Fraser Valley Flood Resilience Tour

MAY 14, 2024

A site visit to Valedoorn Farm

This report was prepared by the Lower Fraser Floodplains Coaliton. Facilitation for the May 14th Flood Resilience Tour was provided by Dave Zehnder, with support from Mariah Mund and Lina Azeez. Special thanks to our table facilitators and notetakers from UBC, West Coast Environmental Law, and the Fraser Valley Watersheds Coalition who captured the vibrant discussions and suggestions for action. Photos were taken by Lina Azeez, Deborah Carlson, Mariah Mund, and Emily Chabot. The report was designed by Hanna Araza and developed by Nadine MacDonald.

Hooge wetland created in 2019 as an extension of Peach Creek to promote juvenile salmon rearing and overwintering. Photo Credit: Fraser Valley Watersheds Coalition

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Background

The confluence of the Vedder Canal and Sumas River

The Lower Fraser Floodplains Coalition (LFFC) brought farmers and First Nations together for the first time in February 2023 at Shxwhá:y Village. This decision was a result of previous forums where five principles for working together towards floodplains resilience were agreed upon by regional players, including First Nations, municipal governments, regional districts, and federal / provincial agencies.

Two of the five LFFC Principles for Working Together inspired the work between farmers and First Nations, those being "everyone is part of the solution" and "sustainable economies and resilient communities for the long term." There is an understanding that farmers and **First Nations in the Lower Fraser are disproportionately impacted by flood risk**, and therefore have an important part to play in developing solution to reduce risk and build resilience. The Lower Fraser region plays a role in the vitality of our economy, ecology, and culture. In terms of food security, this region is highly productive, generating over 50% of farm receipts in the province. It is an area essential to First Nations' economies, cultural identity, and community resilience. Underlying all of this is the ecologically sensitive and biologically significant nature of a region that is home to one of the most prolific salmon-bearing rivers in the world. Ensuring the region's ability to withstand inevitable flooding is therefore vital for many reasons.

After our first gathering at Shxwhá:y Village, **farmers and First Nations agreed it was important to continue building relationships**, so the Lower Fraser Floodplains Coalition has continued to create opportunities to gather and learn together. In December 2023, we organized a First Nations Place Names tour and we plan to gather again before the end of 2024 for further dialogue. At each gathering, we move the needle toward an Action Plan for First Nations and farmers that complements the work the LFFC is undertaking to support relationship-building for floodplain resilience.

On May 14th, 2024 we hosted the second event of the series, "The Fraser Valley Flood Resilience Tour." This tour brought together 13 guests from the farming community and 10 from First Nation communities. There was also representation from the Province of BC from the Ministry of Agriculture and the Ministry of Water, Lands, and Resource Stewardship totalling 37 participants.

For this tour, participants visited 3 sites to learn about flooding challenges and potential solutions. Our final stop was Seabird Island, where we broke bread together and continued discussion on specific actions for a roadmap towards floodplains resilience for farmers and First Nations.

