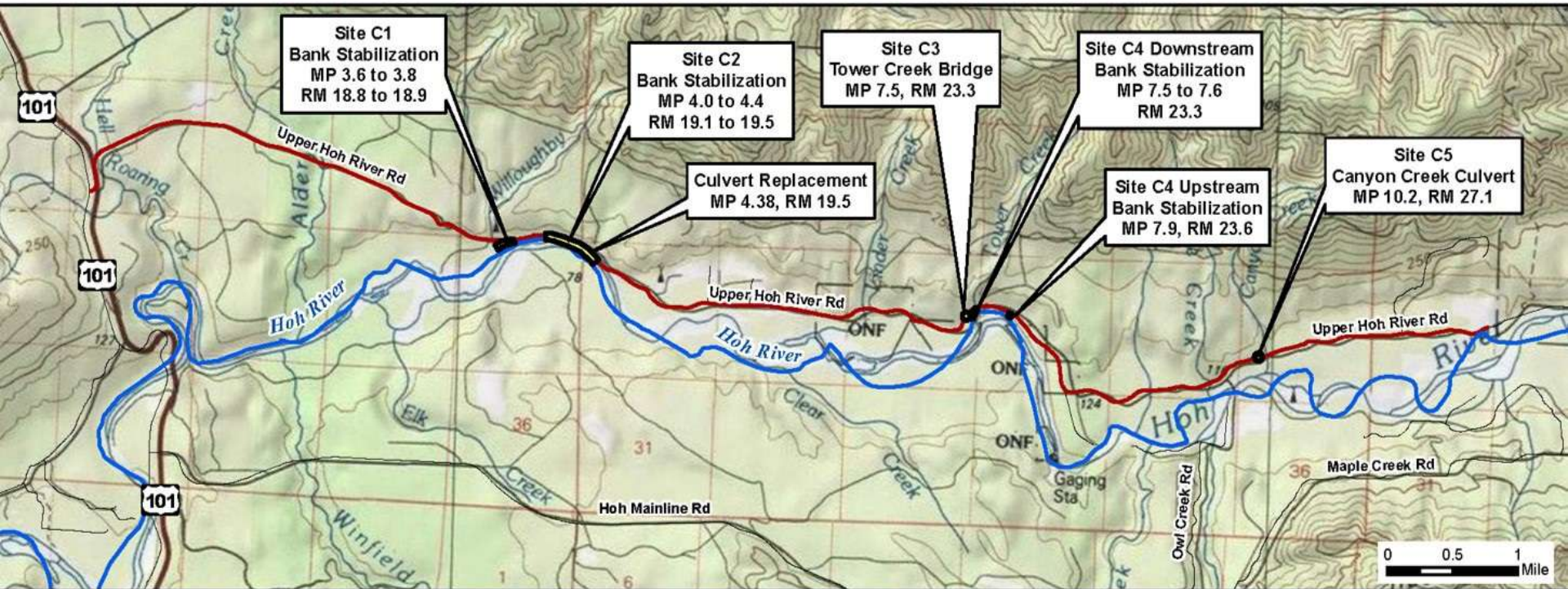




Upper Hoh River Road Project

Jefferson County, Washington



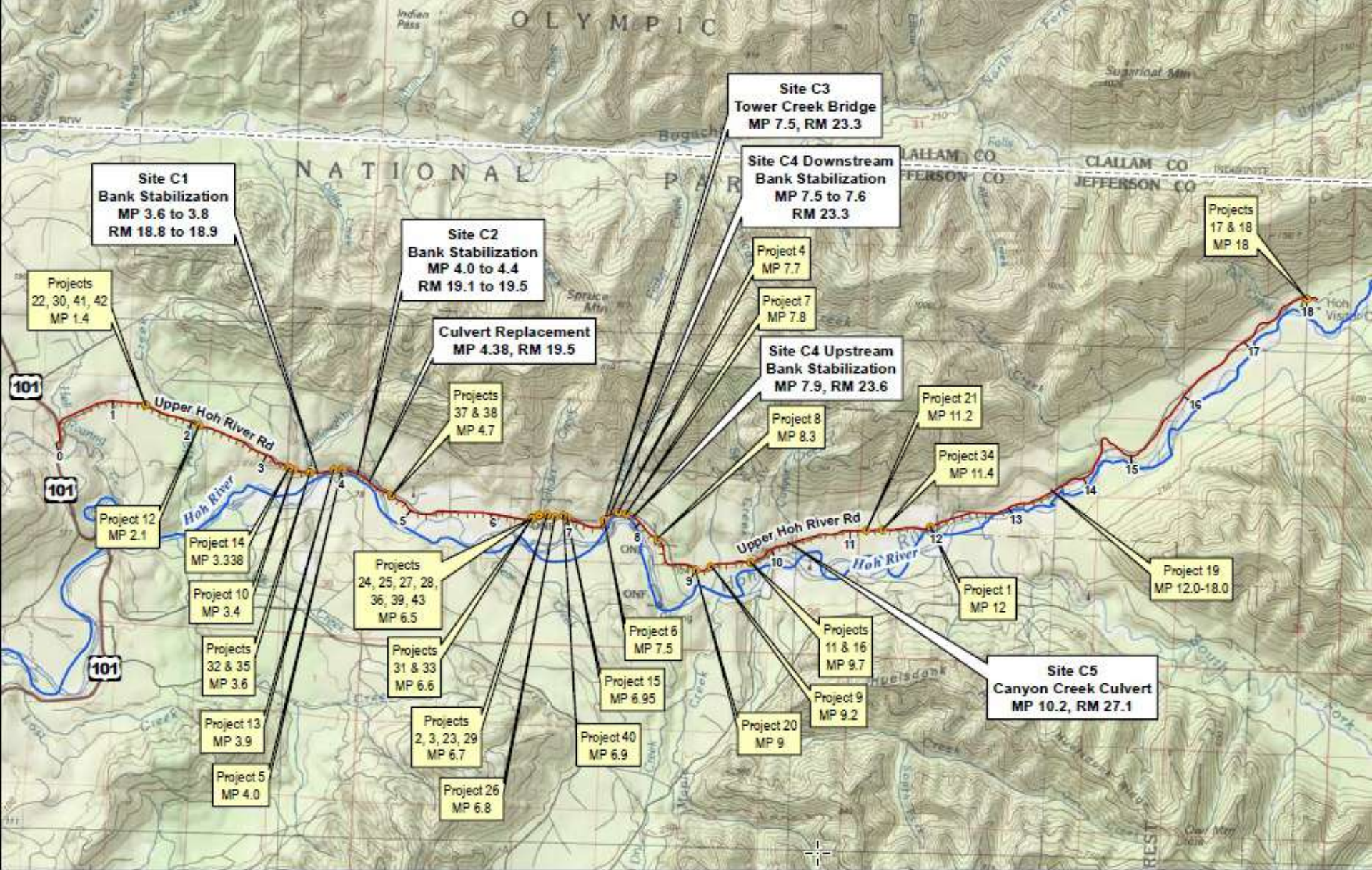
Upper Hoh River Road Project

-  Project Locations
-  Upper Hoh River
-  Upper Hoh River Road
-  Local Road

Project Purpose



Upper Hoh River Road Project



Upper Hoh River Road Project

Projects Analyzed for Cumulative Impacts

- Cumulative Project Location
- Upper Hoh River
- Upper Hoh River Road
- 12 Milepost
- Milepost (tenth)
- - - County Boundary

Date Sources: Jefferson County Washington DNR, USGS NHD, ESRI Base Maps
 Cumulative Projects: Hoh River Trust, Hoh Tribe, Council on Environmental Quality, National Park Service, Jefferson County



