Restoring Watershed Resilience

“Rewetting the Sponge: Using the Umatilla Tribe’s River Vision to restore resilience in the Tucannon sub-basin”

Panoramic of PA-18 - Spring 2020

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Presentation overview:

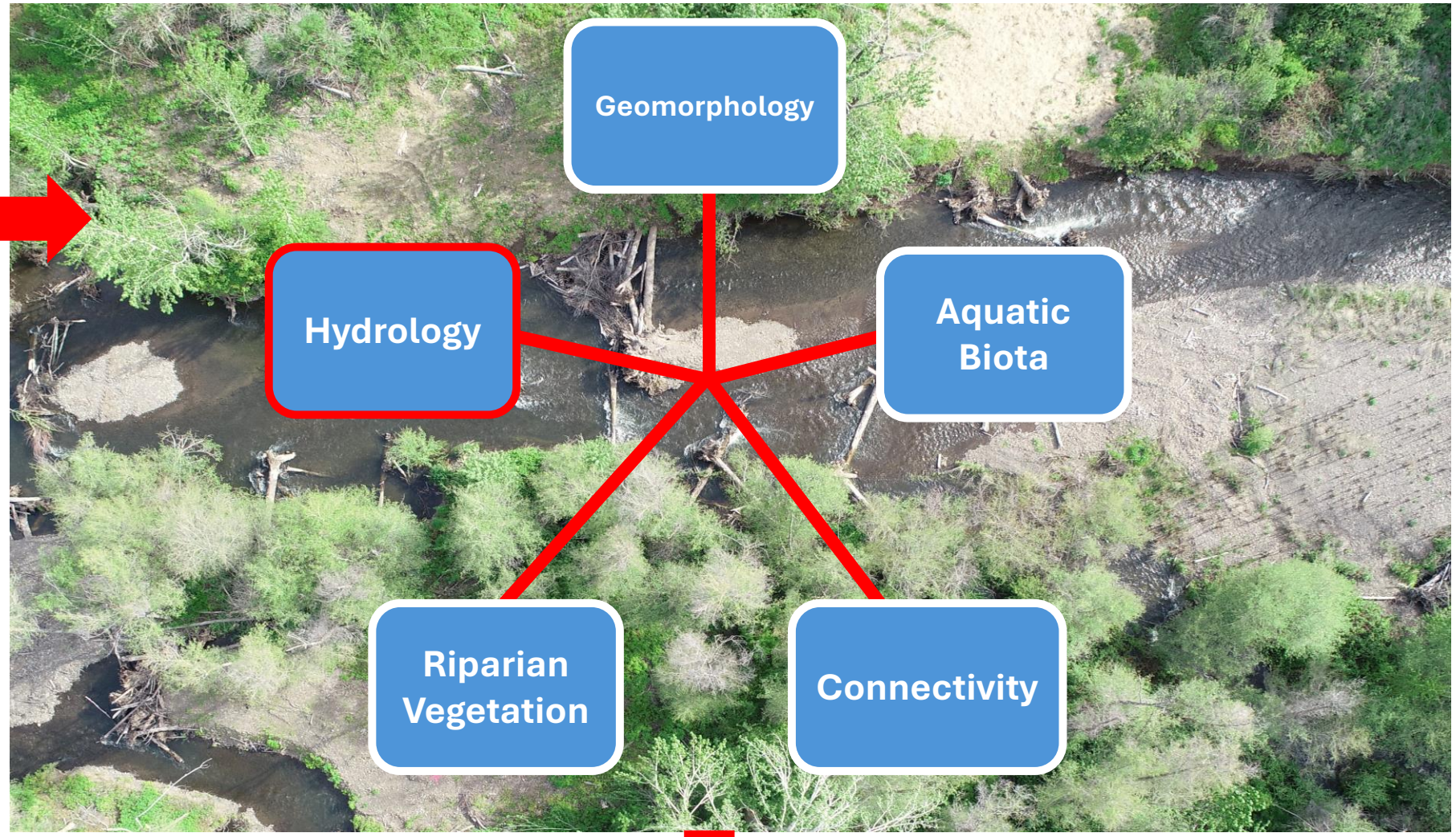
Upper Tucannon Landslide, 6/2022

First Foods Management with a River Vision

(See Jones et al. 2008)

Traditional Longhouse Serving Order

- **Cúuš** (Water)
- **Núsux** (Salmon)
- **Yáamaš** (Deer)
- **Xáwš** (Cous)
- **Wíwnu** (Huckleberry)

