

# River-wetland corridor impacts and changes

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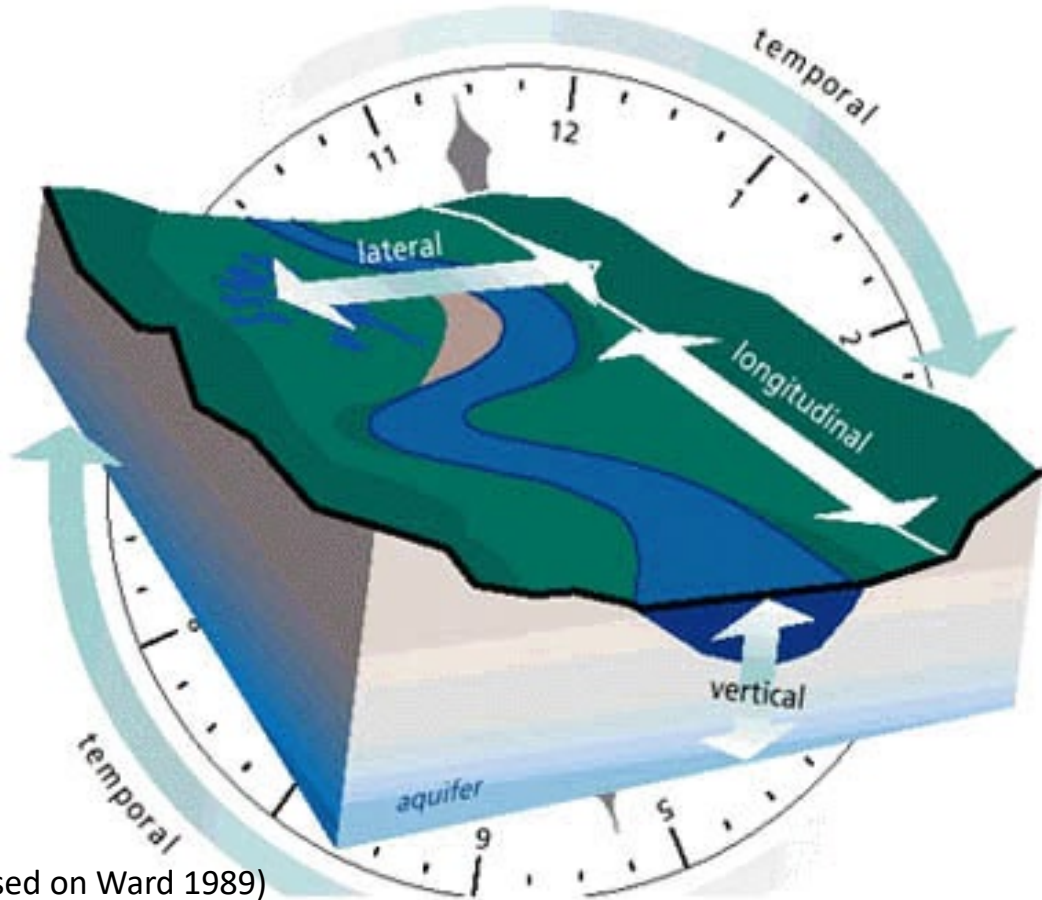
Kalispel Tribe Natural Resources Department



# Objectives

- Focus on changes to the “geomorphic template”, not on flow or temperature changes
- Provide an overview of how land disturbance affects the geomorphology of river-wetland corridors
- Provide regional context for the Priest River

