



LOWER SATSOP ASSESSMENT & DESIGN

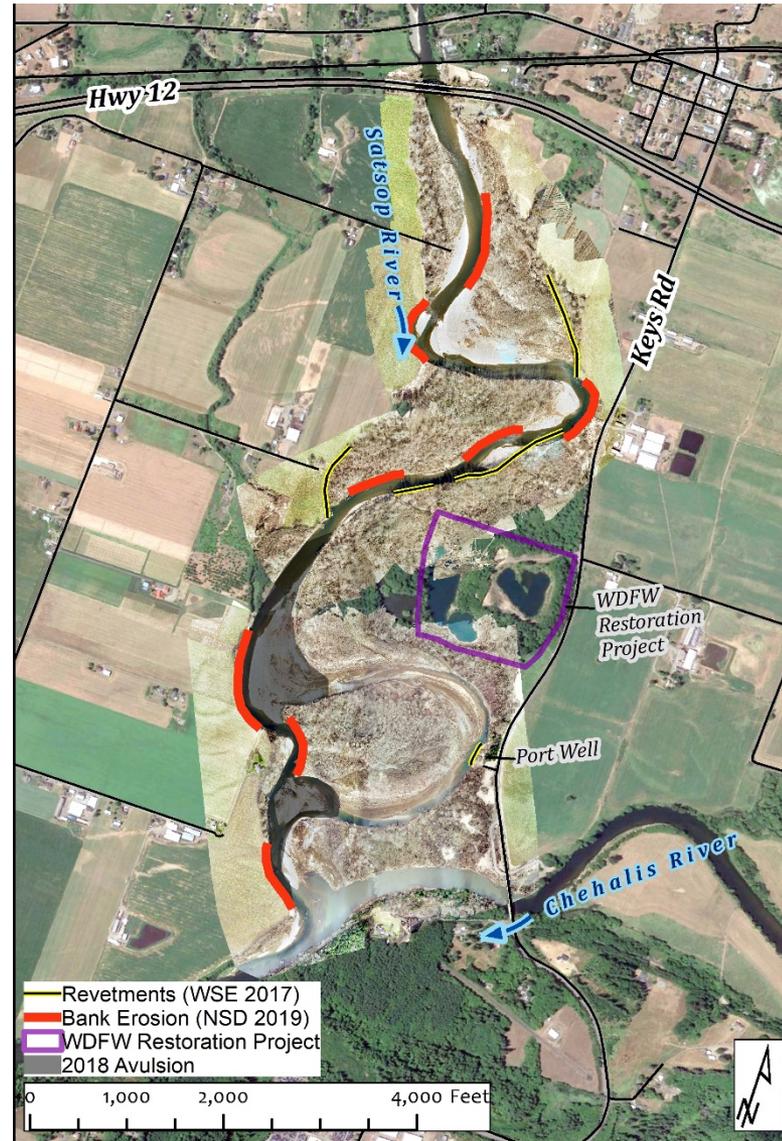
DRAFT PRELIMINARY DESIGN

May 16, 2019



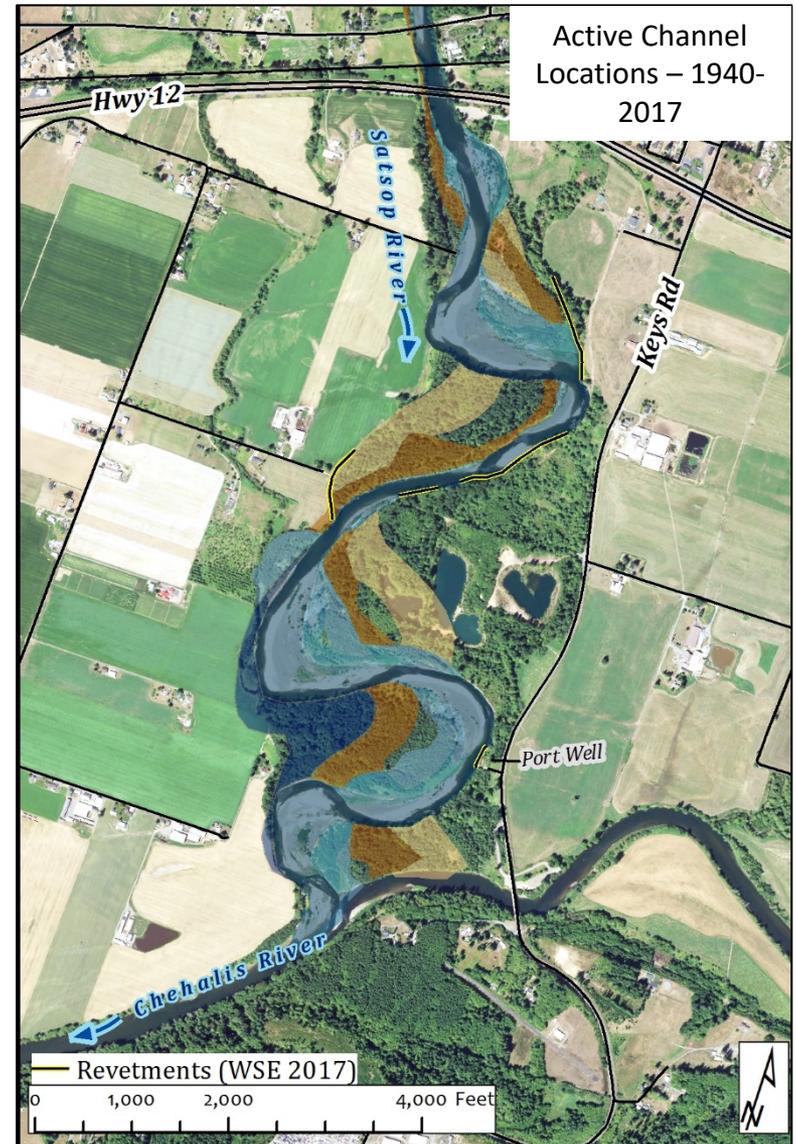
Existing Conditions

- Bank Erosion
- Revetments
- Keys Road
- Port Well
- WDFW Restoration Project
- 2018 Avulsion

