CCLM KNOWLEDGE NETWORK | Canadian Conservation and Land Management

2025 YEAR IN REVIEW

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2. Navigate to the chapter page to explore the topic in more detail.

Note: Some pages have additional summaries, dropdowns and external content that can be selected.

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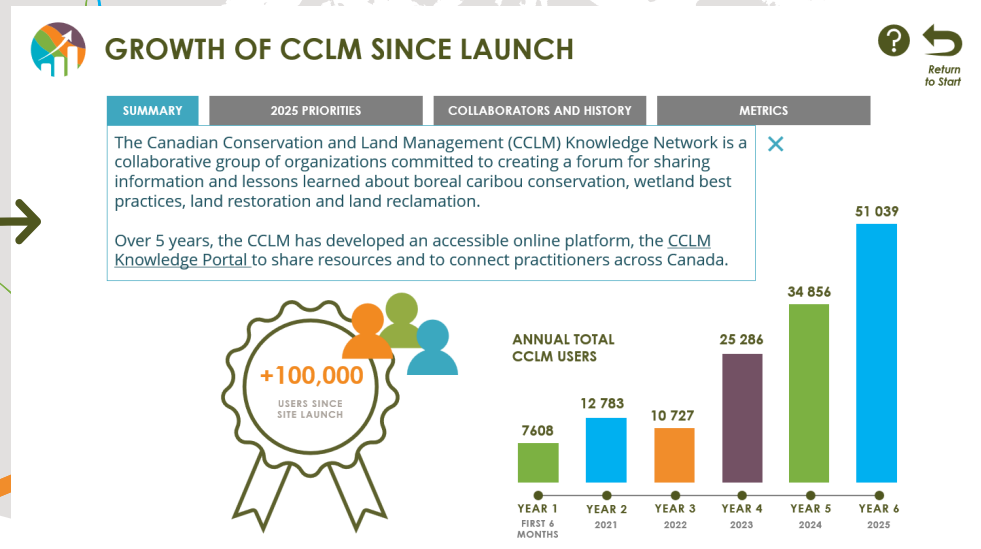

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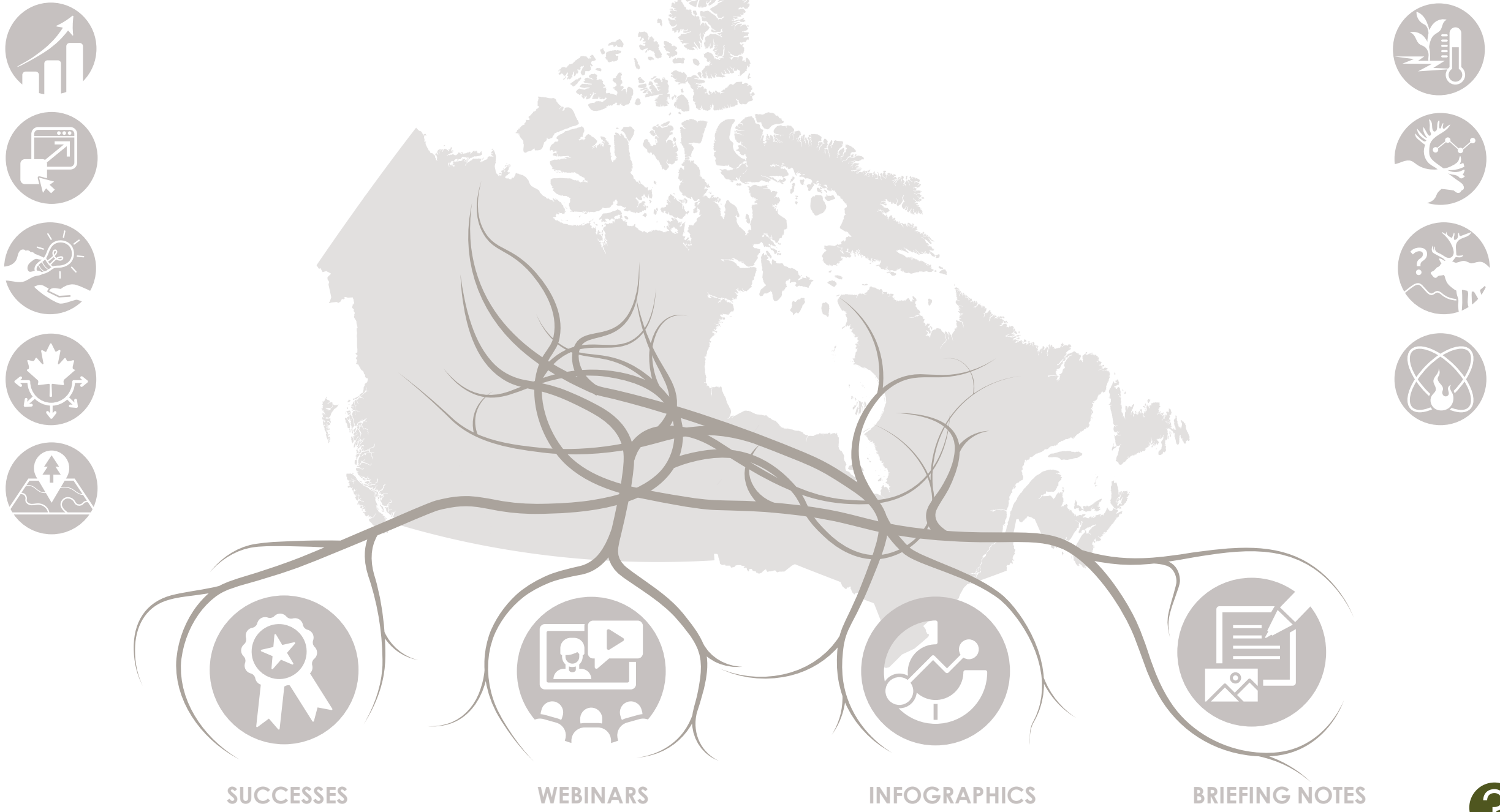
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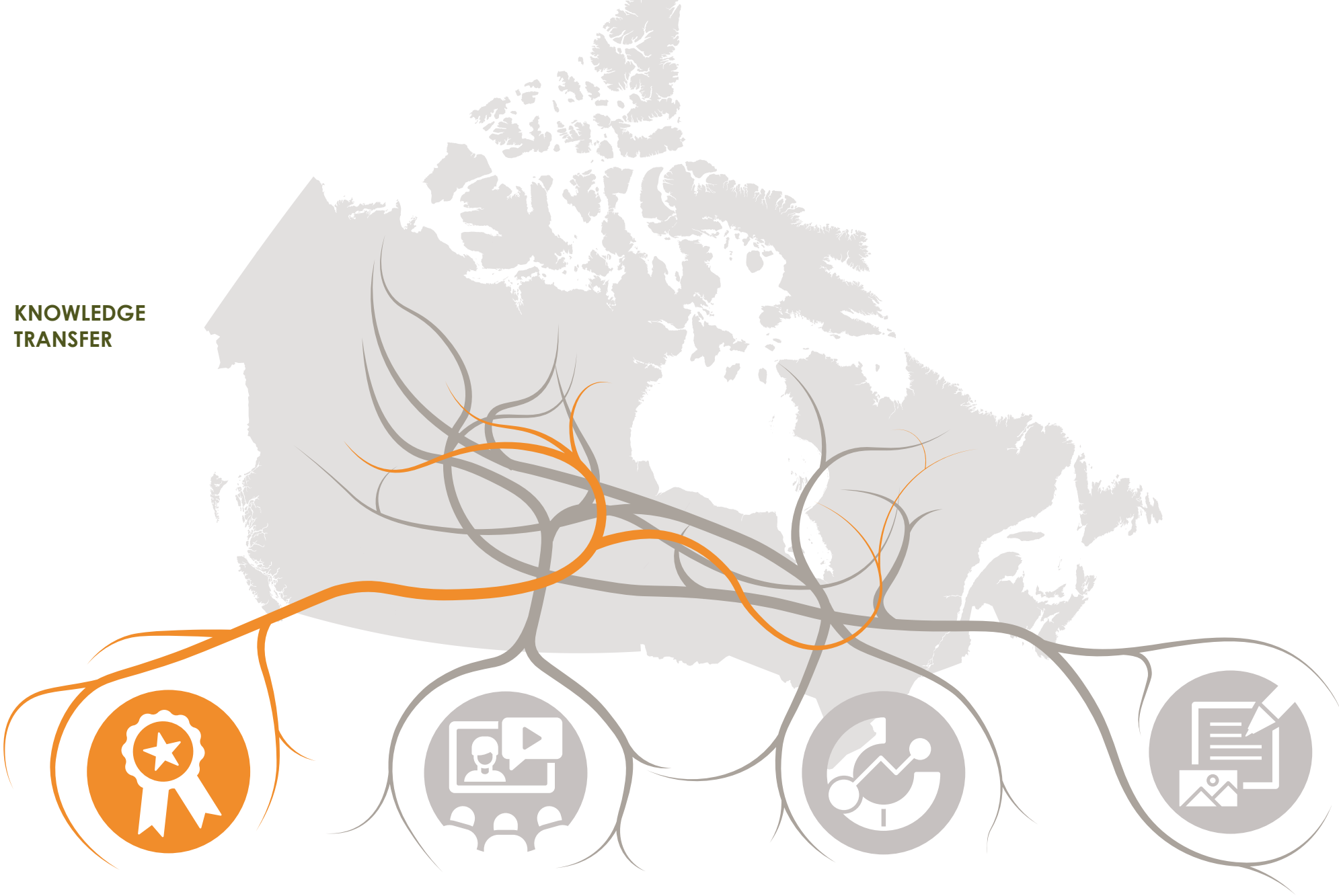