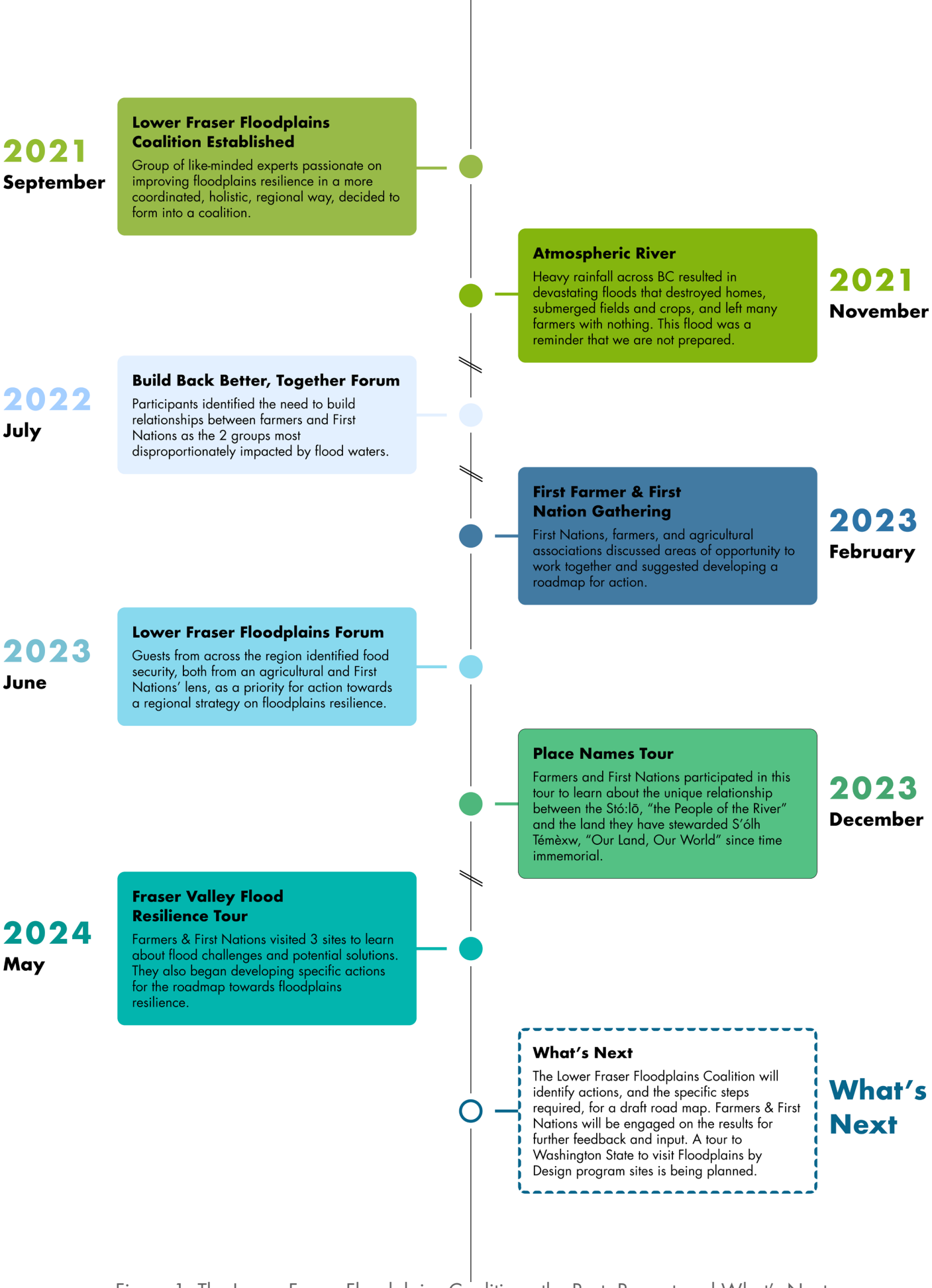


Figure 1. The Lower Fraser Floodplains Coalition - the Past, Present and What's Next

Site Visits

Tolmie Road Blueberry Farm

After the devastating November 2021 floods, Jaswant Dhillon, a blueberry farmer found himself at the heart of the disaster, with his farm submerged under 20 feet of water for 27 days. This led to significant losses, including all of his mature blueberry crops, his home and personal belongings. Dhillon couldn't return home for seven months as he grappled with the aftermath.

Guests listen to Dhillon at his farm in Abbotsford

To rebuild, he is undertaking a lengthy process that includes removing the flood-inundated blueberry plants and replanting his 20-acre farm, costing approximately $50,000 per acre. While the Agriculture Recovery Program covers most of these costs, the blueberry crops will take around five years to produce, resulting in annual losses of $50,000 to $70,000. Anju Gill, the Executive Director of BC Blueberry explained that on average, recovery combined with yield losses until plant maturity have resulted in losses of $122,000 per acre.

Additionally, Dhillon spent over half a million dollars to rebuild his submerged home, which wasn't covered by insurance. The farmer criticized the government's lack of action in building resilience, particularly citing the City of Abbotsford's failure to drain and clean ditches despite paying $30,000 in taxes for these services.