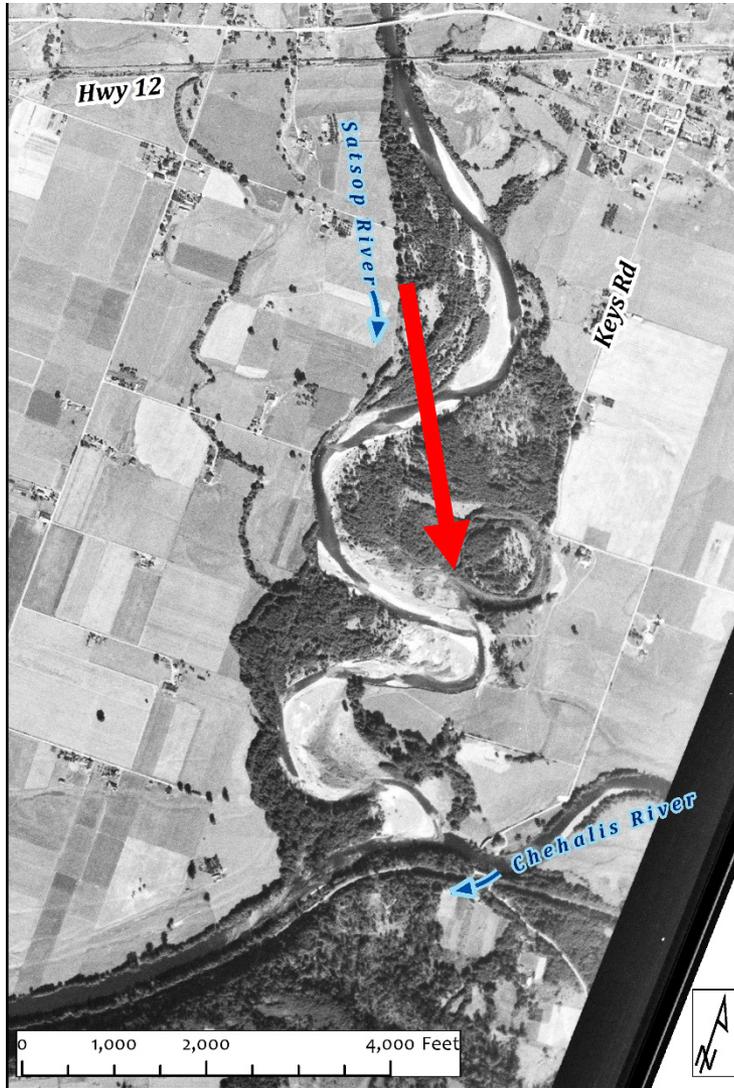


Erosion Risks – Historical occupation zone

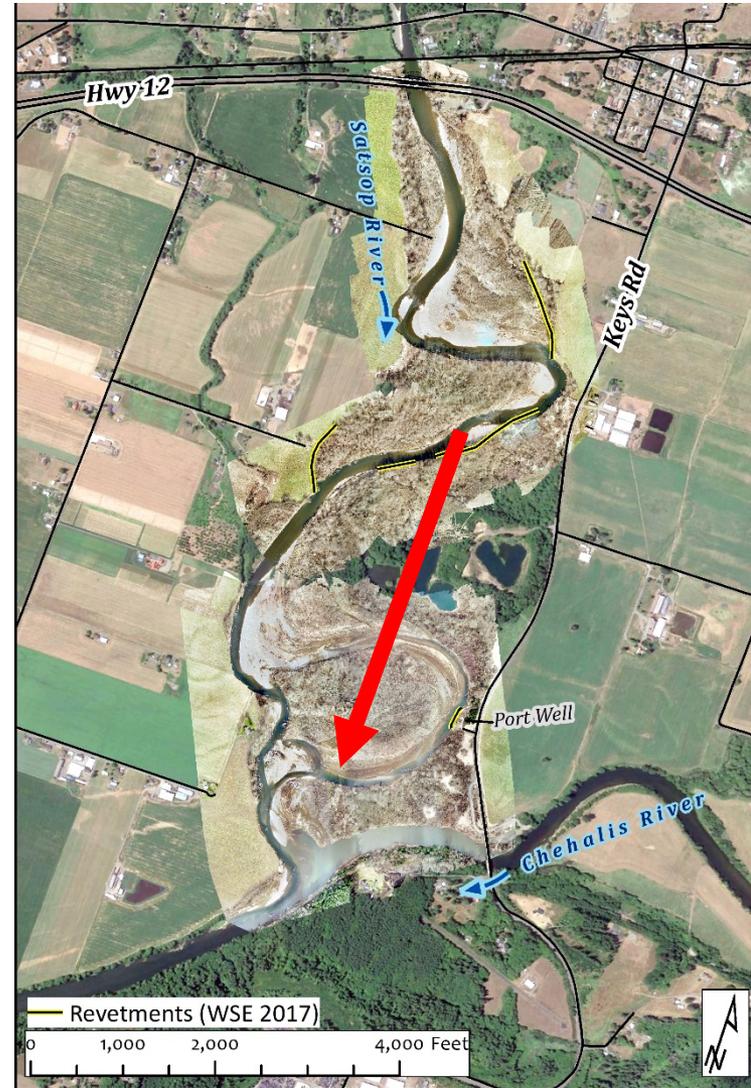
- Areas where the river has already been pose the highest erosion risk because we know that they are capable of being eroded
- Delineated river locations for period of aerial photography record from 1940-2017
- Combined locations to form **Historical River Occupation Zone**



Historic Context

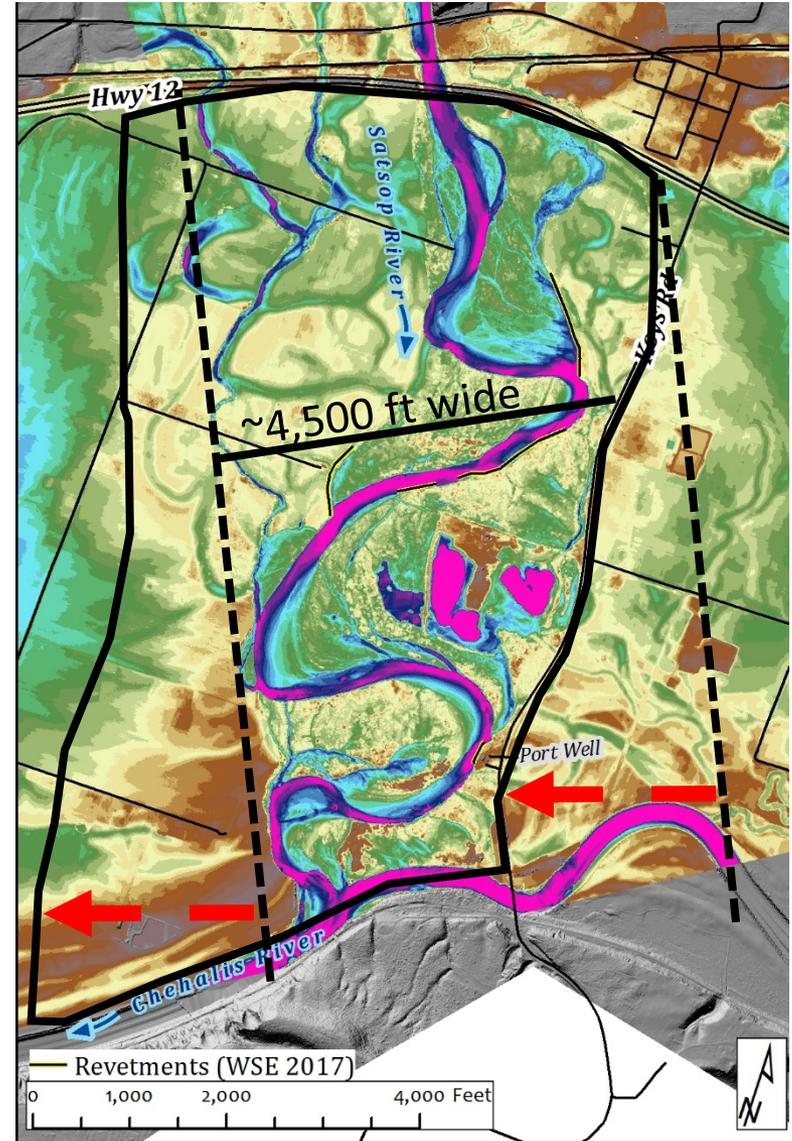
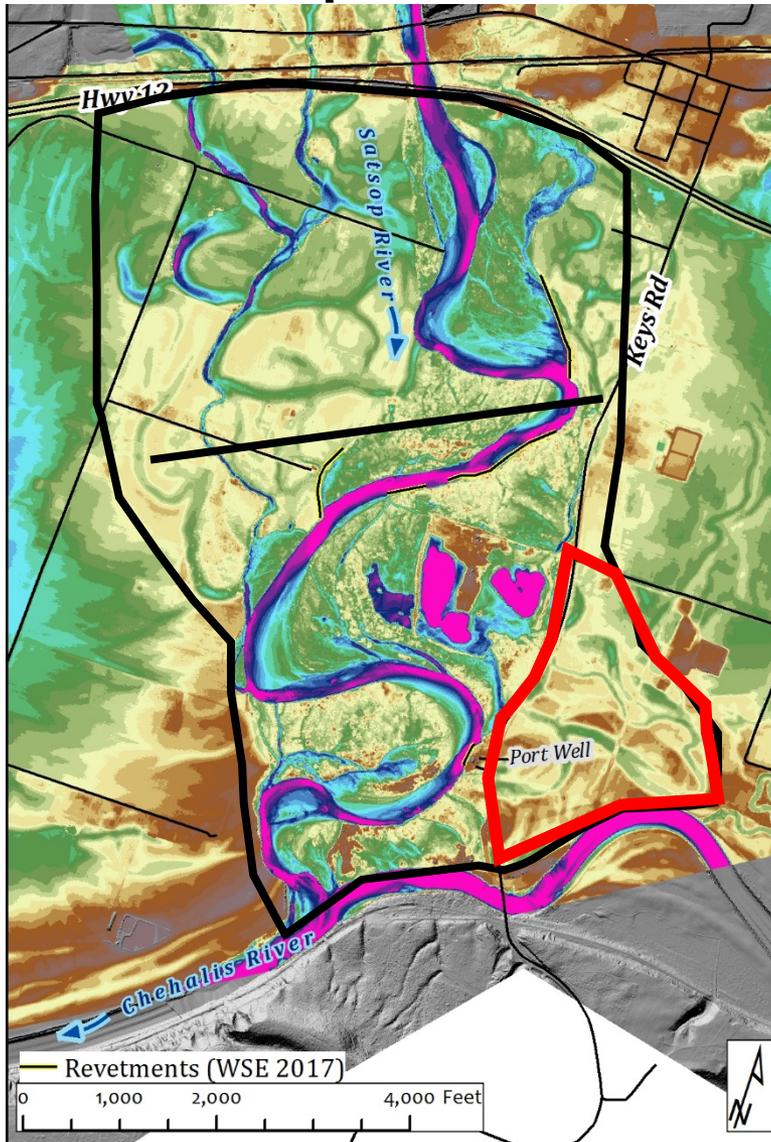