# The four dimensions of rivers



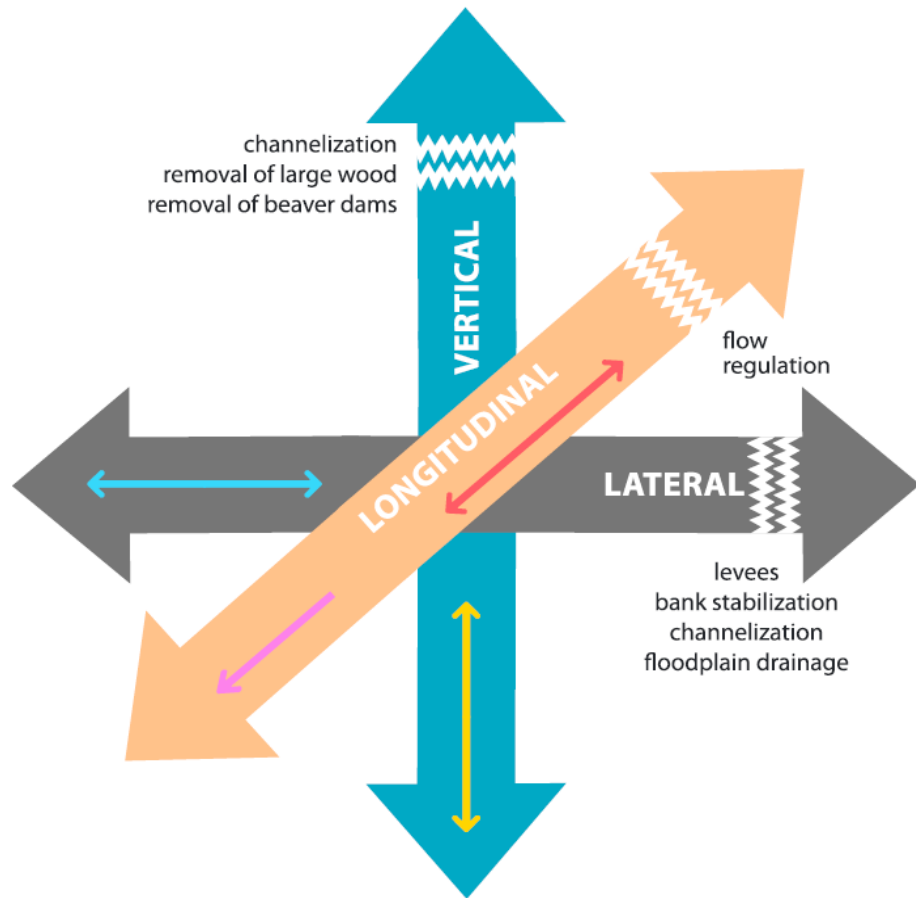
(EPA based on Ward 1989)

# River-Wetland Corridors

(Powers et al. 2022)



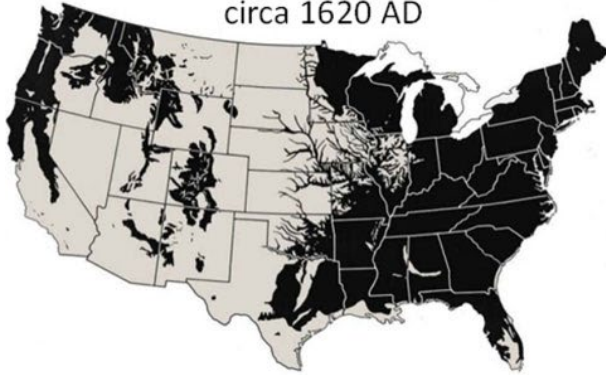
- Water, Sediment, Wood, Solute, Animals
- Water, Sediment, Wood, Solutes
- Animals
- Water, Solutes, Animals



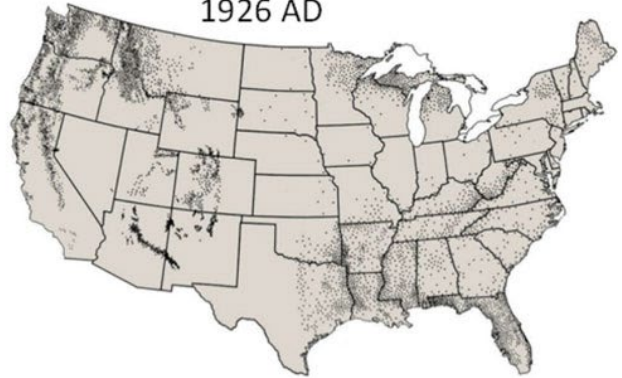
(Wohl et al. 2019)

