

TR'ONDĚK HWĚCH'IN ECOLOGICAL AND LAND USE MONITORING PLAN

2023 – 2025



Prepared by:
Tr'ondëk Hwëch'in
Natural Resources Department
2023

Our people are recognizing that traditional foods taste differently today. Our people are noticing that plants and animal patterns are shifting. Our people mourn the loss of our fresh creeks and our caribou herds.

And our people know that the reinvigoration of our culture, a revitalization of our stories, and a recommitment to Tr'ëhudè is our path back to the Spirit of the Land: and this will help to restore the land's balance.

'Tr'ondëk Hwëch'in Land Vision' (TH Implementation, 2022)

CONTRIBUTORS

This plan was prepared by the Tr'ondëk Hwëch'in Natural Resources Department, along with contributions and internal review by:

- Heritage Department
- Implementation Department
- Tr'ondëk Hwëch'in Council

This plan wouldn't be possible without the perspectives and knowledge provided by the many Tr'ondëk Hwëch'in Citizens who have spoken about their connections to the land, their concerns about how it is being managed, and what is required to ensure our traditional values and priorities are protected for future generations.

This document may be cited as:

Tr'ondëk Hwëch'in, 2023. Tr'ondëk Hwëch'in Ecological and Land Use Monitoring Plan: 2023-2025. Tr'ondëk Hwëch'in Department of Natural Resources, Dawson, YT. Pp. 41.

Questions and comments about this document may be addressed to:

Director of Natural Resources
Tr'ondëk Hwëch'in
Box 599 Dawson, YT Y0B 1G0
(867) 993-7100 ext. 145

See our website for current contacts: <https://www.trondek.ca/natural-resources>

TABLE OF CONTENTS

DEFINITIONS	iii
CULTURAL CONTEXT	1
PART 1: BACKGROUND	3
1.1 Tr’ondëk Hwëch’in Traditional Territory	3
1.2 Ancestral Land Stewardship.....	7
1.3 Adapting to Change	8
1.4 Threats to our Land-based Connections.....	9
PART 2: MONITORING	11
2.1 Rationale for Monitoring	11
2.2 Types of Monitoring.....	12
2.3 Monitoring in our Traditional Territory	13
PART 3: THIS PLAN	14
3.1 Purpose	14
3.2 Guiding Principles	15
3.3 Goals and Objectives.....	16
3.4 Scope.....	17
PART 4: COMMUNITY PRIORITIES	18
4.1 Connecting to the Land.....	18
4.2 Culturally Significant Species, Areas, Ecosystems and Land Uses	20
4.3 Culturally-Relevant Indicators.....	26
PART 5: PLAN IMPLEMENTATION	29
5.1 Meaningful Participation	29
5.2 Project Evaluation	30
5.3 Roles and Responsibilities.....	32
PART 6: PLAN REVIEW	34
6.1 Short-term Reporting.....	34
6.2 Annual Reporting	34
6.3 Five-year Review	35
PART 7: APPENDICES	36
7.1 Documents Relevant to Monitoring in the Tr’ondëk Hwëch’in Traditional Territory	36
7.2 Natural Resource Management Roles and Responsibilities in the THTT.....	37
7.3 Potential Sources of Monitoring Information.....	38
7.4 Template: Project Evaluation.....	39

LIST OF FIGURES

Figure 1 Tr’ondëk Hwëch’in Traditional Territory, Yukon, Canada.....	5
Figure 2 Threats and impacts to Tr’ondëk Hwëch’in connections to the land.	9
Figure 3 How biocultural monitoring in the THTT can reflect and support the TH worldview and traditional values.....	17
Figure 4 How the goals and objectives of the TH Ecological and Land Use Monitoring Plan can support land-based connections and stewardship in the Tr’ondëk Hwëch’in Traditional Territory.....	19
Figure 5 Graphic recording of Land-based Monitoring Priorities Workshop, March 22, 2023.	21
Figure 6 Ladder of Meaningful Participation	29

LIST OF TABLES

Table 1 Risk Matrix for Tr’ondëk Hwëch’in Species of Cultural Significance	22
Table 2 Risk Matrix for Tr’ondëk Hwëch’in Ecosystem Components of Cultural Significance	23
Table 3 Risk Matrix for Tr’ondëk Hwëch’in Areas of Cultural Significance	24
Table 4 Tr’ondëk Hwëch’in Land Use Monitoring Priorities	25
Table 5 Culturally-relevant indicators for the ecological and land use monitoring priorities of Tr’ondëk Hwëch’in	27
Table 6 Summarized project evaluation for ecological and land use monitoring in the THTT	31
Table 7 Roles and responsibilities for Natural Resources staff involved with ecological and land use monitoring.	32

DEFINITIONS

Adaptive Management – an iterative decision-making process that uses best available knowledge to implement management actions, monitors the results of those actions, and adjusts as required to achieve management objectives.

Biocultural Monitoring – repeated observations of indicators that reflect the long-standing interconnection and interdependence that exist between the land, fish, wildlife and people, and their ability to respond and adapt to changing climate and land use.

Community Engagement – a process that seeks to establish an equitable and respectful relationship with Tr'ondëk Hwëch'in, including Citizens, Elders or youth who may or may not live within the THTT, and more broadly, may include other residents of the THTT, such as those who work towards or otherwise share TH values and interests (including TH staff). This process may include the exchange of information or other resources such as stories, interviews, perspectives or assistance with planning or organizing various project components.

Conservation – the management of fish and wildlife populations and habitats and the regulation of users to ensure the quality, diversity and Long Term Optimum Productivity of fish and wildlife populations, with the primary goal of ensuring a sustainable harvest and its proper utilization¹.

Cultural keystone species – plants or animals that influence the cultural identity of a people, as reflected in the fundamental roles these species have in diet, materials, medicine, language, and/or spiritual and ceremonial practices².

Cumulative Effect – a change in the environment caused by multiple interactions among human activities and natural processes that occur across time and space.

Dënezhu (dätr'inch'e) – (We are) the people of this land.

Furbearer – means any of the following species native to the Yukon: beaver; white fox or arctic fox; otter; lynx; martens and fishers; weasel and mink; muskrat; red, cross, black and silver fox; wolverine; wolves and coyotes; marmots; red squirrel; and ground squirrels¹.

Indicator – an attribute that when monitored over time can provide information about overall health, productivity or resilience of an ecosystem, species, community or process.

Indigenous Resource Management – traditional practices used by Dënezhu to maintain balance and strengthen connections to the land, to ensure the persistence of both people and wildlife and the land on which they all depend.

Invasive species - A species of plant, animal, aquatic life or insect that is not native to an area and whose introduction or spread is likely to have net negative effects on our society, our economy, our environment, or our health. These species can spread rapidly and outcompete native species, disrupting ecosystem processes and threatening biodiversity.

¹ Tr'ondëk Hwëch'in Final Agreement (1998). https://www.trondek.ca/sites/default/files/basic_page_files/TH_Final%20Agreement.pdf

² Garibaldi, A., and N. Turner. 2004. Cultural keystone species: implications for ecological conservation and restoration. *Ecology and Society* 9(3): 1. <https://www.ecologyandsociety.org/vol9/iss3/art1/>

Settlement Land – lands owned and managed by TH pursuant to Chapter 5 and described in Appendix A and B of the THFA; Category A Settlement Land, Category B Settlement Land or Fee Simple Settlement Land¹.

Species at Risk – a species that is listed on Schedule 1 of the Canadian *Species at Risk Act* (SARA) as either a species of Special Concern, Threatened, Endangered, or Extirpated; may also include species that are recommended for listing by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Stewardship – spiritual and cultural obligations of Tr’ondëk Hwëch’in to ensure the survival of life for future generations by protecting the ongoing health of the land and all that it includes through various management principles and strategies³.

Subsistence – (1) the use of edible fish or wildlife products by a Yukon Indian Person for sustenance and for food for traditional ceremonial purposes including potlatches, (2) the use by a Yukon Indian Person of Non-Edible By-Products of harvests under (a) for such domestic purposes as clothing, shelter or medicine, and for domestic, spiritual and cultural purposes, but (3) except for traditional production of handicrafts and implements by a Yukon Indian Person, does not include commercial uses of edible fish or wildlife products or non-edible by-products¹.

Sustainable Development – beneficial socio-economic change that does not undermine the ecological and social systems upon which communities and societies are dependent¹.

Target – a desired quantity or condition that can exist naturally or may be reached by implementing management actions. E.g., border escapement targets for Canadian-origin Chinook salmon.

Traditional Economy – harvesting, producing or distributing goods or services based on traditions and customs in keeping with the ancestral values of stewardship of the land and its natural resources³.

Traditional Knowledge – a living and active process that comes from the land, our ancestors, and our way of life. Our values and principles, experiences, and relationships all shape what our observations and experiences mean to us. It is through this lens that we understand our roles and responsibilities. It is from this perspective that we make decisions as we move forward. This is what it means to “traditionally know” or to “have Traditional Knowledge”. Other common words or terms we may use to refer to Traditional Knowledge include Tr’ëhudè, community knowledge, Indigenous knowledge, or just knowledge.

Tr’ëhudè – translated from Hän to English as “Our Way of Life” (going through the world in a good way); speaks to TH teachings, laws, roles and responsibilities of individuals, families, community and government³.

Threshold – a defined limit that, once exceeded, triggers a management action or change in use to slow or stop the observed rate of change. E.g., carbon dioxide levels in the atmosphere.

³ Tr’ondëk Hwëch’in Land Stewardship Framework Project Charter (2019).

CULTURAL CONTEXT

*We are Dënezhu –the people of this land.
We are Tr’ondëk Hwëch’in –the people of this river.
We have always lived here.*

– ‘We are Dënezhu’ (TH Heritage, 2020)



As Tr’ondëk Hwëch’in, our health and well-being have, and continue to be, a direct reflection of the health of the surrounding ecosystem. For millennia, our survival has depended on effectively observing environmental changes and using that information to decide how to best use and care for the land. Important information

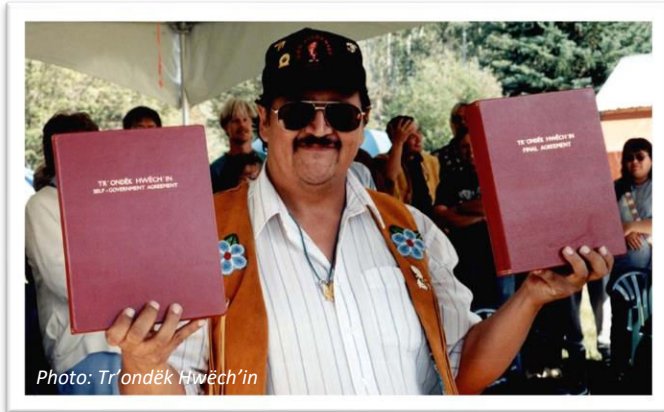
is passed down as [Traditional Knowledge](#) and refined over time as conditions change. That process of continual observation and decision-making is essentially a form of what is now known as [biocultural monitoring](#) and [adaptive management](#).

In less than two centuries, the scale of land use in the Tr’ondëk Hwëch’in Traditional Territory (THTT) has expanded and changed fundamentally. Most people in our Traditional Territory are based out of Dawson City and a network of roads has replaced rivers as the main transportation corridors. As always, seasonal limitations continue to control the accessibility and timing of



many activities throughout the year; however, the range of renewable and non-renewable land-based activities has expanded and intensified. Exploration and mining occur throughout the Traditional Territory, people from around the world visit Dawson City, and many households continue to support their livelihoods with trapping, fishing, outfitting, and woodcutting.

Despite these significant changes, Tr'ondëk Hwëch'in citizens (Citizens) continue to participate in the **traditional economy** through **subsistence** harvest activities and traditional pursuits, allowing us to maintain strong ties to the land and water, and the fish and wildlife that live within them. Maintaining these ties requires healthy fish and wildlife populations, functional ecosystems, Traditional Knowledge, and safe, timely access to the land; however, the impacts of development and a rapidly changing climate are complex and not fully understood. Monitoring ecological and land use processes is critical to understand the causes and consequences of change, to support **sustainable development** and **stewardship**, and to ensure the continuation of traditional pursuits.



The land is fundamental to protecting and enhancing our cultural identity, traditional values and lifestyle, and provides a foundation for self-government. The Tr'ondëk Hwëch'in Final Agreement (THFA), and Self-Government Agreement (SGA) protect our rights, titles and interests to the land, including the rights to full participation in resource management within our Traditional Territory. Therefore, effective

monitoring is critical not only for the protection of natural resources but also as a means of asserting our inherent rights and responsibilities and our authority as a government and as a people.

Good quality monitoring information, combined with existing scientific and Traditional Knowledge, can strengthen the capacity of our leaders, staff and Citizens to fulfil our stewardship obligations and participate more effectively with our partners in land use planning, development assessment, resource management and climate change adaptation.



*“Keep your land clean, keep your animals, they are your friends.
You look after them, they look after you. You look after your
water, land, trees, you look after it, and you respect it.
That’s our spirituality.”
- Elder Percy Henry*

1.1 Tr'ondëk Hwëch'in Traditional Territory



Geology

The Tintina Trench cuts across the THTT along an ancient fault line. This has resulted in distinct differences in terrain, soils and mineral potential between the north and south parts of the TT, which has had significant implications for historical and current land use.



Glaciation

Large portions of our TT were never covered by ice during the last glaciation and were part of a vast area known as Beringia. Soils are thicker and richer than in glaciated regions and can support agriculture in low-lying areas free of permafrost. Placer gold was never scraped away by the ice and can still be found in many streams throughout the THTT, resulting in the highest levels of placer gold mining in the Yukon for well over a century.



