



LOWER SATSOP PROTECTION PROGRAM ASSESSMENT, DESIGN, ACTION

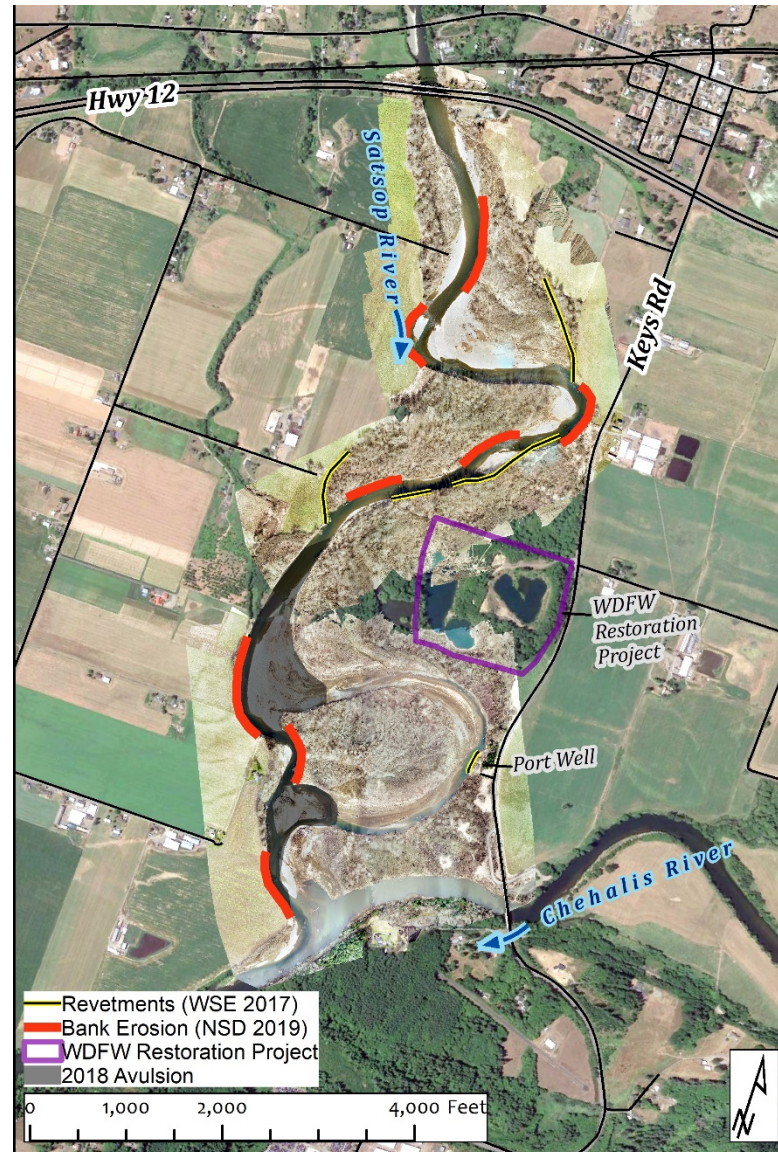
Protect, Preserve, Restore

* Farmland * Essential Infrastructure * River/Floodplain Functions & Habitat

July 25, 2019