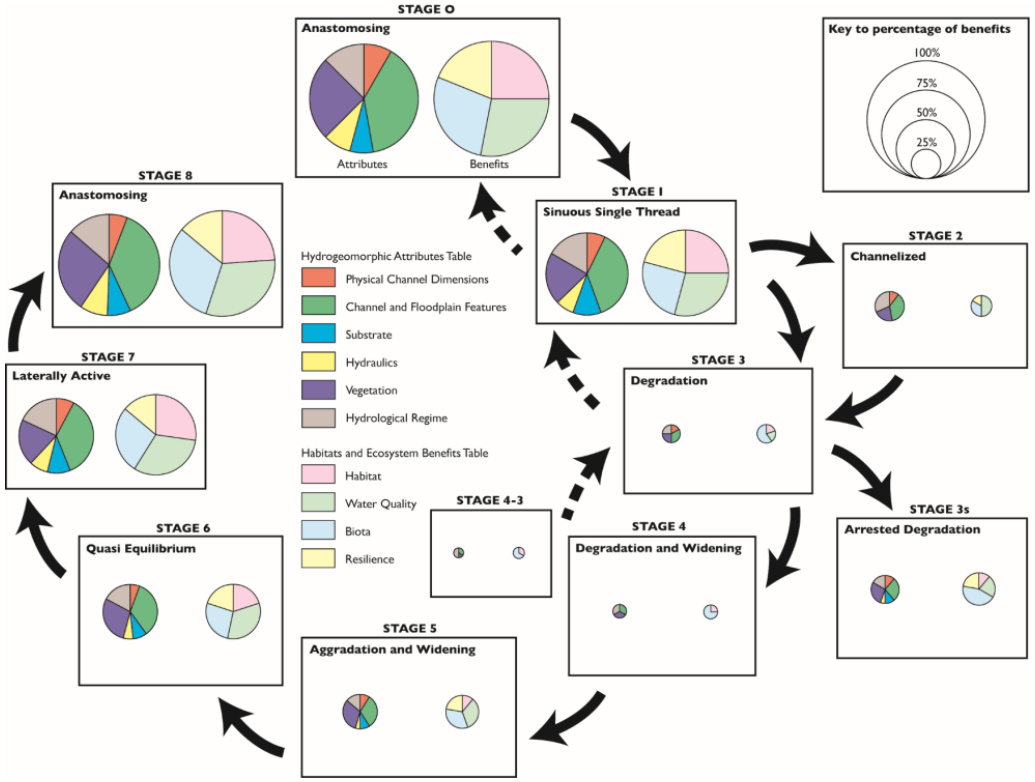


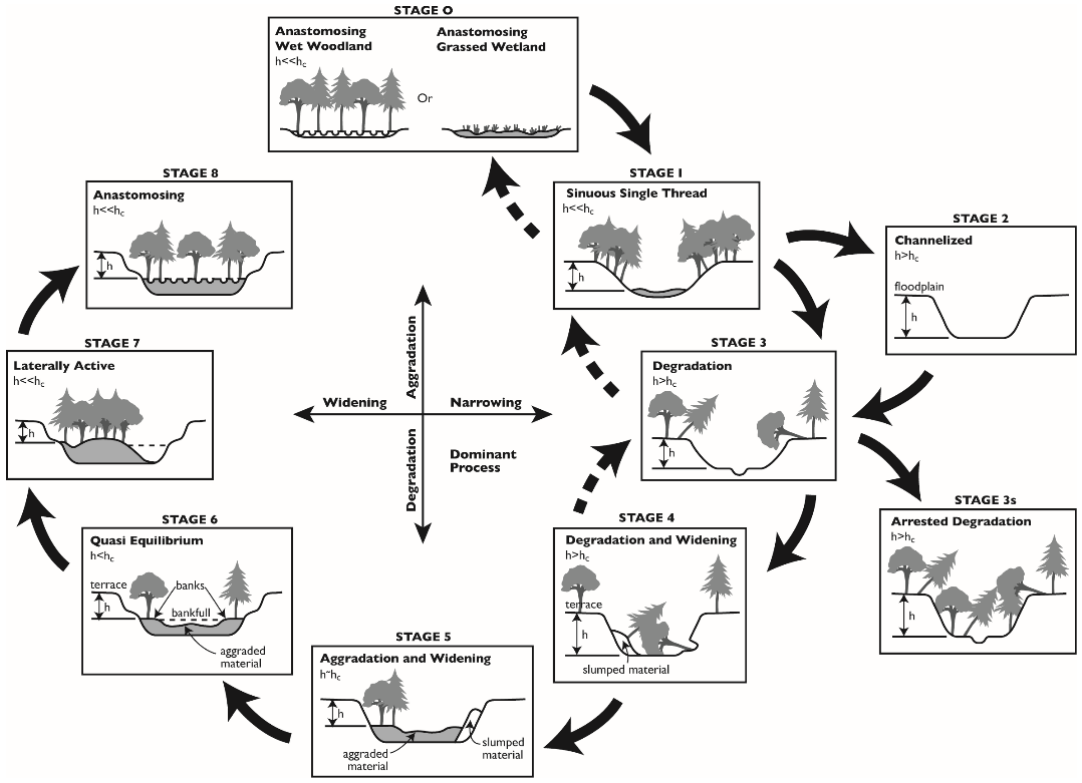
Fisheries Habitat Program Goal

Restore Highly Functioning Floodplains that Increase First Foods for Native Communities

Cluer and Thorne (2013) argued that:

- **high capacity 2yr Bank Full channels are not the historic norm,**
- **there are significant ecological differences between floodplain-connected (8/0/1) and incised stages (2/3/3a/4), as we make it around the different evolutionary stage's**

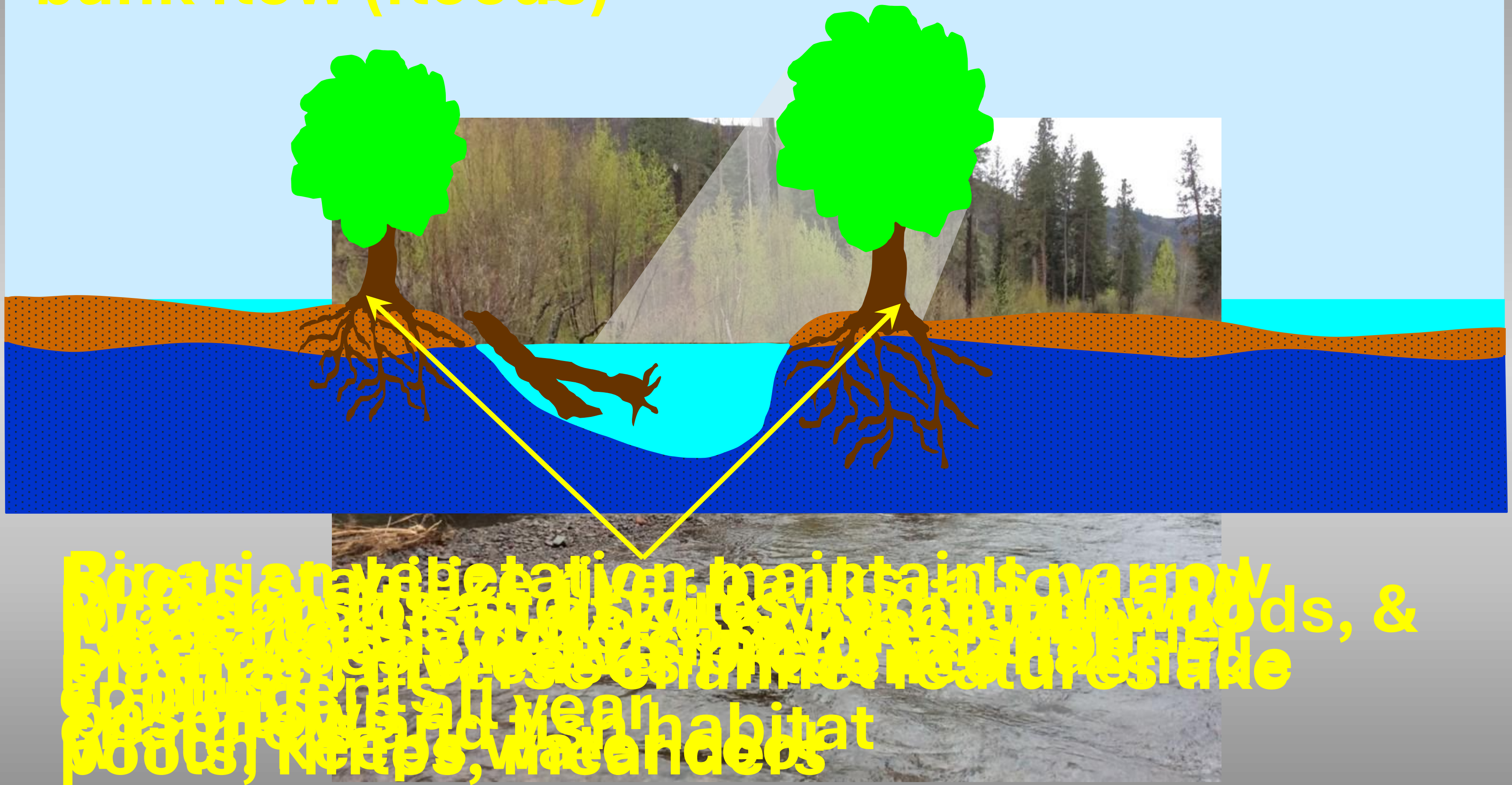




East-Side Rivers:

Vital Structural Components and their Ecological Functions

Narrow channel results in frequent over-bank flow (floods)



