the stewardship protocols that are identified in the Elders Declaration and conceptually described in Section 4. This action includes:
    - Secure funding to develop and deliver cultural training for external governments and organizations working in ACFN and MCFN homelands;
    - Finalize the ACFN-MCFN restoration standards and offsetting calculator and piloting these approaches and protocols with industry partners;
    - Work with external governments and industry to develop access management plans, aggregated development approaches, enforceable targets for linear and area-based disturbances within restoration and active management zones, and other measures to guide development in active management zones in ways that protect habitat for tâdzié/sagow atihk.
    - Work with the provincial government on an appropriate mechanism to fight wildfires in protection zones, until habitat has recovered elsewhere.
    - Establish a wildlife management board with Indigenous communities and organizations in the study area. The Tâdzié-Sagow Atihk Management Board will have authority to manage caribou herds in the study area and will work to implement the Tâdzié-Sagow Atihk Stewardship Plan. Establishing a Boreal Caribou Working Group has been identified as a priority of the ACFN-MCFN-Federal Government Section 11 Conservation Agreement (see proposed terms of reference, Appendix 1 of the draft agreement). The Working Group may provide the initial setting for inviting discussions with the provincial government regarding the establishment of the Tâdzié-Sagow Atihk Management Board.

ACFN and MCFN are confident that by following the guidance included in this stewardship plan, and continuing to rebuild guardianship and monitoring of the boreal ecosystems that are so vital to the Dené and Cree values held by the two nations, tâdzié/sagow atihk populations will recover and thrive long into the future.

ACFN and MCFN knowledge holders involved in the development of Tâdzié-Sagow Atihk Stewardship Plan know that time is of the essence: many plans have been developed to protect and recover tâdzié/sagow atihk,[44] but little meaningful action has been taken. In the meantime, tâdzié/sagow atihk populations have continued to decline. As the traditional stewards of these areas, ACFN and MCFN are confident that by following the guidance included in this stewardship plan, and continuing to rebuild guardianship and monitoring of the boreal ecosystems that are so vital to the Dené and Cree values held by the two nations, tâdzié/sagow atihk populations will recover and thrive long into the future.

44 Alberta Wilderness Association prepared a summary of Alberta's range planning efforts to date (Alberta Wilderness Association. n.d.)

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M71. 2020. Transcript of October 2, 2020 focus group interview for the ACFN-MCFN Tâdzié-Sagow Atihk Stewardship Plan. Firelight Research Inc. for the Athabasca Chipewyan First Nation and the Mikisew Cree First Nation.

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M75. 2020. Transcript of October 6, 2020 direct-to-digital interview for the ACFN-MCFN Tâdzié-Sagow Atihk Stewardship Plan. Firelight Research Inc. for the Athabasca Chipewyan First Nation and the Mikisew Cree First Nation.

APPENDIX 1

Methods for Tâdzié-Sagow Atihk Stewardship Plan Development

1. Indigenous Knowledge to Inform Stewardship Plan

1.1 Overview

The Indigenous use and knowledge (IK) data used in this study includes data collected by both nations over the years, as well as data collected specifically for this study. Study-specific IK was recorded between 2010-2020. Data collected specifically for this study was recorded between 2019 and 2020 using the following four community engagement methods: individual mapping interviews, focus group, on territory field visits and verification meetings. The IK geospatial data was generated using Direct-to-Digital (DeRoy 2016) and on-territory mapping methods. This section details how the data was collected, including both site-specific (i.e., mapped) and qualitative data.

ACFN and MCFN staff identified study participants who were interviewed specifically as part of the development of the Stewardship Plan. All members from both Nations were assigned identifier codes (A## or M##), which are used for confidentiality purposes. The technical team obtained informed consent for each participant whose data and knowledge was used in this study.

1.2 Development of a Shared Database

To develop a shared understanding of tâdzié/sagow atihk based on the Indigenous knowledge from both ACFN and MCFN, the technical team signed a confidentiality agreement that outlined the terms under which datasets from each nation could be shared across the team. The team then compiled and reviewed all of the available Indigenous knowledge and use information related to tâdzié/sagow atihk from both Nations in QGIS (spatial data) and excel (qualitative data in the form of quotes for thematic analysis). This shared dataset was used to determine information gaps and develop the approach for further data collection.

