Norman Wells
Public Listening
Climate Change
& Wildfire

Sahtu Knowledge of Wildfire and Climate Change Impacts on Caribou

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Outline of Presentation:

Part 1: What do we know?

- Overview of existing, publicly-available Traditional and Community Knowledge about impacts of wildfire and climate change on caribou in the Sahtu Region.

Part 2: What should we do?

- Ideas for planning, mitigation, and adaptation that could help caribou into the future.

Part 1: What do we know?

Topics:

- Status and Trends
- Climate and Climate Change
- Health/Body Condition
- Wildfire.

Sources:

- Species at Risk reports
- Advisory Committee for Cooperation on Wildlife Management (ACCWM)
- RRC inputs to planning processes
- University and SRRB research projects.

Bluenose-West Caribou:

Status and Trend Observations

Colville:

- Numbers are stable but animals are more spread out.[1]
- Migration changed in recent years.[2]
- Caribou stay near barren-ground.[3]
- Hunters have to go further to hunt.[3]

Dél̨ı̨ne̹:

- Smaller numbers.[4]
- One or two seen at Neregha.[4]

[1] Advisory Committee for Cooperation on Wildlife Management (ACCWM) 2023, 2021, 2020; Sahtú Renewable Resources Board (SRRB) 2020
[2] ACCWM 2023, 2021
[3] ACCWM 2023, 2021
[4] ACCWM 2020

Bluenose-West Caribou:

Climate and Climate Change Observations

Colville:

- Less snow closer to the barren-grounds; more snow in the trees.[1]
- Migration route shifted further north (about 10 years ago).[2]
- March 2019, weather warmed up fast causing caribou to leave area a month earlier than normal.[2]
- Weather warming so seeing more landslides, erosion, changes in waterways, changes in migration timing, snow crusts, wolves.[3]
- There are more caribou when it's cold.[3]

[1] ACCWM 2023
[2] ACCWM 2021
[3] ACCWM 2019

Bluenose-West Caribou:

Health/Condition Observations

Colville:

- Caribou remain as fat as always.[1]
- Seem to be in good health.[1]
- More grizzlies are staying out of the den and hunting longer.[2]
- Snow is crustier, wolves can get around easier.[2]

Other:

- Animals are healthy and fat.[3]
- Bull to cow ratio about 1:1.[3]
- The more isolated the caribou are from people, the more stressed they are by wolves.[3]
- A lot of caribou do not have much fat, suggesting trouble grazing.[2]

[1] ACCWM 2020; SRRB 2020
[2] ACCWM 2019; ACCWM 2014
[3] ACCWM 2021

Bluenose-East Caribou:

Status and Trend Observations

Dél̨ı̨ne:

- Not as many caribou as in recent years, fewer since 2018.[1]
- Not seen around traditional places like Caribou Point.[2]

Other:

- Seen alone or in pairs, not large groups.[3]
- Did not come near any Sahtu community in 2018.[4]

[1] ACCWM 2023, 2021, 2020, 2019; Headwater Group (HG) 2022b, 2021
[2] ACCWM 2020
[3] ACCWM 2020
[4] ACCWM 2019

Bluenose-East Caribou:

Climate and Climate Change Observations

Dél̨ı̨ne̹:

- The land is drier.[1]
- More shrubs on the tundra.[1]
- Caribou are travelling differently, possibly not as far as normal.[1]
- Snow and ice are changing and impacting travel and food access in winter. [1]
- There is less good home/habitat for caribou to survive on.[1]

General:

- There is lots of snow (2 – 2 ½ feet) with hard crust.[2]
- It's hard for caribou to get at their food.[2]
- They are staying on lakes and in open areas.[2]

[1] Dél̨ı̨ne̹ ʔekwé̹ Working Group (DEWG) 2021
[2] ACCWM 2020

Bluenose-East Caribou:

Health/Condition Observations

Dél̨ı̨ne:

- Caribou are staying far away from the community.[1]
- Insects are causing stress, may impact caribou health.[2]
- Caribou Point harvest: 8 of 12 caribou were pregnant and in fair condition.[3]

Other:

- Group observed with some chafing on legs from ice crust on snow. [4]

[1] ACCWM 2022
[2] DEWG 2021
[3] ACCWM 2020
[4] ACCWM 2020

General Barren-ground Caribou (Nǫ́dele / ʔədə / ʔekwę́):

