A conservation and action plan for the Aishihik bison (*Bison bison*) population

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Prepared by the
Aishihik Bison Technical Team

Approved by

_____
The Honourable Nils Clarke
Minister of Environment
Government of Yukon

_____
Date

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Disclaimer:

This management plan does not create any commitments or obligations that are legally binding on the planning participants. Without limiting the generality of the foregoing, this management plan does not create, affect, define, interpret or apply any roles, responsibilities or interests under Final or Self Government Agreements.

This management plan may be cited as:

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Plan highlights

Since bison were re-established in the Yukon over 30 years ago, the herd has grown and human relationships with bison have evolved. This plan modernizes the management goals for the Aishihik bison population by ensuring that the associated outcomes reflect the aspirations of Yukoners. An explicit aim of this plan is to align local management with national and international bison conservation efforts. Notable updates found in this plan include:

- Fostering appreciation for bison in the Yukon through cultural connection;
- Managing the harvest on a sustainable basis;
- Resolving land use issues such as effects of bison hunting on traplines;
- Aligning with the national recovery strategy for bison; and
- Improving knowledge-sharing between bison management partners and the public.

Acknowledgments

We acknowledge that the known range of the Aishihik bison population falls within the Traditional Territories of the Champagne and Aishihik First Nations, Kluane First Nation, Little Salmon/Carmacks First Nation, and the asserted traditional territory of White River First Nation. We thank these First Nations for their thoughtful contributions to this bison conservation and action plan.

Ryan van der Marel and Thomas Jung were the primary authors of this plan. The plan would not have been possible without the hard work and guidance provided by the Aishihik Bison Technical Team and others that participated in planning workshops (for a list of workshop participants see Appendix A). Alistair Bath kindly facilitated the planning workshops with the technical team and, along with Monica Engel, led the development and analysis of the public survey. Importantly, we would like to thank the hundreds of Yukoners that contributed to the public survey or the review of the draft plan for their interest in bison management and conservation in the Yukon. As bison return to lands they previously occupied, they are slowly returning to the hearts and minds of its people.

Contents

1. Context

Bison in the Yukon

For thousands of years, bison (*Bison bison*) were a dominant presence on the Yukon landscape. Here, they lived alongside woolly mammoths (*Mammuthus primigenius*), Yukon wild horses (*Equus lambei*), caribou (*Rangifer tarandus*), thinhorn sheep (*Ovis dalli*), Arctic ground squirrels (*Urocitellus parryi*) and other ice age species. Ice age predators of bison included humans, lions (*Panthera atrox*), wolves (*Canis lupus*), and short-faced bears (*Arctodus simus*). While some of these ice age species no longer exist, others have persisted, coexisting with Indigenous peoples, including bison, caribou and sheep.

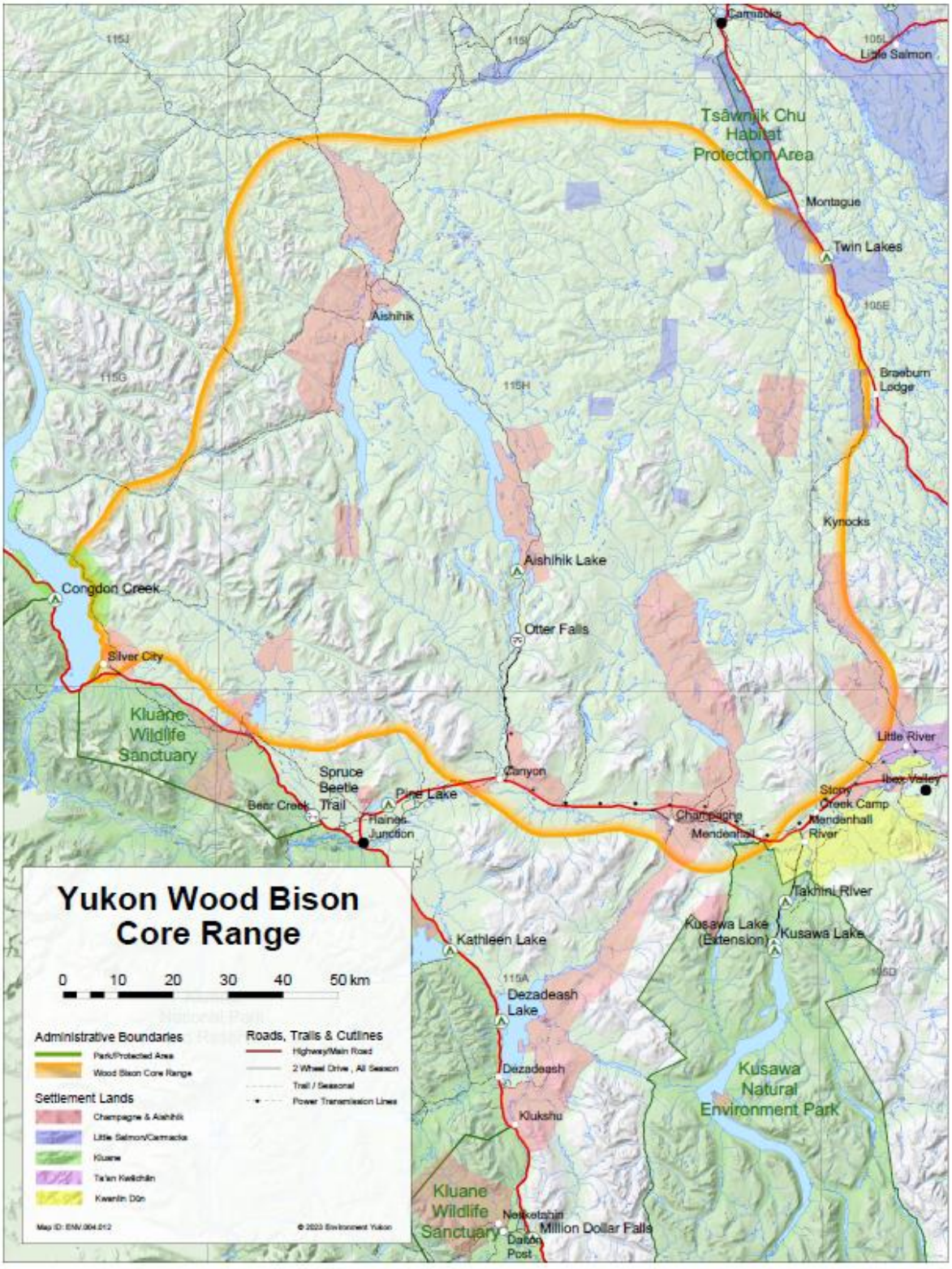
By the close of the 19th Century, bison had largely vanished from the North American boreal forest. The last known bison in the Yukon was observed near Watson Lake in the 1930s. They died out earlier in southwestern Yukon with the most recent fossil evidence indicating bison presence being approximately 350 years ago. Loss of bison from the Yukon was likely a response to a gradual conversion of steppe habitats to boreal forest, as the climate of northwestern North America gradually became warmer and wetter. Disease or human hunting may have also played a role in extirpating small, isolated remnant bison populations, particularly in the latter part of the 19th Century.