1.3 Initial Workshop

To set the stage for the development of the Stewardship Plan, the technical team held two half-day workshops with small groups of key Elders and knowledge holders from ACFN and MCFN in November 2019. These workshops identified the goals for recovery of tâdzié/sagow atihk in ACFN and MCFN homelands, and were used to develop the initial goal and key principles for tâdzié/sagow atihk recovery, confirm the extent of the study area, and get an initial sense of management actions that were supported by the Elders and knowledge holders from both communities. Both workshops were held on November 29, 2019 in Fort Chipewyan, Alberta. Four Elders / knowledge holders participated in the ACFN workshop; seven Elders / knowledge holders participated in the MCFN workshop. All audio was transcribed and coded for key themes.

1.4 Data Collection

The technical team anticipated an intensive field season for data collection in 2020; however, the onset of travel restrictions related to COVID-19 curtailed the technical team's ability to conduct field work in person. The possibility of field work opened up in early October 2020, and two researchers from the technical team were able to travel to Fort Chipewyan for focus groups, interviews, and field work. At that time, two additional half-day workshops were conducted on October 2, 2020 with Elders and knowledge holders from MCFN and ACFN. These sessions were used to refine and confirm the work conducted in 2019 and to gather additional information on appropriate management actions to achieve the goal and principles identified in 2019. In total, these workshops involved 15 Elders and knowledge holders from MCFN and 8 Elders and knowledge holders from ACFN. The ACFN workshop was held in person at the Elders Centre in Fort Chipewyan, while the MCFN workshop was held on a virtual meeting platform, with participants in their homes in Fort Chipewyan and the two facilitators at the MCFN offices.

Following the workshops, the technical team conducted virtual direct-to-digital mapping interviews with Elders and knowledge holders from each community. The team used a semi-structured interview approach to gather data on key knowledge gaps related to tâdzié/sagow atihk, including tâdzié/sagow atihk cultural uses, tâdzié/sagow atihk sightings, tâdzié/sagow atihk habitat use throughout the seasons, input on the proposed zones for the stewardship plan and other management actions, information about impacts to tâdzié/sagow atihk, and initial information about how to restore habitat. In total, four interviews were conducted with ACFN knowledge holders on October 5, 2020, and eight interviews were conducted with MCFN members on October 6 and 7, 2020. All interviews were conducted in English, all audio was recorded digitally, transcribed, and included in subsequent thematic analysis.

In addition to these in-office workshops and interviews, two field visits were conducted on October 3 and 4, 2020, including an ACFN field visit with two Elders / knowledge holders and an MCFN field visit with four Elders / knowledge holders. Additional audio collected during these sessions was recorded digitally, transcribed, and included in subsequent thematic analysis.

1.5 Verification of the Stewardship Plan

The technical team analyzed the data from these interviews and focus groups, as well as earlier data collection efforts, for the development of the stewardship plan (see section 2.1.1 below). To verify the final goal, principles, stewardship zones, and management actions that make up this stewardship plan, the technical team conducted two structured verification sessions in April and June of 2021, with all the Elders and knowledge holders involved in the development of this stewardship plan from both communities. During the April 7th verification session, the technical team confirmed the goal and general approach for management actions taken in the Stewardship Plan. During the June 22nd verification session, the team read aloud each statement from the Stewardship Plan to all participants, and recorded confirmations of each statement from each participant. If participants requested changes to any of the statements, the technical team made these changes and re-confirmed the new statement with all participants. These statements make up the goals, principles and management strategies identified in the Stewardship Plan. In total, fourteen Elders and knowledge holders from ACFN and MCFN participated in the two verification sessions.

1.6 Caribou Camp

The technical team acquired specific funding from the University of Alberta's Taking Care fund to hold a caribou camp on the land from August 2 – 6, 2022. Through this multi-day camp held in the Richardson Range, in an area of known tâdzié/sagow atihk movement and near tâdzié/sagow atihk preferred habitat, ACFN and MCFN Elders, knowledge holders, and youth gathered to share knowledge and direction related to tâdzié/sagow atihk conservation, range planning, and habitat restoration approaches. The main focus of this work was to develop an Elders Declaration that would guide the recovery of tâdzié/sagow atihk in ACFN and MCFN homelands through the re-articulation of Dené and Cree laws that protect all things, and through healing the land using Indigenous knowledge. The camp involved 25 participants, including community members, staff from each Nation, camp cooks, and Firelight staff. In total, eight ACFN members and seven MCFN members participated in caribou camp. The work resulted in the development of an Elders Declaration for tâdzié/sagow atihk and the Dené and Cree Restoration Standard, both of which are in the process of finalization.

