Restoring the Duckabush River Estuary

Project Design Update

September 22, 2021

WSDOT

Hood Canal Salmon Center

Washington Department of Fish and Wildlife

US Army Corps of Engineers
Seattle District

Duckabush Estuary Restoration: Meeting Topics

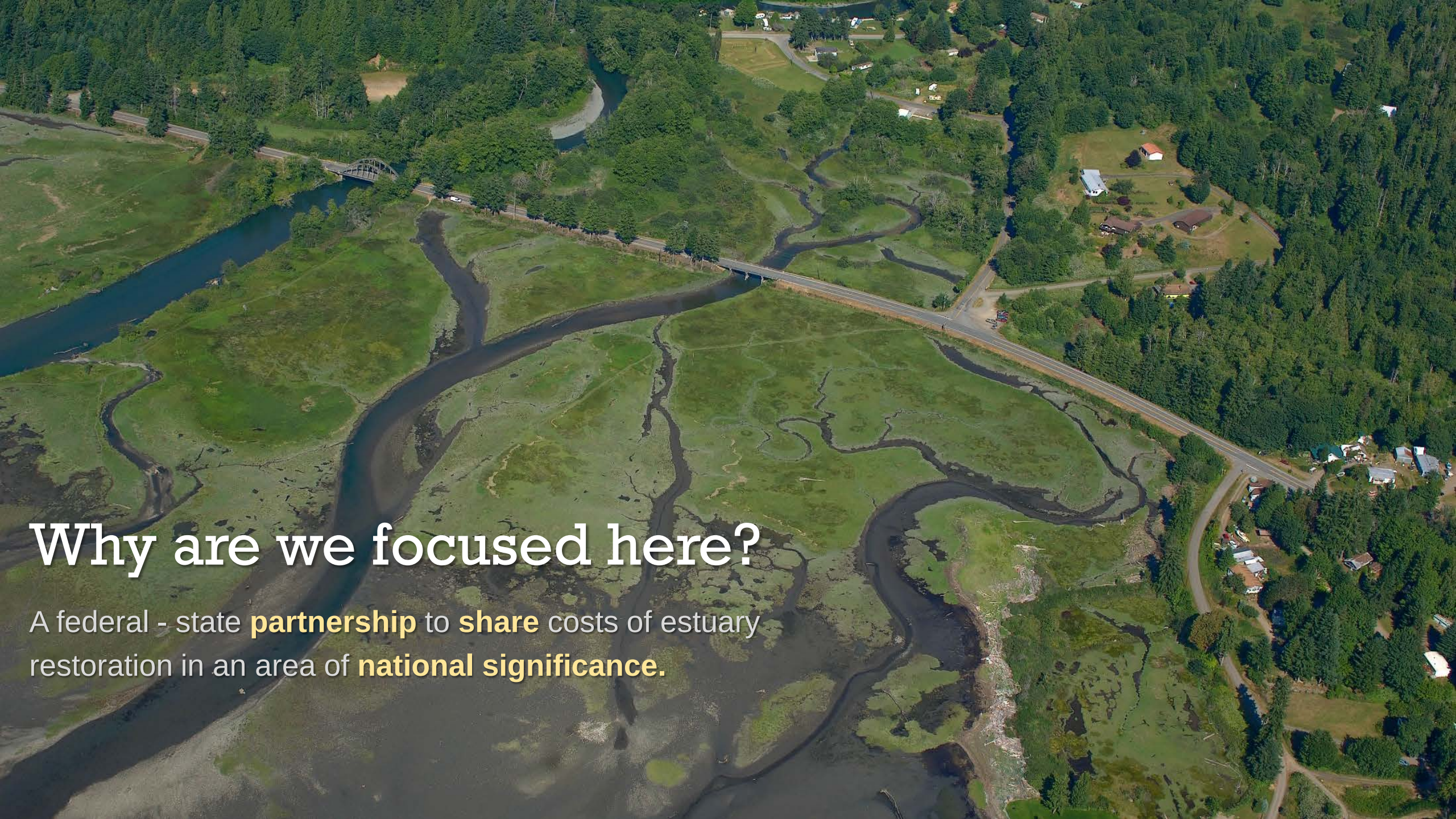
- Background and Project Overview
- Highway Design Features
- Restoration Design Features
- Community Outreach
- Next Steps

- Question and Answers

Duckabush Estuary Restoration: Background and Project Overview

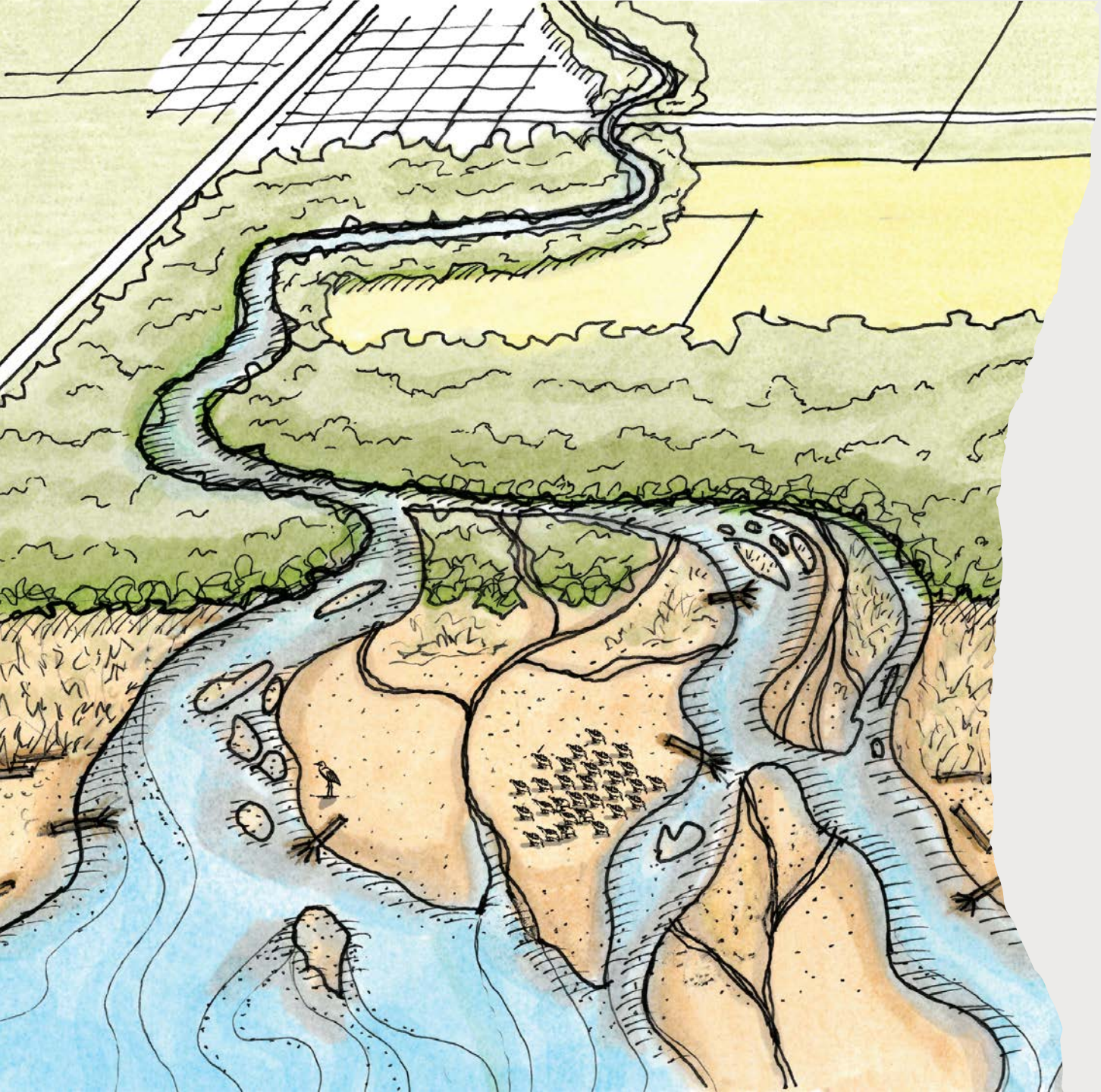
Washington Department of FISH and WILDLIFE

Theresa Mitchell
Project Manager, WDFW
Theresa.Mitchell@dfw.wa.gov



Why are we focused here?

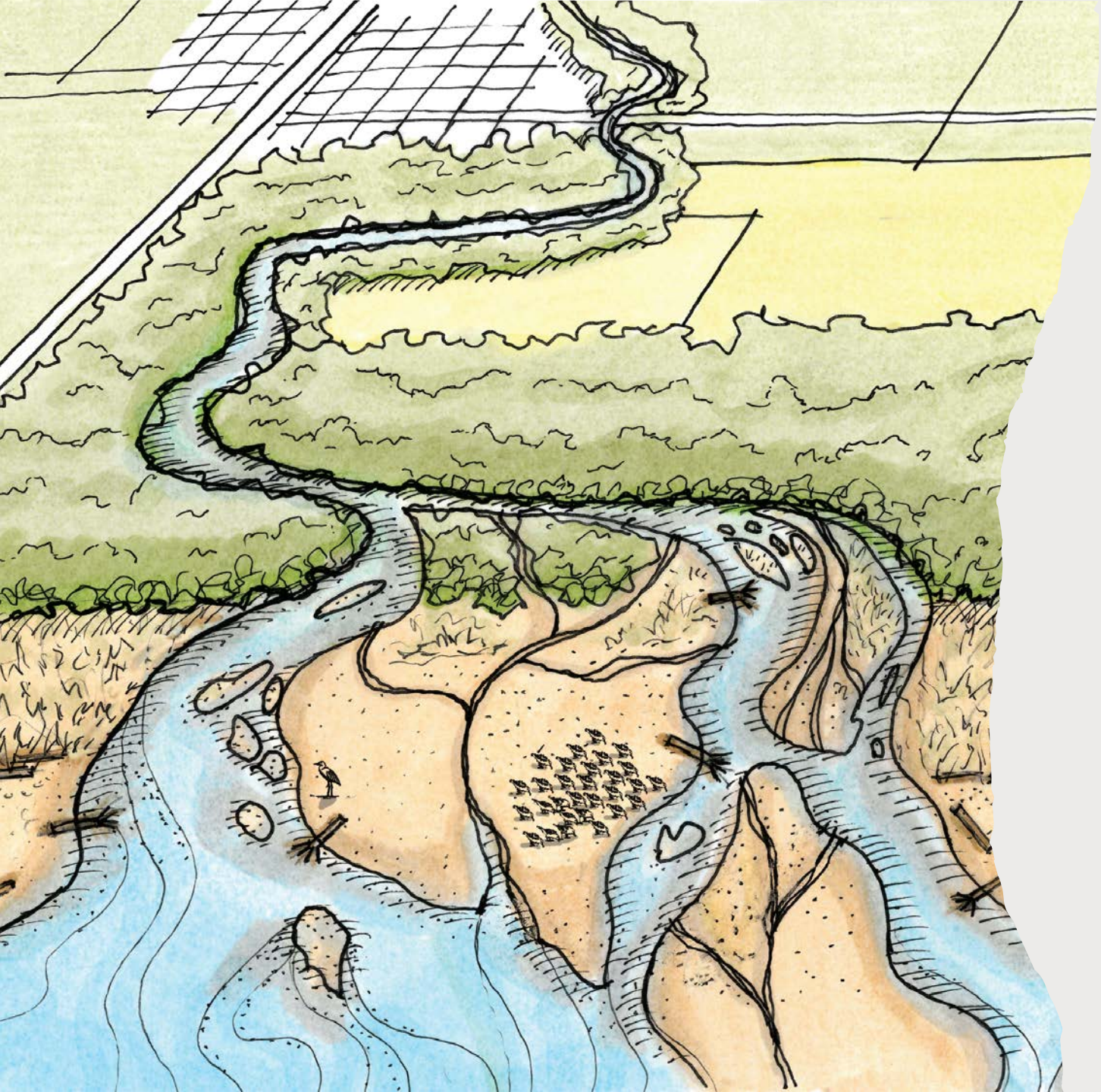
A federal - state **partnership** to **share** costs of estuary restoration in an area of **national significance.**



Why restore Estuaries?