Permafrost

The entire THTT is underlain by either discontinuous or continuous permafrost, which makes us particularly vulnerable to the effects of a warming climate. During the growing season, the occurrence of underlying frozen soils affects soil temperatures and drainage, which in turn affect the types of plants and habitats that are able to persist. Wetlands often develop in lowland areas with cool soils and poor drainage, and these critical habitats perform essential functions like water filtration and carbon sequestration, and are home to many important species of plants and animals.



Water

Our Elders tell us 'Water is life'. Rivers and streams help shape the land, play key roles in the water cycle, provide aquatic and riparian habitats, and serve as transportation corridors in less accessible areas. Water is also essential for placer mining operations and domestic needs. The THTT falls within the Yukon River watershed and the Peel River watershed. Each watershed has its own distinct assemblage of species and aquatic habitats.



Climate

The THTT has a cool temperate climate with long, cold winters and short, warm summers and an average annual temperature of -5.4°C, generally ranging between -50°C in winter and up to +30°C in summer. Each year 300 – 400 mm of precipitation falls as rain or snow. The climate is changing faster here than many other places in Canada and is generally causing our summers to be cooler and wetter while our winters are warmer with an unpredictable snowpack. More precipitation is expected to fall as snow.



Wildfire

Fire produces a patchwork of different forest stand ages, which provide habitats for many important boreal species including moose, grizzly bears, [furbearers](#) and migratory birds. Climate change is impacting the frequency and intensity of wildfires, which may have long-term impacts on how wildlife and people use the land, depending on how long it takes key habitats to regenerate.

Ninänkāk - Our Land

The Tr'ondëk Hwëch'in Traditional Territory is located in west-central Yukon and covers about 11% of the Yukon (53,776 km²) — including 2,590 km² of Settlement Land that is owned and administered by TH according to TH laws and policies.

Within this vast area, a dynamic northern climate and a unique geologic and glacial history have resulted in a diverse mosaic of landscapes, which continues to support a high degree of biodiversity.

It is this biodiversity, which originally attracted our ancestors to this land and supported Dënezhu (people of this land) for millennia. We know this from the stories, Hän place names, traditional trails, routes and other sites that remain from long ago and continue to be used.



Plants and Animals

Current knowledge indicates that the THTT supports 46 species of mammals, 19 species of fish, 182 species of birds, and more than 1100 species of plants.

Cultural Keystone Species

TH Citizens continue to rely on many species for subsistence. This includes fishing for salmon and freshwater species; hunting caribou, moose and sheep; harvesting small game, trapping furbearers, and picking a variety of berries, plants and roots for foods and medicines.

Predators, particularly wolves, are recognized as ‘doctors’ and ‘teachers’ of their prey species, helping to keep populations healthy and preventing the land from being overgrazed.

Other species, such as grizzly bears, are regarded as kin and require additional measures to maintain respectful relationships.

Many of these species are featured in our traditional stories, indicating that relationships with these beings were established long ago. Sustainable harvest practices and *tr’ëhudè* (our way of life) allow us to maintain these connections today.

Species at Risk

The THTT is home to 21 species of mammals, fish, plants and insects that are currently considered by the federal government to be *Species at Risk*. The THTT supports healthy populations of many of these species, thereby acting as a refuge, even as many other parts of their range continue to be degraded.

Rare and Endemic Species

Thousands of years of isolation in Beringia during the last ice age resulted in some species of plants, insects and mammals diverging and evolving into endemic species, which are found nowhere else in the world. Very little has been documented about some of these species, and their abundance and distribution are largely unknown.



Community

Tr’ondëk Hwëch’in have lived here since time immemorial. Our ancestors travelled the land, and developed and maintained relationships with neighboring First Nations through trade and marriage. Learning happened through the exchange of food, materials and stories, which helped transmit complex knowledge of the land that was critical for survival.

In the mid-1800s, through fur trading, missionaries and the discovery of gold, this way of life was forever changed. After the Gold Rush, many Citizens found it necessary to adopt more permanent homes and join the wage economy. The installation of a colonial government and the legacy of residential schools further disconnected Citizens from the land and from their language and culture.

Self-government has provided a path forward to recover, restore and revitalize what has been lost or damaged over the past 150 years.

Tr’ëhudè continues to provide a framework that we can use to adapt to change and incorporate new knowledge about the land. Our stories continue to guide us, even as we adopt new tools and ways of gathering and sharing knowledge about the land.

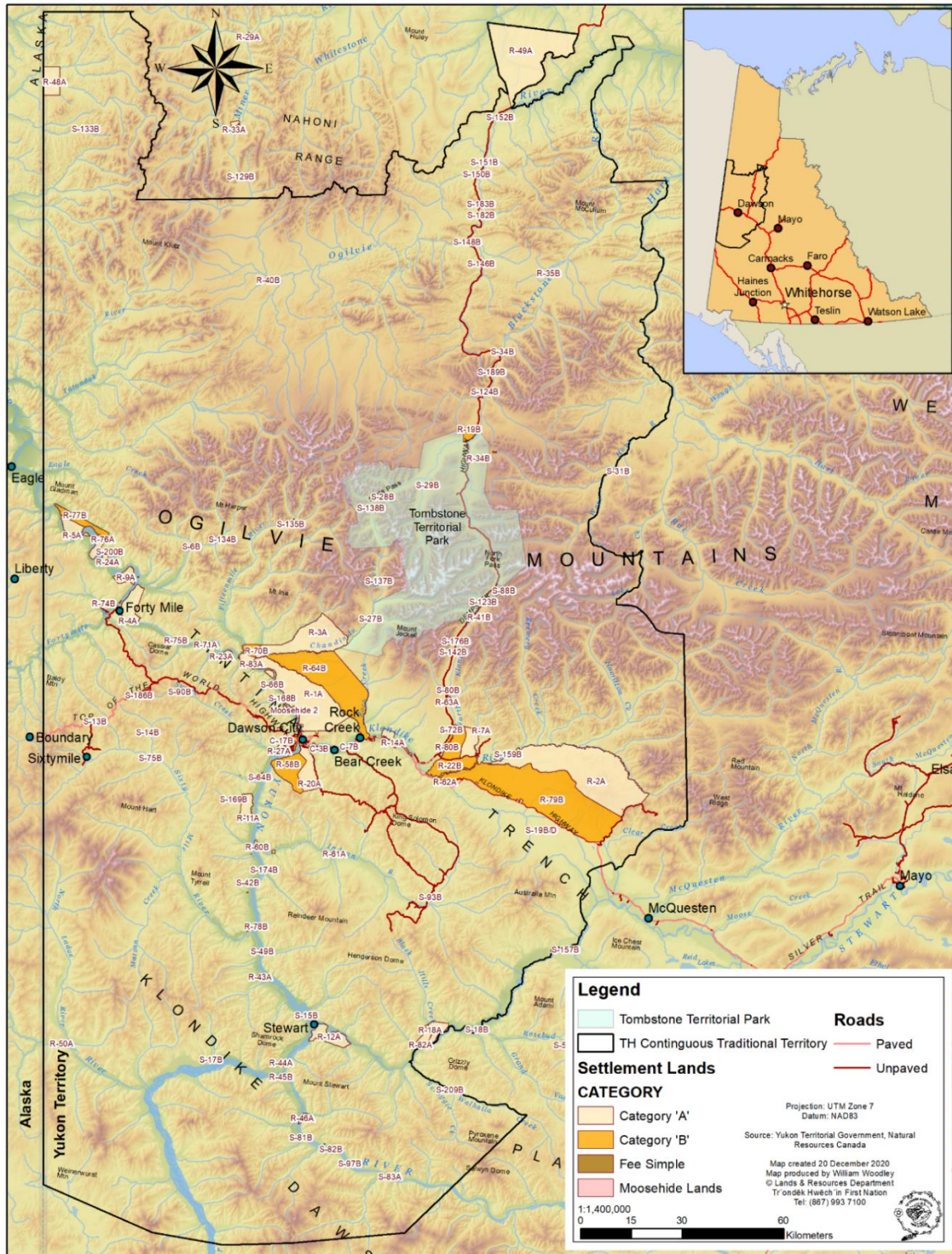
Our Stories

We have occupied this territory for all time. Our place in this world is created, understood and owned through storytelling.

When our world was very different than it is today our cultural hero Tsà’ Wëzhè (Son of Beaver) travelled our territory and brought order to the world. He established relationships with our non-human relatives and formalized our responsibilities to them and to each other.

His journey and the agreements he made are Tr’ëhudè, our way of life, our law. Living our law by engaging with our land brought our society into existence and has shaped our culture and created our identity.

Figure 1 Tr'ondëk Hwëch'in Traditional Territory, Yukon, Canada.⁴



⁴ Tr'ondëk Hwëch'in Final Agreement (1998) boundary modified according to: *Sharing Accord Between Tr'ondëk Hwëch'in and First Nation of Na-Cho Nyak Dun* (2006), *Agreement on Sharing Arrangement Between Vuntut Gwitchin First Nation and Tr'ondëk Hwëch'in* (2018).

OUR IDENTITY AS DĚNĚZHU.

DĚnĚzhu Dătr'inch'e. We are DĚnĚzhu. A Tr'ondĕk Hwĕch'in Declaration of Identity (TH Heritage, 2022)

We are people of this land.

It has shaped us for generations and we have cared for it as it has cared for us.

The land itself brought our worldview into being.

It teaches us that we are an essential part of a bigger environment.

We understand ourselves and our place in the world in relation to all other beings.

This is the foundation of our identity.



Our society is born out of this landscape.

It demands that we remain mobile, that we occupy a vast territory, and that our communities remain fluid.

It requires us to fulfill obligations to each other, to our non-human relatives and to the land itself.

These responsibilities are reflected in our core relationships and our code of conduct.

They are embedded in our language and in the ways that we declare our relatedness to each other and the land.



Our cultural practices and our technology are formed by our land.

We have learned how to live with this landscape by responding to the challenges that it presents.

Our non-human relatives, especially the salmon and the caribou, are our teachers.

We live with them and we live like them.

We journey as part of a dynamic and fluid community.

As we move through our Territory, we concentrate and disperse as the land requires.



Our wealth is in our stories, our songs and our connections with each other.

Our strength is in our knowledge.

We have the wisdom inherited from our ancestors as well as an openness to adapt and move forward in a good way.

1.2 Ancestral Land Stewardship

Our well-being, as individuals and as a community, depends on our ability to form and maintain relationships — with the land, with each other and with others who live here. We are defined by our relationships; nothing exists outside of a relationship. Many of these relationships were established long ago and continue to be shaped by the past and present, as well as consideration for future generations. The development and transmission of knowledge can't happen without a relationship between two or more beings (sentient or non-sentient; past, present, or future; physical or spiritual). Tr'ëhudè is the Hän word that encompasses a set of values and a way of life that we have found are necessary to maintain these relationships and allow us to 'live well' in our Traditional Territory since time immemorial.

Tr'ëhudè guides our interactions with the natural world, and underpins how we relate to the land, and how we participate in natural resource management in our Traditional Territory:

- The land is sacred and provides for our needs. In return, these gifts create an obligation for us to care for the land as stewards.
- All things are connected. We are part of the land; it is not necessary nor even possible to be entirely 'objective' or 'unbiased'.
- We must honour those who came before us, and act with future generations in mind.
- The land maintains an intrinsic balance. It is disrespectful to interfere with natural processes. If we humans control our actions, the land can take care of itself.
- Our holistic approach recognizes that everything in the universe has importance; we humans are just one small part.
- The land and the animals are our best teachers; in turn, we use our knowledge to care for the land, our community, and ourselves.

These beliefs guide the actions we take to fulfil our principal obligations to past, present and future generations. Over millennia, we have learned how to live well in this landscape by responding to the challenges that it presents. More recently, industrial development and climate change have accelerated dramatically. Through continual observation and sustainable practices, however, we can maintain ties to the land and continue our legacy as stewards, all while enhancing our capacity to adapt where needed.

Our relationship with the land

Our traditions remain firmly rooted in a deep respect for the land and ensuring its health in order to sustain us. We have succeeded in maintaining this balance since time immemorial. Our relationships with the land, fish and wildlife have changed and adapted in response to changing conditions, but continue to depend on the:

- existence of healthy ecosystems capable of supporting wildlife and human populations
- availability of fish, wildlife and plants to harvest
- ability to access to the land at the right times so that harvesting can occur
- continued sharing and learning between the generations and with others

1.3 Adapting to Change

Past and present land use practices, and climate change are both accelerating landscape change in the Tr'ondëk Hwëch'in Traditional Territory. Everyone living here today is affected by these changes on some level. While not all changes are negative, longstanding cultural connections and dependence on the land make TH Citizens particularly sensitive to potential impacts from unsustainable development and accelerated climate change, such as:

- population declines or reduced availability or condition of fish, wildlife or plant species;
- changes in water quality, quantity and flow; and/or
- displacement of TH Citizens or changes to traditional activities caused by natural or human-made hazards, intensive land use and/or habitat loss.

Left unchecked, these impacts have the potential to weaken connections between Citizens and the land, and therefore, may threaten our human rights.

Therefore, because our cultural wellbeing is so strongly tied to the landscape, our highest priority is to maintain the health of the land and our ability to use it in accordance with traditional customs and laws.

This commitment was ratified in 1998 when our leaders signed both the TH Final and Self-Government agreements. The objectives of Chapter 16 in the THFA outline our rights to fish and wildlife, including equal participation in fish and wildlife management processes and decisions (16.1.1.4), protection of subsistence harvest (16.1.1.5), and the integration of Traditional Knowledge and scientific knowledge to achieve **conservation** (16.1.1.7). Chapter 14 outlines protection for water quantity, quality and flow (14.8.1), as well as for traditional uses of water (14.5.1). Chapter 11 strives to recognize and promote our cultural values (11.1.1.3), and ensure that our knowledge and experience will be used to achieve effective land use planning (11.1.1.4). TH continues to prioritize the stewardship and responsible use of land, water, fish and wildlife in our Traditional Territory. This high level of commitment reflects the importance we place on our stewardship and conservation responsibilities.