2. Delineating Stewardship Zones

Data sources

Tâdzié/sagow atihk, habitat / landscape, disturbance, and future land use data were all compiled for this project. These datasets were compiled in order to best capture the current tâdzié/sagow atihk habitat use and availability, as well as to understand the industrial demands across the landscape to estimate the relative cost (or more importantly, the relative feasibility) of restoration and protection efforts.

2.1 Tâdzié / Atihk

2.1.1 Tâdzié / Atihk Indigenous knowledge

The traditional use and knowledge (IK) data used in this study is discussed in the above section (appendix 1, section 1). From this data, three main data categories were identified for incorporation into the creation of the Stewardship Plan Zones: tâdzié/sagow atihk specific IK, IK regarding access to tâdzié/sagow atihk, and important tâdzié/sagow atihk areas.

The tâdzié/sagow atihk specific IK included 116 locations pertaining specifically to direct interactions with tâdzié/sagow atihk (e.g., sightings or kill sites) were identified and included as tâdzié/sagow atihk specific IK. These locations were randomized within a 250 m radius and then buffered by 1 km to account for uncertainty and to recognise the importance of the immediate vicinity to tâdzié/sagow atihk. To ensure that the tâdzié/sagow atihk specific IK data identified refers to tâdzié/sagow atihk and not barren ground caribou, data was excluded from the most northern parts of the study area (specifically, this included the area north of Lake Athabasca, the Peace River, and south of the southern boundary of the Caribou Mountains).

To identify community access to tâdzié/sagow atihk, the locations of cabins, trails and campsites were selected from the dataset. Cabins were buffered by 5 km, representing the area likely to be accessed from a cabin. Trails and campsites were buffered by 1 km to represent the immediate areas that are accessible from these locations.

Priority tâdzié/sagow atihk areas were identified and mapped during verification meetings with knowledge holders. These areas are located in and around the Richardson backcountry, Birch Mountains, Firebag River, and Twin Lakes.

2.1.2 Provincial Tâdzié / Atihk Data

Local population range boundaries and telemetry data were both included in the stewardship zone delineation process. The provincially and federally delineated herd range boundaries of the West Side of the Athabasca River, East Side of the Athabasca River, Red Earth, Caribou Mountains, Yates, Richardson and Cold Lake tâdzié/sagow atihk were all included. Telemetry data was only included from the local populations of interest: West Side of the Athabasca River, East Side of the Athabasca River, Red Earth, and Richardson. The tâdzié/sagow atihk telemetry data was shared by the Government of Alberta.

The technical team summarised the tâdzié/sagow atihk telemetry data through kernel density estimates. To do so, the team first calculated a reference bandwidth for each herd using kernelUD from adeHR package in R (Calenge 2006; r-project.org). The tool 'Heatmap (Kernel Density Estimation)' from QGIS was used to calculate kernel density estimates, with the search radii set to the reference bandwidths calculated for each herd, 200 m[1] pixel size and quadratic kernel shape. The technical team included the top three quartiles from the kernel density estimates in order to best represent regions of concentrated use by collared tâdzié/sagow atihk (a 75% kernel), while still preserving the connections between these areas.

2.2 Habitat Data

IK regarding quality tâdzié/sagow atihk habitat and vegetation matches well with both Arsenault's ranking of the Ducks Unlimited Canada's Enhanced Wetland Classification based on tâdzié/sagow atihk habitat preferences and the tâdzié/sagow atihk biophysical critical habitat identified by the Government of Alberta'. As such, both data sources were used in this study.

Arsenault developed a cover type preference rating for Ducks Unlimited Canada's Enhanced Wetland Classification dataset (Arsenault 2014; Smith et al. 2007) that reflects tâdzié/sagow atihk habitat preferences, ranging from most preferred to most avoided. The areas corresponding to the cover type classifications identified as most preferred by tâdzié/sagow atihk were selected from the dataset and included in this study. The selected cover types included upland pine forests, treed bogs, shrubby bogs, tree rich fens, tree poor fens, tamarack swamps, and conifer swamps (habitat classes +3 and +2 in Arsenault 2014; referred to as the Ducks Unlimited habitat). For more information on the data sets and the specifics of the tâdzié/sagow atihk preference ratings, see Arsenault 2014.

Alberta's tâdzié/sagow atihk biophysical critical habitat data was provided to us by the Government of Alberta. The Government of Alberta identified tâdzié/sagow atihk biophysical critical habitat by comparing radio-telemetry data from collared tâdzié/sagow atihk to randomly generated points. The vegetation across the region was classified into vegetation strata using the Alberta Vegetation Inventory (where possible), and the Enhanced Wetland Classification dataset (where no Alberta Vegetation Inventory data exists). The vegetation strata at the locations of the true and randomly generated telemetry data were then compared with each other to identify tâdzié/sagow atihk vegetation strata use and selection (for more information see Alberta Government 2018). Through their analysis, the Government of Alberta identified the vegetation strata outlined in Table 3 on page 36 as biophysical habitat for the Boreal Plains ecozone[2] in Alberta.