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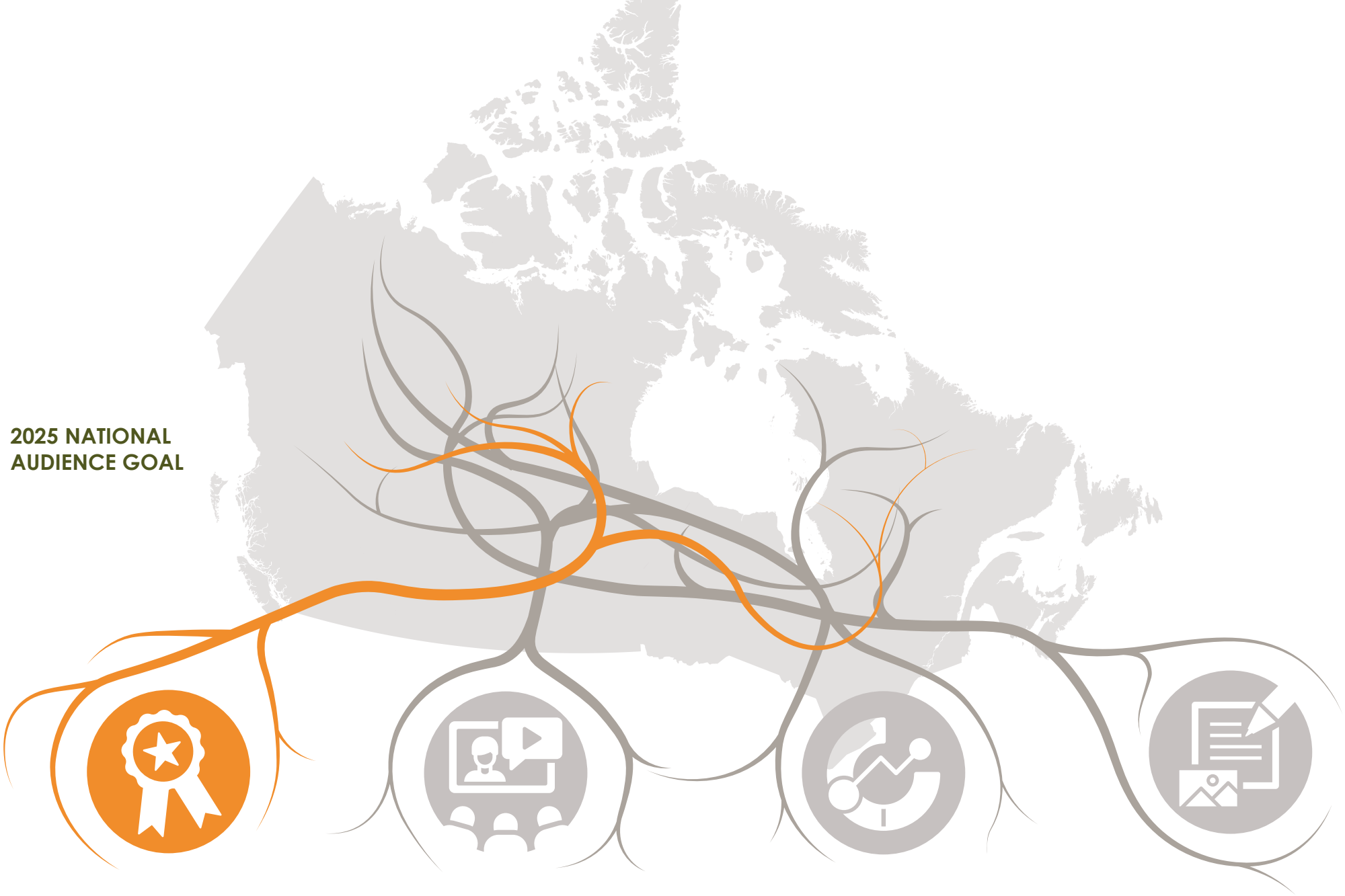

