



Pathways to Action

for Flood Risk Reduction and Resilience

Summer 2023

A report from the Leadership Committee of the
Lower Mainland Flood Management Strategy (LMFMS) Initiative

Acknowledgements

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This report was prepared by the Fraser Basin Council with oversight and direction from the LMFMS Leadership Committee. It was further informed by the input and advice of a multi-government Pathways to Action Working Group. Their collaboration and contributions are also most appreciated.

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¹ As of March – July 2023.

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Executive Summary

The *Pathways to Action* report (*Pathways to Action*) calls for all orders of government to intensify efforts to work together, make significant investments and take meaningful action to successfully implement the report's recommendations for flood risk reduction and resilience in the region commonly referred to as British Columbia's Lower Mainland. Critical to this effort are early and ongoing co-creation efforts with First Nations rights and titles holders in accordance with Articles 18, 19, 29 and 32 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the *BC Declaration Act* and Bill C-15, which formalizes UNDRIP within Canadian law.

Pathways to Action intends to inform and catalyze actions by decision makers and flood planners to reduce flood risk and increase resilience in the Lower Mainland. To this end, contributions were sought from governments and other organizations with flood responsibilities and interests from October, 2022 to March, 2023.

The Leadership Committee of the Lower Mainland Flood Management Strategy (LMFMS) initiative provided oversight and direction on the work, and a Pathways to Action Working Group provided valuable input. The *Pathways to Action* report builds on earlier work undertaken throughout the LMFMS process, including input earlier received on Draft 1 of a strategy. While *Pathways to Action* does not include direct contributions from the 31 individual Mainland Coast Salish First Nation communities, given the short timeframe in developing this report, the Leadership Committee is most appreciative of the participation and contributions of the First Nations-led Emergency Planning Secretariat (EPS) leadership, including EPS outreach to First Nations for preliminary feedback on Draft 1.

Ten key areas for action are profiled within *Pathways to Action* with consideration of:

- ***What is the Issue?***
- ***How to Move Forward on This Issue***
- ***Recommendations***

Supporting process information can be found in [Appendix C](#):

- Related content from Draft 1
- What We Heard from Participants
- Additional Considerations
- Key Questions for Discussion and Resolution

Recommendations in *Pathways to Action* come from a combination of Draft 1 feedback, analysis from the Fraser Basin Council (FBC) as LMFMS secretariat, guidance from the LMFMS Leadership Committee and from the Emergency Planning Secretariat, input from the Pathways to Action Working Group, and wider engagement with strategy participants both before and after the release of Draft 1.

There is broad support to align regional actions, strategies and approaches with the Sendai Framework for Disaster Risk Reduction, which includes four key priorities: 1) improve understanding of risk, 2) support investment and action to reduce risk, 3) strengthen risk governance and 4) enhance preparedness, response and recovery, including “build back better” approaches. There is also recognition of the criticality of a changing climate in terms of the need to continually improve and update flood risk knowledge and to design and implement adaptive approaches to reduce flood risk and increase resilience.

Recommended pathways for early and medium-term action are conveyed under the topics below. Each of these topics relates to one or more of the Sendai priorities. For the complete text of the recommendations, see [Key Actions to Reduce Flood Risk and Increase Resilience](#). **The following is a brief synopsis of recommendations under each area for action:**

1. Improve Understanding of Flood Risk

- Create an ongoing program to better understand Lower Mainland flood hazards and risks. The program would continually improve information about flood hazards, risks and resilience measures, as well as tools to inform flood-related planning and decision-making.

2. Enhance Coordination and Collaboration

- Align a regional strategic approach to flood risk reduction and resilience in the Lower Mainland with the *BC Flood Strategy* and other flood-related initiatives. The *BC Flood Strategy* could be relied on as guidance and/or direction on approaches to regional-scale decision making, including frameworks for prioritization, assessment and funding to implement any future potential regional- and local-scale flood strategies.

3. Assess and Address Regional Priorities

- Identify and prioritize the critical infrastructure and essential services that are at risk from coastal or Fraser River flooding in the Lower Mainland and make these early priorities for flood risk reduction, resilience and climate adaptation.

4. Advance Flood Risk Reduction, Resilience and Climate Adaptation Actions

- Establish a framework to guide and evaluate a full suite of flood risk reduction, resilience and climate adaptation measures, including nature-based solutions, green infrastructure and approaches that make more room for the river.

5. Strengthen First Nations Participation

- Invest in First Nations participation and capacity-building and seek guidance and direction on the implementation of UNDRIP articles 18, 19, 29 and 32, the BC Declaration Act (2019) and Bill C-15, which formalizes UNDRIP within Canadian law (2021), recognizing First Nation title and reconciliation beyond Sec 91 (24) Lands of the *Constitution Act*.

6. Strengthen a Strategy Development Process

- Establish a leadership table to oversee the implementation and ongoing refinement of *Pathways to Action* “early action” recommendations. The leadership table would include all orders of government (First Nations, local, provincial and federal governments).² The leadership table would support direction on a strategic regional approach to flood risk reduction and resilience, including development of new or updated terms of reference.

7. Secure Funding

- Secure funding commitments and invest in urgent actions to address critical infrastructure and essential service priorities with appropriate risk reduction and resilience measures.

8. Strengthen Regional-Scale Decision-Making

- The *BC Flood Strategy* process should provide guidance and/or direction on approaches to regional-scale decision making to implement regional-scale flood strategies. The proposed leadership table (see [Strategy Development Process](#)) should further explore how the unique values, interests, and needs of the Lower Mainland region could inform regional-scale decision making.

9. Refine Strategy Purpose and Goals

- A regional strategic approach to flood risk reduction and resilience should be flexible and iterative in response to changing regional needs, and it should include all four priorities of the Sendai Framework, to: improve understanding of flood risk, support investment and actions to reduce flood risk, strengthen flood risk governance, and enhance flood preparedness for effective response, including to “Build Back Better.”

10. Clarify Geographic Scope and Flood Hazards

- A regional strategic approach to flood risk reduction would initially be expected to focus on both Fraser River and coastal storm surge flood hazards, inclusive of tributaries affected by these flood hazards. This approach would build on existing information, align with other relevant initiatives and advance an assessment of regionally significant pluvial (rainfall) and other flood hazards. Consideration should also be given to watershed-scale influences on flood hazards and risk reduction.

This report is a snapshot in time, and further planning, engagement and implementation of *Pathways to Action* recommendations will be needed. A key theme throughout this report is the need for all orders of government to work together. **This theme spans all recommendations and is critical to securing funding, addressing governance issues, and taking effective and timely action.**

² Participation of the federal government would depend on the scope of roles and responsibilities of the leadership table (to be determined).

Introduction

Context

The region commonly known as the Lower Mainland of BC is home to nearly 3 million people, including those living in 31 Mainland Coast Salish First Nations communities and in the region's 27 municipalities in Metro Vancouver and the Fraser Valley Regional Districts. The Lower Mainland has rich Indigenous cultures, ecological diversity and agricultural productivity, and the region is a major gateway connecting Canada with other nations across and around the Pacific. The region also has significant flood hazards, perhaps most notably the Fraser River spring freshet, winter storm surges on the coast and emergent weather events due to a rapidly changing climate. In November 2021, extreme atmospheric river flood events resulted in significant flood consequences across southwest BC. In the near-term (i.e., next 30–80 years) climate change is projected to increase the frequency and magnitude of Fraser River, coastal storm surge and atmospheric river flooding.³

Increasingly serious flood hazards in the region intersect with a large and growing population and associated growth of communities, homes, businesses, infrastructure and essential services. This is a dangerous situation. Indeed, it highlights the importance of all orders of government and other organizations working together to reduce, not increase, flood-related risks and to improve flood resilience.

The October 2012 release of the *Cost of Adaptation* report by Delcan⁴ was a galvanizing event, estimating the cost of adapting coastal dikes for 1m of sea level rise by 2100 (including seismic resilience upgrades in some cases) to be \$9.5 billion dollars. Assessing costs for Fraser River dikes upstream of the Port Mann Bridge was outside the study's scope. The results of this report led to the Lower Mainland Flood Management Strategy (LMFMS) initiative. The LMFMS has taken a regional and proactive approach to reducing flood risk, with consideration of climate change impacts. This process has included engagement, dialogue and technical analysis, involving more than 60 organizations since 2014.

Initial work in phase 1 of the LMFMS concluded that flood hazards are likely to get larger and more frequent as the century progresses. During phase 1 the losses from a large Fraser River or coastal flood were estimated at \$20-30 billion. Additionally, it was found that the majority of flood protection dikes in the Lower Mainland do not meet current standards for dike crest elevation or seismic resilience. Subsequent analysis has confirmed numerous and complex challenges with flood hazards, risks and risk reduction measures.

In January 2021, a preliminary working draft of the LMFMS (Draft 1) was released to participating governments and other entities with flood planning responsibilities for review and feedback. This step followed a series of Leadership Committee, advisory committee and Pathways to Action

³ [Human influence on the 2021 British Columbia floods - ScienceDirect](#)

⁴ [Cost of Adaptation - Final Report October 22-2012 \(gov.bc.ca\)](#)

Working Group meetings, including workshops designed with and for First Nations participants. Feedback on Draft 1 is summarized as follows:

- There was substantial support for a majority of recommendations in Draft 1 by entities able to actively engage in the process. However, these responses should not be considered to be fully representative of voices in the region; not all entities in the region provided comment.
- There was a diversity of feedback, including divergent perspectives, on several issues of strategic importance. Therefore, additional dialogue among leadership and staff of all four orders of government is needed to clarify a common direction regarding these urgent issues.
- In the context of UNDRIP, there was recognition of the requirement to co-create flood risk reduction approaches with First Nations, including plans, strategies, actions and other approaches.

Throughout the *Pathways to Action* report, there are various mentions of the Lower Mainland Flood Management Strategy (LMFMS) as well as a “regional flood strategy,” or “regional strategic approaches to flood risk reduction.” These references will be familiar to those who have been working on regional flood reduction in recent years. This report, however, does not prescribe specific strategic approaches to advance the report recommendations. Specific approaches would be identified, in a prioritized way, through some form of implementation committee.

Document Context and Purpose

Feedback on Draft 1 of the LMFMS revealed a critical need for further participation and dialogue in the region – and a fresh effort and different approach to tackling the issues. In this context, the *Pathways to Action* report was proposed.

Pathways to Action is not intended to answer all questions on how to best catalyze action on regional flood risk reduction and resilience. Rather, it scans a range of perspectives on challenging issues that need resolution and puts forward recommendations for early and medium-term actions.