Historic Logging

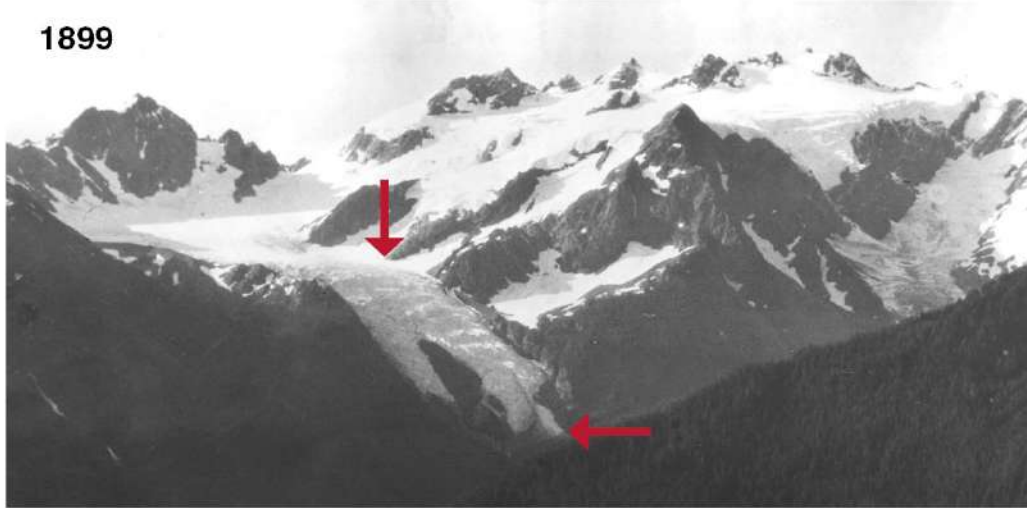


Upper Hoh River Road Project

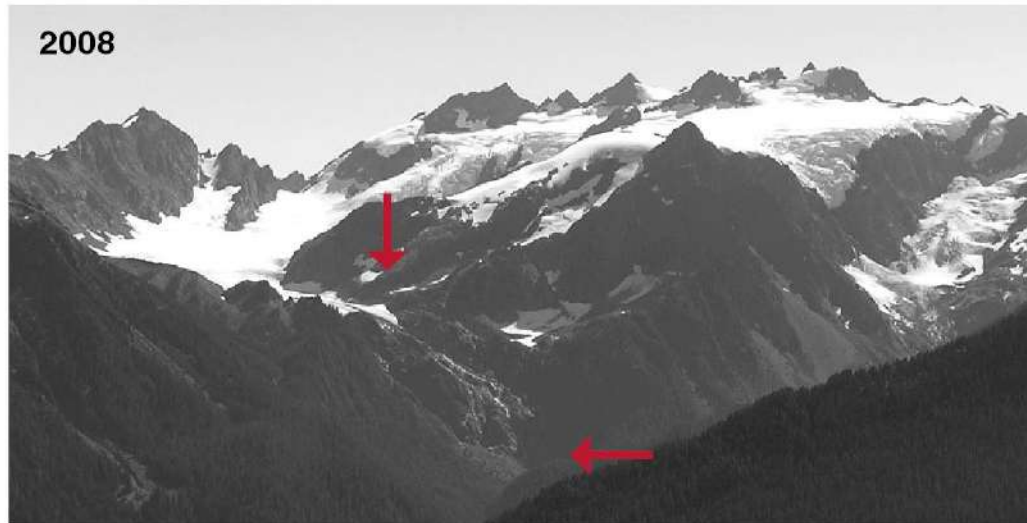
Retreating Glaciers

Olympic National Park - Blue Glacier

1899



2008



Upper Hoh River Road Project



November 2014



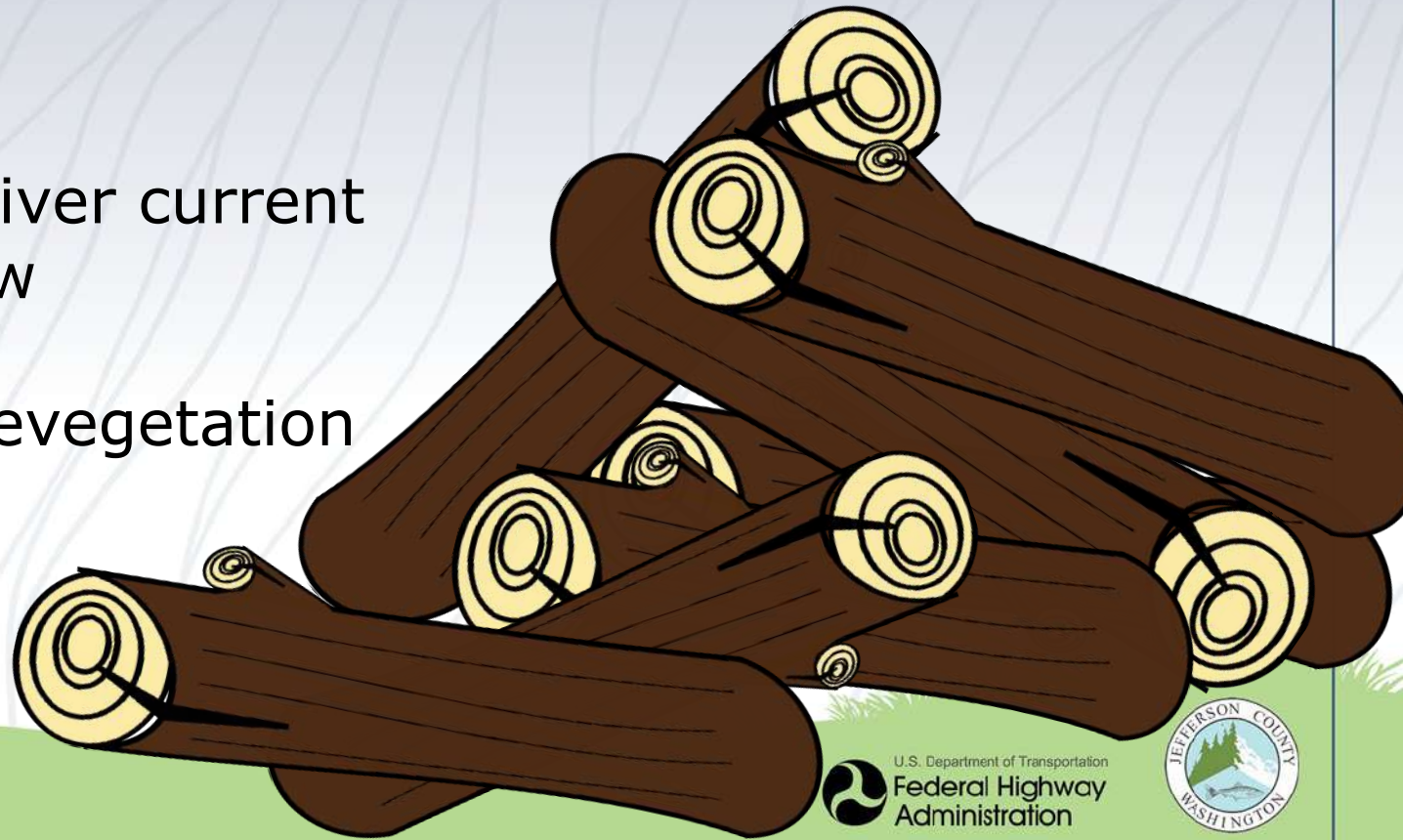
November 2015

Alternatives

- Riprap
- Riprap with incorporated rootwads/large wood
- Stream Barbs
- Log Crib Wall
- Road Relocation