Many farmers face similar risks unless they invest in enhancing resilience. In an attempt to protect against future flooding, the farmer brought in a laser leveling machine to create a two-foot slope to improve drainage on his property. The farmer still fears future flooding, acknowledging that the steeper slope would not prevent the flood waters from inundating his home if levels were the same as the November 2021 flood.

KEY TAKEWAY

Dhillon, and his neighbours, feel left behind by the government. Flood damages have cost him thousands to repair and years of future losses. Reducing flood risk in the area feels unfeasible until the government steps in to better support farmers. Participants reflected that with the right partnerships, nature-based options could be applied to benefit his farm and neighbouring farms.

Vedder River Floodplains Resilience Project

Next, our bus visited the Vedder River Floodplain. Land use on both sides of the Vedder River varies: agricultural lands used for silage and pasture animals, community water wells, recreational use through green spaces, trails, parks, and park amenities. To enhance the area's natural habitat, while reducing fire and flood risk for the community, the Fraser Valley Watersheds Coalition (FVWC) led a multi-year restoration project on the North bank of the Vedder River.

Guests learn about the Vedder River Floodplains Resilience Project

The dike infrastructure built in the mid-1900s had a main dike close to the Vedder river and a setback dike further back. The distance between the two dikes varies between 50m to over 100m. In between the two dikes are spur dikes that move water from into the main channel and away from the setback dike should the river overtop the first dike. The setback dike system allowed for floodplain restoration work to be completed between the two dike systems while maintaining the integrity of the dike.

The purpose of this restoration was to:

- Create more off-channel aquatic habitat to benefit salmon, steelhead and wildlife.
- Restore floodplain values, including replacing invasive species with native plants that are conducive to riparian areas.

Considerable care and attention went into designing the off-channel aquatic habitat known as Hooge Wetlands.The designs considered spawning, rearing and overwintering habitats for salmon, steelhead and species at risk, such as the Salish Sucker. The riparian planning considered FireSmart plants that are both water and drought tolerant and promote increased diversity while being appropriate for riverine floodplain ecology. Many of these plants also hold important First Nation values. Replanting efforts considered sightlines for trail users and adjacent land values. A key consideration was the plants and bioengineering efforts used were to act as catalysts for succession and natural processes to carry forward. These replanting efforts need maintenance for them to fully establish and function as intended. McFaden Pond was constructed and connected to Hooge Wetlands to capture logs and debris during high streamflow events to prevent debris from impacting railway crossings and transportation corridors. This project resulted in a 2000m^2 (hockey rink-size) area of new aquatic habitat, thousands of trees and shrubs replanted by hundreds of volunteers, and the rewatering and creation of 2 km of salmon habitat. Learn more about the project here.

Guests standing on the little dike with Hooge Wetland behind them

During the November 2021 Atmospheric River event, parts of the Vedder River dike were overtopped, but not at the Hooge Wetland. Here, the water was still mostly clear, and salmon and steelhead were observed using these off-channel habitats to spawn. These off-channel habitats, which rely predominantly on groundwater, became a "salmon insurance policy" in that they enabled salmon to swim away from the high waters of the mainstem and spawn safely in these smaller, safer side channels protected by dike wetlands. Learn how salmon survived the 2021 floods, by watching this video.