Key Actions to Reduce Flood Risk and Increase Resilience

This section identifies issues needing additional discussion, direction and/or decisions before advancing flood risk reduction and resilience in the Lower Mainland, based on feedback to date. These areas were discussed by the LMFMS Leadership Committee, the Pathways to Action Working Group and the Joint Program Committee for Integrated Flood Management over a series of six meetings from late 2022 to early 2023. This work led to a series of recommendations to advance early and medium-term actions in the Lower Mainland for each of the following areas:

1. **Improve Understanding of Flood Risk**
2. **Enhance Coordination and Collaboration**
3. **Assess and Address Regional Priorities**
4. **Advance Flood Risk Reduction, Resilience and Climate Adaptation Actions**
5. **Strengthen First Nations Participation**
6. **Strengthen a Strategy Development Process**
7. **Secure Funding**
8. **Strengthen Regional-Scale Decision-Making**
9. **Refine Strategy Purpose and Goals**
10. **Clarify Geographic Scope and Flood Hazards**

While these issues arose through discussions about the LMFMS and in response to Draft 1, they are relevant across flood planning initiatives, particularly, but not limited to regional- and provincial-scale flood planning.

For each area, *Pathways to Action* considers:

- ***What is the issue?***
- ***How to Move Forward on This Issue***
- ***Recommendations***

Supporting process information can be found in [Appendix C:](#)

- Related content from Draft 1
- What We Heard from Participants
- Additional Considerations
- Key Questions for Discussion and Resolution

Recommendations come from a combination of Draft 1 feedback, analysis by the Fraser Basin Council (FBC), guidance from the Leadership Committee and the Emergency Planning Secretariat (EPS), collaboration with the Pathways to Action Working Group and wider engagement with strategy participants both before and after the release of Draft 1.

KEY AREAS AND ACTIONS

1. Improve Understanding of Flood Risk

Over the course of the LMFMS initiative, there has been considerable improvement in information on Fraser River and coastal flood hazards, risk, and risk reduction measures in the Lower Mainland. In particular, several regional-scale datasets and information tools were developed, including:

- **Lower Mainland Dike Assessment (2015)**
- **Analysis of Flood Scenarios (2015)**
- **Regional Assessment of Flood Vulnerability (2016)**
- **Analysis of Flood Protection Infrastructure, Policies, and Practices (2016)**
- **Hydraulic Modelling and Mapping in BC's Lower Mainland (2019)**
- **Lower Mainland Flood Risk Assessment (2020)**
- **Synthesis of Technical Analysis (2023)**

Advancing open source/open data approaches was a key component of the strategy initiative. The intention is to facilitate access to the results and tools in a way that can be both regionally consistent and cost effective, in particular for governments and other entities with flood responsibilities.

Recommendations

There is a need for an ongoing regional-scale program to continually improve understanding and share information about flood hazards, risks, and resilience measures, including the impacts of climate change. This program should build on existing information and tools that inform flood-related planning and decision-making, and it should be aligned with ongoing and emerging initiatives, such as province-wide flood mapping and disaster / climate risk assessment initiatives. It is also critical that information on the impacts of a changing climate on flood hazards and risks is continually improved. Therefore, the following is recommended.

Early Action

1.1 Advance understanding of flood risk through the following activities:

- a) Improve understanding of urgent regional priorities based on flood risks associated with critical infrastructure and local essential services ([Regional Priorities](#)).
- b) Establish an initial framework to provide guidance on and evaluation of collaborative flood management projects that advance reconciliation with a focus on nature-based projects ([Flood Risk Reduction, Resilience and Climate Adaptation Actions](#)).
- c) Expand understanding of risk to include assessment of regionally significant pluvial (e.g., atmospheric river-related) events, groundwater and other flood hazards. ([Geographic Scope and Flood Hazards](#)).
- d) Improve and broaden understanding of risk and values in relation to floods from First Nations' perspectives.

Medium-Term Action

1.2 Continue to regularly iterate, update and adapt understanding of flood risk based on additional information, experience and perspectives to support flood planning, policy and decision-making.

KEY AREAS AND ACTIONS

2. Enhance Coordination and Collaboration

Currently, flood planning responsibilities are widely distributed among all orders of government. In many cases, multiple departments and branches are involved within a single order of government. In addition, a wide range of infrastructure is exposed to flood hazards and there are many different types of land ownership and tenure over infrastructure. There is consequently a

complex mosaic of diverse and overlapping jurisdictions when it comes to Lower Mainland flood hazards and flood risk governance. There is a need for collaborative and coordinated planning, decision-making and implementation to achieve a strategic approach to flood risk reduction and resilience. To advance holistic and integrated flood measures, collaboration among multiple jurisdictions and perspectives is needed.

The recent emergence of several regional and provincial initiatives has created an opportunity to address flood risk reduction and resilience from many different perspectives and promote a strategic and holistic approach at different geographic scales, led by different organizations (e.g., province-led, First Nations-led, multi-interest-led). An initial summary of these initiatives includes the following:

Lower Mainland Flood Management Strategy (LMFMS): This initiative has been a region-wide strategy development initiative to reduce flood risk and improve the flood resilience of communities along British Columbia's lower Fraser River and south coast. Phase 1 and 2 of this process have produced significant technical analysis and tools for governments and others with flood responsibilities. This *Pathways to Action* report identifies early and medium-term go-forward actions for consideration by decision makers.

Lower Fraser Floodplains Forum (formerly Build Back Better Together): This initiative works towards a collaborative and principled approach to flood resilience.

Hilekw Sq'eq'o: This initiative seeks to create a Mainland Coast Salish emergency plan for all hazards and climate change based on the Sendai Framework and rooted in UNDRIP and to encompass the values and priorities of Mainland Coast Salish communities.

Flood Hazard Identification and Mapping Program (FHIMP): This initiative develops high-quality flood hazard maps for communities at risk of flooding across Canada, with several regional projects currently underway in BC.

BC Flood Strategy (BCFS): This initiative has core themes that include understanding flood risk, strengthening flood risk governance, enhancing flood preparedness, response and recovery, and investing in flood resilience. A *What We Heard* report from the engagement process is anticipated to be released in Summer 2023.

BCFS Implementation Plan/BC Flood Resilience Plan: This initiative aims to facilitate action on the flood management needs identified in the BCFS.

BC Emergency Program Act (EPA) Modernization: This initiative is an ongoing process to repeal and replace the *EPA* to modernize emergency management in BC. It's a crucial first step in implementing the Sendai Framework, emphasizing the importance of disaster risk reduction and strengthening the four phases of emergency management – mitigation, preparedness, response and recovery.

Canadian Emergency Management Strategy⁵: This initiative guides federal, provincial and territorial governments and their respective emergency management partners in carrying out priorities aimed at strengthening Canada’s ability to assess risks and to prevent/ mitigate, prepare for, respond to and recover from disasters.

National Climate Adaptation Strategy: This initiative outlines a shared path and sets common direction for a more climate-resilient Canada across a variety of sectors.

See [Appendix B](#) for an overview table of these initiatives.

Considering the evolving context outlined above, there is value in exploring potential alignment to serve the following goals or objectives:

- Identifying **areas of synergy**, where common goals can be advanced through multiple initiatives (e.g., reducing flood risk and increasing resilience for all).
- Identifying **areas of complementarity**, where different areas of focus within different initiatives could collectively address current gaps (e.g., proactive risk reduction and resilience is complementary with strengthened response and recovery).
- Identifying **areas of potential duplication**, to seek efficient use of limited resources and coordinate opportunities for engagement on issues of common interest. (e.g., improving information on flood hazard, risk, risk reduction and resilience).
- Identifying **areas of potential conflict**, or where different initiatives might be at cross-purposes (e.g., some parties might wish to prioritize dike upgrades, while others might wish to pursue dike removals).

There are important timeline and jurisdictional issues to consider. For example, it could be preferable, and perhaps necessary, for additional vision and policy direction to be provided by the Government of British Columbia through the *BC Flood Strategy* and *EPA* modernization processes, including government-to-government discussions and agreements with First Nations to clarify what is appropriate (and possible) to advance through local and/or regional flood initiatives. The *BC Flood Strategy* could be viewed as an overarching document that informs regional and local strategies and approaches. The importance of applying UNDRIP to flood planning is another key consideration; therefore, work advanced through First Nations-led and government-to-government flood planning processes, should inform other related initiatives.

⁵ [Emergency Management Strategy for Canada: Toward a Resilient 2030 \(publicsafety.gc.ca\)](#)

Recommendations

Early Action

To accelerate collaboration and alignment on flood risk reduction and resilience, the following is recommended:

2.1 Convene meetings among the leading organizations of multiple flood-related initiatives to:

- a) Further explore the current goals, scope and timeline of each initiative.
- b) Clarify what issues are best addressed through which initiatives.
- c) Identify and clarify potential areas of synergy, complementarity, duplication or conflict.
- d) Refine initiatives to strengthen synergies and complementarity, reducing duplication and conflict.

KEY AREAS AND ACTIONS

3. Assess and Address Regional Priorities

What is the Issue?

An underlying assumption of Draft 1 of the LMFMS was that priorities must be identified to provide strategic focus and that resources must be invested to get the “best bang for the buck.” The size of the Lower Mainland, its numerous communities, its extensive infrastructure and development, its ecological diversity and its jurisdictional complexity all point to the need for a method to identify broadly supported regional priorities.

How to Move Forward on This Issue

Discussions within the Pathways to Action Working Group revealed a strong consensus that regional priorities are central to regional action for flood risk reduction and resilience. There was support to further develop and refine a multi-criteria, rights-based and risk-informed framework to evaluate regional priorities for initial action and investment. An iterative approach would identify early priorities for urgent action, while a more refined and comprehensive approach could be developed and implemented over time. An initial focus on critical infrastructure and essential services was proposed on the basis that all could agree with the importance of these for the entire region.

There needs to be a process or framework to prioritize a broader context of resilience and mitigation. Although geographic areas with high flood risk (e.g., areas with significant critical infrastructure exposure) are a key consideration, regional priorities should be considered in a broader context including:

- Sectors (prioritize infrastructure sectors, such as transportation, hydroelectricity, hospitals and agriculture).
- Mitigation/resilience measures (prioritize flood-resilient design and natural processes, such as water storage and flood attenuation and other nature-based solutions beyond conventional diking systems, such as living dikes).
- Areas lacking flood planning policies.

A prioritization framework to guide strategic regional approaches to flood risk reduction and resiliency should align with provincial frameworks that may come out of the *BC Flood Strategy* process. A single, consistent framework is preferred across multiple scales.

Priorities should be established by decision makers from all orders of government, informed by technical analyses. See [Decision Making](#) for greater discussion on governance.

Recommendations

There is a need for regional priority-setting actions that will reduce shared risks. As such, the following is recommended.

Early Action

- 3.1** Seek initial funding to understand flood risks to critical infrastructure and essential services impacted by regionally significant pluvial, coastal and riverine flooding in the Lower Mainland and establish a transparent assessment process to prioritize and provide direction to investments and planning to address regional priorities.