These two data sets were then merged to form a single dataset indicating the location of tâdzié/sagow atihk biophysical habitat across the study area. This combined layer was then used as an input layer in our analysis.

1 The 200 m pixel size was chosen following various trials, and provided a good balance between processing time and capturing tâdzié/sagow atihk use.

2 The majority of the tâdzié/sagow atihk ranges within the Boreal Plains ecozone (including the Red Earth, West Side of the Athabasca River, East Side of the Athabasca River and Richardson ranges) selected for the same vegetation strata, however not all did. This section identifies specifically the vegetation strata that fall within the Boreal Plains ecozone grouping that includes the ranges within the study area.

2.3 Disturbance Data

2.3.1 Industrial Disturbance

The technical team used the 2018 Human Disturbance Footprint from the Alberta Biodiversity Monitoring Institute (ABMI)[3] to quantify disturbance across the study area in two ways. First, the team used the overall disturbance footprint within the study area (referred to as the aggregate disturbance layer) in order to understand the distribution of industrial disturbance across the region. Second, the team selected all of the linear features and included these as a separate data source (referred to as the linear disturbance layer). Wolf use of linear features results in an increased predation risk for tâdzié/sagow atihk, resulting in the avoidance of these features and the surrounding habitat by tâdzié/sagow atihk (Latham et al. 2011b). Due to this reason, and the large number of linear features within the study area, the technical team chose to consider this type of disturbance separately. The linear features included runways, seismic lines, pipelines, roads, transmission lines and trails. Both the aggregate disturbance layer and the linear disturbance layer were buffered by 500 m to better reflect the remaining undisturbed habitat available to tâdzié/sagow atihk. This buffering method is an approach developed by Environment and Climate Change Canada to properly reflect the impact disturbance features have on tâdzié/sagow atihk (ECCC 2011).

2.3.2 Wildfire

The technical team used wildfire data from the Alberta Wildfire website[4] as a delineation of the past wildfires in the area. From this, the team used only the fire footprints from the last 40 years (1981-2020), in a manner consistent with Environment Canada (ECCC 2011).

2.4 Land Use

Future land use data including active petroleum and natural gas agreements[5], oil sands agreements[6], oil sands project boundaries (current as of 2015)[7] and forest management areas[8] were included to better potential future industrial developments on the landscape. The parks and protected areas[9] were also included. All of these datasets were obtained from the Government of Alberta.

3. Data Processing

Alberta townships were assigned as the base unit of area for delineating the Stewardship Zones. Townships are approximately 6 miles^2.

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3 https://abmi.ca/home/data-analytics/da-top/da-product-overview/Human-Footprint-Products/HF-inventory.html
4 https://wildfire.alberta.ca/resources/historical-data/spatial-wildfire-data.aspx
5 https://gis.energy.gov.ab.ca/Geoview/OSPNG
6 https://gis.energy.gov.ab.ca/Geoview/OSPNG
7 http://osip.alberta.ca/library/Dataset/Details/716
8 https://maps.alberta.ca/genesis/rest/services/ASRD_Administrative_Area/Latest/MapServer/5
9 https://geodiscover.alberta.ca/geoportal/rest/metadata/item/0d1ac1474eba42fe9444a42a23a4ea1b/html

Each of the data sources outlined in appendix 1, section 2 were summarized by township. To do this, the spatial extent of the data source per township was divided by that township's total area. This resulted in a score between 0 and 1 for each data source, across each township. The scores corresponding to data sources that represent aspects detrimental to tâdzié/sagow atihk (such as disturbances and industrial land use) were flipped such that the scores reflect the landscape from the tâdzié/sagow atihk perspective. To do this, the difference between the value and 1 was used instead. These township level metrics were calculated using QGIS (2020).

4. Stewardship Zone Generation

4.1 Marxan with Zones

The technical team used a systematic conservation planning software called Marxan with Zones (Watts et al. 2009) to help identify possible stewardship zones. Marxan is a decision support tool that can be used to help identify good areas for restoration based on restrictions (for example, cost) and conservation objectives (for example, conservation of 65% of land within tâdzié/sagow atihk herd ranges across the study area). Marxan with Zones allows for the identification of zones other than simply conserved or un-conserved.