The Government of Yukon has participated in the global recovery of bison since 1980, with the explicit aim of establishing a free-ranging herd within their historical distribution in the southwestern Yukon. Collective effort by the governments of Canada and Yukon, with support by the Yukon Fish and Game Association, resulted in the release of 170 bison from a temporary enclosure near Mount Nansen between 1988 and 1993. This was the origin of the Aishihik bison population.

Two other reintroduced bison populations extend into the southeastern Yukon (the Nahanni and Nordquist populations), but they are outside the scope of this plan.

Box 1 shows the core range for the Aishihik bison population. The core range was determined through aerial surveys and radio-telemetry conducted by the Government of Yukon's Department of Environment. Over 95 per cent of the bison population resides year-round within the core range. Although it is possible to encounter small numbers of bison outside the core range, the farther outside the core range you travel, the less likely you are to find bison.

BOX 1: Aishihik bison core range



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Conservation and legal status

Wood bison were once nearly extinct. Currently only 11 small, isolated wood bison populations occur in northwestern Canada and Alaska, and they occupy a small fragment of their original distributional range. All but one of these populations are reintroduced. The reintroduced Aishihik bison population in the southwestern Yukon is one of the largest free-ranging bison populations left on Earth. As such, the Yukon is an important global steward of bison.

Given their dramatic decline, wood bison were among the first species in Canada designated as a species at risk. In response to their near extinction, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated them as *Endangered* in 1978. Due to substantial recovery efforts, COSEWIC reassessed wood bison in 2013 as a species of *Special Concern*; however, they currently remain listed as *Threatened* under Canada's *Species at Risk Act* (see Box 2).

BOX 2: Conservation status of wood bison in Canada

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) periodically reviews and updates the conservation status for species at risk. The following are the status changes to wood bison since they were first assessed by COSEWIC in 1978.

Year	COSEWIC Status	Reason for status	Description of status
2013	**Special Concern**	5,136 to 7,172 mature individuals in nine isolated wild subpopulations, 60% are estimated to be diseased.	A wildlife species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
2000	**Threatened**	This animal continues to face a number of threats to its persistence.	A wildlife species that is likely to become endangered if limiting factors are not reversed.
1988	**Threatened**	Numbers are increasing, however, this animal continues to face a number of threats to its persistence.	
1978	**Endangered**	Low numbers and availability of habitat and susceptibility to disease.	A species facing imminent extirpation or extinction.

As a species legally listed as *Threatened* in the federal *Species at Risk Act*, bison are afforded legal protection on federal lands and their recovery is guided by a national recovery strategy. In 2018, the Government of Canada, in consultation with the Wood Bison Recovery Team, produced a national *Recovery Strategy for the Wood Bison in Canada*. The recovery strategy identified population and distribution objectives for wood bison, threats to bison recovery, and strategies for addressing the threats. Two primary objectives were identified: i) in the short-term, to maintain the disease-free status of healthy populations, and ii) in the long-term, to ensure the existence of at least five disease-free,

genetically diverse, connected, self-sustaining, free-ranging local populations throughout their original Canadian range with a minimum size of 1,000 animals. The recovery strategy recommended the creation of one or more Action Plans to inform recovery objectives and support bison recovery.

In the Yukon, bison are listed as a Transplanted species under the *Umbrella Final Agreement*. This is because they were explicitly brought back to the Yukon for conservation purposes. Since 1998, the population reached a local recovery goal and was listed as a *Big Game Species* under the Yukon *Wildlife Act*, which enabled harvest by eligible hunters with a permit. Bison hunting is regulated and monitored to ensure that harvest does not pose a threat to population persistence.

Population status of Aishihik bison

By 1998, it was estimated that the Aishihik population was close to 500 animals. However, early population counts relied on so-called total counts, and their accuracy became increasingly questionable as the population grew. Beginning in 2007, biologists began using a mark-resight methodology to estimate population size and provide 95% confidence intervals around the modeled estimate. In July 2022, the population size was estimated to be 1,951 adult bison (95% confidence intervals = 1,688–2,295). This indicates the herd has continued to grow during the years between 2007 and 2022 (see Box 3). Rapid growth of reintroduced populations of bison is not unique, and similar rapid growth was reported for other bison populations after they were re-established elsewhere.

BOX 3: Abundance of Aishihik bison

Summary of results from periodic mark-resight surveys of the Aishihik bison population. All surveys used similar methods and the results do not include calves.