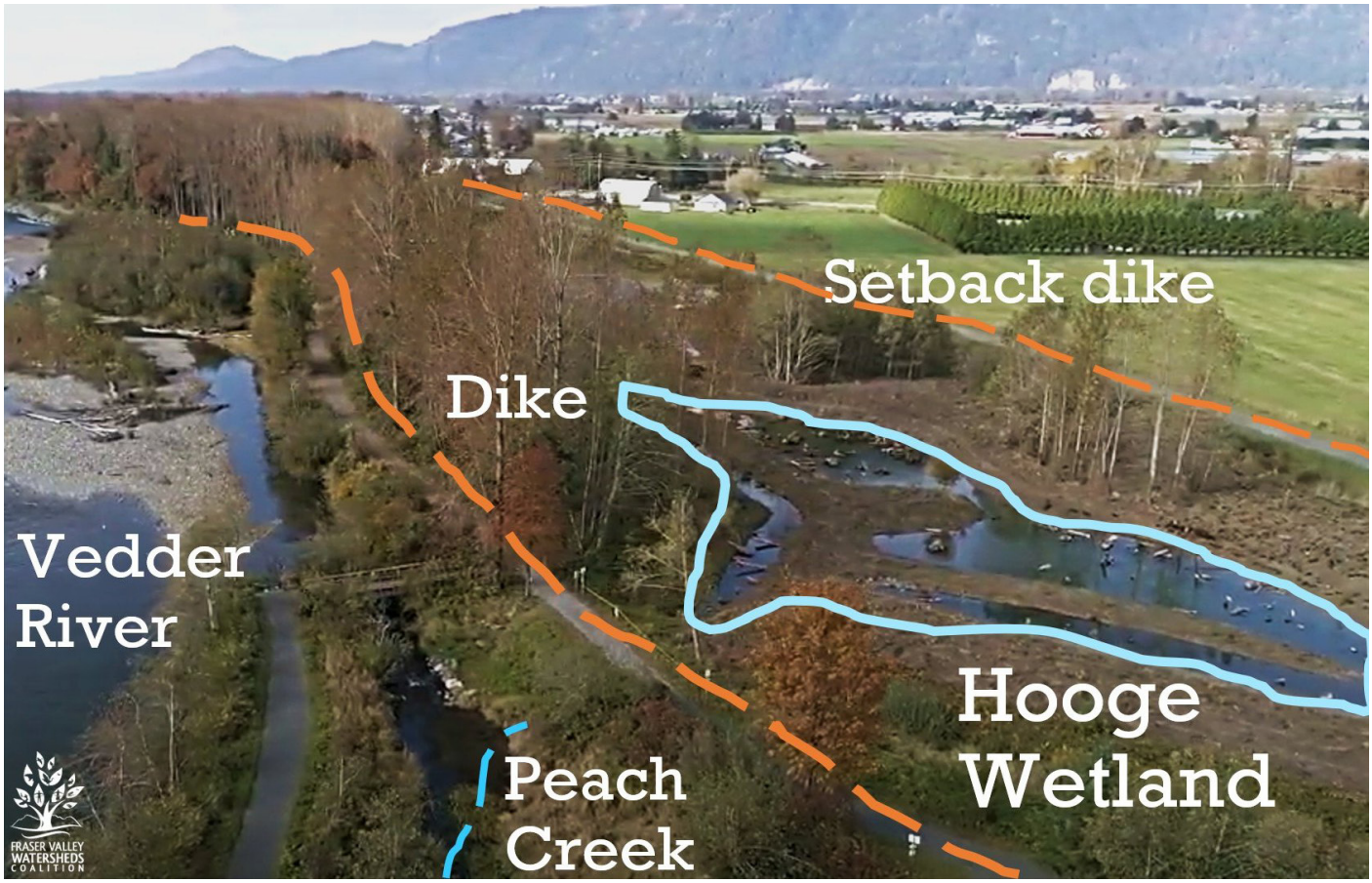


Figure 2: Hooge Wetland makes room for water by adding a setback dike, water can be stored between the dikes during high water flows. Photo Credit: Fraser Valley Watersheds Coalition

KEY TAKEWAY

Solutions to on-farm flooding are possible in the floodplain. Solutions do not always require flood control infrastructure like floodgates and pumps. Solutions can complement dikes and infrastructure - and in some cases, this can offer increased protection for off-channel habitats and genetic diversity during extreme events. Within the diking system, there is an opportunity to use "room for water" concepts and allow many other values to co-exist in floodplains (agriculture, water wells, recreation, cultural and traditional uses). Furthermore, this solution showcased that nature-based options can also account for the values of those living in the community.

Valedoorn Farm

Tom Hoogendoorn's farm borders two kilometres of riverbank. It showcases progressive agricultural practices in collaboration with various organizations like the Watershed Coalition, Farmland Advantage, and Cheam First Nation. Hoogendoorn embraces this progressive approach because of the benefits he has received: riparian planting along the waterway prevents erosion of arable land, native species have made his farm a more liveable environment with calmer winds and a pleasant view, and financial compensation ensures that Hoogendoorn is able to make these decisions without assuming exorbitant costs.