Status and Trend Observations

General:

- Seeing fewer caribou.[1]
- Movement patterns different than when there was less snow.[2]
- Some caribou are not migrating, but staying in mountains or islands on Great Bear Lake.[2]

Dél̨ı̨ne̹:

- People looked for ɔekwę́ at ʔehaı̨la and Neregha in fall and summer 2020, but saw nothing.[3]

[1] HG 2022b; HG 2021b
[2] ACCWM 2021
[3] ACCWM 2021

General Barren-ground Caribou (Nǫ́dele / ʔədə / ʔekwę́):
Climate and Climate Change Observations (1)

Dél̨ı̨ne̹:

- Water in top two feet of Great Bear Lake changed temperature.[1]
- Insects cause stress on caribou.[2]
- Summer 2020 had lots of rain so no fires.[3]
- Dec. 2020 saw rain.[3]

[1] HG 2022b
[2] DEWG 2021
[3] ACCWM 2021

General Barren-ground Caribou (Nǫ́dele / ʔədə / ʔekwę́):
Climate and Climate Change Observations (2)

Overall:[1]

- It's getting warmer/hotter.
- Lake surfaces are getting warmer.
- Water levels are increasing.
- More erosion.
- Melting permafrost.
- Increase of shrubby vegetation in Mackenzie Mountains.
- More willows.
- More swampy ground.
- Insects are more active.
- Caribou are getting bogged down in mud in some areas.
- Less ice patches to protect caribou.
- Weather and wind directions changed.
- Different species observed.
- Ice conditions changing.
- Snowfall timing changing.
- Lakes not frozen as long.

[1] HG 2022a, b; ACCWM 2022, 2021, 2020, 2019; DEWG 2021; Species at Risk Committee (SARC) 2017

General Barren-ground Caribou (Nǫ́dele / ʔədə / ʔekwę́):

Wildfire Observations

Tulít'a:

- Previous generations saw wildfires only once in a while.[1]

Déline:

- No fires in 2020.[2]
- More risk of fire now.[3]

General:

- There are more wildfires and they are more intense than in past.[4]
- Less trees stands means less shade for caribou.[5]
- Lichen being burned and takes a long time to grow back.[6]
- Though seen as part of natural system, people are concerned about impacts of fire on caribou.[7]

[1] HG 2022b
[2] ACCWM 2021
[3] DEWG 2021
[4] HG 2022a; DEWG 2021; SRRB 2016; ACCWM 2014
[5] HG 2022a; SRRB 2016
[6] ACCWM 2014
[7] SARC 2017

Boreal Woodland Caribou (Tǫ̨dzı):
Status and Trend Observations

General:

- Limited new information available about current boreal caribou population trends in Indigenous and Community Knowledge sources.[1]

[1] SARC 2022

Boreal Woodland Caribou (Tǫdzı):
Climate and Climate Change Observations

General:

- Increase in size and severity of fires.[1]
- Changes in snow / ice / permafrost add to habitat degradation and fragmentation.[1]
- Increasing extremes in annual temperature and flooding impacts animals.[2]
- Warmer temps, increased winter rains, milder winters, increasing summer storms. [2]
- Caribou food is impacted by precipitation; too much snow makes it harder to access.[2]
- 85% say winters warmer than in past.[2]
- Differing opinions on changing snow patterns.[3]
- Some suggestions that winter snow levels have decreased, and that river and lake ice may not form as quickly nor as thick as before.[3]

[1] SARC 2022
[2] McDonald 2010
[3] Zimmer et al. 2002

Boreal Woodland Caribou (Tǫ̨dzı):
Wildfire Observations

General:

- Burned areas are not used by caribou until habitat recovers.[1]
- Larger and more severe fires may result in habitat recovery taking longer.[1]
- Fires can impact ability to acquire food.[2]
- Fires can force caribou to relocate to more desirable locations.[2]
- There are different observations regarding how long it takes before boreal caribou return to a burned area; some say it's as soon as there is new growth, others say they never return.[2]

[1] SARC 2022
[2] McDonald 2010

Boreal Woodland Caribou (Tǫ̨dzı):
Heath and Condition Observations

General:

- 2002 generally reported to be healthy.[1]
- Weather plays significant role in health and well-being.[2]
- Increasing extreme temperature and flooding can cause negative impacts.[2]
- Milder winters.[2]
- Increasing summer storms.[2]
- Increased rain in November. These changes can impact food sources and accessibility to food.[2]

