Union River Estuary Restoration Project Description June 2011

Washington Dept of Fish & Wildlife - *landowner*

In partnership with:

Hood Canal SEG
PNW Salmon Center

Public Participation Plan

Scope of work included three public meetings & interim meetings with project partners to provide input to the design process.

July 23, 2010 – Public Meeting #1

- Design project was introduced
  - Project objective
  - Studies underway or completed
- Preliminary conceptual design

Key concerns & messages we heard from public:

Retain the trails in same location - assure a commitment for bridge
Bridge design should avoid slippery decks,
Generally agreed with the purpose, but wanted it to be done while being cost efficient and maintaining trails
Liability issues for school district, Role of NMSD
Trail & stormwater impacts to wildlife resources; Impacts to existing wildlife in pasture
Cost / benefit for salmon; return on investment
Avoid loss of agricultural land; better use of land for wildlife crops, e.g. corn
Documentation of science

Public Participation Plan

Scope of work included three public meetings & interim meetings with project partners to provide input to the design process.

October 6, 2010:

- Design project progress update
- Studies underway or completed
- Preliminary design alternatives (11)

Key messages & concerns we heard from public:

- GMA issues / Mason County involvement
- Liability issues
- Cost/benefit
- Loss of agricultural land in Mason County
- Other community priorities for investment
- RCO involvement in project design
- Documentation of science for breach design

Public Participation Plan

Scope of work included three public meetings & interim meetings with project partners to provide input to the design process.

June 27, 2011:

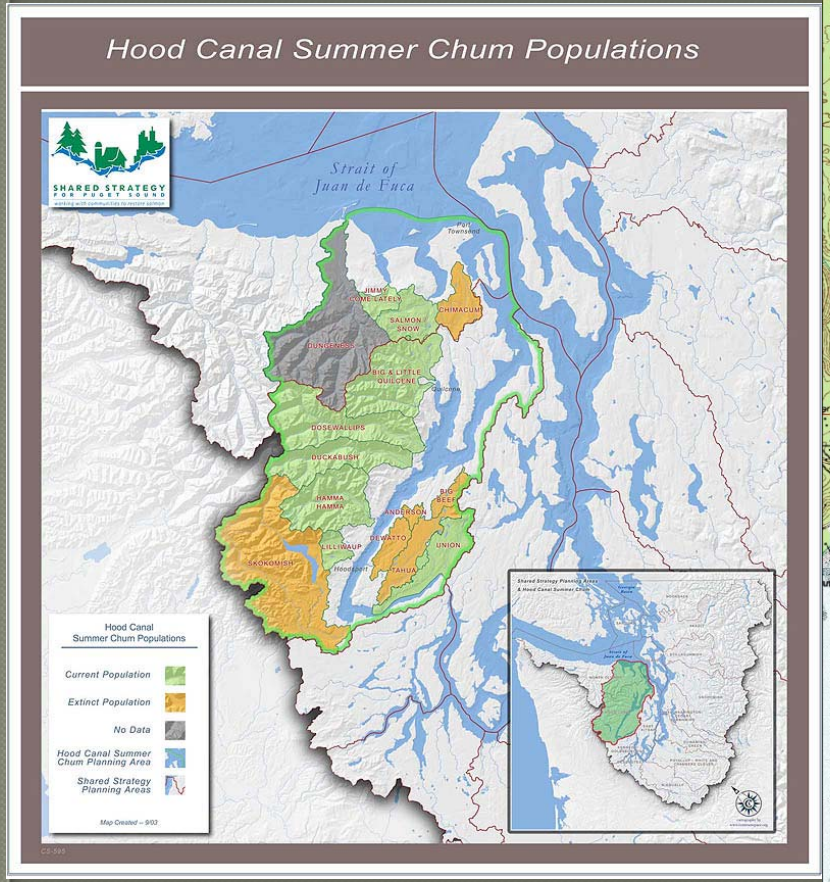
- Review for those new to project
- Update progress on design studies
- Introduce preliminary design preferred by project partners

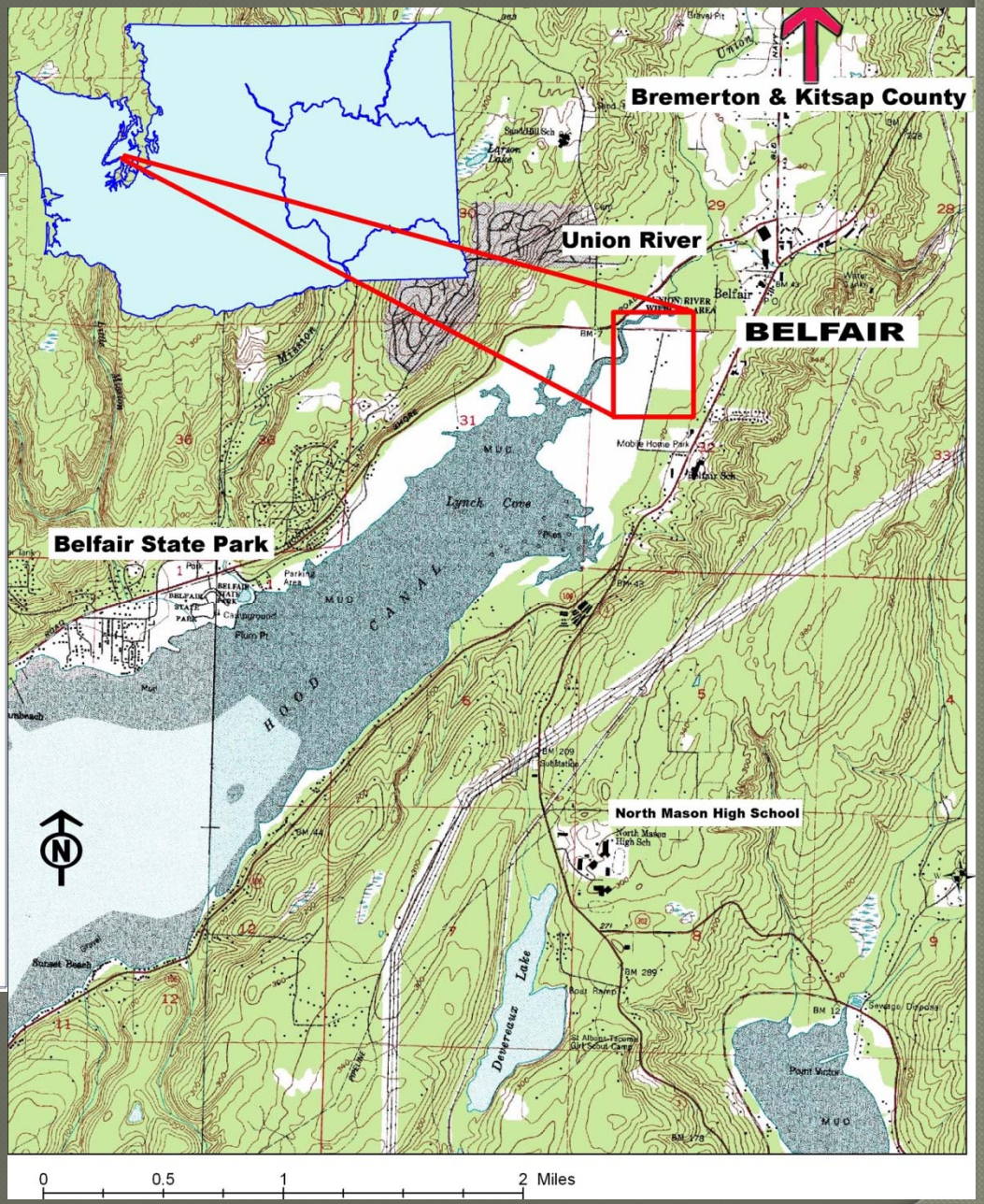
Key messages & concerns we heard from public prior to meeting:

- Liability issues
- Cost/benefit
- Loss of agricultural land in Mason County
- Documentation of science for breach design
- No option as an alternative
- Excavate lower marsh in existing WDFW wildlife area as alternative
- Public participation opportunities

The focus of public participation plan is to share information with and gather input from members of the public who may have an interest in a proposed project.

