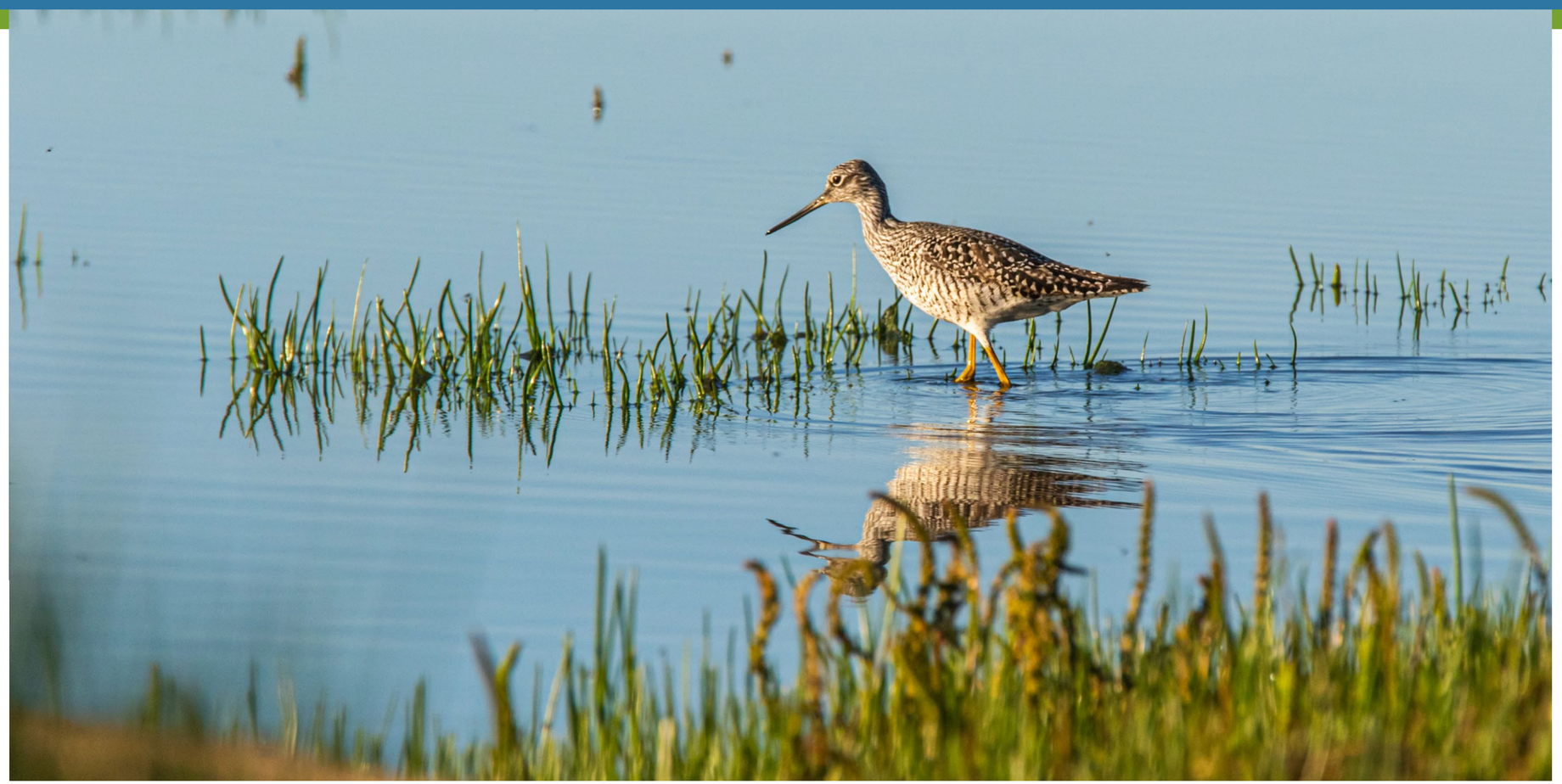
Welcome to the Open House for

City of Surrey's Mud Bay Nature-based Foreshore Enhancements Project - BC EA Exemption Process

January 26, 2023,
3:00 – 6:00 pm at
Surrey City Hall
13450 104 Avenue



Today you will have the opportunity to:

- View presentation boards to learn about the Project
- Understand the BC environmental assessment (EA) exemption process and reason the City is seeking an exemption
- Speak to staff from City of Surrey, Province of BC, Hatfield Consultants, and other project partners
- Provide feedback on the Project as part of the EA Exemption process