This funding would be used to:

- a) Develop a shared understanding and prioritization of critical infrastructure and local essential services in the region that are at risk from regionally significant flood events, building from previous regional knowledge.
- b) Assess the risks associated with the damage, disruption and/or failure of these critical infrastructure and local essential services due to flooding.
- c) Develop principles, values and criteria to advance immediately actionable projects that reduce risk.

- d) Develop cost estimates to identify funding needed to take action to reduce risk and/or increase resilience for the most urgent priorities.

Medium-Term Action

- 3.2 Prioritize for urgent risk mitigation and resilience planning (with associated funding) the critical infrastructure and essential services that have been identified and prioritized from the early action recommendations. Additional priorities that include locally significant critical infrastructure and core services may also be identified for funding. This approach will need to align with *BC Flood Strategy* frameworks as applicable.
 - 3.3 Develop and implement a broader and more refined prioritization process and framework to identify regional and local priorities that reduce risk over the medium and longer term, in alignment with federal and provincial policies and funding mechanisms, after an initial regional flood strategy or other strategic approach to flood risk reduction is completed. Over time, additional priorities should be included in future iterations.
 - 3.4 The prioritization framework should be flexible and evolve over time to adapt to changing circumstances, including climate change, additional hazards and emerging and/or revised priorities.
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KEY AREAS AND ACTIONS

4. Advance Flood Risk Reduction, Resilience and Climate Adaptation Actions

What is the Issue?

Strategic regional approaches to flood planning and mitigation should be high level when it comes to risk reduction and resilience measures in contrast to recommending specific measures for specific locations or communities. In the process leading up to Draft 1 of the LMFMS, participants suggested that a regional strategy should not be prescriptive in the measures it proposes. In response, Draft 1 recommended a limited number of specific measures and did not recommend specific measures for specific locations or communities. Instead, a multi-criteria framework was proposed to inform the planning, design and selection of risk reduction measures.

Some First Nations and other government representatives indicated a preference for more detailed risk reduction options and actions to be presented in a regional strategy. Suggestions ranged from examples of options, to detailed assessments of options, to direct recommendations for “actionable works to reduce flood risk.”

There was an outstanding question about how prescriptive a strategy or strategic regional approaches to flood risk reduction and resilience should be – or whether an enabling, voluntary approach to implementing recommendations was preferred. Although some representatives of government and other entities commenting on Draft 1 highly supported having more consistent policy and requirements in flood planning, others (mostly local governments) preferred guidance, incentives and enabling approaches.

How to Move Forward on This Issue

There is significant support to create a multi-criteria framework to guide the evaluation and design of a wide range of risk reduction and resilience measures. Furthermore, it is recognized that a framework alone is not enough to advance innovative approaches.

There is also support to develop and provide guidance around the suitability of a wide range of flood mitigation and resilience measures across various environments in the Lower Mainland. This could include, for example, measures specific to urban and rural areas, riverine and coastal areas, and different environmental/social/economic circumstances.

Guidance beyond a risk reduction evaluation framework is needed to promote innovative flood measures and support smaller communities with limited capacity to assess measures.

Any frameworks developed for a regional flood strategy should align with provincial frameworks that may come out of the *BC Flood Strategy* process. A single, consistent framework is preferred across multiple scales. The *BC Flood Strategy* or a subsequent related implementation plan may enable or support additional risk reduction measures.

Recommendations

There is a need for identification and development of examples of collaborative, nature-based flood management projects that advance reconciliation.

The following is recommended.

Early Action

4.1 Seek funding to build on previous regional work and establish an initial framework to provide guidance on, and evaluation of, flood risk reduction and resilience actions. This funding would:

- a) Support identification of sub-regional, nature-based/hybrid flood management projects and implement pilot projects via seed funding initiatives. This could potentially inform expansion and refinement of existing provincial funding programs.
- b) Develop and implement a screening-level process to identify regional and local actions that reduce risk and increase resilience over the medium and longer term, in alignment with federal and provincial policies and funding mechanisms.

- c) Incorporate new information as appropriate, including evolving climate impacts data and modelling.

Medium-Term Action

- 4.2 A more refined evaluation framework should be established and evolve over time to adapt to changing circumstances and understanding of risk.

Any evaluation (short or medium-term) should take into account such factors as climate change, additional hazards, innovations, more sustainable approaches to local development, and a full suite of available flood risk reduction and resilience measures.

KEY AREAS AND ACTIONS

5. Strengthen First Nations Participation

What is the Issue?

There is a lack of clarity for many organizations around roles and responsibilities related to First Nations Rights and Titles as described in UNDRIP which is further challenged by the complex jurisdictional overlaps in regional flood planning. The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) was adopted by the United Nations General Assembly in 2007, and Canada became a full supporter of UNDRIP in May 2016, without qualification. British Columbia committed fully to UNDRIP on September 13, 2017, and unanimously passed the *Declaration on the Rights of Indigenous Peoples Act* in November 2019. This is a framework that recognizes existing human rights.

On June 21, 2021, Canada enacted the *United Nations Declaration Act* (UNDA also known as Bill C-15). The federal government has now undertaken the creation of Action Plan Measures to begin implementing UNDA. UNDA will also have to be interpreted in the BC DRIPA context as it relates to emergency management and flood planning.

In addition to UNDRIP and UNDA, Supreme Court of Canada decisions such as *Tsilhqot'in* (recognition of title), *Yahey* (cumulative impacts) and others will have to be incorporated into flood planning in the BC First Nation and federal legal landscape context.

UNDRIP is a prerequisite for flood planning and decision-making, including in a regional flood strategy. Without alignment and inclusion of UNDRIP, a regional flood strategy (and its development process and implementation) cannot be successful and has potential to adversely impact First Nations title and rights. UNDRIP articles 18, 19, 29, and 32 have been highlighted as particularly relevant to flood planning in the Lower Mainland. These articles speak to the importance of First Nations-led institutions and processes. They take a rights-based approach to

planning, and state the right to free, prior and informed consent of Indigenous Peoples regarding decisions and actions taken in, and potentially impacting, their Traditional Territories. For example, UNDRIP Article 29 is about the right to protect land and resources. Therefore, more clarity is needed for many organizations around roles and responsibilities related to UNDRIP in the context of regional flood planning.

The various ongoing flood initiatives in the Lower Mainland contribute to the engagement fatigue and capacity constraints experienced by many First Nations. As governments seek clarity around UNDRIP, any strategic approaches to flood risk reduction and resilience for the Lower Mainland must address the capacity that is required to meaningfully participate in these types of initiatives. It is important to actively seek to minimize and lessen First Nations' engagement burdens through alignment with other initiatives, such as the *BC Flood Strategy*, while at the same time increasing the capacity to engage.

While Draft 1 identified the need for UNDRIP and a broader reconciliation approach, it fell short of adopting a rights-based approach and recognizing the role of government-to-government (G2G) decision-making.

Ideally, recommendations for moving forward on regional action for flood risk reduction and resilience would be developed through multi-government discussions and agreements, including First Nations rights and title holders. The timeline to develop the *Pathways to Action* report, did not support the type of early and collaborative process that is desired and necessary to move forward together. Therefore, the document puts forward recommendations for further consideration and refinement before or during implementation. The approach is to allow for further collaboration, co-development and consensus-seeking approaches to flood risk reduction and resilience for all communities in the Lower Mainland.

In a rights-based approach, it is critical to recognize the governance arrangements, laws and protocols of the specific First Nations communities and governments involved. Key success factors include strengthened capacity and relationships and any further guidance that may be needed on the role of local governments regarding UNDRIP. Suggestions include:

- Review available process and content guidance on UNDRIP that is emerging through other processes, such as Hílekw Sq'eq'ó, *BC Flood Strategy*, DRIPA Action Plan, Building Back Better Together, BC First Nations Climate Strategy and Action Plan, and other UNDRIP-related guidance.
- Consider developing principles with First Nations, including engagement focused on values such as: sharing information honestly and openly, collaborative decision-making, constructive relationships based on trust, recognizing legal precedents, strengthening capacity, and ensuring adequate time to co-create recommendations and decisions.

Recommendations

The following is recommended.

Early Action

- 5.1 Seek funding to support effective First Nations participation in regional risk assessment and flood planning and enhance capacity, including ongoing development of First Nations coordinating organizations (e.g., EPS).
- 5.2 Identify and incorporate priority UNDRIP articles that apply to the intent of the *Pathways to Action* report, including for early actions.

Medium-Term Action

- 5.3 Address further guidance and direction on the implementation of UNDRIP articles 18,19, 29 and 32 and DRIPA as related to flood planning and resilience through the following:
 - a) The *BC Flood Strategy* development and implementation planning outcomes.
 - b) Government-to-government (G2G) discussions and arrangements with First Nations, local, provincial and/or federal governments.
 - c) Specific provincial guidance to local governments regarding flood planning and decision making that may affect title and rights.
 - d) Supporting cooperative, collaborative and inclusive regional and sub-regional planning processes bringing together First Nations, local governments and non-governmental organizations.

KEY AREAS AND ACTIONS

6. Strengthen a Strategy Development Process

What is the Issue?

While there was substantial strategy development work undertaken through the LMFMS initiative, feedback confirmed that the process did not serve all participants well. An improved process is needed to help ensure progress on the *Pathways to Action* recommendations and secure the support of all orders of government.

How to Move Forward on This Issue

During Pathways to Action Working Group discussions in development of *Pathways to Action*, the need for a flexible model and approach towards this issue was highlighted. Any document that

advances strategic approaches across the region should incorporate a flexible model to support evolving needs. The ongoing evolution of reconciliation and implementation of UNDRIP in BC can be embedded into the foundation of the process by creating dynamic documents that are adaptable to changing conditions.

Furthermore, there is the possibility that the *BC Flood Strategy* might address and provide guidance on some aspects of regional flood strategy development processes.

Recommendations

The following is recommended.

Early Action

- 6.1** Seek funding to facilitate a process to establish a leadership table and to draft a working-together agreement to guide leadership's roles in overseeing the implementation of *Pathways to Action* early action recommendations. The leadership table would include all orders of government (First Nations, local, provincial, and federal governments).⁶

Medium-Term Action

- 6.2** The leadership table and the working-together agreement would support direction on a strategy or strategic regional approaches to flood risk reduction and resilience, including development of new or updated terms of reference where appropriate.

KEY AREAS AND ACTIONS

7. Secure Funding

What is the Issue?

The LMFMS initiative found there was broad agreement on the need to enhance funding to reduce flood risk and increase resilience in the Lower Mainland. Participants in the LMFMS process recognized that the current landscape of narrow, time-limited government funding programs is insufficient, inequitable and unpredictable. As a result, those with flood-related responsibilities have limited ability to fulfil those responsibilities in a comprehensive way.

Many jurisdictions work individually and compete for limited funding from senior governments. Smaller communities with less capacity are at a competitive disadvantage, regardless of merit.