# Changes in virgin forest cover within the continental United States

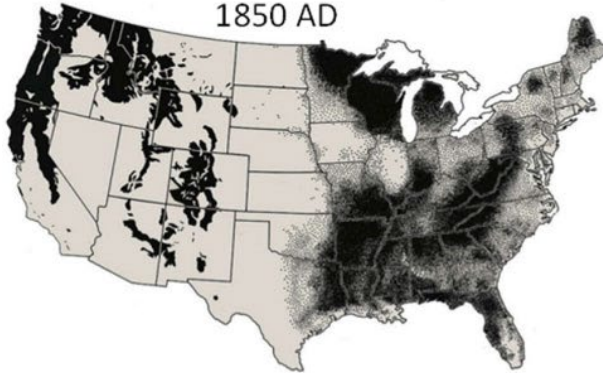
circa 1620 AD



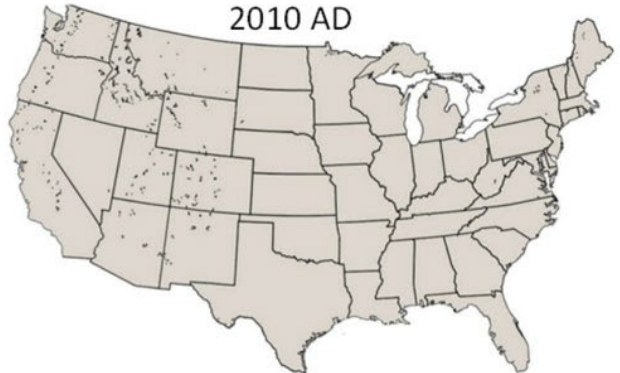
1926 AD



1850 AD

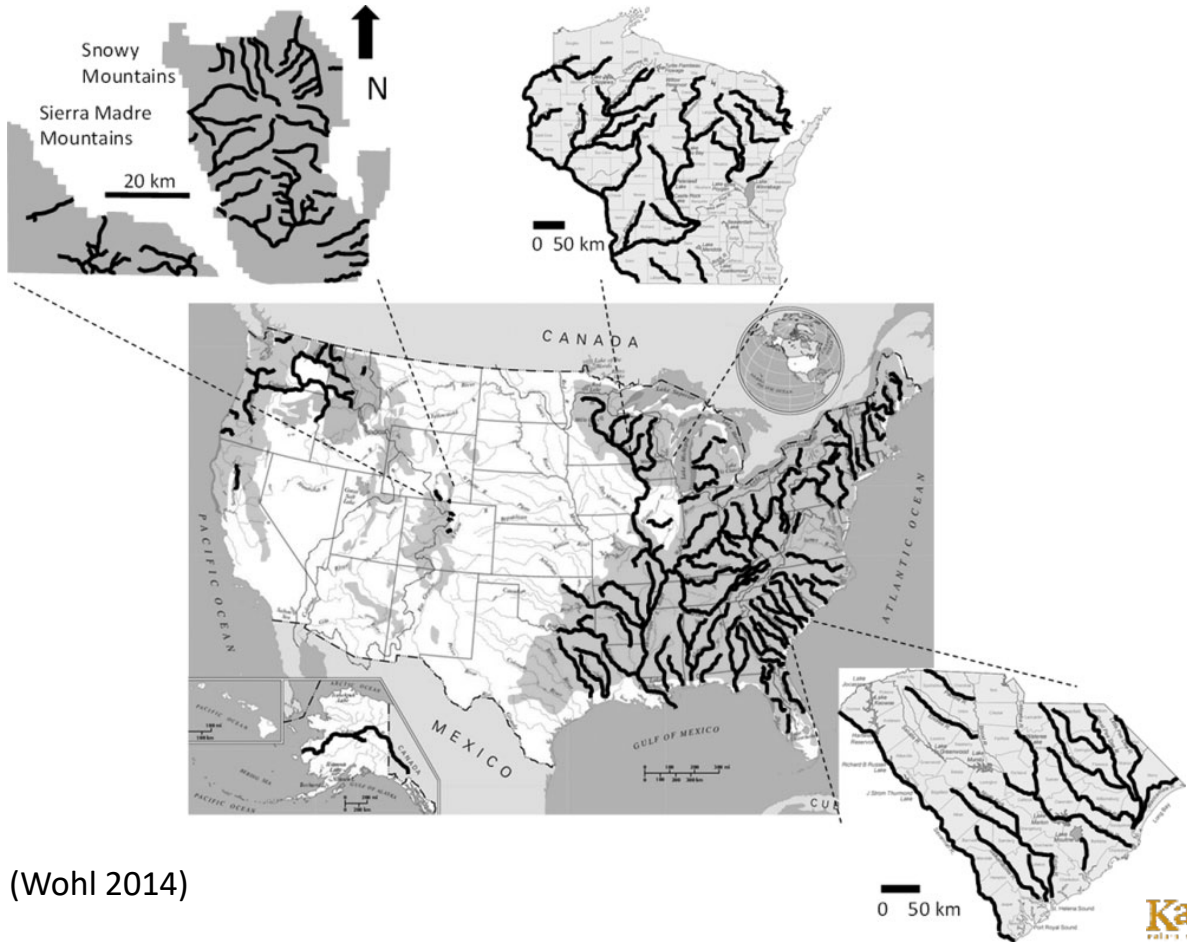