Log Jams

- Natural feature
- Provide fish and wildlife habitat
- Dissipate river current energy/flow
- Allow for revegetation



Engineered Log Jams (ELJs)

- Locally sourced (Olympic Peninsula = cedar, spruce, Douglas fir)
- Large diameter (e.g. 30"-60" dbh) & long lengths (>50' long)
 - **Impractical!**
 - Trees that size are nearly nonexistent now
 - Trees that size are too big to transport on the highway
- Use bundles of wood; smaller diameter, smaller lengths



Engineered Log Jams (ELJs)

For Streambank Stabilization:

- ELJs only work if they stay put
- Hoh River is deep and powerful (15 feet deep, 12 feet/sec flow)
- Wood floats, ballasting difficult





2014/08/14



2014/07/31

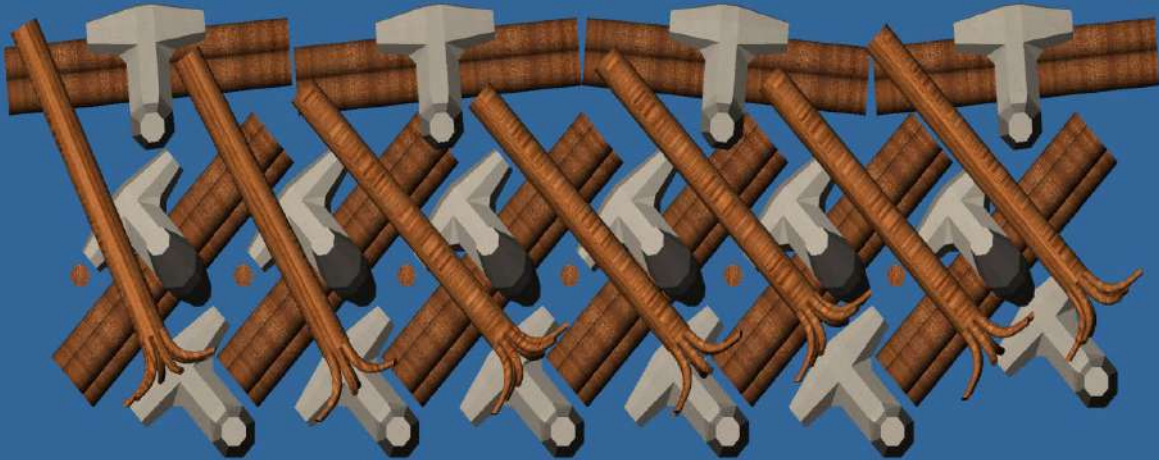
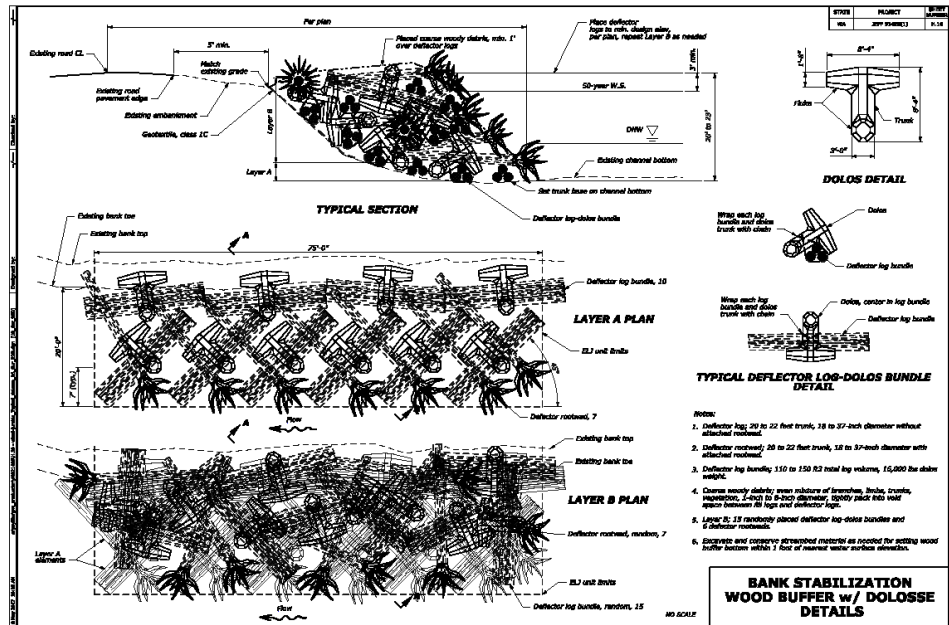
Engineered Log Jams (ELJs)

- Use pre-cast concrete dolos (8 tons each)
- Construct/fabricate ELJ module unit (3 logs/1 dolo) on land
- 1 "Jam" (80' long x 20' wide x 23' high) constructed of ~25-30 module units (think "Tinker Toys meets Lincoln Logs") stacked 2 rows high, all chained together



Engineered Log Jams (ELJs)