4.2 Model Parameters

The basic inputs used to run Marxan with Zones are: (1) the current protected areas, (2) the cost per planning unit, (3) the features per planning unit, and (4) the conservation goals. The technical team used townships as the basic planning units.

The parks and protected areas dataset discussed above was used to delineate the current protected areas.

Four different costs[10] were incorporated per planning unit (township):one cost based on the land use agreements (appendix 1, section 2.4) and three costs based on the buffered aggregate disturbance layer. For the future land use agreements cost, we added the township level metrics from the forest management areas, oil sands agreements, oil sands project boundaries, and petroleum and natural gas agreements. The aggregate disturbance scores were grouped into three categories: low disturbance, medium disturbance, and high disturbance based on the distribution of the disturbance score (low: 0-33 percentile, medium: 33-66 percentile, high: 66-100 percentile). The multiple costs allowed the technical team to assign different weights to each cost (Table 4) and allowed for the delineation of protection and restoration zones despite the very high amount of disturbance across the study area. In addition to these four costs, the team assigned boundary costs (Table 5) to reduce restoration and protection zone fragmentation.

The features included in the analysis were the scores (appendix 1, section 3) of the data sources discussed in section 2 of this appendix (also see Table 4), with one exception: the tâdzié/sagow atihk local populations were grouped into Northern (Caribou Mountains and Yates) and Southern ranges (West Side of the Athabasca River, East Side of the Athabasca River, Red Earth, Richardson, and Cold Lake). The team used

10 These are not the true costs of conserving the land, but a representation of how difficult it would be to do so considering current industrial use.

this approach to ensure that restoration and protection zones were delineated in the south, despite the extremely high levels of disturbances in the southern portion of the study area.

For each feature, the technical team set targets to determine the proportion of each feature included in the protection, restoration, and active management zones (Table 4). Additionally, the team set a high penalty (feature penalty factor) for not meeting the targets for the tâdzié/sagow atihk specific IK and the priority tâdzié/sagow atihk area scores. Specifically, the technical team required that these features to fall within the protection and restoration zones.

TABLE 4. Cost multipliers by cost type per zone.

Zone	Cost Type	Cost Multiplier
Active Management	Land Use Agreements	1
	Low Disturbance	1
	Medium Disturbance	1
	High Disturbance	1
Restoration	Land Use Agreements	1
	Low Disturbance	1
	Medium Disturbance	1
	High Disturbance	2
Protection	Land Use Agreements	2
	Low Disturbance	1
	Medium Disturbance	2
	High Disturbance	2

TABLE 5. Boundary cost multipliers between zones.

	Active Management Zone	Restoration Zone	Protection Zone
Active Management Zone	0	0.5	1
Restoration Zone	0.5	0	0.1
Protection Zone	1	0.1	0

TABLE 6. Feature targets by zone, and feature penalty factor.

Feature Name	Active Management Zone Target	Restoration Zone Target	Protection Zone Target	Feature Penalty Factor
Tâdzié / Atihk Kernel Density Estimate Score	0	0.5	0.35	1
Indigenous Knowledge Cabins, Trails, and Campsites Score	0.33	0.33	0.33	1
Priority Tâdzié / Atihk Areas Score	0	0.49	0.50	10
Southern Tâdzié / Atihk Range Score	0.34	0.325	0.325	1
Northern Tâdzié / Atihk Range Score	0.33	0.33	0.33	1
Tâdzié / Atihk Specific Indigenous Knowledge Score	0	0.49	0.50	10
Ducks Unlimited Habitat Score	0.30	0.30	0.30	1
Alberta's Critical Biophysical Habitat Score	0.20	0.20	0.20	1
Linear Disturbance Score Adjusted for Tâdzié/sagow Atihk	0.20	0.20	0.20	1
Aggregate Disturbance Score Adjusted for Tâdzié / Atihk	0.20	0.20	0.20	1
Wildfires Score Adjusted for Tâdzié / Atihk	0.20	0.20	0.20	1

Finally, the technical team set the number of runs with the same starting condition to 200, and the number of iterations per attempt at a solution per run to 2,000,000. These numbers were determined through iterative runs of Marxan with Zones to select the parameters that yielded the best result.

4.3 Selecting a Solution

The technical team selected the best solution from the Marxan with Zones runs and verified both the graphical output and the output tables from Marxan. Visually, the team compared the graphical output of the zones generated to the priority tâdzié/sagow atihk areas and the tâdzié/sagow atihk specific IK and verified that there are protection and restoration zones that connect all the local populations. The output tables generated from Marxan with Zones were checked to ensure that feature targets by zone were met across the protection and restoration zones.