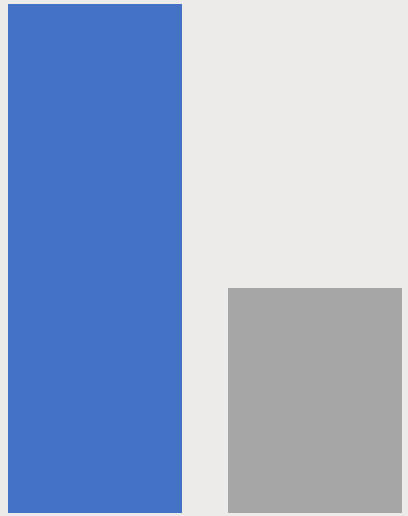
Tidal wetlands occur in river estuaries where fresh and saltwater meet. Wetlands include channels, marshes, and mud flats. Tidal wetlands:

- Provide habitat for fish, birds, shellfish, and other wildlife
- Contain nutrients and prey important to the food web
- Improve water quality by naturally filtering pollutants
- Provide area to absorb tidal and flood waters.



Why restore Estuaries?

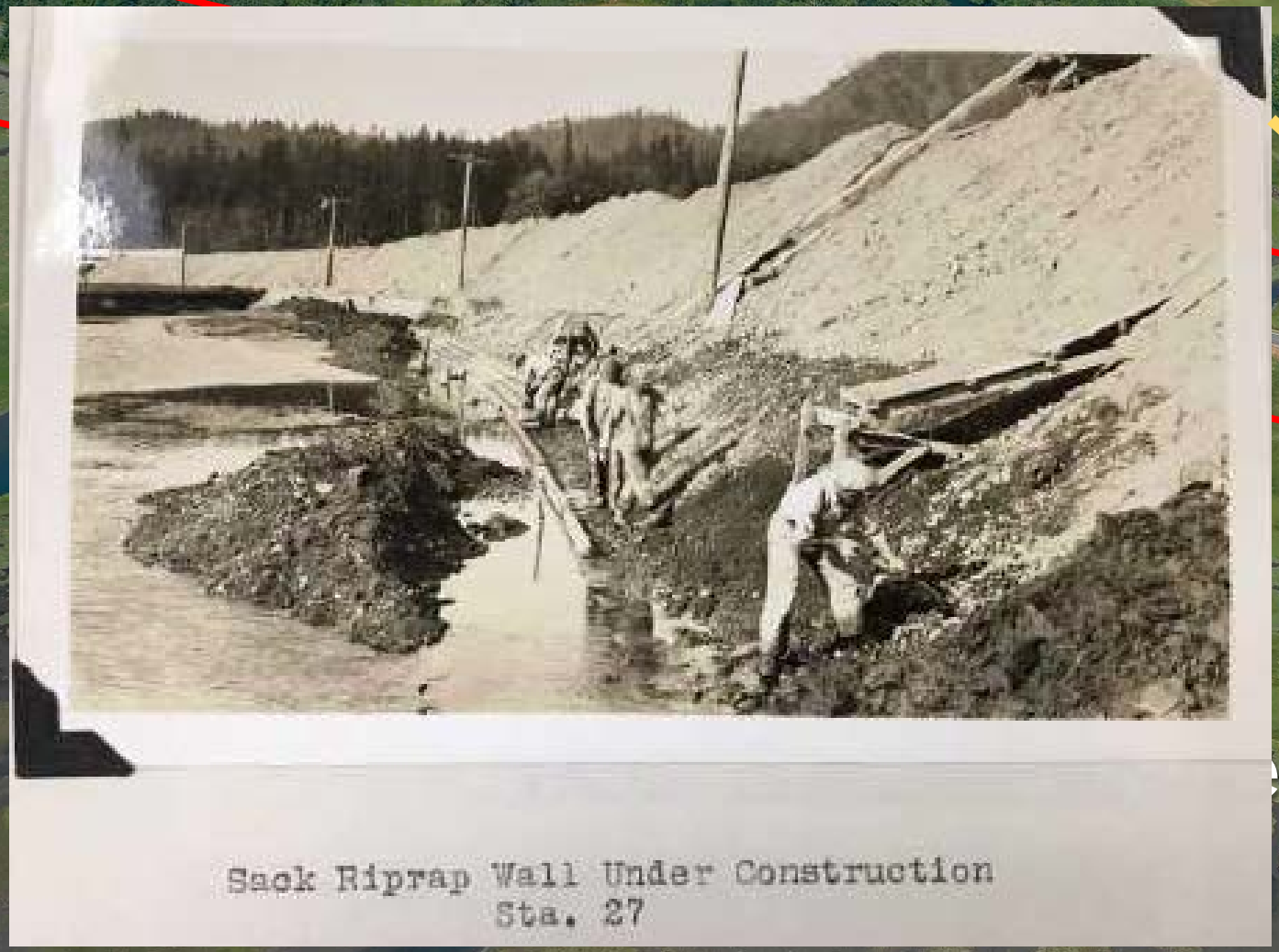
Over **55% loss** of historical tidal wetlands in Puget Sound's 16 largest river deltas since late 1800s.



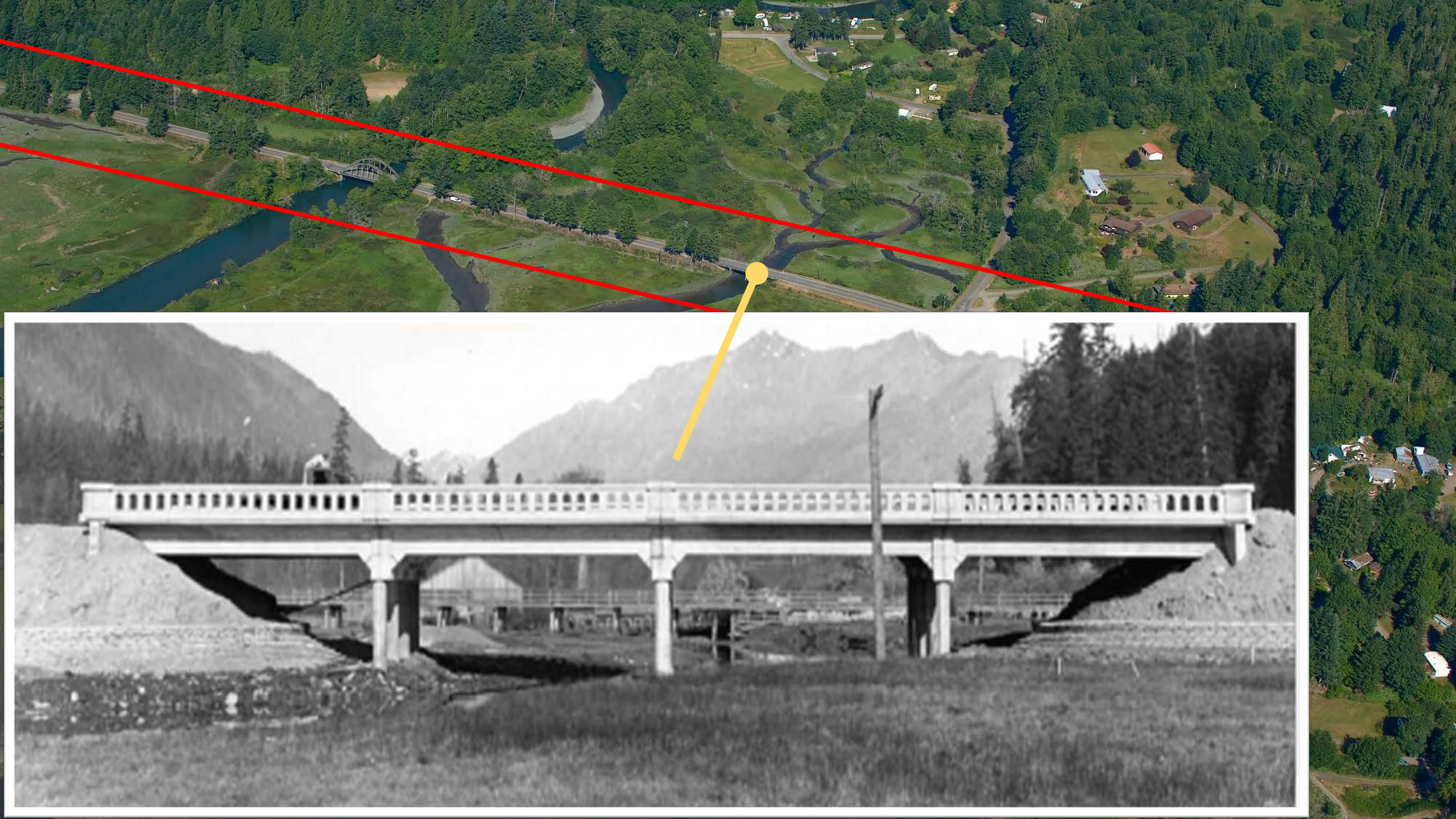
Opportunity for Improvement

Opportunity for improvement

Address highway and other features that are disconnecting river channels, altering water and sediment movement, and natural habitat development.