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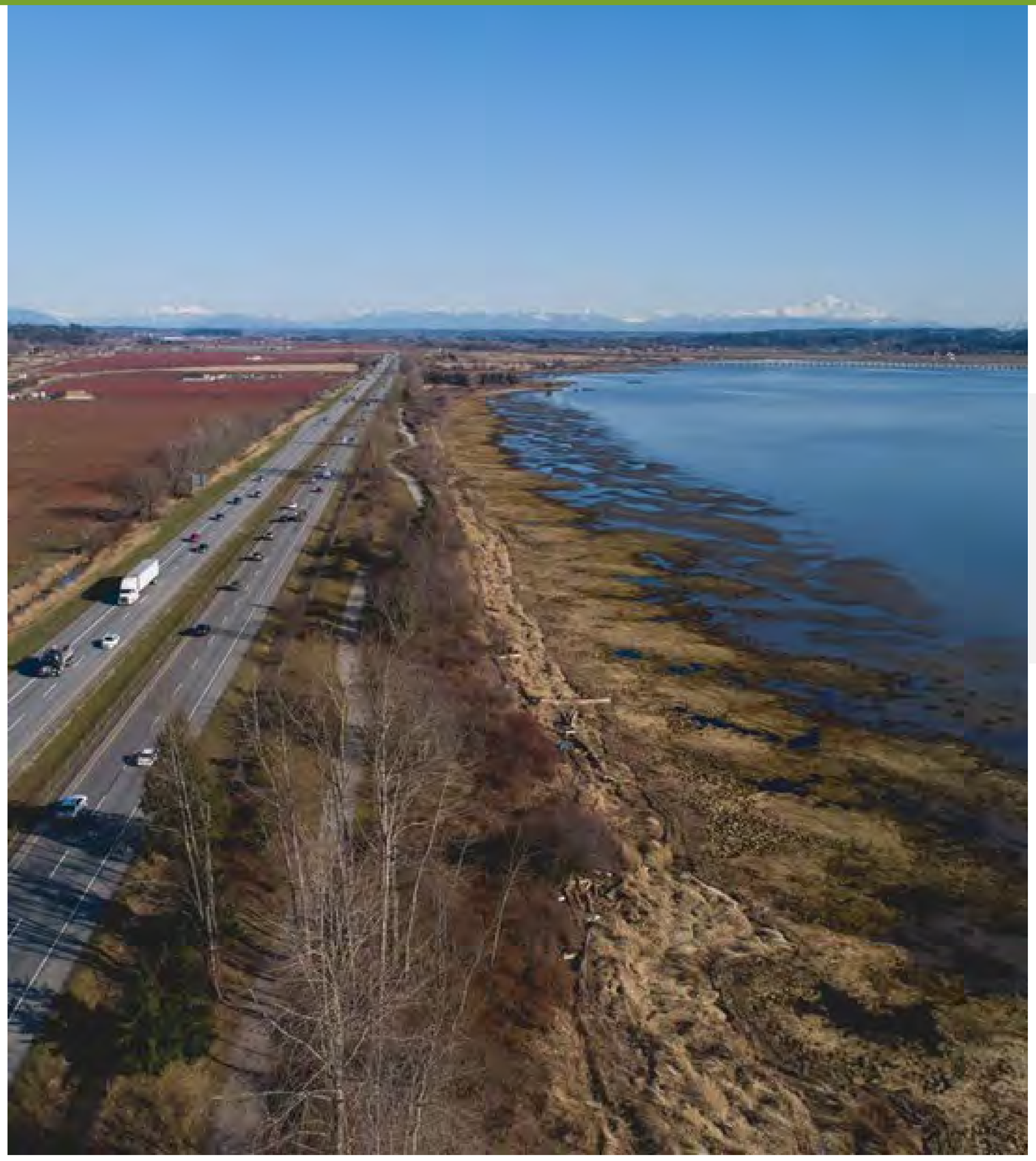

Project Background

With the anticipated impacts of climate change and a rising sea level, the City developed a **Coastal Flood Adaptation Strategy (CFAS)** to help Surrey become more resilient to coastal flooding including reinforcing dykes and adapting critical infrastructure. This process entailed extensive community consultation from 2016 to 2019.

The Mud Bay Nature-based Foreshore Enhancements Project is one of the recommended actions in CFAS. The Project will help protect Surrey's residents, farms, critical infrastructure including Highway 99, BNSF railway, regional power and sewer lines, and internationally recognized bird and wildlife habitats from sea level rise.