- 31 ELJ's
- 2,300 logs
- 775 Dolosse
- 450 Rootwads



ELJ Locations

Mile Post 3.6-4.4



Mile Post 7.5-7.9





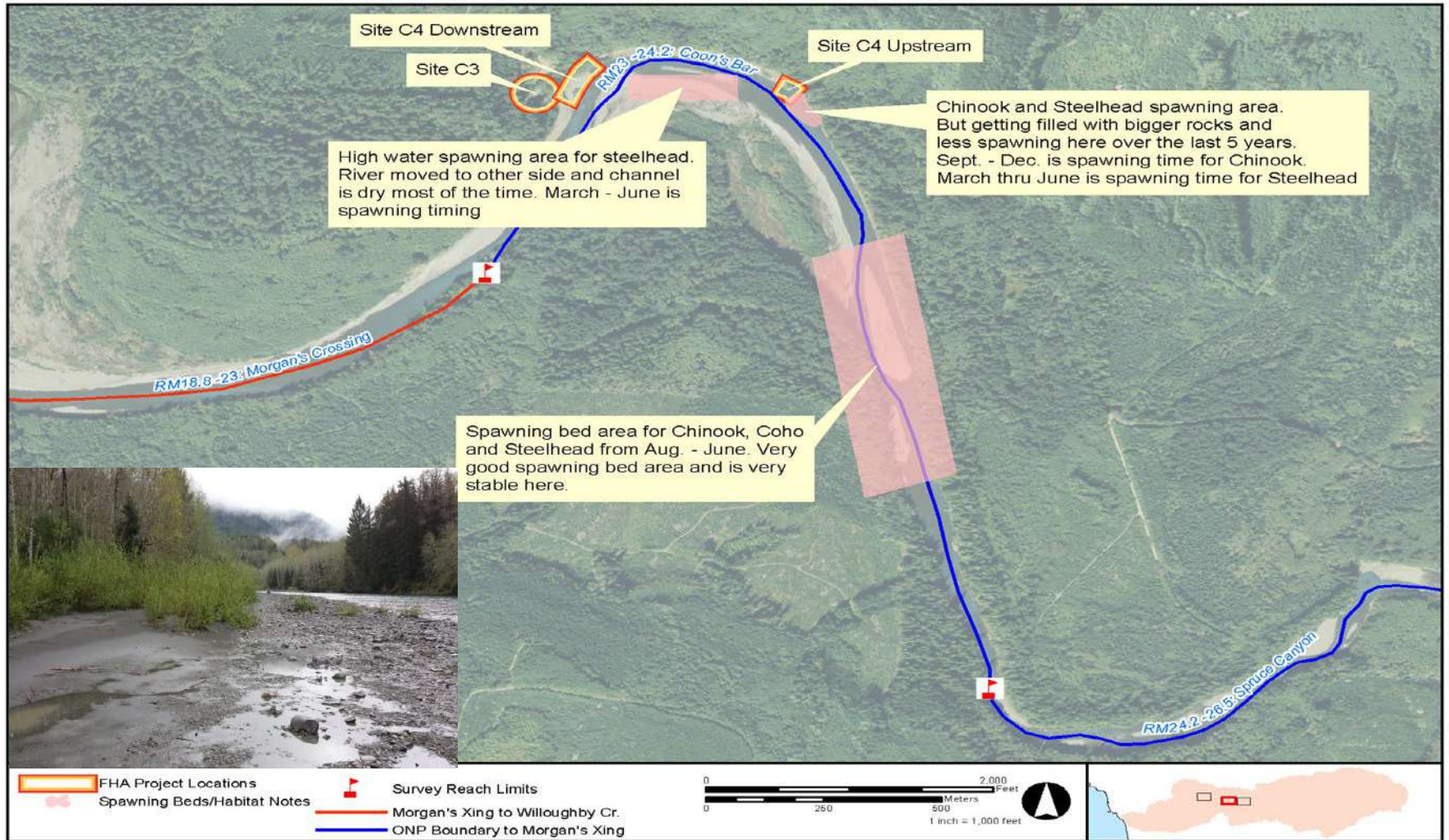
Skagit River - Courtesy WSDOT



Concerns Raised

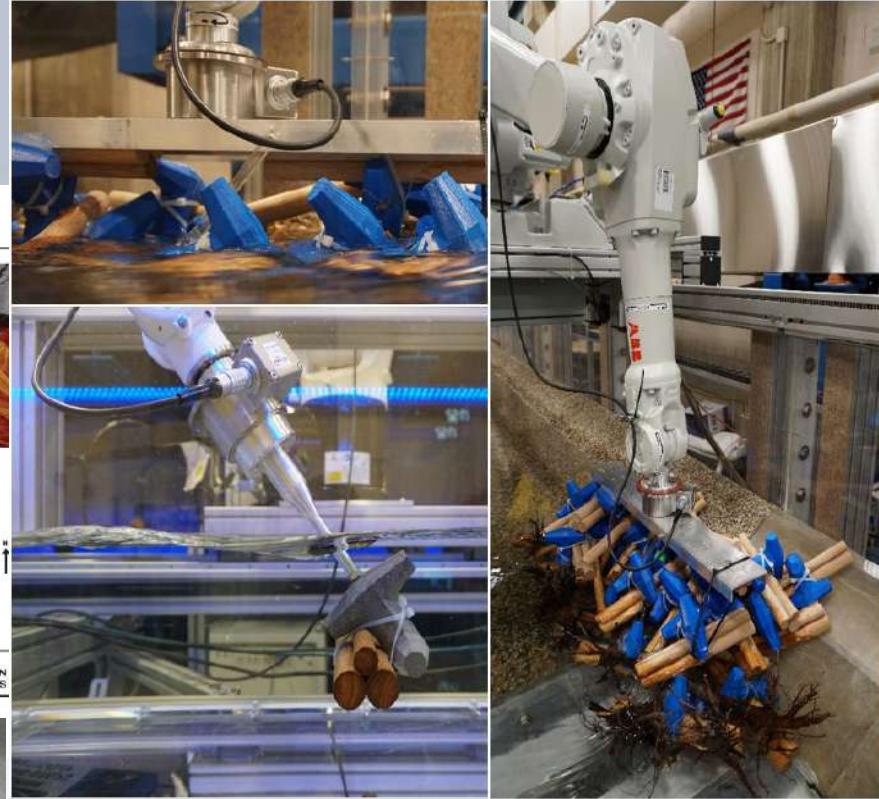
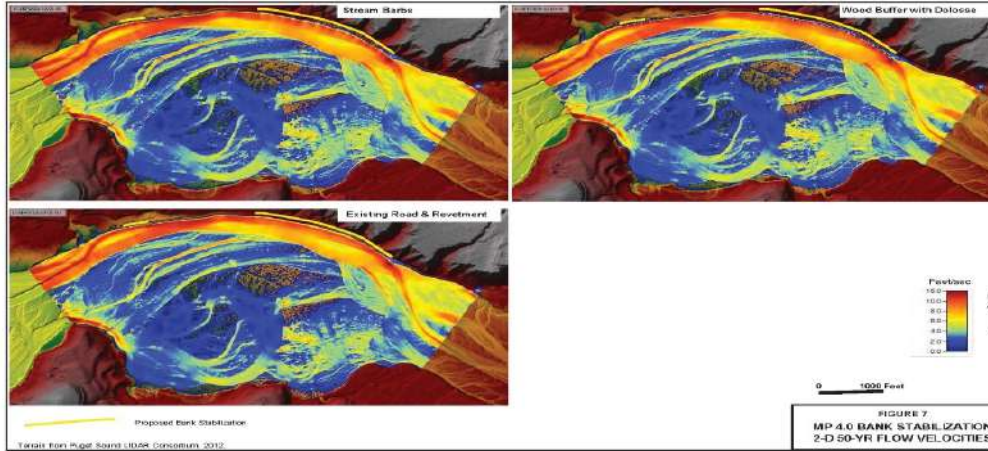


Concerns (fish habitat)



Upper Hoh River Road Project

Design Due Diligence



Upper Hoh River Road Project