Sack Riprap Wall Under Construction
Sta. 27

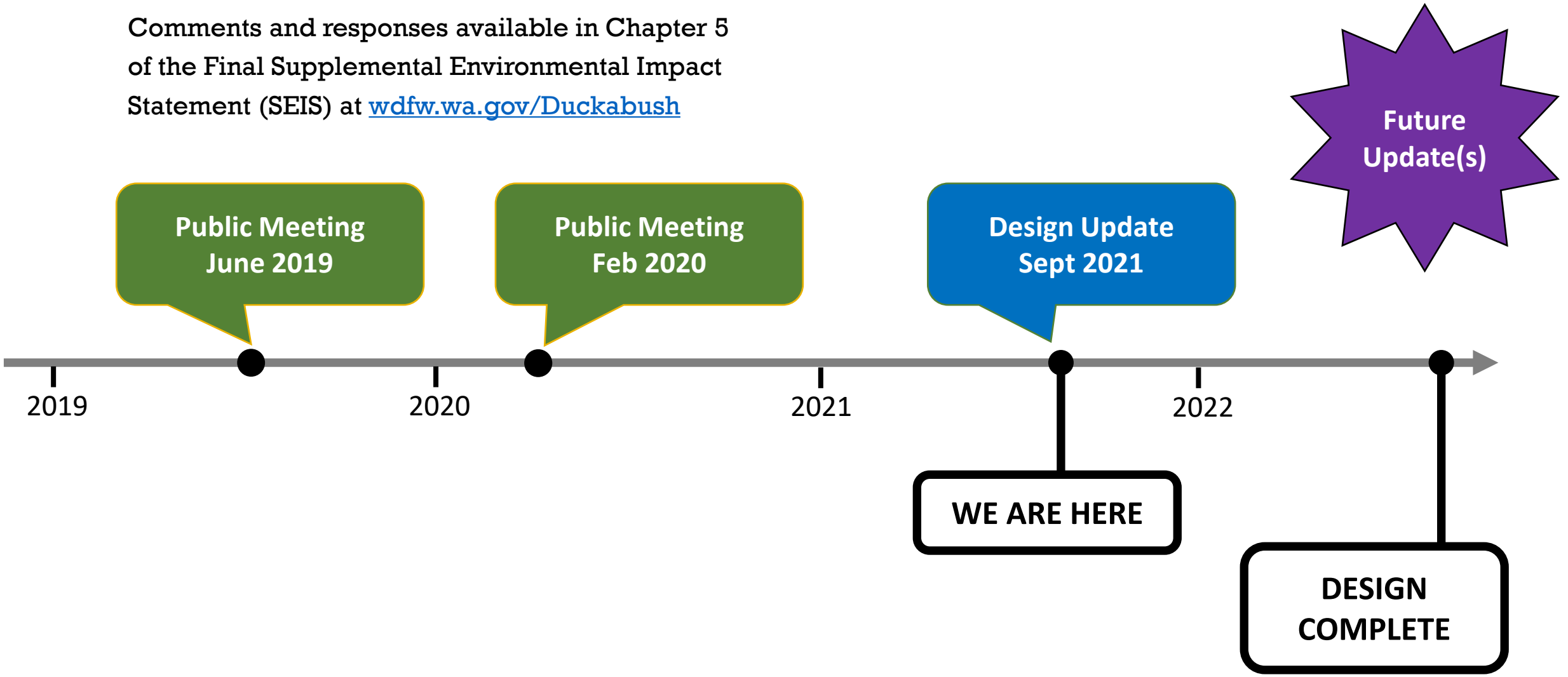


Duckabush T-sheet (ca.1883)

Dept. of Highways Plan (ca.1931)

Design Phase Timeline

Comments and responses available in Chapter 5 of the Final Supplemental Environmental Impact Statement (SEIS) at wdfw.wa.gov/Duckabush

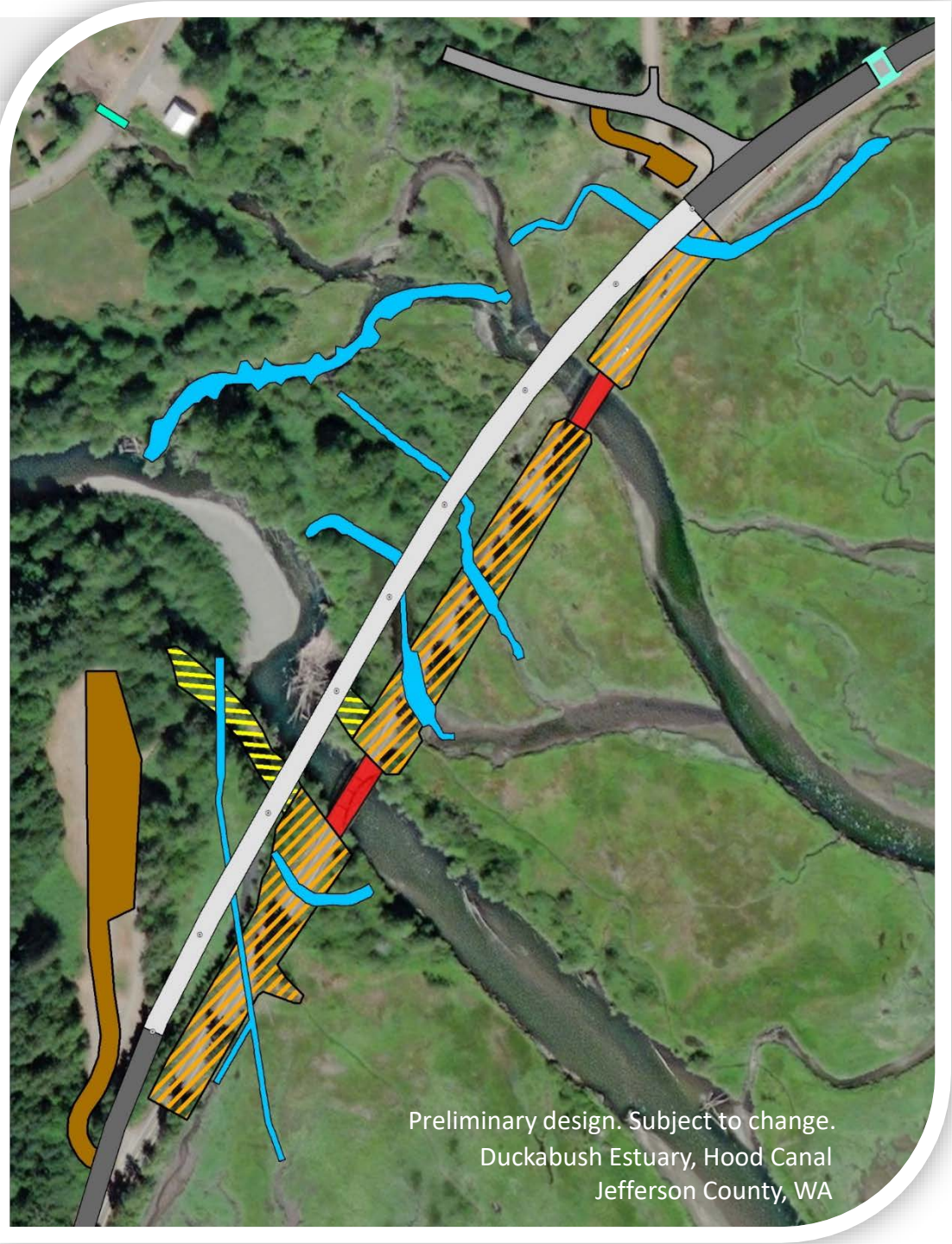


Duckabush Restoration Preliminary Design

- New Highway 101 Bridge
- Redesigned Duckabush Rd Intersection
- Culvert Replacement
- Modified Highway 101
- Bridge Removal
- Causeway Removal
- Levee Removal
- Public Parking
- Reconnected Channels

Indicates elements to be constructed by USACE.

Indicates elements to be constructed by WSDOT.



Preliminary design. Subject to change.
Duckabush Estuary, Hood Canal
Jefferson County, WA

Duckabush Estuary Restoration

ANTICIPATED PROJECT BENEFITS

- **Improved estuarine habitat for fish and wildlife.**
- **Improved water quality.**
- **Reduced backwater flooding.**
- **Modernized highway design with updated safety features.**

Duckabush Estuary Restoration: Preliminary Design Highway Features

Bill Elliott
Project Engineer, WSDOT
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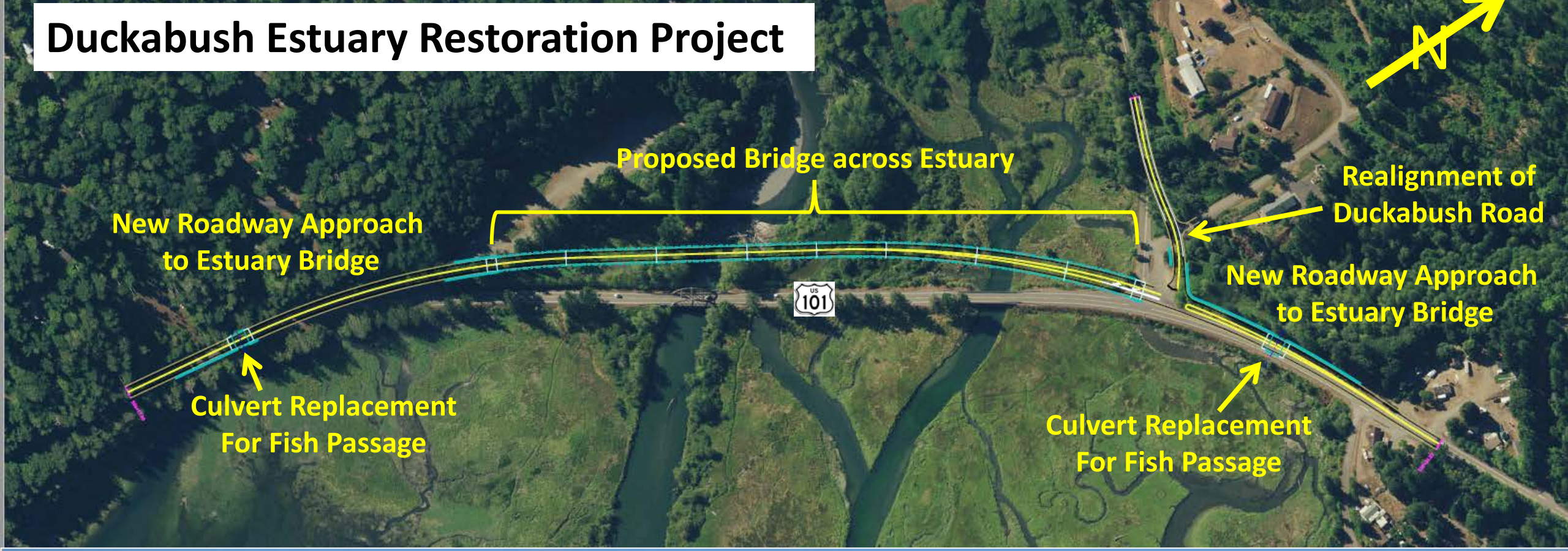
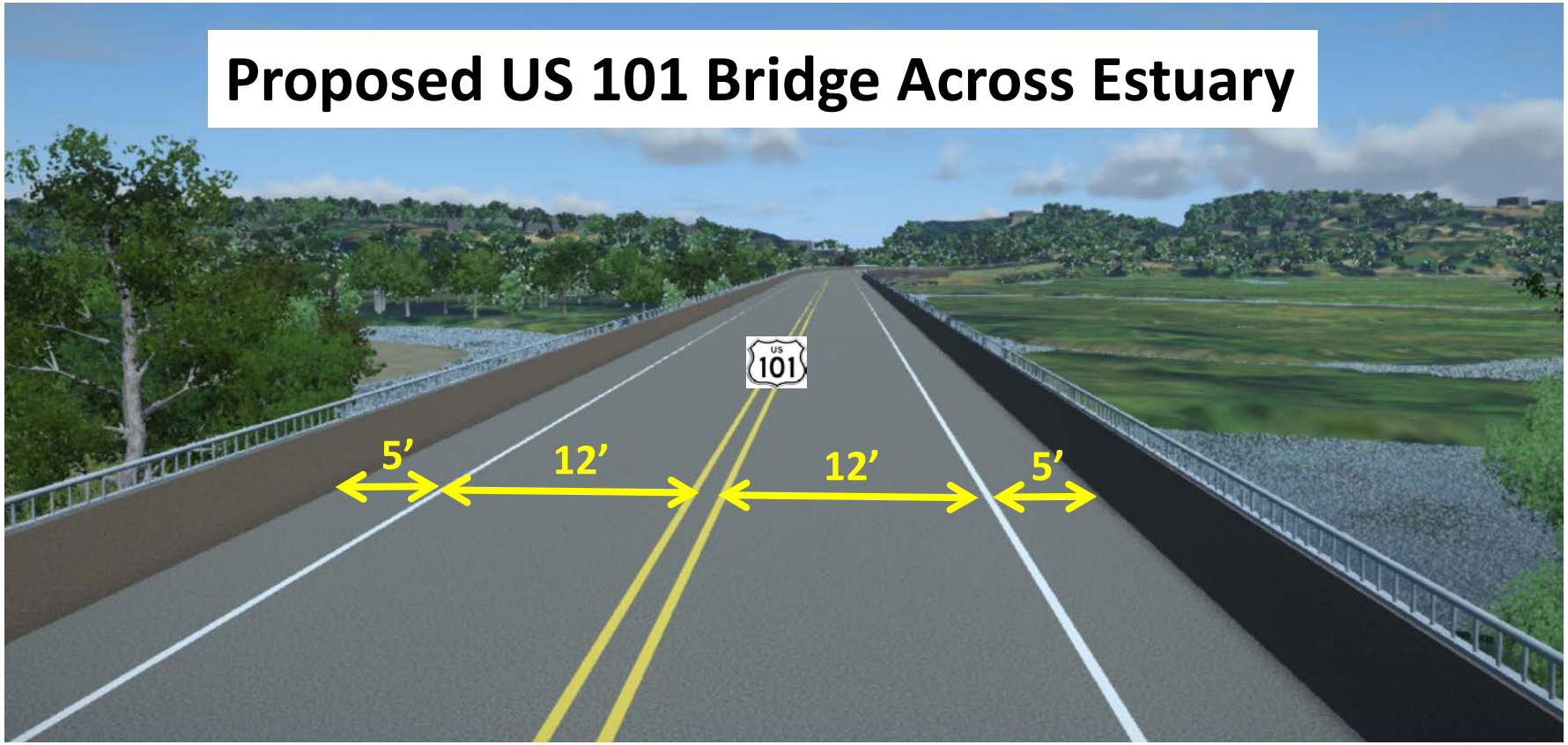
Duckabush Estuary Restoration Project



