Bulkley-Morice Wildfire Resilience Project

SPARK Workplan

Prepared for the Gordon and Betty Moore Foundation's
Wildfire Resilience Initiative

Bulkley Morice WILDFIRE RESILIENCE PROJECT

GORDON AND BETTY MOORE FOUNDATION

PURPOSE OF WORKPLAN

This work plan outlines the goals and expected outcomes for the Bulkley-Morice Wildfire Resilience Project, part of the SPARK[1] program of the Gordon and Betty Moore Foundation's Wildfire Resilience Initiative (WRI). The WRI aims to promote healthy ecosystems and resilient communities by reducing ecosystem vulnerability through improved stewardship and decreasing communities' fire disaster risk through implemented risk mitigations sufficient to disrupt fire pathways and structure-to-structure conflagration in developed wildland-urban interface communities.

The Bulkley Morice project, one of 12 SPARK pilot projects in Western North America, seeks to collaborate with governments, community groups, and land managers to enhance the understanding of wildfire resilience and reduce vulnerability to wildfires. This project will address the growing risk of wildfires impacting communities and ecosystems in the Bulkley Morice area while considering climate change scenarios.

There is a general agreement on the necessity to improve forest and fire management strategies; however, the specifics of effective mitigation and affordable solutions are still uncertain. Wildfire planning must be conducted at a landscape scale to create meaningful change. It should be based on a comprehensive understanding of the system—utilizing the best available scientific research, incorporating local and Indigenous knowledge, and fostering collaborative efforts among stakeholders. This project aims to develop advanced wildfire analysis tools for forest and wildfire planning, focusing on transitioning from fire suppression to managing wildfire resilience.

[1] SPARK - Select Pilots to Achieve Resilience by Key indicators

PROGRAM GOALS

Moore Foundation Wildfire Resilience Initiative Goals

Goal 1: To reduce ecosystem vulnerability through improved stewardship. By 2035, the annual area impacted by beneficial fire will have increased in aggregate, and the annual area impacted by detrimental fire will have decreased in aggregate.

Goal 2: Decrease communities' fire disaster risk through implemented mitigations. By 2035, property loss will stabilize through risk mitigations sufficient to disrupt fire pathways and structure-to-structure conflagration in developed wildland-urban interface communities.

Bulkley Morice Project Goals[2]

Goal 1: To reduce ecosystem vulnerability through improved stewardship. By 2035, stewardship strategies will be implemented that increase the amount of beneficial fire and decrease the amount of detrimental fire, compared to a "no action" base case.

Goal 2: Decrease communities' fire disaster risk through implemented mitigations. By 2035, forest management actions will be taken to disrupt fire pathways, and the assessed hazard to communities of structure-to-structure conflagration originating in the wildland-urban interface will be reduced.

The project comprises two distinct phases:

Phase 1, from April 2024 to March 2027, sets the foundation for change by assessing the land base, including the wildland-urban interface (WUI), to drive policy change and management action. This phase will build knowledge of the current state of wildfire, including model development, and apply these insights through a collaborative planning process to the project area, such as government-led forest landscape planning. The