⁶ Participation of the federal government would depend on the scope of roles and responsibilities of the leadership table (to be determined).

There are no mechanisms now in place to identify regional priorities or to coordinate regional-scale funding decisions. Historically, non-structural approaches have been underfunded. More recently, the National Disaster Mitigation Program, BC's Adaptation, Resilience and Disaster Mitigation Program⁷ and Community Emergency Preparedness Fund⁸ have supported non-structural approaches. It is difficult to align grant intakes with considerations such as local government and First Nations government budget planning cycles, regulatory review processes, and windows for construction that respect environmental and fish habitat requirements.

A regional flood strategy or other regional approaches could seek ways to resolve these issues and ensure stable long-term funding for preventative flood risk reduction, resilience and climate adaptation measures. While there is broad support for enhanced funding, there are diverse perspectives regarding who should make funding decisions, what criteria to use, how regional and local priorities should be considered, and whether or not a region-specific funding program is needed.

How to Move Forward on This Issue

There is a critical need for flood risk reduction and resiliency funding in the Lower Mainland. The flood events of November 2021 brought the costly and devastating impacts of Lower Mainland flooding to the forefront of public attention. The flooding in the Fraser Valley at that time, however, came from tributaries and smaller rivers (e.g., Nooksack River), not the Fraser River. An assessment of coastal and Fraser River flood risks undertaken in the LMFMS initiative indicate that these two flood hazard sources would have a much larger and more profound impact on the region as a whole than the 2021 flooding.

The Working Group discussions indicated that it is too early to pursue a regional funding program and that various regional funding approaches should be further considered. This would take significant additional analysis, especially to meaningfully address First Nations title and rights through participation in decision making or other means of achieving Free, Prior and Informed Consent (FPIC). Analyses would inform a strong understanding of the region's needs and suggest associated decision-making and administrative arrangements.

Recommendations

Early Action

The following is recommended.

- 7.1** The concept of a regionally coordinated approach to the funding of flood risk reduction and resilience in the Lower Mainland from all orders of government should be further explored.

⁷ [New funding for flood mitigation will make communities safer, more resilient | BC Gov News](#)

⁸ [Community Emergency Preparedness Fund | Union of BC Municipalities \(ubcm.ca\)](#)

7.2 The *BC Flood Strategy* process should provide guidance and/or direction on approaches to funding to implement regional-scale flood strategies.

7.3 Seek funding to:

- a) Support effective First Nations participation and enhance capacity.
- b) Advance understanding of regional priorities for risk reduction and resilience measures (outlined above in early priorities in [Regional Priorities](#) and [Risk Reduction, Resilience and Climate Adaptation](#)).
- c) Grow interdisciplinary and specialized capacity to develop complex risk reduction and resilience projects, as well as implement smaller pilot/demonstration projects.
- d) Develop and sustain a structure to work together as a united group moving forward.
- e) Explore the feasibility of a regional-scale approach for coordinated funding decisions.

7.4 Use the feasibility analysis (7.3(e)) to address outstanding regional issues, such as:

- a) Lower Mainland values, interests and needs.
- b) Existing jurisdictional roles and responsibilities.
- c) Scope of eligible projects for funding.
- d) Transparency and accountability regarding funding decisions.

Medium-Term Action

7.5 Seek funding to implement recommendations for reducing risks to regional critical infrastructure (see early actions under [Regional Priorities](#)).

KEY AREAS AND ACTIONS

8. Strengthen Regional-Scale Decision Making

What is the Issue?

The concept of a regional flood entity to implement a regional flood strategy was developed through the LMFMS Leadership Committee in 2019 after a scan of existing roles and responsibilities, a gap analysis at the regional scale, and consideration of governance models found elsewhere.

This concept was further refined in 2020 to include a Board structure composed of all orders of government. While many governments and other organizations providing comments on Draft 1 of the LMFMS supported this concept, at least one organization was opposed, and others expressed concerns or had questions to be resolved. There was concern, for example, that the creation of a regional entity could reduce current authority and autonomy at the local or provincial levels. There

were also concerns raised about ensuring transparency and accountability, and concerns about the types of decisions that might be made through a regional flood strategy, since these could potentially impact First Nations title and rights.

How to Move Forward on This Issue

There is a recognition that new opportunities for regional-scale flood governance and decision making might require the delegation of new roles and responsibilities from the Government of BC, potentially including legislative changes. As such, the question of new governance arrangements for the implementation of a regional-scale strategy might need to flow from a wider provincial policy framework, such as that which is emerging through the *BC Flood Strategy*. It is also recognized that the needs and circumstances in the Lower Mainland are unique to this region (e.g., First Nations rights-holders, ecosystem values, jurisdictions, hazards and risk profile). As such, there is a rationale for continued dialogue to inform an approach to decision-making that is tailored to the Lower Mainland.

Recommendations

The following is recommended.

- 8.1 The *BC Flood Strategy* process should provide guidance and/or direction on approaches to regional-scale decision-making to implement regional-scale flood strategies.
- 8.2 The proposed leadership table (see [Strengthen a Strategy Development Process](#)) should further explore how the unique values, interests and needs of the Lower Mainland region could inform regional-scale decision-making.

KEY AREAS AND ACTIONS

9. Refine Strategy Purpose and Goals

What is the Issue?

From the outset, the overarching goal of the LMFMS initiative was to reduce flood risk in the Lower Mainland. The initiative has included the participation of governments and some non-government organizations with varying jurisdictions, interests, needs and values. A single strategy, however, cannot adequately address all needs of all participants. While all agreed on the need to reduce flood risk, different participants had diverse expectations of what the strategy should be and what types of actions that should be recommended in the strategy. This included expectations on the breadth of the strategy goals and the scope of the geographic area.

First Nations were not included early in the LMFMS process, and as a result, several interests of First Nations were missed during the original scoping of the strategy initiative. For example, early in the process, participating organizations agreed to focus on proactive approaches to reducing flood risk associated with Fraser River and coastal flood hazards. Later in the process, First Nations highlighted their respective needs for emergency response and recovery, as well as concerns about flood hazards from other sources. First Nations also highlighted the harm they experience from past and current approaches to flood planning, including impacts on the environment and community resources.

How to Move Forward on This Issue

The overall purpose of the LMFMS initiative was to reduce flood risk, including through increasing resilience in the Lower Mainland. Recommended actions in this *Pathways to Action* report focus on advancing this purpose.

During discussion, Working Group members concluded that the fourth Sendai Framework priority “*Enhancing disaster preparedness for effective response and to ‘Build Back Better’ in recovery, rehabilitation, and reconstruction*” should be incorporated into a regional strategy for the Lower Mainland. The fourth priority recognizes that, with the growth of disaster risk in communities, there is a need to strengthen disaster preparedness for response, to take action in anticipation of events, and to ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phase is a critical opportunity to build back better, including through integrating disaster risk reduction into development measures.⁹

Without recognition of past and ongoing impacts of harmful legislation and flood mitigation practices on First Nations, and a commitment to address these impacts wherever possible, any strategic regional approaches to flood risk reduction and resilience in the Lower Mainland would be incomplete. Regional and local flood strategies should facilitate more thought and dialogue to explore how to recognize and address past and present impacts of flood activities on First Nations and the environment. This is most likely to occur at the local scale in the context of specific projects or proposals. However, a regional strategy or other strategic regional approaches to flood risk reduction and resilience need to learn from, and improve on, past decisions.

Recommendations

The following is recommended.

9.1 A regional strategy and/or regional strategic approaches should be flexible and iterative in response to changing regional needs, and include all four priorities of the Sendai Framework, adapted as follows:

- a) Improve understanding of Lower Mainland flood risk and increase awareness.

⁹ [What is the Sendai Framework? | UNDRR](#)

- b) Support investment and actions to reduce flood risk, avoid the creation of new risk, and build resilience of communities, ecosystems and critical infrastructure.
- c) Strengthen flood risk governance in the Lower Mainland, including collaborative, integrated planning, and meaningful participation of rights and title holders.
- d) Enhance flood preparedness for effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction.

9.2 Strategic approaches should be informed by learning from past and ongoing impacts of flood and flood management activities on First Nations and the environment, from the historical displacement of First Nations to reserve lands and from use of and access to their traditional territories.

9.3 Strategic approaches, and their subsequent implementation, would also be informed by, and align with existing and emerging related initiatives, such as the *BC Flood Strategy*, BC Flood Mapping initiative and BC Disaster and Climate Risk and Resiliency Assessment.

KEY AREAS AND ACTIONS

10. Clarify Geographic Scope and Flood Hazards

What is the Issue?

Based on early advice and guidance from local, provincial and federal government participants and other entities, the LMFMS initiative was developed to address lower Fraser River freshet flooding and coastal flooding in the Lower Mainland. As such, a wide range of Fraser River and coastal flood hazard scenarios, including climate change scenarios through the year 2100 were modelled, mapped and/or otherwise assessed to inform the strategy. During the LMFMS engagement process, some First Nations wanted additional flood hazards to be considered (e.g., other rivers, groundwater hazards, dam releases). The November 2021 atmospheric river flooding demonstrated the regionally significant consequences of such flood events.

How to Move Forward on This Issue

The geographic scope and hazards addressed in a regional flood strategy are intrinsically tied to the strategy’s overarching purpose. In the case of the LMFMS, this was to reduce flood risk and increase resilience in the Lower Mainland. As regional strategies and approaches evolve over time, the identification of flood hazards in addition to coastal and Fraser River freshet floods will be critical, including incorporation of the latest climate change science. An iterative approach will be needed as flood hazards and risks evolve over time.

Pathways to Action Working Group discussions affirmed that the lower Fraser River and coastal flood hazard areas provide a strong foundation for developing a regional strategy or other strategic

approaches to flood risk reduction and resilience. Such a process, however, can also allow other hazards to be addressed. If there are additional hazards that have the same type of impact on communities, they should be accounted for in some way. Examples can include:

- Atmospheric rivers and heavy rainfall flood hazards.
- Flood hazards from other rivers and streams in the Lower Mainland (e.g., Chilliwack, Chehalis, Alouette, Coquitlam).
- Other flood hazards, such as from groundwater, dam releases and tsunamis.

To successfully reduce flood risk and build resiliency, it is important to recognize the impacts of other hazards in the flood hazard area. For example, some areas may subside and/or liquefy from an earthquake event. In Lower Mainland coastal communities, these areas significantly overlap with flood hazard area and can have high risk and cost implications.

The Working Group discussed how the upper, middle and lower sections of the Fraser River are influenced by different hazards. While there may be ways to finesse the scope of a strategy in an evergreen document and account for various upstream influences, there was a preference for the currently defined geographic scope (from Yale to the Salish Sea and from White Rock to Squamish). Furthermore, most members of the Joint Program Committee for Integrated Flood Management also supported keeping the current geographic scope of the LMFMS. Watershed implications and upstream influences (such as upstream water storage and land disturbances on Fraser hydrology) should be discussed in a strategy, but detailed analyses of these issues are not currently available. Over time, additional hazards could be included for a regional flood strategy to be more complete.