Proposed US 101 Bridge Across Estuary



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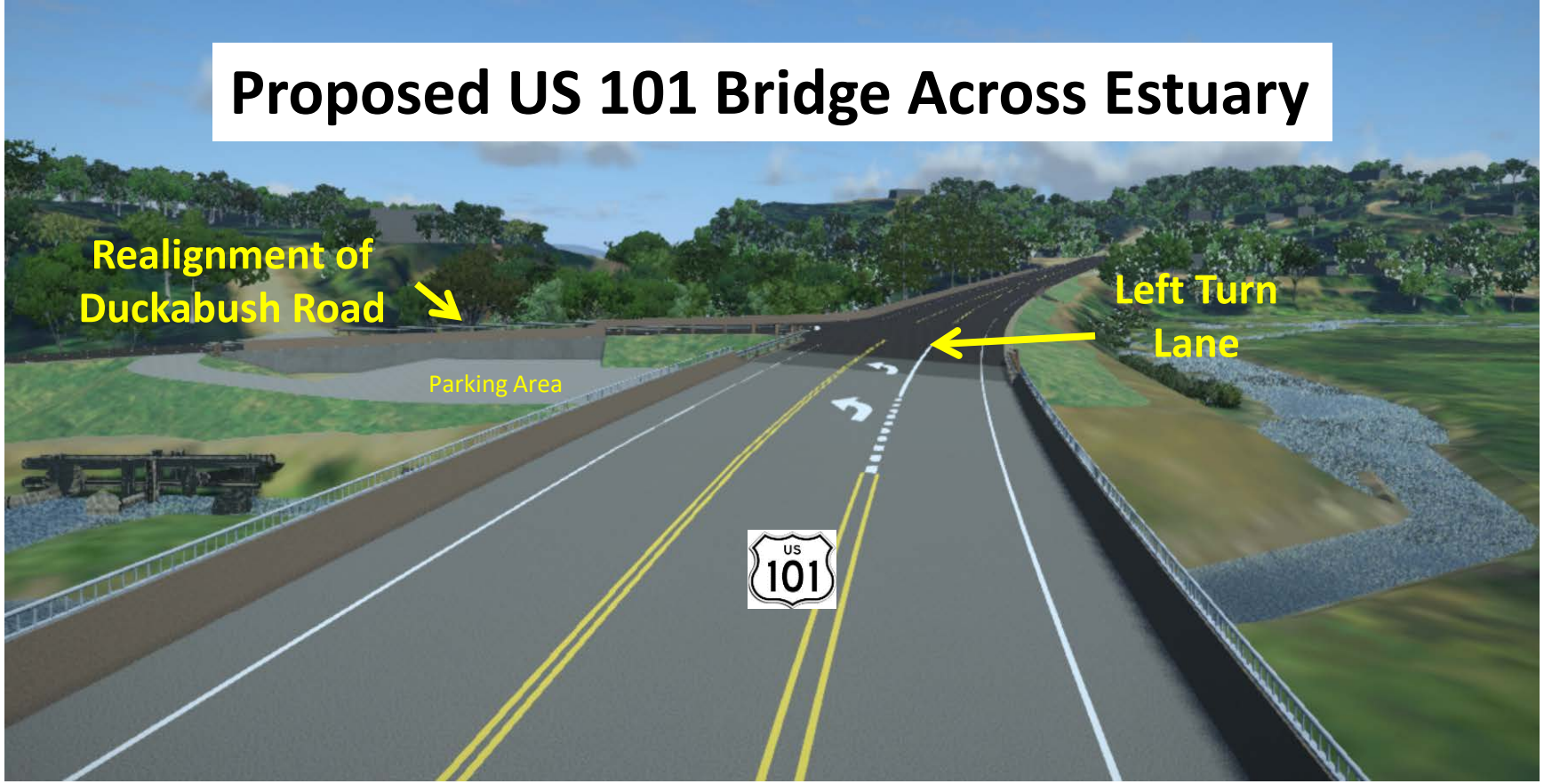
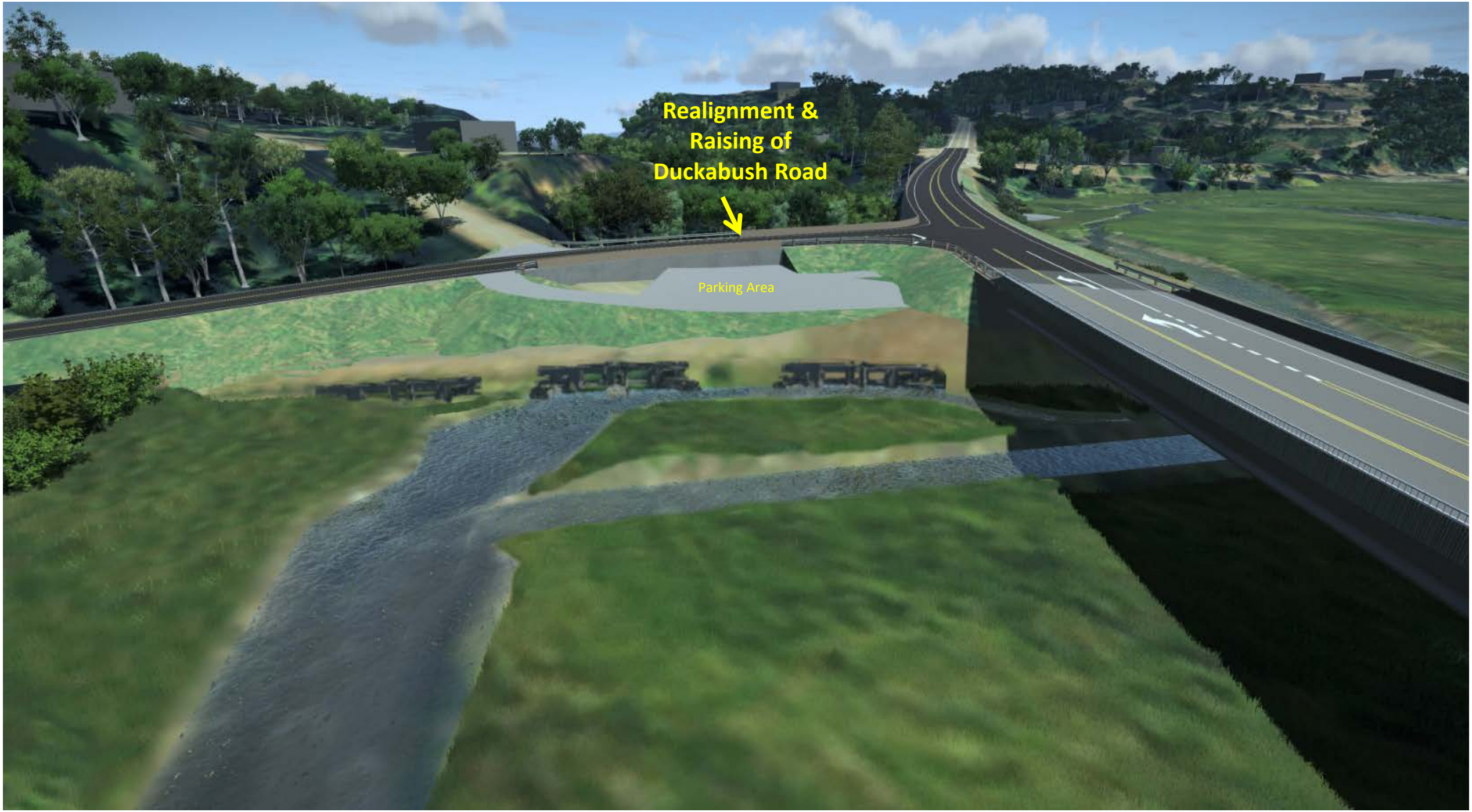
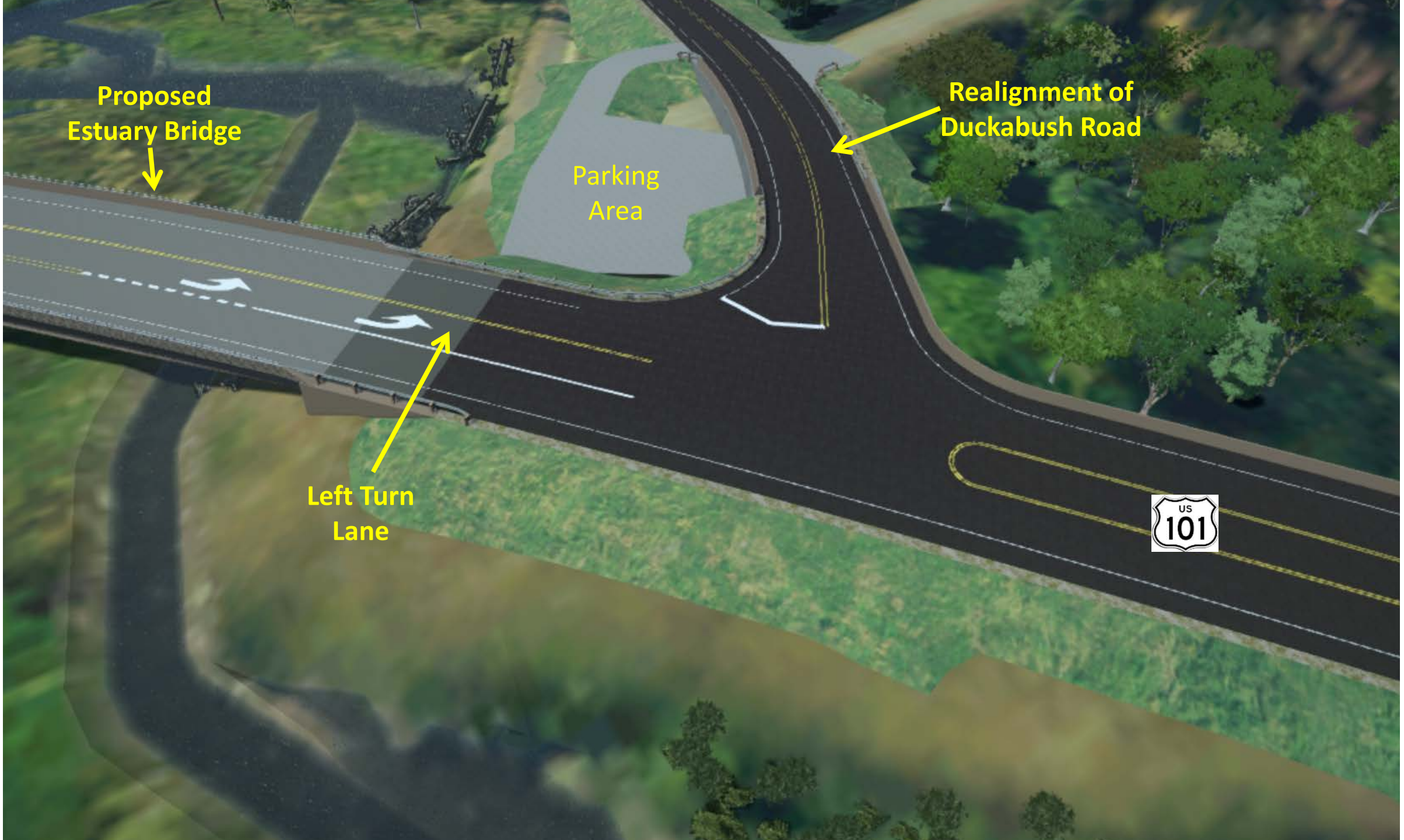
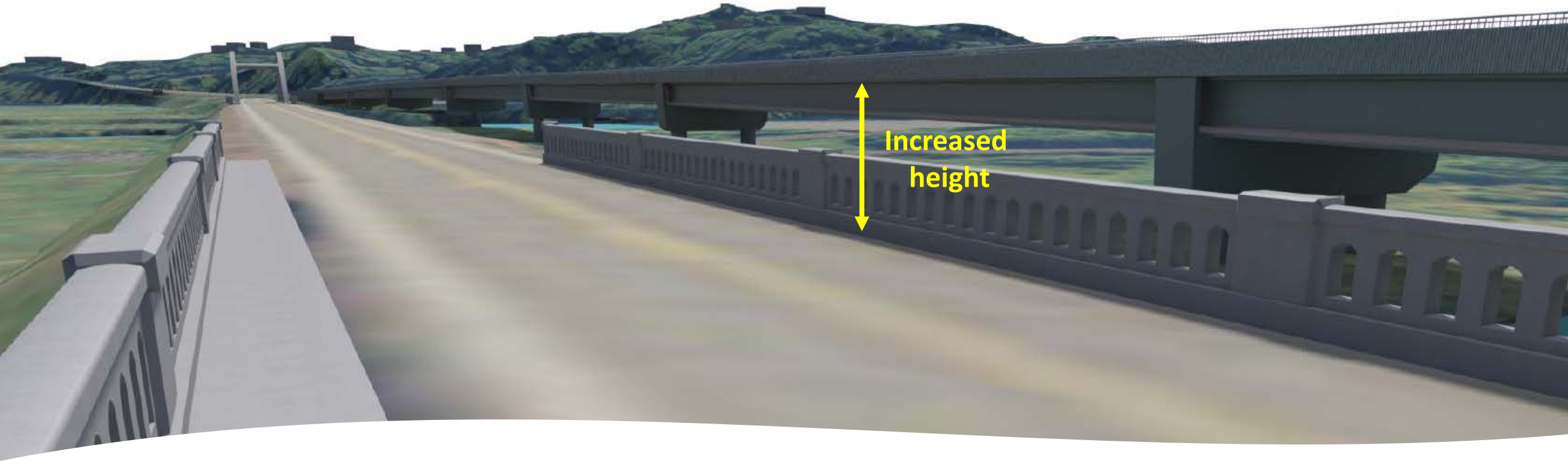