[1] Zimmer *et al.* 2002
[2] McDonald 2010

Northern Mountain Caribou (Shúhta goʔepé):
Status Trends and Observations

General:

- Overall population trend unknown, but likely small, localized declines in some areas.[1]
- Distribution appears to be changing; unclear if ‘natural’ shift or if in response to climate change.[2]

Tulít’a:

- Migration routes and movements around Keele River and Caribou Flats have changed.[3]
- Shúhtaot’ı̨ne oral histories say caribou used to travel much further north in their migrations.[4]
- Caribou seem to be moving away from their usual areas.[4]

[1] SARC 2020; Winbourne 2019
[2] Winbourne 2019
[3] Winbourne 2017b; Olsen et al. 2001
[4] Winbourne 2017a

Northern Mountain Caribou (Shúhta goɔepé):
Climate and Climate Change Observations

General:

- Warming.[1]
- Shrubification.[1]
- Shrinking ice patches and glaciers.[1]
- Variability in snow pack.[1]
- Timing of melt, icing events, rapid snowmelt. [1]
- Drying tundra in places.[1]
- Warmer summer months and increased insect harassment.[1]
- Changes to migration, displacement, insect harassment.[1]
- Distribution and movement patterns are changing, as well as frequency of unfavourable conditions.[2]
- Concerns about higher numbers of grizzly bears hunting caribou.[3]

[1] Winbourne 2019, 2017a,b
[2] Winbourne 2019; Olsen et al. 2001
[3] Winbourne 2017a

Northern Mountain Caribou (Shúhta goʔepé):
Wildfire Observations

General:

- Damaging habitat, especially winter range, and increasing in number and level of damage (at least three areas destroyed in 2014).[1]
- Wildfires increasing in size and intensity; can destroy lichen caribou depend on for food and cause them to move from wintering areas.[2]
- Fires can also cause travel disruptions if they go through migration corridors, influencing distribution of caribou, other ungulates, and predators.[2]

[1] Winbourne 2017a
[2] Winbourne 2019, 2017a, b

Northern Mountain Caribou (Shúhta goʔepé):
Heath and Condition Observations

General:

- When caribou suffer from environmental changes, they may be more susceptible to other factors, such as predation and/or parasites.[1]
- They may be less productive.[1]
- If climate change results in a warming trend in summer, that increases fly activity.[2]
- There could be an impact on caribou body condition.[2]

[1] SARC 2020
[2] Winbourne 2019

Part 2: What should we do?

Indigenous-led climate change adaptation:

- The Bigger Picture
- Nuts and Bolts
- Special section: Planning for Wildfires.

Sources:

- Outreach to colleagues and partners
- Online and literature searches.

The Bigger Picture: Indigenous Rights in a Changing Climate

Principal Indigenous rights affected by climate change that should impact policy design and implementation:

- The right to self-determination;
- The right to participate and to free, prior and informed consent;
- The right to culture and Traditional Knowledge;
- The right to lands and resources; and
- The right to health, food, water and an adequate standard of living.[1]

[1] Indigenous Climate Action 2023b

The Bigger Picture: Indigenous Rights in a Changing Climate

Challenges:

- Rights are recognized at global level, but barriers exist.
- States are failing to acknowledge Indigenous rights to participate in decision-making and to veto climate policies that harm their rights.[1]

Ways Forward:

- International actions, e.g., 'International Indigenous Peoples Forum on Climate Change'; Indigenous Climate Action', etc.

"Governments are obligated to ensure the full and effective participation of Indigenous Peoples, protect Indigenous knowledge systems, and recognize and respect Indigenous jurisdiction over land."[2]

[1] Indigenous Climate Action (ICA) 2023a,b; United Nations 2023
[2] ICA 2023b

Impacts of Climate Change on Indigenous Peoples are Unique

Challenges:

- Indigenous Peoples are uniquely and disproportionately impacted by climate change, especially in the north.
- Need increased awareness, interest, and understanding about ways that climate change affects Indigenous cultures, lands, and traditional ways of life.

Ways Forward:

- Essential to understand unique, local vulnerabilities in planning.
- Must consider local values, history, culture, socio-economic and political circumstances, as well as understand local capacities.
- Use info to create policies more relevant to individual communities.[1]

[1] See SRRB 2014; Chief *et al*. 2014; Nakashima *et al*. 2012; Roche 2010, among others.