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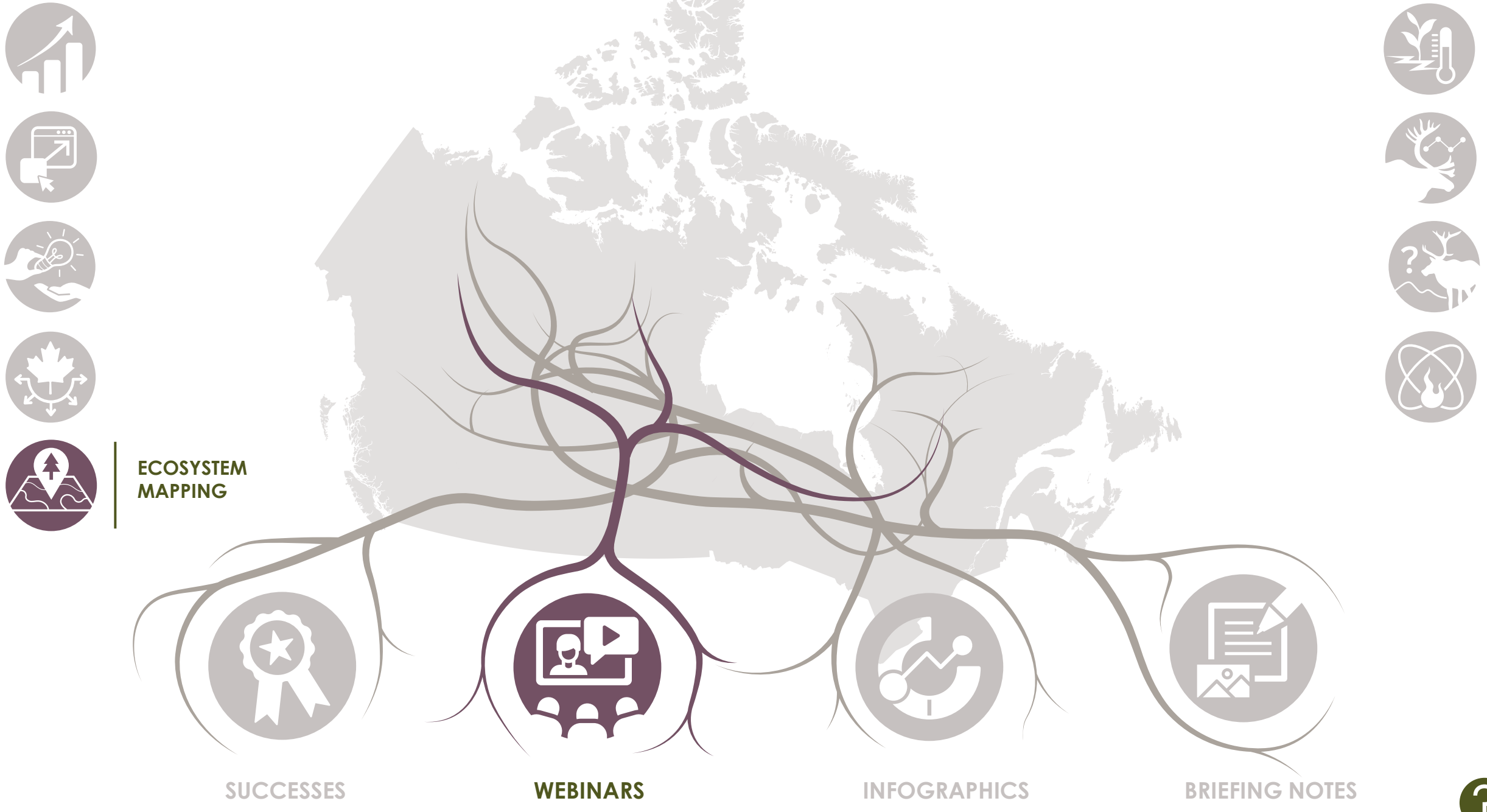
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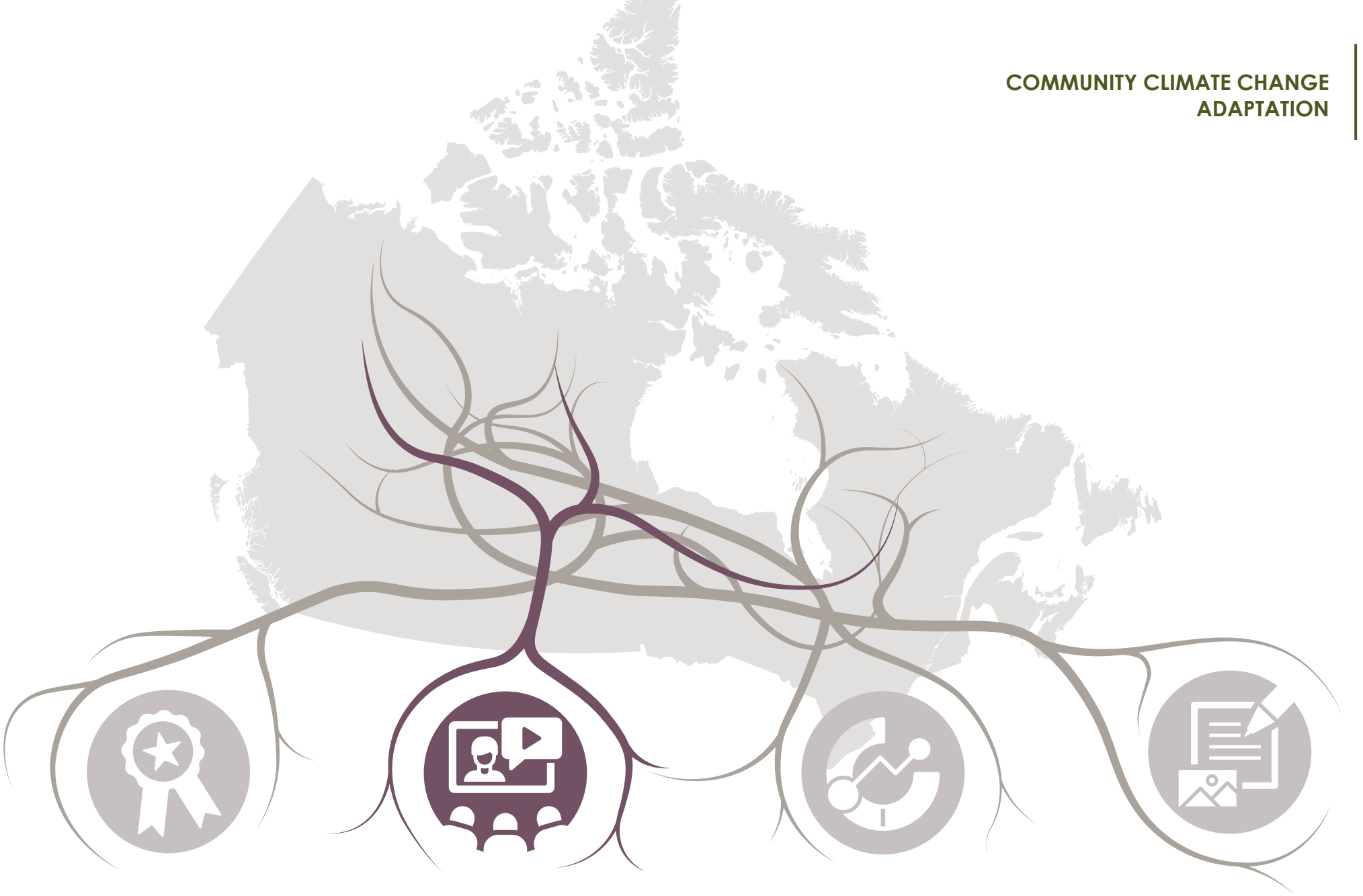

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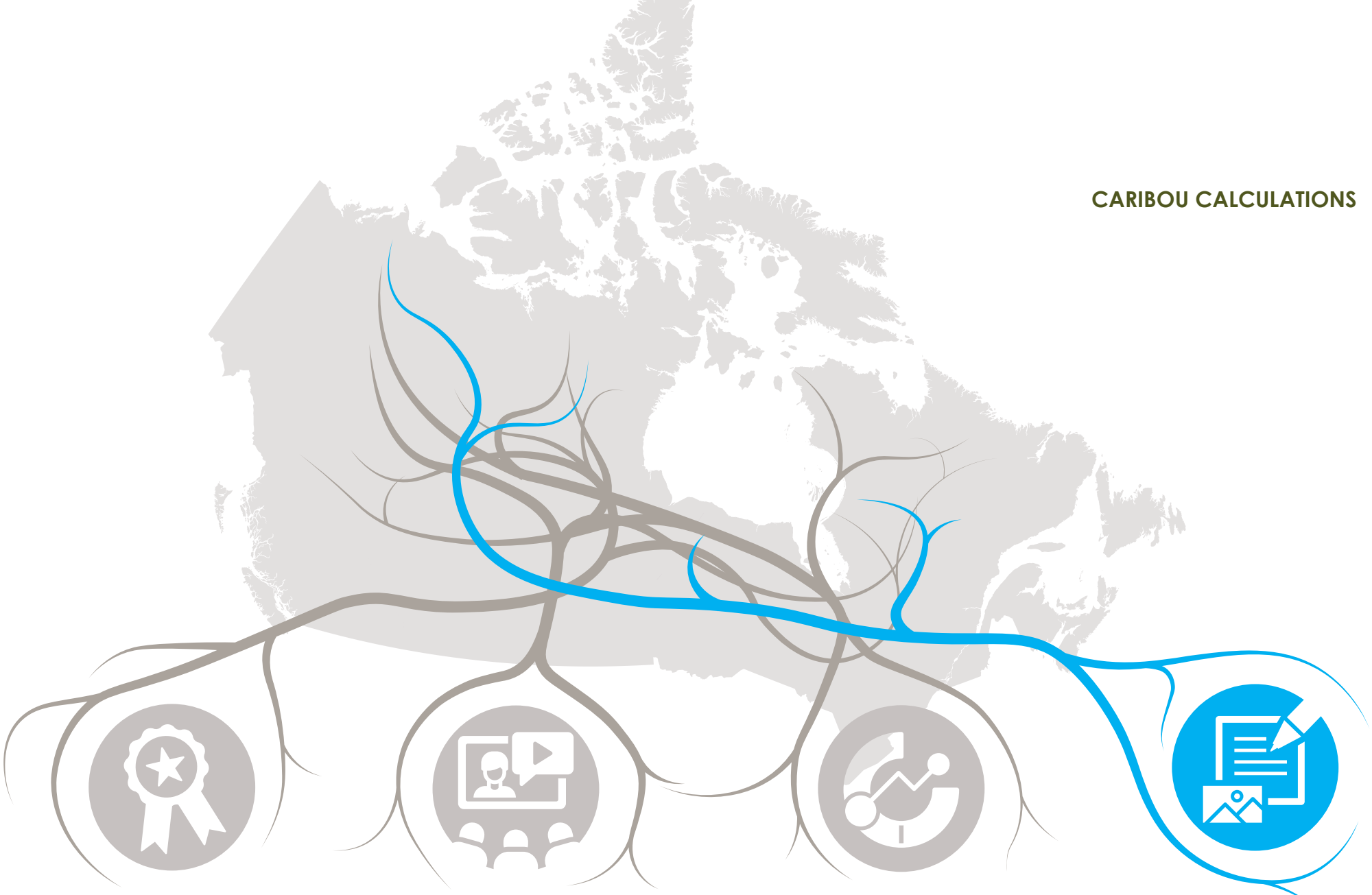