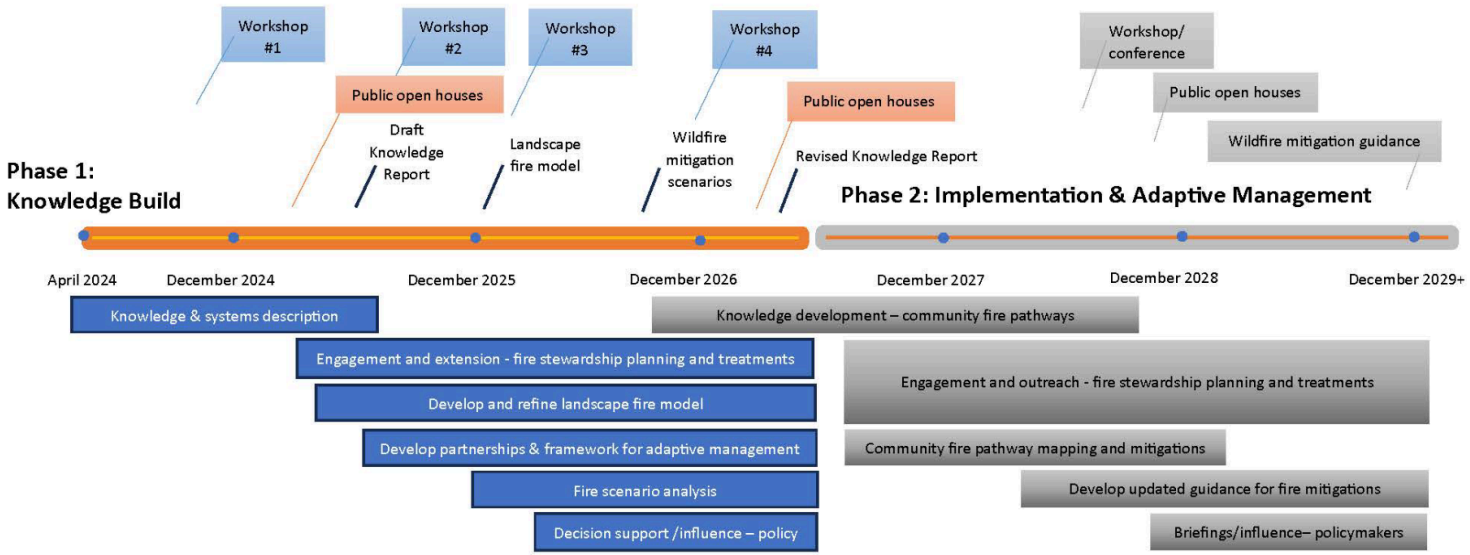
[2] Project goals are specific to the BuMo project and are aligned with the overall Wildfire Resilience Initiative

primary objective of Phase 1 is to provide information and decision support for forestry and wildfire management plans and risk reduction strategies that will be applied immediately to enhance the protection of communities and wildland assets within the project area. A plan and supporting partnerships will be established during this phase to pave the way for implementation in Phase 2.

Phase 2, beginning April 2027, will build upon the outcomes of Phase 1, including establishing partnerships to secure funding and progress toward the objectives identified earlier. This phase will focus on supporting the implementation of risk mitigation strategies using an adaptive management framework. In phase 2, the project will increase the engagement and outreach work using the project learnings from phase 1 to influence prescriptions and management actions that will increase the amount of beneficial fire, such as the return of prescribed and cultural fire. New focus areas may involve developing knowledge and tools to further analyze and model fire pathways from wildland areas to communities and risk mitigation strategies.

