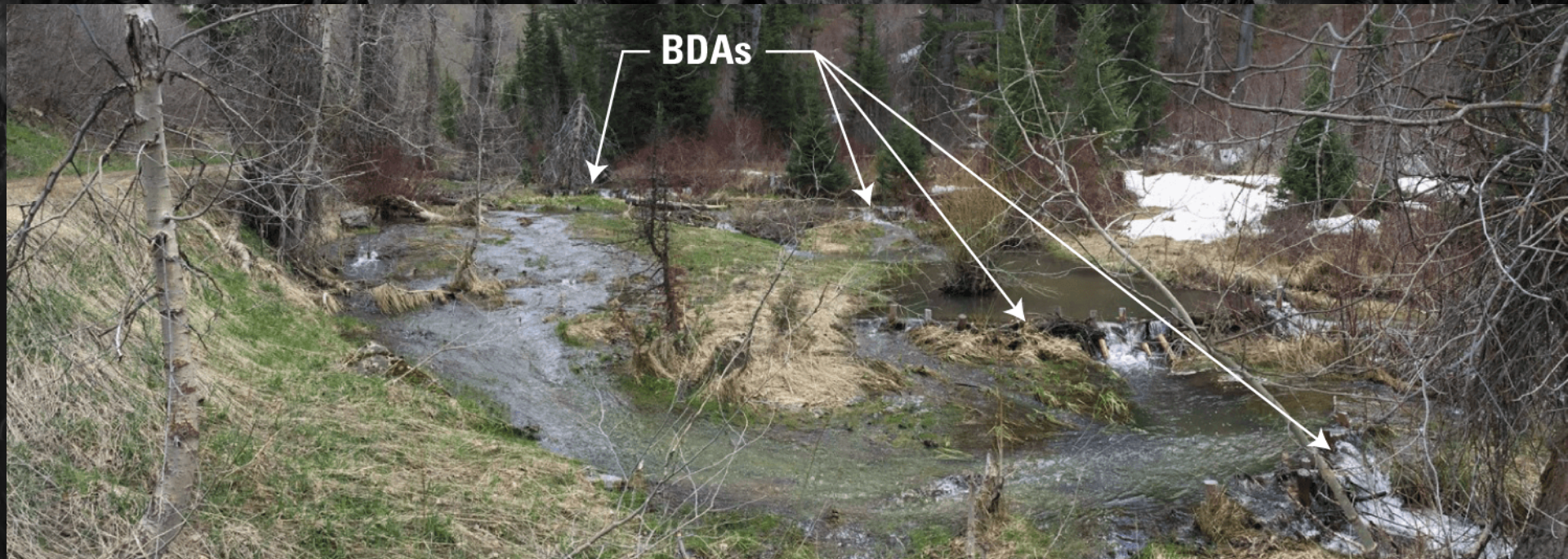


LTPBR WORKSHOP

LOW-TECH APPROACHES BEAVER DAM ANALOGUES



OUTLINE:



- I. Background of low-tech
- II. Low-Tech approaches to be aware of
- III. Low-Tech structures we will focus on
 - I. PALS
 - II. BDAs

From Shahverdian et al. (2019) – Chapter 1 & 4 of LTPBR Manual

DOI: [10.13140/RG.2.2.14138.03529](https://doi.org/10.13140/RG.2.2.14138.03529) DOI: [10.13140/RG.2.2.22526.64324](https://doi.org/10.13140/RG.2.2.22526.64324)

Mimic → **Promote** → **Sustain**



Beaver dams
Beaver Dam Activity



Wood
accumulations

PALS and BDAs



P A L S

POST-ASSISTED LOG STRUCTURES

- PALS are handbuilt structures that mimic and promote the processes of **wood accumulation**.
- Woody material of various sizes pinned together with untreated wooden posts driven into the substrate.



B D A s

BEAVER DAM ANALOGUES

- BDAs are handbuilt structures that mimic and promote the processes of **beaver dam activity**.
- BDAs are a permeable, channel-spanning structure with a constant crest elevation, constructed with a mixture of woody debris and fill material to promote temporary ponding of water.



From Page 23 of Pocket Guide; Wheaton et al. (2019)

DOI: [10.13140/RG.2.2.28222.13123/1](https://doi.org/10.13140/RG.2.2.28222.13123/1)

BDAs: Different Shapes, Sizes, Materials



BDAs: Different Shapes, Sizes, Materials



Goals of mimicking beaver dam activity?



Ponds, floodplain connection, diversity of depths and flows (aka complexity)

How do we mimic beaver dam activity?