Riparian vegetation maintains narrow

…ds, &

…channel features like

…all year

…fish habitat

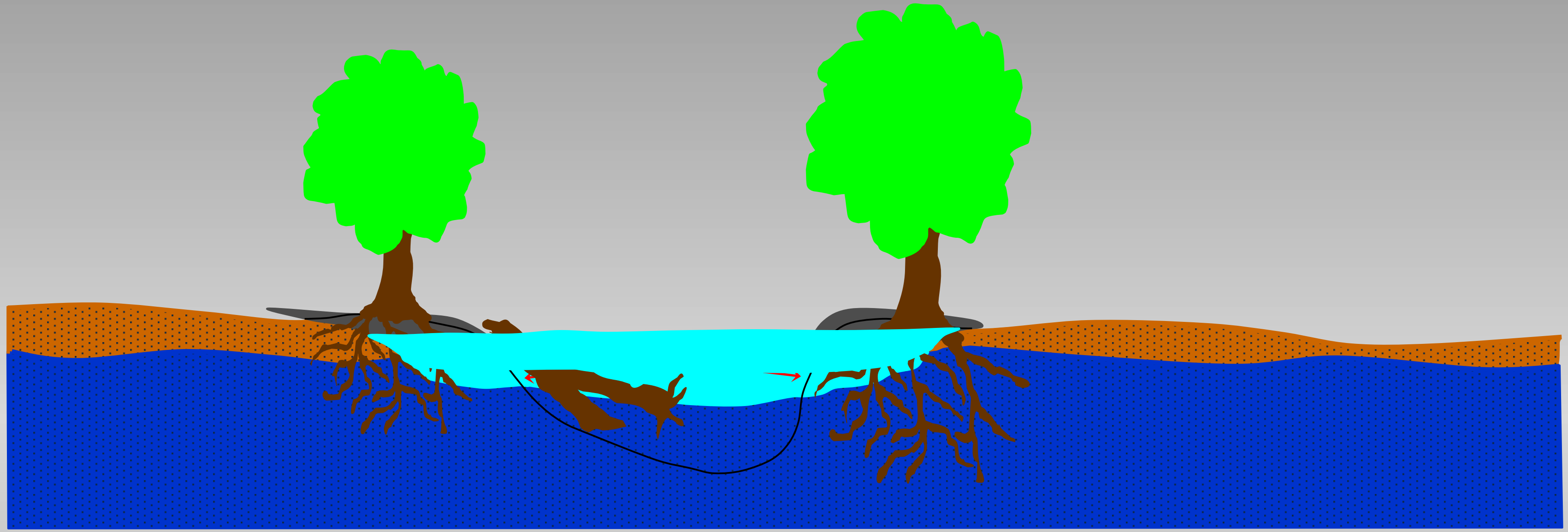
pools, riffles, meanders

How our rivers have changed over time:

... gravel is ...

... riparian vegetation removed

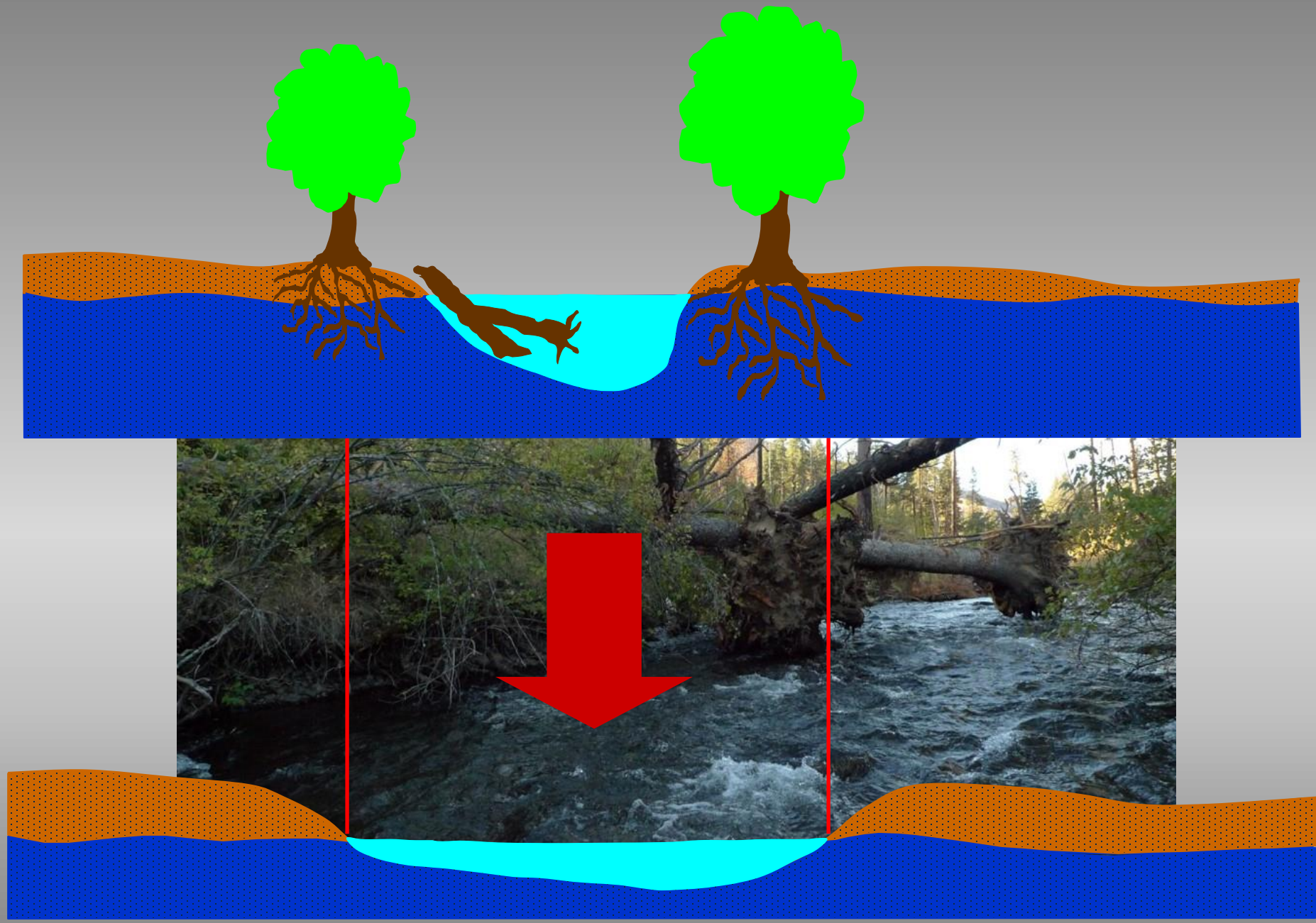
... complexity and fish habitat reduced



Frequency of over-bank flows reduced, larger channel conveys more flood flow, channel becomes unstable

Floodplain function decreased, less sediment/nutrient storage for riparian plants

Water is cut off from the floodplain and less water is stored over time



Depending on topography and other factors, high velocities in the river bed increase