PROJECT ROADMAP

Project timeline and phases 2024 – 2030

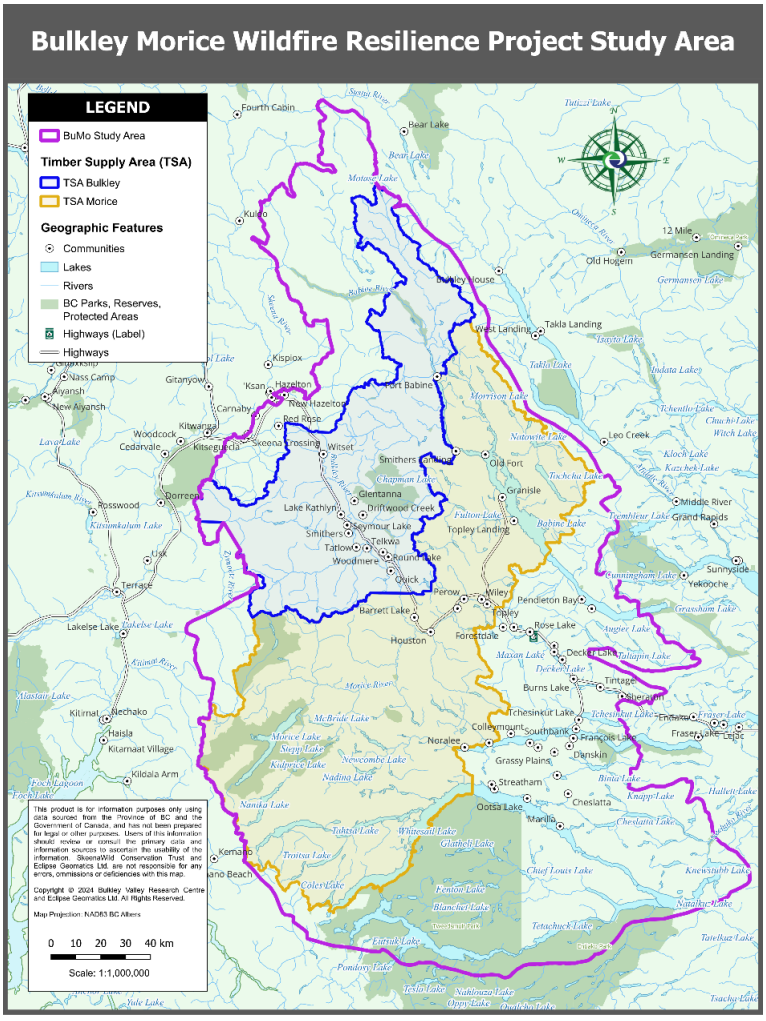


Project Impact Model: *knowledge to action*

BACKGROUND

Project area – biophysical, socio-ecological

The Bulkley-Morice study area (4.392 million hectares), located in the sub-boreal forests of northwestern British Columbia, represents a transition from wetter coastal forests to drier interior forests. This region supports a significant forest industry and has recently faced change from a severe beetle epidemic and increased wildfire activity impacting the structure and composition of its forests. However, this area's fire and disturbance ecology is poorly understood and differs from that of southern British Columbia.



Local studies focusing on the historical disturbance regime and fire ecology have identified some consistent patterns, yet many aspects remain uncertain. Recent findings suggest that fires occurred more frequently and earlier in the year before European settlement than previously believed. The disturbance patterns also vary across different forest types. Many younger forests have experienced fire, while some stands— particularly in wetter, cooler areas known as "fire refugia"—have remained unburned for centuries. Subalpine forests typically experienced infrequent but larger fires, usually ignited by lightning during mid-summer, whereas upland plateau forests experienced intermediate characteristics.

It is acknowledged that a significant portion of the fires before European settlement—often near historic village sites and within low-elevation valleys—were ignited by human activity for stewardship and cultural purposes. However, the role and impact of Indigenous-led cultural burning on historical disturbance patterns and wildfire resilience remain poorly understood. Key questions linger: Have fire suppression efforts been effective over the past few decades, or has a period of relatively cool and wet weather limited wildfires? Are fires in sub-boreal and subalpine forests more "climate-limited" than "fuel-limited"? What was the extent, pattern, and frequency of Indigenous-led cultural burning? Answers to these questions are critical for determining effective strategies for managing wildfire resilience. Finding the right balance between beneficial fire practices and preventing catastrophic wildfires is essential for maintaining a healthy landscape and ensuring safe communities.

Project area - people, governance and land management

The study area encompasses the territories of the Wet'suwet'en, Gitxsan, Lake Babine, and Cheslatta Indigenous Nations. Indigenous fire stewardship and cultural burning were common practices throughout the study area before European settlement. In the 19th century, European settlement, particularly marked by the construction of the railway in 1912, led to the development of forestry, agriculture, and mining in the region.

Currently, the forest sector and land management practices in the project area and throughout British Columbia are undergoing significant transformations in response to reconciliation efforts with Indigenous peoples, a declining timber supply, and concerns about the cumulative impacts of resource extraction. These transformations are further complicated by climate change and the necessity to plan for uncertain future climatic conditions. This project aims to integrate with emerging initiatives in the area, such as Indigenous fire stewardship, tactical wildfire plans, wildfire risk reduction and the new Forest Landscape Plan, which will be co-developed by the provincial government and Indigenous governments.