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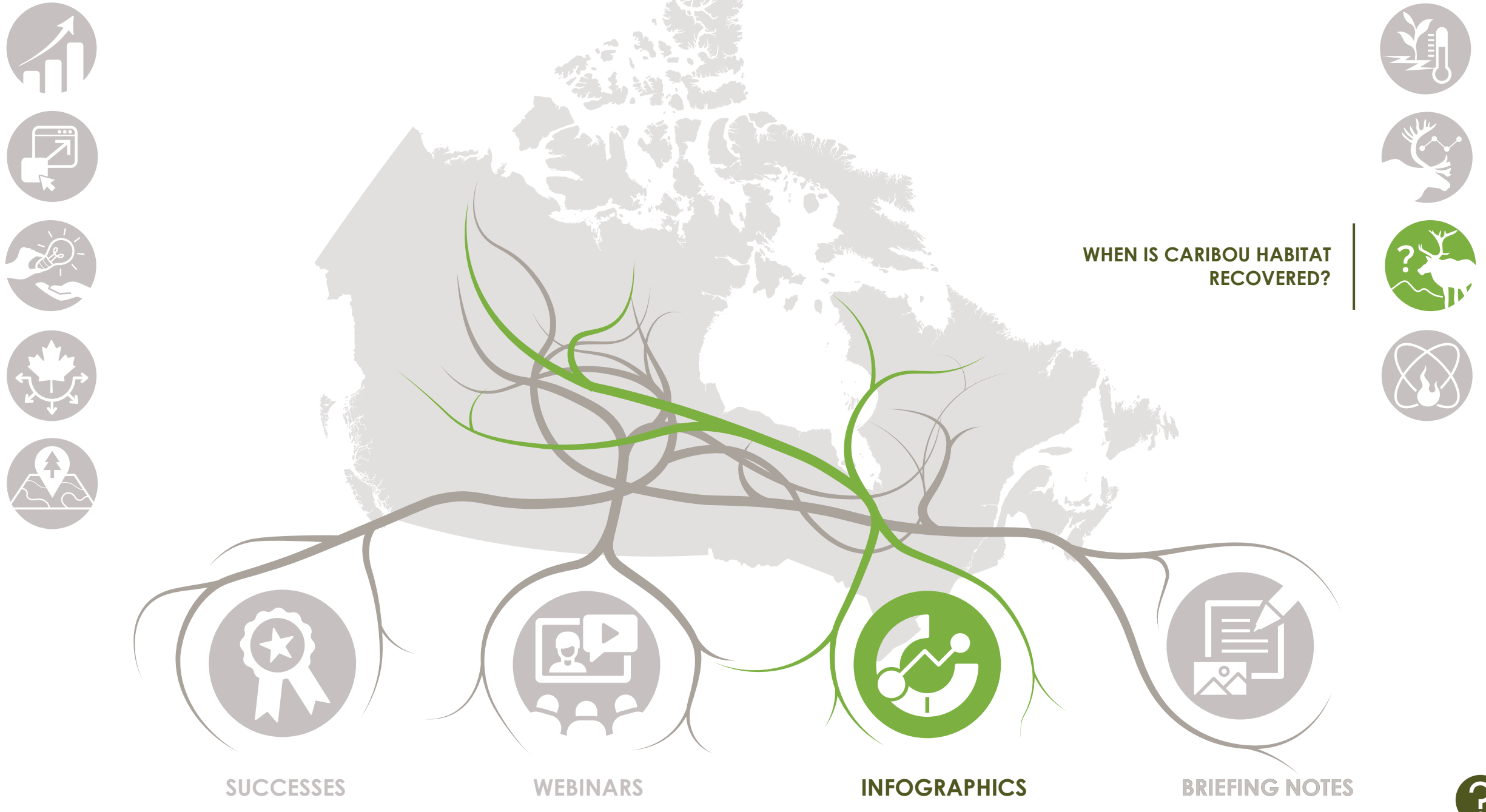
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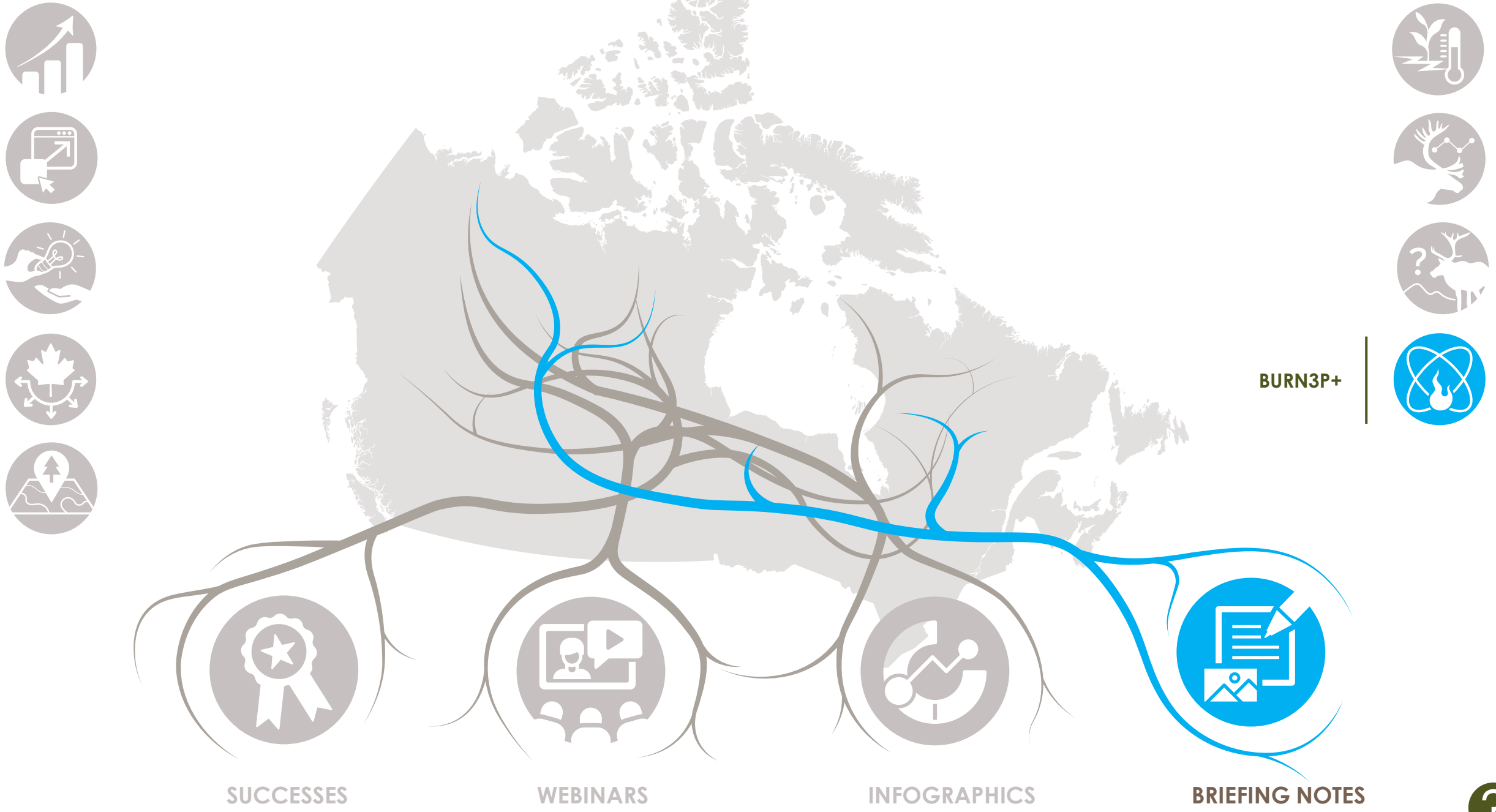
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GROWTH OF CCLM SINCE LAUNCH