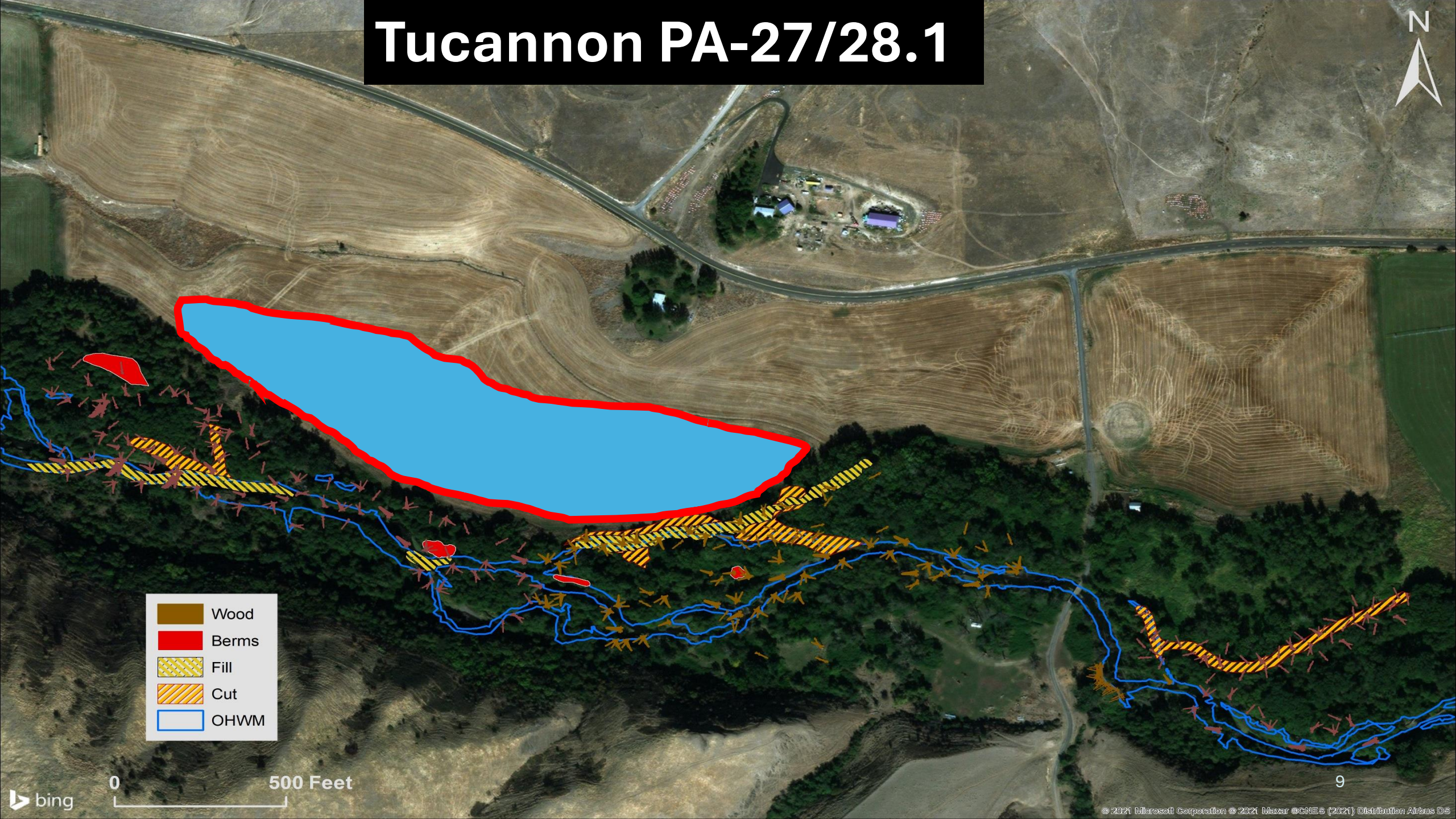
As the channel begins to convey more flood flows, high velocities in the river bed increase

River channel cuts down (incises) into its floodplain

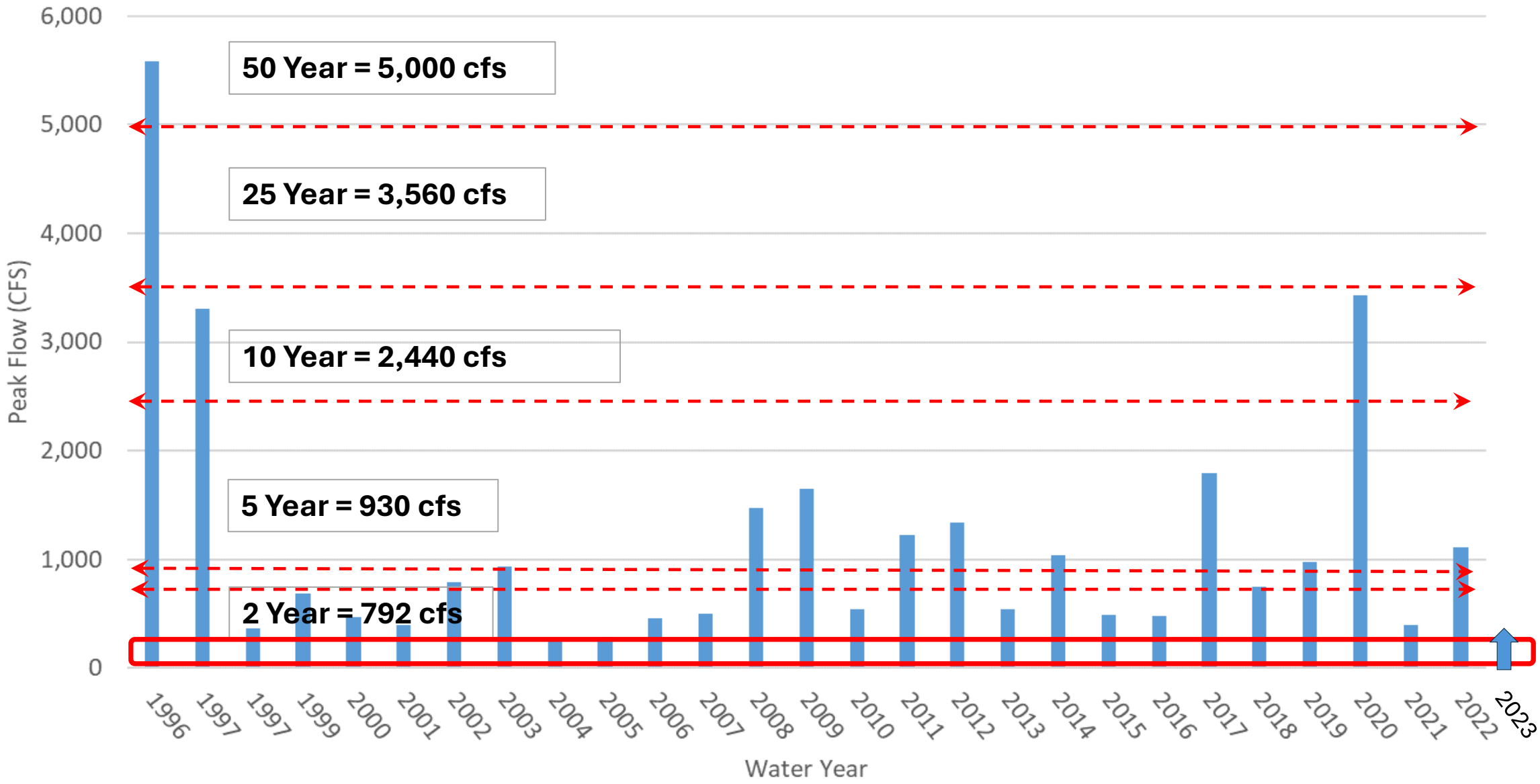
River can lose contact with floodplain, former floodplain dries out