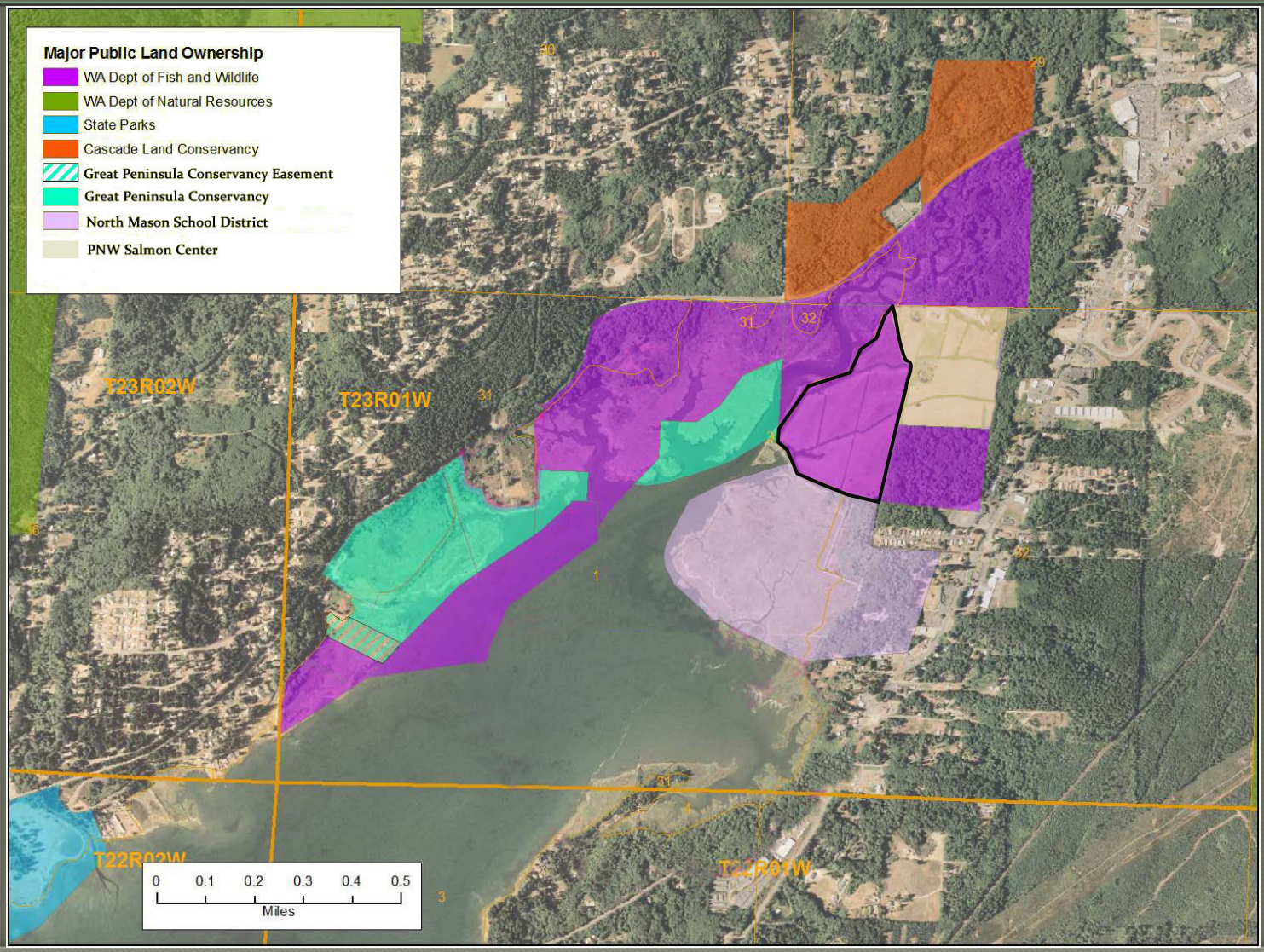
Vicinity Map





Union River >10 river miles
Watershed 24 sq miles

Union River Estuary Conservation Efforts



Estuaries – High Priority Habitat for Protection & Restoration

High fish & wildlife density

High species diversity

Important fish & wildlife seasonal ranges & movement corridors

Limited availability

High vulnerability to habitat alteration

Wildlife Benefits

Union River estuary supports seasonally abundant waterfowl

shorebirds
& wading birds

Union River Estuary Restoration Fish Resources

Union River is the stronghold for Hood Canal summer chum salmon

The lower seven miles are low gradient, making for excellent chum spawning habitat. The watershed is relatively undeveloped, particularly in the upper watershed (owned by City of Bremerton).

Volunteer efforts have rebuilt the summer chum run over the last seven years to returns in the thousands of fish per year

Union River also supports good numbers of coho & fall chum salmon and cutthroat trout and smaller numbers of Chinook salmon & steelhead trout

Salmon fry leaving the Union River use tidal channels and estuarine habitat during early life history

Juvenile salmon need estuaries

Union River estuary supports juvenile chum & Chinook salmon in early life stages

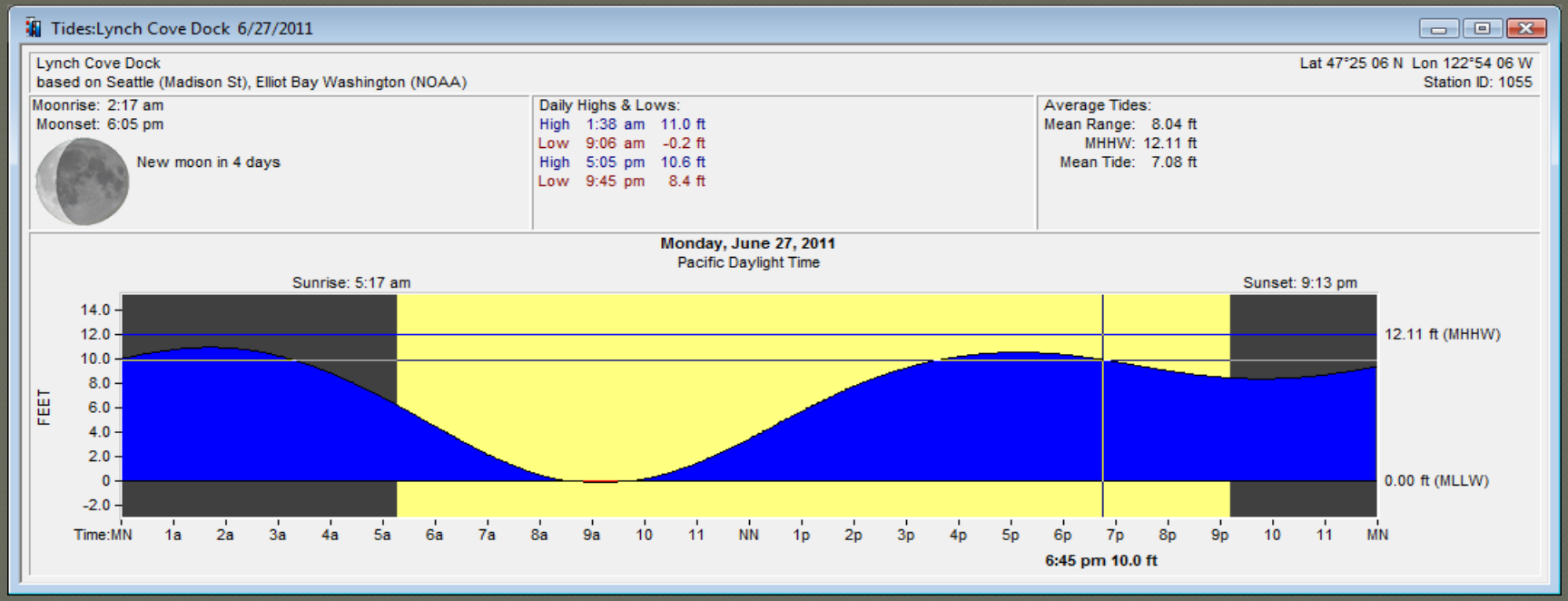
Juvenile salmon that grow big quickly have higher survival rates

Why is this habitat restoration important to juvenile salmon?

Juvenile salmon are small at outmigration and need shallow, protected waters for refuge from currents & predators. A salt marsh is ideal for this.

The mesohaline reach of the lower river allows fish to transition gradually to salt water, using the marsh and tidal channels for feeding and protection from predators.

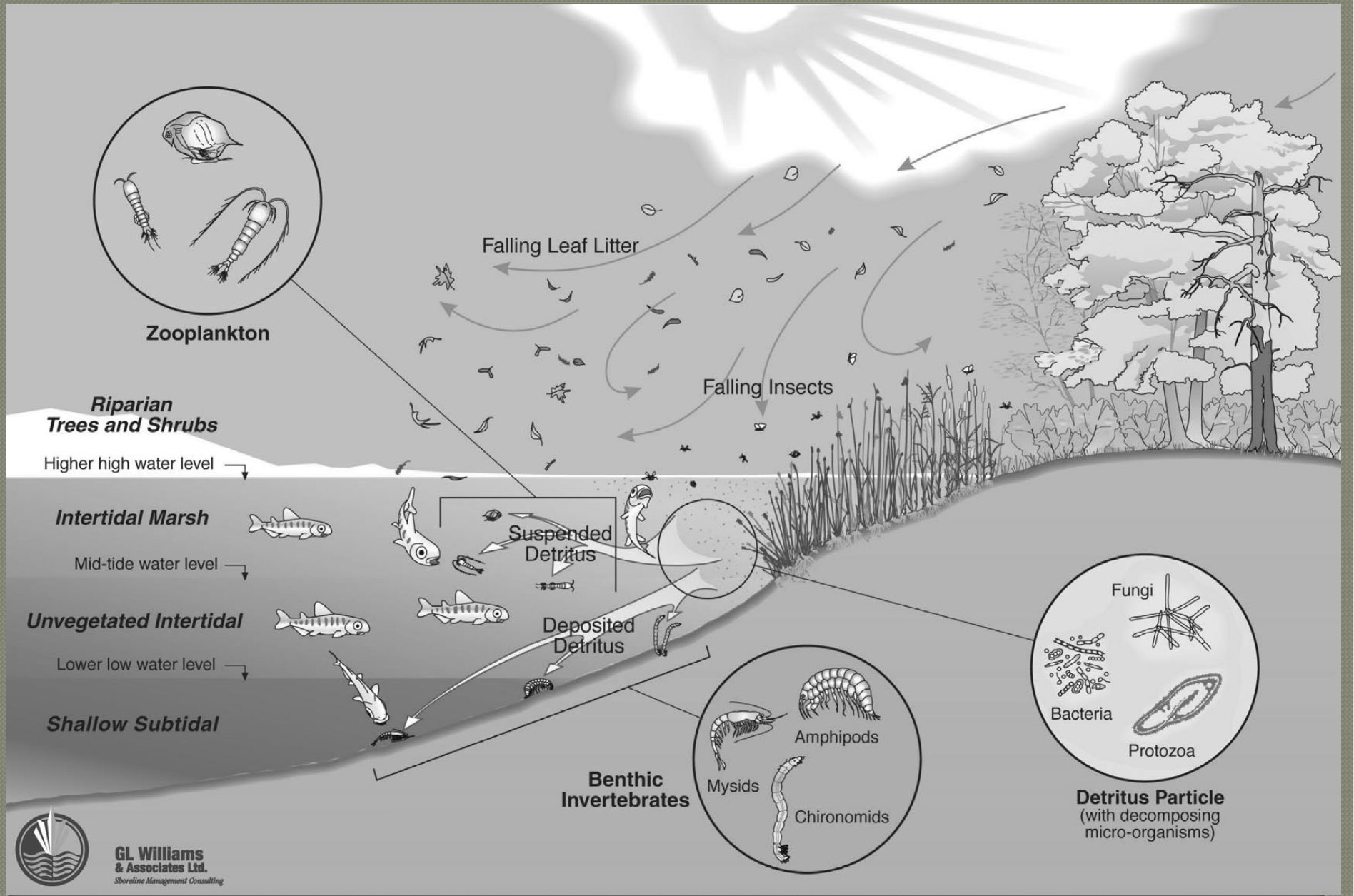
Where is juvenile salmon habitat in a salt marsh?



Tidal channel networks allow juvenile salmon to move deep into the marsh habitat.

The rising tide "activates" the marsh and the receding tide flushes salmon prey into the tidal channels.

The highest tides allow direct fish access into the marsh.