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GROWTH OF CCLM SINCE LAUNCH

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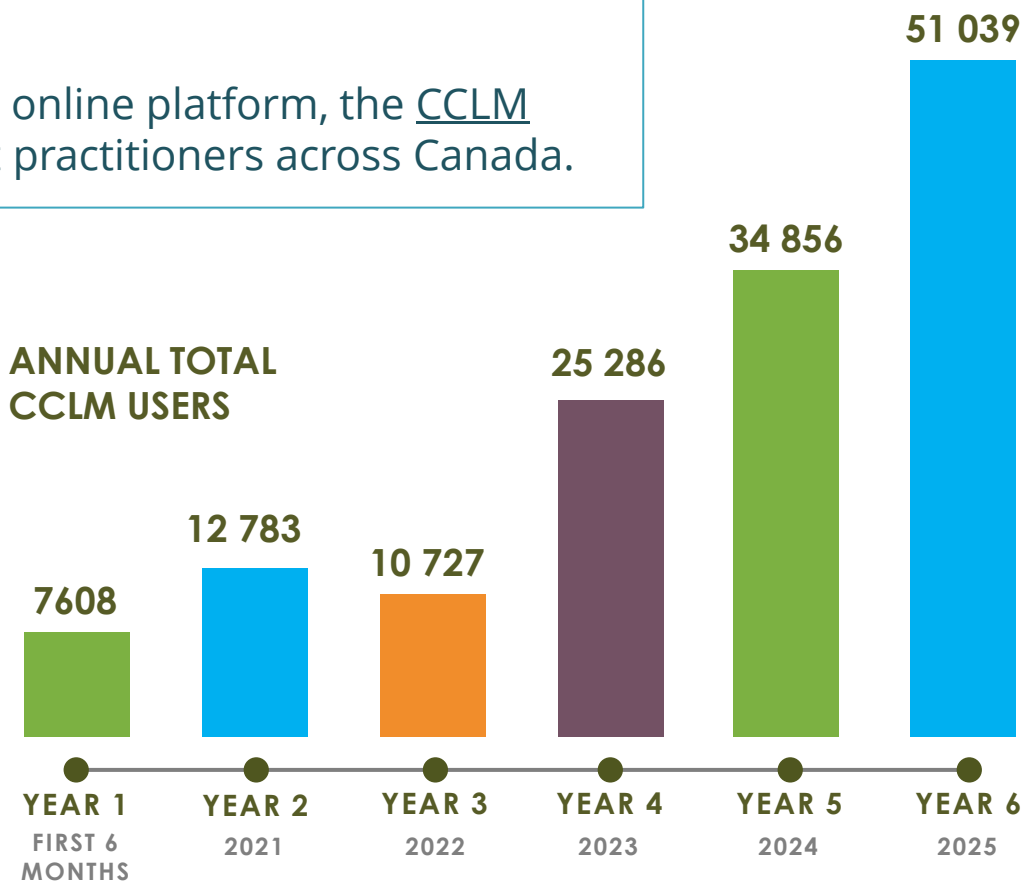
SUMMARY | 2025 PRIORITIES | COLLABORATORS AND HISTORY | METRICS

The Canadian Conservation and Land Management (CCLM) Knowledge Network is a collaborative group of organizations committed to creating a forum for sharing information and lessons learned about boreal caribou conservation, wetland best practices, land restoration and land reclamation.

Over 5 years, the CCLM has developed an accessible online platform, the CCLM Knowledge Portal to share resources and to connect practitioners across Canada.



GROWTH OF CCLM SINCE LAUNCH

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SUMMARY | 2025 PRIORITIES | COLLABORATORS AND HISTORY | METRICS

The CCLM is seeking opportunities to deliver greater value to users.

A 2025 survey conducted by the Canadian Forest Service showed that wildfire, climate change, adaptive forest management, and carbon accounting / modelling are top priorities for forestry stakeholders. The survey also showed that respondents prefer information sharing through webinars, short videos, concise tech notes, and plain-language, in-person engagement – especially for Indigenous partners. Surprisingly, word of mouth remains the most powerful driver of adoption.

The CCLM is following these recommendations to tailor products by audience and topic, use preferred formats, and continuously re-check stakeholder needs. The new design aims to introduce tile-based navigation, making it easier for users - especially those new to topics like wetlands or land management - to find foundational resources without needing to conduct keyword searches. These tiles will provide direct access to important content and be able to link across different portals, supporting users in discovering relevant information efficiently.
The steering committee is actively seeking input and supporting funding applications to make these landing page enhancements possible.

GROWTH OF CCLM SINCE LAUNCH

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PROGRAM LAUNCH

INDIGENOUS-LED CONSERVATION HUB

2020 — 2021 — 2022 — 2023 — 2024 — 2025 — 2026

Ducks Unlimited Canada

NAIT

CENTRE FOR BOREAL RESEARCH

National Boreal Caribou Knowledge Consortium

InnoTech ALBERTA

Natural Resources Canada | Ressources naturelles Canada

GROWTH OF CCLM SINCE LAUNCH

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SUMMARY | 2025 PRIORITIES | COLLABORATORS AND HISTORY | METRICS

There are now over 3,700 resources within the CCLM portal, and this number continues to grow daily as we grow in our membership.

Top 3 searches in 2025: Grass, CNSCB, Indigenous-led Conservation

PLATFORM IMPROVEMENTS

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SUCCESSES

2025

SUMMARY

There is a great deal of work happening behind the scenes to ensure the platform continues to evolve and meet user needs. Regular collaboration between the portal administrator, the CCLM Content Committee, and the web developer helps ensure the site effectively supports the uploading and organization of resources in a way that is intuitive, efficient, and scalable as the resource library continues to grow. This ongoing coordination includes refining workflows, improving navigation, optimizing metadata and tagging practices, and enhancing search functionality so users can quickly find the information they need.

To support continuous improvement, the CCLM also gathered user feedback through an on-site pop-up survey powered by Hotjar. This short survey allowed users to share their experiences, identify challenges, and suggest enhancements in real time. The insights collected will directly inform future updates, helping ensure the platform remains user-centered, responsive, and aligned with the evolving needs of the CCLM.

KNOWLEDGE TRANSFER

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SUCCESSES

2025

LEARN MORE

SUMMARY

As a centralized hub, the CCLM Network reduces barriers to access by bringing together relevant resources from multiple sources, helping practitioners navigate complexity and apply knowledge more effectively on the ground.

Looking ahead, with the next generation of practitioners entering the field, we have observed a significant shift in how knowledge must be shared and transferred. Organizations feel an increasing responsibility to actively support structured, accessible onboarding and learning opportunities so that emerging practitioners can develop a fundamental understanding of a broad range of conservation challenges. The CCLM wants to be part of transferring this essential institutional knowledge, so it is not lost.

The CCLM is actively seeking funding to redesign its sub-portals to create user journeys for early career professionals or for those transitioning from one specialty to another. The proposed approach involves developing intuitive, tile-based interfaces that curate the user's journey and guide practitioners to relevant resources based on their needs and experience level. This redesign will significantly reduce the need for multiple clicks or complex navigation, making vital conservation knowledge easier to discover, understand, and apply in practice.

ECOSYSTEM MAPPING

WEBINAR
May 2025

WATCH | LEARN MORE

This webinar engaged three experts from across Canada:

DAVE BLAINE
Northern Alberta Institute of Technology

REBECCA EDWARDS
Ducks Unlimited Canada

SARAH BANKS
Environment and Climate Change Canada

SUMMARY

Ecosystem mapping is a vital tool in conservation and land management that involves creating visual representations of natural environments. These maps highlight the distribution, health, and interconnectedness of various ecosystems. We can use them to identify sensitive habitats, track biodiversity, and assess the impacts of human activity and climate.

The Canadian Conservation and Land Management Knowledge Portal hosted an insightful webinar on Ecosystem Mapping. This session featured three expert presenters Sarah Banks (ECCC), Rebecca Edwards (DUC) and Dave Blaine (NAIT) who shared innovative approaches, key tools, and real-world applications.

This webinar covers how ecosystem maps can help us sustainably manage wetlands, sensitive areas, and biodiversity and support Indigenous data sovereignty!

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Canadian Conservation and Land Management | KNOWLEDGE NETWORK RESEAU CANADIEN | Connaissances sur la conservation et sur la gestion des terres

Ecosystem Mapping

Presentation and Q&A

May 6, 2025 10:00 AM MT

Presenter
Becky Edwards
DUC

Presenter
Sarah Banks
ECCC

Presenter
Dave Blaine
NWT

WEBINAR

SARAH BANKS

This was one of two webinars hosted by the CCLM Knowledge Exchange program in 2025.

