

Moose Management Guide



Moose are very important for many Indigenous Nations throughout Canada. In most regions, moose populations are in decline. This moose management guide is a resource for Indigenous communities interested in developing a moose management plan for their territory with a focus on the role of Indigenous Guardians in taking care of this important species.

Each section of this guide provides a series of high-level questions to help guide thinking and direct conversations as you move through the steps to build a moose management plan. It is designed to help you identify practical and effective management and monitoring strategies to achieve your Nation’s goals for taking care of moose.

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1. Getting Started on Moose Management

Developing a moose management plan starts with your community. It is important to understand *why* your Nation wants to develop a moose management plan at this point in time. Does your community have concerns about declining moose populations? Are there specific threats to moose? Being clear about why you want to develop a moose management plan will help you prioritize the best management strategies moving forward.

Early Community Guidance

Below are a set of questions you can explore early in the process of developing a moose management plan. Decide who needs to be involved in answering these questions (it will vary from community to community). You may want to:

- have a meeting with local resource management staff and leadership.
- host a community meeting on moose.
- visit community members to discuss these questions.

If you decide to engage the community more broadly at this stage, see [Chapter 13 'Engaging the Community'](#) in the Indigenous Guardians Toolkit for tips and ideas.

Once you have decided who needs to be involved in the initial conversations, consider asking these questions. The answers you gather may form the foundation of your moose management plan.

Worksheet

Early Community Guidance

1. Why are moose important to your community?
2. What concerns do people have about moose? What changes are people seeing with moose in your territory?
3. What is affecting the moose populations in your territory both historically and currently?
4. How is our community taking action on moose going to help?

2. Understanding Moose – Indigenous Knowledge & Western Science

An important initial step in developing a moose management plan is gathering information about moose from different sources, including Indigenous knowledge and western science.

Your Nation will likely have Indigenous knowledge, laws and practices that relate to moose. This information may be held by a variety of people including Elders, knowledge holders, active land users, hunters, Indigenous Guardians, community leaders, and others. Different people may have unique knowledge and responsibilities related to moose. Gathering information from these key people within your Nation will contribute to developing a strong moose management plan that is aligned with your community’s cultural values, laws and practices. Some of these people may also play a role in implementing the moose management plan on-the-ground; it can be useful if they are part of contributing to and building the plan. Before reaching out to people to learn more about Indigenous knowledge, laws and practices about moose, try to do your homework and find out what has already been documented about moose for other purposes and processes.

Two-Eyed Seeing

The concept of Two-Eyed Seeing (Etuaptmuk, in Mi'kmaw) was developed by Mi'kmaw Elder Albert Marshall. It refers to “learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing ... and learning to use both these eyes together, for the benefit of all.”
[\(http://www.integrativescience.ca/Principles/TwoEyedSeeing/\)](http://www.integrativescience.ca/Principles/TwoEyedSeeing/)

Worksheet

Understanding Moose

1. What Indigenous knowledge related to moose has already been documented? Including the teachings, protocols, and values related to moose for your Nation?
2. Who are key people in your Nation that can share important knowledge and guidance about moose?
3. What is the best way to engage these key people to learn from them about their knowledge and guidance about moose?

If you do decide to engage knowledge experts and land users as part of this work, these are some questions you could explore:

1. What teachings/protocols/laws/values guide our relationship to moose?
2. How do we take care of moose?
3. What tells you how healthy moose are in your territory? How healthy are the moose right now?
4. What areas in the territory are important for moose and why?
5. What changes have you observed in moose (e.g. rut behavior, body condition, how many calves you see, how much time it takes to see a moose when hunting, taste of meat, health of internal organs)? What do you think might be contributing to those changes?

Story

Gitanyow Wilp System¹

The Gitanyow Hereditary Chiefs (GHC) continue to manage their traditional territory as they have for millennia, through their Gitanyow Constitution (Ayookxw) and their House (Wilp) system that describes foundational rights, responsibilities and laws. The Gitanyow Constitution provides transparency for Wilp members on their roles and responsibilities, as well as clarity for outsiders wanting to conduct activities on the territory. An example of a legal principle is Hla' Am Wil or “wealth of the land, air and waters of the Lax'yip that must be stewarded for passing on to future generations”. Hla' Am Wil includes good forestlands, plentiful moose, fish, berries, goats and so on.