Graphic courtesy of GL Williams & Associates, Coquitlam, BC

Could we "restore" WDFW property on the wildlife area instead?

Design project

Project sideboards:

- Restore former salt marsh on WDFW property
- Retain trails

Preferred alternative needs to be:

- Technically sound
- Consider local interests & perspectives

Objectives of Restoration Project

PROJECT SIDEBOARDS:

SALT MARSH CREATION: *Restore, to the maximum extent feasible, the salt marsh area to Hood Canal that existed during the 1883 BLM mapping of Hood Canal/Union River/Lynch Cover estuary.*

PEDESTRIAN TRAIL USE AND MAINTANANCE: *Allow for the continuance of the use and maintenance of pedestrian access to the property.*

HABITAT IMPROVEMENT OBJECTIVES

- Improve habitat connectivity and tidal circulation
- Provide a variety of fish and wildlife habitat niches
- Replicate native estuarine habitat
- Restore habitat forming processes within the salt marsh restoration site
- Enhancement of the habitat supporting salmon populations

ENGINEERING OBJECTIVES:

- Salt marsh drainage
- Accommodate storm drainage from adjoining property
- Prevent flooding of surrounding properties during high tides or high flows in the Union River

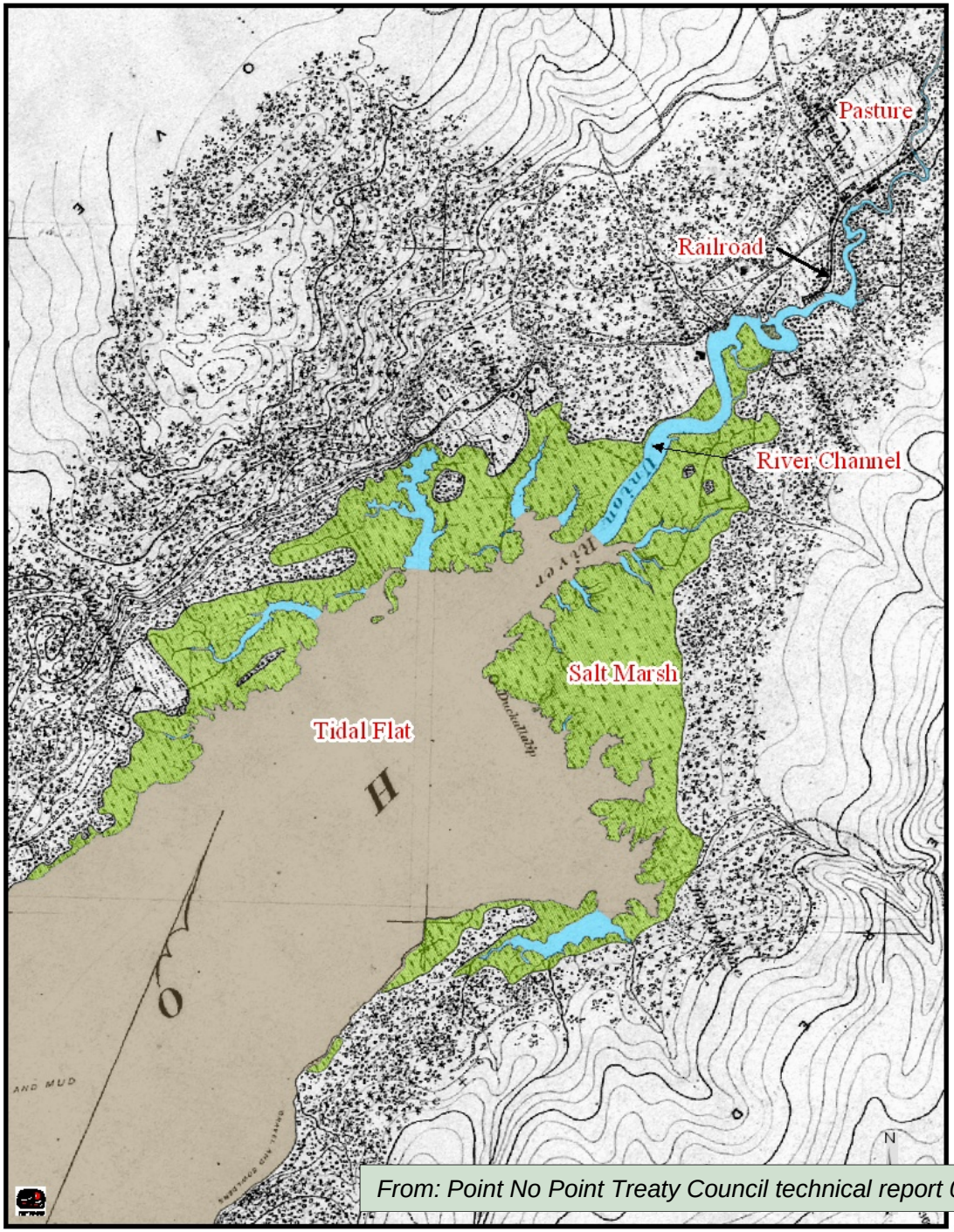
COMMUNITY OBJECTIVES:

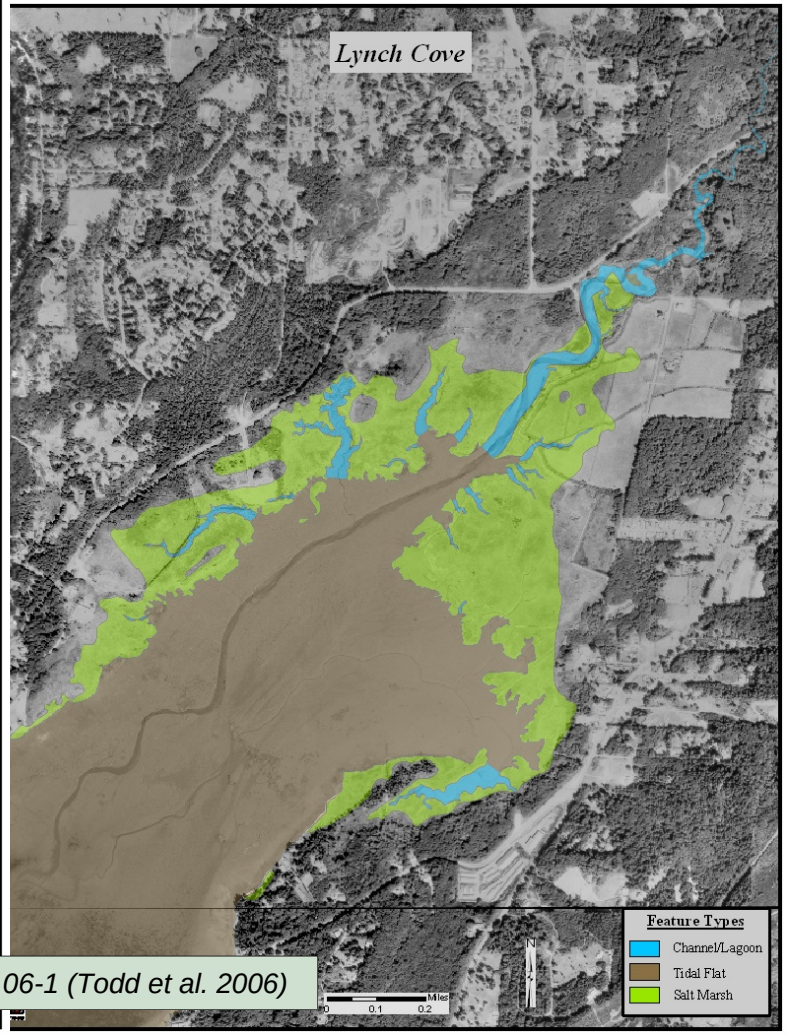
- Encourage estuarine and wildlife viewing
- Construct an aesthetically pleasing project
- Maintain view corridors for upland properties

PRELIMINARY STUDIES FOR DESIGN

- Historic conditions
- Topographic survey and wetland identification
- Soil study
- Analyze wind direction, waves and fetch
- Tidal circulation
- Stormwater drainage study

Historical template of the estuary





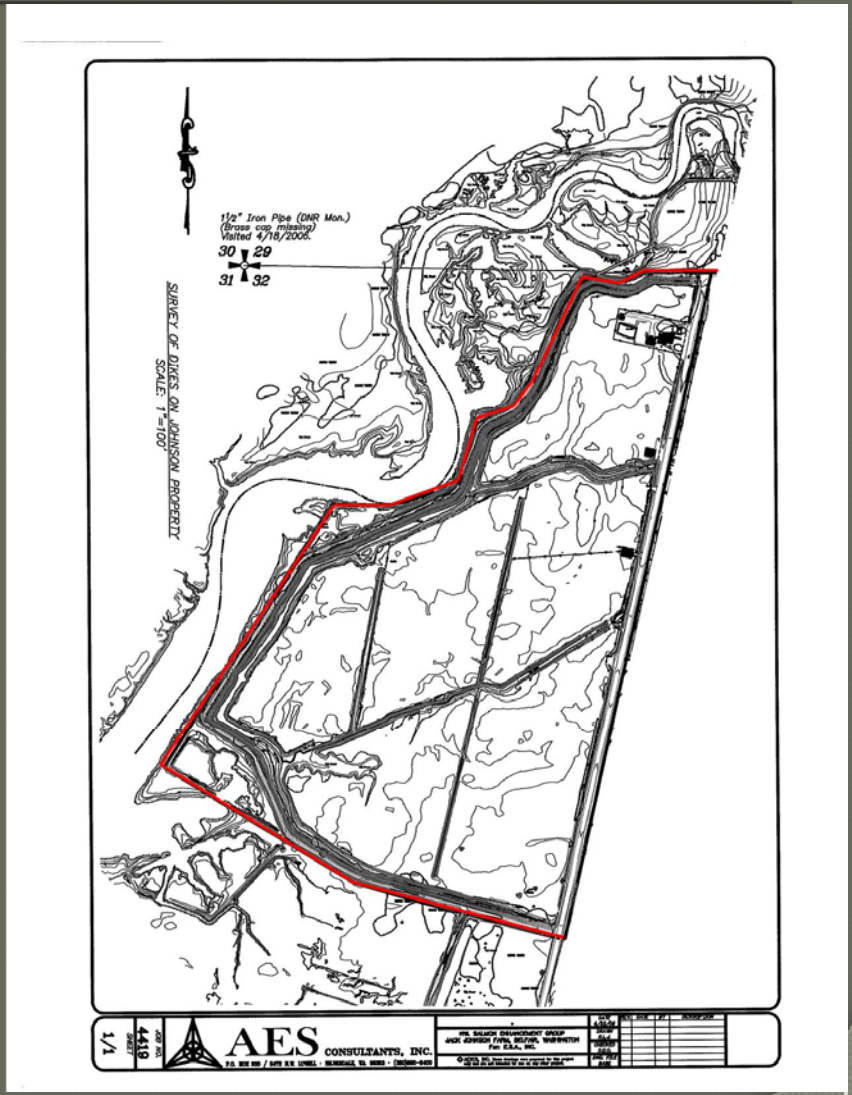
From: Point No Point Treaty Council technical report 06-1 (Todd et al. 2006)