NATIONAL AUDIENCE GOAL 2025

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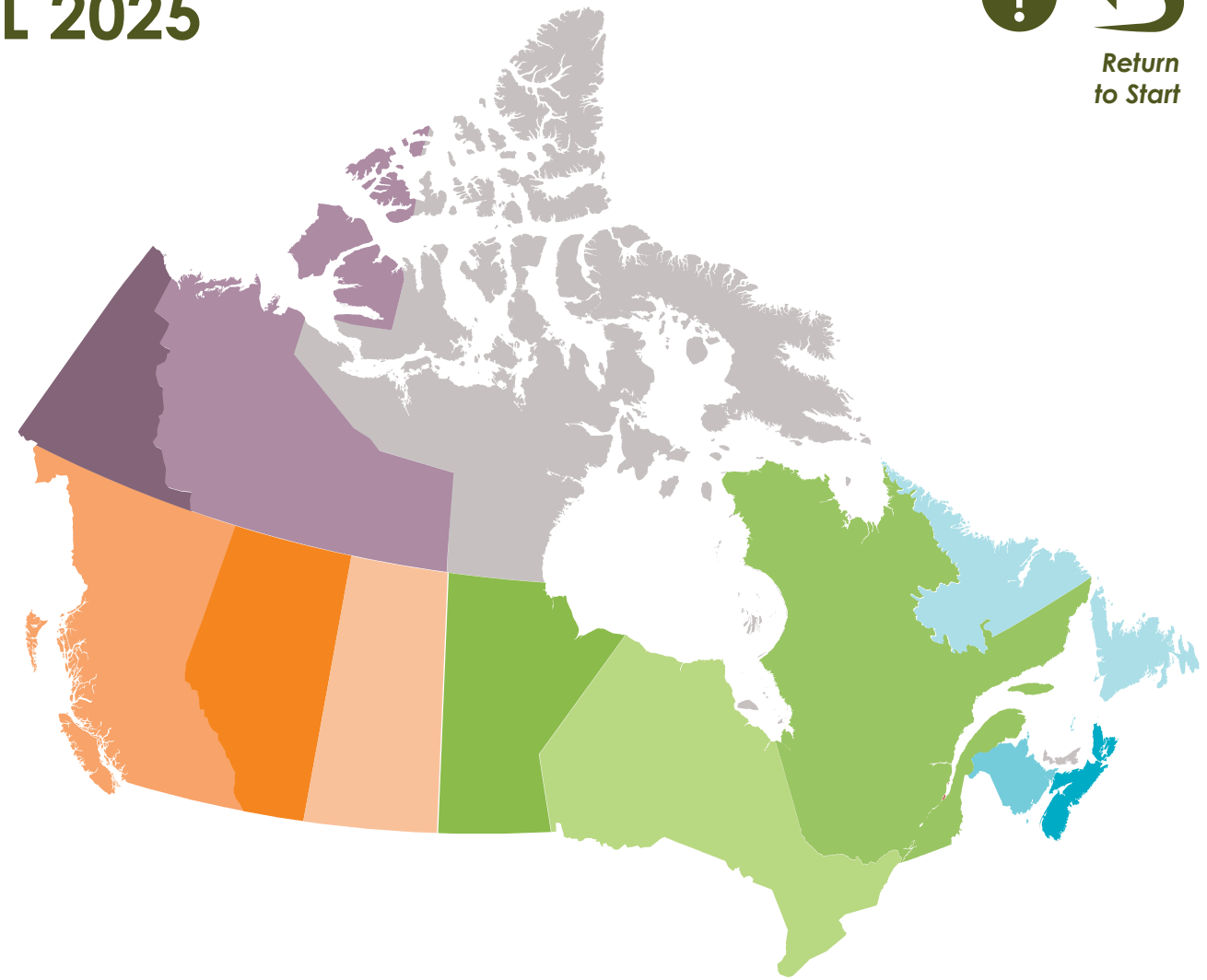
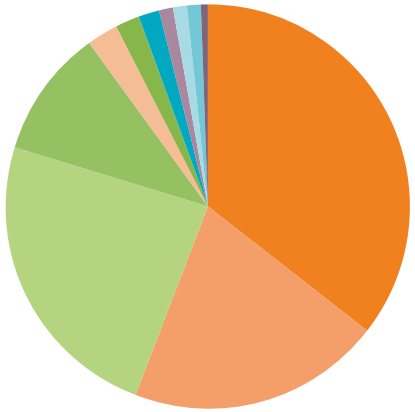
SUMMARY

In 2025, the majority of the CCLM userbase connected from Alberta, British Columbia, Ontario and Quebec. Our goal for 2025 was to prioritize resources and connections to organizations that would provide further value to users in Eastern Canada, the Prairies, and the Territories. In 2026, we will continue to expand our national focus and work with organizations to leverage the valuable resources hosted on the CCLM.



USERBASE BY LOCATION

- 28% AB
- 16% BC
- 19% ON
- 8% QC
- 2% SK
- 1.7% MB
- 1.3% NS
- 0.8% NWT
- 0.9% NL
- 0.8% NB
- 0.6% YK



COMMUNITY CLIMATE CHANGE ADAPTATION

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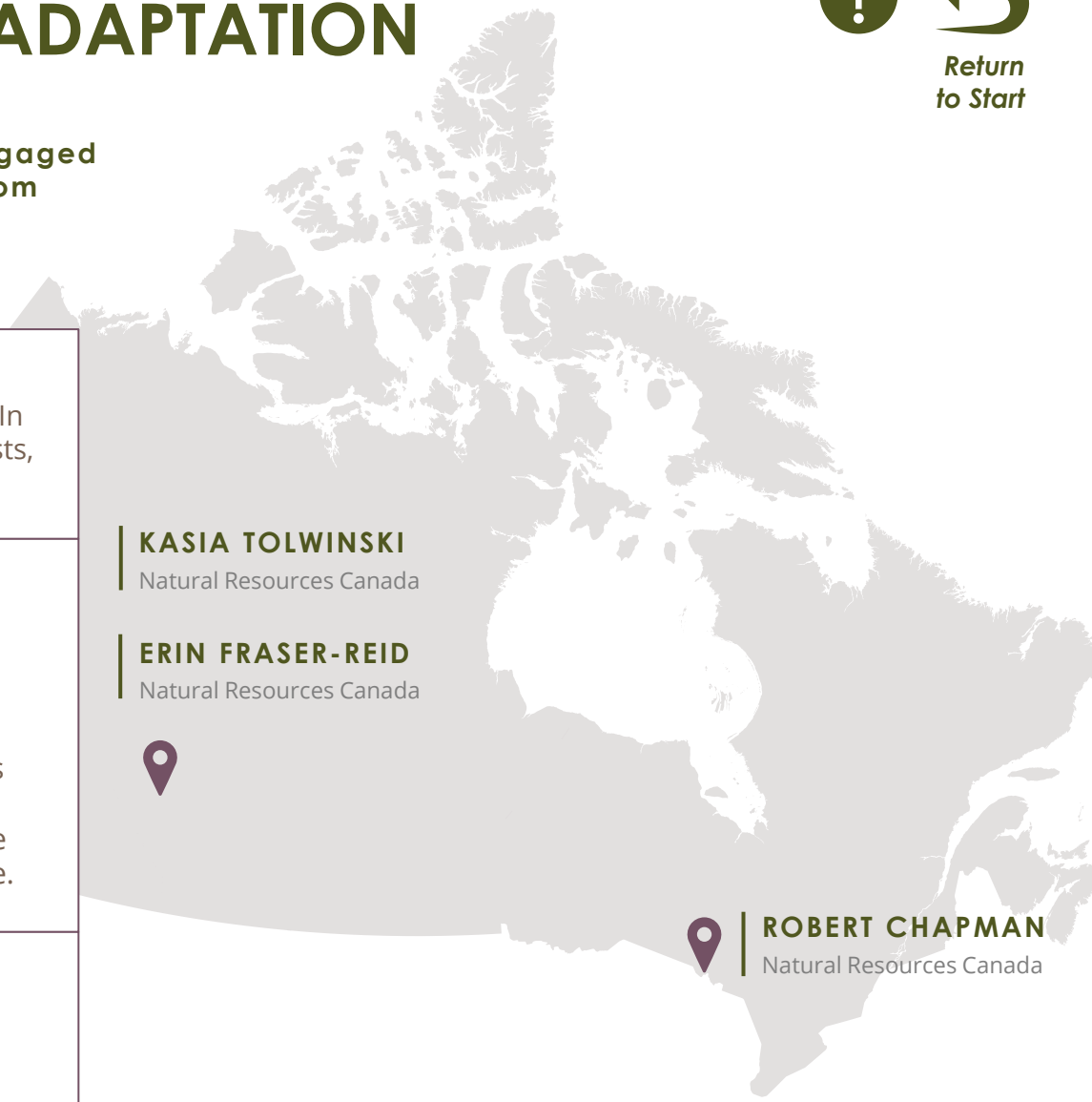
WEBINAR
January 2026

WATCH | LEARN MORE

This webinar engaged three experts from across Canada:



KASIA TOLWINSKI
Natural Resources Canada

ERIN FRASER-REID
Natural Resources Canada

ROBERT CHAPMAN
Natural Resources Canada

SUMMARY

Community Climate Change Adaptation helps local communities understand and prepare for the climate impacts that affect their lands and natural resources. In conservation and land management, this means working together to protect forests, wildlife, and watersheds while also supporting the people who rely on them.