Findings



- ❖ Improved design/more efficient design
- ❖ Design refinements for long-term stability and improve wood 'racking'
- ❖ Hydraulics effects localized
- ❖ ELJ/dolosse units effective at baffling high energy flows

Mitigation

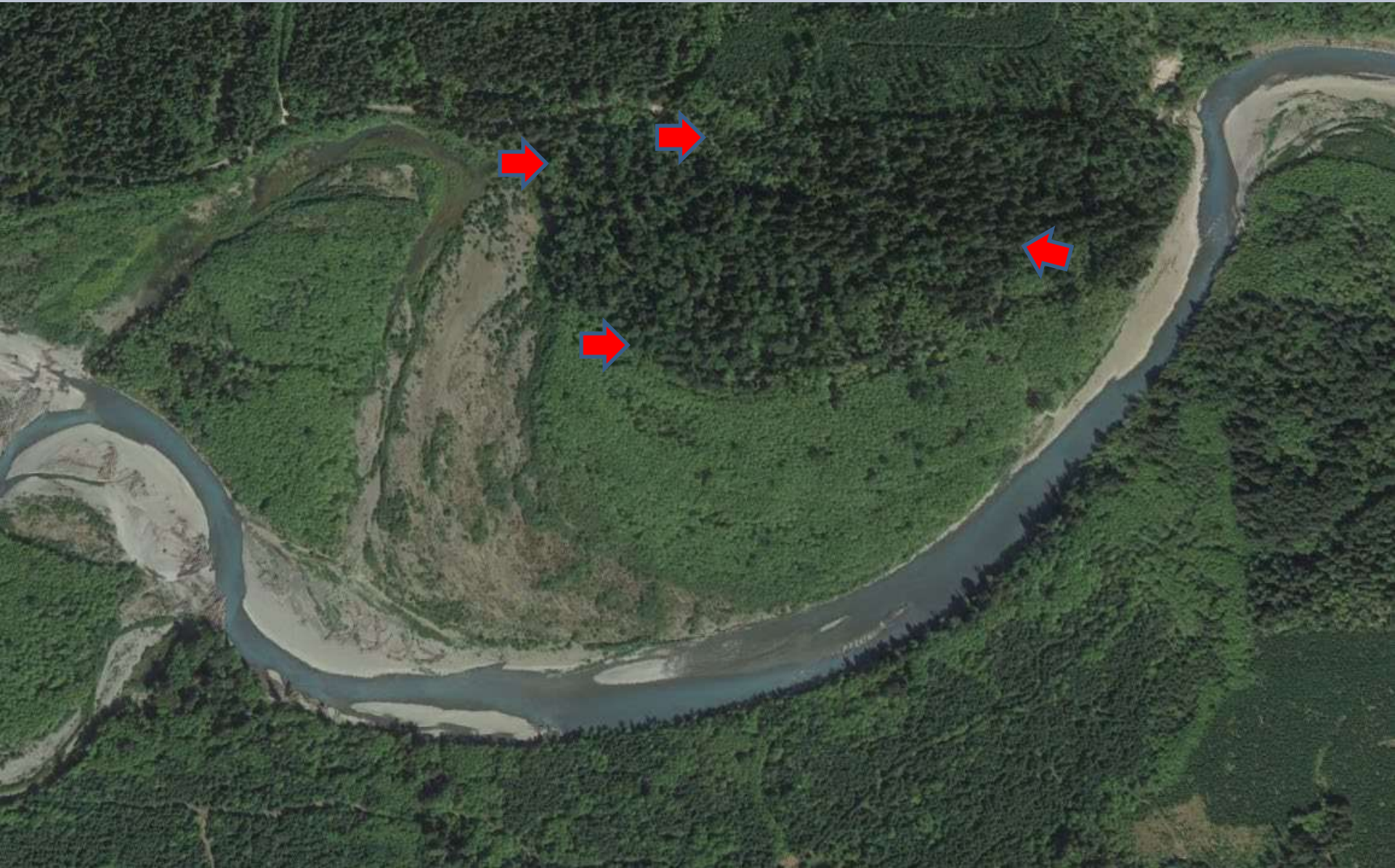
- Are ELJs self-mitigating?
- Compensation for temporary adverse affects during construction
- Limiting factors in the Hoh River

