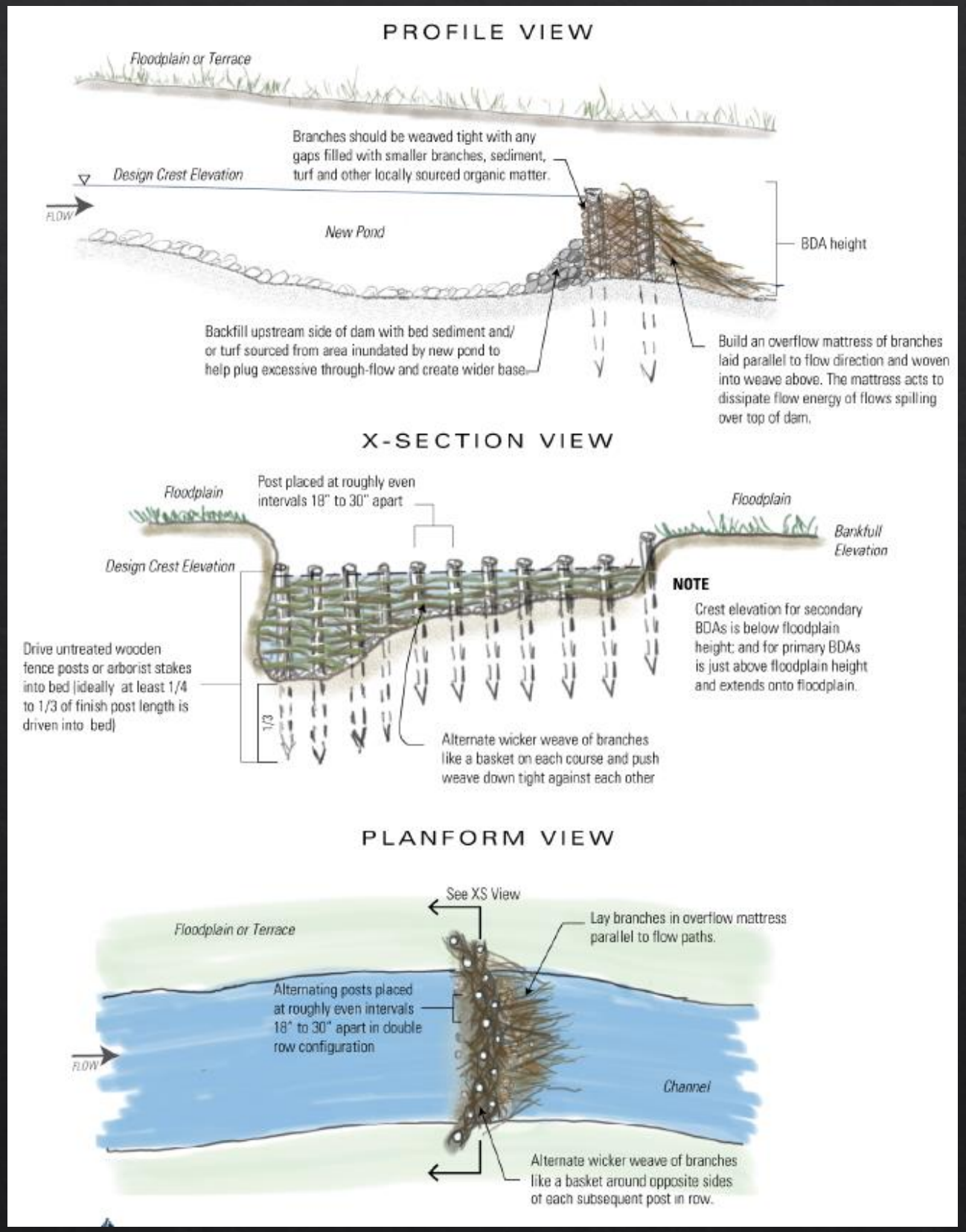
Incorporating Data into Project Siting – Beaver Dam Analogue Case Study

Lead Organizations: Wild Fish Conservancy and WDFW

Partners: Beavers Northwest, Ducks Unlimited, Jorgensen Timber Green Diamond, Weyerhaeuser Company, Port Blakely