“A benefit of our Wilp system is that each Chief has the ability to control specific places on their territory. Where access management is important, the Chiefs can shut down access to hunters in certain areas to give wildlife a refuge for a period of time.” - Jimmy Morgan, Gitanyow Lax'yip Guardian

¹The Gitanyow Hereditary Chiefs in northwestern British Columbia started a moose monitoring and permitting program in 2011. We have woven their story throughout this guide to illustrate one approach that a First Nation has taken. See the full case study for more information.

Alongside the Indigenous knowledge from your Nation, western science can also be a helpful source of information about moose populations in your region. It can be useful to find out what moose monitoring or research has happened in your territory or surrounding areas. Your Nation may also have been involved in collecting scientific data related to moose populations.

Compiling existing information can contribute to your understanding of what is happening with moose in your area, as well as identify gaps in knowledge about moose and their health.

Worksheet

Understanding Moose

1. Who researches or monitors moose in your area and what studies have they conducted?
2. Based on these studies, what is the status of moose in your area? What affects their populations and health?
3. What are the biggest threats to moose and their habitat (from an Indigenous knowledge perspective or western science perspective)?
4. Are there gaps in documented information about moose and their habitat (from Indigenous knowledge or western science perspectives) and what additional research or information would be useful to support the development and implementation of your plan?



Popp, Jesse, Priadka, Pauline, Young, Megan, Koch, Kevin, and James Morgan. 2020. Indigenous Guardianship and moose monitoring: weaving Indigenous and Western ways of knowing. Human-Wildlife Interactions, 14(2):296-308

“Because of their wide distribution, monitoring strategies for moose are typically difficult and cost-extensive, leaving uncertainty and gaps in [Western science] population information. The inclusion of localized monitoring through Indigenous Guardian Programs would therefore greatly benefit the ability to track moose population change and inform collaborative management at local scales.”

3. Making Decisions About Moose – Governance, Plans and Agreements

As you develop a moose management plan, it will be important to understand your Nation's processes for governance and decision-making related to moose, as well as any plans or agreements that provide guidance or direction related to moose. See [Chapter 5: Set up a Governance Structure](#) of the Indigenous Guardians Toolkit. Similarly, it will be important to also understand the Crown governments' decision-making processes, plans and policies related to moose. From the Crown's perspective, moose management across Canada falls under the jurisdiction of provincial or territorial governments.

Worksheet

Making Decisions About Moose

1. Describe the current efforts or involvement of your Nation in moose management.
2. How does your Nation currently make decisions about moose management in particular, or natural resource management more broadly, and who is involved in making these decisions? How has your Nation made decisions about moose in the past?
3. Who specifically from your Nation is involved in discussions and/or negotiations with other decision-makers or parties related to moose, wildlife, and/or broader resource management issues?
4. What plans or agreements exist for your Nation that guide decision-making about moose in particular, or natural resource management more broadly, that would influence/impact issues related to moose?
5. What agencies or ministries from Crown governments are responsible for moose management and what plans or Acts exist that inform moose management in your area? What boundaries are used to manage moose and how do they overlap with your community's boundaries?
6. Who else is involved in decision-making about moose management in your territory?



Gitanyow land use plan and moose

After decades of unmanaged industrial development and three court cases with the province, the Gitanyow Hereditary Chiefs sought to develop the Gitanyow Lax'yip Land Use Plan (LUP) to give certainty to the Gitanyow Hereditary Chiefs, Government and industry. The LUP exercises the inherent title, jurisdiction and law of the Gitanyow Hereditary Chiefs while ensuring territory sustainability. The LUP is a strategic plan that combines Gitanyow and western scientific knowledge to provide technical direction about land and resource management that is grounded in the Gitanyow Constitution (Ayookxw).

The plan gives effect to several legal principles according to how they are set out in the Gitanyow Constitution. The LUP identifies and maps zones of land that maintain habitats, connectivity and ecosystem function throughout the territory. Moose habitat is identified as a high-risk value in the LUP and there are goals, objectives and targets associated with moose habitat.

“The Gitanyow Hereditary Chiefs had to fight to determine which objective were going to be legally enforceable. Part of the success of the Gitanyow Land Use Plan is that it gets right down to detail. It doesn’t say ‘protect water’. What does that mean? It has to have legal teeth.” - Kevin Koch, Gitanyow Fish and Wildlife Biologist

4. Moose Monitoring Methods



Kevin Koch,
Gitanyow Fish and
Wildlife Biologist

“When the moose populations dropped, everyone started pointing fingers. How do you prove that something is not your fault? The way the Gitanyow has proved it is over time building our own data set and developing our own monitoring program. Our moose data is better than the province’s now, they consult with us.”