Realignment &
Raising of
Duckabush Road
Parking Area

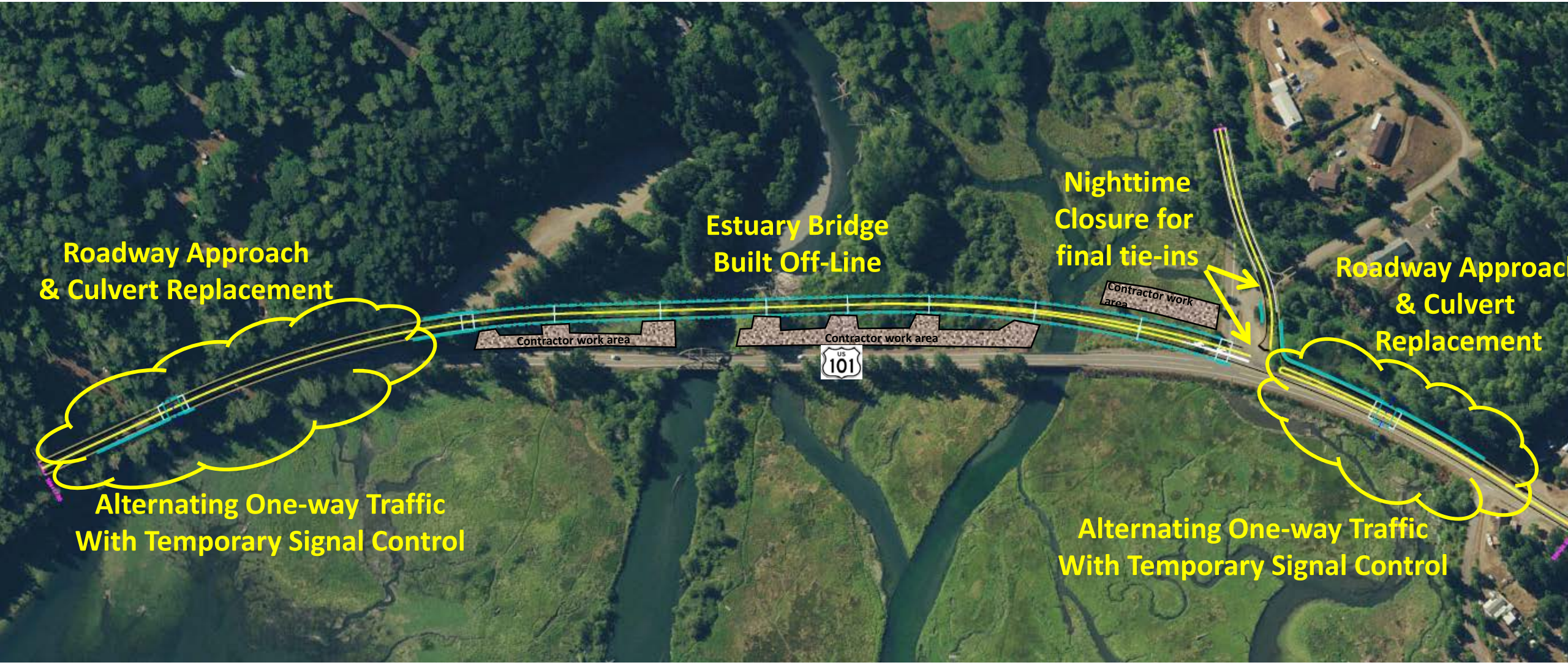

Proposed
Estuary Bridge
Realignment of
Duckabush Road
Parking
Area
Left Turn
Lane
US
101



Road Elevations

New road surface will be slightly higher than existing roadway

Constructability & Traffic Flow

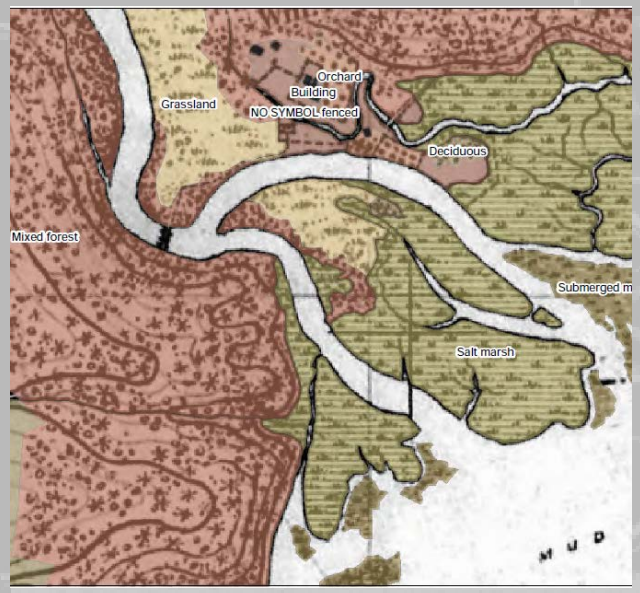


DUCKABUSH ECOSYSTEM RESTORATION DESIGN ELEMENTS

Kristine Ceragioli
General Investigations Program Manager
NWD/Seattle District/Civil Works Branch