1953



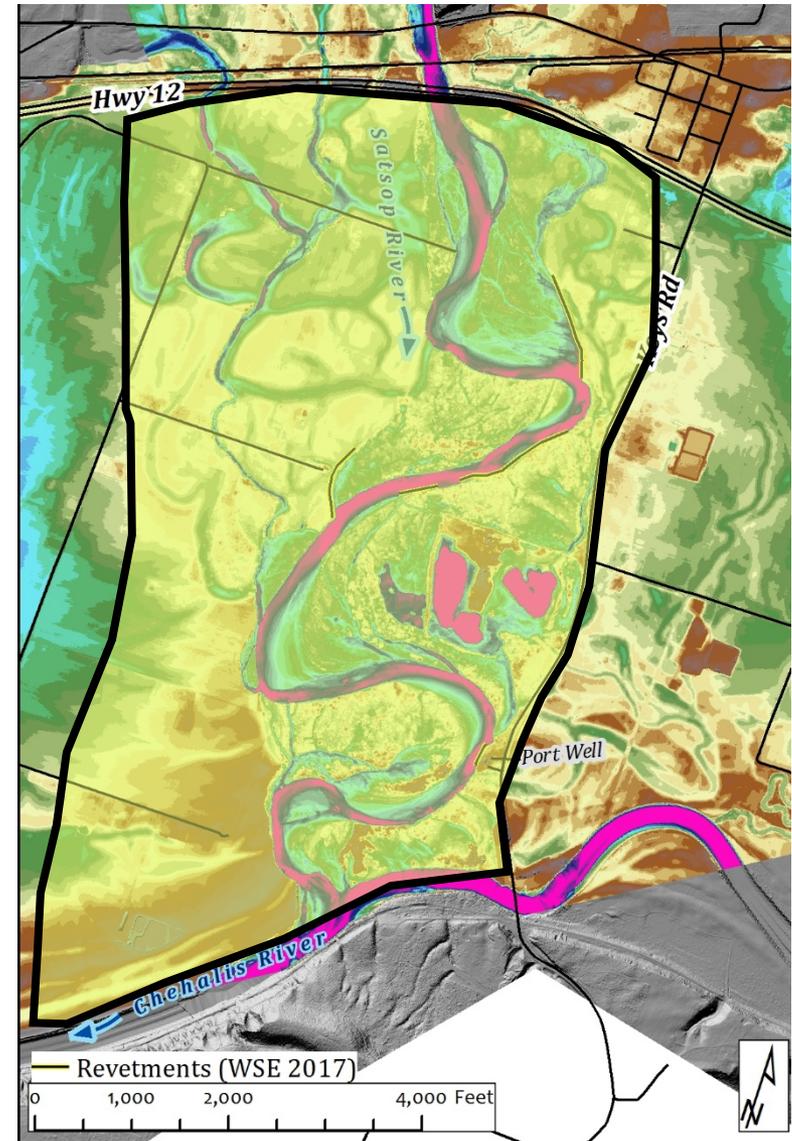
2019

Geomorphic Context

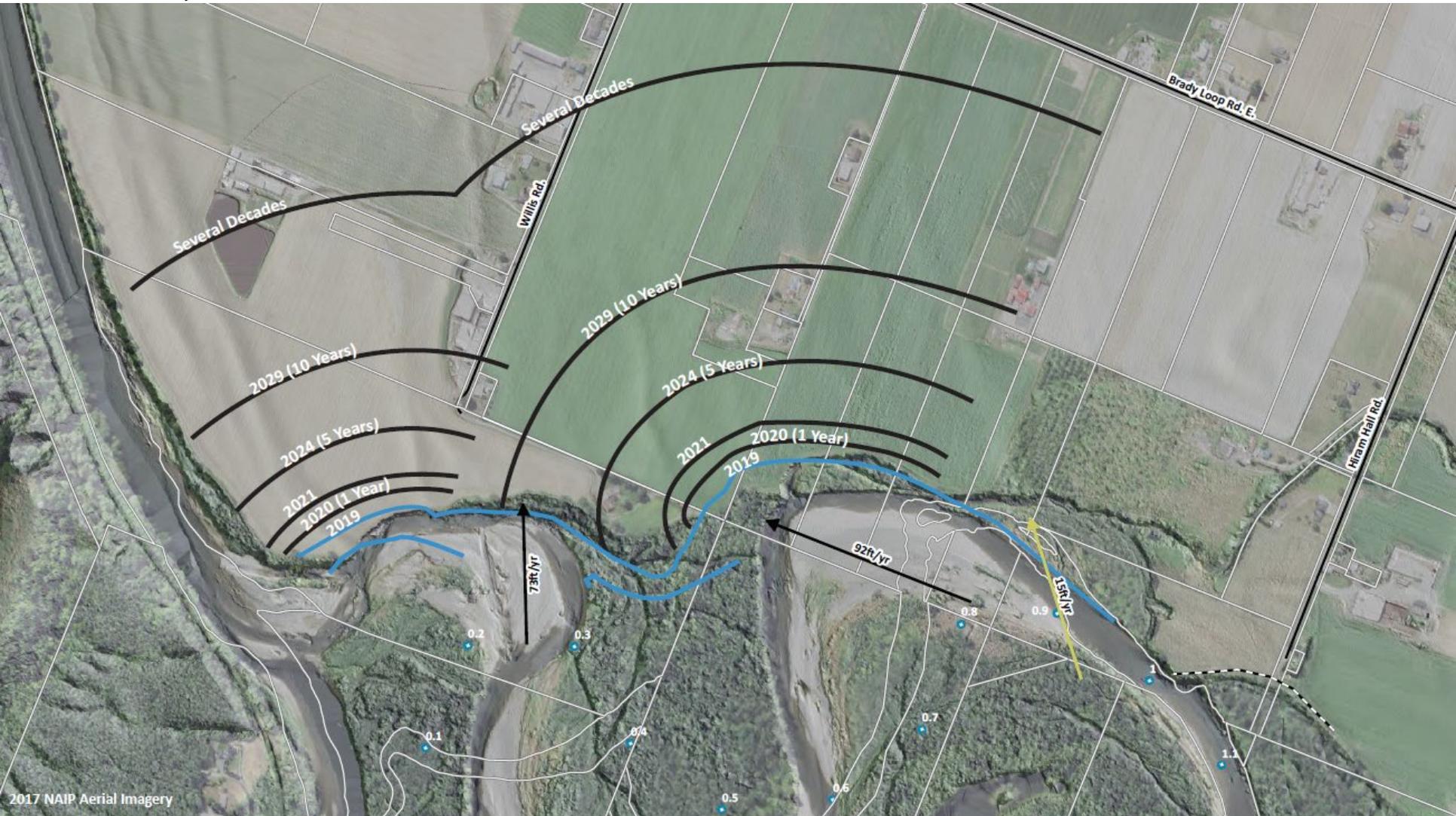


Geomorphic Context

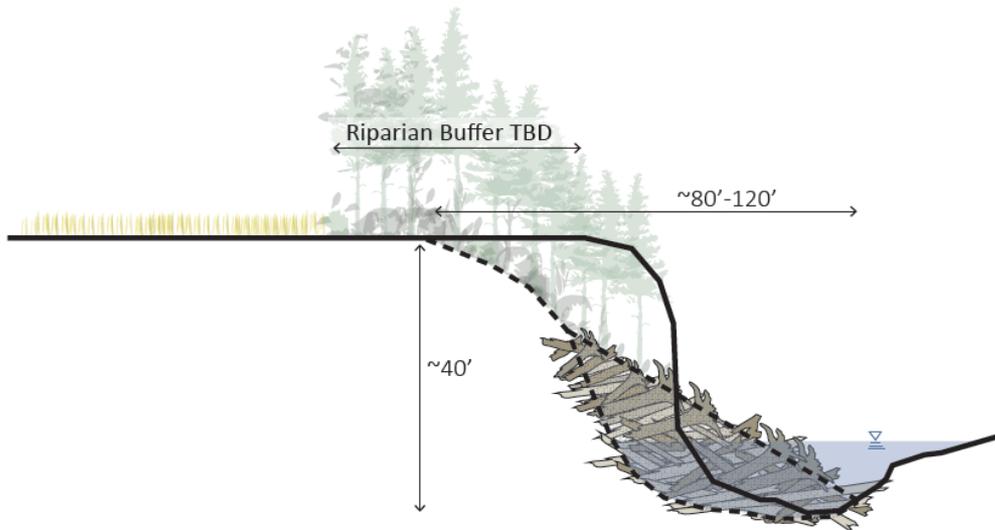
- Meander belt is moving west.
- Erosion hazard zone includes lands not occupied by the river in thousand years or more.