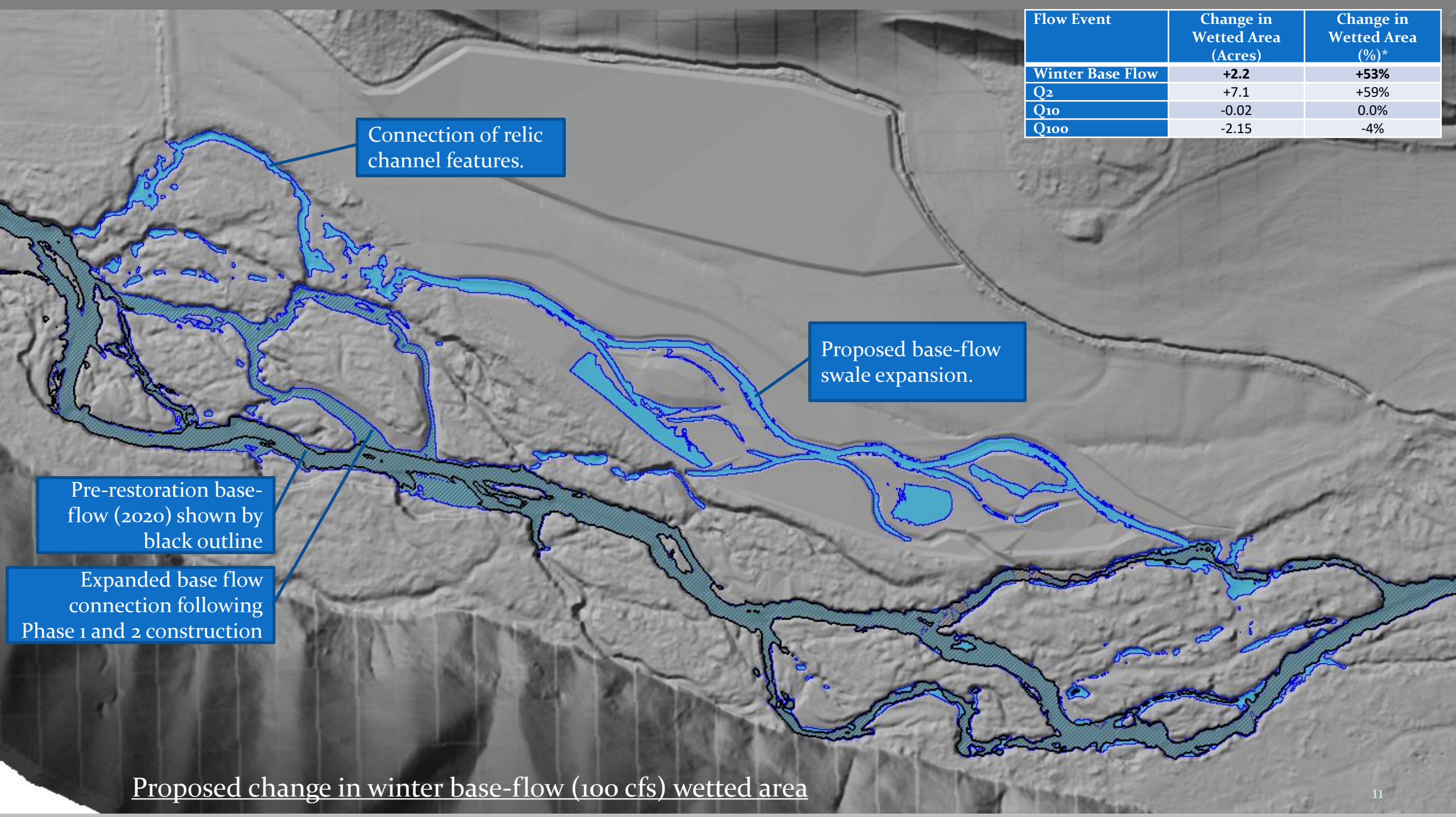
lose important floodplain functions such as water storage

Tucannon PA-27/28.1



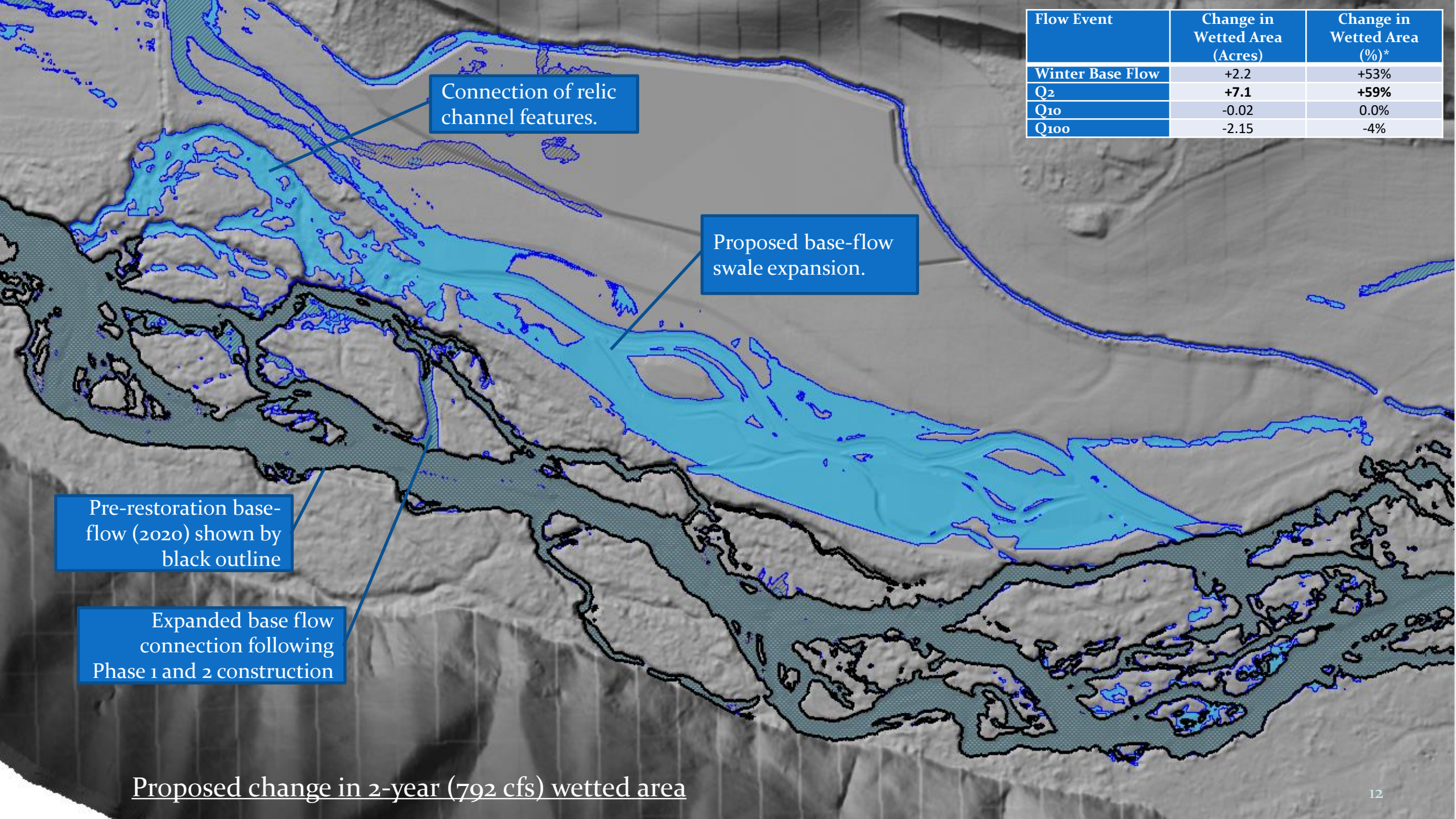
Geomorphic Timeline on the Tucannon River