Glenn Kato
Technical Lead, Civil Design
NWD/Seattle District/Civil Works Branch

Date: 22 September 2021



U.S.ARMY

US Army Corps of Engineers®

PRELIMINARY DUCKABUSH DESIGN

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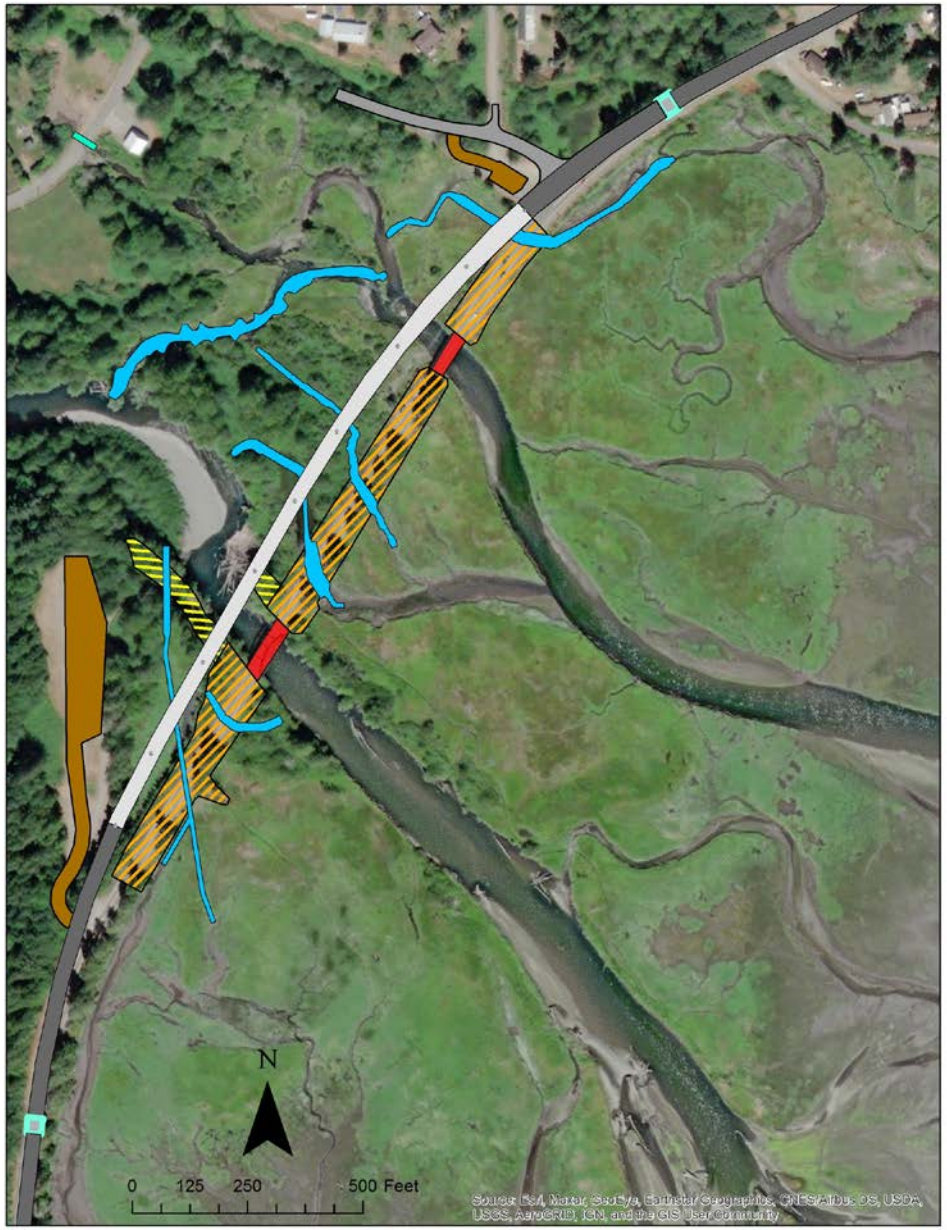

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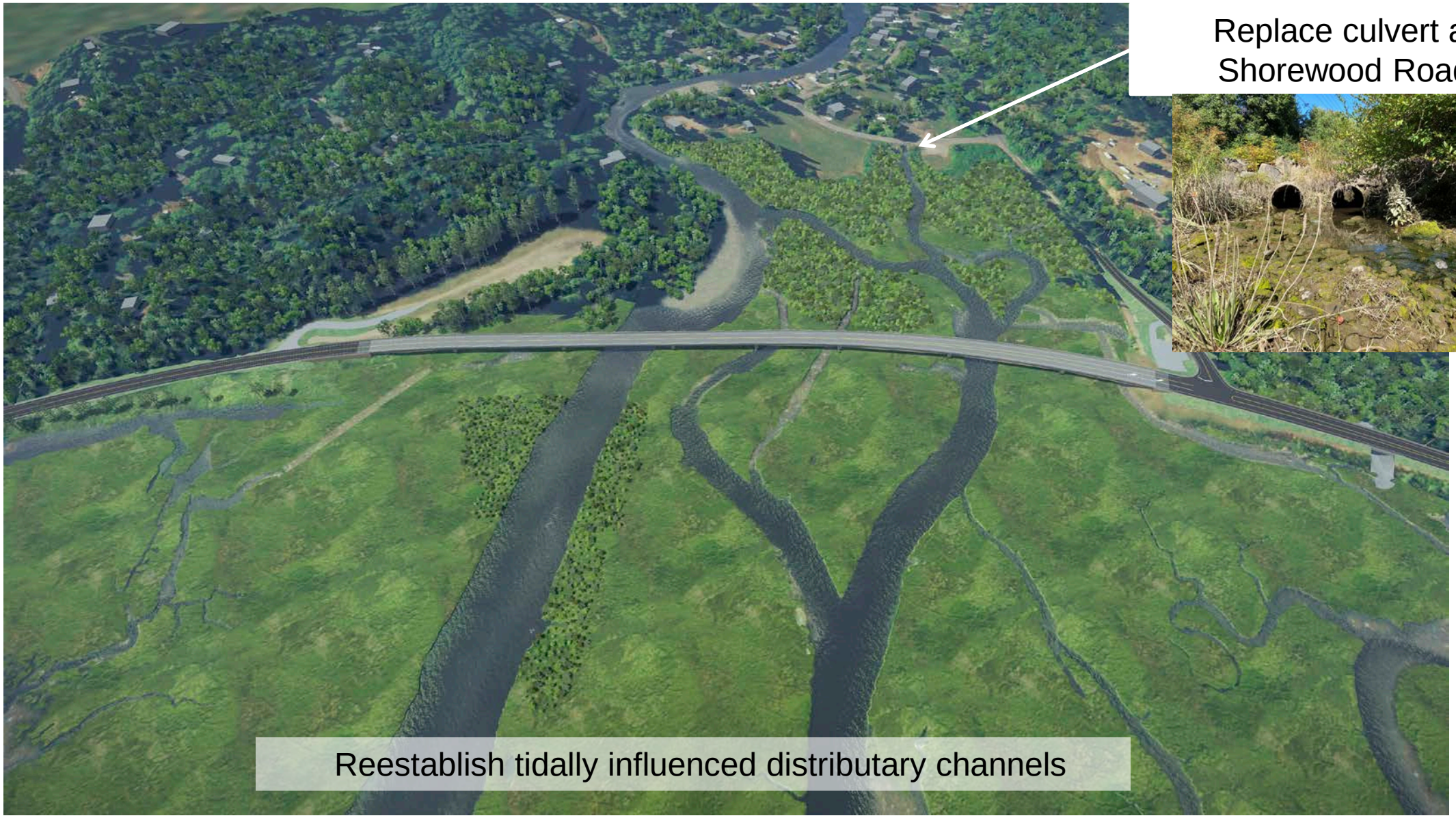
PROJECT ELEMENTS

Removing old highway and temporary work platform after new bridge is built

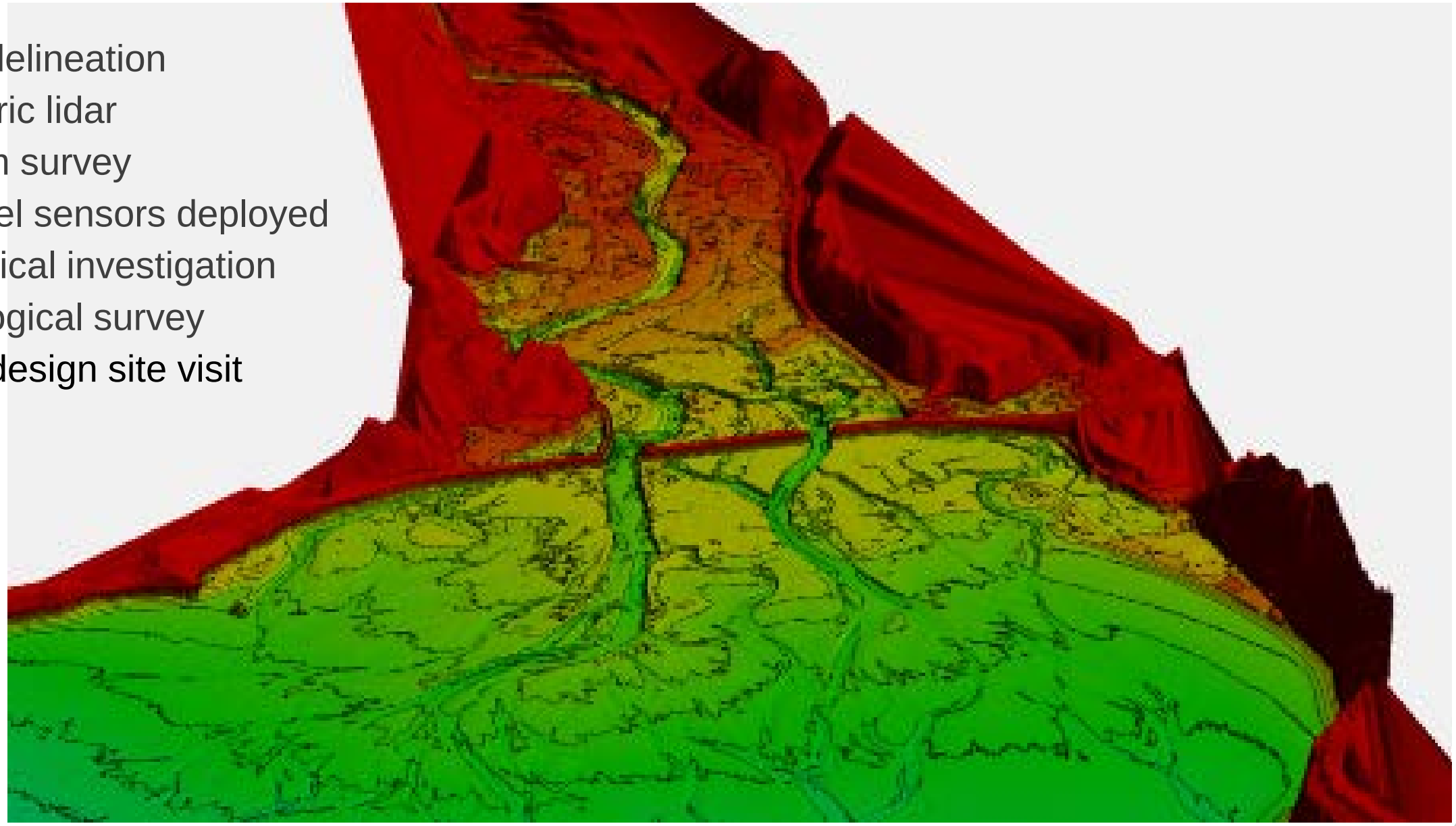
Add large wood, reestablish marsh under old highway and work platform, revegetate disturbed areas