Understanding how and why the land (and our use of it) changes is critical to effectively managing land use and sustainable development. Monitoring and responding to these changes enable us to more effectively ensure our constitutionally-protected rights, titles and interests related to subsistence harvest and the continued use and peaceful enjoyment of the land are upheld, even as the development footprint and human population continue to grow.

The Lasting Impacts of Colonialism

In the last century and a half, there has been a profound and long-lasting shift in the way that natural resources are used and managed in the THTT.

The discovery of gold marked the beginning of a century-long attempt by the Crown and the Church to disempower and disconnect us from the land and our culture.

Fortunately, our ability to adapt and endure ensured our collective survival. However, legacy impacts remain—scars can be seen both on the land and felt within our hearts.

Rebuilding our relationships with the land and with each other are an essential part of healing and **RECONCILIATION.**

1.4 Threats to our Land-based Connections

There are three main drivers of environmental change in the THTT that may impact the ability of the landscape to support fish, wildlife and Citizens, the availability of subsistence species and/or materials, or safe access to the land by Citizens. These drivers include **climate change**, **landscape alteration** and **land use intensity** and they may interact together and amplify, accumulate or accelerate over time, resulting in **cumulative effects**. Figure 2 shows the relationship between these drivers and the subsequent risks to TH Citizens. The impacts of landscape alteration, land use intensity and climate change may affect the availability of species, access to the land and/or ecosystem health. Monitoring the duration, extent and severity of these threats is necessary for effective resource management and protection of our rights, titles and interests.

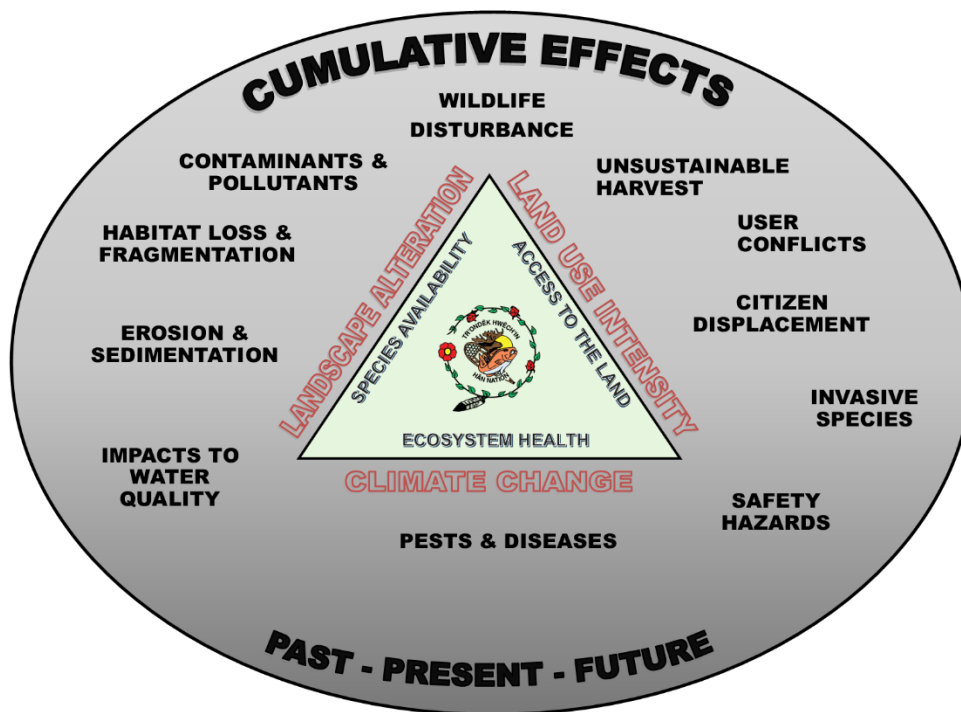


Figure 2 Threats and impacts to Tr'ondëk Hwëch'in connections to the land.



Threat 1: Climate Change

Over the past century, carbon emissions resulting from increasing reliance on burning fossil fuels have had a profound impact on global climate patterns. The climate in the THTT is warming 2 – 3 times faster than the global average. For many years, our Elders have been warning us of the need for immediate action to protect ourselves from the impacts of climate change.

Cumulative Effects

Cumulative effects are changes to the environment caused by the combined impact of past, present and reasonably foreseeable future human activities. Impacts from these changes can also be accelerated by climate change and natural processes.

Depending on the extent, duration and intensity of disturbance, effects can be direct and indirect. Responses by fish and wildlife are influenced by the exposure to the risk as well as sensitivity which varies by species, age, reproductive status, mobility, time of year, etc.

Cumulative effects are typically measured by the size of the development footprint, linear disturbance and the zone of influence that surrounds roads and infrastructure.

Unfortunately, we have likely passed a tipping point where climate change impacts will continue even if significant mitigations are implemented on a global scale. Many jurisdictions around the world have declared climate emergencies, including here in the Yukon. We are noticing many changes in the THTT, including alterations in timing of break-up/freeze-up, seasonal weather patterns, fire and flood frequency and intensity, species distributions, timing of migrations, changes in nutritional quality/taste, and permafrost degradation. These changes are experienced by everyone living and working in the TT and the community is becoming ever more vulnerable to increasingly unpredictable conditions and impacts to local food security, economy, access, infrastructure, water quality and well-being.

It will be important to monitor the impacts of climate change and compare them to the historic baseline (where available) to determine the effectiveness of ongoing and future climate change mitigation and adaptation measures.



Threat 2: Landscape Alteration

Changes in land cover and ecosystem function can result from both human activities, climate change and natural causes. Some level of change is a normal part of healthy, functioning ecosystems; however, many unintended consequences can result from altering the landscape, including terrestrial and aquatic habitat loss, reduced water quality, pollution, increased erosion and sedimentation, displaced wildlife, and impacts to subsistence harvest and the use and peaceful enjoyment of the land by TH Citizens. These impacts can last long after people and businesses leave—there are many areas in the THTT where legacy impacts are still visible.

To better understand and ensure sustainable development, it is important to monitor the impacts of the development footprint (on both the land and Citizens), as well as the success of any reclamation or restoration efforts.



Threat 3: Land Use Intensity

The variety of renewable and non-renewable land use activities in the THTT continues to expand and intensify as more and more people are drawn to the plentiful resources and promising lifestyle that can be found here. Mining and tourism are the principal economic drivers in Dawson and the surrounding area, and many people continue to supplement their livelihood by selling renewable products such as firewood, furs and chum salmon. As more people move into the TT, more land is required for residential and commercial development, infrastructure and agriculture. In addition to traditional pursuits, these types of land use activities offer considerable opportunities to Citizens for economic and community development.

With the help of our partners in co-management, it will be important to continue to monitor the extent and intensity of all land use activities in the THTT, while focusing our efforts on documenting the impacts of land use on Citizens, so that we can work towards minimizing user conflicts and Citizen displacement.

PART 2: MONITORING

2.1 Rationale for Monitoring

The world is a dynamic place and we do expect that some level of landscape change is both inevitable and necessary. We don't have much (if any) control over natural environmental change, but we can modify or adapt our use of the land in response to change.

In order to prepare or adapt, we need to consistently observe, record and interpret change over time. As Dënezhu, our survival and well-being has relied on this way of gathering knowledge since time immemorial. The difference today is the many tools available now to measure, analyse and communicate our results. The tools are modern, but our use of them is rooted in our ancestral stewardship obligations to care for the land. We can also draw on the skills and knowledge of partners and other land users in our Traditional Territory.

We share our thoughts and our skills and continually seek to build upon them by learning from others. We believe there are many truths and perspectives and together they make us stronger. — 'We Are Dënezhu' (TH Heritage, 2020)

Biocultural monitoring is essentially the ancient practice of repeatedly observing and responding to the environment and its use over a defined period of time and space. Monitoring is necessary to establish a baseline and learn how quickly changes are happening on the land, the factors influencing those changes, and how best to prepare and adapt.

Monitoring is also a key component of adaptive management—a process that is akin to [Indigenous resource management](#)—where problems (i.e., undesirable changes) are identified, information is gathered, potential solutions are implemented, results are evaluated and actions are gradually refined over time to better balance trade-offs while proactively managing risks.

Monitoring data, together with Traditional Knowledge, can supply information to help reduce uncertainty, inform decisions, and strengthen our capacity to effectively manage land use in our Traditional Territory in accordance with our traditional values.



Benefits of Monitoring

When done consistently and intentionally, monitoring can help:

- Identify problems sooner,
- Better allocate financial and human resources (recognizing that both money and time are limited),
- Assess impacts of land use and a changing climate,
- Evaluate compliance against the terms and conditions required by laws and regulations,
- Support proactive decision-making processes that are required to manage the environment and fish and wildlife,
- Identify further questions that need to be answered, and
- Manage risks associated with uncertainty.

2.2 Types of Monitoring

The terms “inventory”, “research” and “monitoring” are sometimes used interchangeably, but each has a unique focus and purpose, and all three types of activity are needed to address our resource management challenges.

Inventories can be used to establish a baseline in occupancy, occurrence or extent of species, activities or features of the landscape, and typically answer WHAT? and HOW MUCH? Measurements occur one time or at longer intervals (years or decades). **Research** is often used to find an explanation for observed variability, and typically focuses on answering HOW? and WHY? Research projects rarely extend beyond 4 – 5 years and can be limited to providing shorter-term understanding of current conditions. **Monitoring** focuses on documenting changes over space and time, and typically answers WHERE? WHEN? and HOW OFTEN? Monitoring activities can be most effective when incorporating strong relational understanding and long-term familiarity of the THTT, which exists within the TH community (5+ years up to decades or even generations). For this reason, our plan emphasizes monitoring because it is most compatible with our worldview, community perspectives and our role as stewards.

Four different types of monitoring provide valuable information:

- ❖ **Biocultural Monitoring** — Tracking changes so that we have a better understanding of how natural events or human activities are affecting the land, and how fish, wildlife or Citizens are responding. Both science and Traditional Knowledge can be used to collect information and gain understanding.
- ❖ **Compliance Monitoring** — Comparing the effect of land uses and development against defined standards, [targets](#) or [thresholds](#). This type of monitoring is often mandated in legislation, regulations or guidelines. Exceedances of thresholds can be identified and enforcement actions can be taken to stop or prevent further issues or impacts.
- ❖ **Effectiveness Monitoring** — This type of monitoring is a key component of adaptive management. The effectiveness of management actions are documented and the information is used to evaluate and refine further action(s).
- ❖ **Incidental Observations** — Recording observations on weather, wildlife, land use and anything else of note during the course of regular field patrols or traditional pursuits. These observations are an important way to connect office-based decision-makers with people on the land to identify problems or issues that may require follow-up action(s).

Community-based Monitoring

Whenever possible, communities should guide the identification of monitoring priorities, sharing of knowledge, gathering of data and response/ adaptation to local issues.

Community-based monitoring (CBM) is led by communities, for communities. CBM is a knowledge-gathering process centred on a set of common values and concerns that exist within a community. Enhancing community participation in research and monitoring activities can provide local context to research questions and data interpretation, fill knowledge gaps, foster stewardship, and promote collaboration within and outside of the community.

2.3 Monitoring in our Traditional Territory

Tr’ondëk Hwëch’in have always collected and used land-based information to guide decision-making. Today, modern technology, such as remote sensing, can help expand our powers of observation. As ever, our Dënezhu ways continue to provide guidance on how to interpret, use and share this knowledge. As we implement our Final Agreement, there is a growing need for information about a broader range of land-based issues and concerns that affect Citizens. As partners in co-management, it is important that we are aware of all relevant monitoring activities in the THTT, so that we are not duplicating efforts or missing out on opportunities.

Given the high level of biodiversity found in the THTT and the unique biocultural history of this area (Sec.1.1), as well as the growing land use footprint, there continues to be substantial interest by people outside of the community in studying many aspects of this land and its use. Each year TH staff review many research and monitoring project proposals — primarily Scientist and Explorers Permit applications, Tombstone Park Permit applications (Research and Education) and YESAB project assessments.

Additionally, funding agencies will often favour proposals that incorporate Indigenous participation. Consequently, TH is often invited by external researchers to support a wide range of research and monitoring projects. Support can range from writing letters, providing feedback on various project components, assisting with fieldwork, contributing Traditional Knowledge and facilitating [community engagement](#).

Providing this support takes time and resources that could, instead, be put towards our own monitoring projects and priorities. It is therefore important that staff are able to effectively evaluate and prioritize incoming requests and opportunities, and support those projects that are most likely to benefit TH, in terms of providing:

- relevant information (in a format and timeline that are useable for our decision-making),
- capacity-building opportunities (beyond simply learning about the project),
- meaningful engagement with the community (while being mindful of “consultation fatigue”).

We need a framework to more effectively evaluate opportunities for partnerships and/or funding, maintain accountability to Citizens and co-management partners, and ensure that traditional values and community priorities remain at the forefront of our monitoring activities, now and into the future.

Tr’ondëk Hwëch’in Monitoring

Community-based monitoring can be implemented to meet the needs of TH as we articulate our priorities, gather information and observations, share Traditional Knowledge when appropriate, and decide how best to mitigate or adapt to changes that we observe. Our monitoring priorities arise from implementing the THFA, the TH Strategic Plan, the Land Stewardship Framework, and plans and policies that have been developed with our partners in co-management.