Habitat at Risk



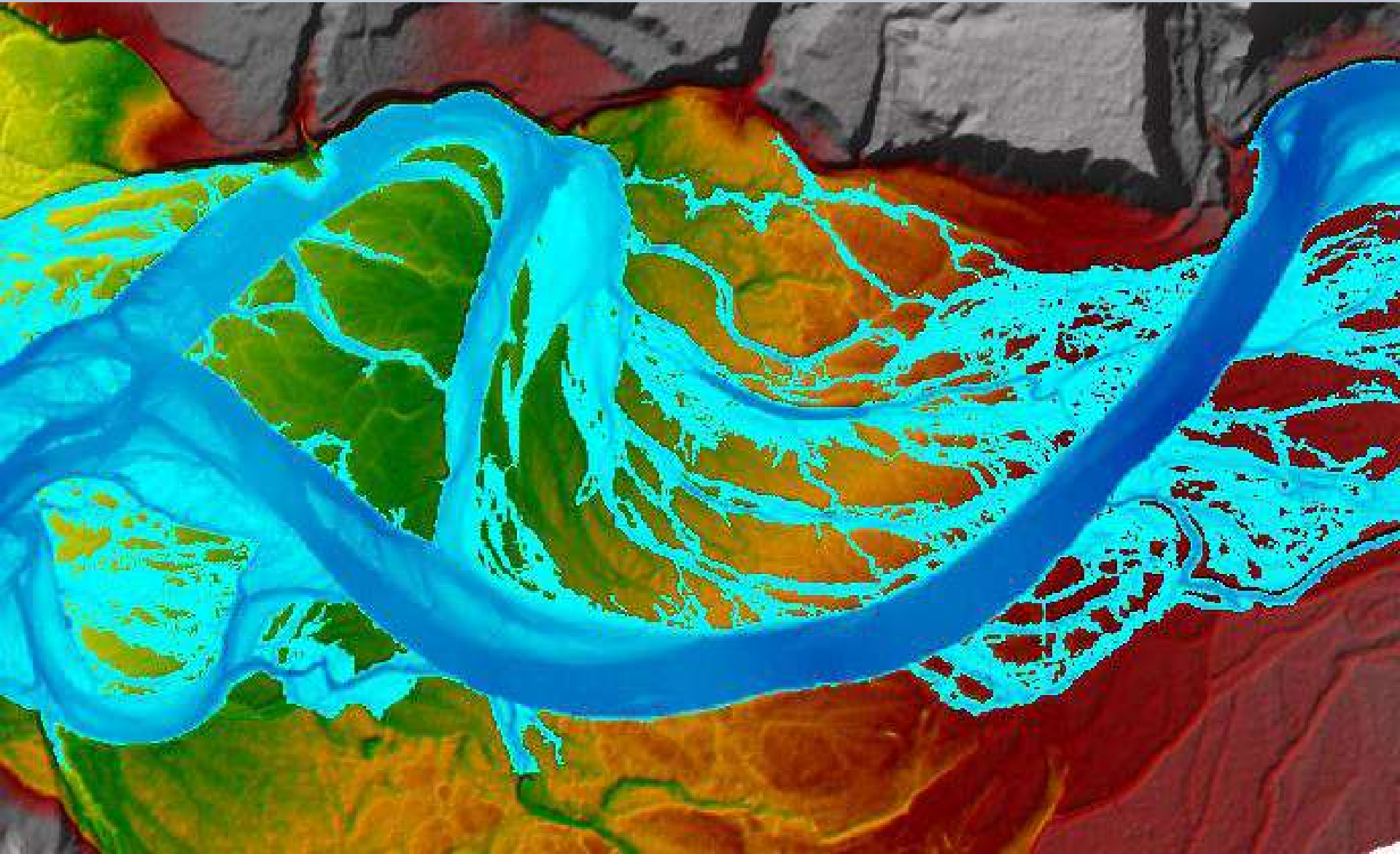
Upper Hoh River Road Project

Hoh River @ MP 6.7 (Morgans Crossing Reach)