 Steve Bennett

pages 35-48 pocket guide

A Recent History of BDAs

From:



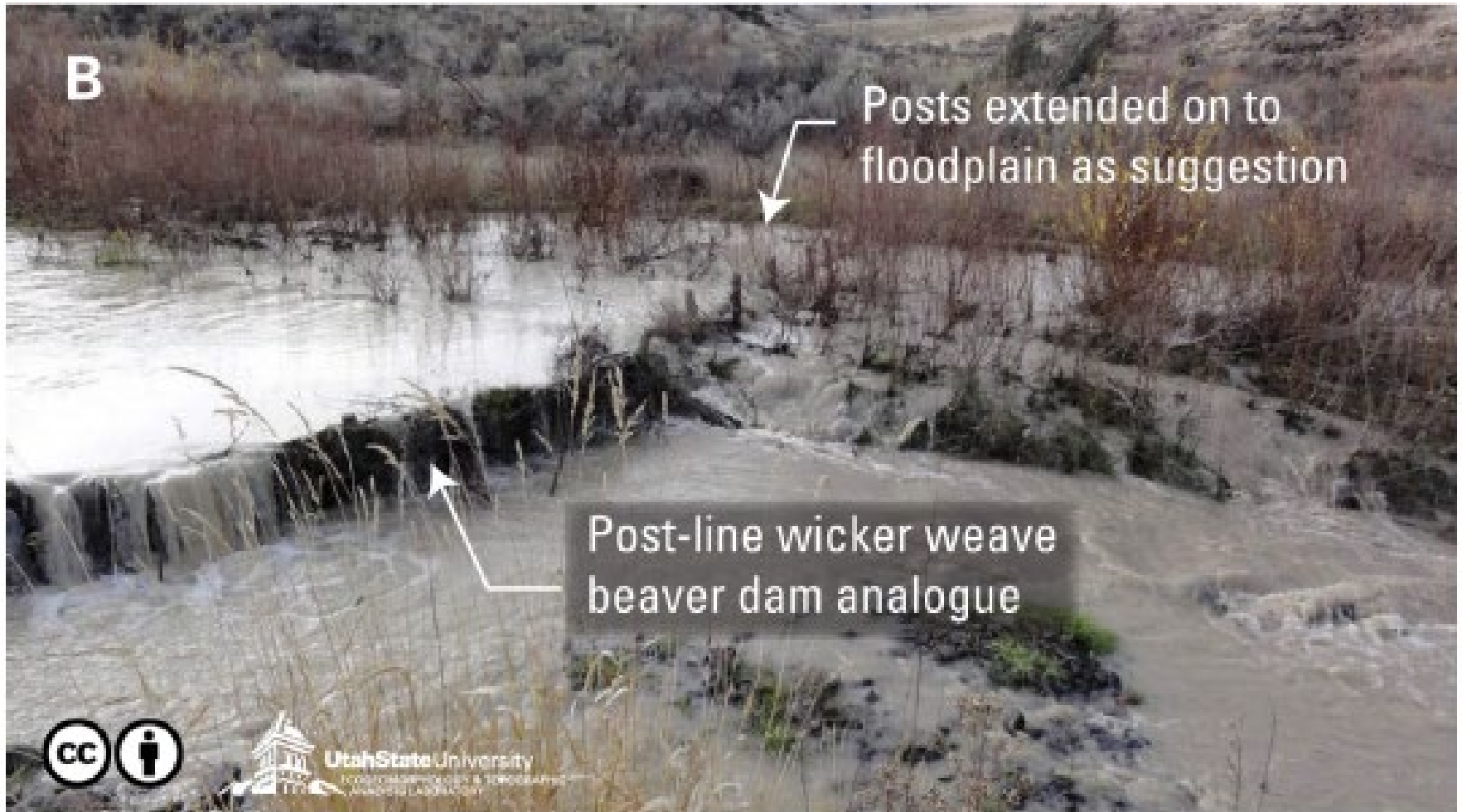
To:



Reinforced Natural Beaver Dams

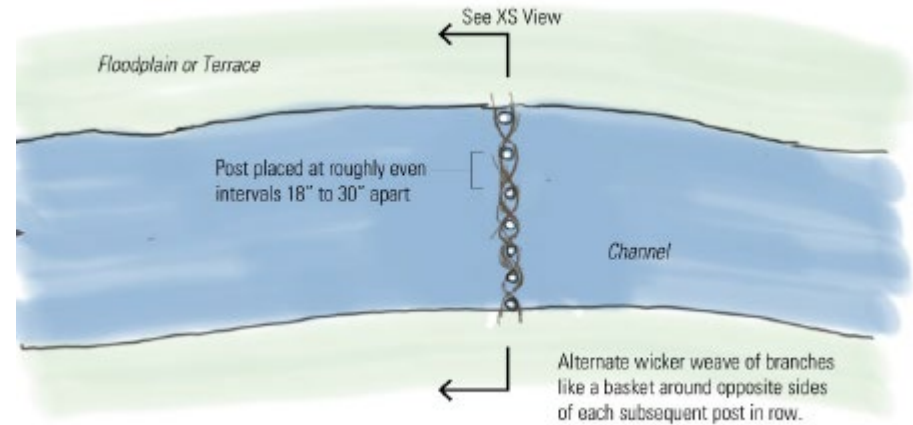


Post-Line Wicker Weave (BDA v.1)