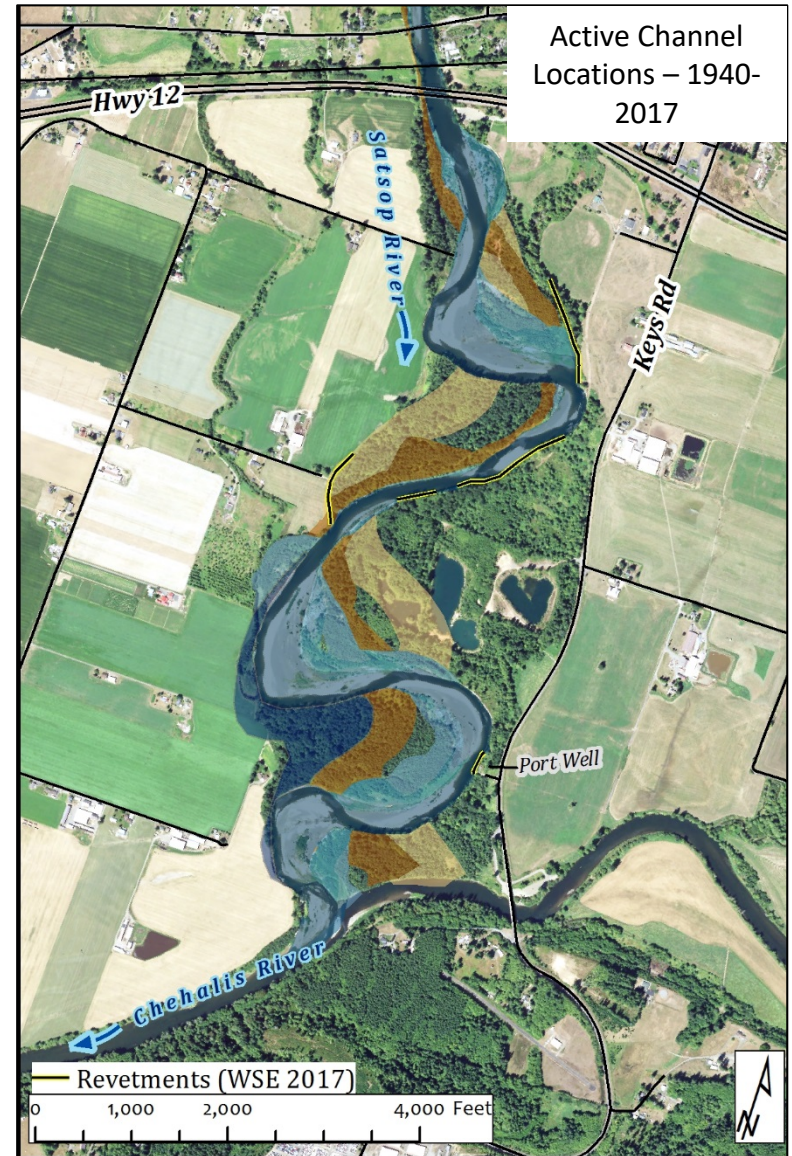
Existing Conditions

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

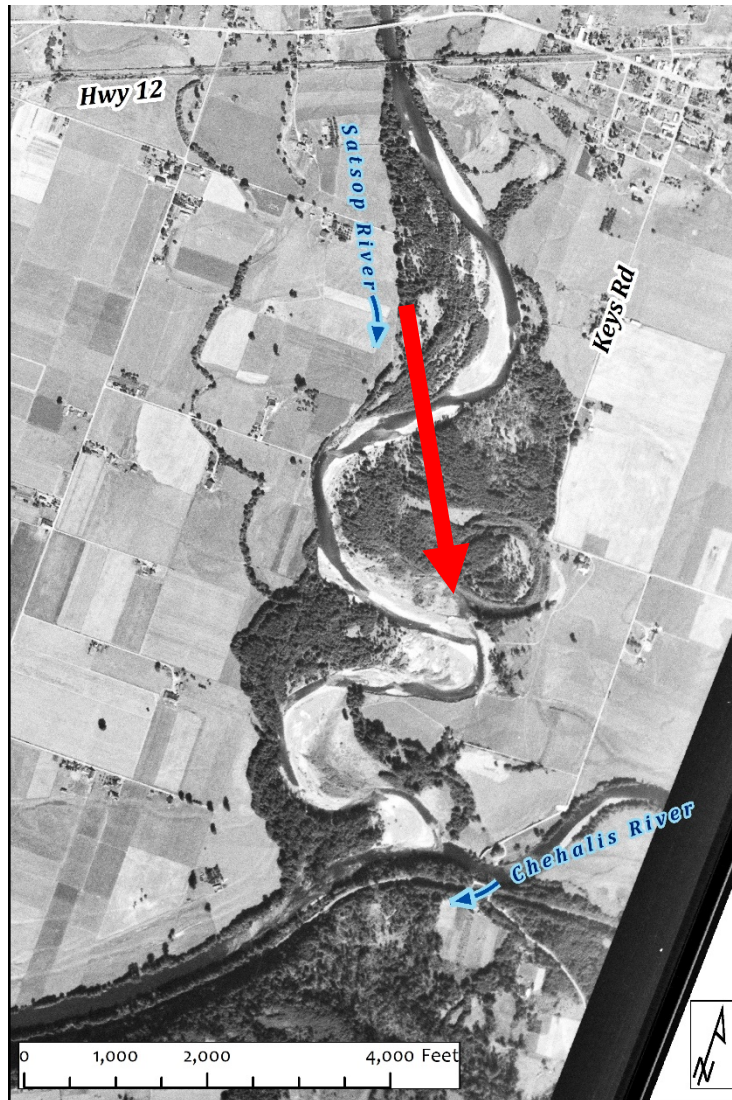


Erosion Risks – Historical occupation zone

- 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**