Many communities are interested in first being able to monitor moose, before deciding on moose management practices. Good data and information give power to your management decisions. Because monitoring, data collection, and information management take time and resources, it is important to ensure that all hard work is guided by the purpose and outcomes you are working towards. It is also important to understand who will have access to the data and in what form. Hunters or other people who share information on moose will likely want to know this before participating in any monitoring surveys.

Once you understand what decisions you want to inform and what data you want to collect, you can start to determine what specific information you will gather, how you are going to collect it, who is going to collect it, and who you can work with on the design and delivery of a monitoring program.

There are various methods used for monitoring moose populations. See the report called *Considerations and Recommendations for Initiating Indigenous-led Moose Monitoring and Research* for an overview of the most common moose monitoring methods, (e.g. aerial surveys, radio telemetry or GPS collars, fecal pellet surveys track counts, trail cameras, and land user surveys/interviews) and associated considerations. For additional ideas and information see [Chapter 10: Monitor and Collect Data](#) of the Indigenous Guardians Toolkit.

When thinking through who is going to monitor and collect data related to moose, be creative! Your community might have existing staff, like Indigenous Guardians, to carry out moose monitoring in the territory. It may also be important to engage community members in helping to report observations about moose populations (such as sightings, road kill, etc.) as this will greatly strengthen your moose management plan.

 **Worksheet**

Moose Monitoring Methods

1. Why do you want to monitor moose? What decisions do you want to make or influence from this information? What questions do you have?
2. How will the data you collect inform your Nation's decisions about moose management? What do you need to be able to report on? Who needs to hear what the data have to say, and how will it be shared with them?
3. What methods will you use to collect this data? Are your methods compatible with other people who are collecting data so that your efforts can contribute to larger data sets?
4. What role will Indigenous knowledge and western science play in your monitoring program? Do you want to take a two-eyed seeing approach?
5. What financial resources do you have available for monitoring moose?
6. What expertise exists within your community for conducting moose monitoring activities? What training is available on moose monitoring?
7. Who can you partner with to monitor moose populations? See the Finding Allies and Partners section on page 13.
8. How will you collect and store data (e.g. paper forms, using app, enter into excel file)?

 **Story**

Biigtigong Nishnaabeg Land-User Surveys with Phone App

Biigtigong Nishnaabeg is an Indigenous community in northwestern Ontario. Concern over declining moose populations in the community's traditional territory motivated a moose monitoring program in collaboration with the Anishinabek/Ontario Fisheries Resource Centre. Data on moose sightings and harvest were collected by hunters and land-users using a mobile application by Trailmark systems. Individuals were also able to record their own observations and Indigenous knowledge in the form of photos, audio, and text, in order to document changes in population trends and behaviour over time. In addition to the land-user surveys, 35 members of the community were interviewed and shared Indigenous knowledge on moose population trends and threats to moose. For more, see this story on CBC.ca: <https://www.cbc.ca/news/canada/sudbury/moose-monitoring-app-first-nations-1.4506052>

5. Importance of Engaging the Community in Moose Management

Community buy-in and ongoing communication with community members and knowledge keepers can be vital for this work. Build off any engagement you did for early community guidance on this work. Consider ways to involve community members in tracking observations of moose or using different ways to stay connected so people are aware of the moose monitoring work that is happening and know how they can stay informed and engaged. Below are some questions to get you started. For more information, see [Chapter 13: Engage the Community](#) of the Indigenous Guardians Toolkit.

Worksheet

Engaging the Community

1. How will you engage with knowledge keepers and community members to solicit initial and ongoing input to the moose management plan? See community knowledge, laws and practices section for more information.
2. How will you communicate with your community about the moose project? What methods will you use to share information with the community? (e.g., community meetings, Facebook page, etc.)
3. What information will you report to the community and how frequently will you report?

Engaging communities in moose management

There are many great ways to engage your community around moose management work. Here are some examples from other community moose initiatives:

- information sharing and participation in community events such as pow wows or moose hunt camps
- putting on a 'wildlife week'
- setting up information booths
- creating a Facebook page
- putting a one-page summary of the results in every resident's mailbox

6. Roles and Responsibilities of Indigenous Guardians

Your stewardship/resource management staff, such as Indigenous Guardians, are key to implementing and monitoring your moose management activities. Their roles can include:

- educating others about Indigenous protocols around moose
- monitoring killed moose (hunted, roadkill)
- monitoring hunters
- collecting hair samples
- helping conduct research studies (e.g., winter habitat, predation)

Consider the work plans of your Guardians or other stewardship staff. From there you can determine how to best work with others to achieve your moose monitoring and management priorities. For more ideas, check out [Setting Strategic Priorities](#) in Chapter 4 of the Indigenous Guardians Toolkit.