2010 AD



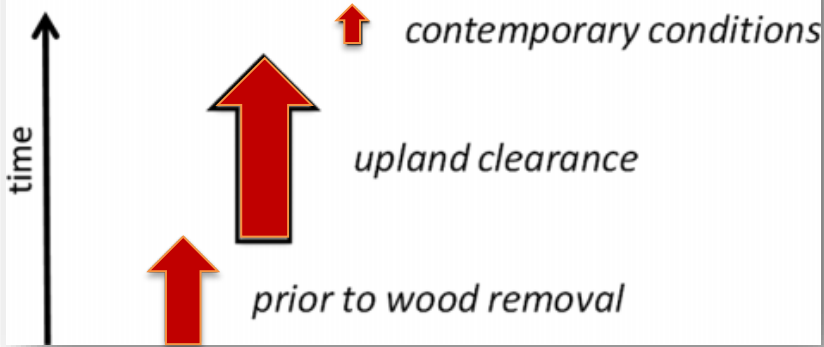
(Wohl 2014)

# Historical timber rafting routes

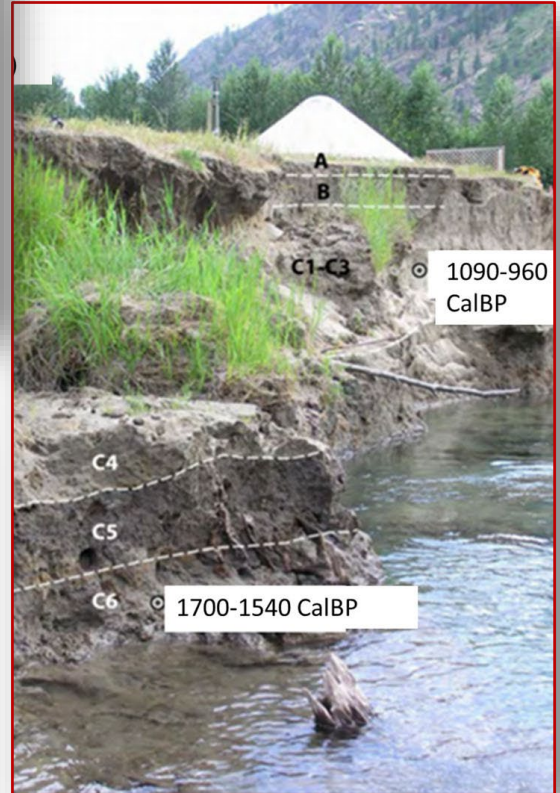


(Wohl 2014)

# Relative floodplain aggradation rate



(Wohl 2014)



(Powers et al. 2022)