The project design is based on an integrated social-ecological approach that acknowledges the interdependence between community well-being and ecosystem health. It will seek to

incorporate Western science alongside local and Indigenous knowledge, with multiple engagement opportunities for local land managers and community stakeholders. The project will focus on creating a toolkit and providing engagement and outreach services, ensuring that outcomes can influence emerging planning initiatives and policy development. For instance, the project outputs can be directly linked to a wildfire working group outlined in the Bulkley Morice Forest Landscape Plan.

The Bulkley Morice Wildfire Resilience and SPARK projects are designed to accelerate progress and demonstrate wildfire resilience, offering valuable lessons and insights for larger-scale resilience projects throughout British Columbia and Western North America. Funding for the project is provided by the Gordon and Betty Moore Foundation's Wildfire Resilience Initiative. The initiative seeks to foster healthy, fire-adapted ecosystems and resilient fire-prone communities by mitigating the threat of extreme wildfires and promoting beneficial fire practices. The long-term vision is to achieve wildfire resilience in Western North America, where beneficial fire is the primary contributor to the annual burned area.

PRINCIPLES AND CONCEPTS THAT GUIDE THE PROJECT

Place-Based: Understand the local context, current conditions, knowledge and data needs, vulnerabilities, and the concerns and aspirations of the community and land managers. Set project goals and objectives based on these local needs and circumstances.

Knowledge-based: Ensure that decisions and actions integrate Western science with Indigenous and local knowledge. Embrace the concept of "two-eyed seeing" in the project.

Collaborative: Inform project outcomes through multiple interactions with land managers, stakeholders, Indigenous peoples, and the public. Engaging diverse perspectives ensures that solutions are shaped by local expertise, cultural values, and community priorities, leading to more inclusive and equitable outcomes.

Outcome-focused: Design project outputs to influence land and resource management policy and decision-making at both regional and provincial levels.

Partnerships: Effectively mobilize and leverage limited resources, including funding, personnel, equipment, and technical expertise. Collaborating with various funding sources and land management agencies enhances the project's scope, scale, and influence.

Adaptive: Support a systematic process that fosters continual improvement in management policies and practices. Learn from the outcomes of operational activities through measures and assessments based on scientific and knowledge-driven protocols.

Holistic: Recognize that wildfires transcend political, jurisdictional, and organizational boundaries. Addressing the complex challenges of wildfire risk reduction requires collaborative partnerships and coordinated efforts from multiple entities and sectors.

Two-Eyed Seeing is a concept introduced by Mi'kmaw Elder Dr. Albert Marshall from the Eskasoni First Nation. It emphasizes the importance of learning to see the world through two perspectives: one embodies the strengths of Indigenous knowledge and ways of knowing, while the other represents the strengths of Western knowledge and ways of knowing. The goal is to integrate these two viewpoints for the benefit of all.

Wildfire resilience is the ability of a system (ecosystems + communities) to react to perturbations, internal failures, and environmental events by absorbing the disturbance and/or reorganizing to maintain its functions. This includes the capacity of ecosystems, people, and communities to adapt, persist, develop, or even transform into new development pathways in the face of dynamic change.

PROJECT GOVERNANCE

The project is an independent research project delivered through the Bulkley Valley Research Centre (BVRC). The BVRC provides administrative services and support, including financial management, website hosting and data management.

Steering Committee

A steering committee provides project guidance and strategic oversight. This includes defining the project's strategic focus, defining audiences and appropriate venues for outreach and stakeholder engagement, and establishing linkages as appropriate to separate initiatives that may apply to the project's results.

Membership of the steering committee includes:

- Provincial government: Ministry of Forests, District Operations
- Provincial government: Ministry of Forests, BC Wildfire Service
- Wet'suwet'en Peoples
- Lake Babine Nation
- Cheslatta Carrier Nation
- Gitxsan Hereditary Chiefs
- Forest sector
- POLIS Wildfire Resilience Project (ex-officio membership)
- Project Manager (ex-officio membership)
- Technical Team Lead (ex-officio membership)

Project Technical Team

A project team of researchers, local resource management experts, and knowledge holders will provide the project's technical and planning functions, including research, modelling, outreach and engagement, policy advice, and planning and administrative support. Expertise will be retained on contract to achieve the project objectives.