Projected Erosion without Treatment



Bank Stabilization – Why Not?

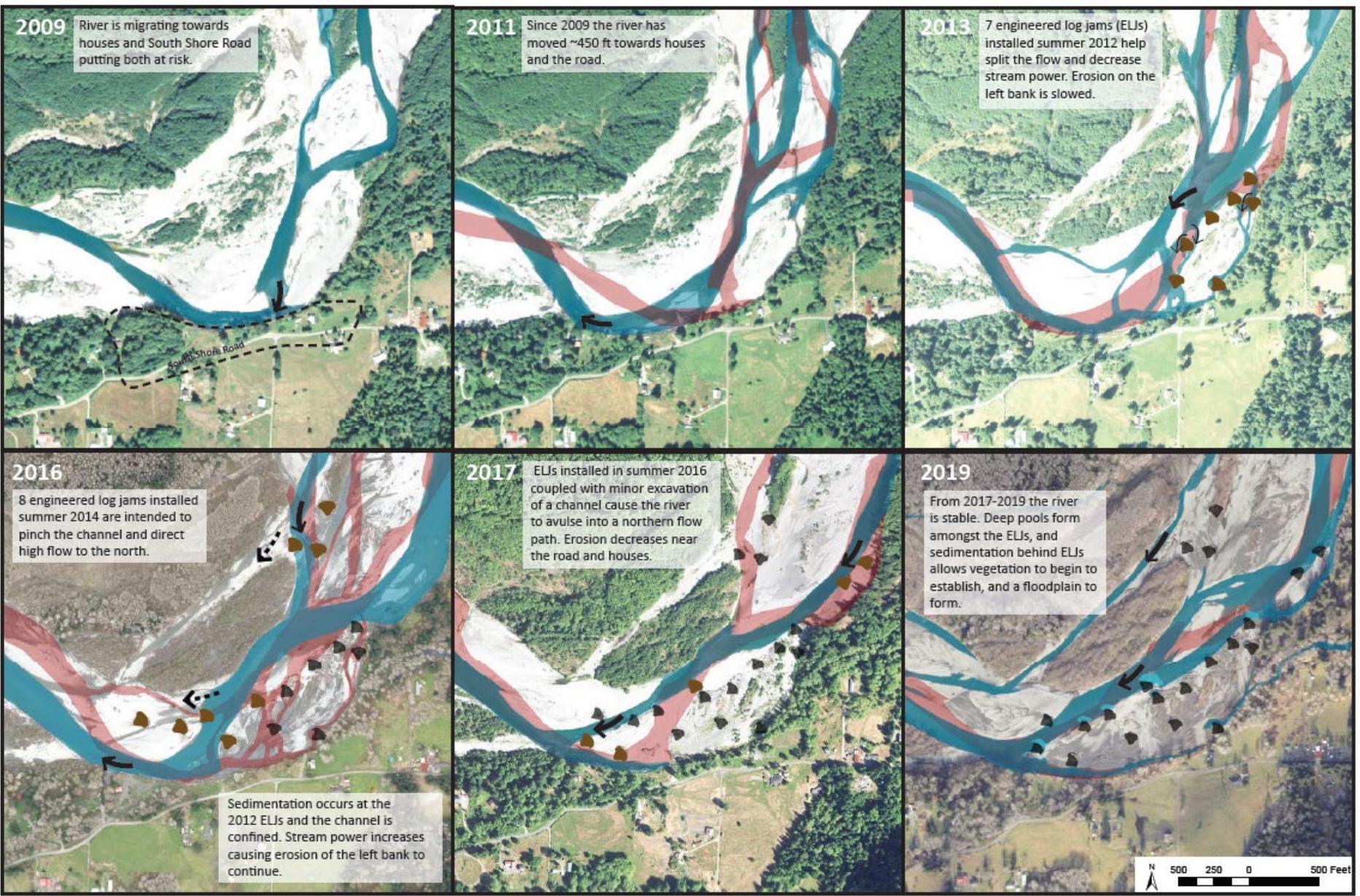


Source: Pierce County Dolosse & Dolotimberstm fact sheet

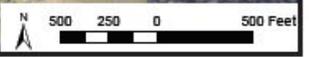
- Prohibitively Expensive > 2MM/bank
- Does it improve aquatic habitat?
- Does it support geomorphic process?