Worksheet

Roles and Responsibilities of Indigenous Guardians

1. What specific role will your Guardians and other stewardship staff play in moose management?
2. Is there enough internal capacity within your Nation to achieve your objectives? If not, are there others you could collaborate with?
3. How might Guardians learn from Elders and Indigenous knowledge holders in your community, regarding moose? How might they share their knowledge with other community members?

Story

Gitanyow Guardians

The Gitanyow Lax'yip Guardians are considered the pillars of the Gitanyow moose monitoring and permitting program. They are involved in all aspects of its implementation, from issuing permits to monitoring compliance with their Chiefs' rules and expectations. Public education and awareness raising are other important roles of the Gitanyow Lax'yip Guardians. The Gitanyow Lax'yip Guardians are also committed to engaging with the youth in their community.

The Gitanyow Lax'yip Guardians are central to enforcing the Gitanyow Ayookxw and implementing the Gitanyow Lax'yip Land Use Plan. The Gitanyow Hereditary Chiefs know it is important to have a strong presence on their wilp to stand solidly on their laws and culture, while also bringing these into a modern context. The Guardians ensure that the authority of the Chiefs is respected and understood.

7. Finding Allies and Partners on Moose Management

Consider who you would like to engage with in order to most effectively develop and implement your moose management plan. Maybe it is most important that the plan is developed by your Nation for your Nation. Or maybe there are others you want to involve at different stages of developing and implementing your plan for various reasons (strategic reasons, funding, technical support, etc.). Allies and partners might include neighboring Indigenous communities, provincial or territorial agencies, resident hunters, recreational associations, universities, research institutes, environmental organizations, consultants, etc. Consider the following questions when thinking about the allies and partners who might be best for your moose management plan. For more ideas, see [Chapter 16: Create a Network or Alliance](#) in the Indigenous Guardians Toolkit.

As you assess the technical support that exists within your community, you might want to consider bringing in someone with wildlife biology expertise to assist with your moose management plan. This support could come in the form of hiring someone as staff, forming a partnership with a university professor, or hiring someone on a contract basis to support this work. There could be an opportunity to share the costs of a wildlife biologist with nearby Indigenous communities who are also looking for that support.

Worksheet

Finding Allies and Partners

1. Who might be useful to work with as you develop and implement your moose management plan and why?
 - a. Can you work with neighboring Nations to manage moose regionally? If you can't work together, it might be a good strategy to inform them of what you are working on. This way they are informed firsthand, instead of hearing about your work through public or other channels.
2. If you need additional technical expertise to develop or implement your moose management plan, who has it? What recommended consultants or university professors are experienced in this area?

8. Options for Moose Management

There are many different management strategies that your community can implement to achieve your Nation's goals. Remember, your goals and strategies will likely be connected to the community's concerns about moose, what has been identified as threatening the health of moose, and available information on the current health of moose populations.

Across Canada, the primary tools used to manage moose populations, both by First Nations and by Crown governments, are:

1. population monitoring
2. harvest management

Some Nations may prefer to start with monitoring and collecting information on moose. This, paired with engaging the community, might be the necessary first step to determining what is best for the community. From there, your community may want to consider potential management strategies.

Developing and implementing management strategies will mean the work of your Nation will intersect with resource agencies (e.g. Crown government wildlife departments) who also have wildlife management responsibilities. Revisit question 5 in the "Making Decisions About Moose" section of this document. It is important to keep this in mind when developing your plan. For more information, check out [Chapter 15: Establish Relationships with Resource Agencies](#) of the Indigenous Guardians Toolkit.

Moose management strategies can also relate to any or all of the following:

- Predator management (e.g., wolf trapping program and incentives).
- Manage number of deer to reduce transmission of parasites to moose.
- Reduce vehicle collisions (signage, patrols, reduce salting, etc.).
- Modifying land uses, including restoring, protecting or enhancing winter and other seasonal habitats:
 - Prescribed burns to increase moose forage.
 - Creating protected areas around critical moose habitat.
 - Regulating industrial activities, pollution, noise, traffic.