TOPOGRAPHIC SURVEY

Determine grading to achieve:

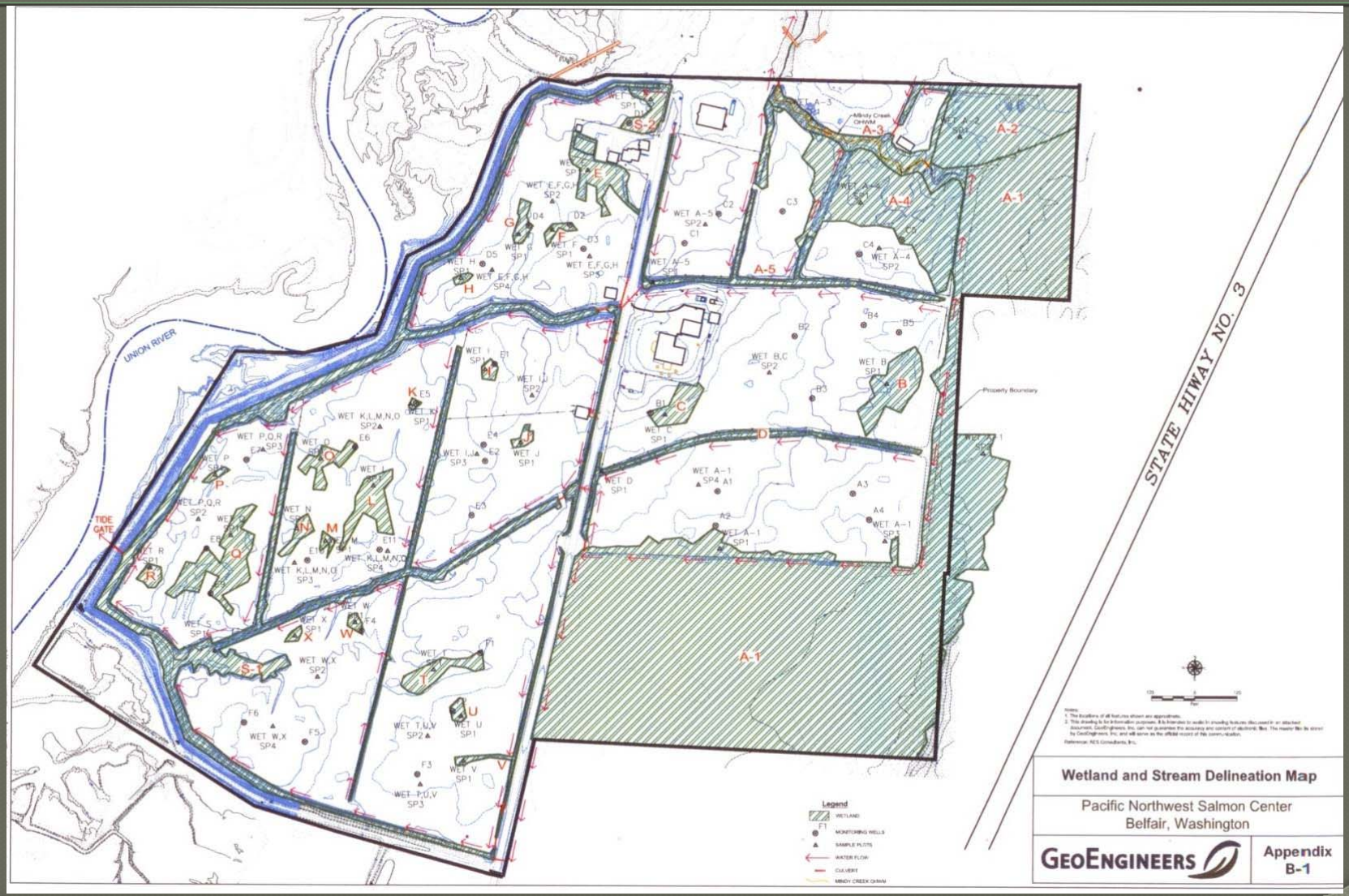
- Tidal circulation and drainage
- Desired plant communities
- Protection of infrastructure and adjacent properties

Evaluate subsidence of soils due to dike



WETLAND STUDIES

COMPLETED BY GEO ENGINEERS IN 2009



SOIL STUDY

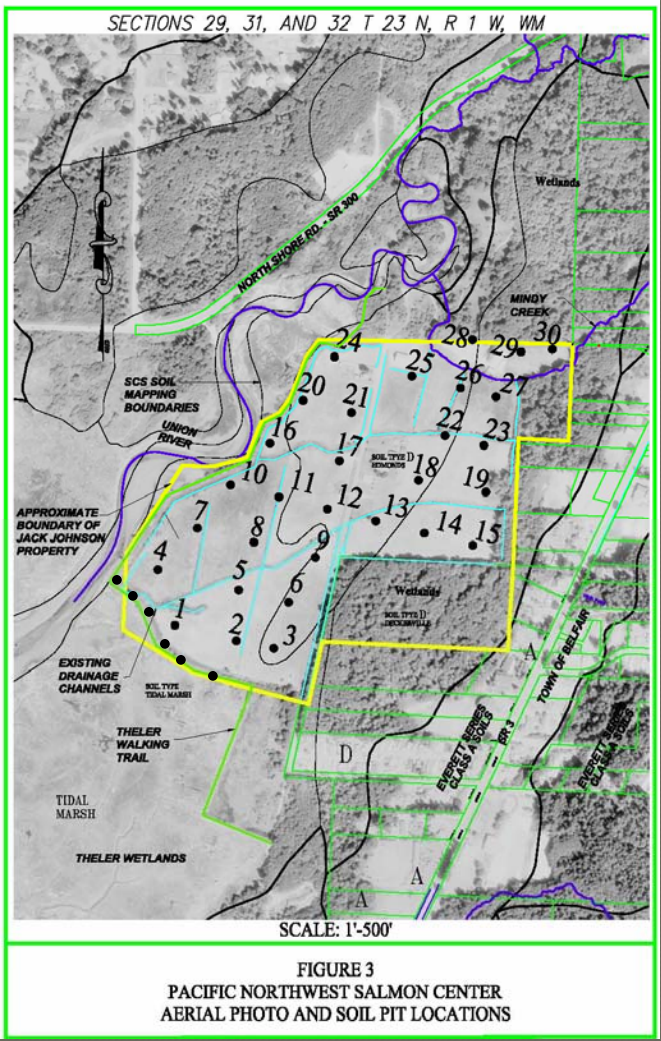


FIGURE 3
PACIFIC NORTHWEST SALMON CENTER
AERIAL PHOTO AND SOIL PIT LOCATIONS

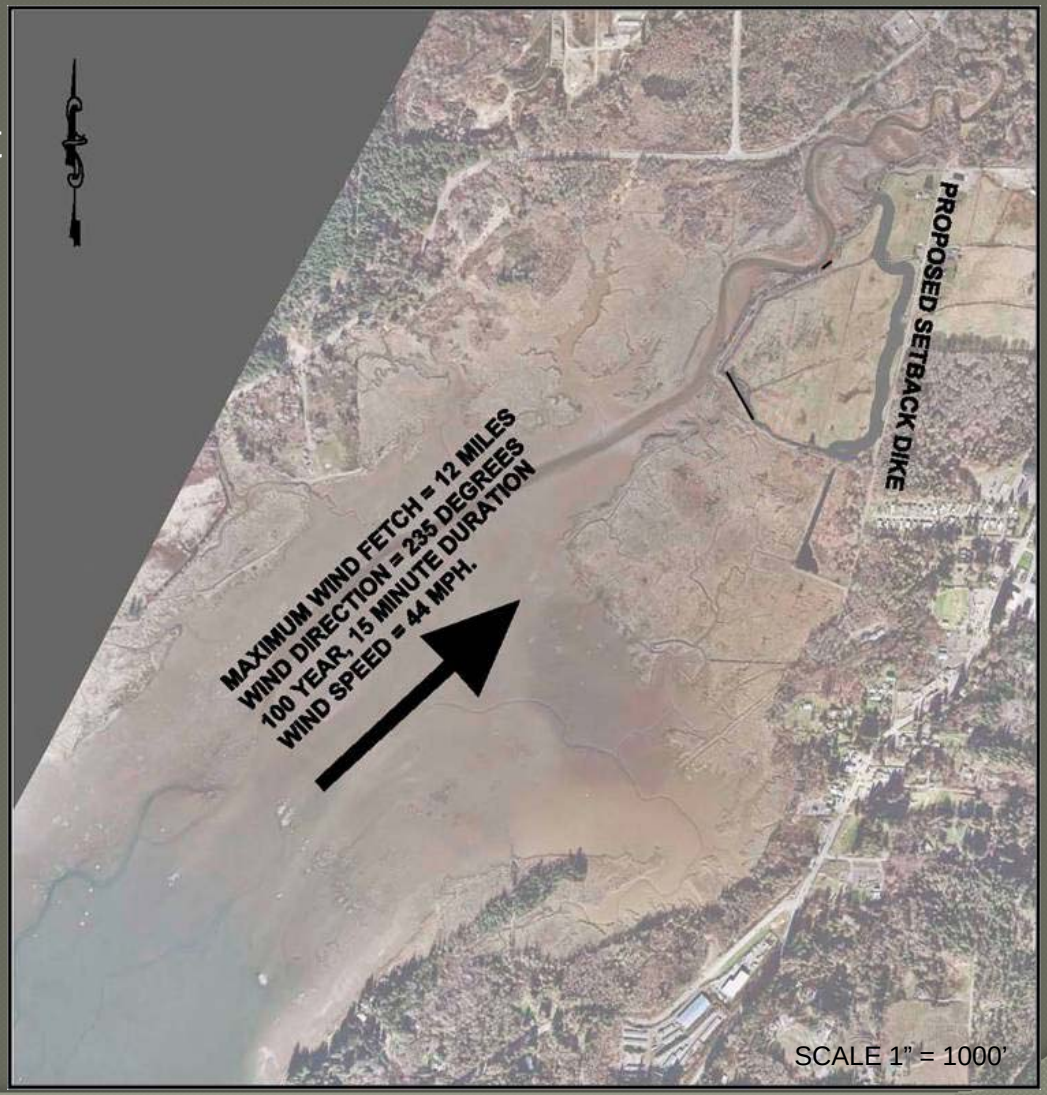
Soil pits throughout the site & borings along the dike indicated that the soils are predominantly silty sands with organics (“bay mud”) with a layer of up to two feet of sandy silt and organic top soils.