Supporting Organizations: Grays Harbor CD, Lewis CD, Thurston CD

Reed Ojala-Barbour, WDFW
Jamie Glasgow, WFC



Shahverdian et al. 2019

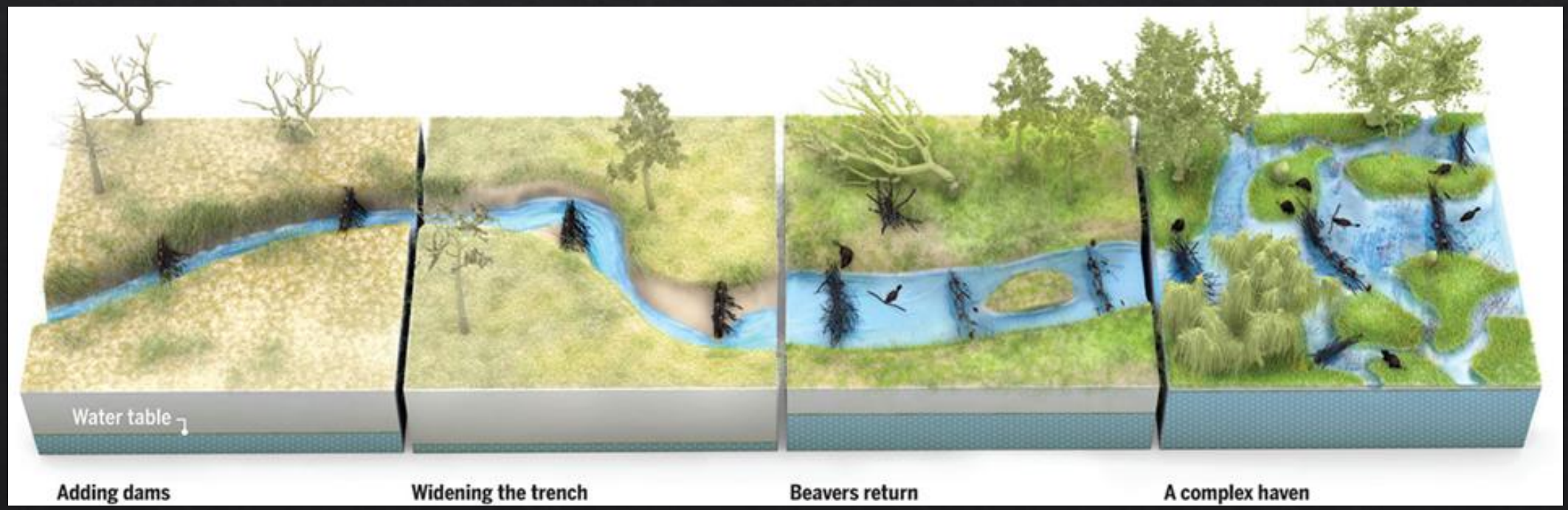


USFS 2021

BDAs as Process-based Restoration

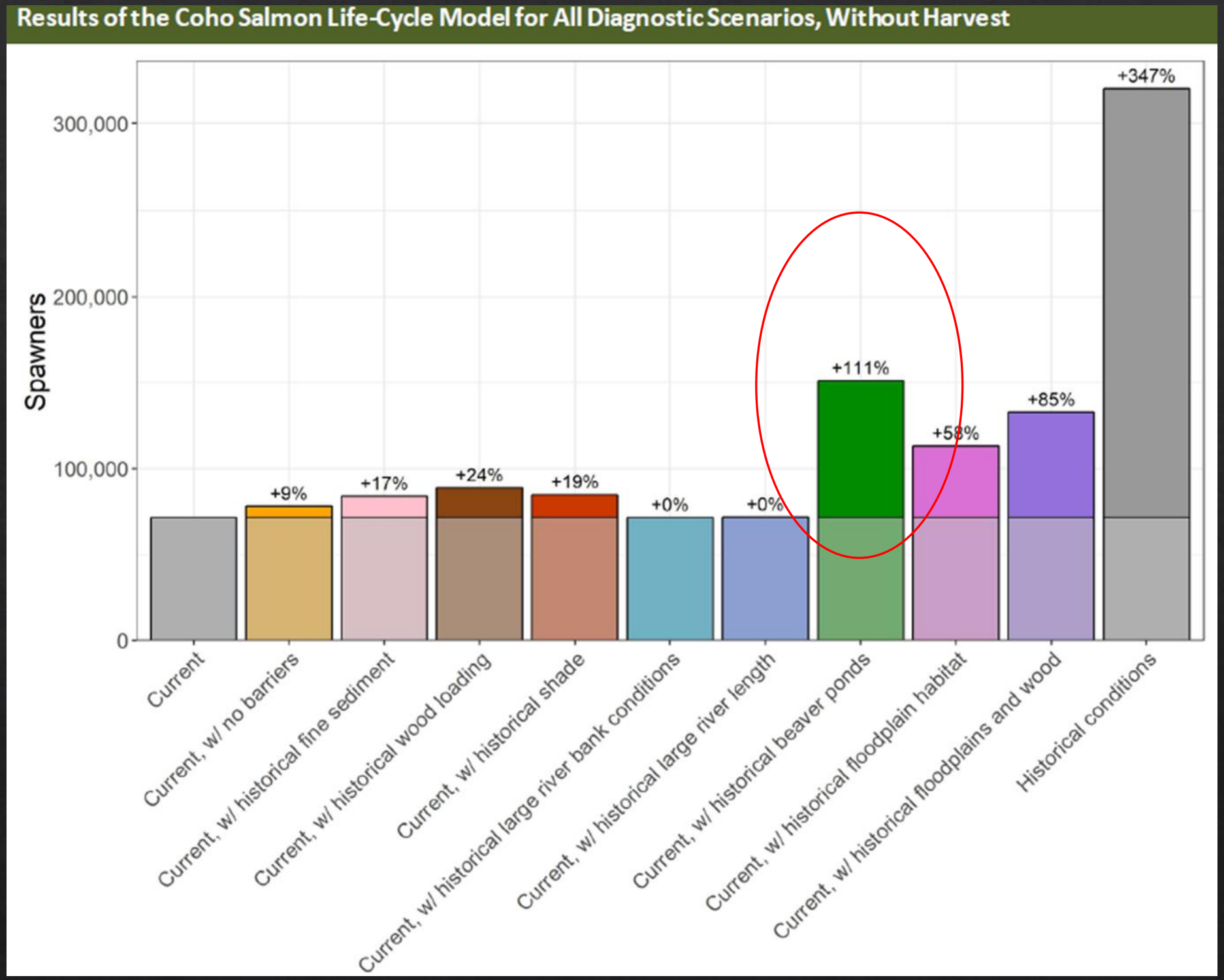
BDAs can enhance and restore a suite of aquatic functions:

- create wetland habitat;
- promote river-floodplain connectivity;
- retain sediment;
- enhance aquatic productivity;
- increase thermal complexity;
- improve water storage and groundwater recharge.



Adapted from Goldfarb, 2018

Beaver and Coho



ASRP 2019, Appendix C

Goals and Objectives

1) Restore beaver habitat and associated processes

2) Develop decision support tools to assist practitioners in siting and installing BDAs.