There is an acknowledged trade-off between a strategy or strategic approaches that are more narrowly scoped and those that are more holistic and comprehensive.

Recommendations

The current Lower Mainland geographic scope, and Fraser River and coastal flood hazard scope, is appropriate for initial focus on early action. There is also an interest in advancing assessment of regionally significant pluvial flood hazards and other hazards over time. Therefore, the following is recommended.

Early Action

- 10.1** Seek opportunities with ongoing initiatives to advance understanding of flood hazards.
- 10.2** Initiate analysis and assessment of regionally significant pluvial flood hazards (such as atmospheric rivers) and groundwater flood hazards in communities.

Medium-Term Action

- 10.3** Flood strategies and/or strategic regional approaches covering the lower Fraser River flood hazard area should include further consideration of watershed-scale influences, including upstream implications of wildfire, forestry and other land use practices, climate change, and opportunities to open up the river corridor. These considerations may be explored in the *BC Flood Strategy* and other provincial scale strategies.
- 10.4** Flood strategies and/or strategic regional approaches in the Lower Mainland region should include further consideration of additional flood hazards, as well as interdependencies with other hazards.

Appendix A. LMFMS Process: Relevant Documents

Pathways to Action builds on what was heard through the LMFMS process to advance regional action on flood risk reduction and resilience.



The *Lower Mainland Flood Management Strategy (LMFMS) Draft 1* (2021) is referenced throughout this document. Some *Pathways to Action* report sections feature select LMFMS Draft 1 recommendations to contextualize the issues addressed in *Pathways to Action*. For brevity, many of these recommendations and the “Related Draft 1 Content” subsections in [Appendix C](#) are summarized. Readers can refer to the *LMFMS Draft 1* to better understand the full suite of recommendations proposed in that document.



In addition to Draft 1, the *What We Heard about Draft 1* (2021) report is another related document preceding *Pathways to Action*. Like the *Draft 1* excerpts, selections from *What We Heard* have been paraphrased for brevity.

These selections are found in the “What we Heard from Participants” sections. Consult the *What We Heard* report to see a full range of participant feedback.

Appendix B. Alignment with Other Flood-Related Initiatives

An initial summary of the initiatives listed in Section 2.2 is as follows:

Initiative	Scope	Primary Focus	Sendai Priority	Stage
Lower Mainland Flood Management Strategy (LMFMS)	Lower Mainland communities (Hope to Salish Sea, White Rock to Squamish)	Flood Risk Reduction and Resilience	All 4 (per Working Group)	LMFMS Draft 1 (2021); <i>Pathways to Action</i> with recommendations for advancement (March 2023)
Lower Fraser Floodplains Forum (formerly Build Back Better Together)	Fraser Valley	Flood Recovery and Long-Term Resilience	Recovery	
Hílekw Sq'eq'ó	Mainland Coast Salish First Nations	Flood Risk Reduction and Resilience for Mainland Coast Salish First Nation communities	All 4	
Flood Hazard Identification and Mapping Program (FHIMP)	Canada-wide, regional projects within BC	Regional flood hazard mapping	Understanding Risk (hazard identification)	Initially funded projects to be completed March 2024
BC Flood Strategy (BCFS)	BC-wide		All 4	Strategy to be released 2023
BCFS Implementation Plan/BC Flood Resilience Plan	BC-wide		All 4	Co-develop in 2023- 2024
BC Emergency Program Act (EPA) Modernization	BC-wide	4 pillars of emergency management	All 4	
Canadian Emergency Management Strategy¹⁰	Canada-wide	Strengthen Canadian Resilience by 2030	All 4	Released 2019
National Climate Adaptation Strategy	Canada-wide	Climate Adaptation	All 4	Strategy released 2023

¹⁰ [Emergency Management Strategy for Canada: Toward a Resilient 2030 \(publicsafety.gc.ca\)](https://publicsafety.gc.ca)

Appendix C. Additional Information on Key Actions to Reduce Flood Risk and Increase Resilience

Appendix C includes supporting information to the 10 recommendation sections in the main body of the report that illustrate in greater detail the process for coming to the recommendations.

For each recommendation section this Appendix provides:

- *Related content from Draft 1*
- *What We Heard from Participants*
- *Additional Considerations*
- *Key Questions for Discussion and Resolution*

Appendix C mirrors the section titles and headings found in the main body of the report.

1. Improve Understanding of Flood Risk

This topic focuses on the improved available knowledge-base of Fraser River and coastal flood hazards, risk, and risk reduction measures in the Lower Mainland developed over the past several years, and how gaps still remain.

Related Content from Draft 1

Section 5.1 of Draft 1, titled “Improving Understanding of Flood Risk,” proposed a broad, long-term, regional-scale, technical program with provisions to improve access to information, and broader public education needs. This combination was proposed to improve information on hazards, risks and risk reduction measures, while advancing capacity-building and training.

- For example, Recommendation #1 was to “Establish a long-term regional-scale program to facilitate flood hazard and risk modelling and mapping and improve access to resources and information needed to make evidence-based, sound decisions about flood management.”

Related recommendations included: consistent flood mapping across the region, maps to inform preparedness and response, improved and sustained coastal flood modelling and storm surge forecasting, enhanced funding to support flood information, and a variety of training opportunities and guidance documents.

What We Heard from Participants

There was strong and broad support for the Draft 1 recommendations regarding a regional scale program to develop, improve, maintain, and share high-quality, consistent information across the

Lower Mainland region (*What We Heard about Draft 1*). In addition to these analyses, results, and information tools informing the LMFMS, there has been significant demand from dozens of communities and organizations over the years to access these tools to support additional analysis at other scales for related purposes. As an example, the Lower Fraser HEC RAS 2D hydraulic model has had an average of 20 requests per year (to access and use the model and/or its outputs) since its completion in 2019. Feedback on LMFMS Draft 1 also highlighted the importance of assessing other flood hazards in addition to the Fraser River freshet and coastal storm surge.

Recommendations

Pathways to Action recommendations for Understanding Flood Risk focus on advancing a regional-scale program to continually improve understanding and share information about flood hazards, risks, and resilience measures, including the impacts of climate change.

2. Enhance Coordination and Collaboration

Currently, flood planning responsibilities are widely distributed among all orders of government, and in many cases, multiple departments and branches are involved within a single order of government. To advance holistic and integrated flood measures, collaboration among multiple jurisdictions and perspectives was explored in the process that created the *Pathways to Action* recommendations on this topic.

Related Content from Draft 1

Section 5.3.1 of Draft 1 focused on “Collaborative and Coordinated Flood Planning.” This included recommendations 51–56, such as:

- Establishment of formal mechanisms for improved coordination and collaboration between all jurisdictions;
- Support for local and sub-regional collaborative planning processes with funding and technical expertise;
- Development of guidance and case studies on how Local Governments, First Nations, provincial Ministries, and Infrastructure Providers/Agencies can collaborate and develop partnerships for flood planning and resilience (and related) activities;
- Development of more formal, consistent, and comprehensive communications protocols between First Nations and other jurisdictions; and
- Engagement with utilities, infrastructure providers, different sectors, and their corresponding regulatory jurisdictions in regional, sub-regional and local flood planning.

What We Heard from Participants

Broad support was expressed for improved coordination and collaboration (*What We Heard about Draft 1*). Some considered this to be key to the entire LMFMS initiative and that a regional flood strategy should propose a method or roadmap for improving regional collaboration and coordination. It was noted that some local governments are already collaborating well.

Building and strengthening relations is key to effective coordination and collaboration. The EPS submission on Draft 1 recommended laying out legislation, actions, or frameworks to enable improved communication and coordination, noting some First Nations experience challenges in working with neighbouring municipalities, utilities, and emergency services providers during emergencies. Suggestions include complementing or building on existing arrangements, not being prescriptive, and ensuring that processes are realistic given available resources.

Recommendations

Pathways to Action recommendations for Enhance Coordination and Collaboration focus on accelerating collaboration and alignment by bringing together the leading organizations of flood-related initiatives.

3. Assess and Address Regional Priorities

The geographic size, environmental diversity, and jurisdictional complexity of the Lower Mainland all point to a need for a method to identify broadly supported regional priorities. *Pathways to Action* explored related content from Draft 1 and used Pathways to Action Working Group discussions to advance ways to set regional priorities.

Related Content from Draft 1

A risk-based approach was proposed in Draft 1 where the magnitude and distribution of different types of flood risk were assessed to identify geographic areas with high flood risk. Initial quantitative assessment was undertaken through the Lower Mainland Flood Risk Assessment (LMFRA). However, data gaps, under-representation of First Nations, and equity considerations that the LMFRA was unable to include led to a proposed multi-criteria framework to account for these missing lenses when identifying areas of high risk.

These lenses were suggested to balance the consideration of more easily quantifiable flood risks (e.g., building and infrastructure damages from the LMFRA) with other aspects of risk including frequency of flooding, under-serviced areas, and areas with higher proportional risks.

The criteria proposed in Draft 1 included:

- Areas with quantitatively high flood risk
- Areas that are at risk from frequent and high-likelihood floods

- Areas with disproportionately high flood risk, relative to community capacity
- Areas with flood risk that are currently underserved with regard to flood protection or emergency response measures
- Areas with high critical infrastructure and essential sector impacts

The prioritization of flood risk areas in a holistic way was a core concept of Draft 1. Proposed risk reduction initiatives that addressed regional priority areas would be given priority for funding and implementation, based on multiple criteria. Section 5.3.3 presented five draft criteria to support prioritization, their rationale and some potential implications, and their measurement and data constraints. The section recommended that a full prioritization framework be developed, and that additional required data be gathered through further consultation with First Nations and local authorities *after* the strategy is finalized (Draft 1: Recommendations 63 and 64).

During the development of Draft 1, it was recognized that establishing regional priorities would be the role of decision makers, most likely after finalizing the strategy; not the role of technical advisors and practitioners during the process of developing the strategy. This is why a multi-criteria framework was proposed for consideration in Draft 1 rather than specific priorities within Draft 1.

What We Heard from Participants

Feedback received was largely supportive in principle of a regional prioritization process (*What We Heard About Draft 1*). At least one local government opposed this approach, citing that prioritization decisions should happen at the local government level, and any regional-scale prioritization should be led by the provincial government rather than through a regional flood strategy.

Comments included:

- The proposed approach would help local authorities know what they need to address on their own and what could be addressed through funding provided through a regional strategy. It could help reduce wasted effort on grant applications.
- This approach is more equitable for First Nations and small municipalities as it considers need. It could address inequities resulting from funding decisions that favour communities with the highest staff capacity, and disfavour communities with little or no capacity to prepare competitive grant applications.
- This approach would mostly prioritize high-density areas due to high population and easily quantifiable assets in the flood hazard area.
- It is unclear how equity will be assured and how agreement would be reached.