The Project is also part of Surrey's **Disaster Mitigation and Adaptation Fund (DMAF) Program** which consists of 13 Coastal Flood Adaptation Projects. The DMAF Program received over $76 million funding from the Government of Canada. Projects must be completed by end of 2027 to receive funding.

The City plans to first do Pilot Studies for the Project in two locations in Mud Bay. The Pilot Studies are not part of the BC Environmental Assessment (EA) review process.

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Project Description

The Project involves a nature-based approach to flood protection known as a 'Living Dyke'.

The living dyke concept is based on the idea of establishing a gentle, raised slope to help natural marshes keep up with sea level rise.

The City will create the Living Dyke by adding sediment and planting native salt marsh species on the Mud Bay foreshore. More marsh will be planted over time to gradually increase the elevation of the salt marsh. The goal is to help the natural marshes lining Boundary Bay adapt to one metre of sea level rise.

The Living Dyke will enhance biodiversity, reduce wave energy, and increase coastal flood control.

The Project will be supported by the design, construction, and adaptive management of nature-based salt marsh Pilot Studies in the City of Delta and the City of Surrey. The results and lessons learned from the Pilot Studies will be used to inform the design, construction, and adaptive management of the Living Dyke.

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Project Location

The Living Dyke will be created in Mud Bay, immediately south of Highway 99, by Mud Bay Park and the Boundary Bay Dyke Trail.

The Project falls within the core territory of Semiahmoo First Nation and the traditional territories of the Katzie, Kwantlen, Sto:lo, and Tsawwassen First Nations.

The City plans to first pilot the living dyke concept at two locations. One in front of the Boundary Bay Dyke in Delta (not shown on the map), and the other on the shore immediately west of Mud Bay Park in Surrey. The fully implemented Living Dyke will extend along the shoreline for a combined length of approximately 790m of linear shoreline.

While the pilot projects will inform the fully implemented Living Dyke, they are not part of the EA process.

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Project Timeline

2018 – present

Collaboration with the Boundary Bay Living Dike Roundtable:

- Created in 2018, the Roundtable consists of representatives from Indigenous nations, environmental regulators, coastal engineering experts, municipal staff, and researchers.

2020 - 2023

Planning and design, Environmental Studies, Research

Continued Collaboration:

- Sharing Project information and seeking input from local First Nations
- Meeting regularly with Semiahmoo First Nation
- Working closely with the Boundary Bay Living Dike RoundTable

2023

Environmental Assessment Review process:

- Public Comment Period (Jan 11 – Feb 27):
  - Open House: Jan 26, 3:00 – 6:00 PM,
  - Virtual Session: Feb 1, 12:00 – 1:30 PM
- EA Certificate Exemption Decision expected: Fall 2023

Work begins at the living dyke pilot sites

2024 to 2027

If the City receives the Environmental Assessment Certificate Exemption Decision, and the Pilot Studies are successful, work on the Surrey Living Dyke site can begin in 2024, and the Project can be completed in 2027 to meet DMAF funding requirements.

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Project Benefits

Nature-based flood protection to mitigate coastal flooding

Mud Bay has a conventional coastal dyke that is in danger of failing. The coastal dyke is expected to be overtopped multiple times per year by 2070.

This type of conventional dyke can be costly, as it requires continual maintenance because of erosion. It also needs to be increased in height and width to keep up with sea level rise and storm surges. In Mud Bay, the City is limited in how wide the dyke can be extended because of Highway 99.

The Living Dyke offers a more sustainable approach and will reduce the likelihood of dyke failure by reducing erosion by slowing waves and reducing their erosive force. It will also have additional benefits including improved water quality, the capturing and storing of carbon, increased marsh area to support fisheries and biodiversity, and nature conservation.

The Living Dyke will include the planting of native salt marsh vegetation. Salt marshes provide flood protection by decreasing the size of waves, storing water, and reducing coastal erosion. **During an extreme storm, the salt marsh can slow down waves and reduce their height and impact on the coastline.** The salt marsh can help protect our community, critical infrastructure and precious natural habitats in Mud Bay from flooding.