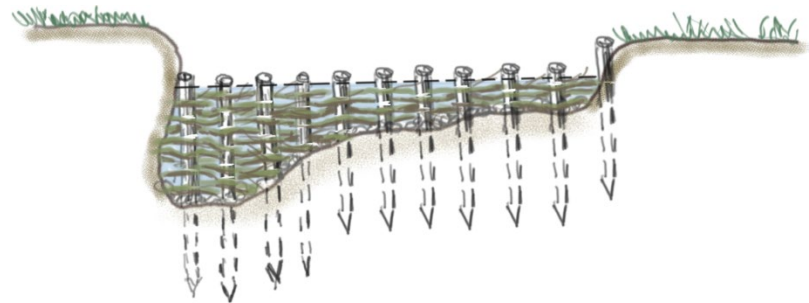


Post-Line Wicker Weave (BDA v.1)

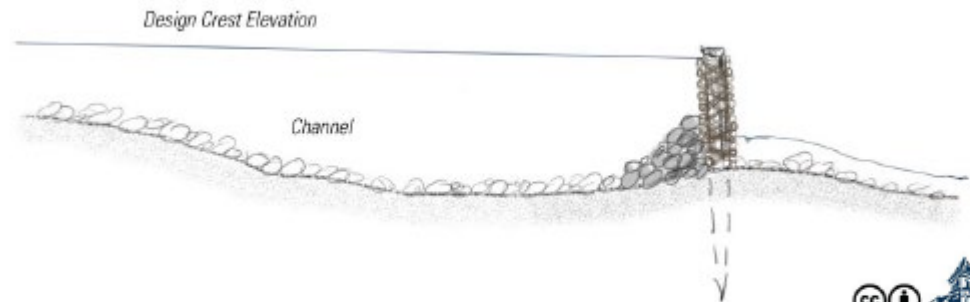
Planform



Cross-section



Profile



Flow



Post-Line Wicker Weave + Mattress (BDA v.1.1)



Post-Line Wicker Weave (BDA v.1.2)

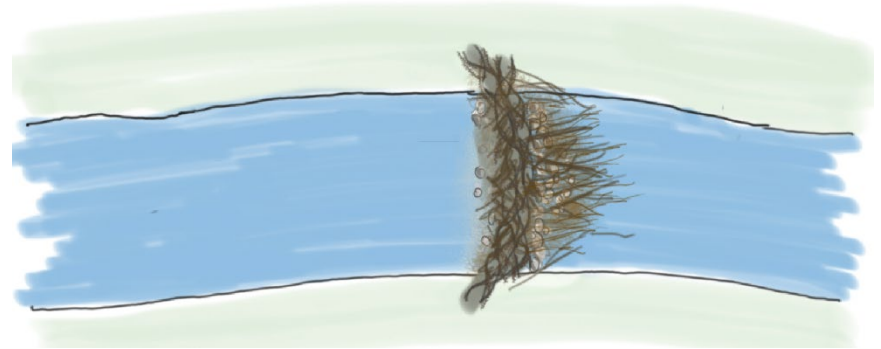


Postless BDAs (BDAs v.2.0)

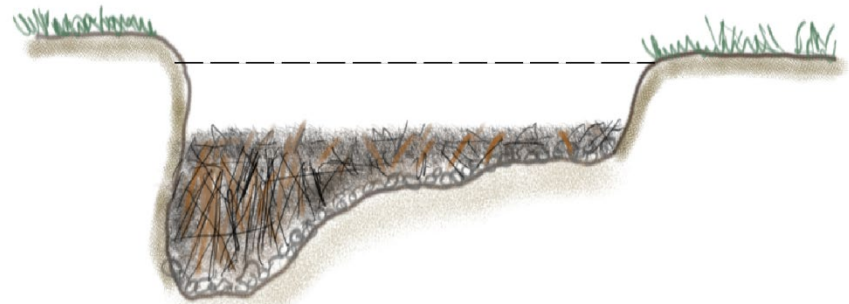


Postless beaver dam analogues (BDA v.2.0)