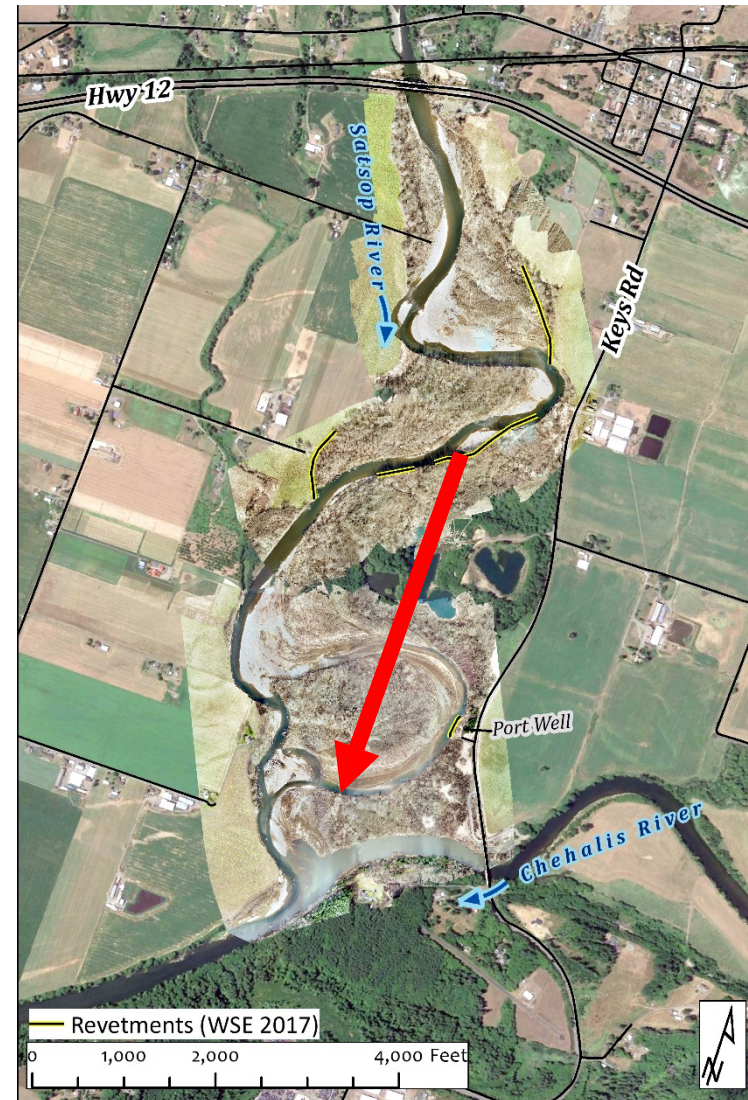


Historic Context



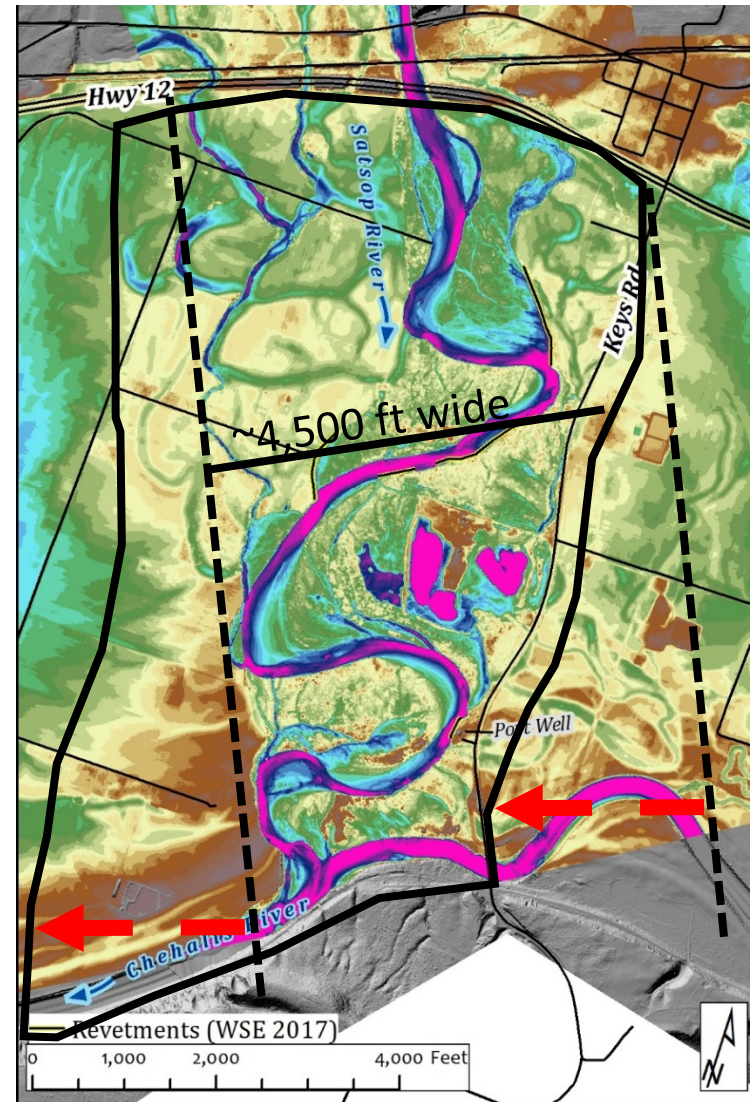
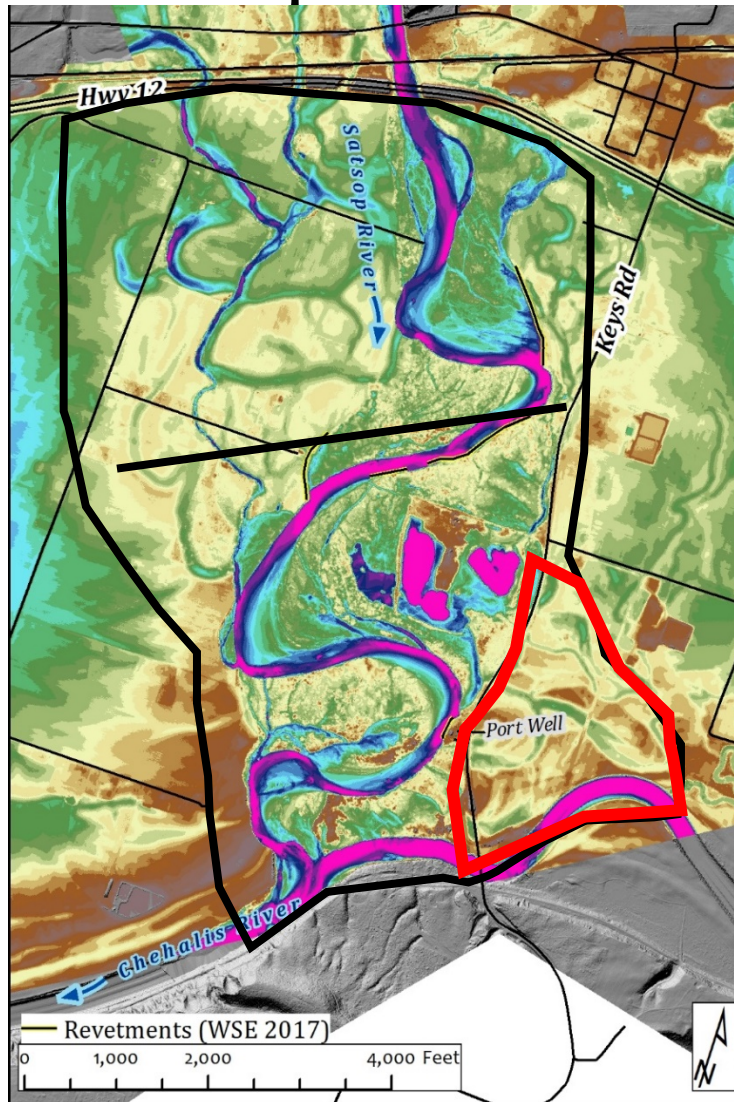
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1953