3) Evaluate effectiveness of BDAs



Site Selection Process

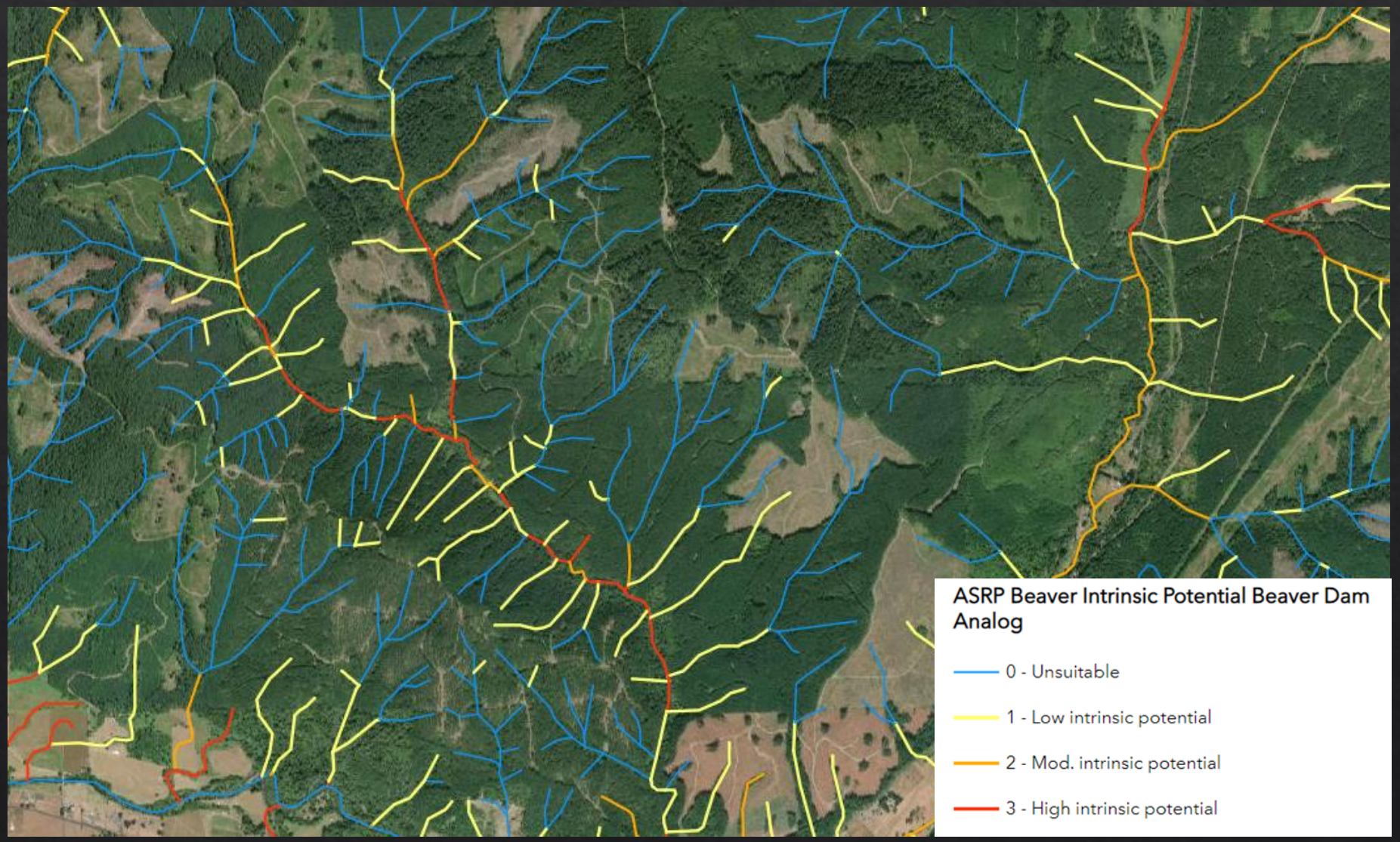
GIS Screening → Landowner Dialogue → Field Assessment

Design and Build

Design and Permit → Field-fit from Typical