APPENDIX 2

Recovery Timeline Estimate

We explored three models of habitat recovery across the tâdzié/sagow atihk stewardship zones to better understand the timeline required to reach the target of 65% undisturbed habitat (as set out by the Environment and Climate Change Canada 2020 Amended Woodland Caribou Recovery Strategy). In these models, we used linear disturbance data (Appendix 1, 2.3.1) and wildfire data (Appendix 1, 2.3.2) to understand the current disturbance across the landscape. We buffered the linear disturbance layer by 500 m to reflect the total disturbed habitat as described by Environment Canada's scientific assessment for critical habitat (ECCC 2011). Additionally, those features that did not have an initial disturbance date — due to gaps in the original data source — were assigned the year 2021 as the date of disturbance. The wildfire footprints of fires from 1981-2020 were selected from the dataset to reflect the areas in which fire disturbance continues to impact tâdzié/sagow atihk habitat use (Environment Canada 2011). All of the analysis for the following models was conducted in QGIS version 3.20.2-Odense.

Model 1

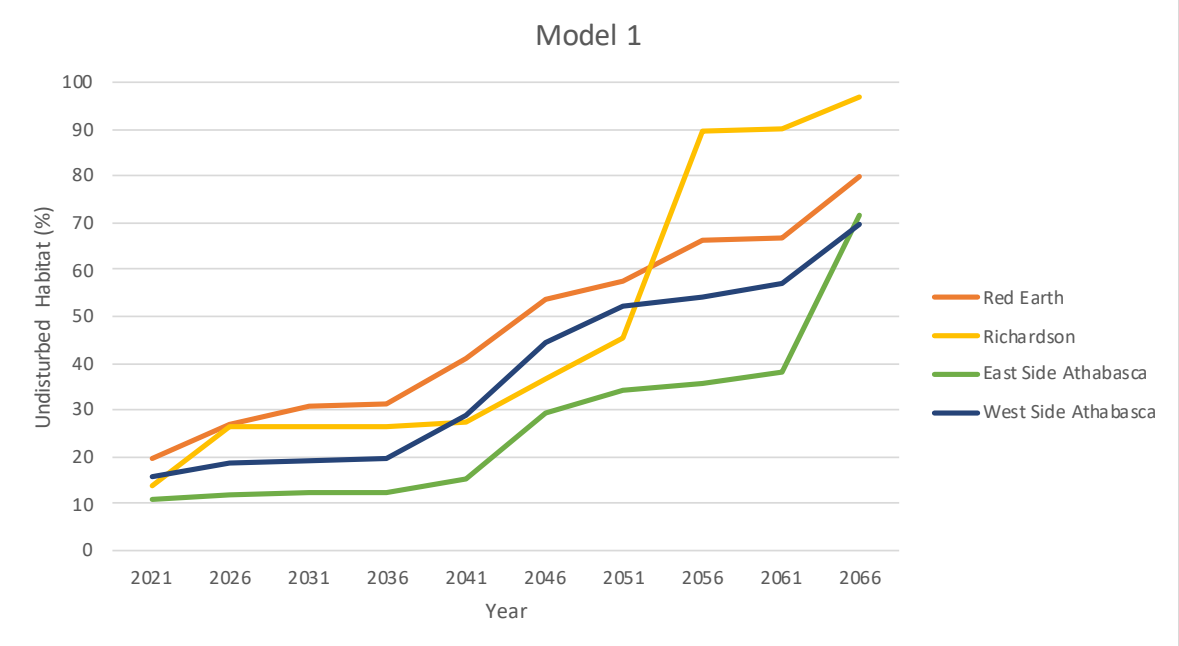
Model 1 provides a basic estimate of the tâdzié/sagow atihk habitat recovery timeline for habitat within herd range boundaries. The first model is based on Environment Canada's scientific assessment for critical habitat (Environment Canada 2011) in which 40 years is the estimated time required for disturbances to recover.

To calculate the habitat available to tâdzié/sagow atihk, we first separated the buffered linear disturbance by those within the active management zone and those within the recovery area (the protection and restoration zones). We then calculated the difference between the total study area (as outlined in Appendix 1) and the area within the active management zone covered by the buffered linear disturbance (using "difference" in QGIS).