If your community sees the need to explore harvest management to keep moose healthy, there are many options for how to do that. Some potential strategies include:

- Voluntary or mandated harvest reporting.
- Implementing harvest seasons (e.g., cannot hunt at certain times of year, no antler hunting seasons).
- Avoiding harvest of cows and young.
- Implementing and enforcing harvest allocations, which could include developing a permitting system and/or having guardians patrol hunting areas.
- Restricting access to resident or non-resident licensed hunters.
- Managing hunting access to critical areas to limit harvest.
- Education and/or hiring patrols to reduce poaching.

It is possible to implement a variety of strategies, some more short-term (like limit hunting) and some more long-term (e.g., habitat restoration). You may want to weigh the pros and cons of each to understand how they will help you achieve your goal.

The strategies you decide on to meet your community's needs and goals may also vary based on:

1. The nature and causes of moose declines in the area. For example, if vehicle collisions are a major source of deaths, managing predators might not get the intended results.
2. Costs and available resources.
3. Timeliness to get to results. For example, protecting critical habitat might take more time to have an effect than limiting harvest.
4. Achievability. For example, it might not be possible to implement and enforce harvest quotas.
5. Potential risks and unintended consequences.

An important component to moose management is tracking whether your strategies are working and, if they aren't, to make adjustments. It is not about changing goals necessarily, but rather making different decisions or tweaking your plan based on new information, changes to the environment, or how things are going on the ground. Here are some questions to consider when thinking about your options for moose management.

 Worksheet

Options for Moose Management

1. Discuss with leaders, land users and stewardship staff: What practices should be implemented to manage moose? (e.g., Nation permitting system for community members, community reporting systems, etc.)
2. Discuss with leaders, land users and stewardship staff: What is the end goal? What are we ultimately trying to do? How will we determine if management is working? When will management initiatives stop?

 Story

Gitanyow permitting system

The moose permitting system established by the Gitanyow Hereditary Chiefs is for all hunters willing to establish a relationship with the Chiefs. Each Gitanyow Hereditary Chief approves food, social and ceremonial permits for their wilp. The Gitanyow Lax'yip Guardians are responsible for advertising the resolution and permitting system, enforcing compliance with the rules, and monitoring the moose population and harvest. Through negotiations with crown council, provincial Conservation Officers also assist the Gitanyow Lax'yip Guardians to monitor and enforce their permitting system.

“The Chiefs were frustrated that some of their own people weren’t following the laws anymore, they weren’t asking permission. Gitanyow law around hunting needed to be re-asserted. Through the permitting program, we are trying to get back to a time where relationships are established between hunters and the Chiefs, where the Chief knows who is in his territory and how much people are taking out.” Jimmy Morgan, Gitanyow Lax'yip Guardian

9. Building a Moose Management Plan

After considering some of the questions outlined in the previous sections, you may start to have a good sense of the key issues and threats related to the health of moose in your territory. Maybe you've started collecting data to inform your decisions or held discussions about the moose management strategies that your Nation wants to implement.

As you start to build out your moose management plan, consider the following components:

Principles and Goals:

- What principles, values or laws are guiding your Nations moose management plan?
- What are your moose management goals and strategies?
- What information/data do you need to meet these goals?
- How will you track the moose population over time to determine effects of your management strategies?

Roles and responsibilities:

- What will be the process for approving moose management activities and liaising between community leaders, knowledge keepers and technical and Guardian staff?
- What will the decision-making process be? (hereditary chiefs, Elders Council, Band councilors, delegated authority to technical staff, etc.)
- What will be the role and responsibility of technical staff? (E.g., Stewardship/lands staff, Guardian manager, Guardians, etc.)

Story

Gitanyow annual harvest allocation process

Each year, the Gitanyow Hereditary Chiefs establish a moose harvest strategy resolution that sets the rules for the coming hunting season. They meet to discuss the past year's moose monitoring results, to review biological data and to set harvesting and permitting rules. This resolution determines when hunting season will start and finish, establishes closed areas, and determines the harvest allocation. The Gitanyow Hereditary Chiefs make decisions by consensus, but the moose harvest strategy resolution allows for wilp-specific rules to be set based on individual opinions and or specific concerns about their wilp.

Engagement and Outreach:

- How will your Nation engage with Crown agencies who are also involved with moose management?
- What is your process to engage hunters, leadership, knowledge keepers, youth, and the wider community in the implementation of the management plan?
- What is your Nations process for doing outreach to the following audiences:
 - to neighboring Nations
 - to other groups – e.g. individuals and organization reps of licensed hunters, e.g. wildlife associations

Management Plan Implementation

- Who will ensure the moose management plan is implemented in your Nation?
- What resources will be required?