Flow Event	Change in Wetted Area (Acres)	Change in Wetted Area (%)*
Winter Base Flow	**+2.2**	**+53%**
Q2	+7.1	+59%
Q10	-0.02	0.0%
Q100	-2.15	-4%

Proposed change in winter base-flow (100 cfs) wetted area



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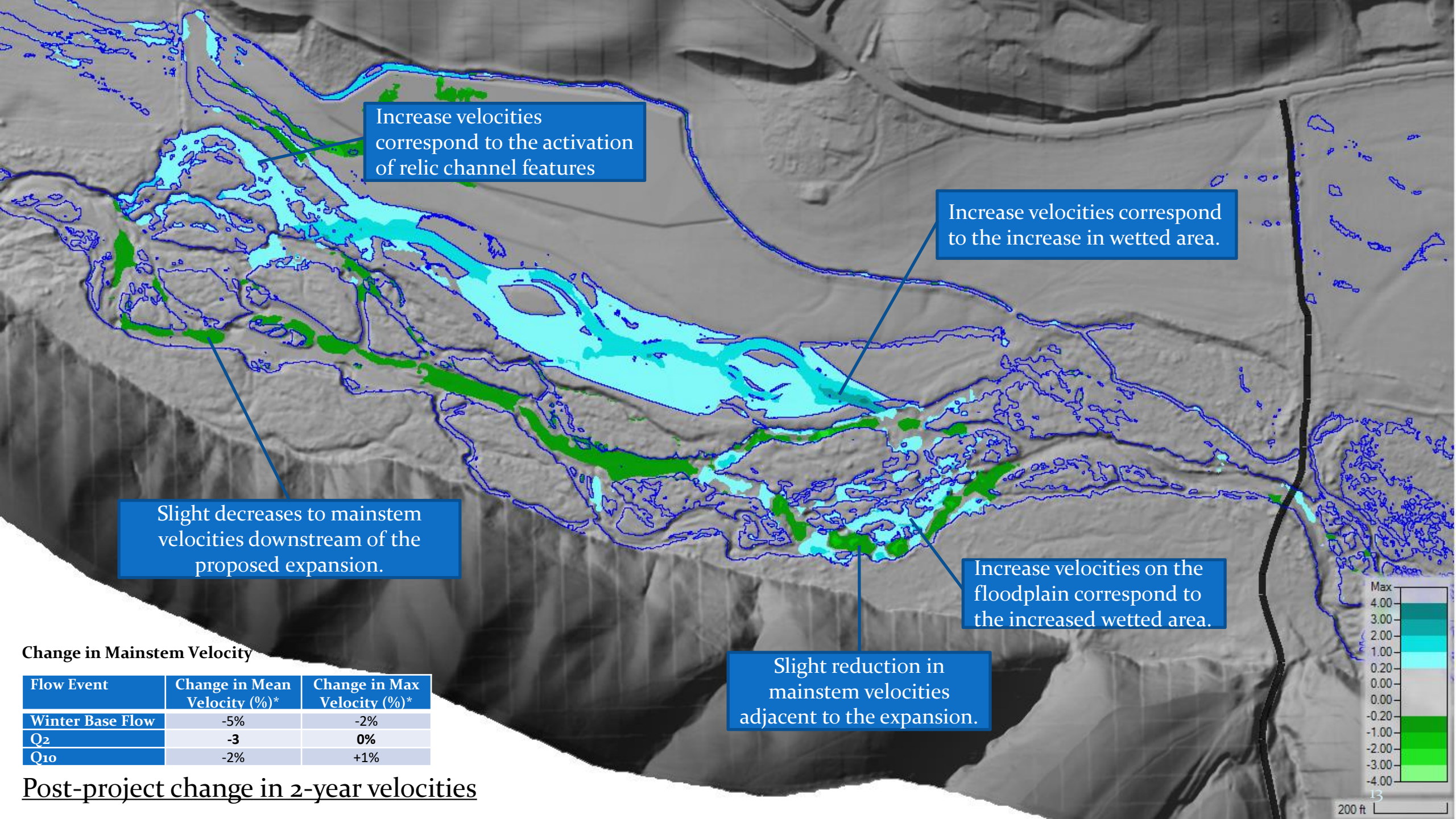
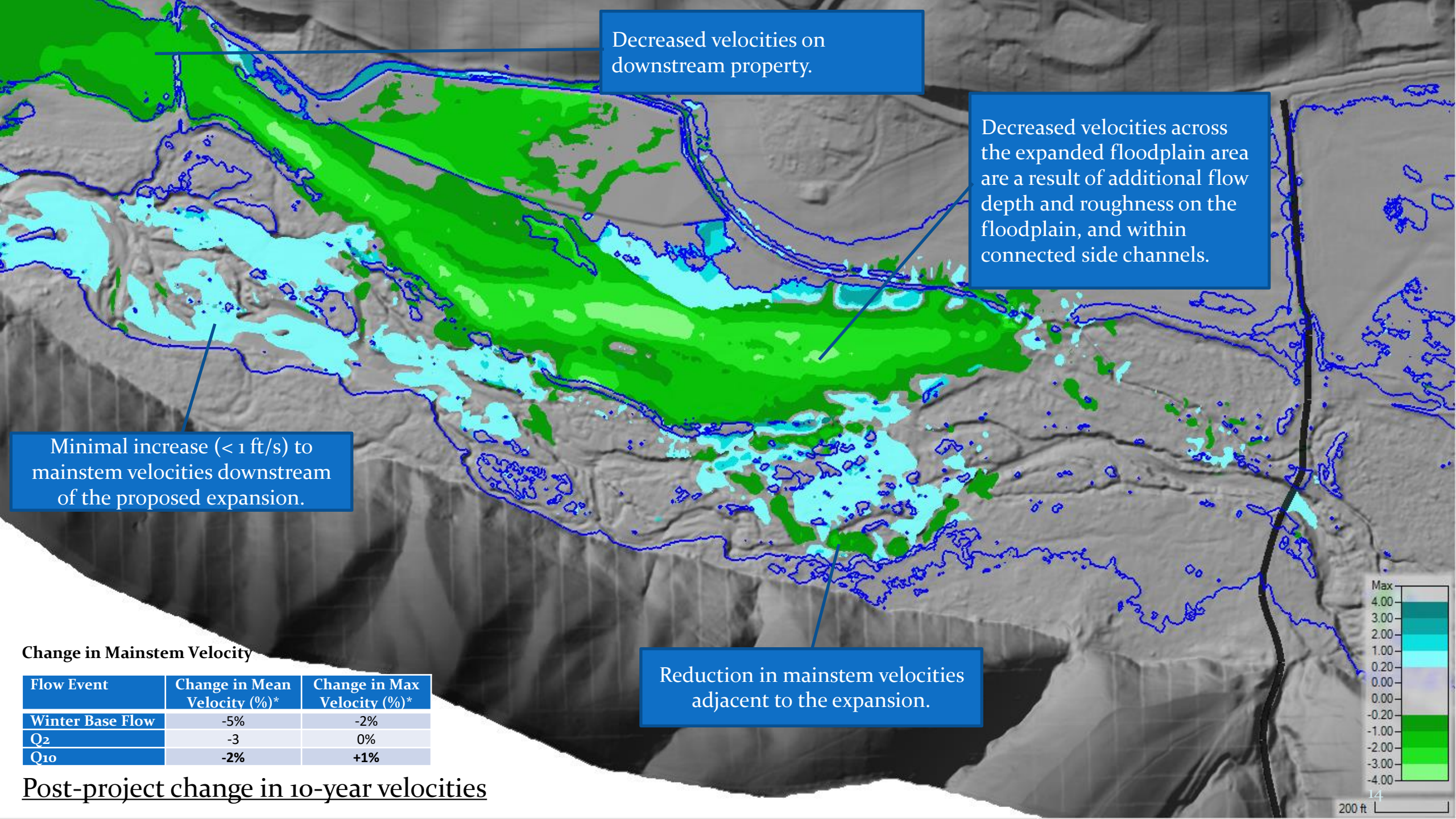
Proposed change in 2-year (792 cfs) wetted area