Stewardship is our collective responsibility. TH staff, Citizens, Elders and youth can all play a role. CBM can help us to fulfill our inherent stewardship responsibilities.

PART 3: THIS PLAN

3.1 Purpose

This monitoring plan, tailored to address Tr'ondëk Hwëch'in biocultural values and priorities, will provide a framework that will allow us to overcome past limitations, allocate limited monitoring resources more efficiently, identify and address problems sooner, document cumulative impacts, evaluate compliance, and learn from and share knowledge with our resource management partners and allies.

This plan ensures that, going forward, monitoring and research projects initiated or formally supported by the TH Natural Resources Department will reflect our core cultural values, meet our goals and objectives, and address our community priorities.

Through this lens, we will be able to better evaluate potential partnerships, future funding opportunities, and target those projects that will be of most benefit to TH Citizens and staff. This plan will provide guidance on what level or type of participation is appropriate for us, particularly in response to information requests, permit applications and review processes involving proposed research and monitoring activities.

By providing a higher level of coordination, accountability and consistency for ecological and land use monitoring in the Tr'ondëk Hwëch'in Traditional Territory, this plan will ensure that monitoring information collected by TH staff, Citizens and/or our co-management partners will contribute towards:

- 1. Supporting informed decision-making**
- 2. Upholding and protecting the rights, titles and interests entrenched in our constitutionally-protected agreements, and**
- 3. Allowing us to fulfil our stewardship obligations to the land, and the fish, wildlife and people who depend upon it.**

Successfully implementing this plan will help TH to more effectively influence and guide local resource management, build capacity of staff and Citizens, and ensure that we are able to gather and use land-based information in a format and timeline that are useful for us.

Why we need this monitoring plan

In the past, dependence on others for funding, training and/or information has meant that our needs for *self-determination, meaningful participation and informed decision-making* have not always been prioritized to the level necessary.

We recognize that a vast Traditional Territory with widespread land use and limited capacity by all levels of government requires collaboration to effectively monitor and manage the land.

This plan will provide guidance for TH staff to pursue research and monitoring projects that align with our values, meet our community priorities and build equitable research and monitoring partnerships.

3.2 Guiding Principles

PRINCIPLE 1: *Our monitoring priorities are defined by the TH community, the THFA, the Land Stewardship Framework, and other relevant agreements, plans and policies that TH has formally committed to and has a role in implementing.*

PRINCIPLE 2: *Baseline information and changes caused by natural processes and human land-use are documented, particularly those changes that are being accelerated through cumulative effects and climate change.*

PRINCIPLE 3: *Inventory, monitoring and research help to manage the risks associated with uncertainty, by identifying information gaps and working to fill them.*

PRINCIPLE 4: *Biocultural monitoring is a key component of adaptive management, cumulative effects management, conservation and stewardship.*

PRINCIPLE 5: *Meaningful participation in biocultural monitoring by TH staff and Citizens helps to advance reconciliation between TH and other governments and organizations.*

PRINCIPLE 6: *Land-based knowledge and monitoring resources continue to be exchanged with our partners and allies, as an important way to build and maintain respectful relationships and work towards our common goals and interests.*

PRINCIPLE 7: *Biocultural monitoring is a tool that can be used to meet our ancestral stewardship obligations so that the land will continue to provide for our current and future needs.*

PRINCIPLE 8: *Accountability is maintained with Citizens, leadership councils (Tr'ondëk Hwëch'in Council, Elders' Council, Youth Council), the General Assembly, and our resource management partners.*

PRINCIPLE 9: *Biocultural monitoring measures culturally-relevant indicators based on both Western knowledge and Traditional Knowledge systems.*

3.3 Goals and Objectives



GOAL 1: GATHER KNOWLEDGE about our community's identified land-based priorities to support informed decision-making, stewardship and co-management, and to uphold our rights to subsistence harvest and the continued use and peaceful enjoyment of the land.

Objective 1.a.: Status, trends and distribution of priority species, areas, ecosystems and land uses in the THTT are monitored using culturally-relevant indicators.

Objective 1.b.: Monitoring information is used to help understand how and where changes are happening on the land, what is driving those changes, and the implications of those changes on TH land-based relationships.

Objective 1.c.: Stewardship, conservation planning and adaptation measures in the THTT are informed by learning about the resilience or vulnerability of culturally-relevant species, areas, ecosystems, and/or the community as a whole.



GOAL 2: BUILD CAPACITY for biocultural monitoring by staff and Citizens to enhance community-based stewardship and conservation.

Objective 2.a.: Incoming opportunities for funding and/or partnerships are evaluated and prioritized to build equitable relationships with resource management partners while maximizing meaningful participation and benefits for TH.

Objective 2.b.: Both formal and informal education and training opportunities related to biocultural monitoring are made available to Tr'ondëk Hwëch'in staff, Citizens and youth.

Objective 2.c.: The collection, storage, analysis and reporting of land-based data by the TH Natural Resources Department is streamlined and improved to facilitate the increased use and sharing of monitoring information for decision-making.



GOAL 3: IMPROVE COMMUNITY ENGAGEMENT in biocultural monitoring activities in the THTT to help build relationships, promote knowledge sharing and strengthen land-based connections.

Objective 3.a.: Opportunities are provided for Citizens, Elders and youth to be engaged in research and monitoring activities in the THTT.

Objective 3.b.: Appropriate engagement and outreach strategies are used to target different audiences within our community, including youth, Elders, and Citizens who live outside of the TH Traditional Territory (who have felt overlooked in the past).

Objective 3.c.: TH staff and Citizens receive relevant information and/or other resources from monitoring partners in a timely manner, and project materials are easy to understand.

3.4 Scope

To be meaningful and useful, monitoring projects initiated or supported by TH must respect our values and the long-term, holistic and interconnected lens through which we view the world (Figure 3).

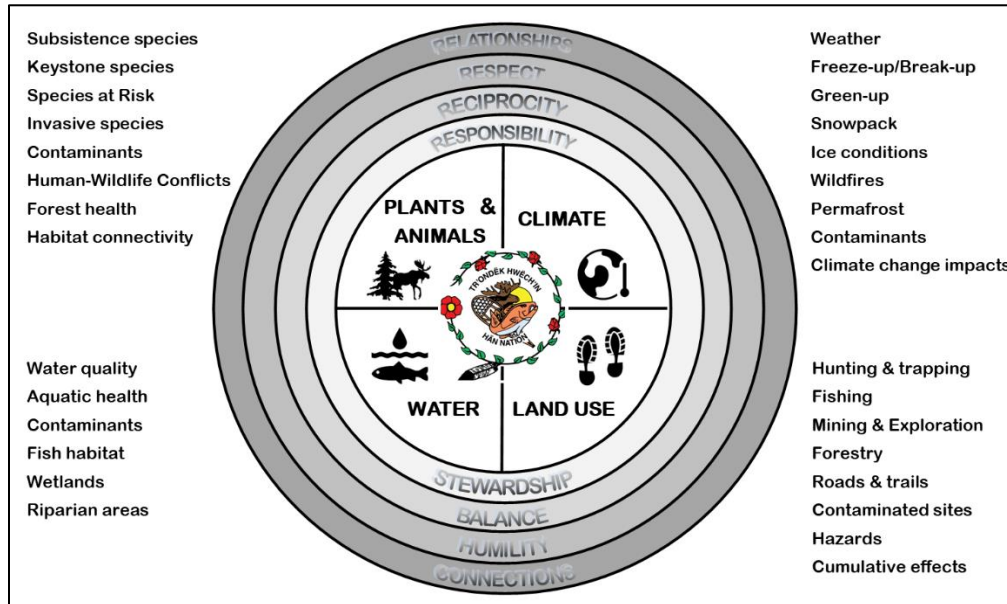


Figure 3 How biocultural monitoring in the THTT can reflect and support the TH worldview and traditional values.

What?

The scope of this plan will include the identification and monitoring of:

- *culturally-significant* species of fish, wildlife and plants as well as their habitats, including water, wetlands, riparian areas, mountains, forests and climatic factors (Table 1, Table 2), and
- land use activities that affect TH [Settlement Land](#), other areas of cultural significance in the THTT, and those activities that may affect subsistence harvest rights or the use and peaceful enjoyment of the land by TH Citizens (Table 4)

Where?

We value the land *in its entirety* and recognize that each part, including ourselves, is dependent on the health of the whole. While this plan applies to the entire Tr'ondëk Hwëch'in Traditional Territory (Figure 1), we are focusing our time and resources on *areas of cultural significance* (Table 3).

For how long?

Our unique perspective is based on the collective wisdom of untold generations of knowledge before us and our responsibilities extend many generations into the future. Tr'ondëk Hwëch'in is in a strong position to advocate for and/or lead longer-term monitoring in the future.

Our Worldview

Beliefs, values & customs are reflected in an overall *worldview*, which influences how people perceive and interact with the world around them.

Since colonization, the Western scientific worldview has dominated the study and management of natural resources in the THTT.

The Tr'ondëk Hwëch'in worldview is distinct from the western scientific worldview in significant and important ways.

We view the world with a holistic and long-term lens that spans generations, and prioritizes relationships, with the land and with one another, above all else. We maintain these connections through a code of conduct built upon respect, reciprocity & responsibility.

PART 4: COMMUNITY PRIORITIES

4.1 Connecting to the Land

Tr'ondëk Hwëch'in Mandate:

The Tr'ondëk Hwëch'in will maintain our relationships with the land, preserve our heritage and culture, empower our people, and utilize land and resources within our Traditional Territory in a sustainable way that creates opportunities and prosperity for citizens.

In order to achieve our mandate, the principal focus of the Natural Resources Department is ultimately to support TH Citizens to build and maintain strong, healthy relationships with the land, fish and wildlife, and each other.

To maintain healthy connections with the land, Citizens require:

- 1) Healthy land, water, and fish and wildlife populations**
 - a) Sustainable populations of species of cultural significance
 - b) Intact habitats to support species of cultural significance
 - c) Clean air and water
 - d) Species resilience or ability to adapt to change
- 2) Availability of species to meet subsistence needs**
 - a) Abundant and well-distributed species of cultural significance
- 3) Access to the land and time to spend on the land, at the right time**
 - a) Minimal land use conflicts or displacement
 - b) Safe access over land, water or ice at appropriate times
- 4) Development and transmission of Traditional Knowledge**
 - a) Learning and practicing traditional skills on the land, including Hän language, ceremony and storytelling
 - b) Opportunities for Elders and youth to build relationships and transfer knowledge

These four basic needs, as well as the threats facing those needs (Figure 2), help us to frame and prioritize the monitoring of culturally significant species, areas, ecosystems and land uses in the THTT.

This plan is an example of how community-based monitoring can be implemented to empower communities to take the lead in addressing community priorities, gathering and sharing knowledge about the condition of the land and changes that are occurring over time, as well as assessing the effectiveness of management actions to address issues and concerns with land use.

Our Connections with the THTT

As TH Citizens, we each have a unique **RELATIONSHIP** with our Traditional Territory that has been built upon values of **RESPECT, RECIPROCITY** and **RESPONSIBILITY**, and is strengthened over time with experience and with Traditional Knowledge that has been passed down to us through the generations.

The quality of this relationship is also highly influenced by connections within our families and community. Therefore, a healthy land and a healthy community are reliant upon and support one another.

Helping Citizens strengthen their relationships with the land is a key component of conservation and land stewardship in the THTT.

Figure 4 illustrates how our land-based needs (green box) and the threats facing those needs (red box) influence community stewardship priorities (blue box) and the role that monitoring can play in addressing those priorities.

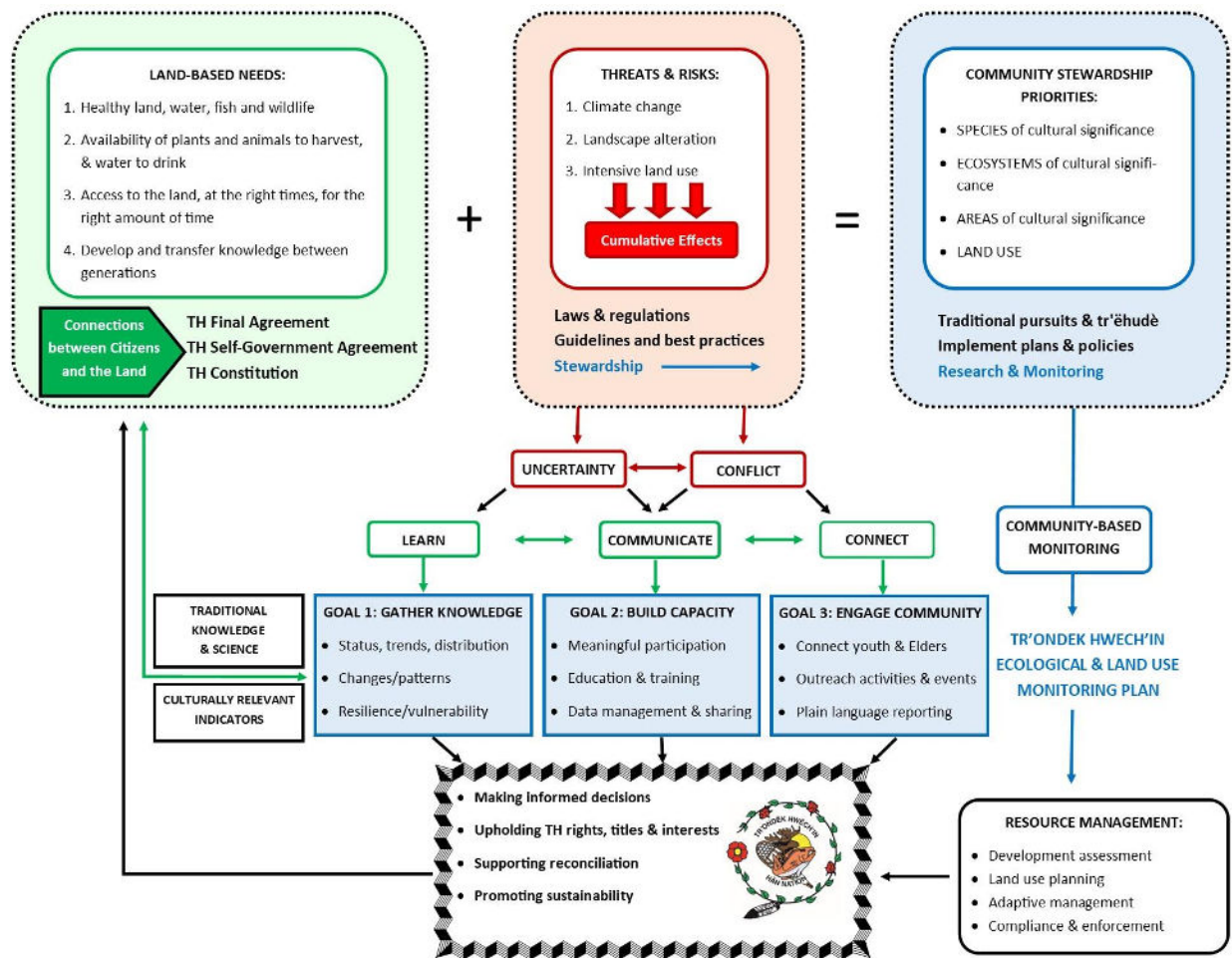


Figure 4 How the goals and objectives of the TH Ecological and Land Use Monitoring Plan can support land-based connections and stewardship in the Tr'ondëk Hwëch'in Traditional Territory.