PROJECT ELEMENTS

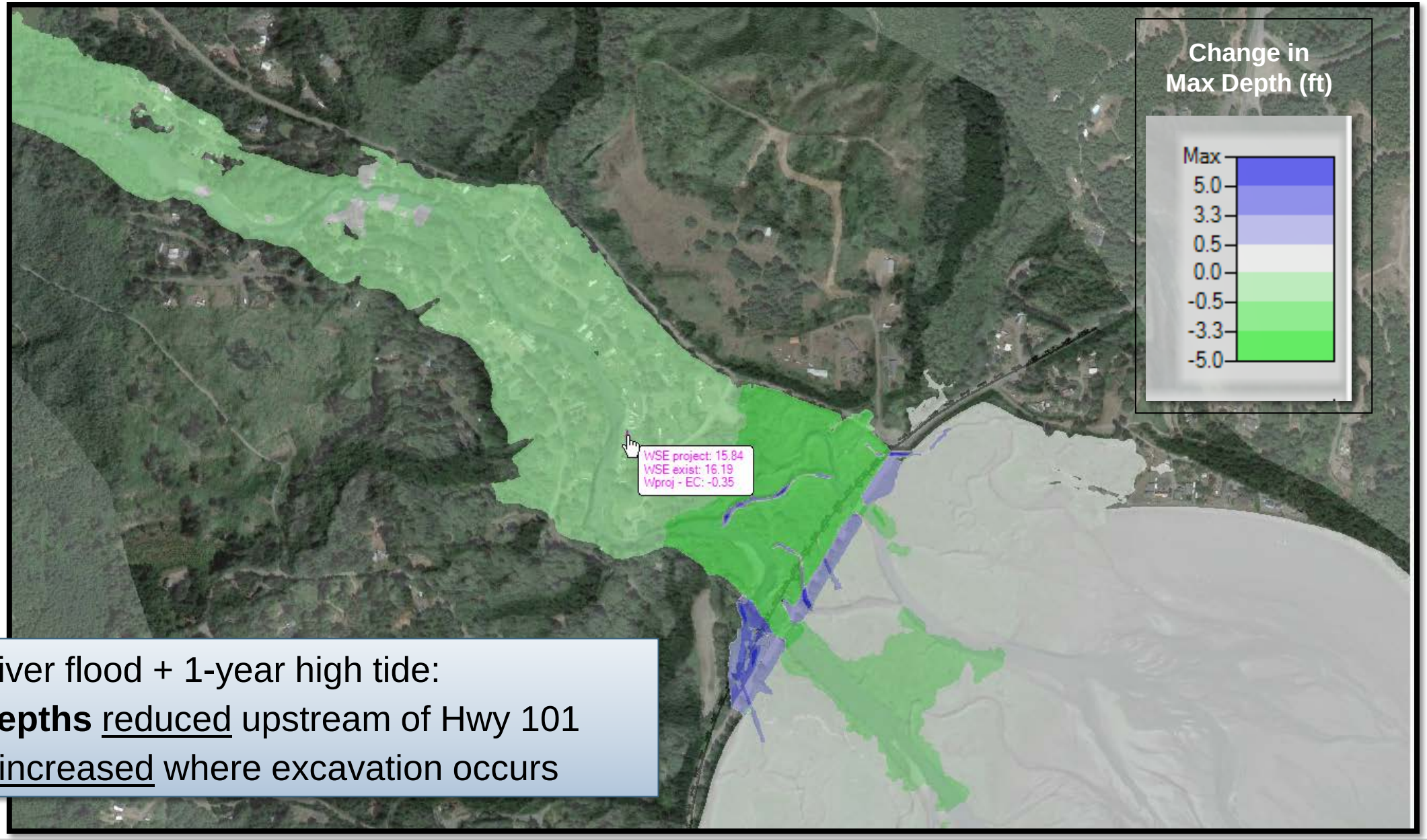


FIELDWORK AND DATA COLLECTION EFFORTS

- Wetland delineation
- Bathymetric lidar
- Multibeam survey
- Water level sensors deployed
- Geotechnical investigation
- Archaeological survey
- Channel design site visit



MODELING OF RIVER AND FLOOD CONDITIONS

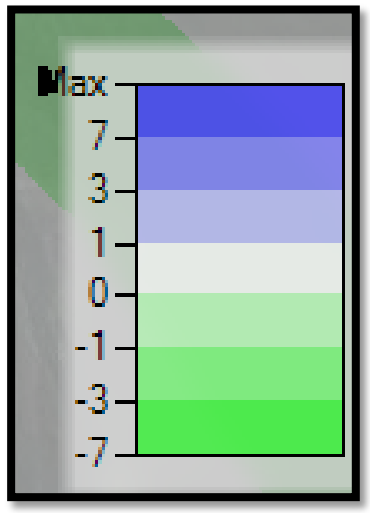


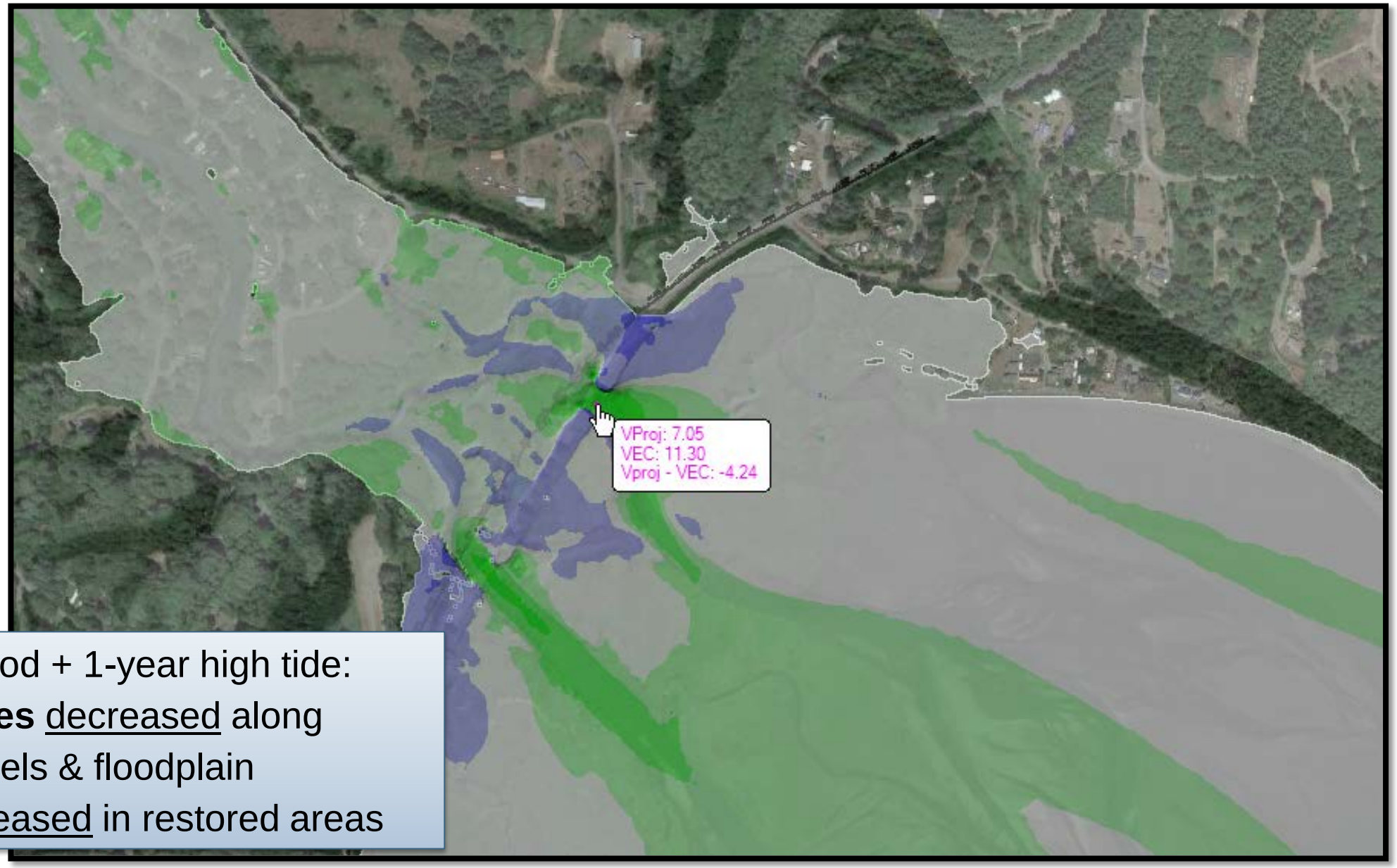
100-year river flood + 1-year high tide:

- Flood **depths** reduced upstream of Hwy 101
- Depths increased where excavation occurs

MODELING OF RIVER AND FLOOD CONDITIONS

Change in Max Velocity (ft/sec)