Survey Year	Years Since the Last Survey	Estimated Population Size	Estimated 95% Confidence Intervals
2007	0	899	891 – 1,128
2009	2	1,004	850 – 1,220
2011	2	1,053	749 – 1,266
2014	3	1,192	1,039 – 1,404
2016	2	1,325	1,157 – 1,552
2022	6	1,951	1,688 – 2,295

Management of the Aishihik bison population

Management of the Aishihik bison population is at the discretion of the Yukon Minister of the Environment, who is guided by recommendations by the Aishihik Bison Technical Team and by responsibilities laid out in the federal *Species at Risk Act*. The technical team was established in 1999 and serves as a co-management body for the Aishihik population. Organizations with a role in bison management are on the technical team, including the federal and territorial governments, four affected First Nations (Champagne and Aishihik First Nations, Little Salmon/Carmacks First Nation, Kluane First Nation, and White River First Nation), four Renewable Resource Councils (Alsek, Carmacks, Dän Keyi, and Laberge), and the Yukon Fish and Wildlife Management Board. The Yukon Fish and Game Association, Parks Canada, and the local outfitter are permanent observers on the team.

The technical team strives to cooperatively manage the Aishihik bison population and typically meets twice a year to share information about bison research, monitoring, and management. It makes recommendations to the Government of Yukon regarding the management of the Aishihik population, with a particular emphasis on the bison-hunting regime. With respect to hunting recommendations, the technical team has developed hunting management principles (see Section 4) to guide adaptive management (see Box 4) of the hunt. When requested by the Minister, the technical team also periodically reviews or develops a new draft management plan for the Aishihik bison population and makes recommendations on plan implementation. The Government of Yukon consults with Champagne and Aishihik First Nations, Little Salmon/Carmacks First Nation, Kluane First Nation, and White River First Nation before making management decisions that could affect their rights.

BOX 4: Adaptive management

Adaptive management is a framework used to adjust course when a sudden response is needed or when management outcomes are not being met. In 2008, bison were the first species in the Yukon to which an adaptive management framework was explicitly applied. Specifically, the Minister of Environment can make in-season changes to bison hunting following consultation with affected First Nations, Renewable Resources Councils, and the Yukon Fish and Wildlife Management Board. An adaptive management approach requires monitoring the impact of management actions and modifying those approaches to achieve desired outcomes, when necessary. Using new information as it becomes available is part of an adaptive approach.

Bison painting by Nathalie Parenteau

Management plans for the Aishihik bison population

This plan is the fourth management plan for the Aishihik bison population in the southwestern Yukon. Previous plans came into effect in 1980, 1998, and 2012, each replacing the former as overall management direction for the population (see Box 5).

Restoring bison in the Yukon has not been without challenges. The overall intent of the previous (2012) plan was to provide short-term direction for an increasing population that was raising concerns with local communities over the bison's relationship with other species, ecosystems, and land uses. Some concerns have persisted since bison were first re-established. These challenges were a focus in the 1998 and 2012 management plans. One key issue is low tolerance toward increases in bison abundance by some affected First Nations, because of concerns about ecological and socioeconomic effects of bison. The 2012 plan describes hunting as the primary tool to manage the growth of the population and reduce the potential or realized effects of bison and accommodate the interest of hunters. Interest in bison hunting by Yukoners has been high and direction from previous management plans have increased harvest opportunities. For over 20 years, bison have provided Yukoners with both tangible and intangible benefits such as meat and on-the-land experiences with family and friends. The benefits accrued through bison hunting have increased public awareness, appreciation, and value for the population. An example of this is the popularity of the school bison hunts, which are often accompanied by First Nations Elders, in which students learn about respect for the land and animals. Increases in bison hunting have also brought new concerns regarding the effects of bison hunters on First Nations subsistence, other wildlife, the land, and bison themselves. Reported impacts include trail proliferation, hunter congestion, and disturbance to traplines. Many of the issues identified in the 2012 plan are being addressed by targeted scientific or social science research (see Appendix C) and management actions,

including discussions between management partners and substantial public education and outreach. However, these issues persist.

This new plan updates the previous plan and articulates a longer-term vision and direction for conservation and management of the Aishihik bison population. This plan will also serve as an action plan for the Aishihik population under the umbrella of the 2018 national recovery strategy.

BOX 5: An evolution of Yukon bison management plans

- 1980 plan focused on re-establishing bison in the Yukon, with a focus on the logistics of transplanting them to a remote enclosure on the Nisling River. Several biological studies were recommended and completed (see Appendix C). An initial population target was established to deem if the project was a success.
- 1998 plan established a co-operative management strategy, implemented bison harvest, and identified emergent issues with bison reintroduction. The main intent was to address community concerns with a growing population of bison.
- 2012 plan also addressed both long-standing and emergent issues on ecological and social impacts, established population targets, and identified where to harmonize efforts with national bison conservation initiatives. Several biological studies were recommended and completed under the plan.

The planning process

A plan review process was initiated in response to the national recovery strategy and interest in re-examining the long-term vision for the Aishihik bison population, and to address arising concerns over hunter impacts to the land. The technical team came together for four planning workshops between September 2019 and September 2021 to develop a new plan. With the support of an independent facilitator, workshops were hosted in the affected communities: first in Haines Junction, then Burwash Landing, Carmacks, and then on the land at Airport Lake.

The plan was additionally informed by a Yukon-wide statistically random survey to understand Yukoners' attitudes toward bison. This survey showed that public concern over the effects of bison hunters is similar to the concern of bison managers themselves. Overall, the public favoured population growth of the herd despite a detectable degree of conflict within some groups, which included hunters and managers. More work would be needed to fully capture First Nations' perspectives and this plan identifies the intent to undertake further human dimensions work (see Box 6). Other key, new pieces that informed the plan were Environment and Climate Change Canada's 2018 *Recovery Strategy for the Wood Bison (Bison bison athabascae) in* Canada, a 2022 population survey, a 2021 bison hunter survey, and various research and monitoring reports and studies completed since the 2012 management plan (see Appendix C).

The Aishihik Bison Technical Team meeting at Airport Lake, September 2021.Photo by R. van der Marel.