Change in Mainstem Velocity

Flow Event	Change in Mean Velocity (%)*	Change in Max Velocity (%)*
Winter Base Flow	-5%	-2%
Q2	**-3**	**0%**
Q10	-2%	+1%

Post-project change in 2-year velocities



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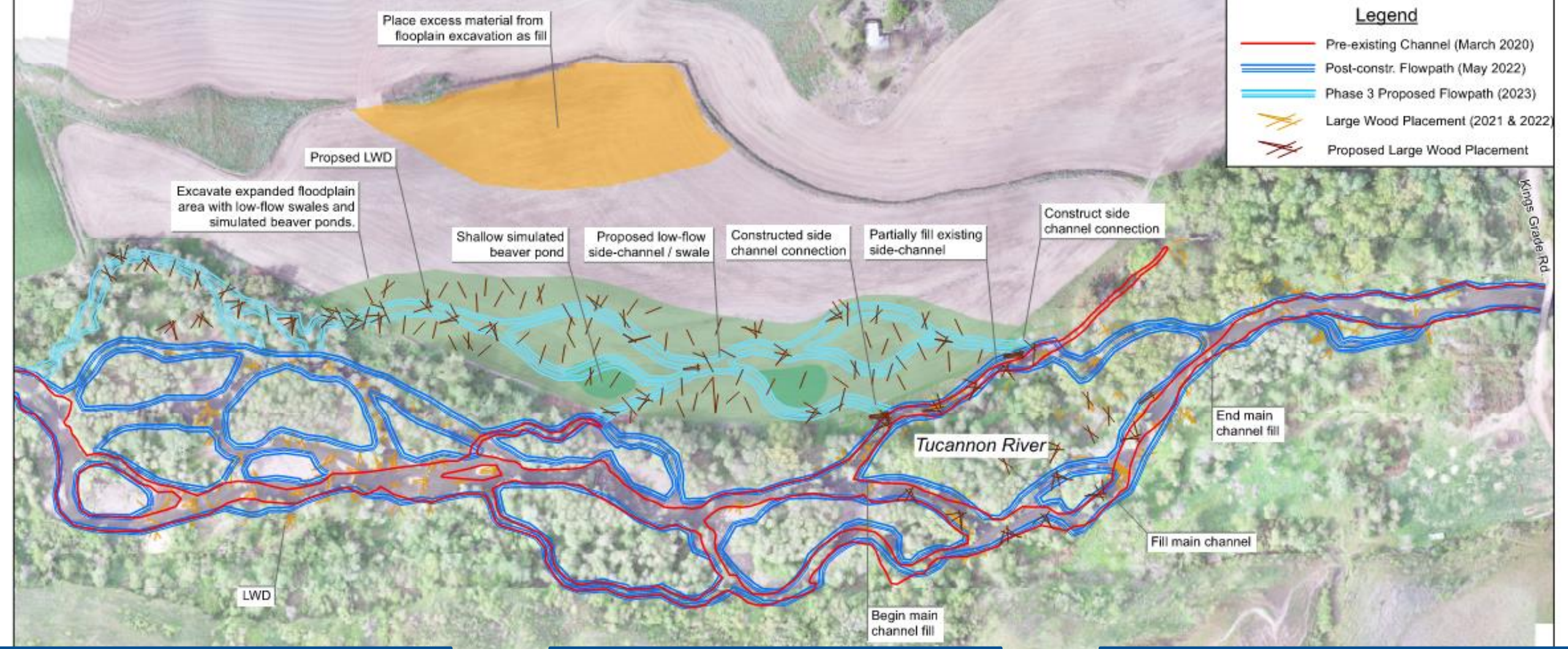
Flow Event	Change in Mean Velocity (%)*	Change in Max Velocity (%)*
Winter Base Flow	-5%	-2%
Q2	-3	0%
Q10	**-2%**	**+1%**

Post-project change in 10-year velocities



Pre-project

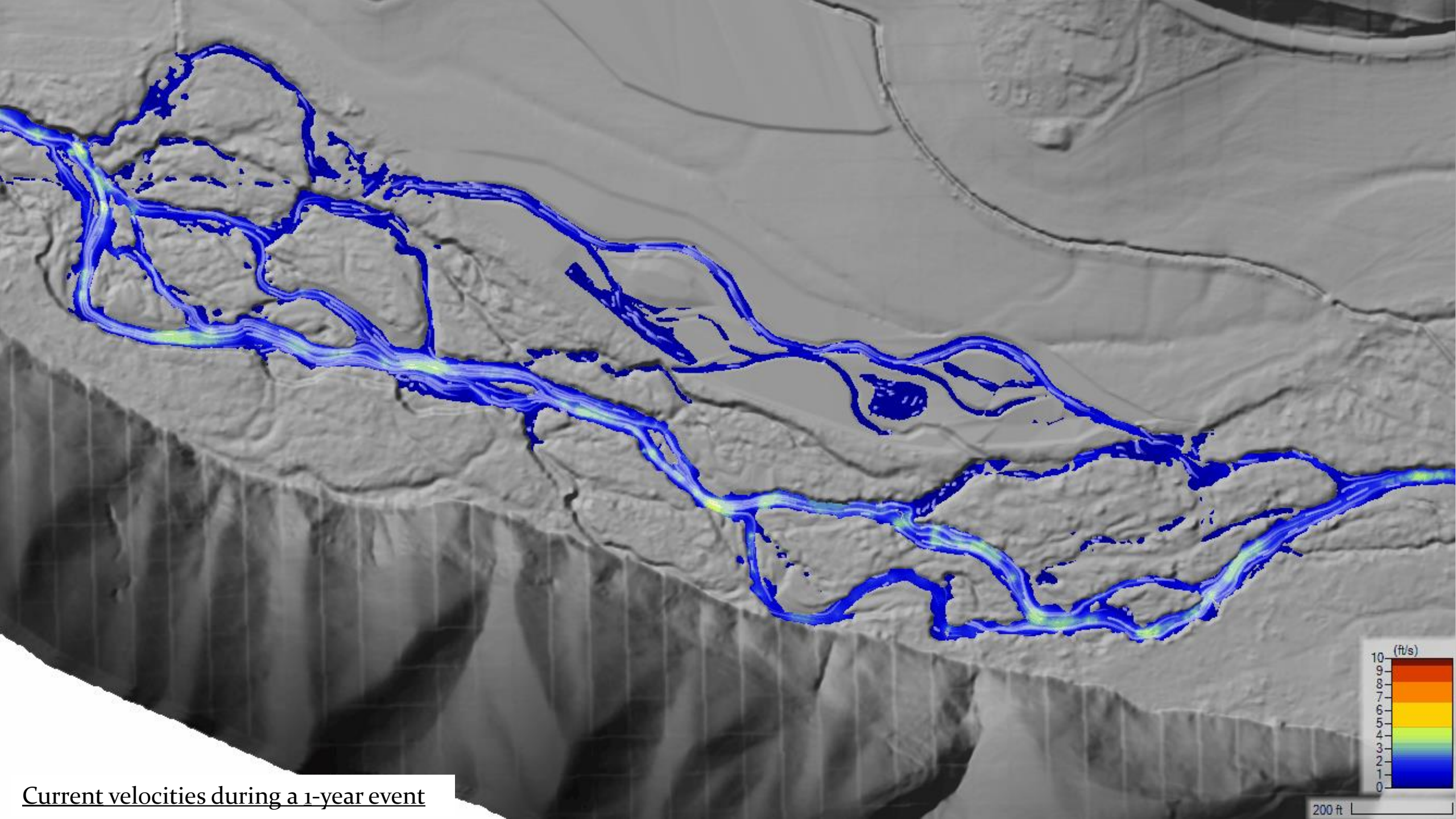
- 107 LWD (>6m long & 0.3m dia.)
- 43 pools (#)
- 1,956 (m^2) pool area
- 474 m perennial side channel
- 669 m of high flow channels
- 1.51 km main channel length