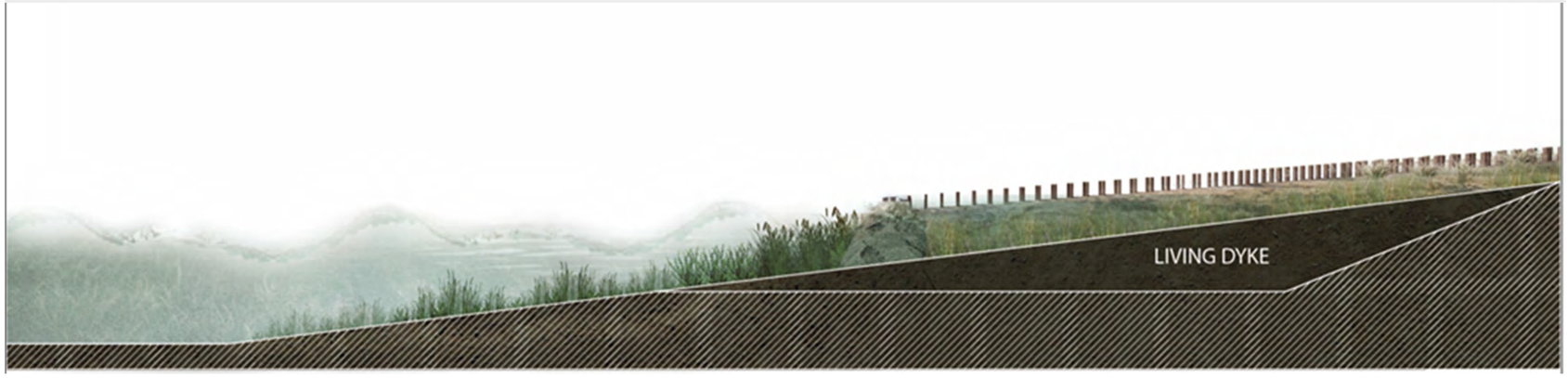

Image not to scale.

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Project Benefits

Build natural habitat and enhance biodiversity

Mud Bay currently consists of unique habitats including mud flats, eelgrass beds, and salt marshes.

This estuary ecosystem supports migratory birds, salmon, seals and other marine life.

The Living Dyke will increase the natural habitat in Mud Bay so that wildlife can continue to thrive. The image shows some of the birds and other wildlife in Mud Bay that would be supported by the Living Dyke.

Image not to scale.

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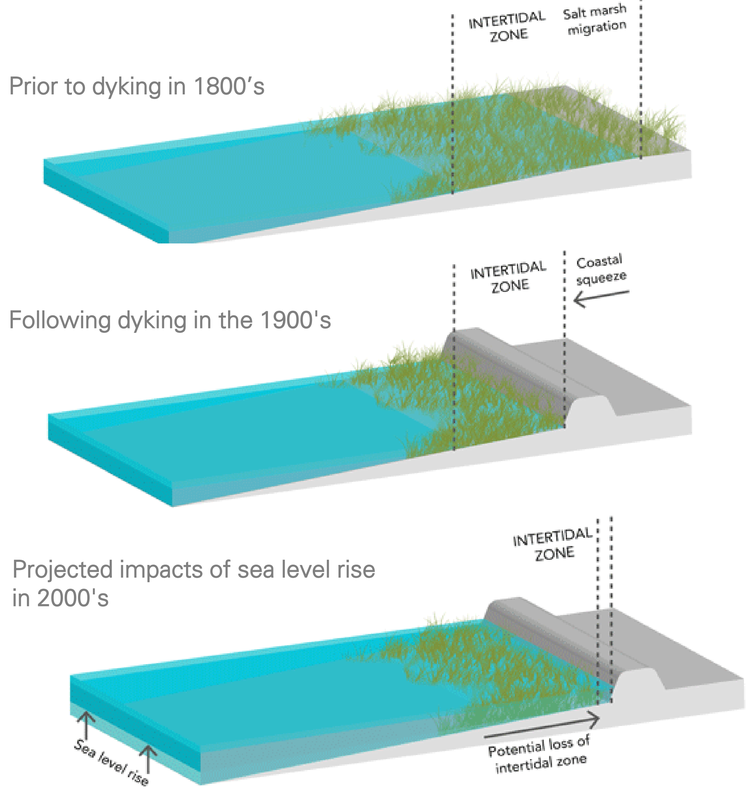
Project Benefits

Prevent marsh habitat from disappearing from sea level rise

Salt marshes are very valuable for flood protection, improving water quality, storing carbon, and supporting our wildlife. With rising sea levels, the coastal marshes that we depend on are at risk of disappearing due to **coastal squeeze**.