- The process of identifying and understanding priorities of different organizations could be an opportunity to further common goals and preferred risk reduction methods, making this process truly regional.
- Different ideas for prioritization of flood risk areas include performing a cost-benefit analysis, a values-based analysis, and/ or a sub-regional approach.
- First Nation communities favour an approach that focuses first on prioritizing areas for protection and/or risk reduction before discussing funding.

Additional Considerations

Incompleteness of data is an important unresolved issue. The Lower Mainland Flood Risk Assessment (LMFRA) included significant region-wide data across 5 categories and 20 sub-categories of risk. However, this project was not able to include information on First Nations communities and some critical assets. In addition, coastal flood risk assessment work is not consistent within and outside of the Fraser River flood hazard area. Section 5.3.3 acknowledged that implementing the proposed criteria would require additional data gathering and analysis. However, given limited resources, there is a limit to how much analysis could be included in a consistent manner across the region — for example, broader economic impacts, or anticipated impacts of potential risk reduction measures, could be quite challenging.

In general, there is uncertainty and disagreement about which communities would benefit from the multi-criteria approach. Some were hesitant to support a proposed framework without seeing the results of such a framework.

In addition to areas of high flood risk, it is important to consider other types of priorities. For example, priorities can also be informed by urgency or critical gaps, such as capacity constraints, knowledge gaps, and logistical considerations, which are significant considerations in addition to areas of high flood risk.

Key Question(s) for Discussion and Resolution

These questions were formulated for discussion with the Working Group and helped inform the recommendations presented in *Pathways to Action*.

- Is there a need to identify regional priorities for flood risk reduction and resilience?
- If a regional strategy should address regional priorities, what is the appropriate framework and criteria to identify regional priorities? What additional information/data/analysis is needed to implement the prioritization framework?
- What is the appropriate sequence of identifying regional priorities and developing a longer term strategic regional approach?

- Should a regional strategy or other regional approaches to flood risk reduction and resiliency also support local priorities that are important, but not necessarily identified as regional priorities? If not, how could local priorities be addressed?

Recommendations

Pathways to Action recommendations for Assess and Address Regional Priorities focus on regional priority setting actions that will reduce shared risks across the Lower Mainland.

4. Advance Flood Risk Reduction, Resilience and Climate Adaptation Actions

Strategic regional approaches to flood planning should take a high-level view on the many risk reduction and resilience measures in place across the region. The *Pathways to Action* process explored the value of a multi-criteria framework and the non-prescriptive measures that Draft 1 recommended, as well as ways to advance this topic, found in the main body of the report.

Related Content from Draft 1

Draft 1 called for studies to better understand dike-related vulnerabilities and ways to reduce risk around diking by creating plans and upgrading dike designs (Recommendations 19–21). Furthermore, land use planning policies and flood management measures were proposed (Recommendations 41–47). In Draft 1, specific measures were not recommended in a prescriptive way for specific locations or communities. The proposed funding program (Recommendation 68) was to ensure the proposed recommendations were adequately supported.

Section 5.2.2 of Draft 1 recommended developing a multi-criteria framework to guide the design, evaluation of, and funding decisions on, flood risk reduction initiatives (Recommendations 27–30). The section put forward 17 draft criteria under four categories as the basis of the proposed framework:

- Impacts on flood risk
- Alignment with existing frameworks
- Design for a range of positive impacts (e.g., ecosystem resilience)
- The planning, design and implementation process

The proposed criteria supported reducing flood risk in a way that minimized negative impacts, produced positive co-benefits, was adaptable and sustainable over time, and supported the values identified by participants in the strategy development process. It was recognized that the same approaches would not be appropriate in all circumstances. The framework provided flexibility that was responsive to unique local characteristics, conditions and circumstances of communities within the Lower Mainland.

What We Heard from Participants

There was general agreement in principle for a holistic set of criteria in the draft framework, and the development (and regular update) of an evaluation framework for flood risk reduction initiatives (*What We Heard about Draft 1*). However, there were several concerns with the proposed framework:

- The criteria, as is, are too vague and need refinement.
- It is unclear how this would be implemented.
- The framework might conflict with the current practices of permitting agencies.
- Proponents might be overburdened with requirements and forced to find token incorporations of the criteria.
- Criteria do not account for trade-offs or weighting of negative consequences.
- Several concerns focused on the weighting and integration of environmental and habitat values and outcomes in the criteria.
- The framework should incorporate lifecycle perspectives for projects.

At least one local government was opposed to the evaluation framework entirely, citing that any evaluation framework should be led by the Government of BC rather than through a regional strategy process.

First Nations and some additional organizations felt the strategy as described in Draft 1 was too broad and high-level. It was suggested that specific risk reduction measures be included going forward. This would recognize that some organizations might not have the capacity or funding required to undertake the type of multi-criteria analysis proposed by the framework outlined in Draft 1.

Additionally, some feedback on Draft 1 indicated there was an over-emphasis on dikes. Other feedback included a desire for a regional strategy to take a stronger advocacy approach for nature-based solutions and advance a paradigm shift in flood management towards resilience.

Additional Considerations

Presently, there are multiple regulatory processes and required permits and authorizations, particularly for flood protection dikes. Additionally, when it comes to climate adaptation planning, jurisdictions have expressed that current guidance is ambiguous, creating difficulty in planning to a standard. The proposed framework from Draft 1 could create more red tape, rather than streamlining the process. Without funding and capacity support to oversee and implement the framework, it might not be feasible to operationalize and could be unsuccessful.

Key Question(s) for Discussion and Resolution

- How prescriptive or enabling should a strategy or strategic regional approaches be in terms of advancing risk reduction measures?
- Is there a need for a multi-criteria evaluation framework (beyond current regulatory processes and funding criteria) to identify flood risk reduction measures that would be appropriate to implement?
- If so, what is the appropriate framework and criteria?
- Should further evaluation of measures be undertaken before completion of a regional flood strategy or later as part of strategy implementation?
- Are there other ways to provide additional information about potential risk reduction and resilience measures?

Recommendations

Pathways to Action recommendations for Advance Flood Risk Reduction, Resilience, and Climate Adaptation Actions focus the identification and development of examples of collaborative, nature-based flood management projects that advance reconciliation.

5. Strengthening First Nations Participation

British Columbia committed fully to UNDRIP on September 13, 2017, and unanimously passed the *Declaration on the Rights of Indigenous Peoples Act* in November 2019. It is a framework that recognizes existing human rights. While Draft 1 identified the need for UNDRIP and a broader reconciliation approach, it fell short in terms of adopting a rights-based approach and addressing the role of government-to-government relations.

Pathways to Action explored related content from Draft 1 and used Working Group discussions to advance ways to strengthen First Nations participation in flood related initiatives.

Related Content from Draft 1

The most notable reference to UNDRIP in Draft 1 was as a prerequisite to decision-making regarding implementation of the LMFMS (Recommendation 67).

- *67. Establish a new regional flood entity, mandated by the Government of BC, and aligned with UNDRIP, to oversee implementation of the LMFMS.*
 - *The regional flood entity would include a Board structure, composed of First Nations, local, provincial and federal governments and infrastructure providers.*

UNDRIP and the *BC Declaration Act* (DRIPA) were reinforced in Recommendation 27, which focused on the evaluation, selection, and design of risk reduction initiatives through a proposed criteria framework. This criteria framework, developed to support recommendations 27–30, which focus on methods to evaluate, select, and design flood risk reduction included alignment with First Nations reconciliation.

- *B1. Reconciliation with First Nations: How the proposed process and product are designed in ways that advance reconciliation with Mainland Coast Salish First Nations communities in alignment with DRIPA, engage meaningfully with First Nations, address historical and current inequities in flood management, and strive to protect important First Nations values.*

Section 5.3.2 in Draft 1 put forward additional recommendations to advance reconciliation with First Nations as it pertained to flood management. These recommendations called for:

- *57. Enhance capacity for First Nations governments and communities to be leaders in flood-related planning and decision-making . . .*
- *58. Enhance capacity for First Nations governments to fully participate in meaningful ways in the flood planning and decision-making of other jurisdictions to ensure First Nations values, interests, title and rights are considered and accommodated . . .*
- *59. Co-create with First Nations guidance/best practices for First Nations consultation in flood planning and decision-making . . .*
- *60. Require local governments and other jurisdictions . . . to include participation and collaboration with First Nations at the outset of flood management projects.*
- *61. Clarify and develop guidance on how to implement the BC Declaration on the Rights of Indigenous Peoples Act in flood management activities including, but not limited to, collaborative flood planning and achieving free, prior and informed consent.*
- *62. Based on the guidance that has been developed, seek free, prior and informed consent from affected First Nations in flood management planning and projects . . .*

Section 5.1.2 also looked to address information access and data sharing with First Nations.

- *9. Explore opportunities and establish protocols for including traditional knowledge and protecting/securing data and information owned by First Nations used in collaborative flood planning and decision-making.*

What We Heard from Participants

There was mixed feedback on the above recommendations (*What We Heard about Draft 1*). Many non-First Nations participants, including the Government of BC, indicated broad support for

several of the recommendations focusing on First Nations reconciliation (57–62 outlined above). However, several First Nations and local governments expressed opposition to Draft 1 due to lack of inclusivity, among other reasons.

Some comments from participants questioned whether the content of and development process for the draft strategy advanced the implementation of UNDRIP and DRIPA. The EPS submission recommended that content pertaining to First Nations be framed in the context of DRIPA and calls for DRIPA and Bill C-15 (the Federal Act respecting UNDRIP) to be applied during a regional strategy development process and by local governments and other parties during any subsequent processes. To be successful, a regional strategy and broader decisions related to flood mitigation and resilience would need Free, Prior and Informed Consent from First Nations. A collaborative, co-development approach could provide an effective pathway to consent.

Additional Considerations

Collaborative relationships are needed between First Nations governments, local governments, and all organizations leading or participating in flood planning processes. This will take time and strengthened capacity by all parties, including sustained funding for First Nations to support long-term capacity among technical staff and leadership.

Significant guidance is needed from First Nations and the Government of BC regarding roles and responsibilities in terms of respecting and implementing UNDRIP and DRIPA. Specific guidance is needed on how to support free, prior, and informed consent, such as through First Nations-led flood planning and/or collaborative flood planning processes.

Working towards a regional flood strategy might lead to the establishment of a decision-making flood governance entity (see [Decision Making](#)). For such an entity, alignment with UNDRIP would be critical, as First Nations need to be involved in decisions that could impact their rights and title.