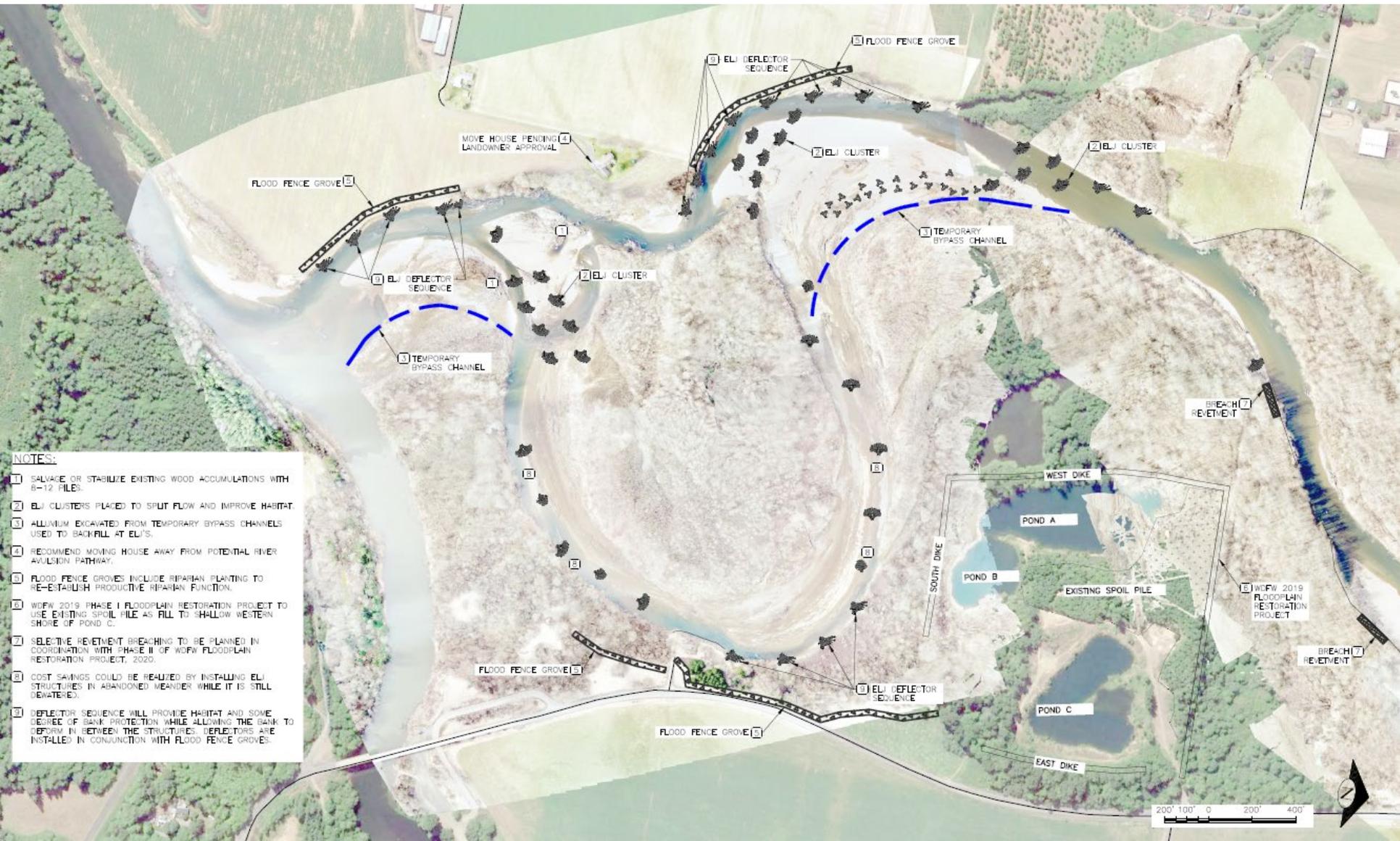
Upper Quinault Channel Migration Lower PA5



- Key:**
- Existing Channel Location
 - Previous Channel Location
 - Design Intent
 - Actual Flow Path
 - Most Recently Built ELJs
 - Past Built ELJs