By using local knowledge and community priorities, adaptation efforts can:

- Identify which natural areas and resources are most vulnerable
- Adjust land management practices to better handle climate stresses
- Improve the health and resilience of forests and ecosystems
- Strengthen collaboration among landowners, agencies, and residents

Connecting community adaptation with conservation ensures that both people and the landscapes they depend on are better prepared for a changing climate.

This webinar covered two complementary presentations: **Urban Forestry in Canada - Role of the Canadian Forest Service** and **Climate Change Adaptation Guidebook for Forest-Based Communities.**

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Canadian Conservation and Land Management | KNOWLEDGE NETWORK RESEAU CANADIEN | Connaissances sur la conservation et sur la gestion des terres

Community Climate Change Adaptation

Presentation and Q&A

January 15, 2026 11:00 AM MT

Presenter
Rob Chapman
NRCan

Presenter
Erin Fraser-Reid
NRCan

WEBINAR

This was one of two webinars hosted by the CCLM Knowledge Exchange program in 2025.

CARIBOU CALCULATIONS

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BRIEFING NOTE

June 2025

PREVIEW DOWNLOAD

JOSIE HUGHES

Environment and Climate Change Canada (ECCC)

SUMMARY

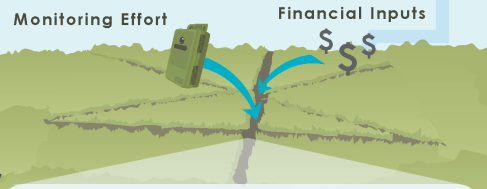
Boreal caribou once ranged across Canada's vast boreal forests, but their populations are now in decline, especially in areas of high disturbance. There is also uncertainty in caribou population viability projections.

This uncertainty is especially important where future development is planned. Without better information, conservation actions can be delayed. To address this, researchers are developing models that combine local disturbance levels and known demographic data to estimate population viability with quantified uncertainty.

This infographic highlights the findings from the article by Josie Hughes, Sarah Endicott, Anna M. Calvert, and Cheryl A. Johnson, (2025) Integration of national demographic-disturbance relationships and local data can improve caribou population viability projections and inform monitoring decisions. By identifying where and why data gaps exist, we can better protect caribou now – and prepare for what's ahead.

CARIBOU CALCULATIONS: MODELLING UNCERTAINTY FOR DECISIVE ACTION

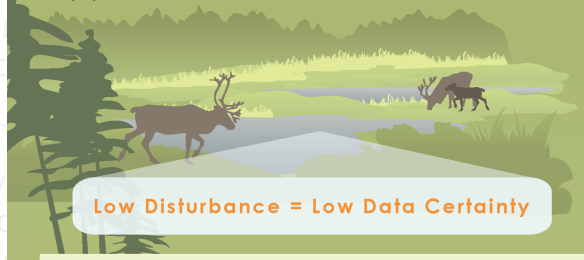
BOREAL CARIBOU ARE FOUND ACROSS THE CANADIAN BOREAL REGION IN HABITATS WITH VARYING AMOUNTS OF HUMAN DISTURBANCE. THE LEVEL OF UNCERTAINTY ASSOCIATED WITH CARIBOU POPULATION ESTIMATES VARIES ACROSS THESE DISTURBANCE LEVELS.



Caribou populations in highly disturbed areas are consistently unstable or in decline without intervention measures such as maternal penning or predator control.

Typically, population data from high disturbance areas is highly certain. But, in areas with low disturbance, we need **demographic data** to reduce uncertainty about local caribou population statuses.

Monitoring efforts and resources are often concentrated in disturbed areas.
High Disturbance = High Data Certainty



Low Disturbance = Low Data Certainty

Identifying uncertainty in the data is particularly important in low-disturbance habitats where there are plans or potential for future disturbance.

Ultimately, the goals are to reduce the risk that a lack of information will delay conservation action and to help local decision-makers to decide how to allocate limited resources for monitoring and conservation.

THE MODEL

Researchers are developing statistical models that use **habitat disturbance levels and available demographic data** to estimate uncertainty in population viability projections. The models account for uncertainties in local data and in demographic-disturbance relationships.

National Demographic Disturbance Relationship + *Local Demographic Data* = *Improved Population Viability Projections*

The models will help resource managers combine local demographic and disturbance data with the national demographic and disturbance relationship to assess caribou population trends.

APPLICATIONS

- Focus monitoring efforts on regions where more data is needed.
- Provide a tool to help conservation partners analyze monitoring scenarios.
- Update and improve caribou population trend estimates over time as information becomes available.

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TO LEARN MORE ABOUT THE CARIBOU DEMOGRAPHICS MODEL ON THE CCLM VISIT, WWW.CCLMPORTAL.CA

References:

Hughes et al. (2025) Intergration of national demographic-disturbance relationships and local data can improve caribou population viability projections and inform monitoring decisions

WHEN IS CARIBOU HABITAT RECOVERED?

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INFOGRAPHIC

December 2025

PREVIEW DOWNLOAD

CRAIG DEMARS
University of Alberta

SUMMARY

The decline of boreal caribou across Canada is a significant conservation challenge.

The Habitat Restoration Working Group of the National Boreal Caribou Knowledge Consortium commissioned a report to summarize learnings from habitat restoration projects aimed at disrupting the pathways leading to caribou decline.

This infographic from the CCLM highlights the findings from the report by Wilson, S. (2024) Boreal Caribou Habitat Restoration Practices: Application and Outcomes.

Discover the key takeaways around knowledge sharing, scaling restoration and the issue of confounding factors. It is clear that communities of practice, like the CCLM network, can enhance caribou recovery by integrating collective insights into restoration practices.

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WHEN IS CARIBOU HABITAT RECOVERED?

LINKING MONITORING INDICATORS TO MECHANISMS OF POPULATION DECLINE

Habitat recovery is a core objective for conserving boreal caribou and other species threatened by habitat loss. Yet, determining when a species' habitat is sufficiently recovered can be difficult.

Researchers recently proposed a series of indicators linked to known mechanisms of decline in caribou populations, creating a framework that ensures habitat recovery leads to caribou population recovery.

Currently, the amount of disturbance in a range is the core measure of caribou habitat recovery. However, a simple focus on disturbances levels may not capture the complexity of caribou habitat recovery.

This study creates a **continuous series of indicators to reveal trends towards caribou habitat recovery** in a region, with each indicator associated with a mechanism that causes caribou decline.

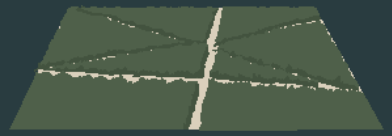
The suggested approach focuses on two primary types of disturbances, and linked these disturbances to two primary mechanisms of caribou population decline:

DISTURBANCES

POLYGONAL

Harvest blocks, fires, and well pads

LINEAR



Legacy linear features

MECHANISMS

DISTURBANCE MEDIATED APPARENT COMPETITION

Disturbances transform mature, conifer-dominated forests into younger stands rich in leafy browse. These areas, **increase moose and deer numbers who feed on the leafy forage, which in turn draw predators.**

ALTERED PREDATOR BEHAVIOUR

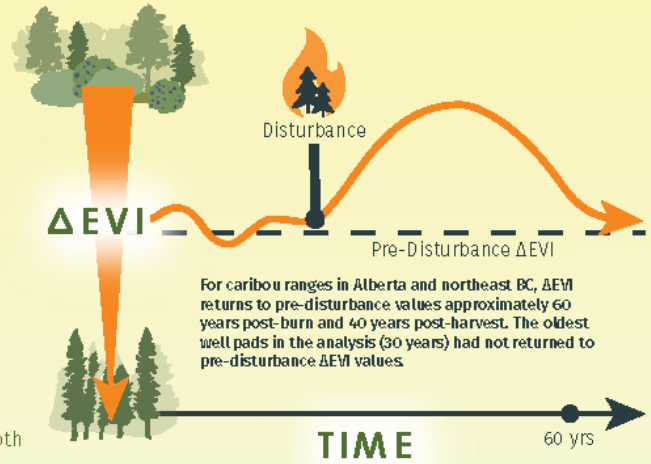
Increased linear disturbance **increases wolf access** to previously inaccessible caribou habitat and increases movement speed and efficiency.