In the past, if sea levels rose, coastal marshes were able to move further inland. But in Mud Bay, Highway 99 and the existing dyke prevent salt marshes from migrating to higher grounds.

If these habitats disappear, the small fish, insects and invertebrates that support birds and larger predatory animals – like salmon and seals – will also be impacted. The Living Dyke will help these coastal marshes remain healthy.



What is Coastal Squeeze?

As sea levels rise, coastal salt marshes retreat landward, but when their retreat path is blocked by hard structures like dykes and seawalls, wetlands are lost as they become 'squeezed' between the rising water and the hard structure.

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Project Benefits

Increase our understanding of viable coastal marsh adaptation approaches

The Living Dyke is a more sustainable approach to adapting to climate change and sea level rise.

This Project will improve our understanding of how to construct marshland and preserve salt marsh habitat. The techniques can be replicated by other coastal municipalities across BC and beyond.

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Image not to scale.

Project Design

Trying new nature based techniques

The City of Surrey and the City of Delta are going to test the living dyke concept in a couple of Pilot Studies. A range of approaches are being tested to evaluate the least impact.

The results and lessons learned from the Pilot Studies will be used to inform the design and construction of the Living Dyke in Surrey.

The image on the left shows the different stabilization techniques under consideration. Selection of the best approach will be made after results of the Pilot Studies are completed.

One of the innovative stabilization techniques being tested includes a brushwood dam (on display) and shown on left.