Beaver Intrinsic Potential Model

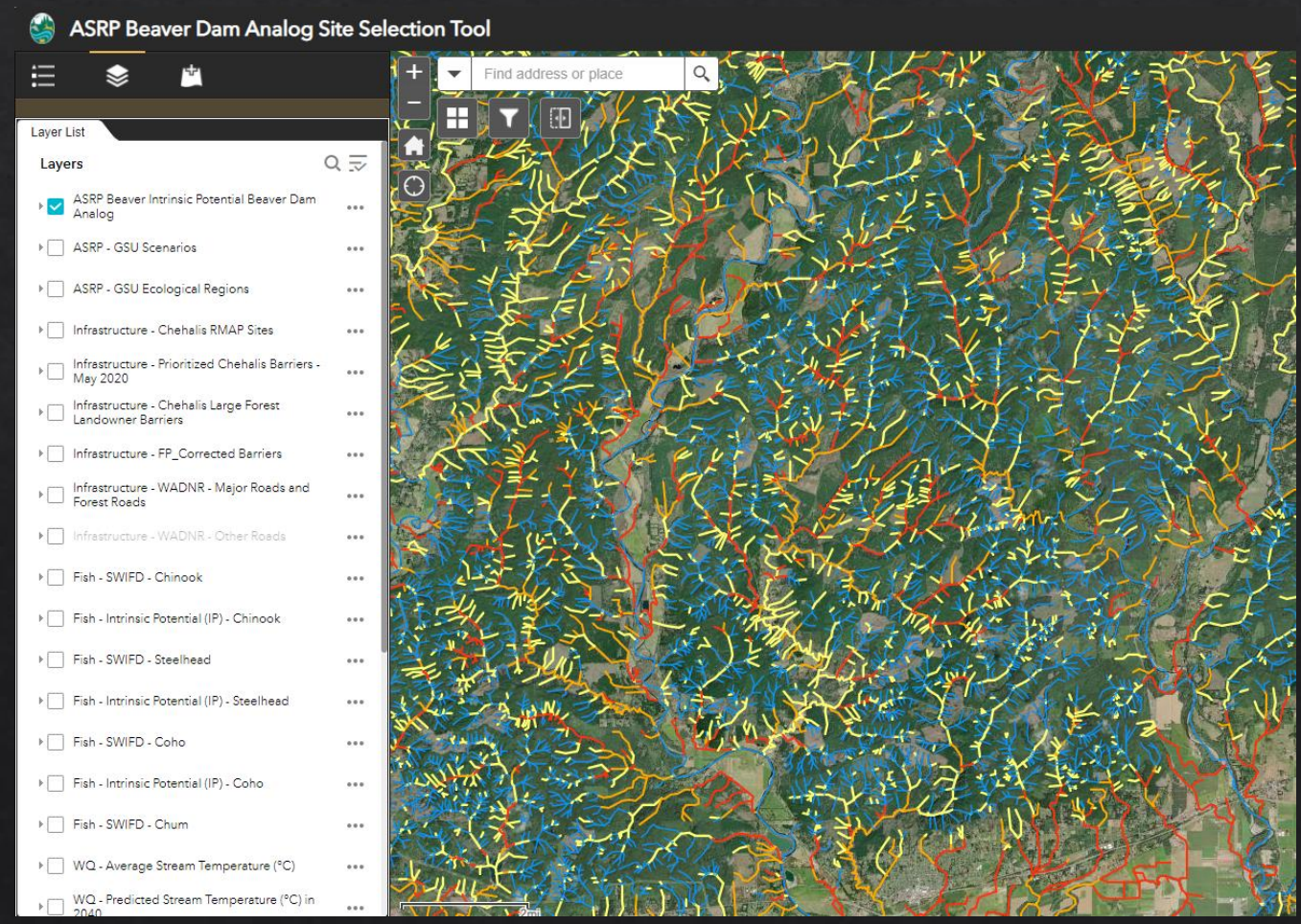
- Landscape's potential to support beaver dams
- Includes channel gradient, bankfull width, and valley width