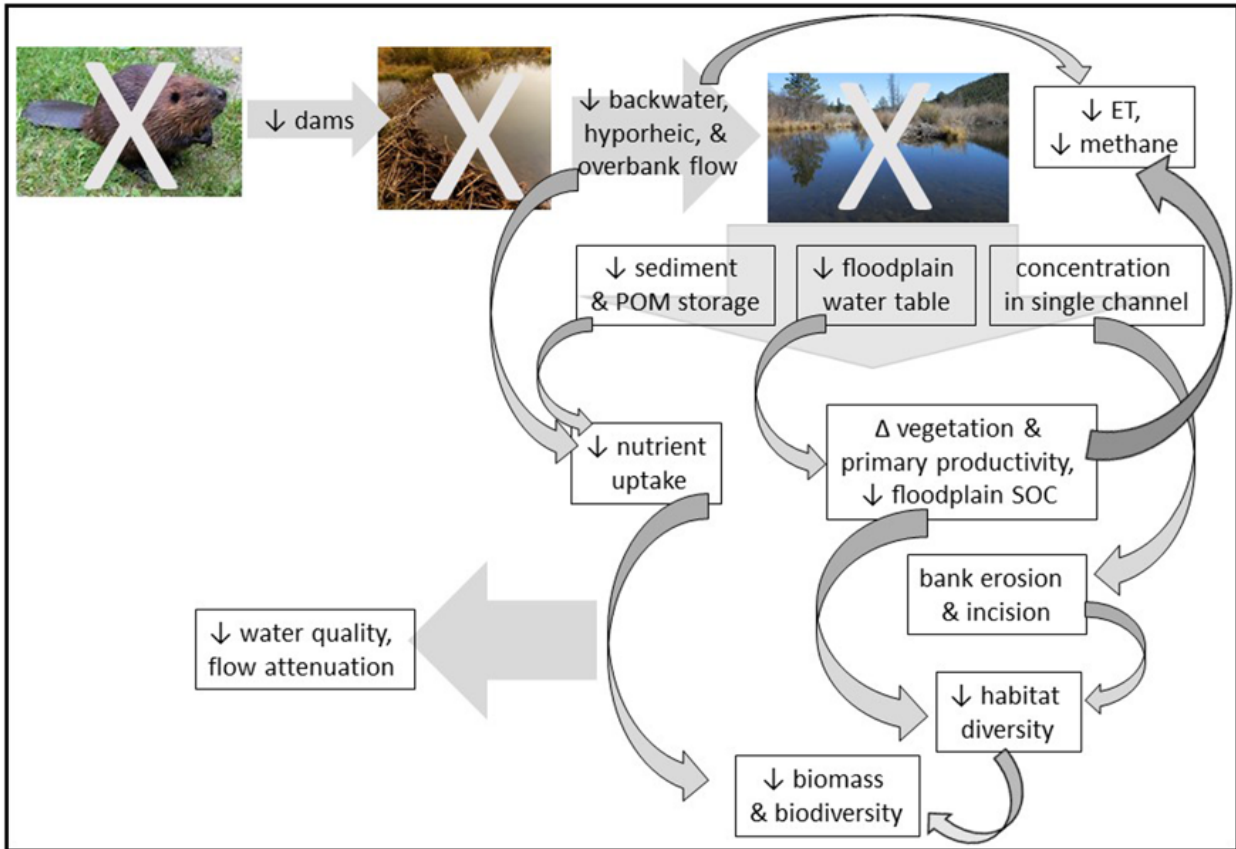


# North American beaver distribution



(Baker and Hill 2003)

# Effects of loss of beaver

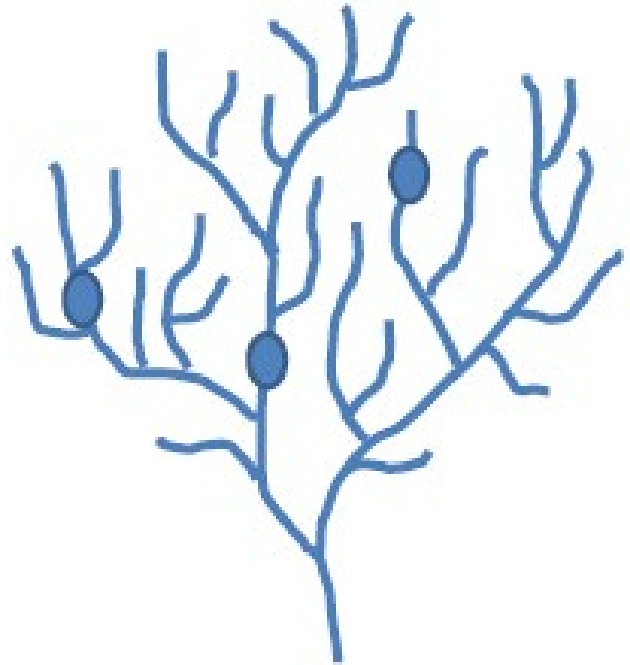


(Wohl 2021)

## Pre-settlement



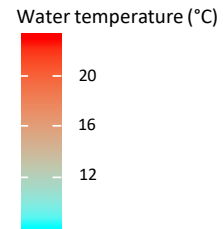
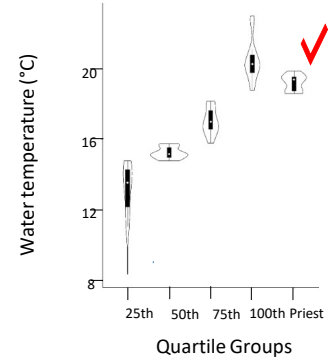
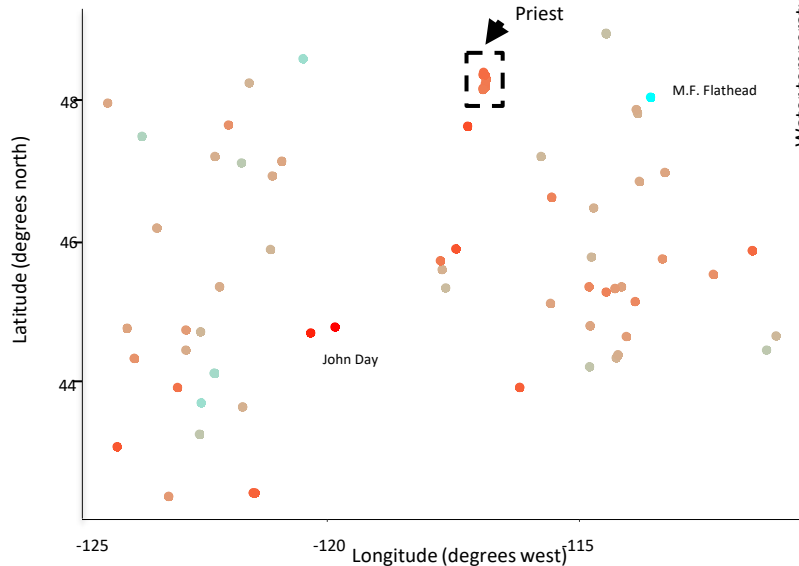
## Today