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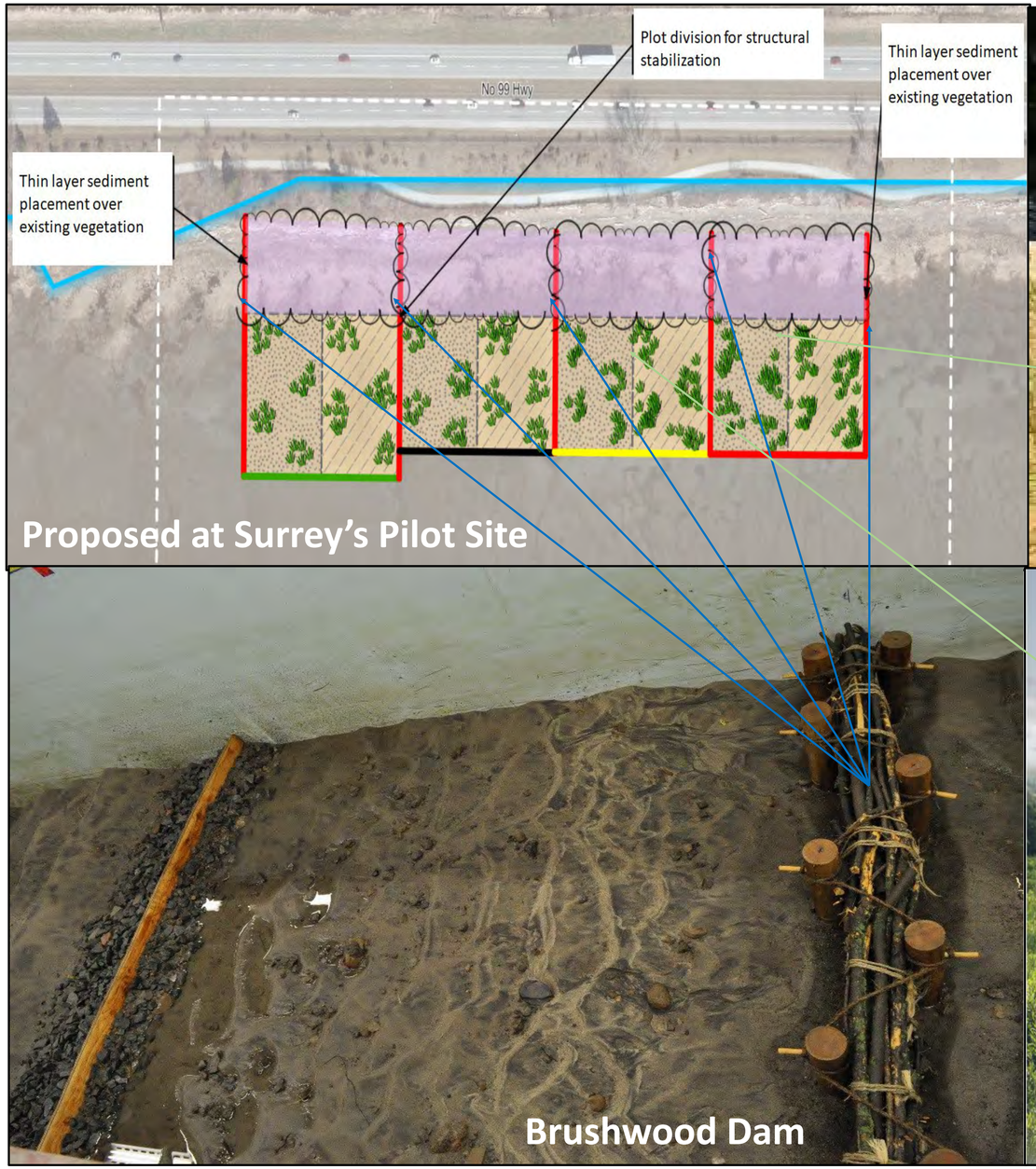
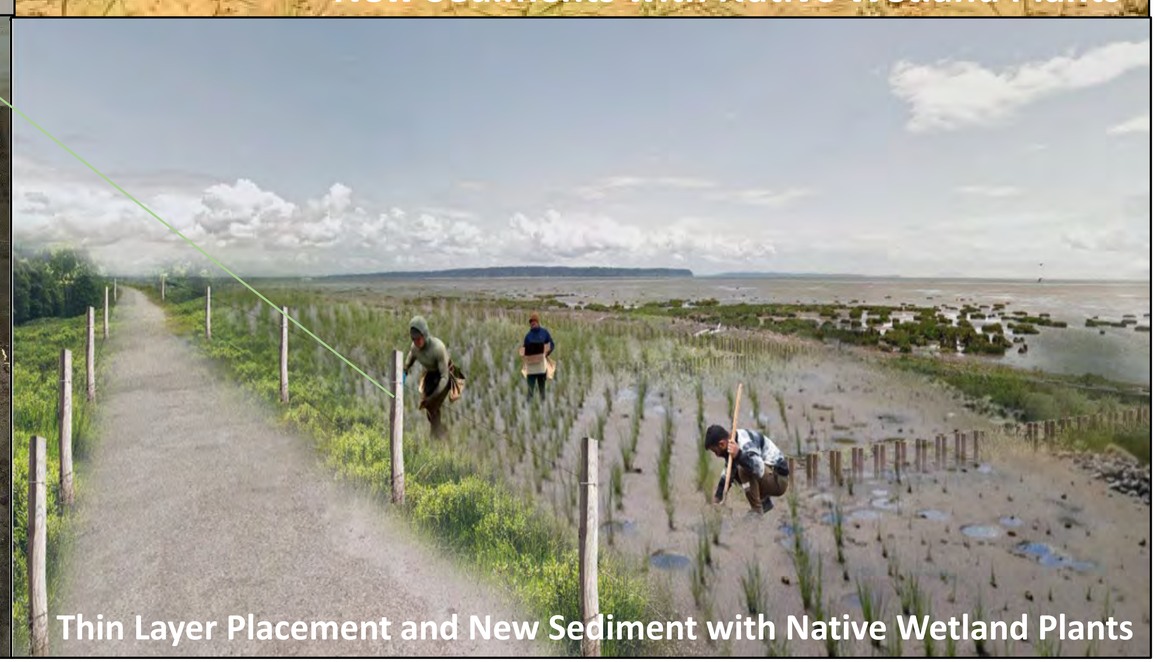
Pilot Study Project Design