Key Question(s) for Discussion and Resolution

- Strengthened participation of First Nations is a critical prerequisite for flood planning, including, but not limited to regional action on flood risk reduction and resilience. How can First Nations values, interests, worldviews and concerns be better included in the process and addressed in the content of regional flood action for the Lower Mainland?
- What does implementation of UNDRIP look like in flood planning?

Recommendations

Pathways to Action recommendations for Strengthen First Nations Participation focus on priority UNDRIP articles, additional funding for First Nations participation, and guidance on developing government to government relationships.

Strengthen a Strategy Development Process

Feedback on Draft 1, and subsequently over the past year, clarified that the strategy development process for the LMFMS was not satisfactory to all participating organizations. The *Pathways to Action* process explored how a regional strategy, or regional strategic approaches, would need an improved process to enable development and creation of an approach that is supported by all participants, including First Nations.

What Process Developed Draft 1

The Fraser Basin Council facilitated a process whereby input on the LMFMS was provided through meetings of the Joint Program Committee, a Leadership Committee, project-specific Advisory Committees, and over 12 workshops. As process facilitator, FBC collated and reviewed all input and prepared Draft 1 based on FBC's best judgment of what was heard. The Leadership Committee focused especially on governance and funding arrangements pertaining to strategy implementation (Recommendations 67 and 68). Terms of Reference were established for the Leadership Committee and Advisory Committees, but not for the overall LMFMS development process.

What We Heard from Participants

There was a wide range of comments from participants about the strategy development process (*What We Heard about Draft 1*). Feedback included:

- Provide more information on the process so participants have a common understanding.
- Strengthen and broaden the Terms of Reference to cover the overall strategy development process, including common guiding principles and clarity on roles, responsibilities, and lines of reporting.
- A co-development approach would be more appropriate than FBC drafting the content based on its interpretation of all input.
- The Leadership Committee should have a greater decision-making role regarding the strategy development process and strategy content.
- Participation by all organizations should be formalized, including responsibilities to represent their organizations' perspectives in the process and to brief decision makers within their organizations.
- There needs to be better inclusion of First Nations to guide the process and co-develop the content. Capacity funding and an appropriate timeline are critical to support this.

Additional Considerations

In response to feedback received and emerging process challenges, FBC sought external, expert advice on ways to strengthen the process. The primary recommendation was to develop an updated Terms of Reference as an overarching agreement for working together to create a shared set of expectations and accountabilities that would better guide the overall process to develop a regional flood strategy. This would clarify common guiding principles, roles and responsibilities, how the various committees fit together, and other process considerations.

Key Question(s) for Discussion and Resolution

- How can the LMFMS development process be strengthened to be more inclusive and effective?

Recommendations

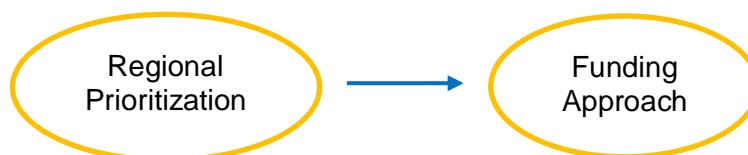
Pathways to Action recommendations for Strengthen a Strategy Development Process focus on establishing a leadership table that would support direction on strategic regional approaches to flood risk reduction and resilience in the Lower Mainland.

6. Secure Funding

The LMFMS initiative found broad agreement for the need to enhance funding to reduce flood risk and increase resilience in the Lower Mainland. The *Pathways to Action* process explored methods to understand who should make funding decisions, what criteria to use, how regional and local priorities should be considered, and whether or not a region-specific funding program for the Lower Mainland is needed.

Related Content from Draft 1

Regional Prioritization Leads to Funding Decisions:



To address the shared desire by participants in the LMFMS to enhance funding for flood risk reduction and resilience, Draft 1 proposed a stable long-term funding program to support implementation of a regional flood strategy. This program would coordinate funding decisions based on the identification of priorities at a regional scale, for example, based on relative flood risk, as well as capacity and equity considerations. There is a need for both (a) a process for equitable, transparent prioritization of flood risk areas, and (b) a more predictable, long-term funding approach for a variety of flood assessment, planning, and risk reduction and resilience initiatives.

To allow for a thorough process to explore and address these areas of disagreement, Draft 1 proposed that a newly formed regional decision-making entity would make decisions on regional prioritization after the strategy was finalized.

Section 6.1.2, Recommendation 68 of Draft 1 recommended establishing a long-term, stable funding program to support implementation of a regional flood strategy and regional-scale flood risk reduction. It would implement regional, sub-regional and local initiatives aligned with the LMFMS, and support the operations of the regional flood entity proposed in Draft 1. The funding program would potentially be administered by the proposed regional entity, with either decision-making or advisory roles.

- *68. Establish a long-term, stable funding program to support implementation of the Lower Mainland Flood Management Strategy. The primary purposes would be to:*
 - a. *Implement LMFMS recommendations, such as:*
 - *Technical information and analyses, such as flood hazard modelling, flood mapping and flood risk assessment*
 - *Inter-jurisdictional, multi-sectoral flood mitigation planning at local and sub-regional scales*
 - *Enhance financial resources available for First Nations*
 - *Training and capacity building*
 - *Communications and public education*
 - b. *Implement projects, policies and programs aligned with the LMFMS, such as:*
 - *Structural and non-structural flood risk reduction measures (e.g., dike improvements, green infrastructure, floodproofing, and integrated flood management plans)*
 - *Associated costs, such as land acquisition, rights-of-way, environmental assessments, consultation and engagement and other related project costs*

A sample budget over the initial 5 years of the program was provided in Draft 1 along with the recognition that a larger and longer-term budget was ultimately required to substantially reduce flood risk across the Lower Mainland. This was critical for considerations of increased flood hazards resulting from climate change.

What We Heard from Participants

Although many participating organizations strongly supported the provision of stable, dedicated, long-term funding to advance proactive flood planning, risk reduction and resilience, and, there was considerable uncertainty and some disagreement around the funding process that Draft 1 proposed (*What We Heard about Draft 1*).

Some were concerned that the proposed regional funding program this may limit access by local governments in the Lower Mainland to other province-wide funding programs. Some local governments, typically with more staff capacity, have been very successful in securing flood-related funding through competitive grant applications to provincial or federal governments, and are satisfied with the current process. A concern from the provincial government revolved around potentially diminished decision-making ability, and the need to ensure accountability for funding decisions. Small communities would also have challenges if local cost-sharing is required through

a proposed regional funding program. Other feedback received following Draft 1 of the LMFMS included:

- Uncertainty/disagreement about where funding would come from: some local governments assert the funding should come from senior governments; the Government of BC has expressed that there should be contributions by other parties.
- Concerns about accountability and equity.
- Uncertainty and concern regarding impacts to local authorities' access to other funding sources (especially to address local priorities).
- Implementation costs (budget table in Draft 1) seem to be arbitrary and premature.
- Budget does not indicate what resources will be needed after the initial funding period.

Additional Considerations

There has not been a major, multi-decade, flood funding program specific to the Lower Mainland since the Fraser River Flood Control Program (approx. 1970s–1995). This program was limited to upgrades to flood protection dikes and associated works, such as pumps and flood gates. While a more integrated and holistic approach would be needed in the Lower Mainland today, the idea of a multi-decadal funding program being applied at a regional scale remains relevant.

More work is required for all four orders of government to agree on the source(s) of funding, the associated cost-sharing arrangements, and the approach to funding. Asking for a region-specific funding program to implement a flood strategy in the Lower Mainland is a significant request to make of the provincial and federal governments compared with simply accessing BC-wide and/or Canada-wide funding programs. Other regions throughout the province and country may perceive special treatment for the Lower Mainland if a region-specific program were established.

Additionally, more clarity and certainty are needed regarding impacts on local authorities' access to other funding sources and what initiatives would be eligible for funding through a regional funding program.

The table below illustrates some of the potential pros and cons of a Lower Mainland-specific funding program:

Approach	Pros	Cons
Lower Mainland Funding Program	<ul style="list-style-type: none"> • Tailored to specific Lower Mainland needs. • No need to compete with proposals outside the Lower Mainland. 	<ul style="list-style-type: none"> • Significant work required including financial/policy analysis. • Would likely require legislative change or Order in Council.
BC-Wide and Canada-Wide Funding Programs	<ul style="list-style-type: none"> • Simplicity of administration. 	<ul style="list-style-type: none"> • Current funding levels are inadequate. • BC/Canada programs are not necessarily designed for Lower Mainland needs. • Lower Mainland proposals would compete with other regions, provinces.

Key Question(s) for Discussion and Resolution

- Should a regional funding program be part of a regional flood strategy?
- What is required for provincial and federal governments to agree to fund a program in the long-term?

Recommendations

Pathways to Action recommendations for Secure Funding focus on dialogue around the design and implementation of a regional funding approach to catalyze action on flood risk reduction and resilience.

7. Strengthen Regional-Scale Decision-Making

The concept of a regional flood entity to implement the LMFMS was developed through the Leadership Committee *and refined* to include a Board structure composed of all orders of government to ensure that broad voices would be heard. The *Pathways to Action* process considered ways to inform an approach to decision-making that is tailored to the Lower Mainland.

Related Content from Draft 1

Section 6.1.1, *Recommendation 67* of Draft 1 recommends establishing a regional entity to implement and oversee implementation of the LMFMS.

- *67. Establish a new regional flood entity, mandated by the Government of BC, and aligned with UNDRIP, to oversee implementation of the LMFMS.*
 - a. The regional flood entity would include a Board structure, composed of First Nations, local, provincial and federal governments and infrastructure providers.*

- b. *The primary purposes of the regional flood entity would be to:*
 - i. *Implement/oversee implementation of the LMFMS; and*
 - ii. *Support and strengthen regional coordination and collaboration.*
- c. *The regional flood entity would be supported by professional staff to be determined in relation to the scope of roles and responsibilities of the entity.*
- d. *The overarching role of the regional flood entity is to implement and oversee implementation of the LMFMS.*

Proposed purposes for the entity included:

- Delivering regional-scale technical, communications and education services.
- Establishing regional priorities.
- Advising on or delivering funding decisions for risk reduction initiatives (using the prioritization and evaluation frameworks proposed in sections 5.3.3 and 5.2.2)
- It was proposed that the entity **would not** assume current responsibilities of existing jurisdictions.

What We Heard from Participants

While many organizations supported this concept, at least one organization was opposed, and others expressed concerns or had questions to be resolved (*What We Heard about Draft 1*). There was a concern that the creation of a regional entity could reduce current authority and autonomy at the local or provincial levels. Regarding funding decisions, it could be seen as taking away power from the Government of BC by including local and First Nations governments at the proposed regional decision-making table. There were also concerns raised about ensuring transparency and accountability, and about the types of decisions made through a regional flood strategy, which may influence potential impacts on rights and title.