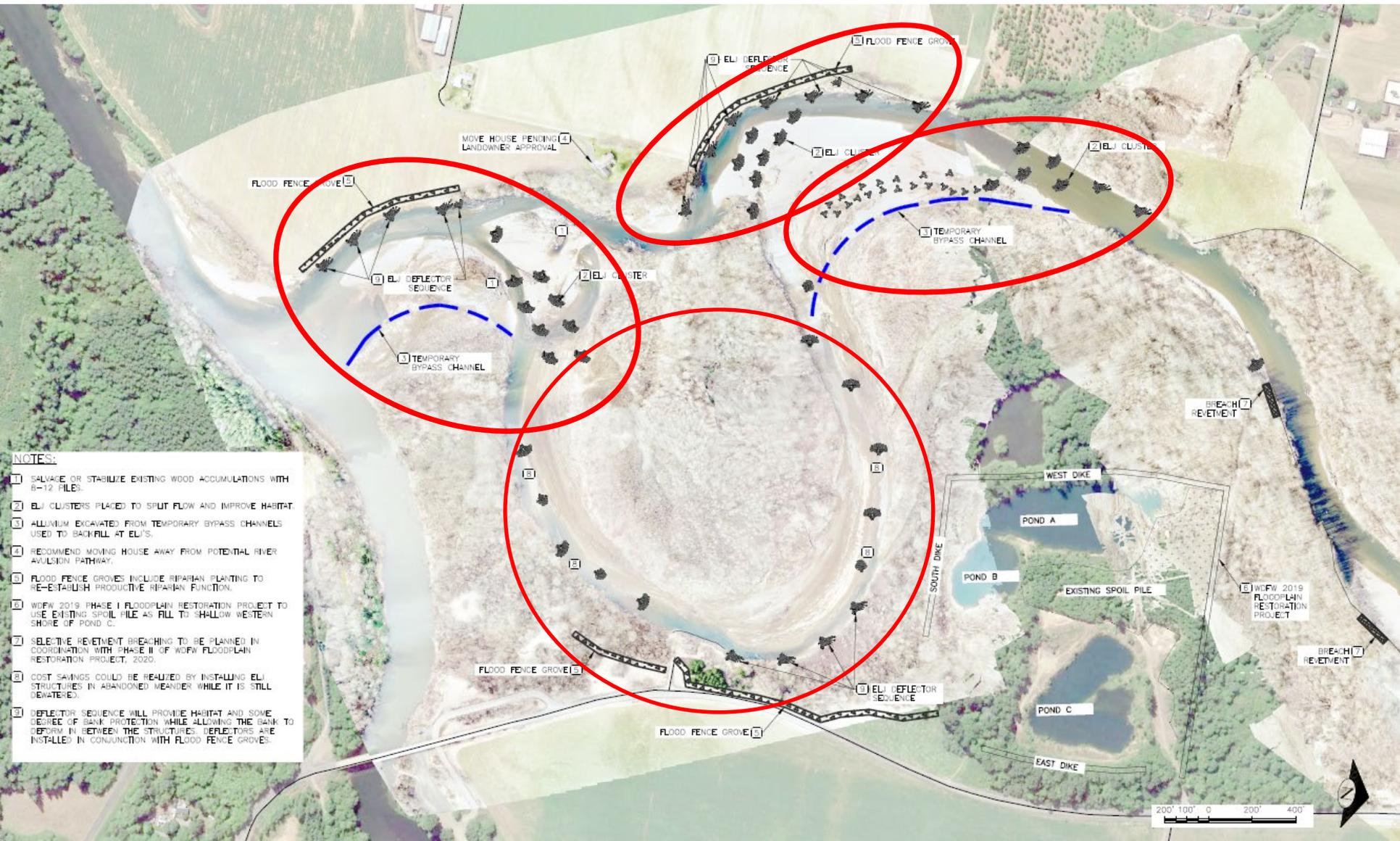


DRAFT Preliminary Design



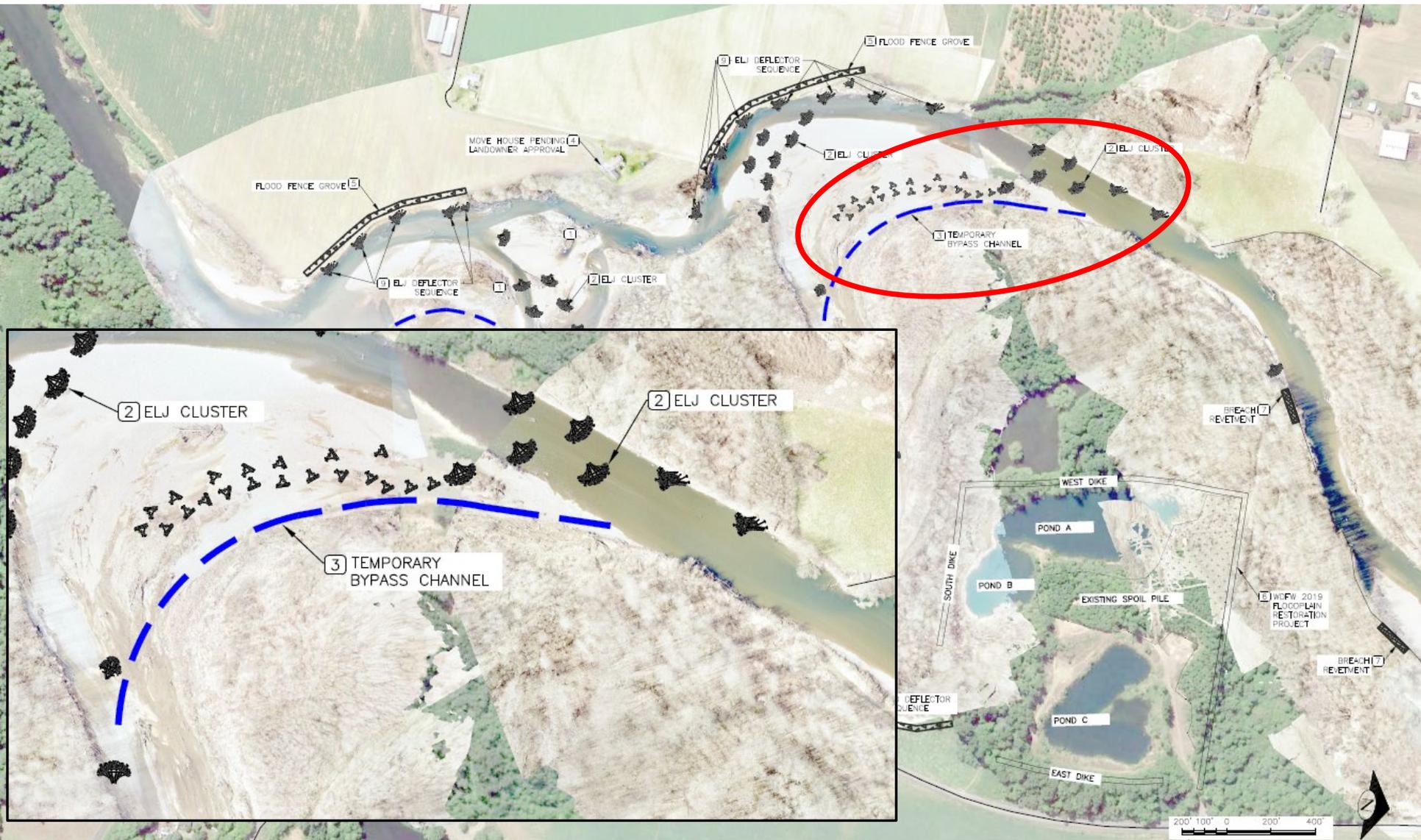
- NOTES:**
- 1 SALVAGE OR STABILIZE EXISTING WOOD ACCUMULATIONS WITH 8-12 PILES.
 - 2 ELJ CLUSTERS PLACED TO SPLIT FLOW AND IMPROVE HABITAT.
 - 3 ALLUVIUM EXCAVATED FROM TEMPORARY BYPASS CHANNELS USED TO BACKFILL AT ELJ'S.
 - 4 RECOMMEND MOVING HOUSE AWAY FROM POTENTIAL RIVER AVULSION PATHWAY.
 - 5 FLOOD FENCE GROVES INCLUDE RIPARIAN PLANTING TO RE-ESTABLISH PRODUCTIVE RIPARIAN FUNCTION.
 - 6 WDFW 2019 PHASE I FLOODPLAIN RESTORATION PROJECT TO USE EXISTING SPOIL PILE AS FILL TO SHALLOW WESTERN SHORE OF POND C.
 - 7 SELECTIVE REVETMENT BREACHING TO BE PLANNED IN COORDINATION WITH PHASE II OF WDFW FLOODPLAIN RESTORATION PROJECT, 2020.
 - 8 COST SAVINGS COULD BE REALIZED BY INSTALLING ELJ STRUCTURES IN ABANDONED MEANDER WHILE IT IS STILL DEWATERED.
 - 9 DEFLECTOR SEQUENCE WILL PROVIDE HABITAT AND SOME DEGREE OF BANK PROTECTION WHILE ALLOWING THE BANK TO DEFORM IN BETWEEN THE STRUCTURES. DEFLECTORS ARE INSTALLED IN CONJUNCTION WITH FLOOD FENCE GROVES.