BOX 6: Human dimensions of wildlife management

Traditionally, wildlife management has focused on wildlife and wildlife habitats. However, this focus ignores that management or conservation actions operate within and are influenced by people's social, cultural, and economic realities. This acknowledgement of the human influence on wildlife management is called "human dimensions of wildlife management". Increasingly, wildlife management practitioners are recognizing that successful wildlife management requires addressing and incorporating both the wildlife and human dimensions.

How human dimensions influence wildlife management is a broad and complex topic. In general, the focus is on:

- How humans value wildlife;
- How humans want wildlife to be managed; and
- How humans affect, or are affected by, wildlife and wildlife management decisions.

While this renewed focus on the human component of human-wildlife relationships does present a more human-centered perspective, it is not intended to diminish the importance or intrinsic value, of wildlife and their habitats. In fact, it acknowledges that management or conservation actions are inherently about managing, guiding or influencing human actions, and doing so requires an understanding of the social or cultural context for those actions.

2. Vison and goals

It is envisioned that over the life of this plan, the Aishihik bison population will increasingly be valued by Yukoners. Healthy, wild bison are in keeping with the Yukon's vast wilderness landscape that provides space for large mammals to persist in intact ecosystems. Bison should continue to provide a source of high-quality on-the-land hunting experiences, supporting food security for local communities.

Prospects for bison conservation in the Yukon are also strongly connected to national and international bison restoration efforts. On an international scale, recovery efforts have focused on re-establishing multiple herds within their historic range, distributed widely across the boreal forest of western Canada and Alaska. The Yukon's Aishihik bison are well-placed to support these broader conservation objectives because the population sustains a minimum of 1,000 bison, is disease-free, and there is substantial community support for bison recovery in the Yukon.

The vision for the Aishihik bison population is as follows:

Through fostered appreciation that inspires and sustains human cultures, bison are ecologically and culturally restored to the land, in balance with the fullest possible set of other native species.

This vision provides overarching direction for the management of the Aishihik bison population. It is where we would like to be in the near- and long-term future. Key to the vision is that the population is both ecologically and culturally restored. Ecological restoration means that they are a contributing part of fully-functioning ecosystems including predation, competition, migration, and maintaining habitat for other species. Cultural restoration entails that bison are part of the fabric of local people and are fully integrated into regional socio-ecological systems.

To achieve this vision, seven goals were developed to help ensure a long-term, biologically-viable, and healthy population in the Yukon. When met, these goals will ensure a bison population that provides both non-consumptive and consumptive opportunities for Yukoners to interact with bison, while also contributing to the global conservation of bison. Each goal has a series of outcomes and specific actions that will be taken to meet it.

GOAL 1: Ensure a viable bison population is restored to the land

GOAL 2: Promote greater awareness of, and connection to, bison

GOAL 3: Strengthen cooperative bison management

GOAL 4: Provide opportunities for respectful and sustainable bison hunting

GOAL 5: Acknowledge and address human-bison coexistence issues

GOAL 6: Assess the effects of bison on ecosystems

GOAL 7: Secure habitat for the Aishihik population

3. Outcomes and actions

This section reflects the desired outcomes that align with the vision and goals for the Aishihik bison population. Actions are identified which satisfy criteria for being SMART (specific, measurable, achievable, relevant and timely), while leading toward the aspirational vision of the plan. Restoration of bison is a long-term venture that requires a sustained vision.

GOAL 1: Ensure a viable bison population is restored to the land

Outcome 1: The Aishihik bison population maintains a minimum population of 1,000 animals

A minimum of 1,000 adult bison satisfies the long-term population objective from the 2018 national recovery strategy and assumes a sufficiently large population to remain reasonably resilient to known threats. Managing the Aishihik bison population this way is a shift toward managing them like we do other wild species, like moose or caribou. Field surveys and deployment of radio-collars, as well as population modeling, are to be used to annually estimate and track population size and trends.

Outcome 1: Implementation table

#	Action	Role[1]	Details/Performance metrics	Date	✓
1.1	Assess the status of the herd	YG	• Annually monitor changes in population size based on various indicators, including conducting surveys as necessary • Determine annual survival and calving rates by monitoring a sample of the population with radio-collars	Ongoing	□
1.2	Model population dynamics of the Aishihik herd	YG	▪ Model population dynamics to project population growth or decline, understand trends, and assess the likely impacts of various management scenarios	Ongoing	□
1.3	Use adaptive management (see Box 4) to manage the size of the bison population	BTT	▪ Until a more comprehensive model of the bison population exists, use the interim Bison Harvest Guidelines (see Appendix B) to provide direction for population size	Ongoing	□

[1] Implementation tables throughout this plan refer to: the Government of Yukon as 'YG'; the Bison Technical Team as 'BTT'; Champagne and Aishihik First Nations, Little Salmon/Carmacks First Nation, Kluane First Nation, and White River First Nation as 'FNs'; Alsek, Carmacks, Dan Keyi, and Laberge renewable resources councils as 'RRCs' Environment and Climate Change Canada as ECCC and to all of the above agencies as 'ALL'.

Outcome 2: The Aishihik bison herd remains disease-free and genetically pure

Diseases can pose a major threat to bison, with tuberculosis, brucellosis, and anthrax being of greatest concern for bison. Previous work has indicated that the Aishihik herd is likely free of these diseases of concern; nonetheless, genetic diversity and purity are a concern for all wild bison. This is particularly true given that the Aishihik bison population was established from a small number of individuals. The strategies to maintain genetic purity are generally the same as managing for disease prevention: preventing contact between free-ranging and captive bison, limiting imports of bison, and controlling, eliminating and/or preventing contact with plains bison, game-farmed bison, and cattle to mitigate hybridization or disease spread. The closest wild plains bison herd is located near Delta Junction, Alaska, approximately 470 km from the Aishihik bison. Should genetic diversity prove to be low, augmentation with the DNA of new individuals from other populations may be necessary to improve genetic health.