SPARK Learning Exchange

The BuMo project is part of the SPARK Learning Exchange. The learning exchange was established to support the WRI and deepen awareness and understanding across SPARKs of each pilot's key focus areas, strengths, roles, and activities/products. It provides a forum to discuss how SPARKs navigate partnership development and sustainability as part of their approach to achieving their objectives.

PROJECT OUTCOMES

Phase 1: 2024 -2027: Knowledge Development, Tools and Planning

- Improve knowledge in the planning area on what wildfire resilience means in the face of a changing climate and increased wildfire risk.
    - By 2025, improved knowledge of the effectiveness of mitigations at reducing fire spread.
    - By 2026, guidance on forest and fuel management practices will be shared to improve wildfire resilience (e.g. through extension activities).

- Land management decisions, including planning tables, land management policy, Indigenous territorial plans and wildfire tactical response, are based on the best available science of wildfire resilience and applying strategies that increase ecosystem resilience to wildfire.

    - By 2027, future operational forestry plans and wildfire mitigation prescriptions will be consistent with new strategies and updated wildfire resilience knowledge.

- By 2027, an adaptive management framework will be developed for the Bulkley Morice area to support the implementation of actions, foster learning and innovation, and address management uncertainty and risk.

Phase 2: 2027 – 2030+: Adaptive Management and Implementation

- Partnerships.
    - By 2027, partnerships will be developed to expand project scope and funding sources.

- Improved knowledge of wildfire hazards is applied in the project area.
    - Fire hazard mapping will be updated by 2027, incorporating the Time-based Empirical Fire Model (TEF) and the best available science/knowledge.
    - By 2028, community fire pathways will be mapped.

- Managed wildfire.
    - By 2029, wildfire planning and response tactics will incorporate "managed wildfire" into their operations.

- Improved knowledge of fire pathways into communities is applied.
    - By 2029, fire pathways will be disrupted to slow fast-moving fires and prevent wildfires from entering and spreading in the built environment.

Worksheet 1: Objectives, strategies, measures

SPARK objective	BuMo Indicators (measures)[1]		
	planning & permitting	project sustainability	project implementation
PRE-FIRE ECOSYSTEMS			
Desired ecosystem functions, recruitment levels, and biomass levels are supported through appropriate fire regimes (based on historical intervals, range of variability, management goals, and in consideration of climate futures) on the landscape through natural and management actions, with desired organisms present.	% of land managers/decision-makers reporting wildfire resilience knowledge has improved. Measure annually through project survey. Target: 80 % by 2027.	% of land managers/decision-makers who report treatment plans and prescriptions reflecting the Knowledge Report and guidance. Measure annually. Target: 90% by 2027. The Bulkley-Morice landscape-scale stewardship plan (FLP) is prepared and includes actions aligned with wildfire resilience outcomes. Measure: decision-maker survey.	% of on-the-ground treatment actions that are informed by the Knowledge Report and guidance. Measure annually by decision-maker survey starting in 2026. Target: 80% by 2027 Reduction in detrimental fire. Measure: Compare the projected detrimental fire that would have occurred without planned mitigations to the treatment scenario (e.g. treatments compared to the base case or no treatment). The target is a downward trend.[2]
Ecosystem heterogeneity. Habitat characteristics are adaptively managed to promote biological diversity, ecosystem services, and a mosaic of habitat types and successional stages on the landscape	% of land managers/decision-makers that report operational planning documents include guidance (policy direction) on implementing wildfire resilience concepts in conservation and	The Bulkley – Morice landscape-scale stewardship plan (FLP) includes wildfire resilience concepts in conservation and biodiversity strategies. Measure: decision-maker survey	% of land managers/decision makers reporting wildfire resilience concepts are being applied in conservation and biodiversity strategies. Measure: decision-maker survey starting in

[1] Measures and targets will be reviewed and adjusted in 2027 to incorporate new information and methods.
[2] To be measured starting in 2029. Correct target to be determined in 2027.