COASTAL GEOMORPHOLOGY

Determine maximum wave height & duration based on known predominant wind direction & speed during storm events and tide events

Protect infrastructure & adjacent properties

Design for tidal circulation, drainage, wood placement, sediment distribution



TIDAL FLOODING FREQUENCY LYNCH COVE

	TIDE RANGE (reference MLLW)	FLOODING FREQUENCY (# times exceeded per year)
Low Marsh	7.5’ - 9.5’	626 - 705
Medium Marsh	9.5’ - 11.1’	444 – 626
High Marsh	11.1’ - 13.0’	74 - 444
Salt Tolerant	13.0’ - 14.0’	11 - 74
MHHW	12.2‘	196
MHW	11.1 ‘	444

TIDAL FLOODING IN THE UNION RIVER ESTUARY

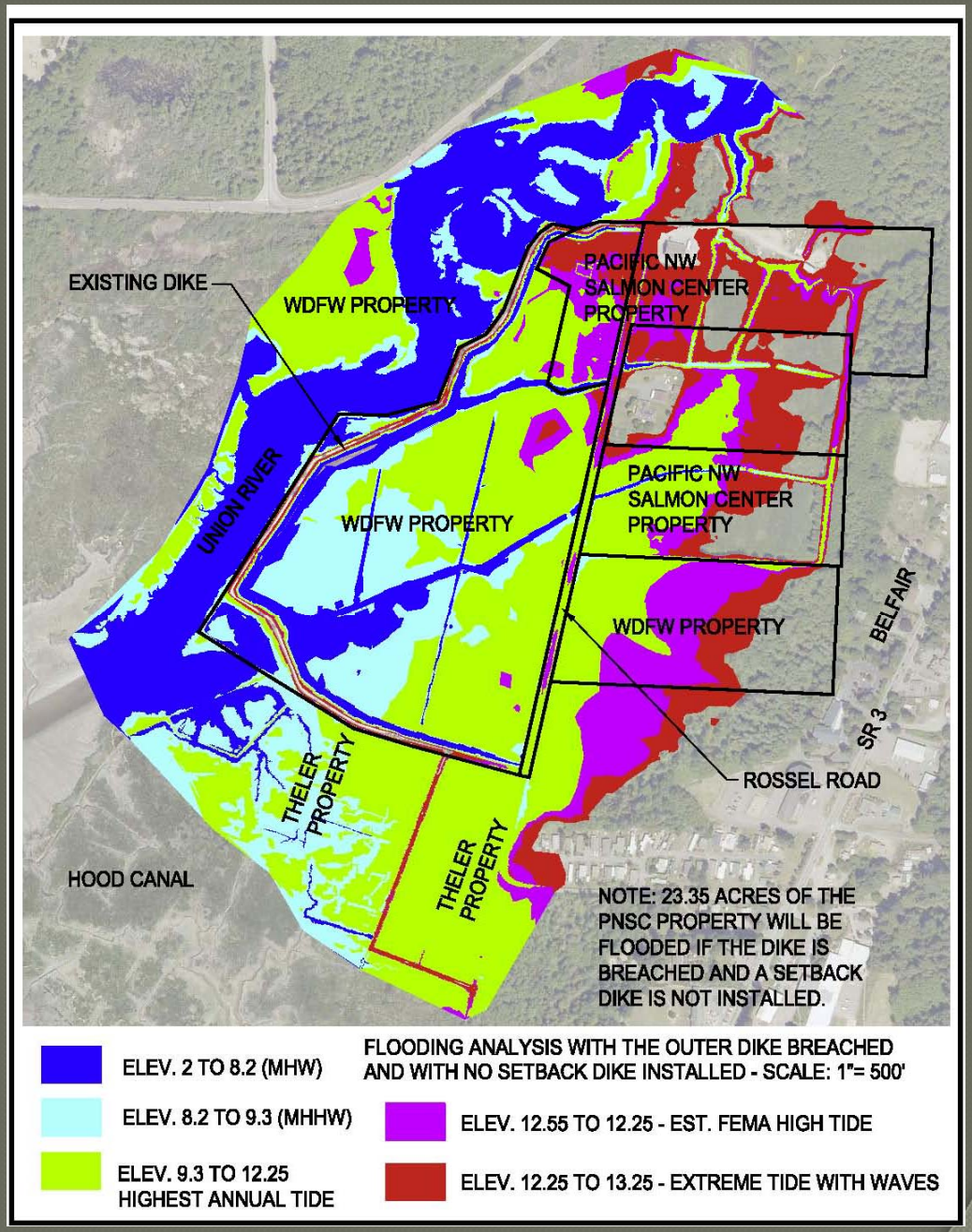
November 3, 2010 at 1pm
Tide: 12.7’ MLLW @ Theler Wetlands

The 12.7’ tide is exceeded 117 times per year in Lynch Cove.

The only vegetation showing is high salt marsh, salt tolerant upland plants and upland plants.

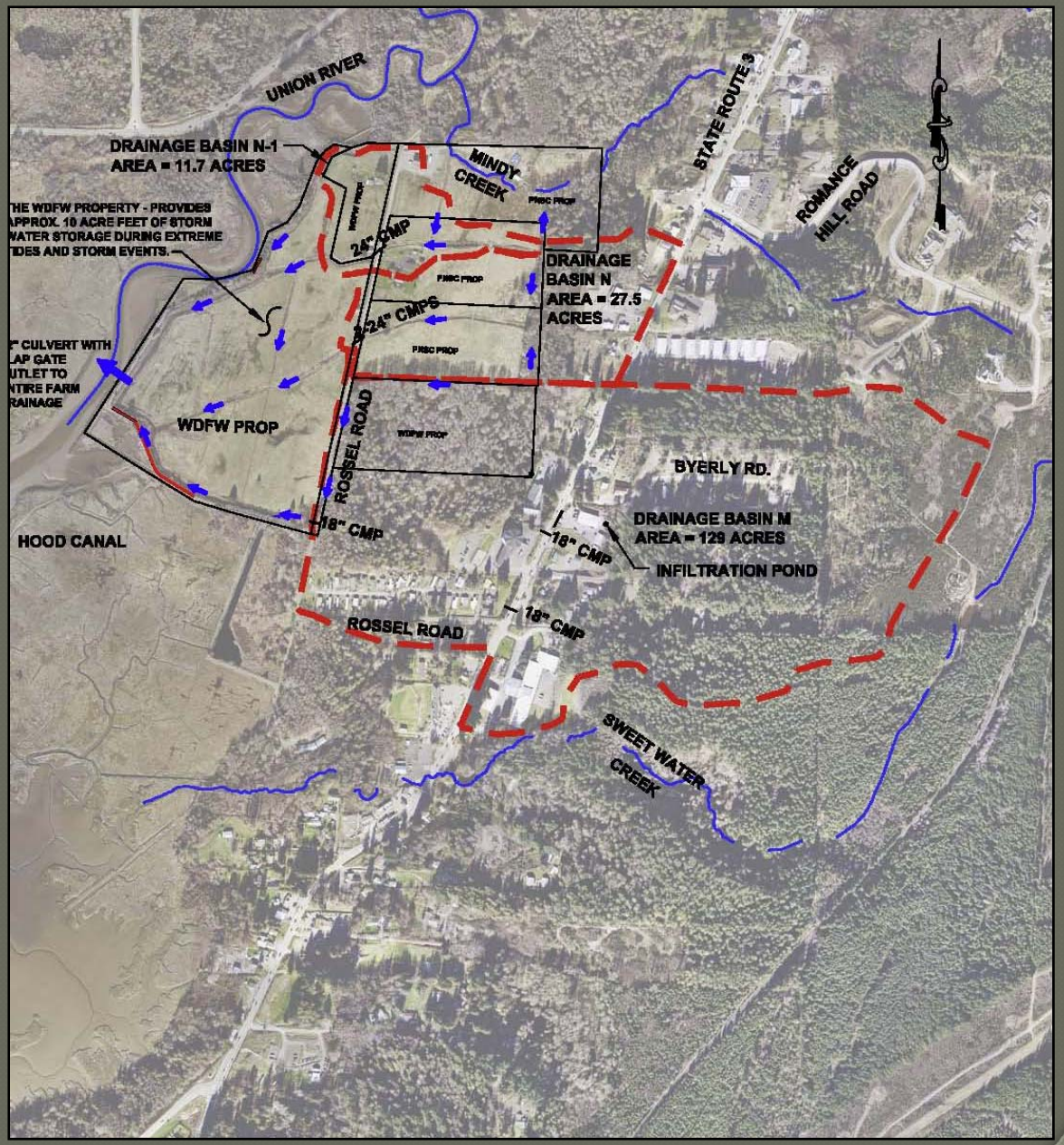
Tidal flooding of the surrounding properties if the existing levee is removed and no setback dike is constructed.

A setback dike to protect infrastructure and farm fields is part of the design proposal.



Current watersheds and stormwater with drainage toward the WDFW property.

At high tide, the restored estuary site would no longer store runoff – it would back up into the PNWSC farm fields. A stormwater storage solution is part of the design proposal.



THE DESIGN MUST CONSIDER

- Setback dike location and configuration
- Dike removal opening location and size
- Estuary grading and marsh habitat creation
- Tidal channels layout and design
- Pedestrian trail structure type and location
- Stormwater storage alternatives
- Constructability
- Cost

RESTORING THE TIDAL FLOODING PROCESSES

Ecologically, removal of the dike would be most effective for habitat restoration.