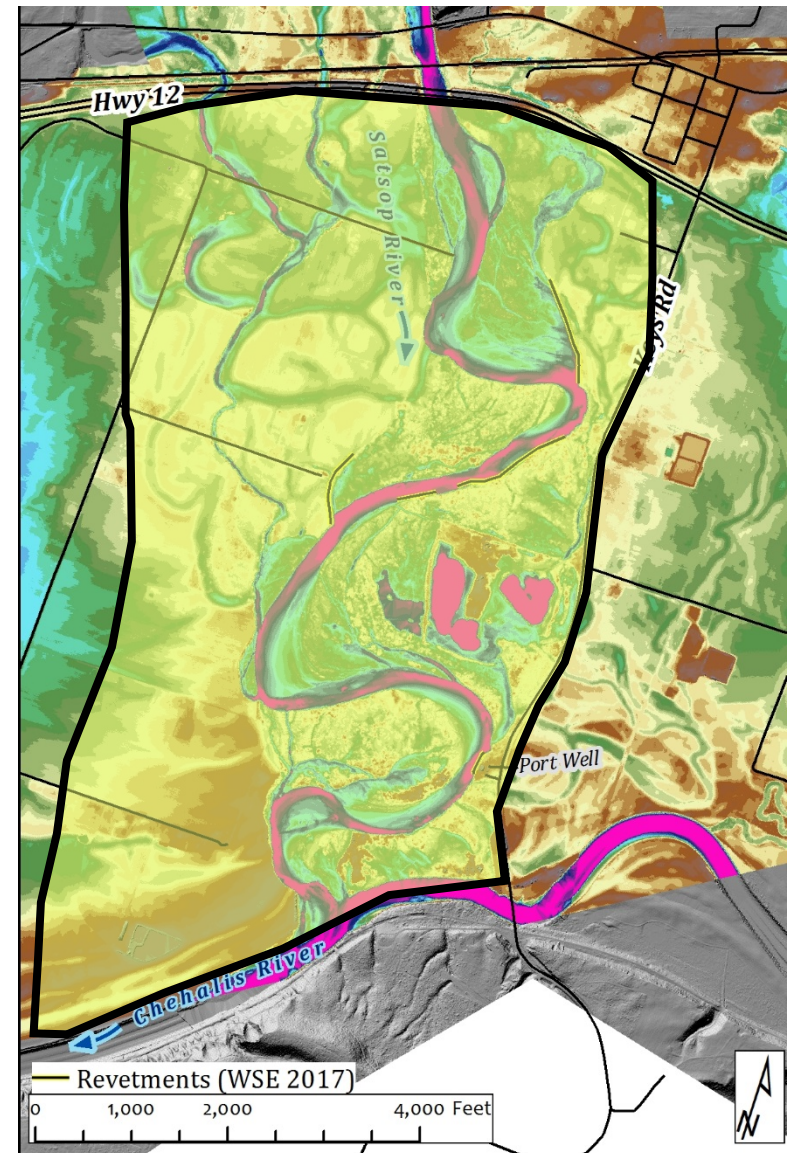
2019

Geomorphic Context

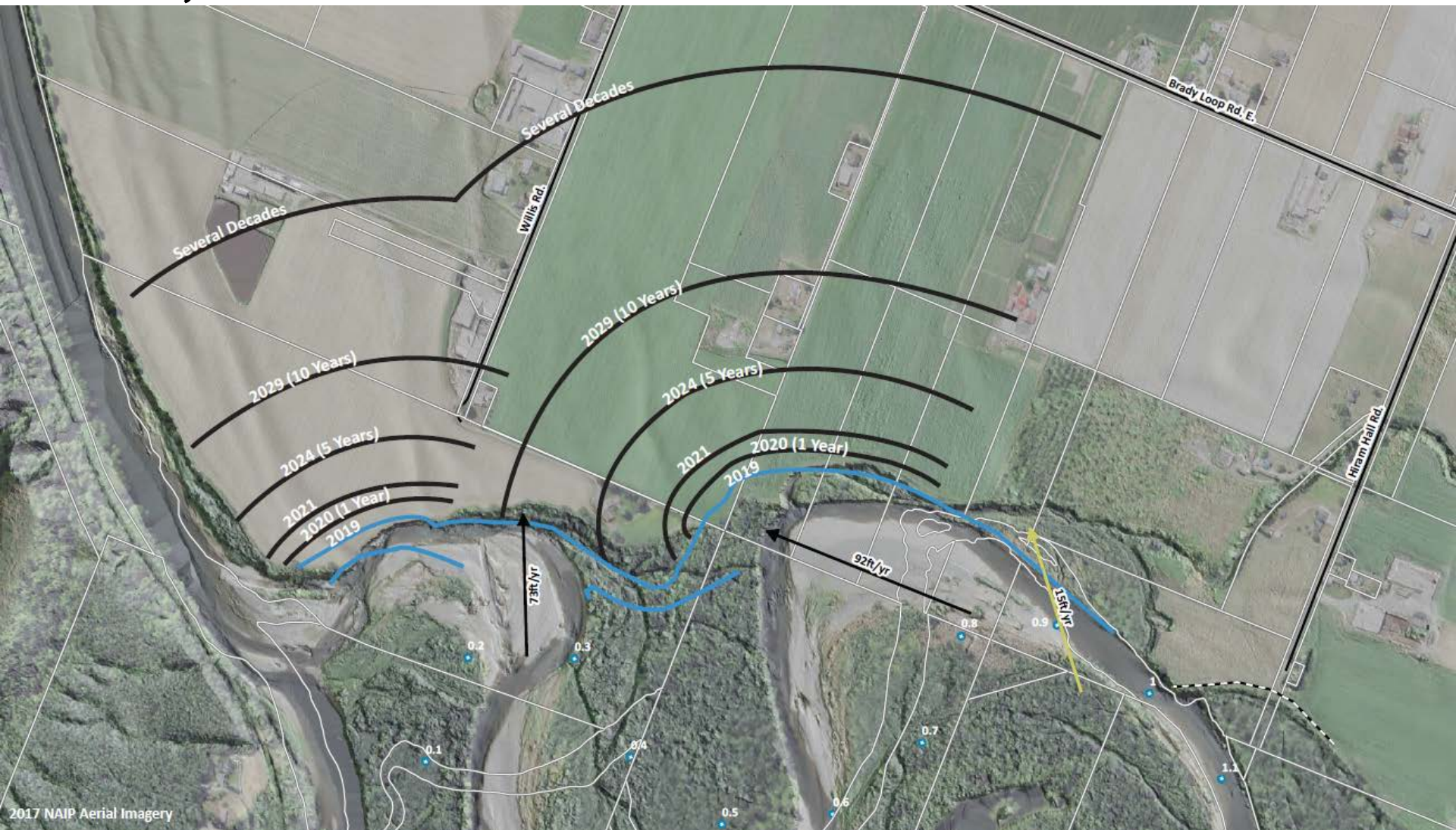


Geomorphic Context

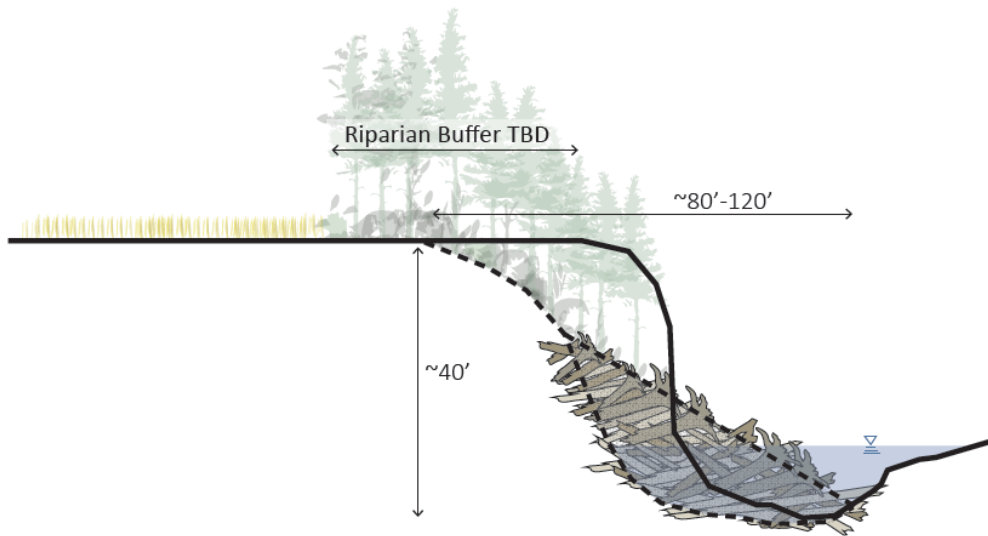
- Meander belt is moving west.
- Erosion hazard zone includes lands not occupied by the river in thousand years or more.



Projected Erosion without Treatment



Bank Stabilization – Why Not?