Within the recovery area, we filtered the buffered linear disturbance footprint by the date of the original disturbance, and only included the footprint for the disturbances from 1981 onwards. We calculated the difference between the remaining area within the study area and the filtered disturbances within the recovery area (using "difference"). The Wildfire disturbance dataset was then filtered by the same date range, and the difference between the remaining area from the last step and the filtered wildfire footprints was calculated (using "difference"). The remaining area was then calculated within each herd range boundary (Appendix 1, 2.1.2) (using "clip", "field calculator" and "temporary joins").

We repeated the filtering by date and the subsequent difference calculations, and calculated the remaining area within each herd range boundary for each five-year interval from 1981 to 2026.

FIGURE 10. Model 1 forecast. A modeled forecast of the percent undisturbed habitat available in the Red Earth, Richardson, East Side Athabasca River, and West Side Athabasca River tâdzié/sagow atihk herd ranges following the protection of the protection and restoration zones.

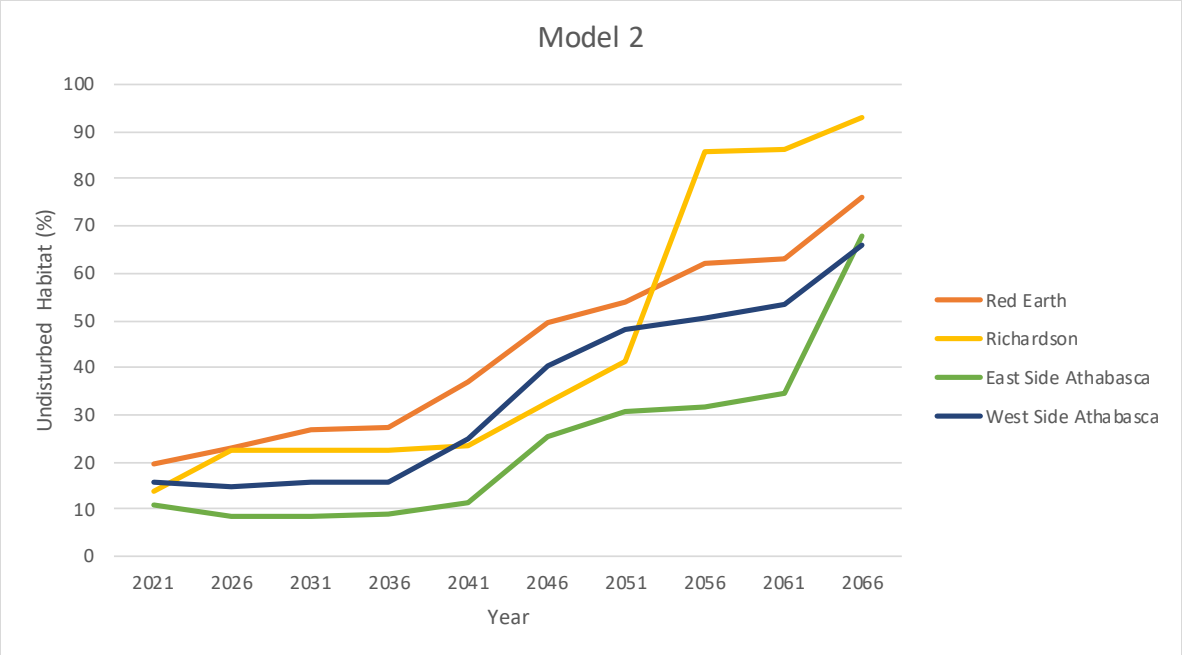


Model 2

The second model provides an estimate of the timeline for tâdzié/sagow atihk habitat recovery within herd boundaries, with the assumption that wildfires will continue in the area. This model is similar to Model 1, however the average area burnt by wildfires over each five-year interval was removed from the available tâdzié/sagow atihk habitat.

Specifically, the total wildfire area within the study area was calculated per year from 1981 to 2021 and averaged over the time period. This value was then determined per herd range by calculating the proportional amount of wildfire per herd range boundary area. Finally, from each five-year interval in Model 1 (starting from 1986), we removed five years' worth of the per herd range average annual wildfire area. This method is a rough estimation of the total area that future wildfires are likely to impact within tâdzié/sagow atihk habitat. By removing the estimated burnt area from the total available habitat, we have a more accurate understanding of the available habitat likely present after each five-year interval.

FIGURE 11. Model 2 forecast. A modeled forecast of the percent of undisturbed habitat available in the Red Earth, Richardson, East Side Athabasca River, and West Side Athabasca River tâdzié/sagow atihk herd ranges following the protection of the protection and restoration zones. Model 2 includes a projection of wildfires based on the average amount of burnt area over the study area within the last 40 years. The area covered by wildfires was averaged, and a proportional amount of available habitat was removed from each herd range annually. All anthropogenic disturbance recovers in 40 years.