Fortunately, our land-based needs (top green box) have been protected at the highest possible levels. Our inherent rights, titles and interests to the land have been entrenched into our Final and Self-Government Agreements, as well as the TH Constitution.

Factors that put our land-based needs at risk (top red box) include climate change, landscape alteration and intensive land use and their interactions over space and time. When not managed or managed in ways that conflict with Dënëzhū laws, these threats can lead to uncertainty and conflict. However, there are a number of strategies to prevent or mitigate the many threats and risks to our values. Ranging from high level to ground level, these include enacting laws and regulations, issuing guidelines or best practices for land users/developers, and practicing and promoting land stewardship by all land users.

Community stewardship (top blue box) can be promoted through several means to address our identified priority species, areas, ecosystems and land uses. Citizens can continue to practice traditional pursuits, governments can collaboratively develop and implement plans and policies, and knowledge can be gathered to help to answer our questions about how and why the land is changing and how Citizens and other community members are being impacted by those changes.

Working towards the three main goals of the TH Ecological and Land Use Monitoring Plan and their objectives (Sec.3.3) can help to reduce *uncertainty* and *conflict* by promoting *learning, communicating and connecting* between TH Citizens, other land users, and various levels of government. The information gathered using multiple forms of knowledge and culturally-relevant *indicators* link directly back to the land-based needs, and can be used by TH in development assessment, land use planning, adaptive management and compliance and enforcement. Overall, use of monitoring information in this way will help to (i) ensure informed decision making, (ii) uphold our rights, titles and interests, (iii) support reconciliation, and (iv) promote sustainability — all of which help ensure that current and future generations of Citizens will continue to enjoy healthy relationships with the land and with each other.

4.2 Culturally Significant Species, Areas, Ecosystems and Land Uses

TH Citizens, Elders and staff have identified particular species and areas of cultural significance, mainly through the cultural mapping completed as part of the Tr'ondëk Hwëch'in Land Stewardship Framework (LSF) initiative. Additionally, specific priorities for ecological and land use monitoring in the THTT are also highlighted in various plans and policies that TH formally supports or has a role in developing and/or implementing.

Our priorities typically focus on harvested species including fish, wildlife and plants, and critical habitats and ecosystems that support those species such as wetlands, migration routes, spawning beds and mineral licks. However, we recognize that all species and habitats play an important role in overall ecological function. Tables 1 – 3 outline these priorities, their cultural significance and the relative risk that each value faces from various threats in the THTT.

Minimizing land use conflicts and displacement of Citizens are also high priorities. We typically rely on other jurisdictions for data on the intensity and extent of land use activities; however, it is important that we begin to document any land use conflicts or displacement that Citizens experience, as well as the impacts of those interactions on subsistence activities and the peaceful use and enjoyment of the land by Citizens. Table 4 outlines the priority land uses that are of greatest concern to TH, including both risks and opportunities.

Other governments and organizations (e.g., Dawson District Renewable Resource Council) share many of these priorities. It will be important to continue working together and sharing information, so that we benefit from each other's experience and resources, and continue to work together to fulfil the objectives of the THFA.

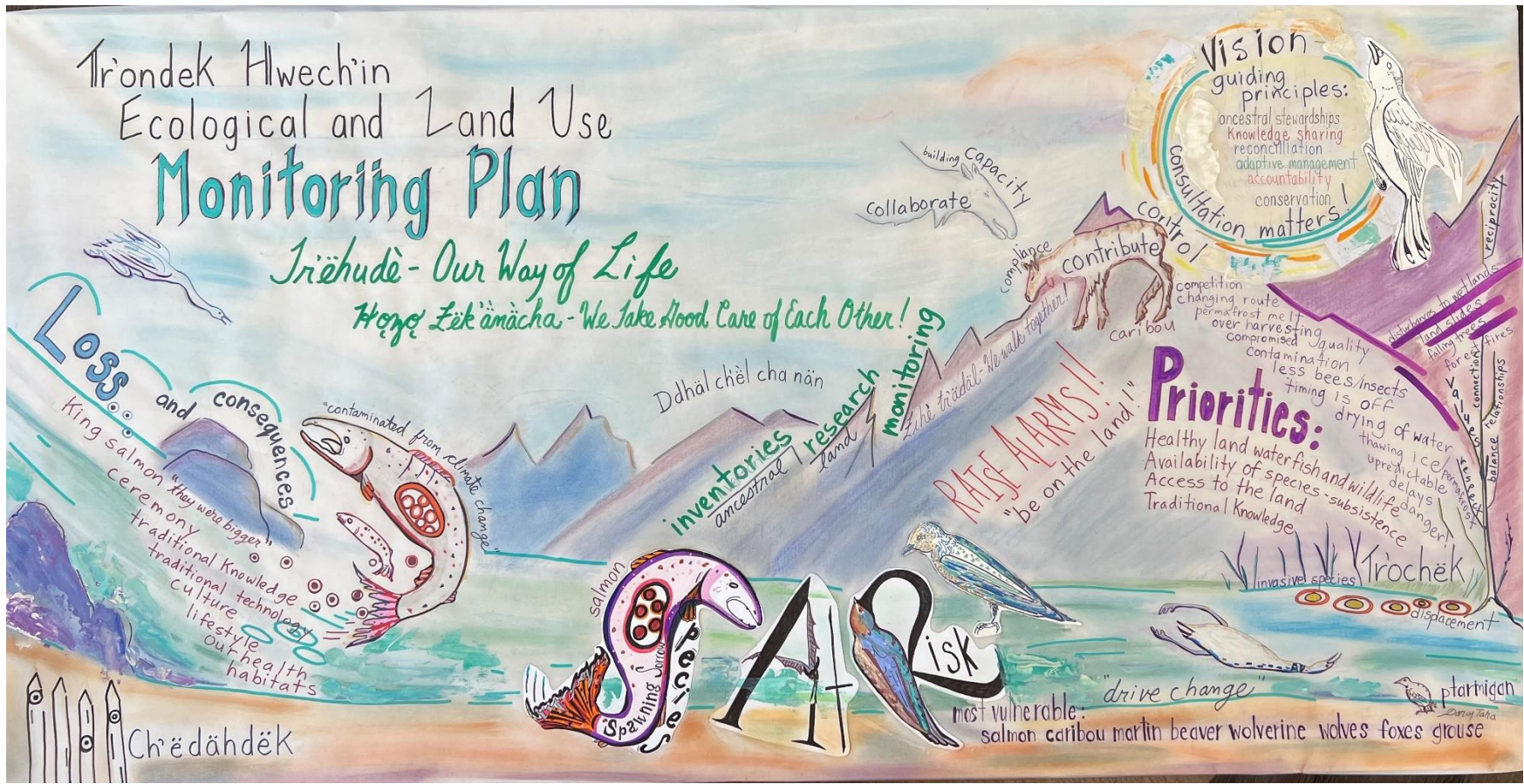


Figure 5 Graphic recording of Land-based Monitoring Priorities Workshop, March 22, 2023.

Table 1 Risk Matrix for Tr'ondëk Hwëch'in Species of Cultural Significance



















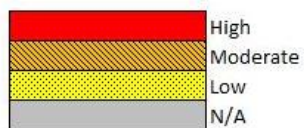
		 Fish	 Ungulates	 Furbearers	 Small game	 Predators	 Plants/fungi/ trees	 Species at Risk
Legend		High						
		Moderate						
		Low						
		N/A						
RISKS/THREATS to:	- habitat and/or populations							
	- species availability							
	- accessibility by citizens							
Climate change	Cumulative effects							
	Habitat loss/fragmentation							
CULTURAL SIGNIFICANCE	Population fluctuations/crashes							
	Commercial/licensed harvest pressure							
	Disturbance to fish & wildlife							
	User conflicts/citizen displacement							
	Erosion/sedimentation							
	Water quality impacts							
	Safety hazards							
	Contaminants & pollutants							
	Invasive species, disease, pests							
	DESCRIPTION	Fish	<ul style="list-style-type: none"> • Salmon • Resident freshwater species • Species at risk (dolly varden, Bering cisco) 	<ul style="list-style-type: none"> • Moose • Caribou • Dall sheep • Species at risk (northern mtn woodland caribou) 	<ul style="list-style-type: none"> • Wolf, fox, lynx, marten, weasel, otter, mink, beaver, muskrat, squirrel • Species at risk (wolverine) 	<ul style="list-style-type: none"> • Snowshoe hares • Grouse & ptarmigan • Porcupine 	<ul style="list-style-type: none"> • Bears • Wolves • Raptors • New species (cougar, coyote) • Species at risk (grizzly bear) 	<ul style="list-style-type: none"> • Medicinal plants • Food plants & berries • Mushrooms & chaga • Tree products • Species at risk • Invasive species
CULTURAL SIGNIFICANCE		<ul style="list-style-type: none"> • Subsistence • Commercial chum fishery • Spawning habitat • Migration • Juvenile rearing habitat 	<ul style="list-style-type: none"> • Subsistence • Calving/lambing • Migration routes • Key seasonal ranges • Population & distribution • Body condition 	<ul style="list-style-type: none"> • Commercial and subsistence trapping • Predators and/or prey 	<ul style="list-style-type: none"> • Subsistence • Crafting materials • Prey for raptors and furbearers 	<ul style="list-style-type: none"> • Roles in keeping prey populations healthy • Northern range shifts/new species 	<ul style="list-style-type: none"> • Food and medicine • Crafting materials • Commercial mushroom picking • Firewood & timber • Habitat & forage 	<ul style="list-style-type: none"> • Flyways & nesting habitat • Beringian species • Indicators of ecosystem health

Table 2 Risk Matrix for Tr'ondëk Hwëch'in Ecosystem Components of Cultural Significance

		ECOSYSTEM FACTORS					CLIMATIC FACTORS	
								
		Water	Riparian	Wetlands	Mountains	Forests	Permafrost	Atmosphere
DESCRIPTION		<ul style="list-style-type: none"> Quality, quantity, flow Streams & lakes Groundwater 	<ul style="list-style-type: none"> Adjacent to streams High water table Flood plain Water-tolerant vegetation Productive soils 	<ul style="list-style-type: none"> Bogs, fens, marsh swamps, open shallow water <10% of the THTT 	<ul style="list-style-type: none"> Alpine tundra Subalpine Slope & aspect Elevation 	<ul style="list-style-type: none"> Boreal forest Deciduous forest Upland forest Riparian forest 	<ul style="list-style-type: none"> Rate and extent of thaw Ground temperatures Periglacial features 	<ul style="list-style-type: none"> Air temp & pressure Humidity, wind, rain, snow Snow pack Ice conditions
	CULTURAL SIGNIFICANCE		<ul style="list-style-type: none"> Water is life Drinking water Aquatic habitats Nutrient cycling Traditional use Recreation Transportation Spiritual values 	<ul style="list-style-type: none"> Support biodiversity Streambank stability/erosion control Traditional use Agriculture/food production Recreation 	<ul style="list-style-type: none"> Support biodiversity Water filtration Aquatic habitat sequestration Carbon Runoff/flood control Traditional use 	<ul style="list-style-type: none"> Support biodiversity Headwaters Climate refugia Biogeoclimatic influences Spiritual values Traditional use Recreation 	<ul style="list-style-type: none"> Support biodiversity Carbon sequestration Soil stability/erosion control Runoff/flood control Traditional use Timber/firewood 	<ul style="list-style-type: none"> Carbon sequestration Role in development of wetlands Influence on vegetation
	Climate change	High	High	High	High	High	High	High
	Cumulative effects	High	High	High	High	High	High	High
	User conflicts/citizen displacement	High	High	High	High	High	High	High
	Habitat loss/ fragmentation	High	High	High	High	High	Moderate	Moderate
	Water quality impacts	High	High	High	High	High	Moderate	Moderate
	Erosion/sedimentation	High	High	Moderate	Moderate	Moderate	High	Moderate
	Contaminants & pollutants	High	Moderate	Moderate	Moderate	Moderate	Moderate	High
	Population fluctuations/crashes	High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Commercial/licensed harvest pressure	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Disturbance to fish & wildlife	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Safety hazards	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Invasive species, pests & diseases	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate



Legend



RISKS/THREATS to:


- habitats or ecological processes
- availability of species or materials
- accessibility by citizens

Climate change

Cumulative effects

- User conflicts/citizen displacement
- Habitat loss/ fragmentation
- Water quality impacts
- Erosion/sedimentation
- Contaminants & pollutants
- Population fluctuations/crashes
- Commercial/licensed harvest pressure
- Disturbance to fish & wildlife
- Safety hazards
- Invasive species, pests & diseases

Table 3 Risk Matrix for Tr'ondëk Hwëch'in Areas of Cultural Significance

		Klondike River Watershed	Sixty Mile/California Ck	Goldfields/ Indian River	Top of World/ Clinton Ck/ Fortymile River	Dempster Hwy/ North Fork/ Brewery Ck	Yukon River/ Stewart River	Clear Creek/ Klondike Hwy
DESCRIPTION		<ul style="list-style-type: none"> Placer mining City of Dawson Residential subdivisions Dawson airport Transportation corridor Tintina Trench flyway Historic sites Tourism Recreation Agriculture 	<ul style="list-style-type: none"> Placer mining Quartz exploration Traplines FMCH range 	<ul style="list-style-type: none"> Placer mining Critical wetlands Northern Access Route Historic sites/ tourism Dominion Ck woodlots 	<ul style="list-style-type: none"> Seasonal hwy to AK border Ch'ëdähdëk site Clinton Ck mine Placer mining Bruin Ck woodlots Traplines FMCH range Access to West Dawson/Sunnydale 	<ul style="list-style-type: none"> Tombstone Park Peel River Watershed Brewery Ck mine Antimony Ck quartz exploration Transportation corridor PCH winter range HRCH year-round range Sheep habitat Timber harvest Fibre line install 	<ul style="list-style-type: none"> Seasonal access Boat-based recreation Boat-based hunting Commercial chum fishery Boat-based tourism Summer barges Ferry/ice bridge 	<ul style="list-style-type: none"> Placer mining CCCH range Transportion corridor Tintina Trench flyway
	CULTURAL SIGNIFICANCE	<ul style="list-style-type: none"> Subsistence harvesting Settlement land Tr'ochëk Central Tr'ondëk Mgt Area Traplines 	<ul style="list-style-type: none"> Subsistence harvesting Settlement land 	<ul style="list-style-type: none"> Subsistence harvesting Settlement land Family harvest camps 	<ul style="list-style-type: none"> Subsistence harvesting Fall harvest camp Historic fishing camp at Fortymile Transportation 	<ul style="list-style-type: none"> Subsistence harvesting Settlement land Heritage sites Woodlots Transportation Traplines First Hunt camp 	<ul style="list-style-type: none"> Subsistence harvesting Settlement land Family fish camps Heritage sites Transportation Traplines Moose hide First Fish camp 	<ul style="list-style-type: none"> Subsistence harvesting Settlement land Transportation Woodlots
RISKS/THREATS to:								
- habitat and/or populations								
- availability of species or materials								
- accessibility by citizens								
Climate change								
Cumulative effects								
User conflicts/citizen displacement								
Commercial/licensed harvest pressure								
Water quality impacts								
Habitat loss/fragmentation								
Erosion/sedimentation								
Population crashes								
Disturbance to fish & wildlife								
Contaminants & pollution								
Invasive species, pests & disease								
Safety hazards								

Legend

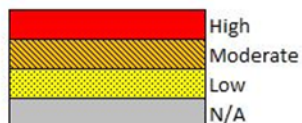






Table 4 Tr'ondëk Hwëch'in Land Use Monitoring Priorities

LAND USE	DESCRIPTION	OPPORTUNITIES	RISKS/THREATS
<p>MINING AND EXPLORATION</p> 	<ul style="list-style-type: none"> • Staking • Exploration • Mining/production • Reclamation/remediation • Placer and quartz • Abandoned mines and legacy impacts 	<ul style="list-style-type: none"> • Direct seasonal employment for Citizens • Small business opportunities to support industry • Local economic driver 	<ul style="list-style-type: none"> • Erosion/sedimentation • Habitat loss/fragmentation • Wildlife disturbance • User conflicts • Citizen displacement • Contaminants and pollution • Water quality impacts • Safety hazards • Invasive species
<p>COMMERCIAL AND LICENSED HARVESTING</p> 	<ul style="list-style-type: none"> • Licensed hunting and fishing • Big game outfitting • Commercial chum fishery • Commercial trapping • Commercial firewood and timber harvest 	<ul style="list-style-type: none"> • Support a diversified economy • Spend time on the land • Healthy, active lifestyle • Wildlife population control/carrying capacity • Local/Traditional Knowledge • Local food security 	<ul style="list-style-type: none"> • Low salmon escapement • Overharvest • Increasing harvest effort with declining harvest success • User conflicts • Citizen displacement • Wildlife disturbance • Safety hazards
<p>CUMULATIVE EFFECTS</p> 	<ul style="list-style-type: none"> • Resource roads and trails • Industrial development • Spot land development • Residential/municipal • Agricultural • Tourism and recreation • Past, present, future 	<ul style="list-style-type: none"> • Improved access by Citizens to remote parts of the TT • Meet residential needs • Support a diversified economy • Local food security 	<ul style="list-style-type: none"> • Habitat loss/fragmentation • User conflicts • Citizen displacement • Reduced food security • Water quality impacts • Erosion/sedimentation • Contaminants and pollution • Wildlife disturbance • Invasive species • Safety hazards
<p>TRADITIONAL PURSUITS</p> 	<ul style="list-style-type: none"> • Land grants • Personal timber permits • Culture camps • Land-based programming • Hunting consent for YFNs • Harvest reporting 	<ul style="list-style-type: none"> • Spend time on the land • Healthy, active lifestyle • Local/Traditional Knowledge • Local food security • Facilitate access to the land by Citizens 	<ul style="list-style-type: none"> • User conflicts • Citizen displacement • Wildlife disturbance • Invasive species • Safety hazards • Contaminants and pollution

4.3 Culturally-Relevant Indicators

Indicators are features or attributes of the environment (or use of the environment) that are observed, measured or documented to determine baseline conditions or change over time (trends).

Ecosystems are complex and it is not possible nor necessary to monitor every aspect of the environment to gain an adequate understanding of overall conditions. Therefore, for practical reasons, good indicators need to be:

- easy to find, identify and measure/collect/document,
- sensitive to change,
- informative of broader conditions,
- cost effective (personnel, training, access, equipment, supplies, analysis),
- measured using straightforward and repeatable methods, and
- culturally relevant.

Indicators that are culturally relevant to TH are those that document or measure:

- The **health** of culturally significant species, areas, or ecosystems
- The **availability** of culturally significant species, areas or ecosystems
- The **accessibility** of culturally significant species, areas or ecosystems

Examples of culturally-relevant indicators and metrics are provided in Table 5. It is anticipated that this list will grow over time as the monitoring program develops. Potential data sources are included in Appendix 7.3.

Indicators can be used in combination with pre-defined **targets** or **thresholds** to determine when management actions might be warranted. Determining appropriate targets or thresholds, however, typically requires some knowledge of baseline conditions, and can also depend on complex social, cultural, political or other decision-making factors, and is, therefore, beyond the scope of this plan.

In this plan, there are no indicators related specifically to the development, use and transmission of Traditional Knowledge and values (Tr'ëhudè). This is to avoid quantifying TK or treating it as a commodity. Instead, Tr'ëhudè is incorporated throughout this plan and will continue to guide all aspects of our involvement in research and monitoring in the THTT, including at all stages of project management. We will strive to move away from token inclusion of TK in existing projects and towards viewing TK as vital in the decision-making process of how best to collect and interpret land-based information, and how to act on that knowledge in alignment with traditional values.

Documenting change

Many indicators of change for both ecosystem health and land use have been studied, used and standardized by other organizations in the Yukon and elsewhere.

On the other hand, **CULTURALLY-RELEVANT** indicators informing subsistence needs or ability to access the land are much more limited, but still equally important to Tr'ondëk Hwëch'in.

Over the life of this plan, greater focus will be placed on determining culturally-relevant indicators that are informed by Traditional Knowledge and that will support the ongoing relationships between Tr'ondëk Hwëch'in Citizens and the land that have endured over millennia.

Table 5 Culturally-relevant indicators for the ecological and land use monitoring priorities of Tr’ondëk Hwëch’in

PRIORITY	CITIZEN NEEDS	ATTRIBUTE	INDICATOR	Examples of metrics
ECOSYSTEM HEALTH	Sustainable populations of fish, wildlife and plants	Population productivity	<ul style="list-style-type: none"> • Age/sex composition • Population growth • Pregnancy/parturition • Survival • Emergence 	<ul style="list-style-type: none"> • Cow:calf ratios • Rut composition • Growth rate (%) • Calf survival rate (%) • Salmon emergence
		Health of individuals within populations	<ul style="list-style-type: none"> • Body condition • Disease • Size 	<ul style="list-style-type: none"> • Body fat • Pathogens or toxins • Fish ASL data
	Intact habitats	Habitat quality, quantity and distribution	<ul style="list-style-type: none"> • Occurrence of key features • Distribution of available habitat • Amount of available habitat • Migration corridors 	<ul style="list-style-type: none"> • % wetlands in THTT • Km² or hectares of habitat
	Clean air and water	Water quality, quantity, flow	<ul style="list-style-type: none"> • Aquatic habitats 	<ul style="list-style-type: none"> • Temp, dissolved oxygen, pH • Depth and velocity • Benthic invertebrates
			<ul style="list-style-type: none"> • Contaminants 	<ul style="list-style-type: none"> • Heavy metals • Toxins • Parasites • Microplastics
			<ul style="list-style-type: none"> • Sedimentation 	<ul style="list-style-type: none"> • Total Suspended Solids • Turbidity
	Species ability to adapt to change	Habitat use	<ul style="list-style-type: none"> • Presence vs absence • Avoidance vs selection 	<ul style="list-style-type: none"> • Breeding bird surveys • seasonal range use • Pika occupancy surveys
		Behaviour	<ul style="list-style-type: none"> • Timing of life events • Movement rates • Human-wildlife conflicts • Diet 	<ul style="list-style-type: none"> • Peak of calving • # vehicle collisions • Fecal analysis • Zones of influence

		Genetics	<ul style="list-style-type: none"> • Genetic diversity 	<ul style="list-style-type: none"> • <i>eDNA</i>
AVAILABILITY OF CULTURALLY SIGNIFICANT SPECIES	Presence of species of interest	Abundance	<ul style="list-style-type: none"> • # observed per time period or area • Population size • Population density 	<ul style="list-style-type: none"> • <i>Salmon escapement</i> • <i>Herd size</i> • <i>Number moose per km²</i>
		Distribution	<ul style="list-style-type: none"> • Location • Proximity • Movement patterns 	<ul style="list-style-type: none"> • <i># observations</i> • <i>Seasonal migrations</i>
ACCESSIBILITY TO THE LAND FOR TRADITIONAL PURSUITS	Occurrence of harvesting	Harvest Effort	<ul style="list-style-type: none"> • Harvest/unit effort 	<ul style="list-style-type: none"> • <i># harvested/day</i> • <i># trips/season</i> • <i>% harvest success</i>
		Total harvest	<ul style="list-style-type: none"> • Amount of harvest • Harvest composition • Harvest location 	<ul style="list-style-type: none"> • <i>Harvest #s</i> • <i>% males harvested</i> • <i># nets in water</i>
		Harvest flexibility	<ul style="list-style-type: none"> • Shifting target species • Subsistence needs met 	<ul style="list-style-type: none"> • <i>Species harvested</i> • <i>Harvest sharing</i>
	Minimal user conflicts	User conflicts or displacement	<ul style="list-style-type: none"> • Occurrence of user conflicts • Extent of displacement 	<ul style="list-style-type: none"> • <i>#, freq, type of user conflicts</i> • <i>Places avoided by TH harvesters</i>
		Extent or intensity of land use	<ul style="list-style-type: none"> • Amount of use • Location of use • Size of development footprint 	<ul style="list-style-type: none"> • <i># land use permits issued</i> • <i>Road density (km/km²)</i> • <i>Camp size</i> • <i># helicopter flights per day</i>
	Safe access	Hazards	<ul style="list-style-type: none"> • Number or frequency of hazards • Location of hazards • Type of hazards 	<ul style="list-style-type: none"> • <i>Hazard mapping</i>
		Amount of access	<ul style="list-style-type: none"> • Settlement land access • Culture camps 	<ul style="list-style-type: none"> • <i># Land Grants</i> • <i>SL Expressions of Interest</i> • <i># participants in camps</i>

PART 5: PLAN IMPLEMENTATION

5.1 Meaningful Participation

Given the high level of biodiversity and land use activities occurring in our large Traditional Territory, as well as the complex co-management regime in place under the THFA, we recognize that a phased approach is necessary to implement this monitoring plan over time. We are gradually building on small successes, with full consideration given to internal and external capacity limitations. As capacity improves over time, we are taking a greater role in initiating and guiding future research and monitoring projects in the THTT.

Successfully implementing this plan allows us to focus our efforts and resources on projects that provide greater benefits and decision-making powers to TH, improves accountability to Citizens and enhances our ability to fully address our ancestral stewardship obligations and the responsibilities that are broadly set out in the THFA, the TH *Lands and Resources Act*, the TH *Fish and Wildlife Act*, and detailed in various co-management plans and policies.