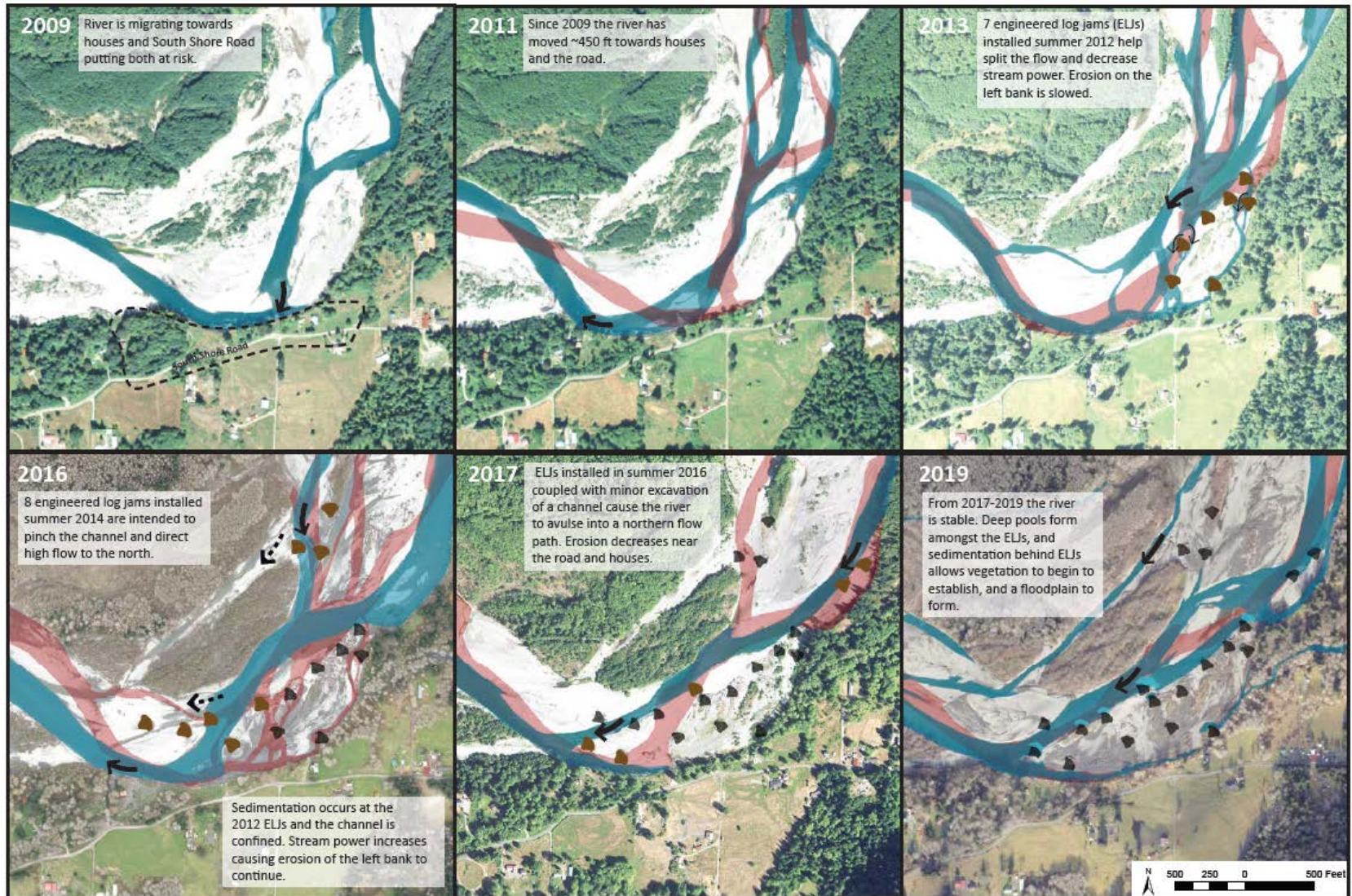


Source: Pierce County Dolosse & Dolotimberstm fact sheet







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



Upper Quinault Channel Migration Lower PA5

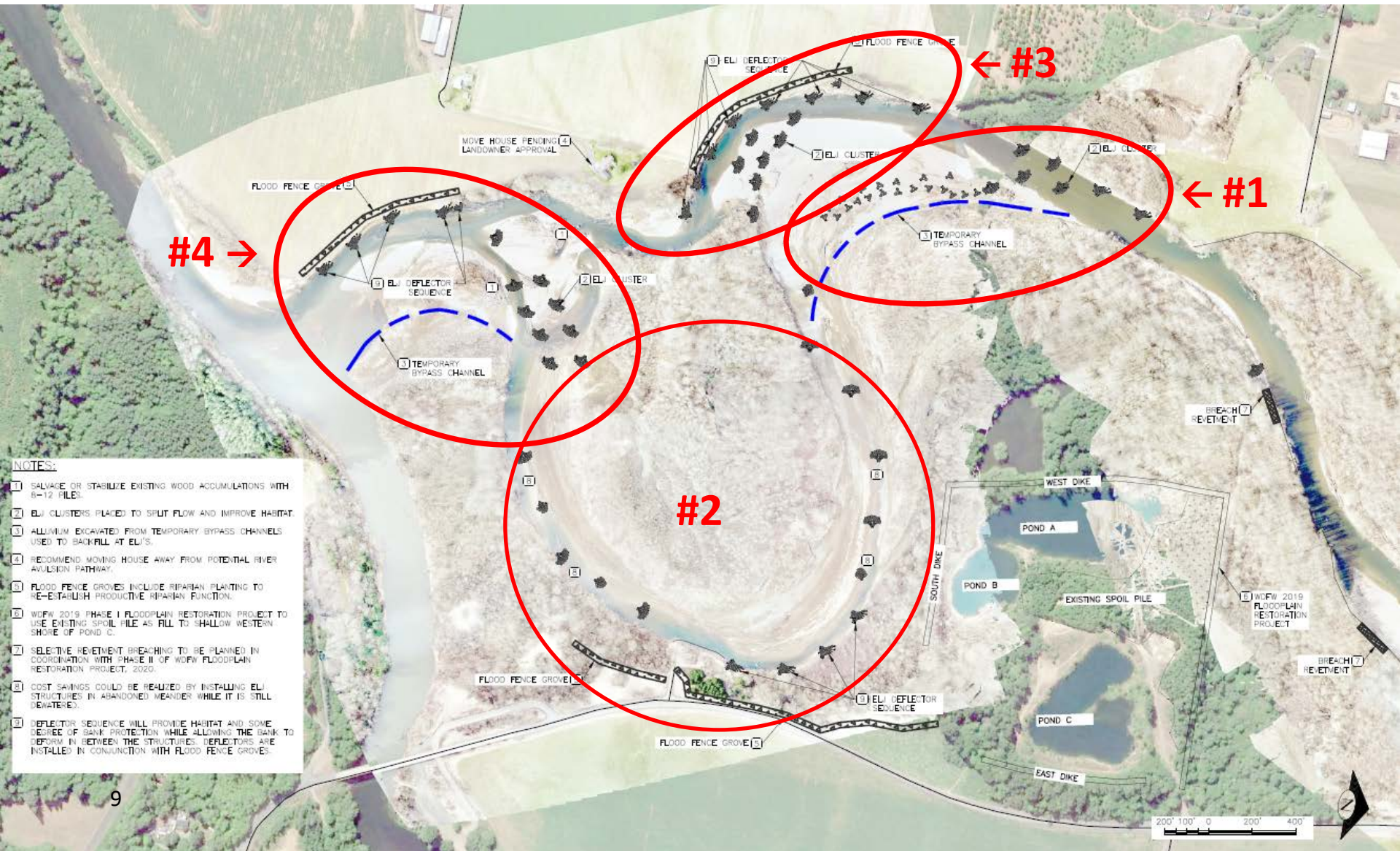


Key:

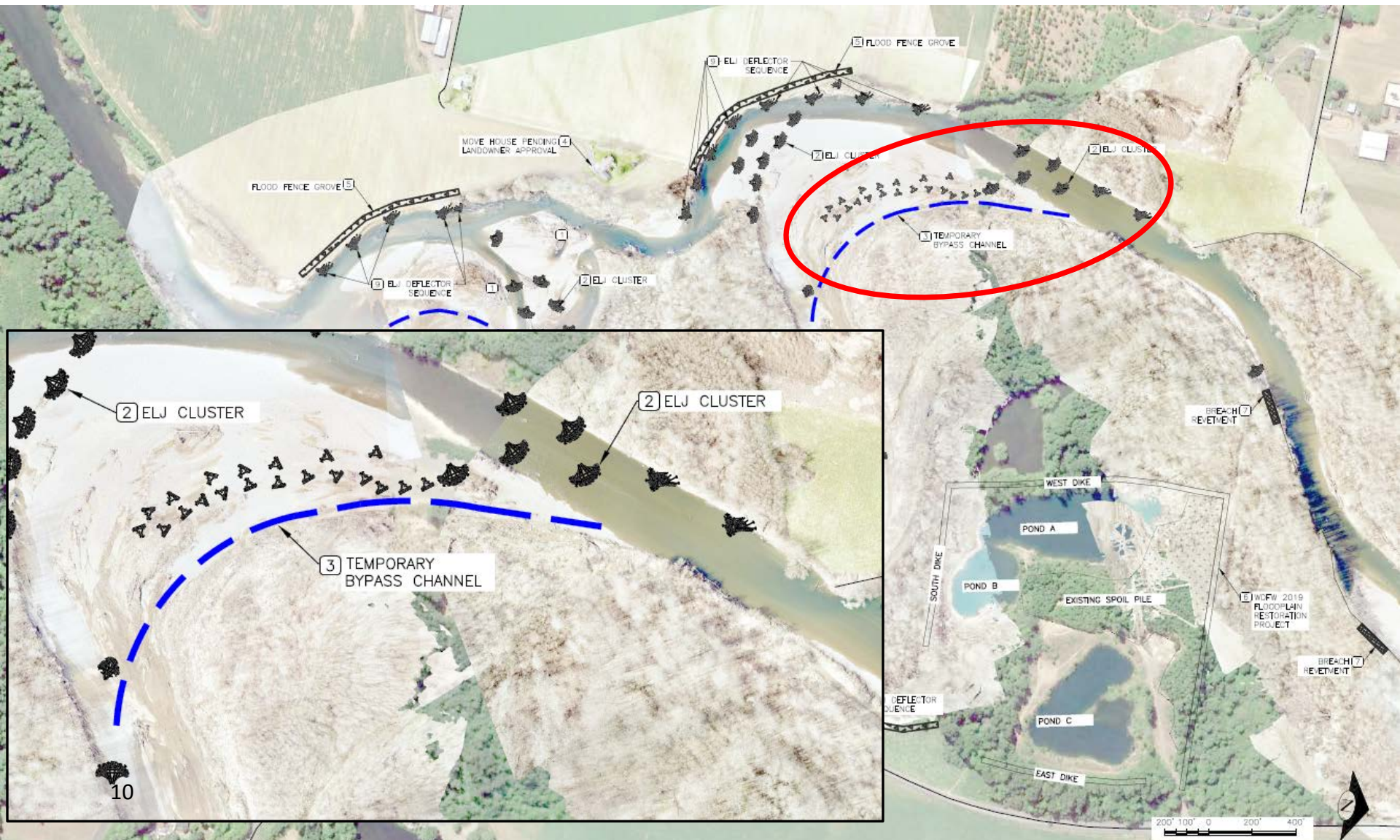
 Existing Channel Location	 Design Intent	 Most Recently Built ELJs
 Previous Channel Location	 Actual Flow Path	 Past Built ELJs

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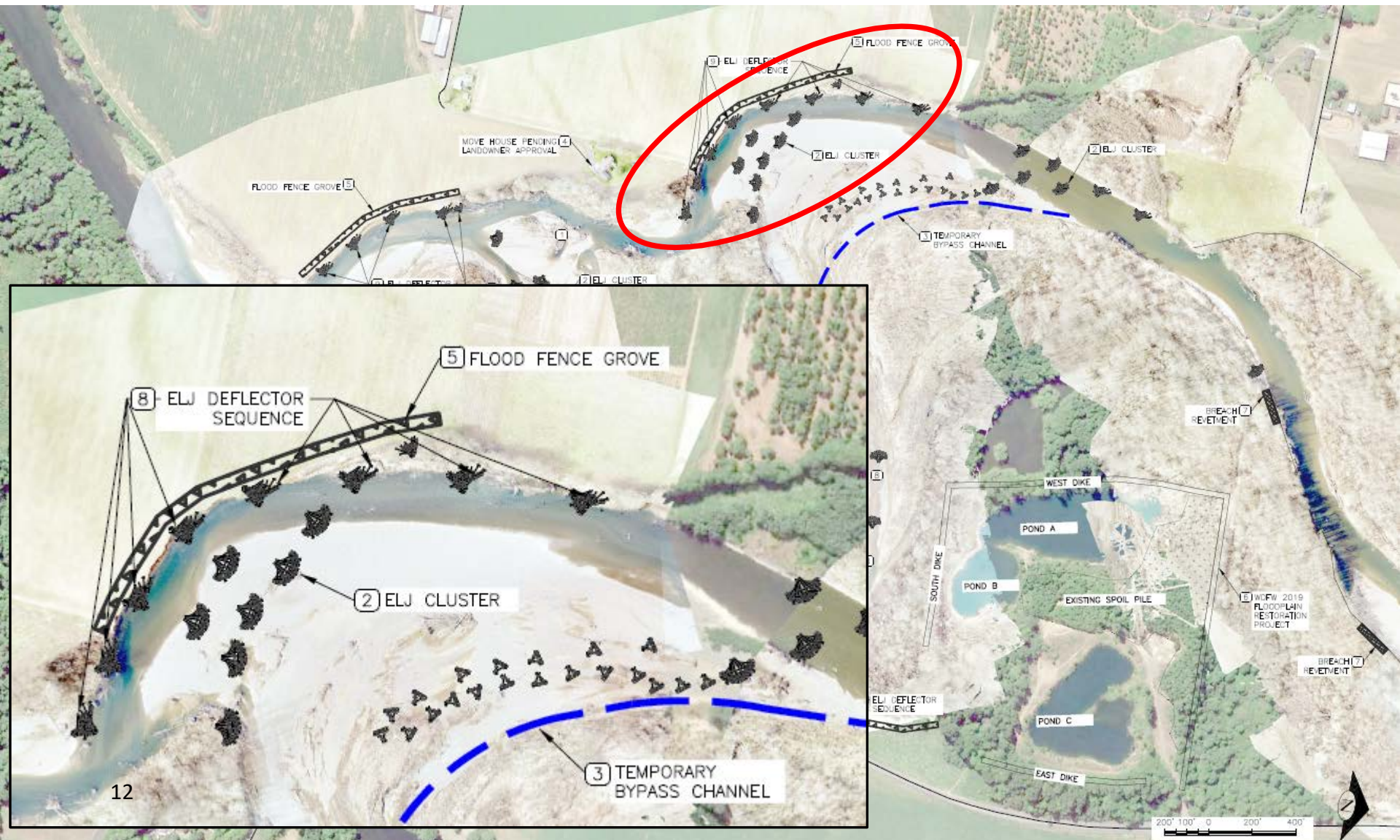
Preliminary Design (Geomorphic Action Groups)