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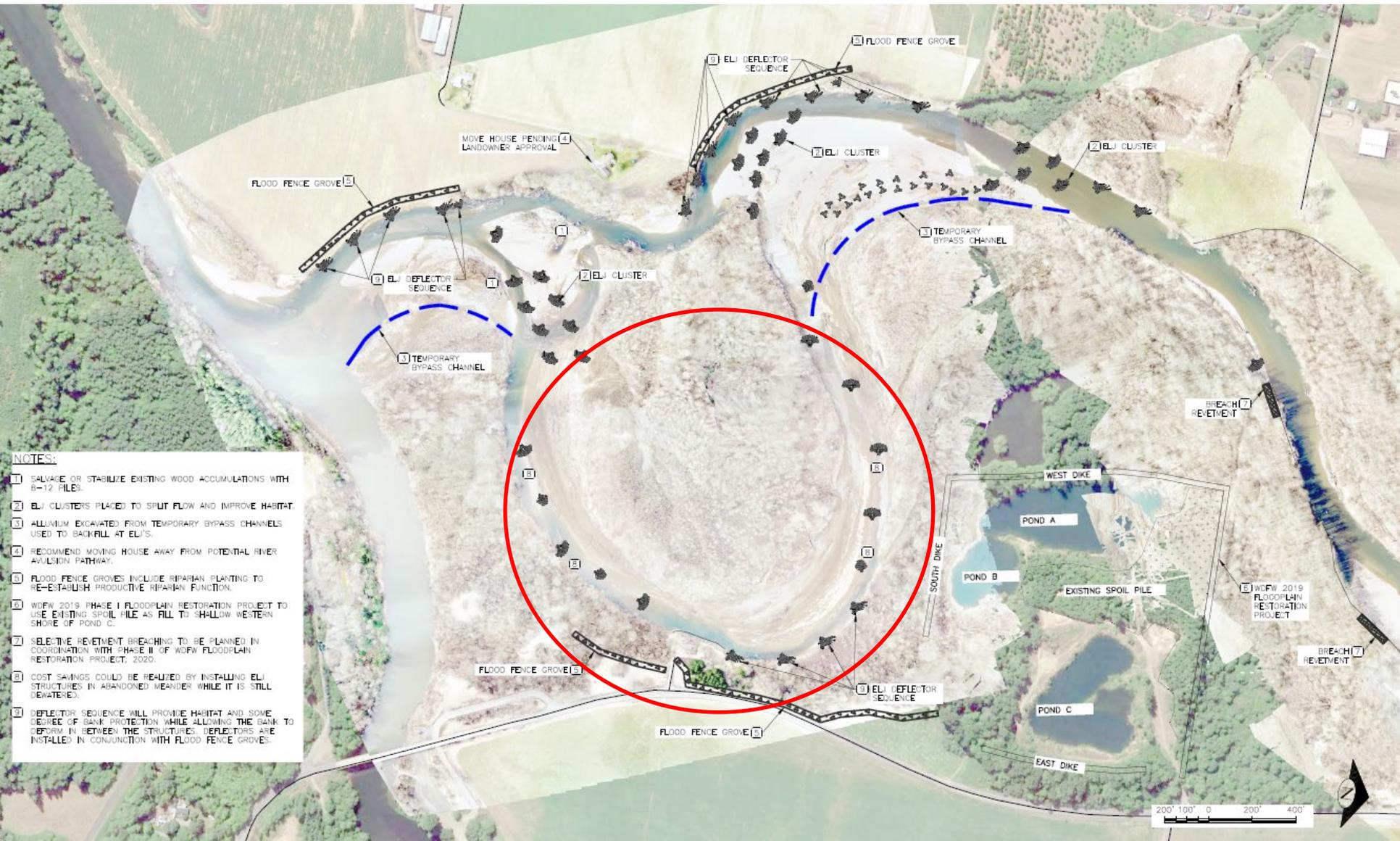


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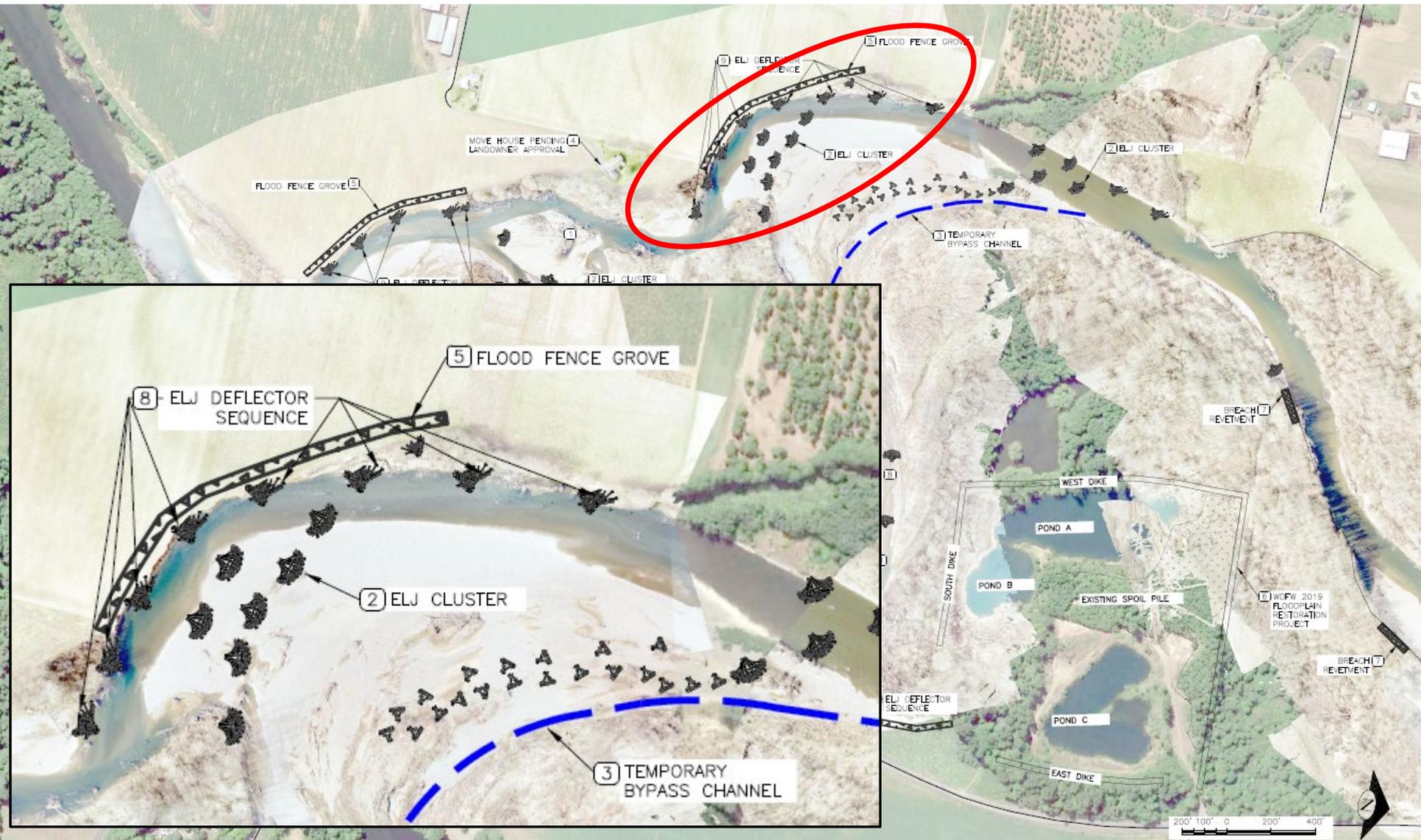
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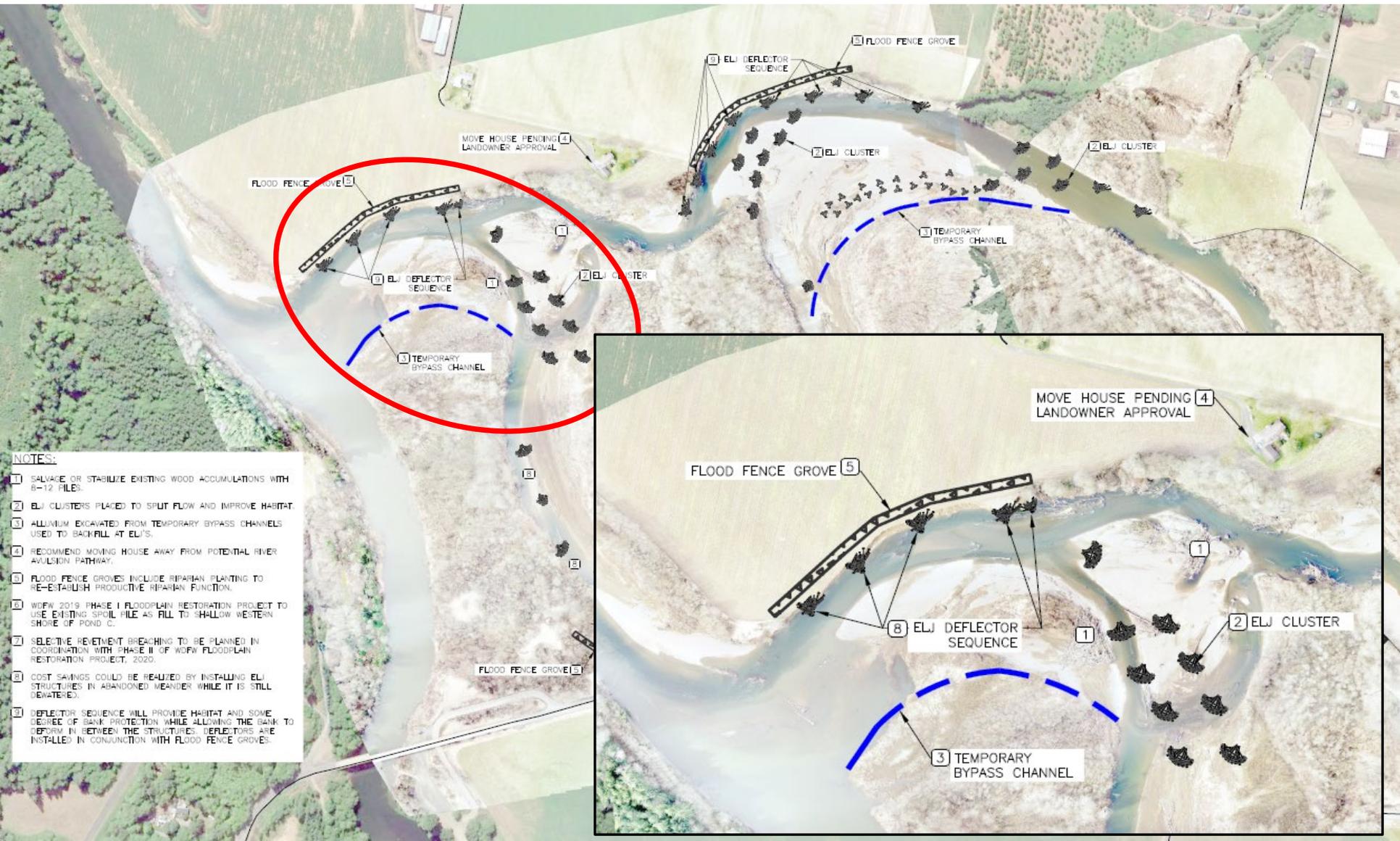
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Proposed Action Phases