Outcome 2: Implementation table

#	Action	Role	Details/ Performance metrics	Date	✓
1.4	Assess and, if needed, improve the genetic diversity of the herd	YG	▪ Collect genetic samples from harvested bison ▪ Assess genetic status of the population when opportunities arise ▪ Consider genetic enhancement, if deemed necessary after modeling future genetic scenarios ▪ If considering this work, discuss appropriate methods for enhancing genetic diversity with the Technical Team and First Nations	Ongoing	□
1.5	Prevent contact between bison and farmed animals	YG	▪ Discourage new bison farms in the Aishihik bison core range and explore the feasibility of bison control areas, which would outline zones in which there are no new bison farms ▪ Develop protocols to prevent contact between wild bison and livestock ▪ Develop a contingency plan for how to deal with cases of bison coming into contact with farmed animals	2023	□
1.6	Prevent contact between different bison populations	BTT	▪ Develop a plan that includes no bison zones in the Yukon to ensure that Aishihik bison and plains bison do not interbreed ▪ Codify a protocol for all bison transported through the Yukon	2023	

1.7	Develop a health and disease monitoring and mitigation plan	YG	▪ Monitor and report on disease status of wild bison ▪ If disease is suspect, sample bison to assess prevalence ▪ Develop a contingency plan that details the response to the occurrence of diseases of concern	Ongoing	□

A group of bison on a frozen pond. Photo by K. Egli.

GOAL 2: Promote greater awareness of, and connection to, bison

Outcome 3: Inform and involve communities in bison management

Opportunities to learn about the bison can contribute to community support for management actions and overall social acceptance of bison. Methods to increase community participation include sharing information about bison management and communication of scientific, local and Traditional Knowledge.

Outcome 3: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
2.1	Host community events where bison managers can interact with community members	BTT	▪ Periodically host and attend community events to discuss bison conservation ▪ Provide space for community members to share their concerns	Ongoing	□
2.2	Make the results of research and monitoring initiatives publicly accessible	YG	• Publish and distribute research results using the various media available (e.g. Hunter Education brochure, front counter display, community events, etc.)	Ongoing	□
2.3	Conduct human dimensions research to better understand community perspectives and to evaluate effectiveness of education and outreach	BTT & YG	• When possible, collect human dimensions data and use it to guide co-management of bison conservation • Use human dimensions data to evaluate the effectiveness of education and outreach efforts	As needed	□

Outcome 4: Increase public outreach and appreciation about bison

As intelligent, powerful animals, bison evoke strong emotions. Increasing the understanding of, and respect for, bison may translate into a willingness for long-term stewardship and conservation. Opportunities to learn about and interact with the population may contribute significantly to increased community support for management actions. Youth participation in these activities has benefits to bison conservation and to youth directly. Methods to increase public outreach and appreciation include presentations in schools, providing information to local residents and through arts and culture—this could be visual arts, photography, literature, story-telling, or some other media that profiles the uniqueness of having bison in the Yukon.

Opportunities to view wildlife are an important component of Yukon's tourism industry and are cherished by residents. As a relatively accessible population, the Aishihik herd can, in some seasons, provide outstanding wildlife viewing opportunities.

Outcome 4: Implementation table					
#	**Action**	**Role**	**Details/Performance metrics**	**Date**	**✓**
2.4	Provide opportunities to foster appreciation of bison among youth	BTT	▪ Identify opportunities for youth bison appreciation (e.g. school hunts) ▪ Develop ongoing partnerships to implement identified opportunities	Ongoing	□
2.5	Produce and distribute coordinated public information about bison	YG	▪ Identify opportunities for education and outreach on bison ▪ Produce media-appropriate content for dissemination	Ongoing	□
2.6	Promote bison viewing opportunities	YG	▪ Explore the feasibility of bison viewing opportunities during the non-hunting season ▪ Maintain bison interpretive sites	As needed	□
2.7	Promote appreciation for bison through the arts	YG	▪ When possible, support local artists or cultural events that include bison ▪ Showcase local bison artwork in educational material	Ongoing	□

School bison hunt. Photo by J. Welsh.

GOAL 3: Strengthen cooperative bison management

Outcome 5: Share information, listen, and participate in collaborative decision-making

Plan implementation requires coordination and collaboration by all responsible organizations. Management of the Aishihik population relies primarily on guidance provided in this management plan, adaptively implemented through sustainable harvest. Adaptive decision-making requires a constant inflow of information and clear communication between partners and communities. Traditional, local, and scientific knowledge are important *ways of knowing* that complement and enhance each other.

Outcome 5: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
3.1	Integrate Traditional Knowledge, western science, and local knowledge	BTT	▪ Identify, discuss, and utilize various *ways of knowing* in bison management	Ongoing	□
3.2	Increase communication between all bison management partners	BTT	▪ Increase communication between game guardians and conservation officers	Ongoing	□
3.3	Continue to set regular meetings for the Bison Technical Team	BTT	▪ Meet at least twice a year in affected communities to discuss implementation, progress, and concerns and share information	Bi-annually	□

GOAL 4: Provide opportunities for respectful and sustainable bison hunting

Outcome 6: Maintain sustainable long-term bison hunting opportunities

Hunting is used as a management tool to manage population size and meet other management objectives for the Aishihik population. Hunting opportunities are provided in a manner that is consistent with the other goals and outcomes of this plan. An annual allowable harvest is permitted when the population is estimated to be greater than 1,000 adults on April 1. The annual allowable harvest is to be set based on the number of bison available to be hunted, along with a need to mitigate other management concerns. Examples of management concerns could be human-bison conflicts such as bison on the highway or in communities or in other areas where they are not desired. If there are fewer than 1,000 adults as of April 1, then harvest will not be permitted. The annual allowable harvest should be informed by population models that predict population outcomes under different harvest scenarios. Harvest guidelines, based on sustainability and supported by population models, should be developed to guide annual allowable harvest decisions by the technical team. Harvest management applies an adaptive process where the Aishihik Bison Technical Team modifies management recommendations as

new information becomes available. Hunting management principles are in Section 4 and interim guidelines for harvest are provided in Appendix B.