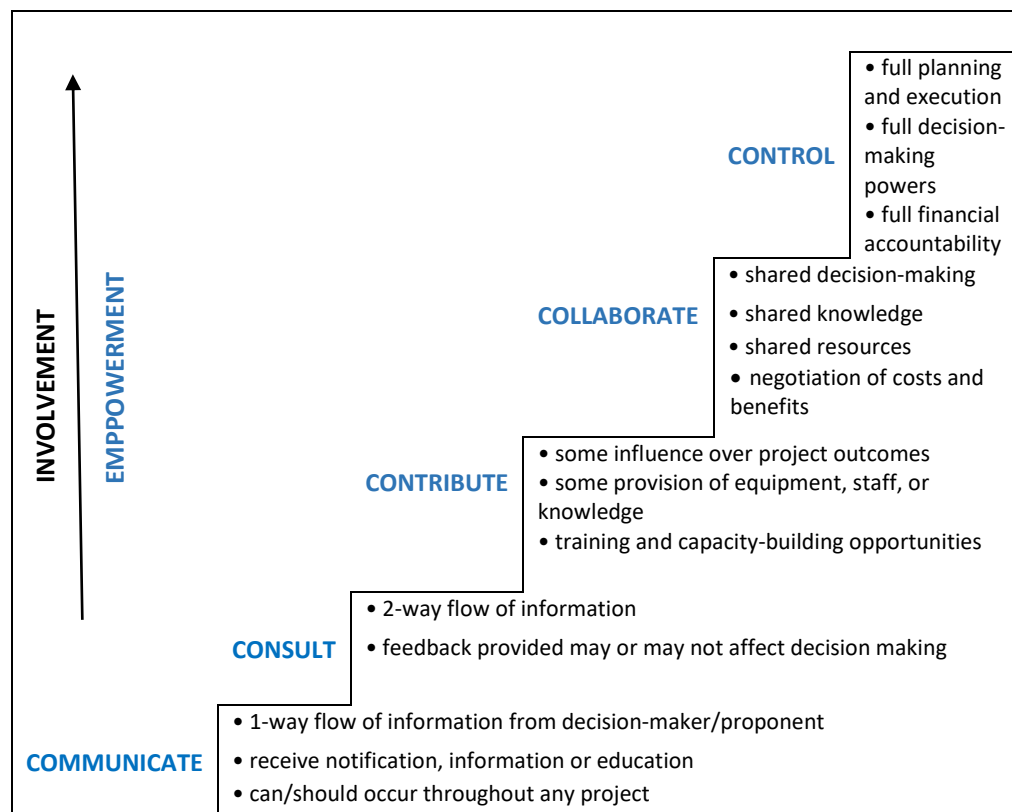


Figure 6 Ladder of Meaningful Participation

Ladder of Participation

Participation in monitoring can happen in a variety of ways (Figure 5).

The most basic level of participation is **COMMUNICATION** about a project. The most meaningful level of participation is having full **CONTROL** of a project. There are several steps in between these two extremes, with varying levels of decision-making powers and flow of communication.

To date, requests for TH participation in research and monitoring have often been limited to **COMMUNICATION** or **CONSULTATION**.

Implementing this plan will allow us to focus on greater participation in **CONTRIBUTING**, **COLLABORATING** with others and **CONTROLLING** our own projects.

5.2 Project Evaluation

We acknowledge that research and monitoring activities can have both positive and negative consequences for the land, water, fish and wildlife, for our community and culture, and for internal and external decision-making. We strive to support and focus on projects that minimize risk while maximizing benefits for Tr'ondëk Hwëch'in Citizens and staff.

For projects initiated by or requiring formal support from Tr'ondëk Hwëch'in, ecological and land use monitoring projects shall have the following characteristics:

- ❖ **Compatible:** Align with TH values & address TH goals and priorities as outlined in this plan (Sec.3.3, Sec.4.2).
- ❖ **Inclusive:** Acknowledge and/or incorporate our holistic, interconnected and long-term Indigenous worldview and/or the value of Traditional Knowledge (Sec.3.4).
- ❖ **Comprehensive:** Monitor ecological or land use indicators that are culturally relevant and at scales and timelines applicable for TH decision-making (Sec.4.3).
- ❖ **Collaborative:** Ensure meaningful participation for TH when considering partnerships that include other governments, institutions or organizations, particularly regarding decision-making powers and the equitable distribution of costs and benefits amongst partners (Sec.5.1).
- ❖ **Community-centred:** Foster community engagement throughout the project timeline, using language and media appropriate for each audience, to promote capacity building and intergenerational knowledge transfer (Sec.2.2).

Based on these characteristics, Table 6 summarizes how project components for monitoring will be evaluated by the TH Natural Resources Department. We acknowledge that strengths, weaknesses, opportunities and threats exist along a continuum. This table serves only to provide a basic understanding of TH perspectives for project planning purposes.

A project evaluation template is included in Appendix 7.4 that can be used:

- (1) by TH staff to evaluate funding opportunities, develop project proposals, and/or review external research projects, and
- (2) by external organizations seeking TH assistance or participation in research or monitoring projects in the THTT, to understand the information we need to define project success and determine an appropriate level of TH involvement.



Table 6 Summarized project evaluation for ecological and land use monitoring in the THTT

COMPONENTS	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS/RISKS
FUNDING	<ul style="list-style-type: none"> • Long-term/core • Comprehensive • Flexible 	<ul style="list-style-type: none"> • Short-term • Narrow scope • Conditional 	<ul style="list-style-type: none"> • Contribution agreements • In-kind support 	<ul style="list-style-type: none"> • Budget cuts • Changing mandates
KNOWLEDGE GATHERING/ DATA COLLECTION/ METHODOLOGY	<ul style="list-style-type: none"> • Consistent and defensible • Culturally relevant indicators • Accessible sites • Non-invasive sampling • Automated sampling • Long-term/multi-year • High resolution • Data sharing agreements 	<ul style="list-style-type: none"> • Costly • Unproven methods • Air access only • Destructive sampling • Short-term • Requires substantial human resources • Specialized equipment 	<ul style="list-style-type: none"> • Education and training • Traditional/local knowledge • Community-based monitoring • Site selection • Digital apps • High-res satellite imagery • Drones 	<ul style="list-style-type: none"> • Limited technical expertise • Unclear project oversight • False/weak assumptions • Lack of consideration for community protocols/customs
ANALYSIS AND DATA MANAGEMENT	<ul style="list-style-type: none"> • Open access • Stable data formats • Existing database/networks/portals 	<ul style="list-style-type: none"> • Reliant on outdated or expensive technology/software • Specialized training required • Costly to access or maintain 	<ul style="list-style-type: none"> • Compatible with TH land-based data management system 	<ul style="list-style-type: none"> • Limited lab availability • Cost-prohibitive lab analysis • Technological obsolescence • Lack of geospatial data management • Uncertainty/background 'noise'
REPORTING	<ul style="list-style-type: none"> • Plain language • Timely and relevant • Regular intervals • Visually appealing 	<ul style="list-style-type: none"> • Technical jargon • Raw data only 	<ul style="list-style-type: none"> • Community engagement • Briefings for leadership 	<ul style="list-style-type: none"> • Delays • Lack of interpretation • Misinterpretation
DECISION MAKING	<ul style="list-style-type: none"> • Clear patterns/connections • Actionable recommendations • Relevant scope/scale/timing • Supports adaptive management 	<ul style="list-style-type: none"> • Weak links between results and potential management actions 	<ul style="list-style-type: none"> • Implementation of agreements • Co-management of resources 	<ul style="list-style-type: none"> • Inability to act on results • Staff turnover/ loss of corporate knowledge

5.3 Roles and Responsibilities

Tr’ondëk Hwëch’in Natural Resources (NR) will be the primary department to oversee and coordinate TH participation in ecosystem and land use monitoring projects. The table below outlines the level of participation anticipated for various permanent Natural Resources staff positions⁵.

Table 7 Roles and responsibilities for Natural Resources staff involved with ecological and land use monitoring.

	PLAN	EVALUATE	GATHER	ANALYSE	COMMUNICATE	ACT
NATURAL RESOURCES STAFF	Develop & coordinate an ecological and land use monitoring plan	Assess monitoring proposals and funding opportunities	Collect field data for culturally-relevant indicators	Analyse and interpret monitoring data	Reporting and updates to: Citizens, THC, GA, Elders Council, mandated boards, funders, etc.	Use monitoring results to support informed decision-making and co-management
Natural Resources Director	Review and approval	✓			Review and feedback	✓
Lands & Resources Manager	Review and feedback	✓	✓	Review and feedback	Review and feedback, updates	✓
Fish and Wildlife Manager	Review and feedback	✓	✓	Review and feedback	Review and feedback, updates	✓
Fish and Wildlife Projects Coordinator	✓	✓	✓	✓	✓	
Natural Resources Analyst	Review and feedback	✓	✓	✓	Review and feedback, updates	
Fish and Wildlife Steward			✓	✓		
Land and Resources Officers			✓	✓		
Development Assessment Coordinator		YESAB projects	✓	Review	Review and feedback	
Development Assessment Assistant		S&E applications, park permits (R&E)	✓			

⁵ Staff positions in Table 7 do not include term or auxiliary on-call positions that are dependent on temporary and/or project-specific funding.

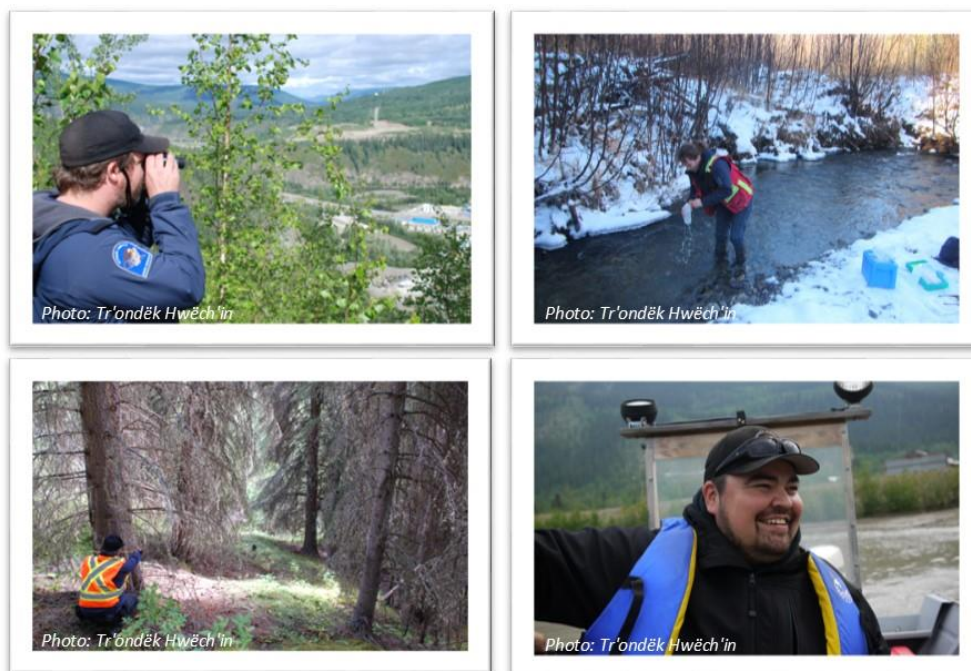
GIS Coordinator			✓ Spatial data	✓ Spatial data		
Special Projects Coordinator		✓ Clinton Ck	✓ Clinton Ck	Review and feedback	Review and feedback	
Land Use Planning Coordinator		Settlement land		Review and feedback	Review and feedback	

Other TH departments also participate in activities related to ecological and land use monitoring in the THTT. The Natural Resources Department often works closely with the Implementation and Heritage departments on land-based initiatives, particularly on the development of various components of the Land Stewardship Framework. This plan will facilitate continued collaboration so that we are able to efficiently fill data gaps, engage the community, and meet the needs of Citizens.

In addition to TH staff, our governing bodies, such as TH Council, Elders’ Council, Youth Council and the General Assembly, have important roles in:

- identifying monitoring priorities,
- receiving updates,
- providing feedback and recommendations, and
- approving the development and/or revision of relevant policies, plans and legislation that may benefit from monitoring information.

Accountability to Citizens remains a top strategic priority. Over time, implementing this plan will facilitate more opportunities for TH Citizens, Elders and youth to be involved in monitoring activities.



PART 6: PLAN REVIEW

Accountability shall be maintained through regular communication and engagement with TH staff, Citizens and leadership regarding monitoring activities and information.

Flexibility to act on the feedback received about monitoring priorities should be built into regular plan reviews so that the plan can continue to meet ongoing and emerging information needs.

6.1 Short-term Reporting

Reporting and communicating findings are a key component of all monitoring projects, including routine field patrols. Adequate time needs to be factored into schedules, work plans and project plans to facilitate the use and sharing of the information gathered.

Reporting requirements for various types of monitoring are typically set by managers, plans and policies, academic institutions or funding agencies. Reporting may take the form of field reports, occurrence reports, briefing notes, videos or films, posters, presentations, summaries, theses, peer-reviewed publications and other types of documents.

The frequency of reporting and level of detail required often depends on how quickly the information is needed for decision-making, and who the decision makers are. For example, managers typically require a higher level of detail and need to be updated more frequently than leadership.

Standards can vary widely, but written reports are preferred over verbal accounts or emails/texts. Photos and GPS coordinates shall be collected, whenever possible, to help visualize conditions and locate sites. Raw data should be reviewed for errors soon after it's collected as part of quality control/quality assurance processes. The personnel collecting the data in the field shall be the ones to enter the data into databases and review for errors, as well as review reports and summaries for accuracy.