(Wohl et al. 2017)

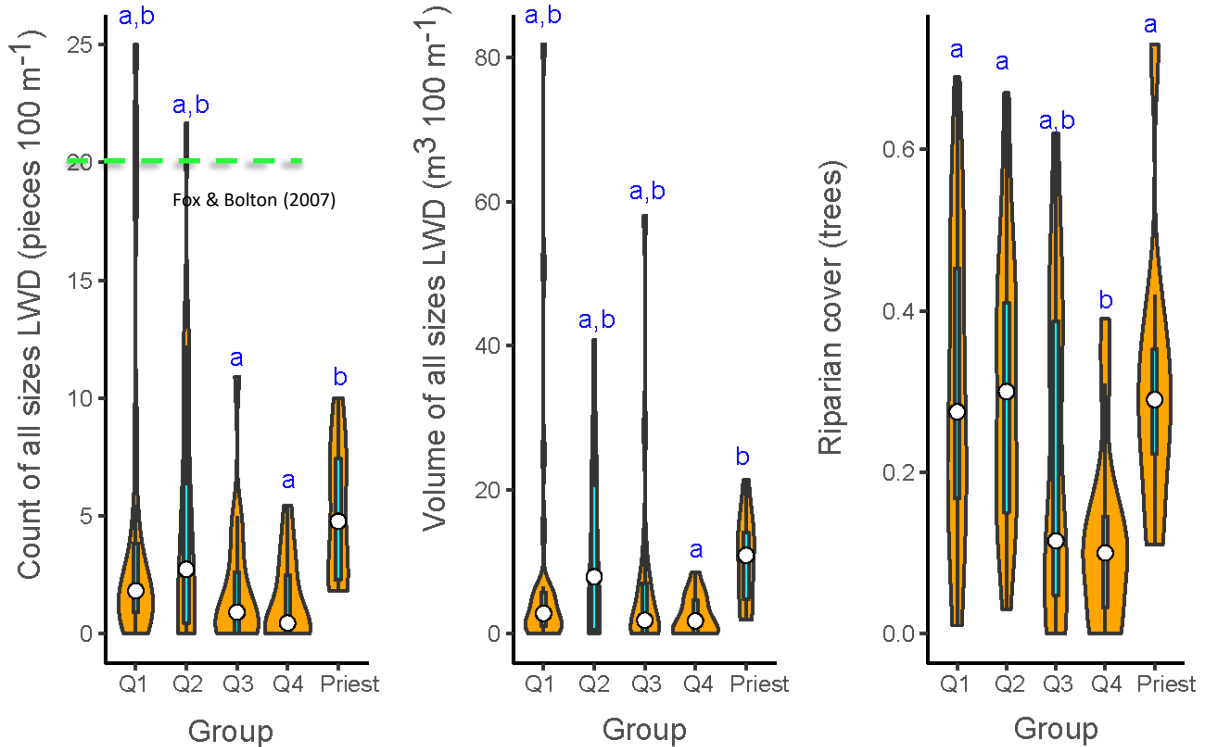
# How does the Priest River compare to other medium-sized rivers in the Pacific Northwest & Northern Rockies?