Outcome 6: Implementation table					
#	**Action**	**Role**	**Details/Performance metrics**	**Date**	**✓**
4.1	Adaptively manage bison numbers through changes to the annual allowable harvest	BTT	▪ Agree on the annual allowable harvest ▪ Use the harvest management guidelines (Appendix B) and principles (Section 4) ▪ Do not permit bison hunting if the adult population is estimated at less than 1,000 adults before April 1	Annually	□
4.2	Use population models that consider different harvest scenarios to guide annual allowable harvest decisions	YG & BTT	▪ Model harvest scenarios and develop/use guidelines under different scenarios to determine short- and long-term harvest sustainability	2024	□
4.3	Monitor harvest statistics and communicate results to the public	YG	▪ Collect and summarize hunting statistics ▪ Publish statistics in the Yukon Hunting Regulations Summary or online	Annually or as needed	□

Outcome 7: Support hunters to be active stewards in bison management

Hunting bison is challenging and requires knowledge of the animal and the land. Given that bison are a species at risk in Canada, the opportunity to hunt them is unique. Hunters should be informed as to the methods and ethics of harvesting bison. Hunters contribute to bison management and conservation by providing samples from bison they kill. Moreover, hunters, trappers and other people on the land often have intimate knowledge of the area and animals. Their observations can be very valuable for better understanding and managing bison, and should be shared with bison managers.

Outcome 7: Implementation table					
#	**Action**	**Role**	**Details/Performance metrics**	**Date**	**✓**
4.4	Provide hunter training about safe and ethical bison hunting	YG, FNs & RRCs	▪ Continue to provide a Bison Hunter Workshop ▪ Host workshops in interested communities, as requested	Ongoing	□
4.5	Engage hunters in collection of biological samples	YG, FNs & RRCs	▪ Continue to make the collection of necessary bison samples from hunters a permit requirement ▪ Engage hunters in collecting additional bison samples, as needed	Ongoing	□
4.6	Encourage hunters to report on-the-land observations	YG, FNs	▪ Encourage hunters to record and report on-the-land observations while bison hunting (e.g. T.I.P.P. line)	Ongoing	

		& RRCs	▪ Review reporting requirements ▪ Develop mechanisms for hunters to submit their observations online		
4.7	Effectively communicate with hunters about harvest management objectives	BTT	▪ Communicate and distribute materials to hunters about bison harvest management objectives and changes in hunting regulations and requirements	Ongoing	□

Outcome 8: Encourage respectful hunting and reduce the effects of hunters on the land

Hunters are one of the primary user groups that benefit from having bison in the Yukon. Like any human activity, the combined effects of many hunters can have adverse outcomes. Some of the issues that have been raised during the management planning process include excessive trail proliferation and noise from snowmobiles, garbage left behind, and disturbance to traplines, historic and cultural sites, and other resident wildlife, such as moose. Solutions will involve participation from the hunting community and other land users to understand what may work best. In addition to promoting stewardship, targeted approaches with various interest groups and dispersing the effects of bison hunters will help reduce conflicts.

Outcome 8: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
4.8	Conduct outreach to reduce environmental degradation	All	▪ Target affected communities and bison hunters with education and awareness to address respect for the land, including habitat degradation by snowmobiles	Ongoing	□
4.9	Conduct outreach to target bison hunters with education and awareness to respect active traplines	YG	▪ Continue to include respect for trapping cabins and trails in bison hunting workshops and seminars ▪ Maintain 'respect for trapping' signage at popular bison hunting locations ▪ Continue to provide "Active Trapping Area" signs for licensed trappers		
4.10	Promote cultural sensitivity between licensed hunters and affected First Nations in their respective Traditional Territories/ asserted traditional territory	All	▪ Target affected communities and bison hunters with education and awareness to address cross-cultural relationship-building and respect for First Nations and their rights	Ongoing	□
4.11	Consider mechanisms to reduce the number of permits in areas to address problems	YG & FNs	▪ Identify areas of concern to affected First Nations	2024	

			▪ Temporarily limit the number of permits available for identified areas to reduce hunter impacts ▪ Evaluate the effectiveness of these measures in reducing hunter effects	
4.12	Enable the enforcement of no access to hunting on Settlement Lands where it is not permitted by a First Nation	YG & FNs	▪ Explore means to enforce no access to hunting on Category A and B Settlement lands without a First Nation permit ▪ Continue to work collaboratively to ensure that bison hunting on Traditional Territories is respectful	2024
4.13	Create hunting refugia to reduce hunter-induced impacts on bison, moose and other wildlife, as needed	YG & BTT	▪ Identify one or more bison and moose refugia from scientific data and local and Traditional Knowledge ▪ Close identified areas to bison hunting during a portion or all of the hunting season	As needed

GOAL 5: Acknowledge and address human-bison coexistence issues

Outcome 9: Decrease potential for bison risks to human safety

Bison are large animals that may threaten human safety when they become defensive. Increased communications are needed to decrease human injuries due to bison. There are several territorial recreation parks within the Aishihik bison core range, such as Aishihik and Otter Falls campgrounds. Although not reported frequently, it is possible that bison come into campgrounds and other areas of high human use. Information on human safety when encountering bison should be provided at these campgrounds.

Outcome 9: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
5.1	Educate hunters and non-hunters about being safe around bison	YG	▪ Develop and distribute content that increase public knowledge of bison behaviour and recommendations for best practices when encountering a bison ▪ Provide education materials in campgrounds in the bison core range ▪ Work with park management teams on appropriate responses, if bison become an issue in national or territorial parks ▪ Target education materials for visitors to Yukon regarding safe bison viewing	Ongoing	□

Outcome 10: Reduce collisions with vehicles through various mitigation measures

Bison (and other ungulates) are likely attracted to highway right-of-ways because of food availability and ease of travel. As such, there is a continued risk of vehicle collisions with bison. While bison-vehicle collisions are not common in the Yukon, they are a serious concern in adjacent jurisdictions, including British Columbia and the Northwest Territories.