We could accomplish tidal regime re-establishment with a fairly small opening (<100').

Additional habitat benefits from larger opening:

- habitat connectivity
- sediment distribution
- habitat diversity

Find the balance between habitat values with community values

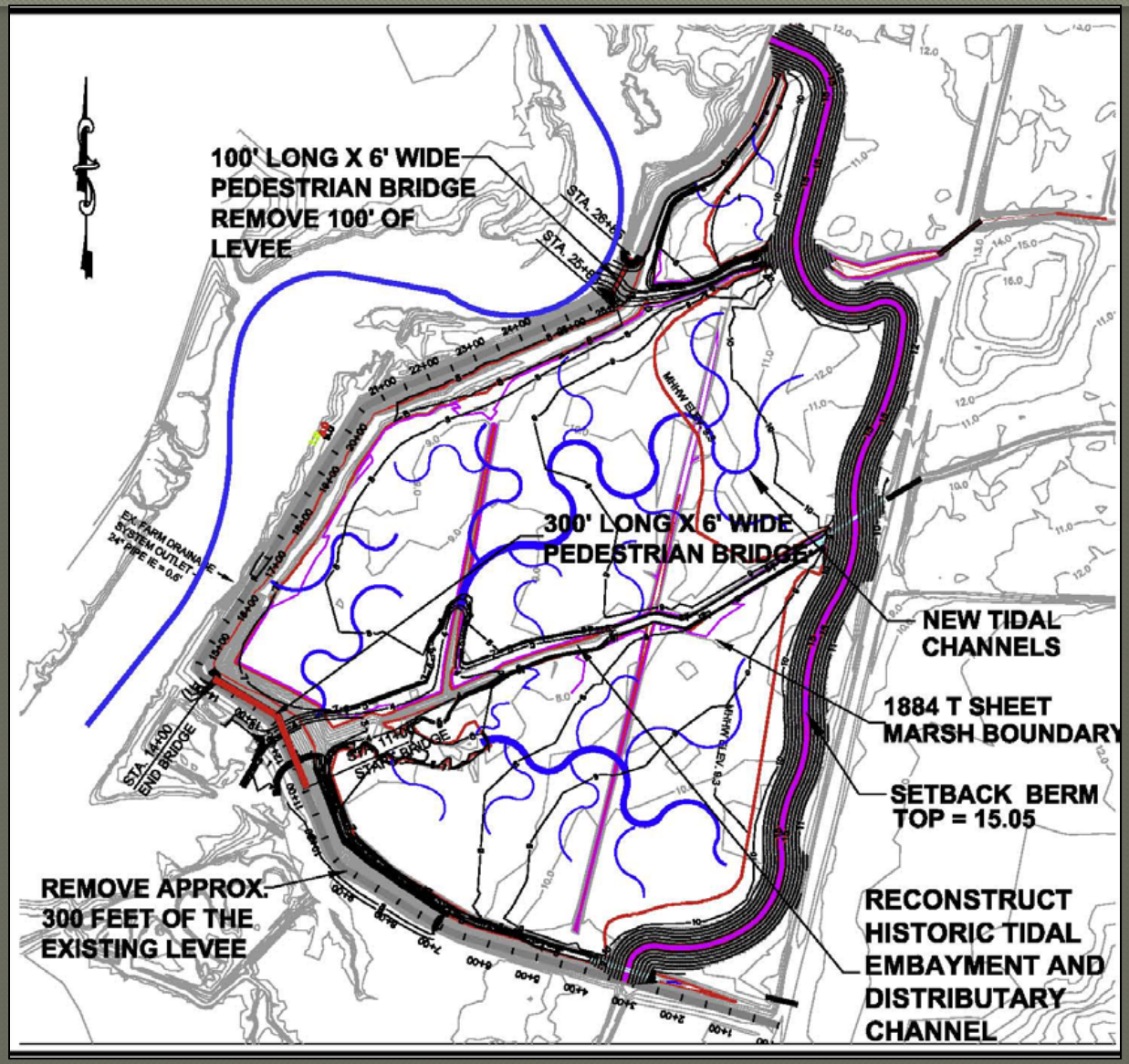
Preferred Alternative
(Alternative 12)

Features:

300' southern opening and 100' northern opening along the existing dike.

Concrete bridge to span dike openings to retain the trail in the same location.

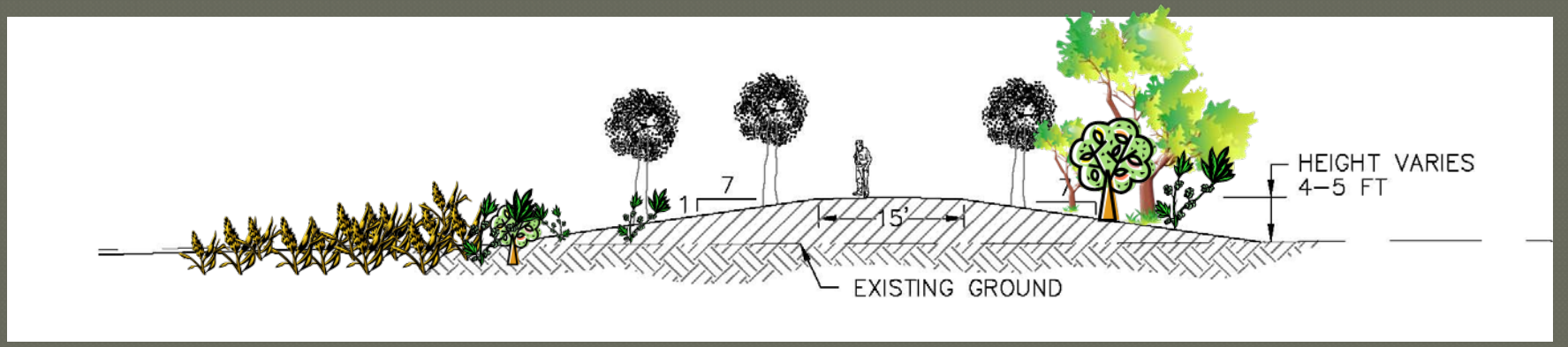
Site grading is limited to the tidal channel excavation and drainage and removal of the topsoil. Borrow ditches will be filled with some of the excavated material.



Additional excavated material will be used to construct the setback dike (with an additional trail).

Excess spoils will be deposited on the PNWSC farm fields for beneficial re-use.

SETBACK DIKE CROSS-SECTION

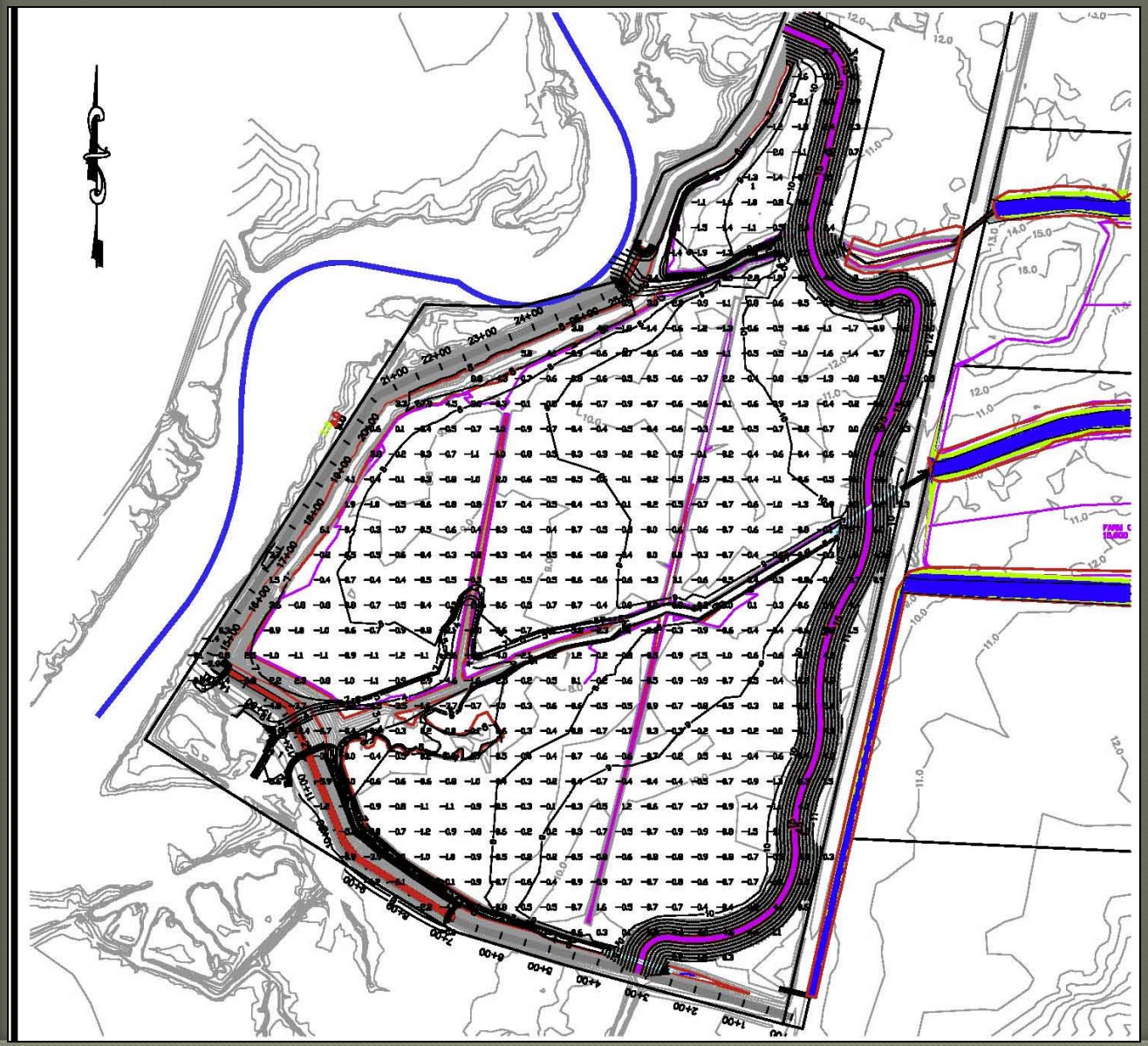


PROPOSED SETBACK DIKE AND TRAIL

Top of dike = 18.0’ MLLW

Side slopes are 7:1 to simulate a natural shoreline.