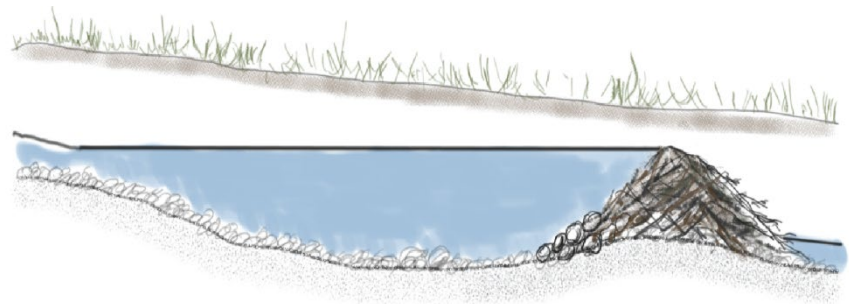
Planform



Cross-section



Profile



From pages 35-48 of Pocket Guide; Wheaton et al. (2019)

DOI: [10.13140/RG.2.2.28222.13123/1](https://doi.org/10.13140/RG.2.2.28222.13123/1)

See also Appendix E of Shahverdian et al. (2019) – Chapter 4 LTPBR

Manual DOI: [10.13140/RG.2.2.22526.64324](https://doi.org/10.13140/RG.2.2.22526.64324)

Flow



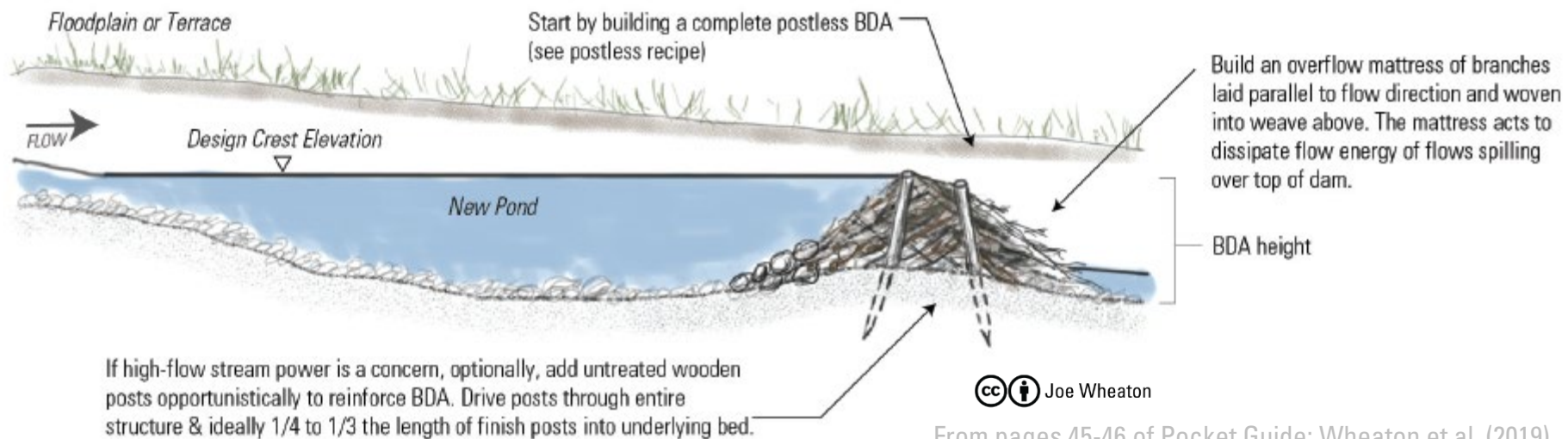
CC BY Joe Wheaton

POST-ASSISTED BDA

- Posts can provide some temporary anchoring and stability to help with initial dam stability during high flows in systems with flashier flow regimes or that produce larger magnitude floods.
- For situations where additional support during high flows is deemed necessary, our suggested practice is to start out following the instructions to build a postless BDA, and then simply add posts as extra reinforcement after the fact.



PROFILE VIEW WITH POSTS



From pages 45-46 of Pocket Guide; Wheaton et al. (2019)

DOI: [10.13140/RG.2.2.28222.13123/1](https://doi.org/10.13140/RG.2.2.28222.13123/1)

SUMMARY: BDAs

- Leaky structures **mimicking** and **promoting beaver dam activity**
- Force immediate upstream ponding
 - May force overbank flow
- Range of sizes, shapes, materials (woody material, turf, organic matter and sediment)
- Typically used to:
 - Immediately **mimic** beaver dam activity
 - Create *temporary* deep water habitat for existing dispersing beaver or translocated beaver, hence **promoting** process of **beaver dam activity**



SUMMARY: Low-Tech Approaches

- Simple, cost-effective, **process-based**
- Scale to scope of problem