Post-project in-channel work

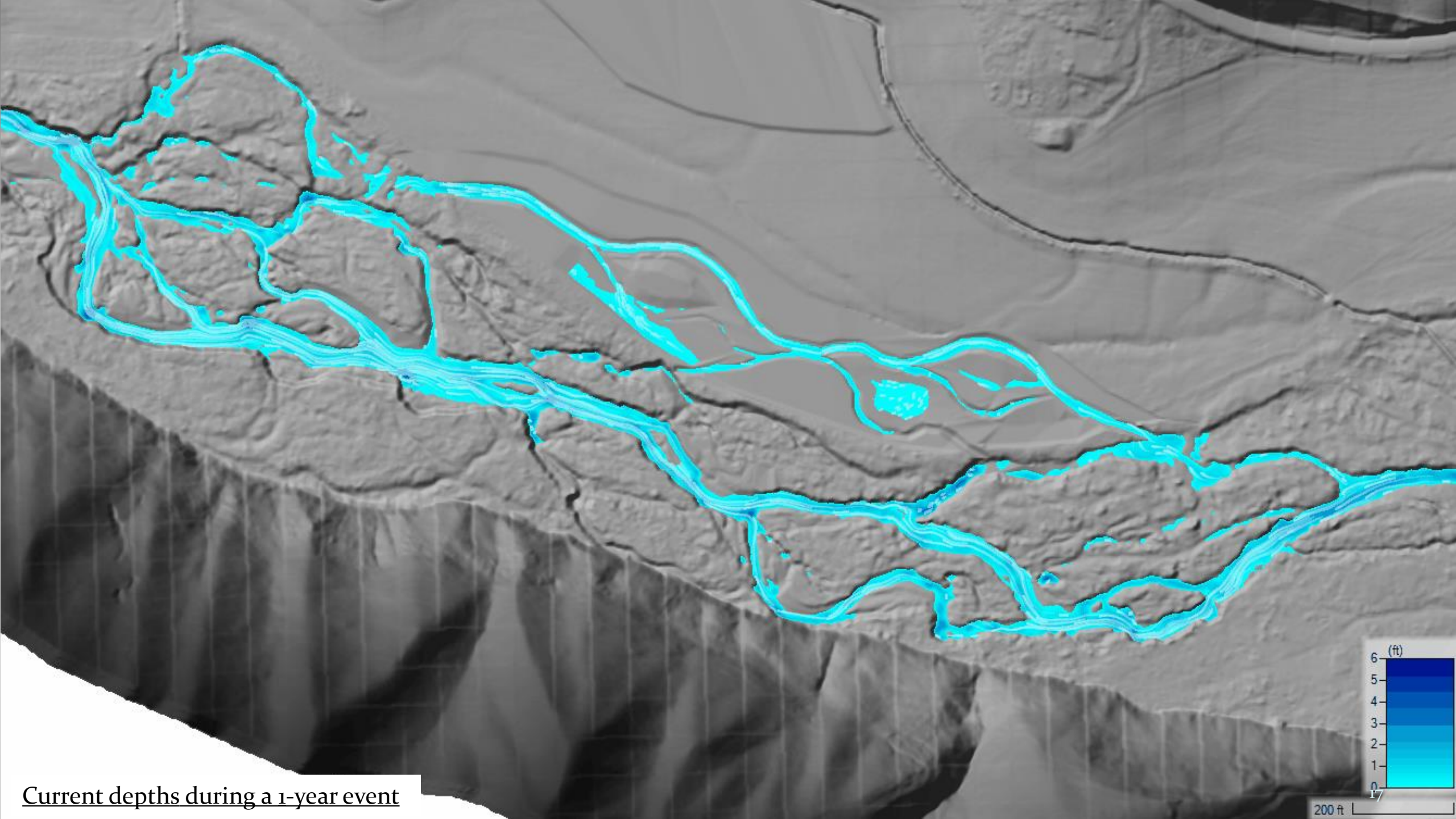
- 911 LWD (>6m long & 0.3m dia.)
- 81 pools (#)
- 5,730 (m^2) pool area
- 2,231 m perennial side channel
- 2410 m of high flow channels
- 1.65 km main channel length

Post-project floodplain work

- 226 LWD (>6m long & 0.3m dia.)
- 745 m perennial side channel
- 6.9 Acres of enhanced floodplain
- 7.1 Acres of passively created wetland

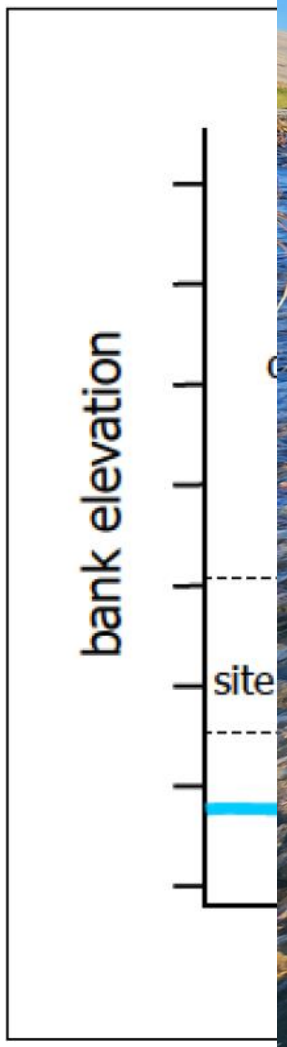


Current velocities during a 1-year event



Current depths during a 1-year event

So,



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oot growth

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is looking

floodplain

Cottonwoods sprouting at PA 27/28 after the first winter. Peak flow was 308 cfs last year (~ 1.2-year return)!

24 (RRNW)

Tucannon Implementers Workgroup

Species recovery is only possible through the planning, coordination and implementation by all Tucannon partners.

Tucannon Landowners

Snake River Salmon Recovery

Nez Perce Fisheries

Confederated Tribes of the Umatilla Indian Reservation

Bonneville Power Administration

Washington State Recreation and Conservation Office

Columbia Conservation District

Forest Service U.S. Department of Agriculture

Washington Department of Fish and Wildlife

Thanks

Floodplain connectivity on PA 27/28 completed in 2022

Moment of Zen

Salmon returning to the Upper Klamath Watershed!