Indigenous Self-Determination: A Key to Climate Action

Challenges:

- Climate change is a result of colonial systems.
- Adaptation requires a technological shift and a shift in social and ecological priorities.

Ways Forward:

- Indigenous Knowledge is not only a source of environmental observations, but of relational philosophies and values that can inspire the cultural shift necessary to address climate change.
- Indigenous self-determination is a critical part of climate solutions.
- Decolonization: a critical piece of addressing climate change in Canada.[1]

[1] Climate Atlas of Canada 2023; Cameron 2018; Nakashima *et al*. 2012.

Existing Adaptive Indigenous Capacity

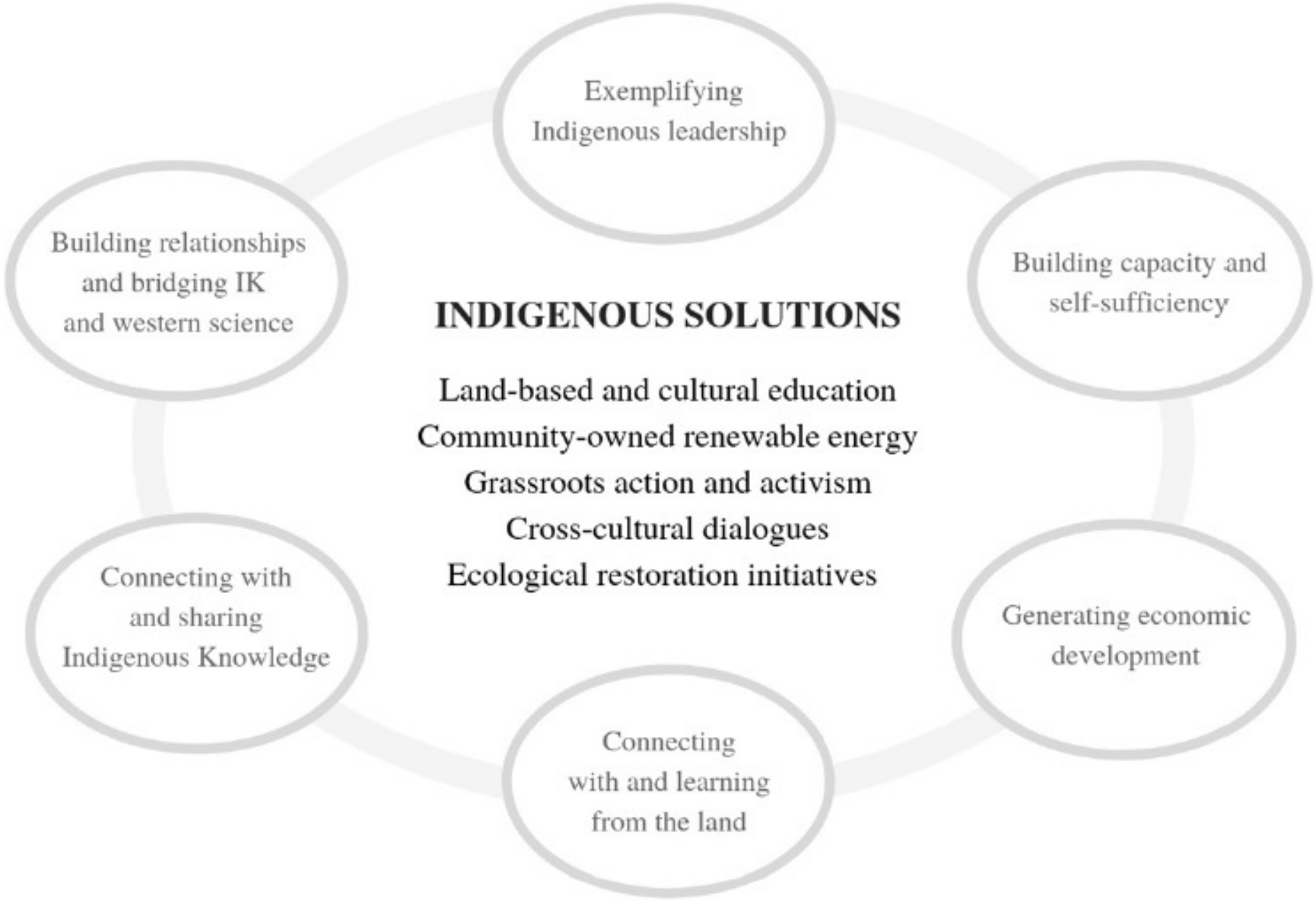
Capacity:

- Indigenous ways of understanding relationships among species, ecosystems, and ecological processes can play a vital role in climate change assessment and adaptation efforts.
- Indigenous cultures, practices, and knowledges possess abundant adaptive capacity.