Touring Valedoorn Farm

During a riparian area tour on his property, Hoogendoorn demonstrated the benefits of his restoration efforts, supported with complimentary efforts from the Farmland Advantage Program. Clearing invasive species and planting trees and shrubs along sloughs provided shade, cooler temperatures, and improved water quality. Notably, the removal of a floodgate facilitated the return of coho salmon to Agassiz slough, highlighting the interconnectedness of restoration efforts. Furthermore, the presence of dead trees and shrubs created habitats for various wildlife and accelerated water flow, deepening river areas. Hoogendoorn also addressed water scouring issues near his house by implementing measures like wattle fences and windbreak vegetation, enhancing overall ecological complexity.

While this farmer embraces innovative techniques, not all farmers, especially in the dairy sector, share this enthusiasm. Participants learned it's crucial to gain buy-in from major producers for widespread adoption. The farmer identified that building relationships among stakeholders, independent of government intervention, is crucial for widespread adoption, as it allows for healthier relationships and educational opportunities to make choices that benefit the entire community.

Participants learn about riparian planting benefits at Valedoorn Farm

KEY TAKEWAY

On farm waterway restoration is beneficial to the community, and done the right way, is also beneficial to the farmer who implements innovative practices. When holding a community-based context, small changes on your farm that allow for benefits such as new salmon habitat can evoke strong positive emotions.

Dialogue Towards Action

Following the morning field trip, the tour ended at Seabird Island Nation where attendees had lunch and spent the afternoon in presentations and discussions to guide the creation of a draft Road Map. The following are summaries of the presentations.

Food Security and Food Sovereignty

On behalf of West Coast Environmental Law, Jessica Mukiri (UBC PhD candidate) conducted research on Agricultural Land Use Regulations (ALR) in relation to Indigenous food security. She highlighted how **laws have historically marginalized Indigenous peoples** regarding food access, intersecting with land appropriation and colonization issues. While food security focuses on access to safe and nutritious food, **food sovereignty emphasizes Indigenous peoples' rights to define and maintain their own food systems.** [1]

Mukiri's case study revealed that Indigenous communities disproportionately suffer from food insecurity despite Canada's status as a major food exporter. Colonial practices have weakened Indigenous food systems, underscoring the need for policy changes to address food-related issues. She recommended **shifting ALR management towards "food lands" management** and integrating Indigenous food security and sovereignty into land use planning.

Dylan Sherlock, Director for Food Security and Climate Strategies from the Ministry of Agriculture, discussed the government's response to food security concerns, particularly after the wake-up call of the November 2021 floods. He noted that climate change exacerbates extreme weather, impacting food production. The government aims to foster collaboration across departments to address these challenges holistically. They recognize the need to support farms while broadening their scope to consider diverse agricultural practices and Indigenous food needs.

Discussion participants emphasized the importance of interdepartmental collaboration, acknowledging Indigenous perspectives, and maintaining positivity amidst challenges like climate change, flooding, food security, and reconciliation. **Breaking down silos within governments and taking a holistic approach were highlighted as essential steps forward.**

Sherlock and Mukiri providing insight into food security

Participants discuss action steps to improve educational and relationship building opportunities

Developing a Draft Road Map for Action

In February 2023, at the first farmers & First Nations gathering, guests discussed the need for a road map towards action. This road map would be a way for farmers and First Nations to work together to build better relationships that support each other's values and needs and take action to adapt to flooding. Using recommendations from previous gatherings, we asked guests to discuss, in greater detail, what a one-year road map for action would include. The breakout sessions were separated into three groups based on major themes from our first gathering. These themes are: shared learning and strengthened relationships, reducing flood risk and its associated impacts, and multi-beneficial floodplains management.

SHARED LEARNING & STRENGTHENED RELATIONSHIPS

Farmers and First Nations understand that learning together is a foundation upon which strong communities are built. When we work together, we can develop meaningful strategies that account for one another's priorities, receive greater funding support from federal and provincial governments, and ensure that solutions benefit everyone. To successfully work together, guests at previous gatherings highlighted the need to continue engaging with one another and to learn about new approaches to floodplains management that can be utilized. During this breakout discussion, attendees identified high-level actions that could move us forward. Three themes emerged: technical/data gathering, farmer outreach/education, and relationship building between farmers and First Nations. Attendees then brainstormed specific steps that would help them and their communities make better decisions to support the overall goal of floodplain.