(as appropriate for the region), including habitats that naturally serve to disrupt wildland fire spread (e.g., wetlands, riparian areas).	biodiversity strategies. Measure: annual project survey. Target: 75% by 2027.	A long-term funding strategy is identified in a financial/business plan.	2026. Target: 50% by 2027, 75% by 2029) Reduction in wildfire hazard levels is achieved to disrupt wildland fire spread. Measure: based on BCWS classification, the area of high wildfire hazard rating declines. Target: measurable decline by 2035.[3]
Ecosystem adaptation to climate futures. Processes, functions, and composition are adaptively managed in response to changing processes and climate scenarios (including but not limited to managing for type conversion as ecologically appropriate, enhancing biodiversity, and increasing carbon sequestration potential).	% of land managers/decision-makers that report operational planning documents include guidance (policy direction) on adaptation strategies for future climate scenarios. Measure: annual decision-maker survey. Target 50% by 2027, 75% by 2029)	The Bulkley-Morice landscape-scale stewardship plans (FLP) are informed by future climate scenarios. Measure: decision-maker survey. % of land managers/decision-makers reporting that operational planning documents include strategies for adaptation to climate futures are incorporated. Measure: annual decision-maker survey. Target 50% by 2027, 75% by 2029)	Reduction in detrimental fire Measure: # of hectares treated. Target: 5 % increase year over year.

[3] Correct target to be determined in 2030.

PRE-FIRE COMMUNITIES			
Prioritized, implemented, and well-maintained network of fuel reduction treatments to disrupt fire pathways to slow fast-moving fires and prevent wildfires from entering and spreading in the built environment. Mitigated defence zones that are wide enough to moderate fire behaviour, reduce ember production, and decrease fire intensity, thereby increasing the success of suppression efforts. Science-based project identification utilizing modelling and decision support tools that identify wildfire risk and fire spread. An integrated land-use planning and risk management approach that considers the WUI and built environment.	**Strategic planning documents, community wildfire protection plans, Local Hazard Mitigation Plans, general safety elements, pre-attack plans, appropriate permits, and agreements were developed.** % of Local government land managers/decision makers reporting wildfire resilience and fire pathway knowledge has improved. Measure: annual project survey. Target: 80% by 2029 % of land managers/decision makers that report WUI level risk reduction treatment prescriptions and planning documents include guidance on implementing scientifically and ecologically-based management treatments, including knowledge of fire pathways. Measure: annual project survey. Target: 75% by 2027.	**Programs developed to address work needed in the WUI.** Project area Community Wildfire Risk Reduction Plans are updated to reflect revised risk mapping and identify fire pathways. Measure: yes/no Treatment priorities are derived from updated risk modelling. (i.e. treatment priorities are informed by modelled fire pathways). Measure: annual survey starting 2028: % of treatments within very high/high-risk zones. Target: 75% by 2030 Funding sources are secured and utilized to ensure the sustainability of treatment planning, permitting and implementation. Measure: treatment funding available / utilized. Target 100%	% of high-priority fire pathways treated with maintenance plans in place. Measure: cumulative area treated/total high-priority treatment area. Target: 80% by 2030