The *Natural Resources Field Operations Manual* shall be drafted and subsequently updated every year to include specific details for each monitoring project that TH is involved with, including tools and equipment required, sampling protocols, forms, reporting requirements, and so on.

6.2 Annual Reporting

Each year, the Natural Resources Department shall produce a written report summarizing all the monitoring activities that Natural Resources staff have been participating in over the past year. This report shall provide an overview to management, leadership and Citizens to inform decision making and support community engagement activities, with respect to natural resources.

For each project, details on the following will be summarized:

- TH priorities/goals/objectives that were addressed
- Questions being answered/indicators being measured
- Type of monitoring/scope/scale, etc.
- Level of TH participation and/or resources being used
- Funding source(s)/project lead
- Timeline/schedule and opportunities for community input/participation (if relevant)
- Project outcomes/products and their anticipated availability

Additionally, an appendix shall be included in the annual report that lists other monitoring projects known to be occurring in the THTT without our direct participation, but that may be producing publicly-available information that can be used to help address the goals and objectives in this plan (e.g., projects permitted under the Yukon *Scientist and Explorers Act*).

This report should coincide with the spring General Assembly (Feb/Mar) and will be mailed out to all Citizens. In addition to the written report, a meeting/open house may also be planned to help engage with Citizens and ensure they have a venue to ask questions, provide input and make recommendations. If appropriate and/or necessary, additional meetings and presentations may be provided for TH Council, Elders' Council, Dawson District Renewable Resource Council, or co-management partners.

This report and the feedback received from the spring GA and other outreach events can be used to support subsequent annual departmental work planning.

6.3 Five-year Review

Unless otherwise required, a review of this plan shall be undertaken by Natural Resources staff every five years to ensure that it remains relevant and continues to serve the needs of staff, Citizens and leadership. The review should coincide with the development/revision of the TH Strategic Plan to ensure that any new objectives related to monitoring arising from that plan can be incorporated into this plan.

Workshops with staff and Citizens will be the primary means to determine:

- Are priorities, goals and objectives still relevant to TH Citizens and leadership?
- What issues and concerns have been addressed by this plan during the period since the last review?
- What new issues and concerns have arisen since the plan was developed or reviewed?
- Does it continue to align with strategic plan goals/objectives for the Natural Resources Department?
- What new plans/policies/strategies have been produced that are relevant to monitoring?
- New risks or opportunities facing Citizens and their ability to connect with the land?
- Are there remaining knowledge gaps that haven't been addressed? Why not?

PART 7: APPENDICES

7.1 Documents Relevant to Monitoring in the Tr'ondëk Hwëch'in Traditional Territory

Agreements and Treaties

- [TH Final Agreement](#) (1998)
- [TH Self-Government Agreement](#) (1998)
- [TH Constitution](#) (1998)
- [Treaty between the United States of Canada and the Government of the United States of America concerning Pacific Salmon](#) (1985)
- [Yukon River Salmon Agreement](#) (2002)
- [Porcupine Caribou Management Agreement](#) (1985)
- [Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd](#) (1987)
- [United Nations Declaration on the Rights of Indigenous Peoples](#) (UNDRIP)
- Sharing Accord Between Tr'ondëk Hwëch'in and First Nation of Na-Cho Nyak Dun (2006)
- Agreement on Sharing Arrangement Between Vuntut Gwitchin First Nation and Tr'ondëk Hwëch'in (2018)

TH Legislation

- [Tr'ondëk Hwëch'in Lands and Resources Act](#) (2004)
- [Tr'ondëk Hwëch'in Fish and Wildlife Act](#) (2009)
- [Tr'ondëk Hwëch'in Heritage Act](#) (2016)

Strategies, Frameworks, etc.

- Tr'ondëk Hwëch'in Strategic Plan: 2021-2025
- *Tr'ondëk Hwëch'in Land Vision (TH Implementation, 2022) (draft)*
- *Tr'ondëk Hwëch'in Consultation Protocol (in progress)*
- *'We are Dënezhu' (TH Heritage, 2020) (draft)*

Plans, Policies and Protocols

- [Adaptive Management Framework \(AMF\) for the Fish Habitat Management System \(FHMS\) for Yukon Placer Mining](#) (2008) - YPS
- [Tombstone Territorial Park Management Plan](#) (2009) - Yukon Parks
- [Porcupine Caribou Harvest Management Plan](#) (2010) and [Implementation Plan](#) (revised 2016) - PMCB
- [Dawson Climate Change Adaptation Plan](#) (2011) - Northern Climate ExChange
- [Management Plan for the Northern Mountain Population of Woodland Caribou in Canada](#) (2012) - CWS
- [Dawson Forest Resources Management Plan](#) (2013) – Dawson Forest Management Planning Team
- [Yukon Wolf Conservation and Management Plan](#) (2018) - YFWMB
- [A Conservation Plan for Grizzly Bears \(*Ursus arctos*\) in Yukon](#) (2019) - YFWMB
- [Peel Watershed Regional Land Use Plan](#) (2019) – Peel Watershed Regional Planning Commission
- [Fortymile Caribou Harvest Management Plan](#) (2020) - YHMC (Appendix 4: Research and Monitoring)
- *Draft Dawson Region Land Use Plan (2021) – Dawson Regional Planning Commission*
- *Draft Wetlands Policy (2021) – Government of Yukon*

7.2 Natural Resource Management Roles and Responsibilities in the THTT

Decision bodies

- [Tr'ondëk Hwëch'in](#)
- [Yukon Department of Environment](#)
- [Yukon Department of Energy, Mines and Resources](#)
- [Environment and Climate Change Canada](#) (ECCC) – Canadian Wildlife Service
- [Fisheries and Oceans Canada](#) (DFO)

Boards and Committees mandated under the Umbrella Final Agreement

- [Dawson District Renewable Resource Council](#) (DDRRC)
- [Porcupine Caribou Management Board](#) (PCMB)
- [Yukon Fish and Wildlife Management Board](#) (YFWMB)
- [Yukon Salmon Subcommittee](#) (YSSC)
- [Yukon Water Board](#)
- [Yukon Surface Rights Board](#)
- [Yukon Environmental and Socio-economic Assessment Board](#) (YESAB)
- [Yukon Land Use Planning Council](#) (YLUPC)
- Tombstone Territorial Park Management Committee
- Fortymile Caribou Harvest Management Committee

Collaborative Networks

- [Canadian Permafrost Network](#) (PermafrostNet)
- [Northwest Boreal Partnership](#)
- [Indigenous Observation Network](#) (ION)
- [Yukon River Basin Long-term Water Quality Monitoring Network](#)
- [Canadian Aquatic Biomonitoring Network](#) (CABIN)
- [Mackenzie DataStream](#)
- [Canadian Mountain Network](#) (CMN)
- [Yukon Snow Survey Network](#)
- Yukon First Nation Salmon Stewardship Alliance (YFNSSA)
- Yukon Observation Well Network
- *National Indigenous Guardians Network (in progress)*

7.3 Potential Sources of Monitoring Information

Interviews/Traditional Knowledge/Reports

- Important sites of interest
- Harvest success/effort/concerns
- Key wildlife areas (spawning, rearing, denning, nests, etc.)
- Changes over time: site characteristics, populations, etc.
- Problem wildlife
- Displacement or user conflicts
- Hazards
- Extreme weather events
- Traditional stories
- Stewardship activities

Data loggers

- Water temp, flow, etc.
- Air temp/pressure/precip/wind, etc.
- Road/trail traffic
- Soil temperature
- Slope movements
- Bird songs/bat calls

Remote sensing

- Satellite imagery
- Landcover classifications
- GIS data (points, lines, polygons)
- Wildlife radio/satellite collar location data

Photographs/Videos

- Patrol-based
- Game cameras
- Drone footage
- Aerial or ortho-photography
- Camera collars (diet/habitat use/behaviour)

Direct observations

- Presence/absence
- Quantity/counts/population census
- Sex/age/antler configuration
- Size/condition/reproductive status
- Behaviour/habitat use
- Hazards
- Non-compliance
- Intensity/duration/extent of use
- Trail/road development and use

In-situ Measurements

- Vegetation characteristics (tree age, diameter, height, stand density, species composition, ecosystem classification, browsing intensity, etc.)
- Animal characteristics (age, size, length, weight, body condition, etc.)
- Snowpack/ice (depth, thickness, density, snow water equivalent, etc.)
- Water (flow, conductivity, turbidity, pH, temperature, dissolved oxygen, etc.)

Samples

- Hair, scales, teeth, otoliths, bone (DNA, age, isotopes)
- Fecals (DNA/pathogens/diet analysis)
- Organs (pathogens/toxins)
- Blood (DNA, cortisol, pathogens, etc.)
- Water (chemical composition/heavy metals/contaminants/eDNA)
- Plants (heavy metals, contaminants, protein, biomass, etc.)
- Soil (microbes, invertebrates, contaminants, classification, etc.)

7.4 Template: Project Evaluation

Project name:

Key personnel:

- Project lead:
- Field staff:
- Partners: (if applicable)
- Lab: (if applicable)

Purpose:

- What questions will (and will not) be answered by this project?
- How will answering these questions address the goals and objectives of this plan (Sec.3.3)?
- Can the results of this study be used to protect or promote connections between TH Citizens and the land? (Sec.4.1)
 - Healthy land, water, fish and wildlife populations and habitats
 - Availability of species of cultural significance (abundance/distribution)
 - Accessibility to the land by Citizens
 - Development and transmission of Traditional Knowledge
- How will answering these questions address our community priorities?
 - o Which culturally-significant species/areas/ecosystems/land uses (Sec.4.2) will be studied?
 - o What culturally relevant indicators will be measured/sampled/collected? (Sec.4.3)
- Will this study address the objectives of any of the agreements/policies/plans listed in Appendix 7.1? If so, list the applicable sections/recommendations/action items of the plan(s).

Scope:

- Timeline
 - o Start date: YYYY/MMM/DD End date: _YYYY/MMM/DD
 - o Is this project suitable for medium to long-term (5+ years) monitoring?
YES NO MAYBE
 - o How could this project be adapted to a longer timeframe? What resources would be required?
- Location
 - o Coordinates: (include map(s))
 - o Why does this project need to happen here?
 - o What characteristics are needed in a good study site/transect/plot?
 - o Do you need assistance to identify appropriate sites? YES NO N/A
- Connections/Networks
 - o Is this project connected to an existing program, network and/or lab?
 - o Are you aware of any other related projects that have occurred in the THTT recently?

Budget:

- How is this project being funded/resourced?
 - o External: list all sources and amounts (or %)
 - How much is being funded by industry? ____%
 - o Internal: list all sources and amounts, including in-kind support
 - How much is funded with core funding? ____%
- How long will funding last for? ____ years.
- Is there opportunity to extend or expand the project? YES NO MAYBE
- o Is the funding conditional? If so, what are the conditions and how will they be met?
 - Does any of this funding require/prefer the participation of First Nation/Indigenous peoples? YES NO
- Are there project funds available to support Indigenous participation/community engagement? If so, how much is available and what types of activities will be covered?

Meaningful Participation by TH:

- What level of TH participation (Sec.5.1) will this project incorporate?
 - o **Communication:** What outreach methods will be used?
 - o **Consultation:** How will TH feedback be used?
 - o **Contribution:** What resources are you asking from TH, what will you be sharing in return? Will there be training/capacity-building opportunities?
 - o **Collaboration:** How will decision-making/knowledge production/resources be shared equitably?
 - o **Control:** Which, if any, project components be controlled by TH?
- Who are you hoping to involve and in what capacity/role?
 - TH staff as _____
 - TH Citizens as _____
 - TH Elders as _____
 - TH youth as _____
 - o How will Citizens and Elders be compensated for their time? (if applicable)
 - o Will you require TH to hire and/or supervise Citizens? YES NO
 - o What training will be provided to Citizens and Elders? (if applicable)

Permits/approvals:

- Does this project need a YESAB assessment?
https://www.yesab.ca/wp-content/uploads/2018/12/13134_YESAB_brochure_ProjectV11.pdf
No Applied Approved Project # _____
- Does this project need a Scientist and Explorers' Permit?
<https://yukon.ca/en/scientists-explorers-licence#apply-for-a-licence-to-conduct-research>
No Applied Approved Permit # _____
- Does this project need a Park Permit (Research and Education)?
<https://yukon.ca/en/park-permit>
No Applied Approved Permit # _____
- Does this project need a TH Land Use Permit?
<https://www.trondek.ca/land-use-permits>

No Applied Approved Permit # _____

- Does this project need a TH Community Knowledge Protocol?
<https://www.trondek.ca/heritage>

No Applied Approved (attach signed protocol)

- What other permits does this project need?

N/A Applied Approved

Schedule:

	Responsibility/Delegation	Anticipated Completion Date	<input checked="" type="checkbox"/>
Project planning			
Funding secured			
Permits/approvals			
Data collection			
QA/QC			
Data analysis			
Reporting			

Methodology:

- Summarize the basic field methodology and any required equipment/tools/training/certification required
- List basic assumptions and hypotheses that have influenced the choice of proposed methodology and analysis
- Who will own and house the data produced from this project?
- Who/what organization has responsibility for QA/QC, metadata and long-term maintenance?
- How will you respond to community safety protocols and/or travel restrictions (*if applicable*)?
- What steps will you take to minimize your carbon footprint while you are working in the THTT?

Reporting/Engagement:

- How will this project be reported?
- What audiences will be targeted? What engagement strategies will be used?
- What plain language products will be available? Timelines?
- How will publicly-available data be housed and accessed? (*if applicable*)
- How will sensitive information be managed? (*if applicable*)
- How will TH contributors be acknowledged? (*if applicable*)