Key Actions from Shared Learning & Strengthened Relationships Breakout Session

Create and distribute educational resources on nature-based options on farmlands

Identified next steps

1. Compile information for on-farm actions
2. Use farmer magazines to spread the word
3. Share the business case (eg: Tom's farm)
4. Introduce the LFFC and farmer + First Nation work (e.g. CountryLife; Tractor)
5. Diversity and translation information
6. Engage with agriculture advisors
7. Attend AgriFair

Responsible Parties

Lower Fraser Floodplains Coalition
Leaders

BC Agriculture Council + Other Producer Associations
Supporters

Ministry of Agriculture
Supporters

Resources Needed

funding | staff capacity | translation support | cultural support

Map inventory of farmlands and food systems, including First Nations' foods

Identified next steps

1. Identify land uses
2. Identify areas of potential conflict of land uses
3. Identify salmon habitat, wapato, forests and berry picking areas
4. Identify unused farmland

Responsible Parties

Ministry of Agriculture
Leaders

Lower Fraser Floodplains Coalition
Supporters

Resources Needed

funding | staff capacity | access to data

Facilitate relationship building to share an understanding of food systems and resilience

Identified next steps

1. Continue with the field trips, gatherings and webinars
2. Explore opportunities for land matching programs
3. Engage First Nations at the subregional scale

Responsible Parties

Lower Fraser Floodplains Coalition
Leaders

RESOURCES AND KEY CONTACTS

First Nations Partnerships

- Sto:lo Tribal Council
- Sto:lo Nation
- Sonny McHalsie, Sto:lo Research and Resource Management Center
- S'ólh Téméxw Stewardship Alliance
- Steve Clegg, SAY Lands

Academic Partnerships

- Teresa Carlson, University of the Fraser Valley
- Support student-led research projects

Agricultural Partnerships

- Producer groups/farm associations
- Farmland Advantage
- Carla Soutar, ProAction (rep) BC Dairy
- S'ólh Téméxw Stewardship Alliance
- Steve Clegg, SAY Lands

Environmental Partnerships

- Fraser Valley Conservancy
- Fraser Valley Watersheds Coalition
- Langley Environmental Partners Society

REDUCING FLOOD RISKS & ASSOCIATED IMPACTS ON FOOD SECURITY

At previous gatherings, it has become clear that flood risk, specifically as it pertains to food security, is not completely understood. From an agricultural lens, we do not know which fields or crops are most at risk, and how critical infrastructure related to the agricultural sector (e.g. roads needed to get food to market) may be impacted by flood events. First Nations' food sovereignty is also important to food security and is at risk during flooding, as flood waters impact salmon habitat, decreasing First Nation ability to fish or gather traditional foods.

At this table, participants were given the opportunity to share about flood risks that impact food security and identify the steps required to understand and then mitigate those risks. Participants could discuss specific actions, who would/should be involved, and resources required to reduce or prepare for risk.

Risks and Proposed Actions from Flood Risks and Food Security Breakout Session

Producers cannot get crops to market during flood events

Identified next steps

1. Complete a more in-depth supply chain analysis to determine where critical food supplies are produced and processed
2. Create a full life cycle product path/process including supply and demand, marketing, etc.
3. Stockpile food and supplies outside of floodplains in anticipation of flooding. Identify how much food would be stockpiled at individual, community, region, provincial, and federal level given how much of the country's food passes through the Fraser Valley. (e.g. X days of reserve for each level)
4. Explore different methods of transportation and storage of agricultural products when typical corridors are down

Responsible Parties

Ministry of Agriculture
Conducting an analysis of the Lower Mainland transportation corridor disruption and the effect on the food system

We don't understand how flood impacts food security or food sovereignty

Identified next steps

1. Review the issues around food security and food sovereignty as it relates to both First Nations and settler residents to understand the full impacts of flood related actions