Outcome 10: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
5.2	Take measures to reduce bison attractants in the highway corridor	YG	▪ Evaluate means to reduce palatable plants on the highway verge ▪ Use hunting or other measures to deter bison from loitering on highway verges during September to end of March	As needed	□
5.3	Review and establish practices to address bison on the highway	BTT	▪ Review and establish measures to be taken when incidents of bison on the highway become a public safety concern	As needed	□

Bison eating by the Alaska Highway. Photo by P. Merchant.

Outcome 11: Mitigate impacts from bison to private property, and cultural sites, including on First Nation Settlement Lands

The long-term viability of bison in the Yukon relies on identifying and addressing local concerns about the impacts bison have to private property and sites of cultural significance. A 2011 socio-economic impact study describes the impacts and informs adaptive management practices.

Outcome 11: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
5.4	Address property damage issues as they arise	YG	▪ Review the wildlife conflict directive as it applies to bison and ensure a measured approach to human-bison conflicts ▪ Update the directive if necessary	As needed	□
5.5	Implement methods to exclude bison from sites of cultural significance	YG & FNs	▪ Identify sites of cultural significance that may be vulnerable to bison disturbance ▪ Work with affected First Nations to develop protocols to protect cultural sites	2023	□

GOAL 6: Assess the effects of bison on ecosystems

Outcome 12: Monitor the effects of bison on other species and ecosystems

Local people have been long concerned about negative impacts of bison to the land and other valued species, such as moose or caribou. A socio-economic impact study, completed in 2011, showed that participants desire a population large enough to sustainably harvest but avoid crossing a threshold beyond which bison may negatively alter the regional ecosystem.

Different knowledge systems provide different views on the presence or absence of negative effects on other species, like moose or caribou, or ecosystems. Scientific research on the impacts of bison on other species has found limited evidence for bison negatively impacting moose or caribou; however, there may be negative impacts to seasonal sheep range and muskrats. So far, researchers have not found a negative impacts of bison on relict boreal grasslands or rare plant communities; rather, bison use of grasslands appears to help maintain them and promote plant diversity.

Additional work should focus on monitoring interactions between bison and other species that may be indicators of change (e.g. in moose, caribou, sheep, or muskrat populations, as well as grassland plant communities). For instance, Kluane First Nation has expressed concern about sheep populations in their Traditional Territory possibly being affected by range degradation due to bison grazing, and research on this concern is encouraged. Monitoring range expansion and developing new research initiatives or management interventions, if necessary, is key to mitigating negative effects. Furthermore, an explicit outcome of this plan is for bison restoration to be measured on whether bison are fulfilling some of the ecological functions they once did before becoming extirpated.

Outcome 12: Implementation table					
#	**Action**	**Role**	**Details/Performance metrics**	**Date**	**✓**
6.1	Monitor for range expansion	BTT & YG	▪ Use telemetry data, aerial surveys, local observations and Traditional Knowledge to monitor for range expansion	Ongoing	□
6.2	Monitor for impacts on other valued wildlife by bison	YG	▪ Monitor for changes in local populations of other species, specifically moose, caribou, sheep, and muskrats ▪ Study the impact of bison on sheep habitat ▪ If necessary, develop research projects to examine the interactions between bison and other species ▪ Monitor for ecological interactions between bison and other species that may be indicators of ecological restoration	Ongoing	□
6.3	Monitor for impacts on local ecosystems and rare plants by bison	ECCC & YG	▪ Monitor for changes in remnant boreal grasslands or other ecosystems (e.g., wet sedge meadows) used extensively by bison ▪ Monitor for changes in rare plant communities in the bison range ▪ If necessary, develop research projects to determine the role, if any, of bison on impacts to those species and ecosystems	Ongoing	□

409 Biologists marking bison with paint for a population survey. Photo by T.S. Jung.

GOAL 7: Secure habitat for the Aishihik population

Outcome 13: Identify critical habitat

The federal *Species at Risk Act* requires that residences and critical habitat be protected from destruction for threatened and endangered species. While this legal requirement applies to bison, habitat loss does not appear to be a pressing threat for the Aishihik population. Regardless, a framework is needed to fill the knowledge gaps on range and habitat use of the Aishihik herd, in order to fulfill federal obligations.

Outcome 13: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
7.1	Obtain knowledge on habitat use and suitability	YG	▪ Develop seasonal habitat suitability maps using radio-collar data ▪ Validate habitat maps with local and Traditional Knowledge holders	2024	□
7.2	Develop and apply an approach to map critical habitat	BTT	▪ Determine how best to delineate critical habitat areas for the population ▪ Recommend areas that should be considered critical habitat	2025	□

Outcome 14: Secure critical habitat

Once critical habitat areas have been identified, it may be necessary to protect it. Doing so will ensure that bison habitat remains into the future, and that the Government of Yukon meets the legal requirements of the federal *Species at Risk Act*.

Outcome 14: Implementation table

#	Action	Role	Details/Performance metrics	Date	✓
7.3	Provide management guidelines for critical habitat areas	BTT	▪ Develop guidelines consistent with the national recovery strategy and this plan	If required	□
7.4	Designate and manage critical habitat areas	YG	▪ Designate and manage critical habitat areas with available policy and legal tools	If required	□

4. Implementation and plan review

Guiding principles for adaptive harvest management

In the implementation of this plan, every effort will be made to understand bison and their management needs to best minimize risks to Yukon ecosystems, communities, and the bison themselves. In September 2021, the Aishihik Bison Technical Team reviewed and revised a series of principles that guide adaptive management of bison harvest in the Yukon. These principles will inform the goals and actions of the plan, and will be a framework for adaptive management decisions during its implementation:

1. Respect for bison and other wildlife sharing the landscape and ecosystems
    a. Take only what you need and use all that you take
    b. Apply the precautionary principle
    c. Minimize impacts to land and wildlife