NorWeST data; Isaak et al. 2017



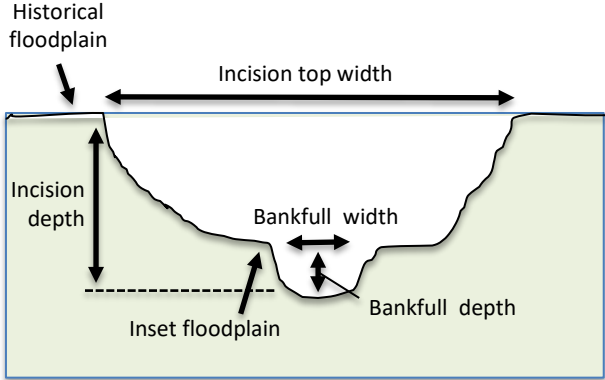
(Mejia et al. 2021)

# Instream & riparian cover



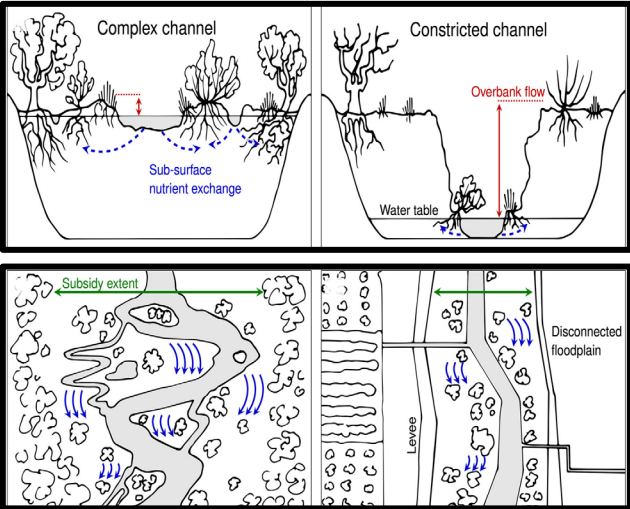
(Mejia et al. 2021)

# Incised channel with inset floodplain & bankfull channel



(Beechie et al. 2008)

# Floodplain disconnection & its impact

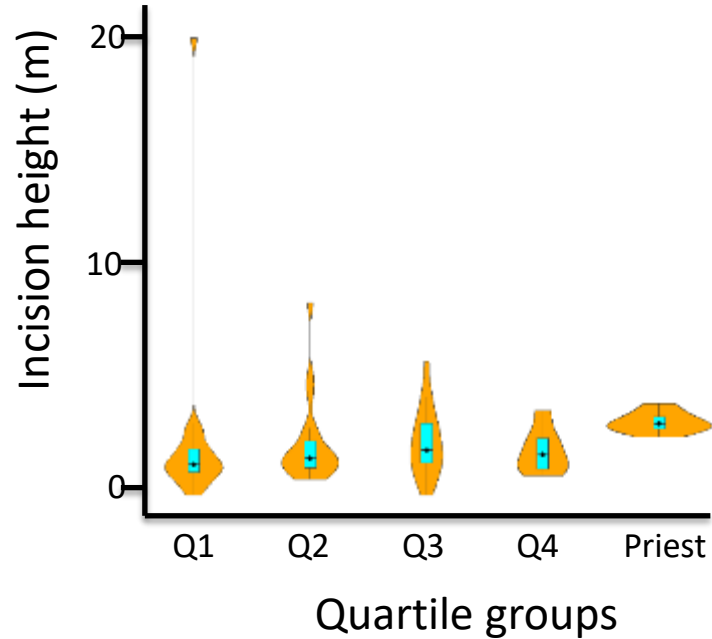


(Schindler and Smits 2017)