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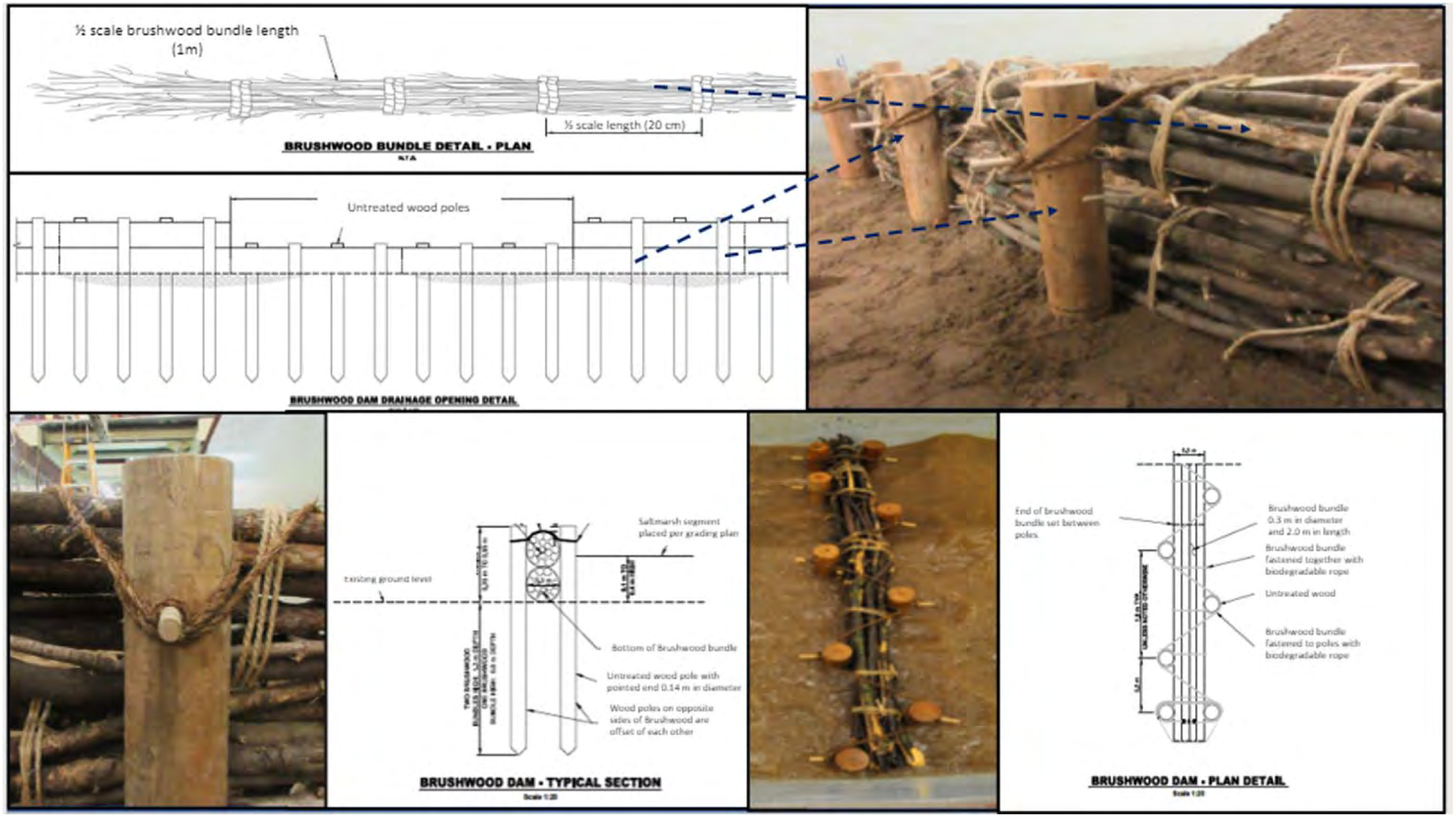
…Project Design



Brushwood Dam

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Indigenous Interests

The City is committed to working with all interested Indigenous Nations to address concerns

The living dyke is within the core territory of Semiahmoo First Nation, the traditional territories of the Katzie, Kwantlen, Sto:lo, and Tsawwassen First Nations, and may be of interest to other Indigenous nations and organizations. Below lists the City's efforts to date working with Indigenous nations:

- Sought input from Indigenous nations through its' Disaster and Adaptation Mitigation Adaptation Program (DMAF), which consists of 13 Coastal Adaptation Projects, and during the development of the City's Coastal Flood Adaptation Strategy (CFAS, 2016 - 2019).
- Meeting with Semiahmoo First Nation on a bi-weekly basis since May 2021 to discuss DMAF projects including the Mud Bay Living Dyke.
- Regular meetings with the Living Dyke Roundtable, which includes representation from First Nations.

(left) Semiahmoo First Nation Chief Chappell shares history of area with Project team and other partners.

- Frequent 'Living Dyke Core Group Meetings' with Semiahmoo First Nation.
- Circulated 50% and 90% Pilot site design for comment to 20 First Nations.
- City provides regular updates and meets with First Nations, as requested to discuss projects. City has met separately with Semiahmoo, Kwantlen, Katzie, and Tsawwassen First Nations to date.