Worksheet 2: BuMo Outcomes / Outputs

SPARK objective	BuMo Outcomes (current: 1-8, proposed new 9)	BuMo outputs (current: 1-3, proposed new & options: 4-7)
PRE-FIRE ECOSYSTEMS		
Desired ecosystem functions, recruitment levels, and biomass levels are supported through appropriate fire regimes (based on historical intervals, range of variability, management goals, and in consideration of climate futures) on the landscape through natural and management actions; desired organisms present. **Ecosystem heterogeneity**. Habitat characteristics are adaptively managed to promote biological diversity, ecosystem services, and a mosaic of habitat types and successional stages on the landscape (as appropriate for the region), including habitats that naturally serve to disrupt wildland fire spread (e.g., wetlands, riparian areas).	1. Improved knowledge of wildfire resilience and the historic disturbance 2. Land managers are engaged in the project, wildfire resilience concepts and the design of decision support tools 3. Land managers have improved knowledge of wildfire resilience and decision-support tools fitted to the area 4. Wildfire-related planning tables are supported with wildfire resilience knowledge and scenario analyses 5. Forest management and wildfire plans have incorporated the best available knowledge of wildfire resilience 6. Land managers are applying the best available knowledge in the operational application of wildfire resilience strategies (e.g. proactive risk reduction prescriptions, reactive wildfire response) 7. Partnerships are developed to expand project scope and funding sources starting in project year 3 (2025/26) 8. Improved knowledge of the effectiveness of mitigations at reducing fire spread 9. Adaptive management/implementation framework is developed and applied in the Bulkley Morice area to foster learning and innovation and address risk.	**1. Knowledge** • Literature Review – Apr 2025 • Version 1 of the Knowledge Report – Apr 2025 • Final draft of the Knowledge Report – Dec 2026 • Final draft of the Literature Review – Dec 2026 • Guidance for silviculture stocking standards – Dec 2026 **2. Engagement and collaborative design** • Outreach materials are developed – March 2025 • Public open houses, round 1 – by March 2025 • Public open houses, round 2 – by March 2027 • 4 Steering Committee meetings/year • Workshop #2 – June 2025 (base case) • Workshop #3 – December 2025 (scenario development) • Workshop #4 – October 2026 (final results) • 4 outreach and training sessions on forest and fuel management practices – by March 2027 **3. Decision support tools** • Landscape fire model (TEF) is validated to fit the local area, base case + future climate – November 2025 • Wildfire mitigation scenarios developed – Jan 2026 • Version 1 mitigation scenarios assessed – Mar 2026 • Version 2 mitigation scenarios assessed – Oct 2026

Ecosystem adaptation to climate futures. Processes, functions, and composition are adaptively managed in response to changing processes and climate scenarios (including but not limited to managing for type conversion as ecologically appropriate, enhancing biodiversity, and increasing carbon sequestration potential).	• Wildfire planning and response tactics incorporate "managed wildfire" into their operations • Community pathways. Improved knowledge of fire pathways (mapped) and fire pathways that are disrupted to slow fast-moving fires and prevent wildfires from entering and spreading in the built environment.	• Extension notes/briefings for decision aid (target is land managers and policymakers) – December 2026 **4. Partnerships** • In collaboration with the BVRC, develop a 5-year wildfire research strategy that includes topic areas (water, fish, wildlife) and funding sources. – December 2025 • Initiate a partnership with BCWS to pilot resilience and managed wildfire concepts into proactive risk reduction and suppression strategies – December 2025

PRE-FIRE COMMUNITIES		
Prioritized, implemented, and well-maintained network of fuel reduction treatments to disrupt fire pathways to slow fast-moving fires and prevent wildfires from entering and spreading in the built environment. Mitigated defence zones that are wide enough to moderate fire behaviour, reduce ember production, and decrease fire intensity, thereby increasing the success of suppression efforts. Science-based project identification utilizing modelling and decision support tools that identify wildfire risk and fire spread. An integrated land-use planning and risk management approach was developed that considers the WUI and built environment.		**<u>Proposed outputs for project years 3+</u>** **Adaptive Management/Implementation** **5. A framework and proposal** are prepared for applying an adaptive management approach in the Bulkley Morice area. Timing to align with FLP - December 2026 **6. Managed Wildfire** (contingent on partnership and funding) ● A project plan to pilot a project examining the application of managed wildfire in the Bulkley Morice area is prepared in collaboration with BCWS – Dec 2026 ● Updated Fire Hazard mapping is completed that incorporates TEF model and the best available science – December 2027 **7. Community Pathways** ● A proposal for knowledge development and decision support tools for managing communities and fire pathways – December 2026 ● Map of potential fire pathways into communities based on topography, wind and projected climate (TEF model + XyloPlan) – December 2027 ● Updated guidance on which mitigations can affect fire behaviour under extreme fire weather and, therefore, which mitigations can potentially reduce community risk – December 2029