# Incision height of medium-sized rivers in the Pacific Northwest

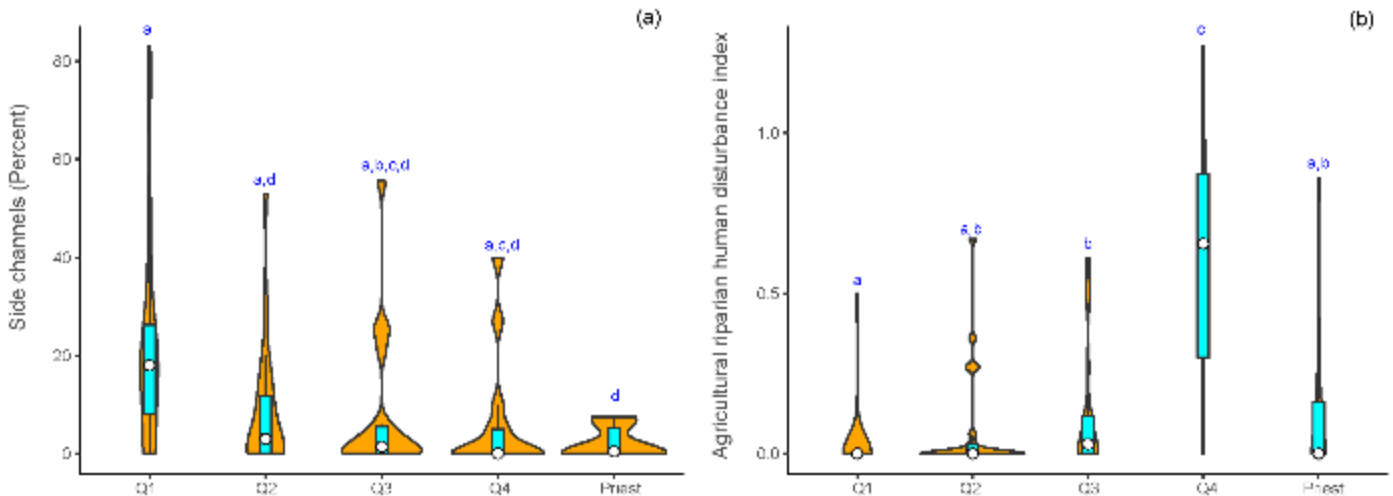


Photo credits: University of Idaho Library



(Mejia et al. 2021)

# Greater channel planform complexity increases lateral & vertical connectivity & enhances surface water & groundwater exchange



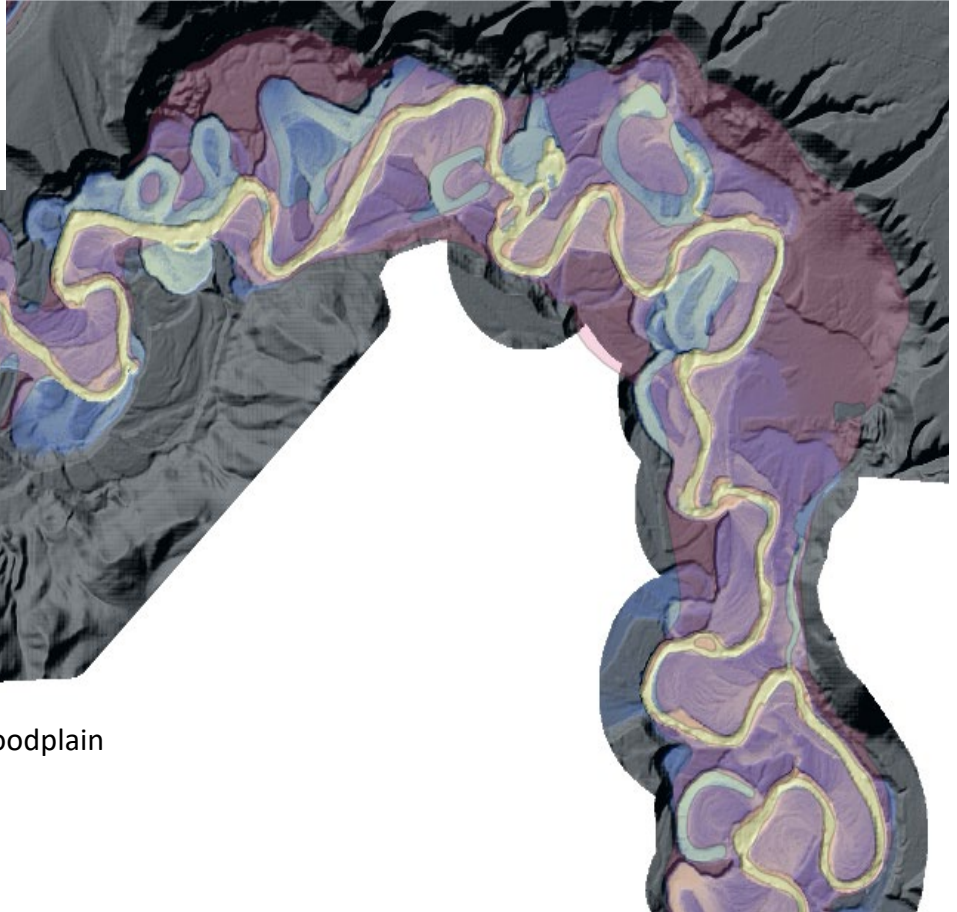
(Mejia et al. 2021)





# River has become less complex

- Narrower corridor
- Less surface area
- Less exchange of materials



Current geomorphic floodplain

Alluvial deposits