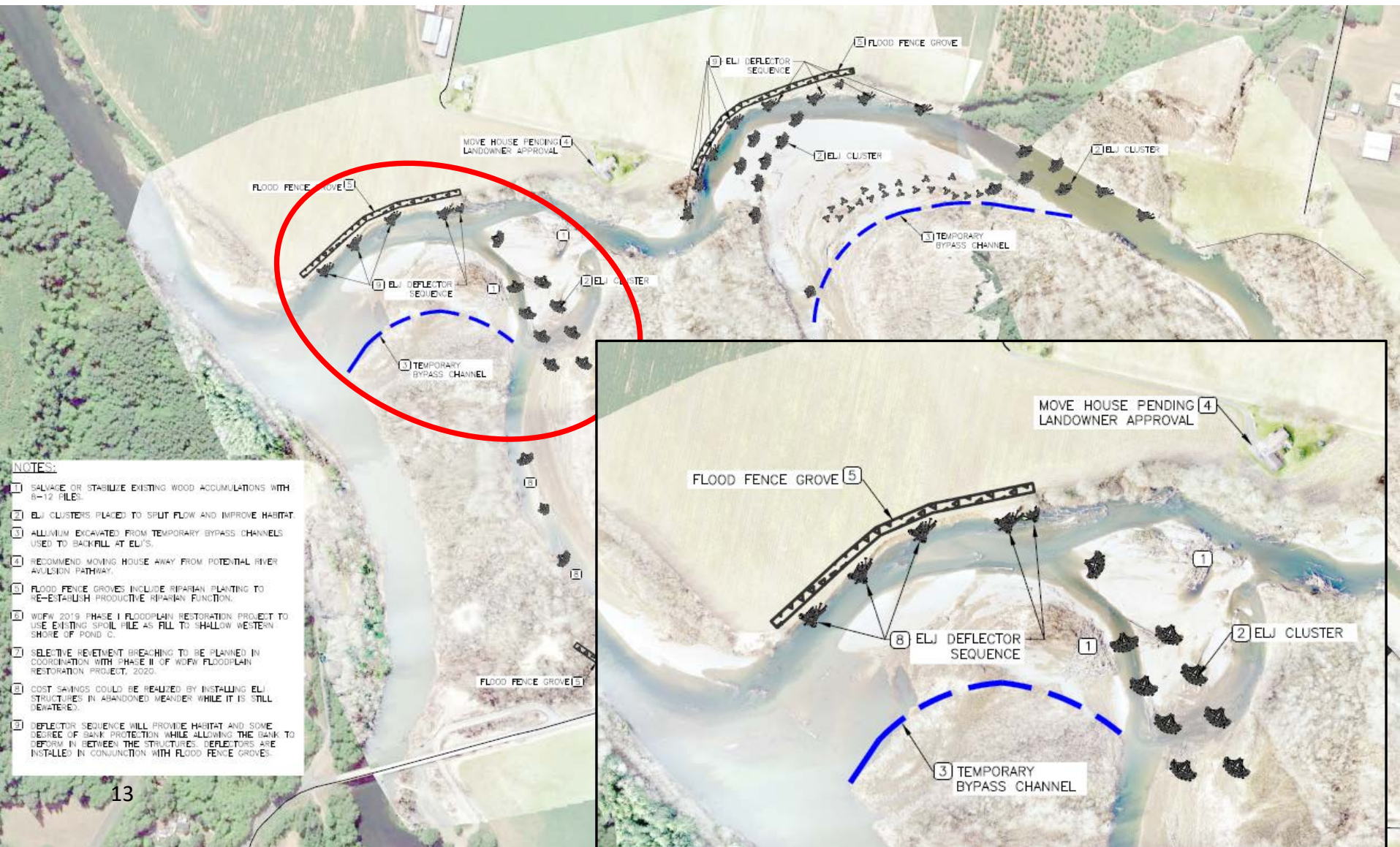
Preliminary Design (Geomorphic Action Group #1)



Preliminary Design (Geomorphic Action Group #3)



Preliminary Design (Geomorphic Action Group #4)