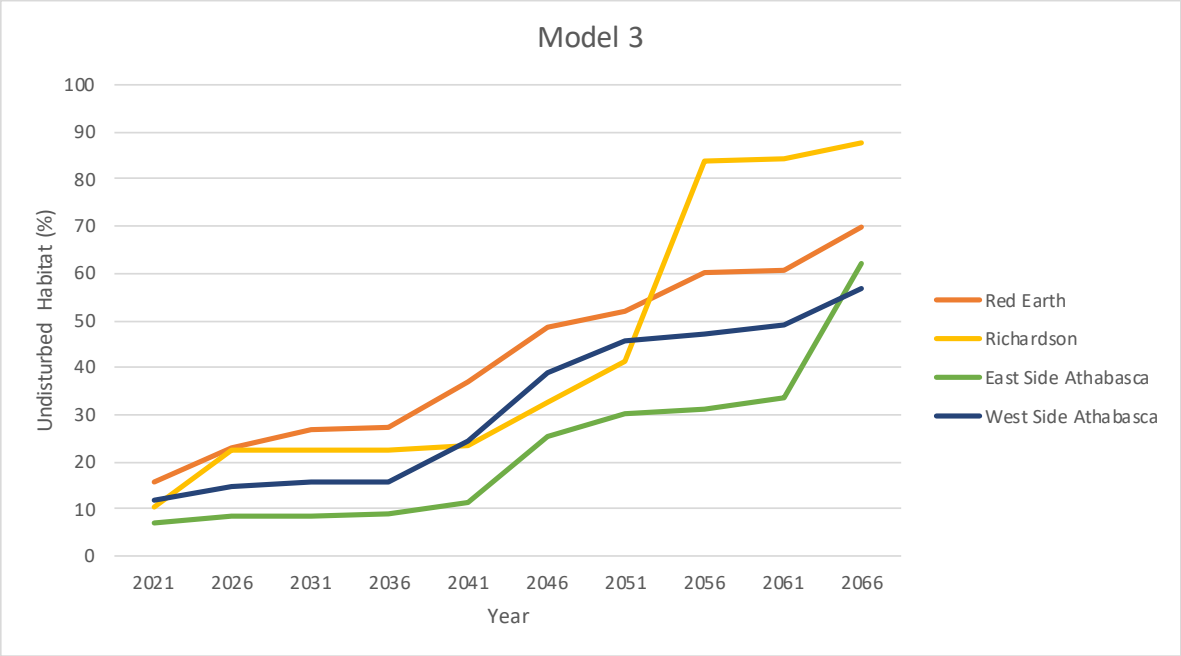


Model 3

Model 3 is an expansion of Model 2 with a more realistic recovery projection for the linear disturbance features. The difference between Model 2 and Model 3 is that Model 3 does not project the recovery of linear disturbance features deemed permanent.

In this model, the permanent linear features were isolated from the buffered linear disturbance layer. These permanent linear features were the roads, transmission lines and runways. The resulting area was then removed from the available caribou habitat in each of the five-year intervals (using "difference"). The yearly wildfires were included in this model and were modeled as in Model 2.

FIGURE 12. Model 3 forecast. A modeled forecast of the percent of undisturbed habitat available in the Red Earth, Richardson, East Side Athabasca, and West Side Athabasca tâdzié/sagow atihk herd ranges following the protection of the protection and restoration zones. Model 3 includes the fire model from model 2 and does not project the recovery of permanent anthropogenic features such as roads, transmission lines and runways.



Model Limitations

All of the above models include the assumption that seismic lines (of all types) recover within 40 years of the initial cut date. This assumption is incorrect as literature has shown that recovery can take much longer (Lee and Boutin 2006; Bayne et al. 2011; van Rensen et al 2015). Specifically, older methods of cutting seismic lines caused disruption to the topsoil, further delaying vegetation regeneration. Our decision to set the initial disturbance year to 2021 — for those disturbances without a recorded date — helps to account for the longer timeline required for older seismic lines to recover, however we are likely still underestimating the time required for seismic lines to recover.

Additionally, the estimated wildfires per year do not account for the fact that some wildfires may occur in already disturbed areas. In Model 2 and Model 3, we remove the average annual wildfire area as well as the area covered by other disturbances from the available undisturbed tâdzié/sagow atihk habitat. As a result, we have slightly overestimated the impact wildfires will likely have on available habitat per year.

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