GRADING PLAN



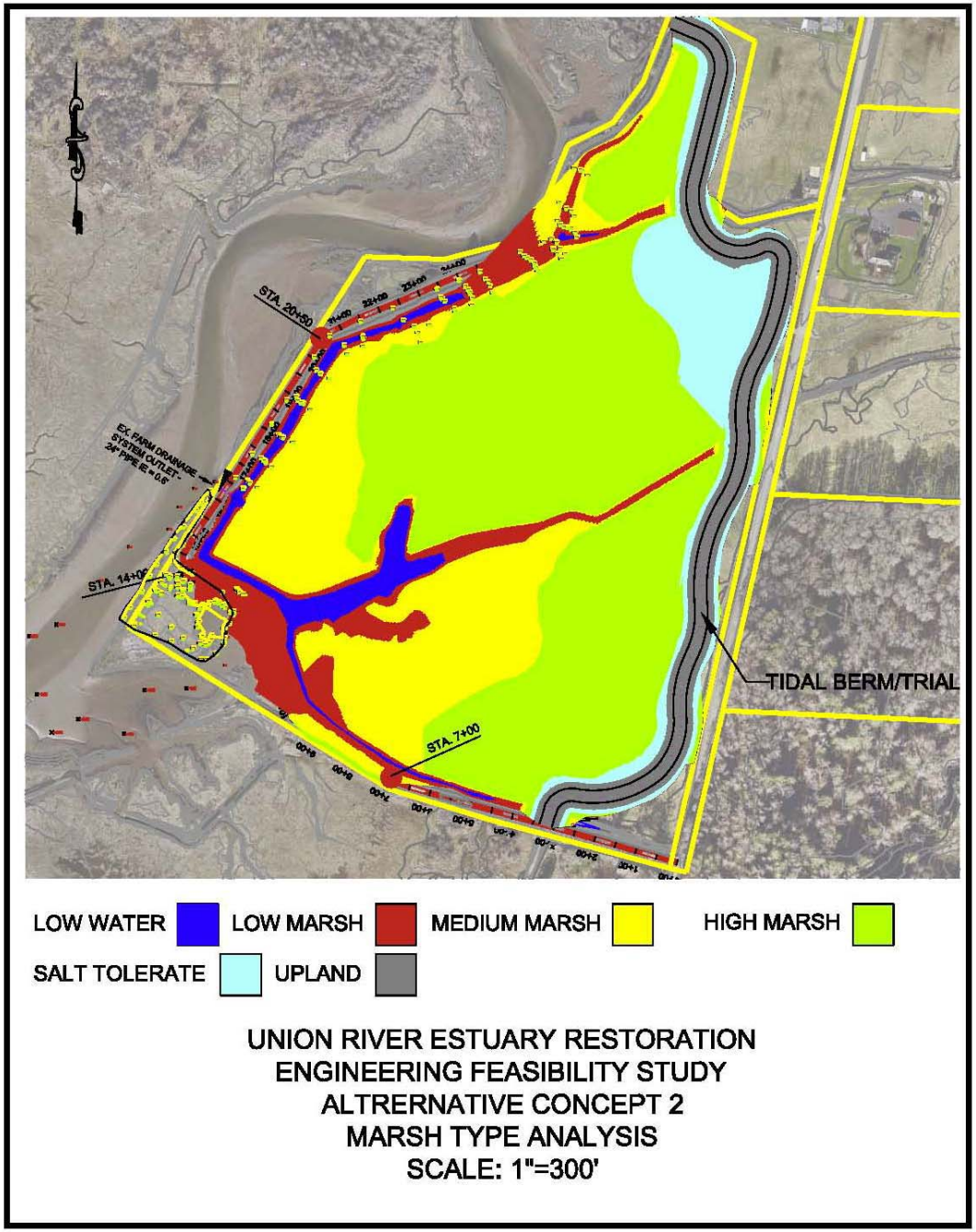
After preparation (plow & disc), the site will be graded to drain toward the southern opening and create tidal channels.

This work will be done before the dike excavation.

Marsh Composition After Restoration

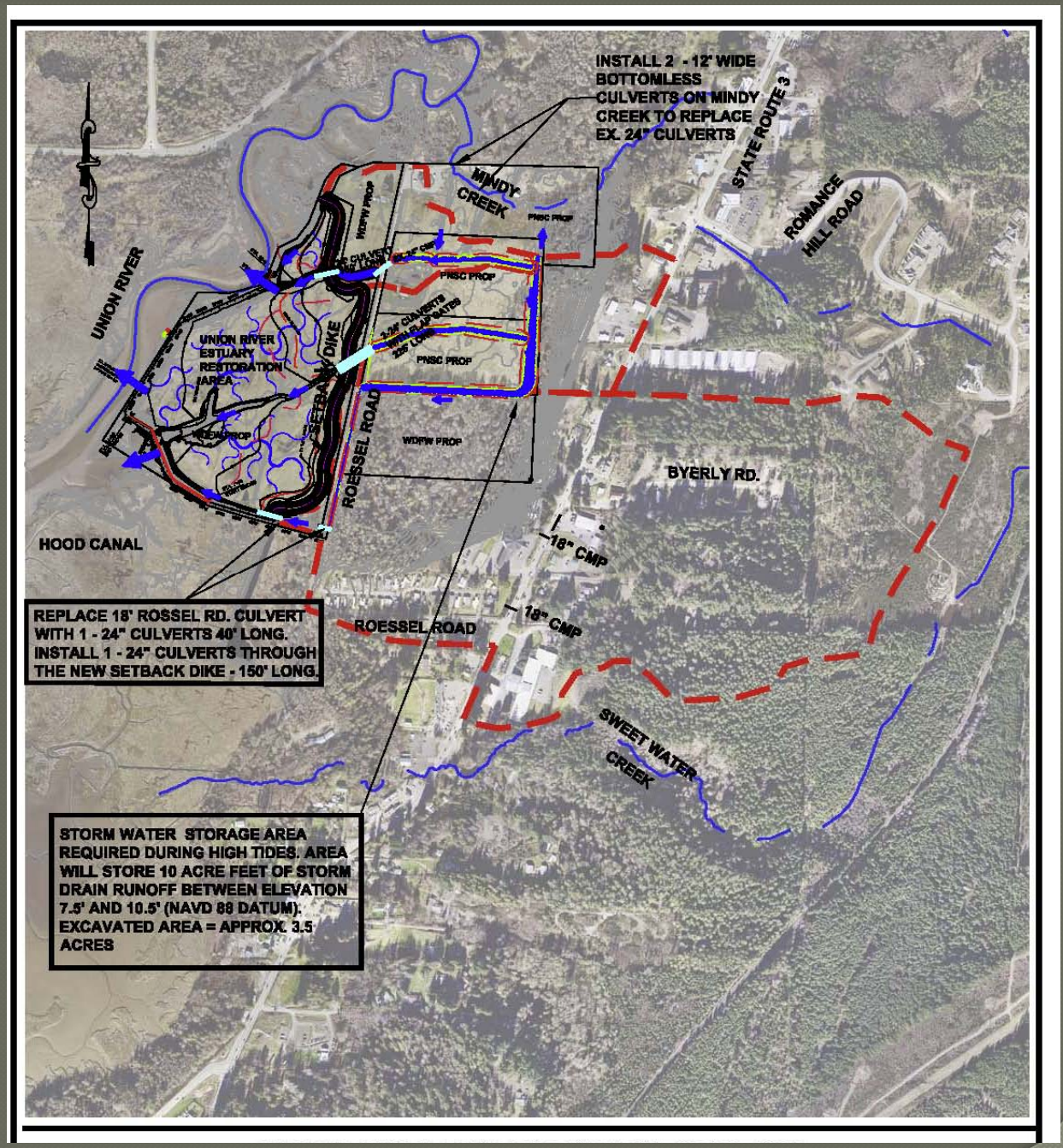
4 %	Tidal channel
10 %	Low Marsh
21%	Low-Med Marsh
55%	High Marsh

Similar to surrounding marsh sites in Lynch Cove



To store the runoff and stormwater from uplands on storm events at high tide, the existing farm drainage ditches at PNWSC will be excavated to be wider and deeper.