Questions and/or concerns posed by participating organizations, included:

- Existing organizations have limited capacity and various biases, so an independent body that includes all orders of government is necessary for successful implementation.
- Some support for the entity, but only in tandem with a long-term funding program and/or if it means immediate action.
- Some see the entity as a decision-making body, while others believe the entity should only have an advisory role and not implement the strategy or make funding decisions.
- It is unclear how the entity would be considered legitimate and held accountable for funds received.

Additional Considerations

The *BC Flood Strategy* is looking at the issue of flood governance across the province. Depending on directions provided through the *BC Flood Strategy*, alternatives to a regional flood entity may need to be considered to address strategy implementation and potential entity roles. These could include delivering regional-scale technical, communications and education services, establishing regional priorities, and advising on or delivering funding decisions for risk reduction initiatives.

It could take one or more years, and potentially legislative amendments, to establish a proposed regional entity if it were to have decision-making authority. If the regional entity concept is removed, it should be replaced by a viable alternative to ensure successful implementation of flood risk reduction and resilience actions.

Key Question(s) for Discussion and Resolution

- What options should be considered to address the identified gaps regarding regional-scale coordination and collaboration?

Recommendations

Pathways to Action recommendations for Strengthen Regional-Scale Decision-Making focus on the importance of provincial guidance and guidance of the *Pathways to Action* proposed leadership table to advance regional-scale decision-making.

8. Refine Strategy Purpose and Goals

The overall purpose of the strategy was to reduce flood risk, including through increasing resilience in the Lower Mainland. Recommended actions throughout *Pathways to Action* focus on advancing this purpose, and this topic includes the supporting information that informed discussions on this topic.

Related Content from Draft 1

The LMFMS was a collaborative, multi-jurisdictional, multi-interest initiative to promote shared ownership in holistic, regional-scale approaches to flood risk reduction and resilience, particularly among all orders of government. Draft 1 of the strategy aimed to recommend a comprehensive suite of actions to support risk reduction and resilience in the region, including strengthening regional flood risk governance in the Lower Mainland.

In Draft 1, the LMFMS centered on three goals for reducing flood risk (informed by three of the four priority areas of the Sendai Framework for Disaster Risk Reduction):

1. Improve Understanding of Lower Mainland Flood Risk and Increase Awareness

2. Support Investment and Actions to Reduce Flood Risk, Avoid the Creation of New Risk, and Build Resilience of Communities, Ecosystems and Critical Infrastructure
3. Strengthen Flood Risk Governance in the Lower Mainland

The Draft 1 goals were informed by the participating organizations in Phase 1, who recommended a focus on proactive, preventative approaches to flood risk reduction and resilience in the Lower Mainland (areas vulnerable to Fraser River and/or coastal flooding). Although the adverse impacts of historical flood protection measures on First Nations title and rights, including the environment, were acknowledged, the potential for the LMFMS to redress these issues and advance reconciliation was not fully examined.

What We Heard from Participants

Some organizations were very supportive of the goals outlined in Draft 1, but others expressed that it fell short of their expectations of a regional flood strategy (*What We Heard about Draft 1*). Some comments included:

- The fourth Sendai priority (preparedness, response, and recovery including Build Back Better) should be more explicitly included in the strategy.
- The strategy should go beyond the original focus of reducing flood risk. It should also:
 - Address the impacts of past and current flood planning practices/activities on First Nations communities.
 - Address the impacts of past and current flood management practices on floodplain ecosystems and habitats. The environment should be a bigger part of the strategy with actions to improve the environment (e.g., habitat restoration) and reduce or remediate the environmental impacts of past, present and future flood risk reduction activities.

Additional Considerations

Draft 1 stated that the initiative’s focus was on proactive mitigation and less on emergency management (the fourth Sendai priority area). However, in response to feedback particularly from First Nations, Draft 1 included “Improved capacity for emergency preparedness, response, and recovery” as an objective and recommends actions (Numbers 3, 48–50, and 54) to address flood preparedness, response, and recovery — particularly the needs raised by First Nations.

While the focus was on reducing flood risk, Draft 1 acknowledged the negative consequences of past and current flood control practices (e.g., dikes) on First Nations communities and natural ecosystems. It included recommended actions to enable the planning, design, and implementation of future risk reduction and resilience actions for reconciliation, and for better environmental and other outcomes (e.g., Numbers 27–30, 37, 57–62).

Key Question(s) for Discussion and Resolution

- Should there be more content on flood preparedness, response, and recovery, and if so, how much more should the strategy include?
- Should the strategy add the goal of — and more direct actions for — addressing the negative impacts of past and current flood mitigation practices?
- What does a successful regional flood strategy look like and mean to participants?

Recommendations

Pathways to Action recommendations for Refine Strategy Purpose and Goals focus on the importance of flexible and iterative regional approaches that incorporate the four Sendai Framework priorities, are informed by past and ongoing impacts of flood management activities on First Nations and align with other flood-related initiatives.

9. Clarify Geographic Scope and Flood Hazards

The LMFMS initially addressed lower Fraser River freshet flooding and coastal flooding in the Lower Mainland, and during engagement on that strategy, some First Nations wanted additional flood hazards to be considered (e.g., other rivers, groundwater, dam releases, etc.) Furthermore, the November 2021 atmospheric river flooding demonstrated the regionally significant consequences of that type of flood event. The *Pathways to Action* process explored the trade-offs between a strategy or strategic approaches that are more narrowly scoped and those that are more holistic and comprehensive.

Related Content from Draft 1

Informed by early advice and guidance from local, provincial, and federal government participants and other entities, the LMFMS initially addressed lower Fraser River freshet flooding and coastal flooding in the Lower Mainland. As such, a wide range of Fraser River and coastal flood hazard scenarios, including climate change scenarios through the year 2100 were modelled, mapped and/or otherwise assessed to inform the strategy. During LMFMS engagement, some First Nations wanted additional flood hazards to be considered (e.g., other rivers, groundwater, dam releases, etc.). The November 2021 atmospheric river flooding demonstrated the regionally significant consequences of that type of flood event.

The geographic extent of the strategy was originally defined to encompass the area east to Hope, west to the Salish Sea, north to Squamish, and south to the US border. The LMFMS' focus was on analysis and actions to reduce risk for two flood hazards considered “regionally significant” in the Lower Mainland — the Fraser River freshet and coastal winter flooding — largely due to their regional, multi-jurisdictional impacts if a major flood of either type were to occur. Draft 1 stated: “The LMFMS does not address other types of floods that may impact individual communities, such as flooding from rivers or creeks, urban flooding from heavy rain events, landslide or debris flow

floods, or tsunamis. While important, these flood hazards are more manageable for local authorities with less need for region-wide collaboration and coordination.”

In terms of the flood magnitude considered, much of the technical analysis, the context section of Draft 1, and messaging for the initiative focused on a “major” Fraser River or coastal flood in the region, as this was the original impetus for the LMFMS. Draft 1 (Recommendations 63–66) included consideration of large and small flood events of varying frequencies and areas at risk from smaller/frequent floods. The definition of “regionally significant” may need to be further considered with recognition of the regionally significant consequences of the 2021 atmospheric river flooding.

What We Heard from Participants

There were some suggestions to adjust the geographic area covered by the strategy (*What We Heard about Draft 1*). These were as follows:

- Consider expanding or reducing the geographic scope with further consideration of the benefits or other implications of being in or out of scope (e.g., the need for additional technical analysis, eligibility for LMFMS-related funding, etc.).
 - Undertake additional analysis for better coverage and consistent treatment of:
 - Fraser River and coastal hazard modelling and risk assessment
 - First Nations and other communities
 - Extend upstream on the Fraser River to include Yale
 - Expand to include analysis of the entire Fraser River Basin, including upstream impacts (e.g., logging, wildfires, water storage, etc.) on flood hazards in the Lower Mainland

Comments, largely but not exclusively from parties representing or working with First Nations, asked for the flood hazard scope to be broadened.

- Additional flood hazards (including flooding from tributaries and creeks, groundwater/seepage, rainfall-generated, dam-release) should be included in the strategy — or the strategy should more clearly explain why they are excluded. The strategy should also address seismic, subsidence, and erosion hazards.
- Suggestions for how these other hazards should be included range from simple acknowledgement to undertaking technical analysis (modelling, ground-truthing, etc.). They also suggested including risk reduction actions that address these hazards and having the proposed regional funding program provide for addressing these hazards.
- The strategy should more greatly emphasize planning for climate change.

- The strategy is too focused on the design flood scenario (e.g., approximately 500-year or 0.2% AEP event); it should address smaller, more frequent flood events, and prioritize bringing unprotected communities up to a baseline level of protection.

Additional Considerations

Equity and inclusion are important aspects for strategic regional approaches to flood risk reduction and resilience. For example, some First Nation communities are more vulnerable to flood hazards other than Fraser River and coastal flooding, so their primary interests are presently outside of the scope of Draft 1 of the LMFMS and the supporting technical analysis. Additionally, some participating organizations' jurisdictions were geographically outside of some of the hazard/risk modelling, mapping, and analyses.

Some communities opted out of regional analyses because they were undertaking more detailed local analyses (e.g., District of Squamish), while inclusion of several communities was limited by the availability of data (e.g., data unavailable on First Nations Reserves resulted in under-representation of First Nations in the *Lower Mainland Flood Risk Assessment*). In particular, additional information was needed to include First Nations interests within a risk-based process of regional prioritization and associated funding.

Many actions recommended in Draft 1 were not exclusive to addressing Fraser River freshet and coastal storm surge and sea-level rise, and so could indirectly help address other flood hazards, such as tributary flooding. Furthermore, flood hazard areas can intersect with areas susceptible to other hazards, such as coastal lands that may subside and/ or liquefy in the event of an earthquake. To successfully reduce risk and increase resiliency in the Lower Mainland, an all-hazards lens should be considered.

Depending on the goals and expectations of the four orders of government, additional flood hazard scope could have implications for the required technical analysis, a regional prioritization process, regional funding approach, and recommended risk reduction actions. For example, if additional technical analysis on these hazards is needed, the timeline for prioritization, the magnitude of budget, and the optimal risk reduction measures could be impacted.

Key Question(s) for Discussion and Resolution

- Should the area for a regional flood strategy in the Lower Mainland be expanded from the LMFMS' extents? If so, to what extent should it expand and in what ways?
- Should a regional strategy continue its focus on "regionally significant" flooding (i.e., a major Fraser River or coastal flood)? Does "regional significance" need to be redefined? If so, how?
- Should a regional strategy include other flood sources that have been out of scope for the strategy but that are of significant concern to some communities? If so, which ones?

Recommendations

Pathways to Action recommendations for Clarify Geographic Scope and Flood Hazards focus on opportunities for alignment with other initiatives, and the importance of iterative strategic regional approaches to further consider additional hazards aside from Fraser River freshet and coastal flooding overtime.