Flood waters breach agricultural land, inundating fields & disrupting crop production

Identified next steps

1. Map at-risk areas and determine which areas will be affected, and to what degree under different flood scenarios. Determine the kinds of overland flows including the speed and volume of the flow if possible
2. Get the water off the fields faster
3. Explore the use of more setback dikes and double diking systems (consider insurance, land purchases, shared responsibility, regulations)
4. Assess appropriate cropping practices between dikes to determine what can be "farmed"; opportunity to diversify crops in the region
5. Explore spaces for water storage on farms that can store flood water and be used as a water source for crops (consider insurance, land purchases, shared responsibility, regulations, green and blue habitat for salmon)
6. Complete analysis of crop water needs to identify the best place for on-farm water storage

Responsible Parties

Ministry of Agriculture

Stewardship Groups

Resources Needed

funding for mapping

funding to coordinate exploration of water storage on dikes (in ponds and through setback dikes)

capacity on farmland

water storage

Flood waters breach land, endangering homeowners in the floodplain

Identified next steps

1. Build an early, automated flood warning system that measures and warns of high water levels
2. Create a public response to early warnings (e.g. triggering a mini pump station)
3. Prepare for an event with a multi agency response. Complete practice simulations and drill exercises
4. Provide more education to all landowners in flood prone areas including insurance + land purchases (shared responsibility, regulation)
5. Explore the use of planned retreat

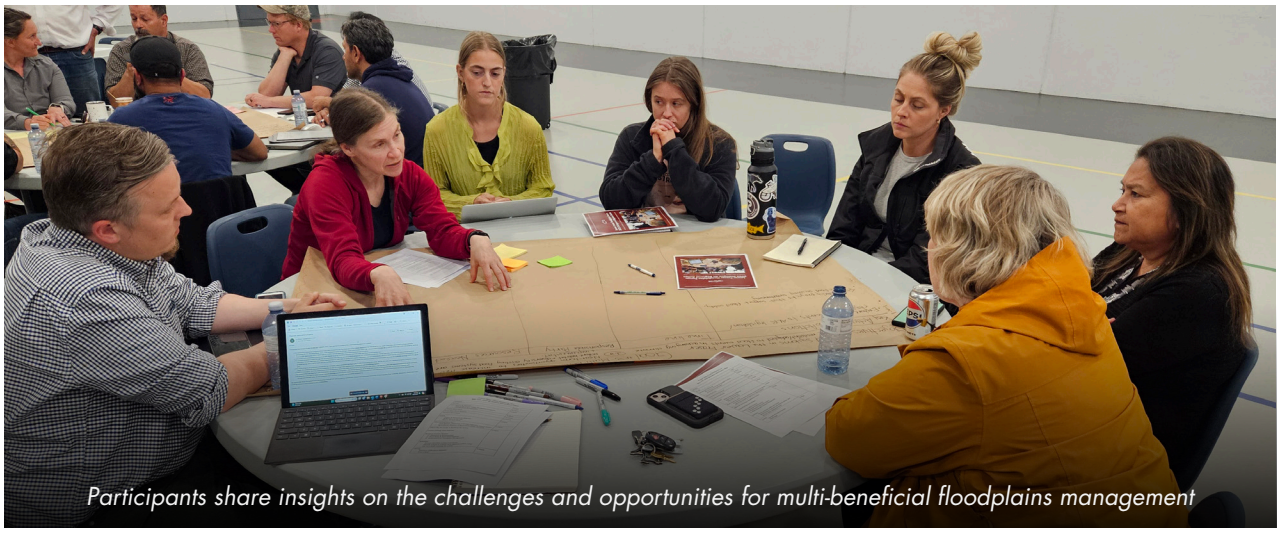
Responsible Parties

Ministry of Agriculture

Resources Needed

funding to establish flood warning and response systems

shared responsibility of preparedness



Participants share insights on the challenges and opportunities for multi-beneficial floodplains management

MULTI-BENEFICIAL FLOODPLAINS MANAGEMENT

At previous gatherings, we heard the need to consider together the environment and the economy, food security and First Nation food sovereignty, protection from flooding and healthy waterways for salmon. We can pursue solutions that produce multi-benefits and this breakout group discussed actions to move towards multi-beneficial floodplains management to ensure food systems in the lower Fraser are resilient to flood events in a changing climate. Attendees considered short-term, long-term, and watershed-scale strategies that could advance floodplain resilience through a multi-beneficial lens.