10 acre feet of storage needed
=
25,500 CY excavation

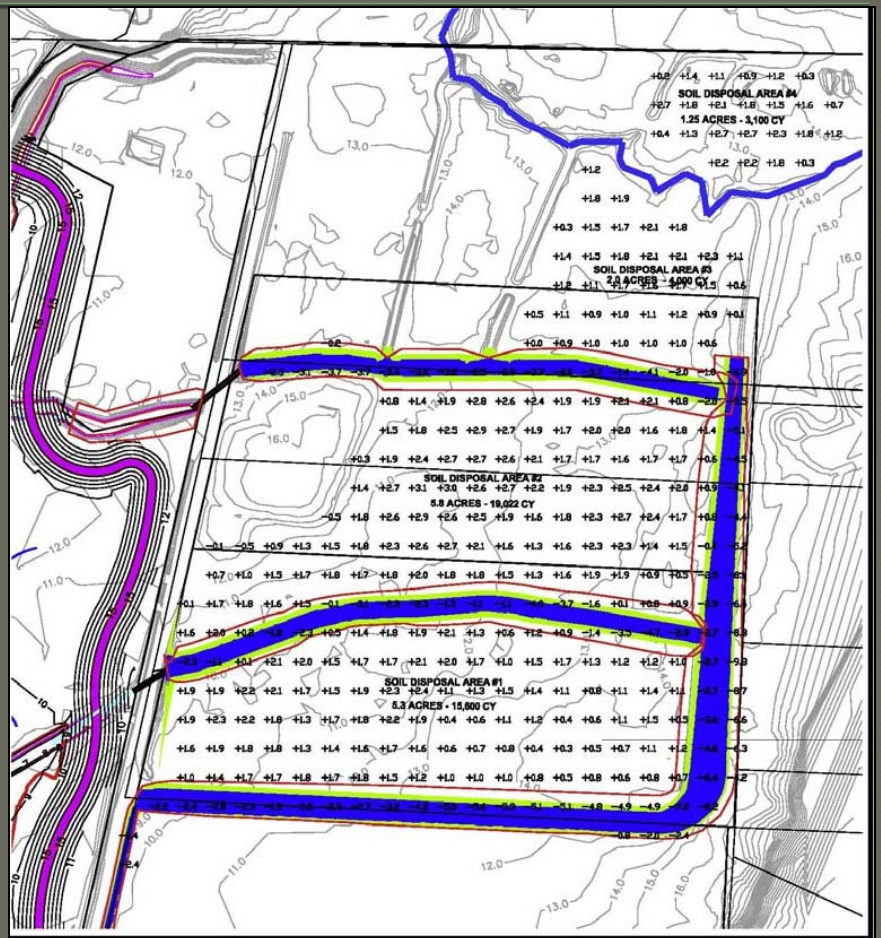


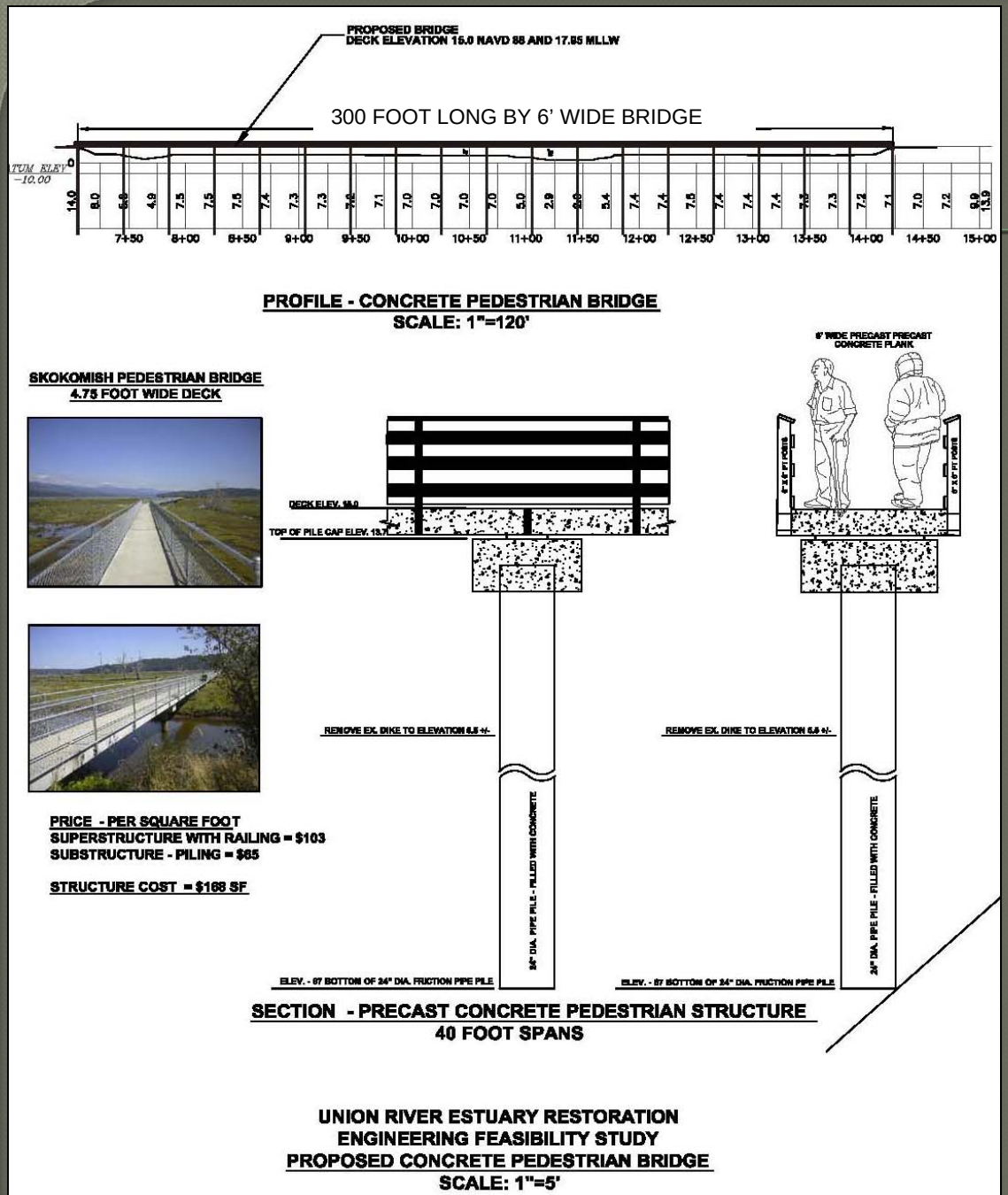
SPOILS DISPOSAL PLAN

Excess excavated materials that cannot be used on site (~ 14,000 CY) are proposed for beneficial re-use to improve farm fields at the adjacent Pacific Northwest Salmon Center. This reduces disposal costs and impacts to roads/traffic from transport to a more distant site.

In addition, ~ 25,000 CY of material will be removed from the existing drainage ditches for stormwater storage.

Use of the PNWSC farm fields for disposal is a big cost savings to the project.





Bridge Structures

Why we chose the concrete bridge option:

10% higher initial cost but,

1. Lower maintenance needs
2. Longer life
   - •Concrete = 70 yrs
   - •Timber = 20-30 yrs

   Annual cost over 70 yrs is similar
3. Concrete can be surfaced to avoid slipping
4. Fewer pilings needed

ESTIMATED COST

UNION RIVER ESTUARY RESTORATION PROJECT
DIKE REMOVAL AND SALT MARSH RESTORATION
ALTERNATIVE 12 -WITH MODIFIED GRADING
Preliminary Construction Cost Estimate
400 Total Dike Removal -Grading Scheme: Re-contour the Estuary Site, Fill Borrow and Farm Ditches, Excavate Distributary Channels - Provide 400 feet of Pedestrian Structure
Updated 6/8/11

Construction set-up	$ 121,250
Excavation on WDFW	$ 305,796
Spoils disposal	$ 57,876
Setback Dike	$ 157,910
Planting & Logs	$ 50,000
Stormwater Storage	$ 229,500
400’ concrete bridge	$ 342,000
SUBTOTAL	**$1,264,332**
Sales Tax	$ 77,476
Bonds, permits	$ 94,994
Project administration	$ 360,079

TOTAL ESTIMATED PROJECT COST $1,796,881

Public Process

- Community input during design
  - Public meetings
  - Correspondence
- Community input during grant review
- Community input during permitting
  - State Environmental Policy Act
  - Local, state & federal permits



Questions & Comments

Doris Small, WDFW
doris.small@dfw.wa.gov
360-895-4756

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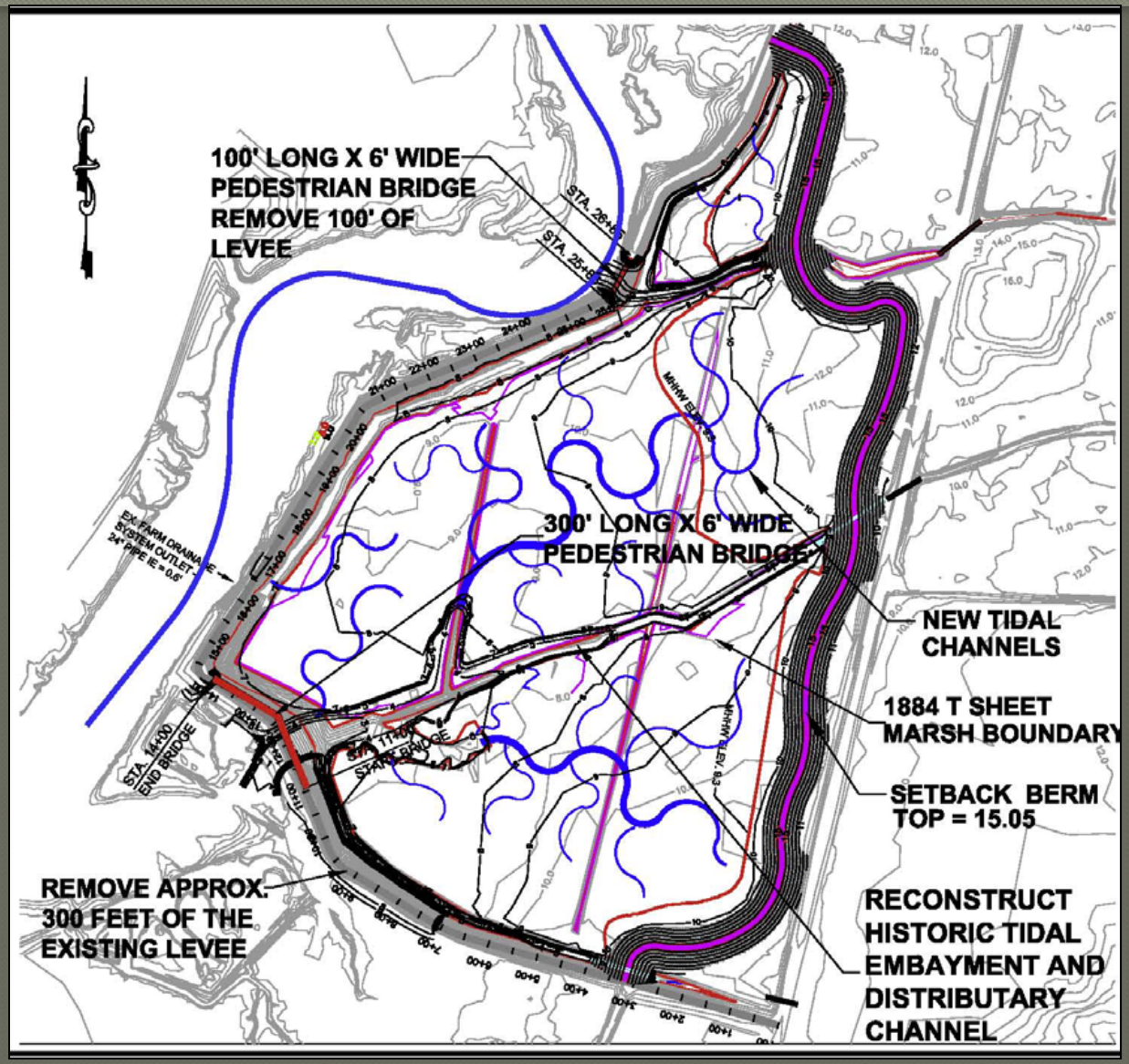

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