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Potential Project Effects

Increased salt marsh habitat and potential positive effects for wildlife that use the salt marsh

Given the restorative nature of the Project, it offers the potential benefit of:

- Increased salt marsh habitat and biodiversity
- Improved water quality
- Increased abundance and distribution of plant species native to Boundary Bay
- Potential positive effects for wildlife that use the salt marsh

While the Project does have the potential for adverse effects, with the implementation of best management practices, mitigation measures and adaptive management, no significant adverse effects are anticipated. Additional permitting and regulatory conditions would also address potential adverse effects.

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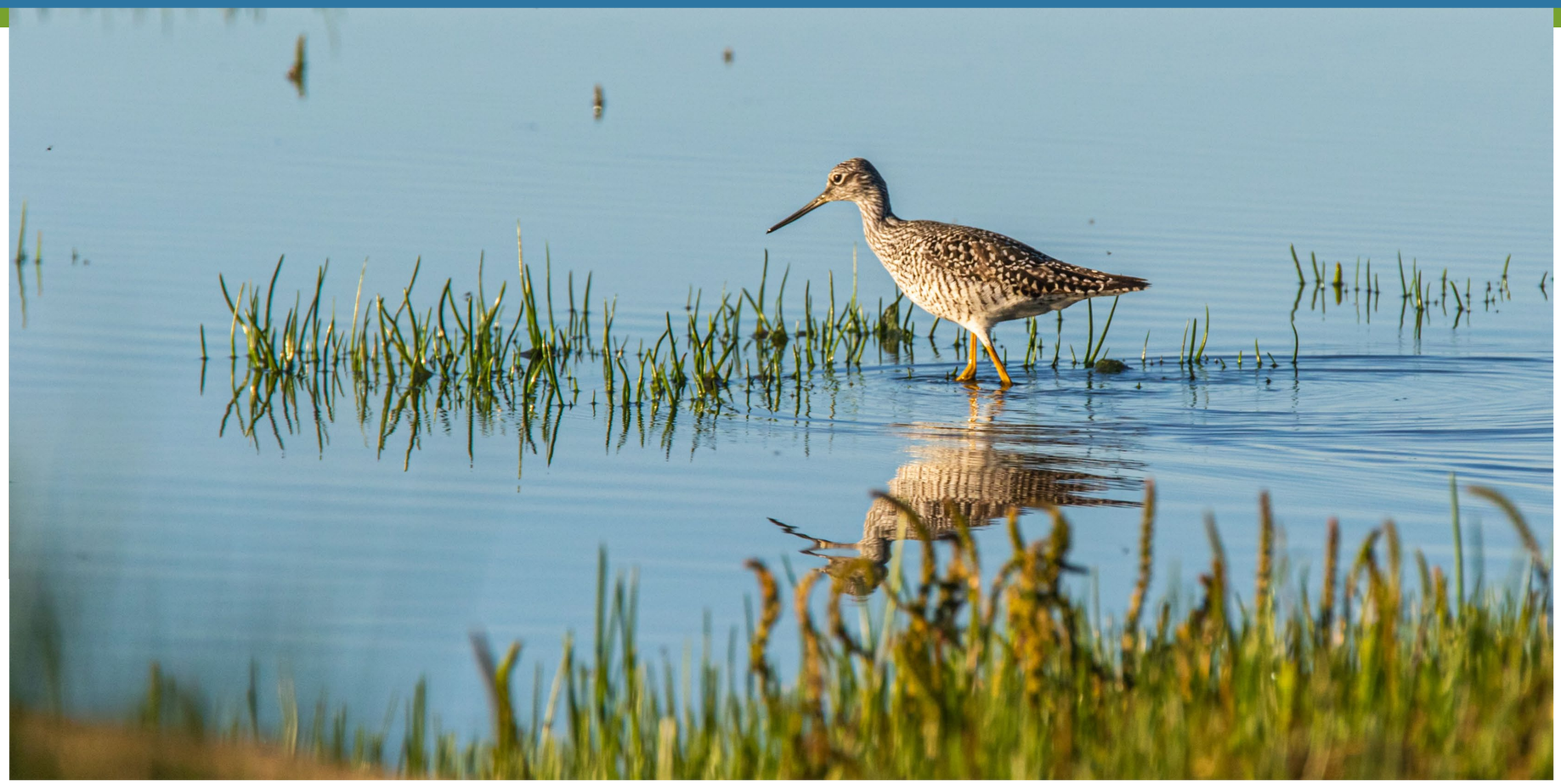
Share your feedback at gov.bc.ca/EAOPublicComment



Thank you for your interest in the Project.

If you would like occasional Project updates, sign up for CFAS newsletter at ***surrey.ca/mudbay***

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