Ways Forward:

- Tailor governance instruments to facilitate and support Indigenous capacities to pursue their own adaptive strategies.
- Research collaboration, government-to-government partnerships, and meaningful involvement of Indigenous Peoples in all aspects of climate policy and strategy development.[1]

[1] See Bell 2023, Chief *et al*. 2014, Nakashima *et al*. 2012, among others.



Cameron 2018:94

Indigenous Climate Change Adaptation: The Nuts and Bolts

- Understand regional and unique local ‘vulnerabilities’ or impacts.[1]
- Develop adaptive strategies.
- Some work done in Sahtu already.[2]
- Neighbouring work (e.g., Inuvialuit, Dehcho, and Yellowknives Dene) is also relevant and useful.[3]

[1] Dene Nation 2023; Chief et al. 2014; Nakashima *et al*. 2012; ENR 2008.
[2] Dél̨ı̨nę ʔekwę́ Working Group 2021; SRRB 2014; Roche 2010.
[3] Bell 2023; Institute for Circumpolar Health Research 2023; Fawcett et al. 2018.

Inuvialuit Example: Climate change impacts

- Identify local vulnerabilities /impacts.[1]

2005	2016
Travel risks and compromised travel routes	
Early and rapid spring melt	Spring melt is early and becoming more rapid
More variable and less predictable weather	More variable and less predictable weather
Longer autumn and less snow in some years	Snowfall is occurring later and affects travel
Rapid seasonal transitions and hazardous conditions lead to more hunters being stranded or injured	Seasonal transitions continue to be rapid but fewer hunters reported being stranded or injured
Changing sea ice dynamics	Sea ice is thinner leading to a greater flux in safe conditions and more travel on land in the winter
Sea ice is taking longer to freeze (or is not freezing) and melting earlier, becoming more unstable	Consistent trend towards later sea ice freeze-up and earlier break-up
Variable winds and increasing storminess, changing wind-ice regime	Winds are stronger and more consistent and variable in direction, leading to smaller windows of opportunity and increasing precautionary costs
Quality and availability of wildlife	
Decrease in the number and body condition of ringed seals and Peary caribou	Fewer seals in the area, partially due to sea ice decline
Shift from caribou to muskox, but muskox are getting further away	Muskox are further away, leading to less hunting success and access constraints
Access to eider ducks restricted by changes to sea ice, wind and boat cost/access	Changes to sea ice and shorter migration window are restricting access to eider ducks
Limited access to Dolphin Union caribou due to wind, distance and equipment requirements	Wind conditions make caribou hunting more dangerous, costly, and increase time constraints
Financial and time constraints	
	Increasing time and financial constraints are sometimes forcing travel in risky conditions

[1] Fawcett *et al*. 2018:123

Inuvialuit Example: Adaptive Strategies

- Develop adaptive strategies.[1]

Adaptive strategies	
2005	2016
Extra precautions	
Taking extra precautions and supplies/gas	More precautionary supplies required, sometimes constraining adequate preparation
Travel in groups and closer to town	Travel in groups and communicate travel plans
	Increase avoidance of risky conditions
Increasing use of communication and/or navigation technology	Technology is widely used, often within the context of individual skills and knowledge
Flexibility – transportation, routes, species, timing	
Change routes and locations	Flexible use of equipment and trails (e.g. caribou hunt by ATV)
Increasing use of boats in shoulder seasons as ice melts earlier – costs can restrict access	
Shift from muskox to caribou	Muskox are under pressure/further away, more difficult to be flexible when hunting them
Sharing networks and diet change	
Changes to species harvested	Changes to species harvested, more concentration on a few specific species
Sharing networks are an important adaptive strategy, starting to be restricted	Increased concentration of sharing networks to enable fewer hunters to be active full-time
Supplement diet with store food	Supplement diet with store food
Community hunts	
	Provide those who may not otherwise have access to a reliable source of country foods with country food

[1] Fawcett *et al*. 2018:126

Special Section: Planning for Wildfire

Challenges:

- Climate change is likely to bring hotter / drier summers to part of the NWT.
- Current fire management policy focuses on valued infrastructure more than critical caribou habitat.
- Cultural burning practices were banned in many Indigenous communities across Canada.