2. Respect for all land users
    a. Promote cultural awareness of First Nations rights and land use
    b. Raise awareness, especially among youth
    c. Minimize impacts to people

3. Governance, accountability, and transparency
    a. Communicate proactively
    b. Be clear on how harvest numbers are developed
    c. Keep things as simple as practicable

4. Bison hunting is a privilege and a tool
    a. Manage harvest to balance opportunities and effects
    b. Don't facilitate ease of hunt for success, promote fair chase
    c. Be inclusive and listen to all land users

Plan review and implementation

This plan will have an unspecified lifespan, having been created for a longer-term vision that recognizes the complexity of managing bison in the Yukon, and the desire to manage the population adaptively. It is the prerogative of any member of the Bison Technical Team to formally signal their desire for a plan review. A review will evaluate the progress towards achieving the vision, as well as provide an opportunity for ensuring the vision and long-term direction outlined in this plan are still relevant and consistent with overall wildlife management direction in the Yukon. A review will also consider the fact that policy and legislation evolves, potentially providing new management opportunities.

Typically, an implementation assessment should be undertaken after 5 years of the plan's enactment to evaluate whether the goals are being met and the actions fulfilled. Following the assessment, the plan's action items or its performance indicators may be updated with an addendum, as appropriate, without triggering a full plan review. Eventually, new issues may dictate other review responses to be initiated as deemed necessary by the Aishihik Bison Technical Team.

Roles and responsibilities

- The Aishihik Bison Technical Team will be responsible for yearly tracking of progress on action items. Information will be requested from other management partners, as required.
- The Aishihik Bison Technical Team will be responsible for reviewing and developing a five-year implementation assessment report.
- Any future full plan reviews will be completed when requested by the Minister of Environment, and in collaboration with all bison management partners.

Appendix A: Planning workshop participants

Organization	Participants
Alsek RRC	Laura MacKinnon, Mark Nassiopoulos, Cassandra Wheeler, Cameron MacKinnon
Government of Canada	Saleem Dar, Shannon Stotyn
Carmacks RRC	Sheila Garvice, Joseph O'Brien
Champagne and Aishihik First Nations	Tinha Chambers, Melina Hougen, Venesa Lutz, Micheal Jim, Monica Krieger, Harry Smith
Dan Keyi RRC	Sian Williams
Government of Yukon	Thomas Jung (Co-Chair), Barbara Coppard, Ryan Drummond, Shailyn Drukis, Rob Florkiewicz, Ken Knutson, Piia Kukka, Mark O'Donoghue, Russel Oborne, Robert Perry, Catherine Pinard, Shawn Taylor, Julie Thomas, Ryan van der Marel, Jim Welsh
Kluane First Nation	Kate Ballegooyen (Co-Chair), Geraldine Pope, Rachel Thom, Kristy Kennedy
Laberge RRC	Len Mychasiw, Ken Taylor
Little Salmon/Carmacks First Nation	Rebecca Freeman (Co-Chair), Calvin Charlie, Mike Vance
Other	Alistair Bath (Facilitator)
Parks Canada	Sarah Chisholm, Craig McKinnon
White River First Nation	Neil McGrath, Ray Sabo
Yukon Fish and Game Association	Eric Schroff, Gord Zealand
Yukon Fish and Wildlife Management Board	John Burdek, Carl Sydney, Graham Van Tighem
Local Outfitter	Tim Mervyn

Appendix B: INTERIM bison harvest guidelines

These INTERIM Bison Harvest Guidelines are meant to provide short-term direction for the annual allowable harvest of the Aishihik bison population. Annual calf production and mortality rates were the main data considered in developing these guidelines. These guidelines are interim because detailed population modeling efforts—based on harvest scenarios—are anticipated to result in these guidelines being updated to reflect the best available science.

Recommended harvest regimes aim to balance bison conservation with optimizing harvest opportunities. Specifically, the intent is to ensure that the population does not decrease below 1,000 adults, while providing a long-term harvest opportunity. As such, the annual allowable harvest is scaled to the estimated population size and trend. As the population grows beyond the 1,000 threshold the number of bison that may be harvested increases, but is dependent on whether the population trend is declining, stable, or increasing. Hunting may be closed, limited to moderate, or liberal, depending on population size and trend. Implementation of these guidelines will require an annual estimation of the population size (from population censuses or modeling), which considers the number of births and mortalities each year.

Importantly, the table below is meant to provide guidelines and not management prescriptions. To address social and other issues that may arise in bison conservation and management, harvest regimes may be modified at ministerial discretion.

A radio-collared bison near Aishihik Lake. Photo by T. Powell.

Estimated adult population size [2]	Recommended harvest regime	
	Decreasing population [3]	Stable or increasing population [8]
Less than 1000	• Hunting closed • Up to 10 bison (bulls preferred) may be taken for cultural, community hunt, or management reasons [7]	
1001 – 1200	• Limited hunting • Annual allowable harvest is 5% (50–60 bison) • 4:1 Bull:Cow harvest ratio • Up to 10 additional bison may be taken for cultural, community hunt, or management reasons [7]	• Limited hunting • Annual allowable harvest is 10% (100–120 bison) • 2:1 Bull:Cow harvest ratio • Up to 20 additional bison may be taken for cultural, community hunt, or management reasons [7]
1201 – 1500	• Moderate hunting • Annual allowable harvest is 12.5% (150–190 bison) • 2:1 Bull:Cow harvest ratio • Up to 20 additional bison may be taken for cultural, community hunt, or management reasons [7]	• Liberal hunting • Annual allowable harvest is 20% (240–300 bison) but may be capped at a lower number [7] • Either sex
More than 1500	• Liberal hunting • Annual allowable harvest is 20% (300 or more bison) but may be capped at a lower number [9] • Either sex but cow harvest may be encouraged	

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[2] The adult population is all animals alive as of April 1 each year (post-hunt), not including calves.
[3] Population trend (decreasing, stable or increasing) is based on the most recent trend.

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