Upper Hoh River Road Project

Hoh River @ MP 6.7 during 2-year flood



Upper Hoh River Road Project

2002

Movement of meanders is limited

7 11-02 13,500'

Tower Creek

County Road Site MP 6.7

23

7

25

8

24

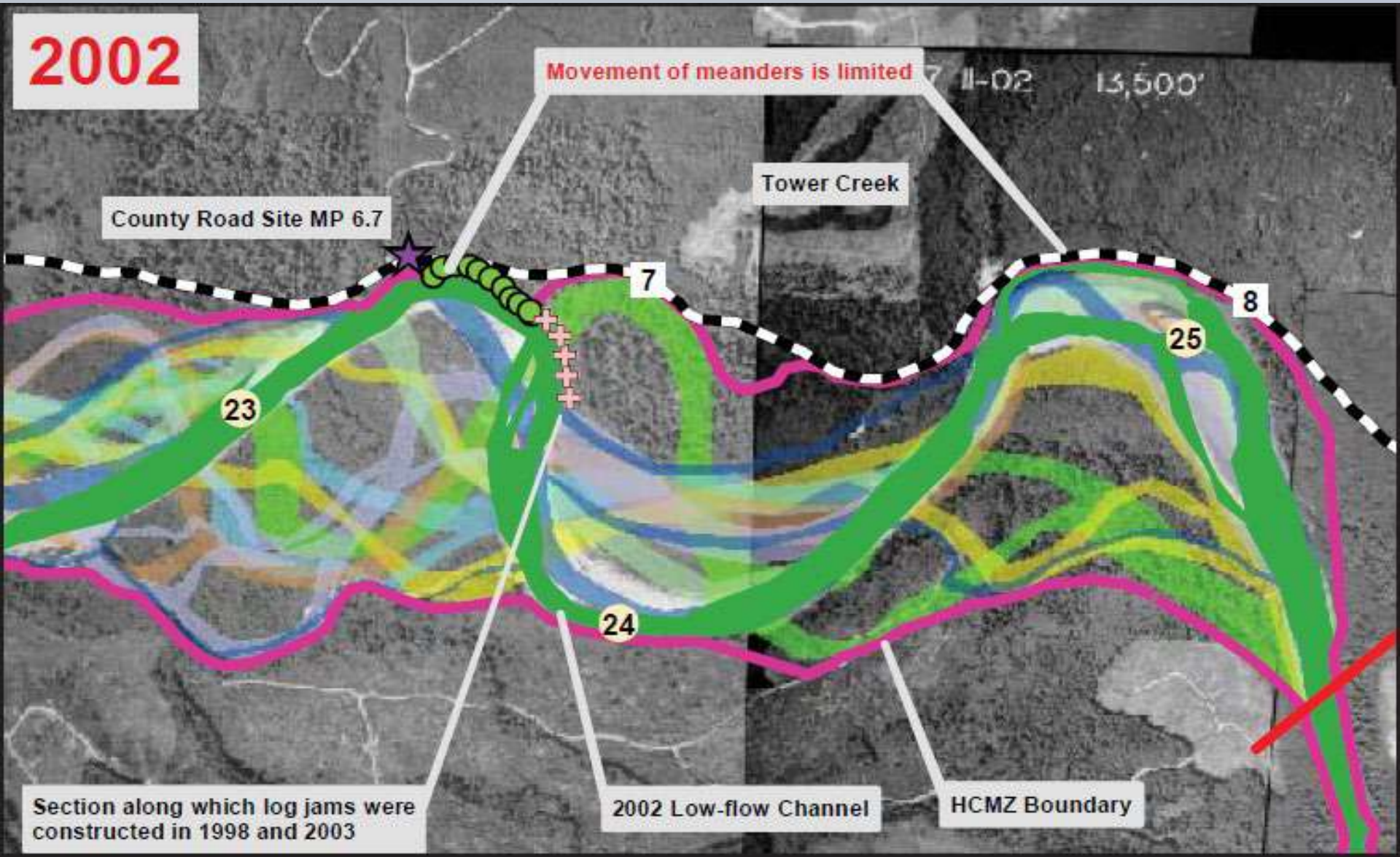
Section along which log jams were constructed in 1998 and 2003

2002 Low-flow Channel

HCMZ Boundary

Upper Hoh River Road Project

Geomorphic Assessment of Hoh River (BOR 2004)



Mitigation Concept



So What?



U.S. Department of Transportation
**Federal Highway
Administration**



May 2017



November 2017



December 2017



Upper Hoh River Road Project