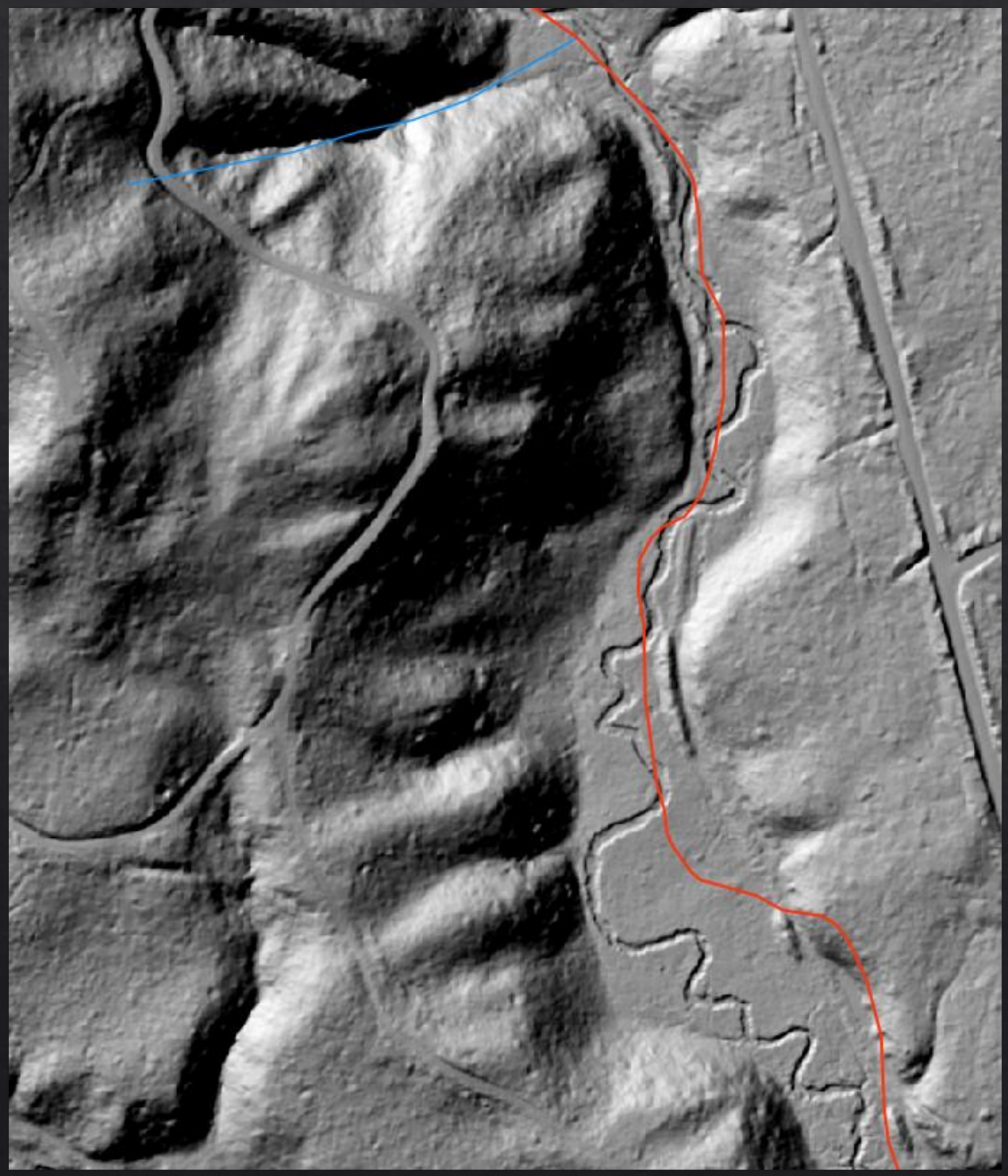
***Dittbrenner B.J.**, Pollock M.M., Schilling J.W., Olden J.D., Lawler J.J., Torgersen C.E. 2018. Modeling intrinsic potential for beaver (Castor canadensis) habitat to inform restoration and climate change adaptation. PLoS ONE 13(2): e0192538.*