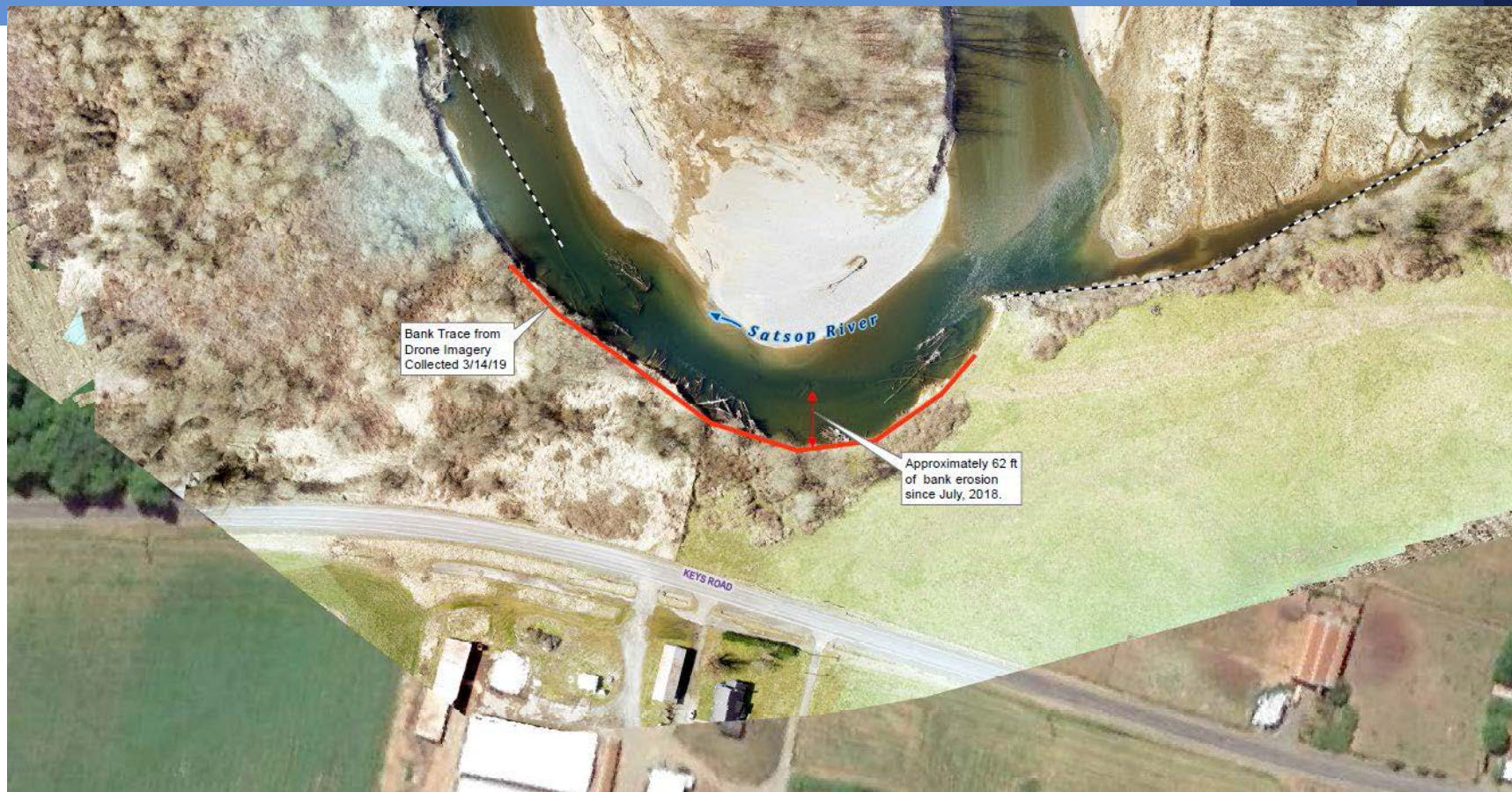


Action Now: Lower WDFW Revetment Removal



- ☒ **Phase I (7/15-19/2019):** Lower 200' (remove rock toe, excavate 20' x 85' flow channel).
- ☐ **Phase II (2020?):** Design underway to remove remainder of
14 revetment and protect Keys Rd. & Port well.

Action Now: Keys Road Protection



- ✓ **2019-21 Capital Budget:** \$185K “Keys Road Flood Protection.”
- **Design, Engineering, Permitting:** Contracting underway for
15 2020 (hopefully) construction season.

Action Now: WDFW Habitat, Floodplain Restoration



- ☒ **Phase I (now):** Remove spoils piles, shallow out ponds.
- ☐ **Phase II (2020):** Remove levees/dikes, reconnect floodplain.



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.

Lower Satsop Protection Program

Prioritized Investment Areas (and Actions)

	Cost	Status
2019:		
1. WDFW -- Construct Habitat Restoration Project (Phase I)	Funded	Underway
2. WDFW -- Construct Lower Revetment Removal (Phase I)	Funded	Underway
3. GHC – Complete permitting for 2020 construction activities.	\$100 to \$160K **	Planned
2020:		
1. GHC -- Construct geomorphic group #1 and #2	\$1.5M to \$1.8M	Planned
2. GHC -- Construct Lower Satsop infrastructure protections (e.g., Keys Road, Port Well)	\$2.5 to \$4.0M **	Planned
3. WDFW -- Construct Habitat Restoration Project (Phase II)	Funded	Planned
4. GHC – Complete permitting for 2021 construction activities.	\$400K to \$600K	
2021:		
1. GHC -- Construct geomorphic group #3 and #4	\$2.5M to \$3.0M	Planned
2. WDFW -- Construct Lower Revetment Removal (Phase II)	Funded	Planned

¹⁹ **NOTE (1):** Costs are high-level estimates (indicators of scale, order of magnitude) to be refined in weeks ahead.
NOTE (2): ** \$185K in 2019-21 State Capital Budget funding secured for Keys Road Protection will be applied here.



Contacts:

Organization	
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Chehalis River Basin Flood Authority	<p>Scott Boettcher 360/480-6600 scottb@sbgh-partners.com</p>

Resource –

https://www.ezview.wa.gov/site/alias__1973/37263/DesktopDefault.aspx?alias=1973&PageID=37263

Grays Harbor County - Lower Satsop

Grays Harbor County - Lower Satsop Planning, Visioning, and Priority Setting Project

[Portal ID #1973]

Overview Contacts Events Library

Documents

File Name	File Size	Category	Date Added
Lower Satsop Update 7-25-2019.pptx	18 MB	None	07/25/19 11:17 AM
Lower Satsop Update 7-25-2019.pdf	7.2 MB	None	07/25/19 11:17 AM
Lower Satsop Funding 2019-2021.pdf	151.4 KB	None	05/25/19 08:07 AM
Keys Road Threat Mile 1.5 to 1.6 (5-25-2019).pdf	14.7 MB	NSD	05/25/19 07:27 AM
Preliminary DRAFT Cost Estimates Action Areas I-IV (5-25-2019).pdf	107.1 KB	NSD	05/25/19 07:26 AM
L Satsop Geomorphic Action Areas (5-25-2019).pdf	12.8 MB	NSD	05/25/19 07:25 AM
PROPOSED-CONDITIONS-v2 5-16-2019.pdf	8.8 MB	5-16-2019 Flood Auth...	05/20/19 09:47 AM
NSD Chehalis Basin Flood Authority Meeting 5-16-19.pdf	6 MB	5-16-2019 Flood Auth...	05/20/19 09:47 AM
L Satsop v3 Apr Concept Binder.pdf	7.8 MB	NSD	04/19/19 02:59 PM
Lower Satsop Advisory Group Meeting 4-17-19.pdf	8.7 MB	NSD	04/16/19 02:02 PM
L Satsop v2 Apr Concept Binder.pdf	7.8 MB	NSD	04/16/19 02:02 PM
Lower Satsop Final Design Drawngs_Reduced.pdf	14.6 MB	WDFW	04/16/19 01:09 PM
Pic5 -- LowerSatsop_20190314_Ortho_fl_1b-1c.pdf	15.3 MB	NSD	04/12/19 12:32 PM
Pic4 -- LowerSatsop_20190314_Ortho_fl_2xgrid.pdf	8 MB	NSD	04/12/19 12:32 PM
Pic3 -- LowerSatsop_20190314_Ortho_fl_1a.pdf	10.1 MB	NSD	04/12/19 12:31 PM
Pic2 -- Satsop ortho upper reach 20190315.pdf	24.1 MB	NSD	04/12/19 12:04 PM
Pic1 -- Satsop ortho 400dpi 20190314.pdf	7.3 MB	NSD	04/12/19 12:03 PM
Revetment Pictures.kmz	22.8 MB	NSD	04/12/19 11:13 AM
Lower Satsop 3-19-2019.pptx	6.6 MB	None	03/19/19 05:45 AM
Lower Satsop 3-19-2019.pdf	3.7 MB	None	03/19/19 05:44 AM
Smith & Wengar 2001 chehalis basin salmonid limiting factors.pdf	6.3 MB	Background	03/19/19 05:10 AM
Grays Harbor County Commission re Satsop.pdf	1 MB	Background	03/19/19 04:45 AM
REM.pdf	5 MB	NSD	03/19/19 04:22 AM
Lower Satsop Investment Plan 3-12-2019.pdf	3.5 MB	None	03/14/19 07:50 AM
2019 Lower Satsop Member Request.pdf	3.7 MB	None	03/06/19 10:54 AM
Lower Satsop Investment Plan Final 2-2019.pdf	12.8 MB	None	03/01/19 12:16 PM