Key Actions from Multi-beneficial Floodplains Management Breakout Session

Near-term opportunities to increase water storage, restore habitat (esp.for salmon) and diversify agricultural crops are identified and implemented

Identified next steps

1. Setback dikes
   a. Explore what crops can be managed in front of setback dikes
   b. Plants with shorter growing season, better roots, hardier vegetables, grasses for cattle etc
2. Move and raise barns and other farming infrastructure proactively
3. Research proactive flooding on farmlands (the benefits and the downsides)
4. Increase riparian buffers

Longer term opportunities to increase water storage, restore habitat and diversify existing food systems are identified and implemented

Identified next steps

1. Protect waterways for water health and for agriculture
2. Develop contingency plans – plan for failure
3. Education on floodplain land – considering First Nation Rights & Title to the land, land ownership, First Nation knowledge, landowner knowledge sharing
4. Need holistic understanding of floodplain → as part of a watershed(s)
   a. Understand how forestry practices are affecting floodplains in a changing climate (water coming faster down slopes, channelization)
   b. Look at opening up waterways, but also consider connections at a watershed scale

Planning and problem-solving take a strategic, multi-tiered, watershed approach

Identified next steps

1. Risks to First Nations communities are understood and managed as a foundation for a regional strategy, both in relation to reserve lands (likely no room for setbacks) and across their territories
2. Understand and account for upstream and downstream relationships, including risk transfers/opportunities for risk transfers
3. Triage the most impacted or less resilient areas for the benefit of the greater region
4. Establish increased transparency in governance model → what are the goals and roles of each party and how do we align these?
5. Develop a better understanding of critical infrastructure (what it is for communities, where it is located, and how systems are connected)

Next Steps

The discussions from each breakout group, as well as input from previous meetings, will be used to develop a draft road map for action. This road map will focus on actions to enhance flood resiliency on agricultural land to benefit both farmers and First Nations, and would contribute to floodplains resilience in the region.

Once a draft road map has been developed, the Lower Fraser Floodplains Coalition will share the road map with participants from the meeting to ensure we captured your ideas correctly. Next, we will conduct outreach to a broader group of people, including farmers, agricultural associations, and other First Nations to receive additional input and guidance. A visit to the Floodplains by design program sites in Washington State is being planned, and will likely take place in early 2025.

As we continue our work on the Action Plan and farmer and First Nations relationship building, members of the Lower Fraser Floodplains Coalition are working in tandem with on-the-ground work to support our overall goals. Resilient Waters has been moving forward with fish-friendly flood infrastructure upgrades. Farmland Advantage is continuing to support farmers with on-farm resilience projects. Emergency Planning Secretariat is supporting communities on their resilience plans and UBC School of Landscape Architecture is supporting communities to visualize restored waterways for planning purposes, to name a few.

Lower Fraser Floodplains Coalition

We are a collaborative group of BC-based organizations and experts with the shared goal of helping BC's upcoming flood recovery and management efforts achieve the best possible outcomes. We offer support from a diverse range of interests, experience and networks, including Indigenous groups, conservationists, farmers, environmental legal specialists, researchers and natural resource professionals. We hope to see BC move towards a more holistic, collaborative approach to flood management that benefits people and other species, like salmon.

Includes: Emergency Planning Secretariat (First Nations-led); UBC Coastal Adaptation Lab, School of Architecture and Landscape Architecture; West Coast Environmental Law; Ebbwater Consulting; Sto:lo Tribal Council; Watershed Watch Salmon Society; Resilient Waters Project; Heron Bridge Consulting; and Kerr Wood Leidal.

The Lower Fraser Floodplains Coalition is a group of BC-based organizations and experts with a shared vision that the floodplains of the lower mainland, and the people and non-human relatives that live within them, are healthy, safe, thriving and resilient to flooding and associated climate impacts.