Screening Tool – Web Map

- Beaver Intrinsic Potential (BIP model)
- Aquatic Resources and Other Considerations
  - ASRP Geo-Spatial Units
  - Fish Distribution - SWIFD and Intrinsic Potential
  - Ecology 303d Water Quality List
  - Wetlands
  - Public Lands
  - Chehalis Thermalscape
- Permitting
  - FEMA Floodplain
  - Shoreline Management Act
- Risk
  - Roads
  - Culverts
  - Landcover (development)



LiDAR Hillshade



BIP model is based on National Hydrography Dataset (NHD)

LiDAR provides additional information:

- Valley Width
- Channel Morphology
- Infrastructure

Field Validation of Reach

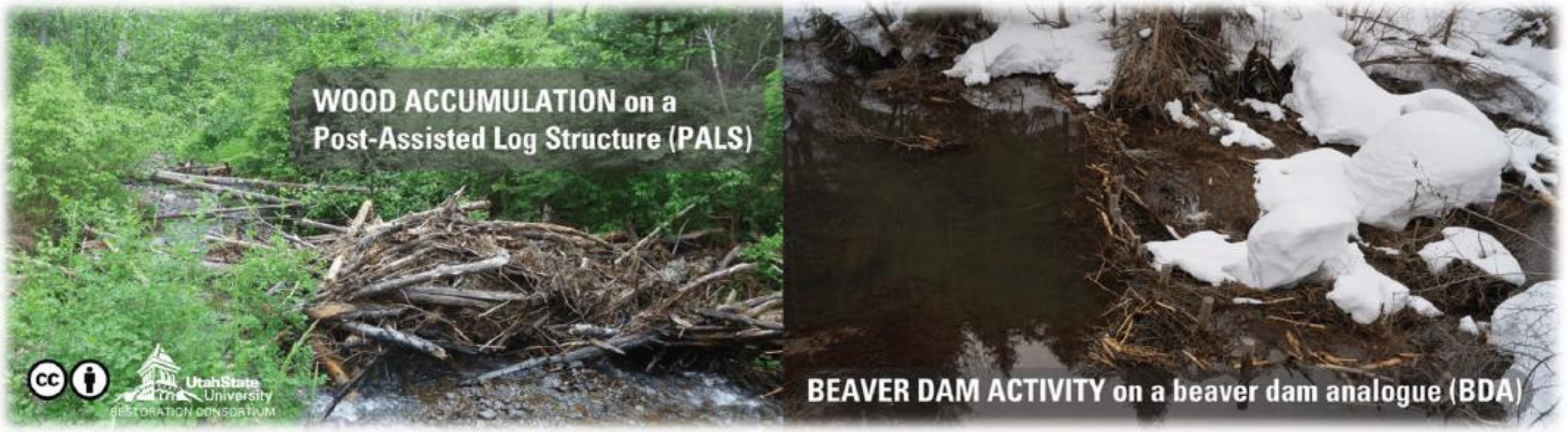
- Verify site conditions:
  - Channel incision
  - Plane-bed channels
- Potential for beaver colonization:
  - Beaver sign
  - Beaver forage
- Site visit with landowner to consider potential impacts

Structure Siting

- Riffle crests
- Side-channel habitat for reconnection
- Channel substrate
- Complements other structures
- Flexible implementation