Phase I

2020

- Flow deflection to abandoned meander.
- Partial removal of WDFW left bank revetment.
- Installation of ELJ's to improve fish habitat and deflect flows from property and infrastructure.

Phase II

2021

- Install Deflector jams along eroding banks in conjunction with flood fencing
- Coordinate with WDFW on possible side channel enhancement based on river evolution.

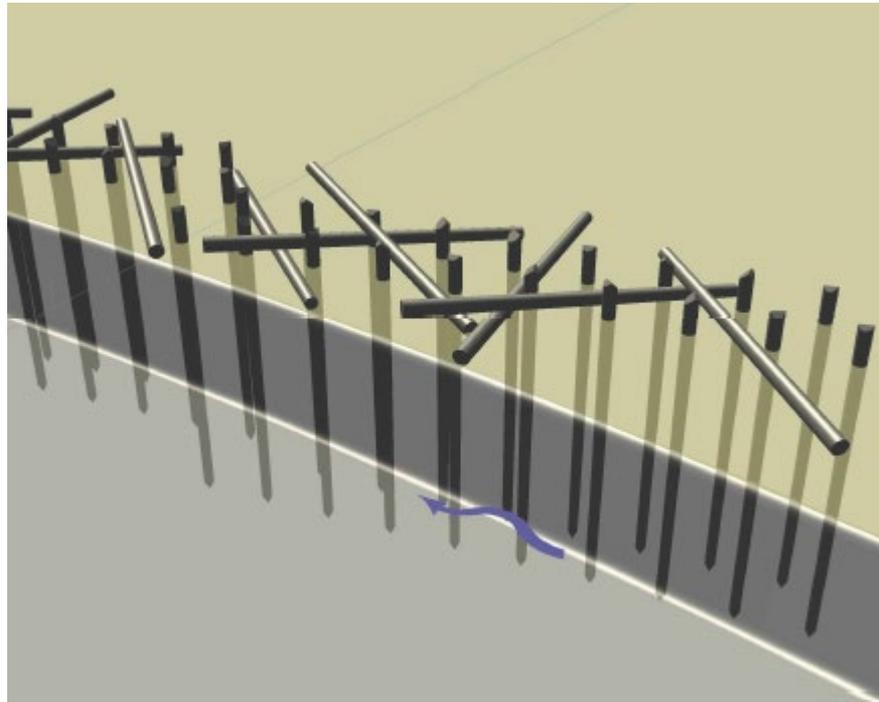
Phase III

2030...

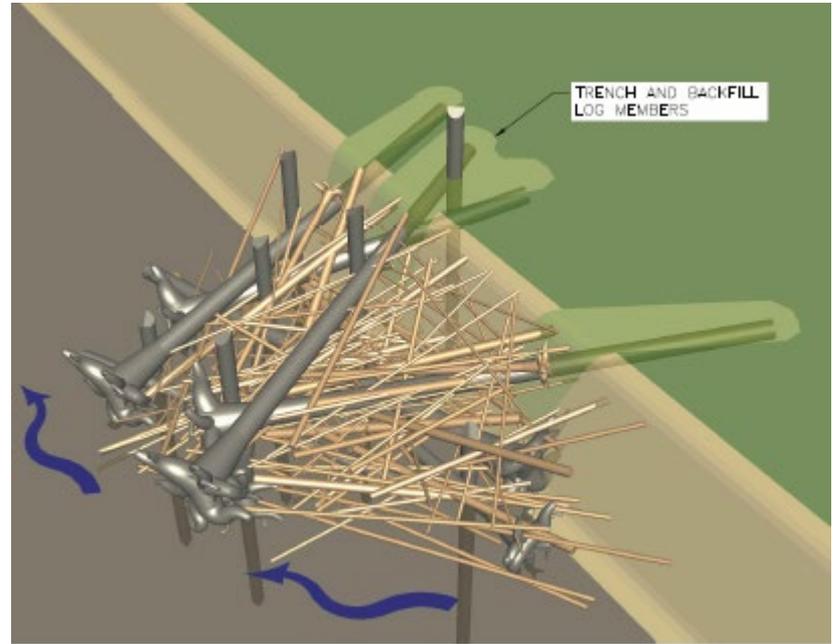
- Install setback revetments to establish protected forest buffer along Keys Road.
- Setback infrastructure restricting Lower Satsop meander belt, Keys Road and Port Well.







FLOOD FENCING PERSPECTIVE
NOT TO SCALE



TYPE 1 BANK ENHANCEMENT PERSPECTIVE
NOT TO SCALE

APEX FLJ PERSPECTIVE ▷
NOT TO SCALE