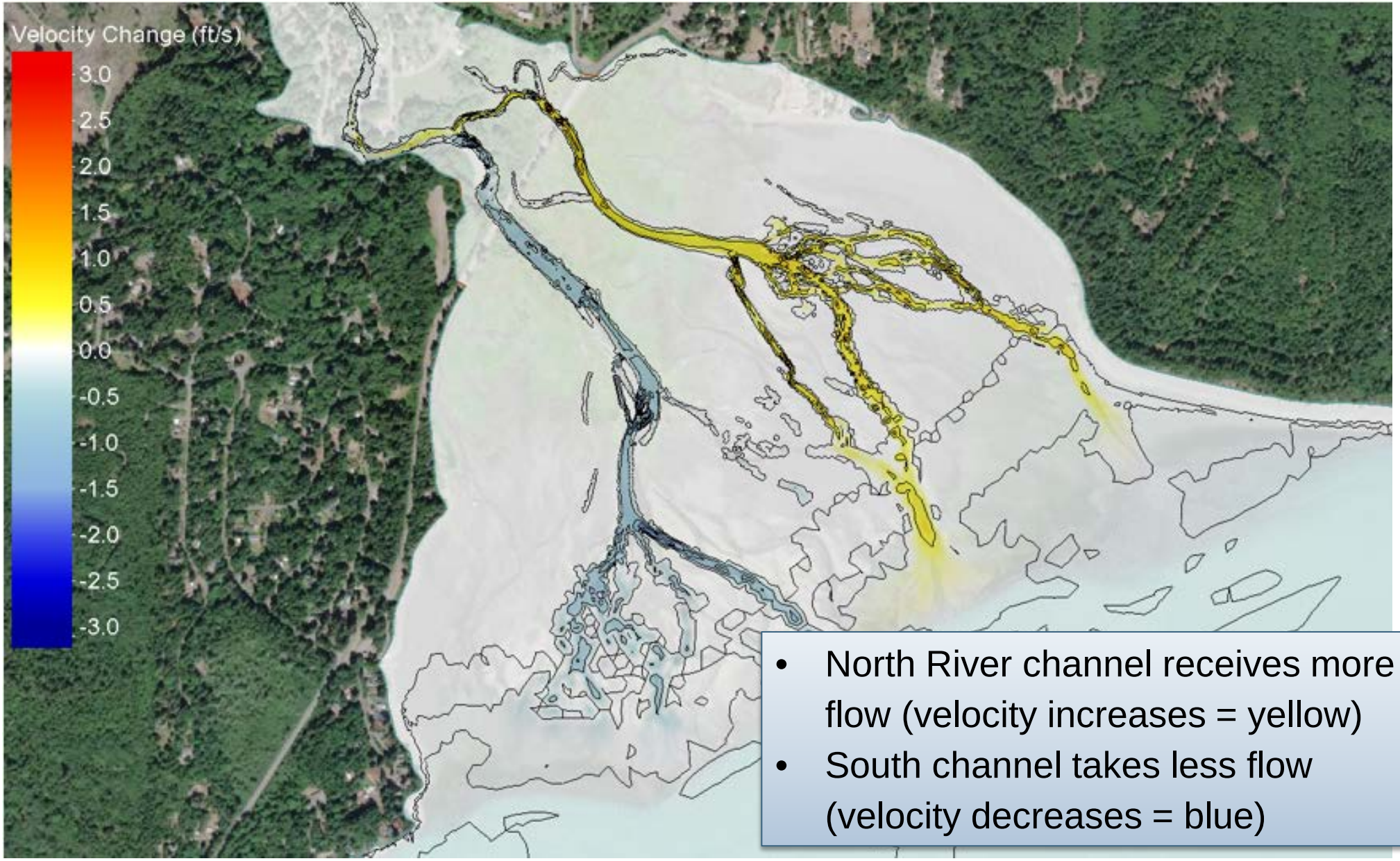




100-year river flood + 1-year high tide:

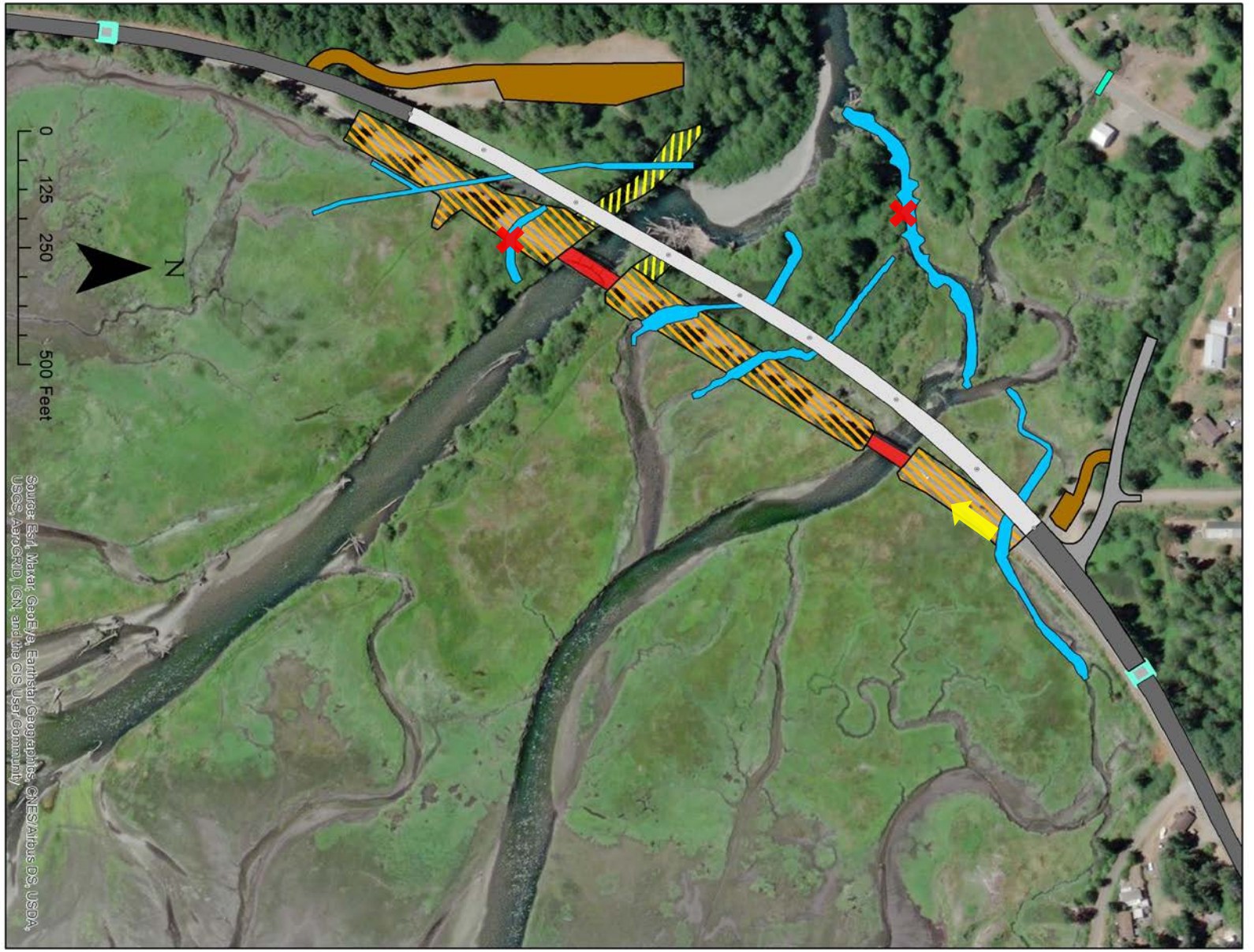
- Flood **velocities** <u>decreased</u> along existing channels & floodplain
- Velocities <u>increased</u> in restored areas

MODELING OF RIVER AND FLOOD CONDITIONS



- North River channel receives more water flow (velocity increases = yellow)
- South channel takes less flow (velocity decreases = blue)

PRELIMINARY DUCKABUSH DESIGN



Duckabush Estuary Restoration: Community Outreach

Mendy Harlow
Executive Director, Hood Canal Salmon Enhancement Group
mendy@pnwsalmoncenter.org

Duckabush Estuary Restoration and Salmon Recovery

- Addresses ESA-listed species:
  - Hood Canal summer chum
  - Mid-Hood Canal Chinook
- Why are healthy estuaries important for salmon?
- Why are Hood Canal summer chum salmon important?
- How does the planned Duckabush Estuary restoration benefit the rest of Hood Canal?

Photo Credit: Morgan Bond

Real Estate Acquisition

HCSEG is working with landowners to acquire key parcels within the project footprint.

1. Fire Station Parcel
2. Intersection Parcel
3. Connector Parcel

Community Outreach

HCSEG hosted the first of many annual Duckabush Estuary Clean Up events in June of 2020.

Nearly **2,500 pounds** of debris and trash from estuary and wildlife area.

Citizen Science Monitoring Opportunities

Pre-project Monitoring of the Duckabush Estuary is underway!

Conditions to be Monitored:

Sediment Deposition
Vegetation
Water Quality
Bird Usage

How to get involved?

Volunteer with the Hood Canal Salmon Enhancement Group

pnwsalmoncenter.org

Duckabush Estuary Restoration: Next Steps

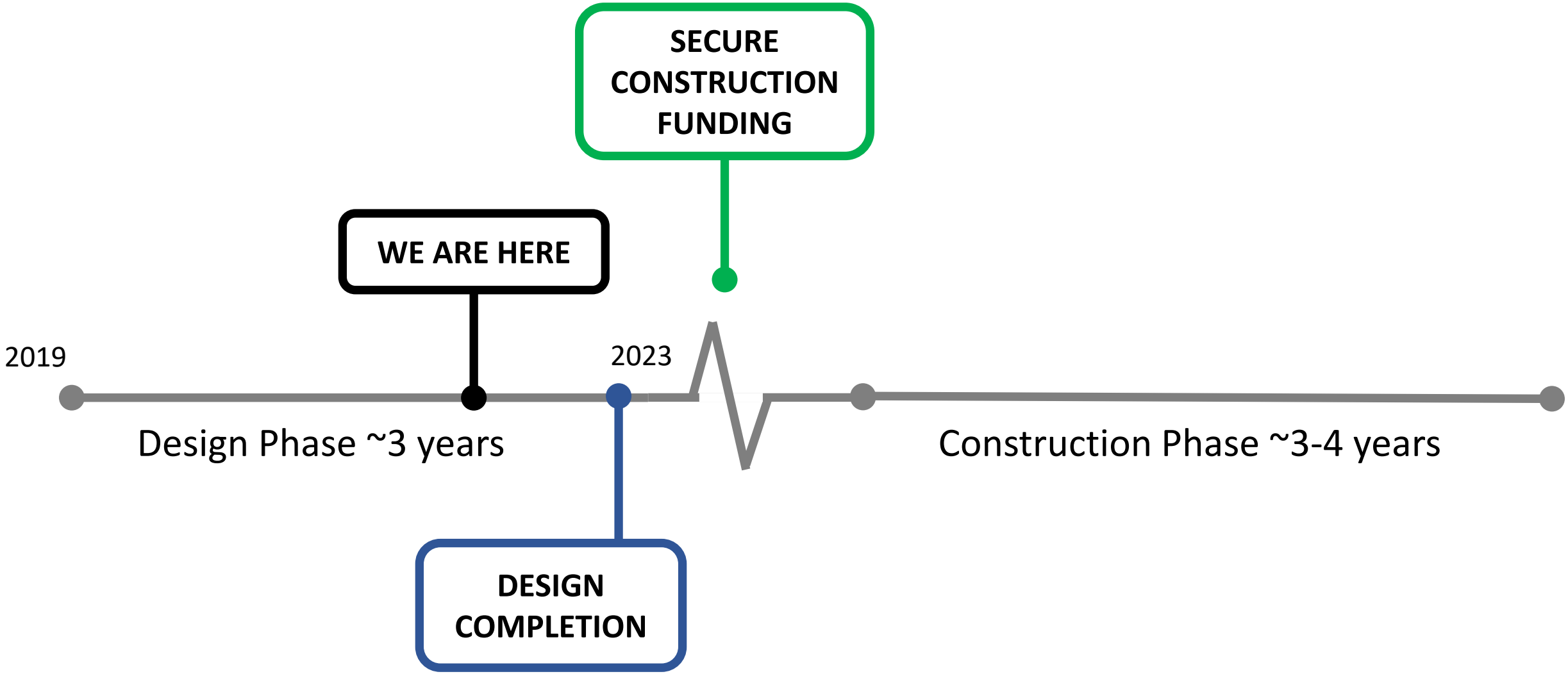
Theresa Mitchell
Project Manager, WDFW
Theresa.Mitchell@dfw.wa.gov

Existing Highway and Proposed Highway

Post-Project Visualization (Preliminary)

Subject to change

Preliminary Project Schedule



More Information?

wdfw.wa.gov/duckabush