Chapter 4 – MIMICKING & PROMOTING WOOD ACCUMULATION & BEAVER DAM ACTIVITY WITH POST-ASSISTED LOG STRUCTURES & BEAVER DAM ANALOGUES



Prepared by:

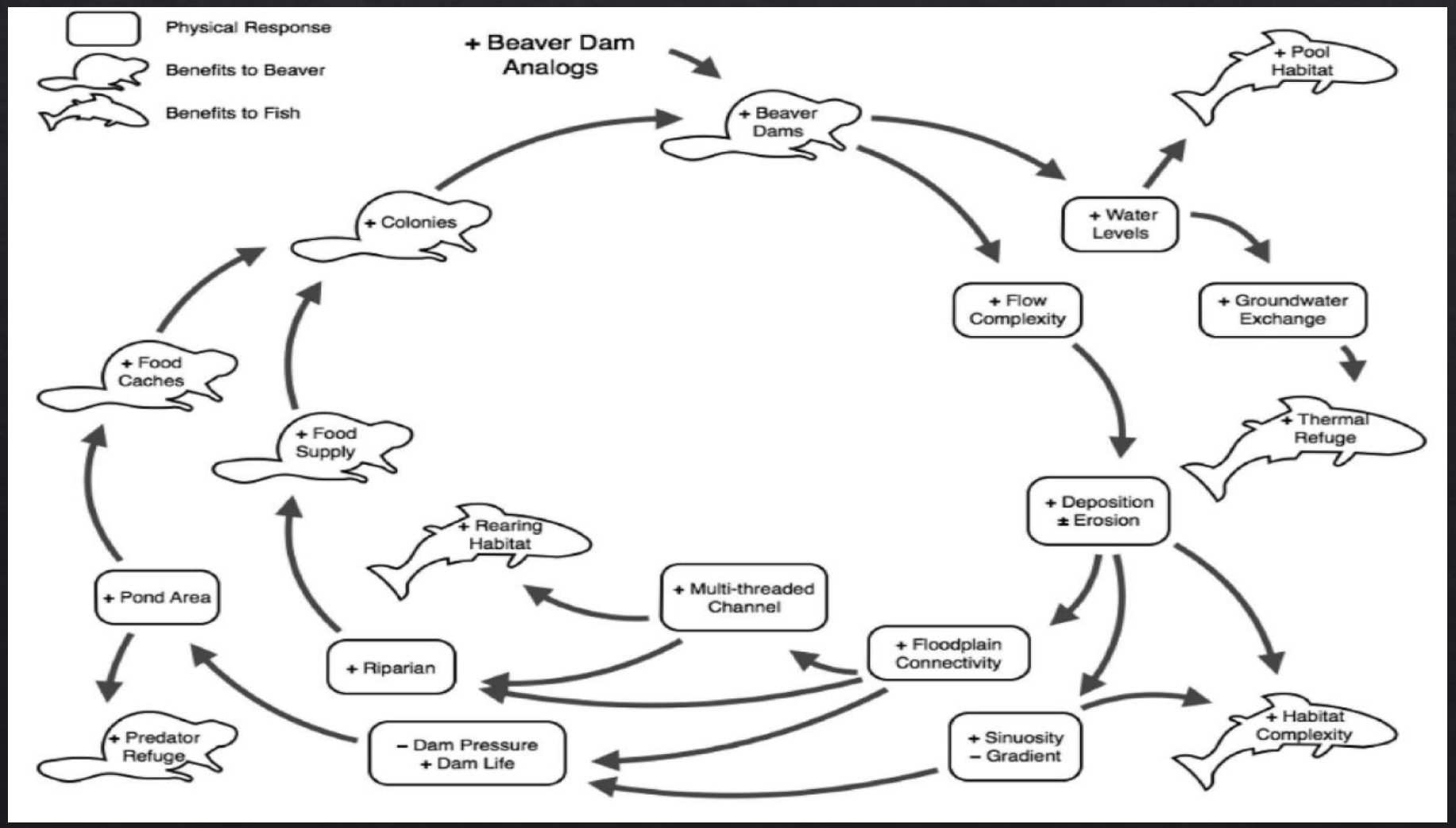
Scott M. Shahverdian, Joseph M. Wheaton, Stephen N. Bennett, Nicolaas Bouwes, Reid Camp, Christopher E. Jordan, Elijah Portugal, and Nicholas Weber

In: J.M. Wheaton, S.N. Bennett, N. Bouwes, J.D. Maestas and S.M. Shahverdian (Editors), Low-Tech Process-Based Restoration of Riverscapes: Design Manual. Utah State University Restoration Consortium, Logan, Utah.