DISTURBANCE MEDIATED APPARENT COMPETITION

Populations of deer and moose, and their predators, should decline as forage production decreases. Thus, an indicator of habitat recovery for caribou is when forage production for apparent competitors returns to pre-disturbance levels.

Using remote sensing, this index can be assessed by the yearly change in the **Enhanced Vegetation Index (ΔEVI)**, which effectively captures changes in browse vegetation and has been positively linked to moose and deer densities.

By estimating when ΔEVI returns to pre-disturbance levels, habitat recovery time can be predicted at both the site and range scales.



For caribou ranges in Alberta and northeast BC, ΔEVI returns to pre-disturbance values approximately 60 years post-burn and 40 years post-harvest. The oldest well pads in the analysis (30 years) had not returned to pre-disturbance ΔEVI values.

ALTERED PREDATOR BEHAVIOUR

Indicators of linear disturbance habitat recovery should measure predator use and movement speed. Recovery is reached once these indicator values match those found in mature forests.

This study proposes two main indicators of altered predator movement:

MEASUREMENTS OF BOTH ΔEVI AND VEGETATION HEIGHT CAN BE MADE USING REMOTE SENSING AND SATELLITE IMAGERY.

INDICATOR 1)

When vegetation reaches an average height of 0.5m, wolf speed declines sharply.

INDICATOR 2)

Average vegetation height is greater than 4.0m, wolf speed matches their speed in a mature forest.

Slower predators should result in fewer caribou kills. For wolves, fewer kills may result in larger territories and decreased wolf densities.

KEY IMPLICATIONS:

This recovery continuum offers practical indicators that show current habitat conditions and help predict recovery timelines. While most indicators are not yet proven to support self-sustaining caribou populations, they complement the federal recovery strategy by adding multiple lines of evidence to guide conservation decisions. Although monitoring may seem costly, it provides valuable, ongoing feedback on restoration effectiveness and represents a minor expense compared to the investment required for large-scale habitat restoration.

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TO LEARN MORE ABOUT THIS RESEARCH AND MORE AT WWW.CCLMPORTAL.CA

Reference: DeMars et al., 2023. When is habitat recovered? Understanding the mechanisms of population decline to evaluate habitat recovery for boreal caribou. Conservation Science and Practice.

BURN3P+

BRIEFING NOTE

June 2025

PREVIEW DOWNLOAD

Return to Start

CHRIS STOCKDALE
Natural Resources Canada

DENYSE DAWE
Natural Resources Canada

SUMMARY

This latest infographic from the Canadian Conservation and Land Management (CCLM) Knowledge Network was inspired by the BurnP3+ SyncroSim Package developed and maintained by the Canadian Forest Service.

BURNP3+ is a powerful fire modeling tool that helps predict wildfire risk and behavior across different landscapes, management strategies, and climate futures.

It supports watershed planning, fuel treatment evaluation, forest management, land-use and development studies, climate change impact analysis, and conservation planning by showing where fire risk overlaps with critical habitat.

Outputs include burn probability maps, fire behavior metrics, and simulated fire perimeters – helping land managers explore future scenarios and make informed decisions to reduce wildfire risk.

BURNP3+

A SIMULATION SANDBOX FOR MANAGING FIRE LANDSCAPES

CANADIAN WILDLAND FIRES ARE BURNING WITH INCREASING FREQUENCY AND INTENSITY. THERE IS A PRESSING NEED FOR TOOLS THAT CAN HELP MANAGE FIRE LANDSCAPES AND REDUCE RISK.

BURNP3+ IS A USER-DRIVEN LANDSCAPE MANAGEMENT TOOL

BurnP3+ provides a snapshot of fire hazard under present-day and hypothetical conditions. It estimates the likelihood of fire and its magnitude if it happened, so that managers can better reduce fire risk.

Developed by the Canadian Forest Service, BurnP3+ combines fire ignition, weather and other burning conditions with a fire growth model on the SyncroSim platform.

LAND MANAGERS AND CONSERVATION PRACTITIONERS CAN USE BURN3P+ TO EXPLORE A RANGE OF POSSIBLE FUTURES, VISUALIZING HOW DIFFERENT MANAGEMENT DECISIONS OR ENVIRONMENTAL CONDITIONS INFLUENCE BURN PROBABILITY.

APPLICATIONS

1. **Prevention & Mitigation:** Compare before/after snapshots of fire hazard under different fuel treatments.
2. **Watershed Planning:** Describe landscape changes that impact ecology, water availability and quality.
3. **Baseline Fire Potential Assessments:** Assess how the current landscape will respond to fire for long-term strategic planning.
4. **Development Studies:** Explore how land-use change would affect the area's fire regime.
5. **Climate Change Impact Studies:** Account for how the weather patterns driving fire will change over time, plus subsequent carbon emissions.
6. **Restoration and Conservation:** Delineate where fire hazard overlaps with critical habitat.
7. **Forest Management:** Integrate with forest management planning tools to target zones for forest harvest, planting, or reclamation.

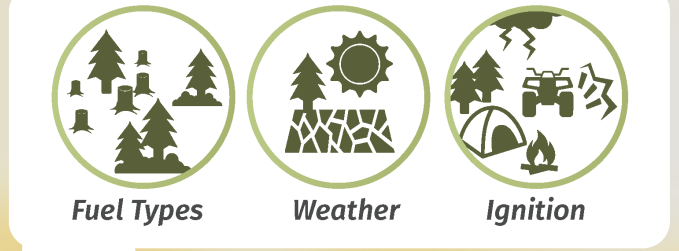
Stochastic models allow randomness to consider a variety of outcomes based on user-defined inputs, rather than the rule-based reproducible outcomes of deterministic models. Because of its complexity, BurnP3+ is excellent when exploring possible scenarios but is not suitable for real-time, emergencies, active wildfire suppression or evacuation efforts.

YES, BURNP3+ IS FOR LONG-TERM LAND MANAGEMENT PLANNING.

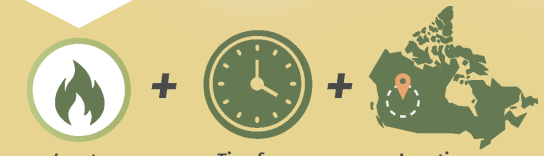
NO, BURNP3+ DOES NOT PREDICT SINGLE FIRE EVENTS.

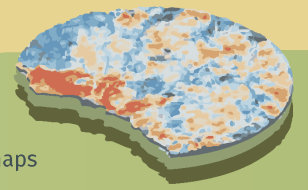
PROCESS

DIFFERENT MANAGEMENT STRATEGIES ALTER THE FIRE REGIME OF A LANDSCAPE. EXAMINING THE EFFECTS OF DIFFERENT DECISION-MAKING SCENARIOS SUPPORTS ACTIONS THAT CAN REDUCE FIRE HAZARD AND BENEFIT LONG-TERM PLANNING.



With BurnP3+, users can change inputs to compare the outcomes. Compare fire hazard of different areas or timeframes by altering the fuel types, fire parameters, ignition distribution, or weather patterns.





PRODUCTS

- Burn probability maps
- Fire behaviour metrics (rates of spread, fire intensity, and fuel consumption)
- Simulated fire perimeters

To learn more or use BurnP3+, visit: burnp3plus.ca

CCLM KNOWLEDGE NETWORK | Canadian Conservation and Land Management

TO LEARN MORE ABOUT BURNP3+ CHECK OUT THESE RESOURCES AND MORE AT WWW.CCLMPORTAL.CA

This research was made possible by ApexRMS and Natural Resources Canada.