Ways Forward:

- Many people would like to see fires fought as a part of habitat management; some Sahtú, Gwich'in, and Tłı̨chǫ communities some are calling for more action on suppressing wildfires.[1]
- Collaborative fire management and reinstating cultural burning practices.[2]

[1] See Benson 2015 and sources in SARC 2022, among others.
[2] See Hoffman *et al*. 2022 & 2021, Christianson *et* al. 2022, Lake and Christianson 2019, Hoffman *et al*. 2022, and Kimmerer and Lake 2001, among others.

Special Section: Planning for Wildfire Examples from Other Places

Projects:

- Using Traditional Knowledge to understand fires / climate change (Alaska).[1]
- Monitoring, planning and responding to fire in Siberia.[2]
- Yukon First Nations Wildfire initiative.[3]
- Indigenous Peoples Burning Network.

Sources:

- 1970s research into use of fire by Dene and Woodland Cree in northern Alberta; work focused on understanding the use of fire as a practice and a tool in achieving certain ecological conditions.[3]
- Other compilations of information on Indigenous Knowledge of fire in Canada exist.[4]
- Work being done by Conservation through Reconciliation Partnership.

[1] Ray *et al*. 2012; Natcher *et al*. 2007.
[2] Snowchange 2022a, b & c.
[3] See Lewis and Ferguson 1988, Lewis 1982 and 1978, among others.
[4] Parks Canada 2021; Sutherland 2020; Smith 2010.

Dákeyi ukaanathị jè: All of you watch over our country with your heart – Restoring forest ecosystems in Kluane National Park and Reserve

- Partners: Champagne and Aishihik First Nations, Kluane First Nation, and Parks Canada.
- Collaborative approach to restore and increase resilience of forests, and help revitalize Southern Tutchone traditions and culture.
- Researching fire history and burning traditions.[1]
- Nov. 2023 update: completed Fire Management Plan

"when we create the space for the Indigenous use of fire, we are directly engaging with issues of sovereignty, reconciliation, and care."[2]

[1] https://www.newswire.ca/news-releases/government-of-canada-announces-2-5m-to-restore-forest-ecosystems-in-kluane-national-park-and-reserve-827743371.html
[2] https://conservation-reconciliation.ca/blog/lighting-a-good-fire-indigenous-fire-knowledge-and-reconciliation-in-protected-areas

Summary (1): Main Points for Sahtu Adaptation Planning

- Impacts of climate change on Indigenous Peoples are unique; need to understand unique 'vulnerabilities'.
- Plans can't be 'cookie-cutter'; need to be tailored to local conditions.
- Elements that make Indigenous Peoples vulnerable to climate change also provide guidance and a way forward.
- Plans should be rooted in traditional understandings of respect and reciprocity.
- Community conservation plans assert a more Indigenous framework and governance in managing for caribou.
- Approaches to climate change need to be based in Indigenous rights; climate change issues (e.g., biocultural diversity, food security, cultural maintenance, etc.) need to be addressed.

Summary (2): Main Points for Sahtu Adaptation Planning

- Work on barriers to Indigenous involvement in climate change policy and adaptation strategy.
- Seek collaboration, outside funding, and capacity support.
- Adaptation planning should be informed by both Traditional and Western scientific knowledges.
- Climate change is a result of colonial systems, so decolonization is a critical piece.
- Consider collaborative wildfire management; ‘fire-keeper knowledge’ can provide insights into how fire could be used to protect caribou habitat.
- Community planning approaches, such as Délı̨nę plan, can provide significant benefits to caribou and people, and re-enhance relationships between people and caribou.

“… real climate solutions are not caught up in maintaining the status quo of capitalism, of colonialism… real climate solutions are rooted in a return to the land, a return to and of the land, and are rooted in decolonization… Real climate solutions are decolonial climate solutions, because they're taking us back to reconnections with the land, to being on the land, to reconnecting with that intimate understanding of how to not just live and survive on the land, but how to adapt and change with it.”

(Eriel Deranger, Climate Atlas of Canada 2023)