Effectiveness Monitoring

BDAs are an exciting and intuitive tool, but how well do they work?

- Before-After Control-Impact design (BACI)
- Evaluate parameters that inform effects of BDAs







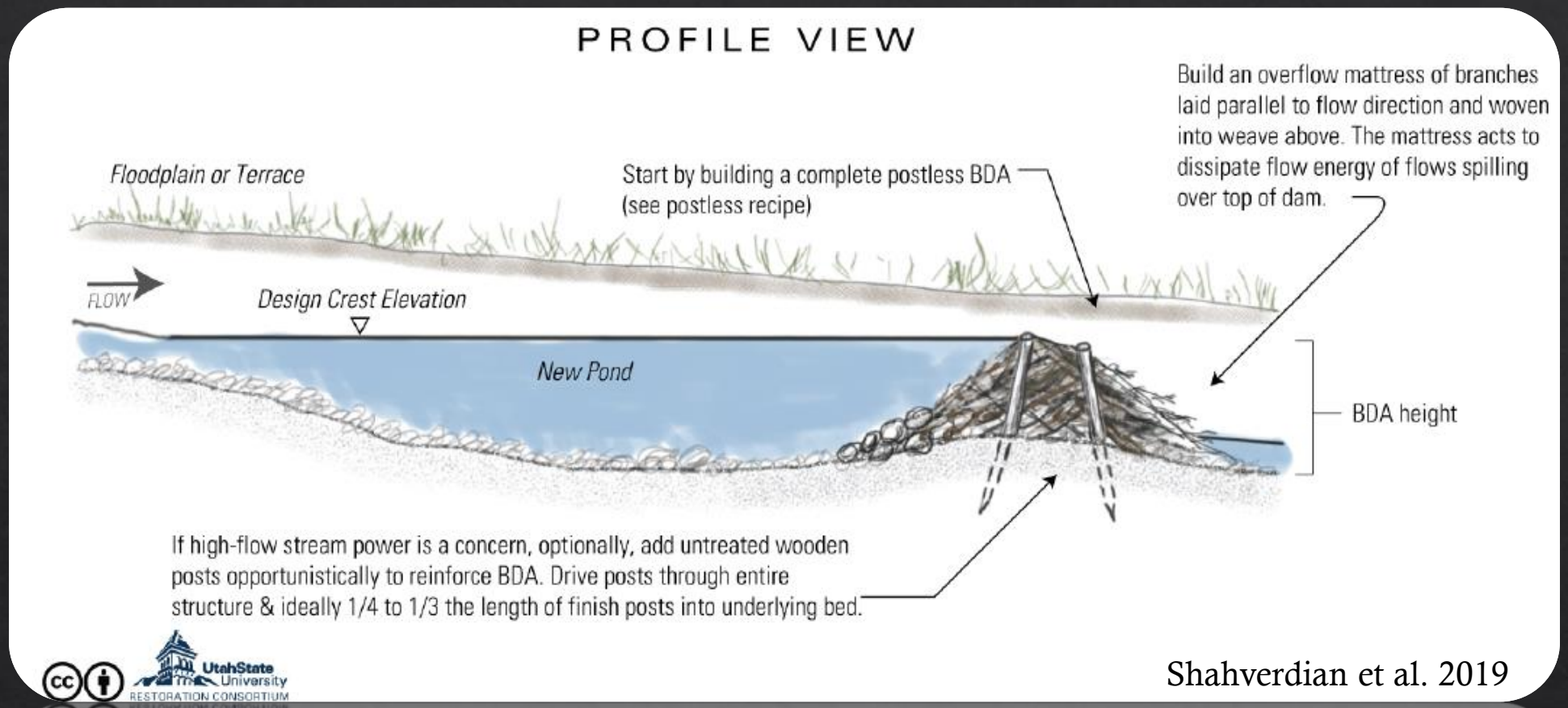
Shahverdian et al. 2019



Conclusions

- Data presented in ASRP highlights the potential benefit of BDAs as a restoration technique
- Spatial data is used as a screening tool coupled with field assessments to identify stream reaches for restoration
- Project Effectiveness monitoring will inform adaptative management and implementation of ASRP

Questions?



Shahverdian et al. 2019

https://geodataservices.wdfw.wa.gov/hp/chehalis-beaver-dam-analog/

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- Jamie@wildfishconservancy.org