

Colorado & Wyoming AFS



Where LTPBR Doesn't Work*



Outline

- Case Studies
- What is 'success?' What does it mean to 'work'?
- Where do we work? Why do we work there?

Did it Work?

- In order to know if it didn't work, we need to define what it means to work

Considerations

- Time Frames
- Spatial Extents and Spatial Resolution
- Restoration Objectives

LTPBR Probably Won't *Work* Everywhere



San Rafael River

- Colorado Plateau
- Sand bed
- Flashy hydrograph
- Highly altered hydrograph
- Baseflow = dry
- Peak flows > 1500 cfs
- Banks armored by native vegetation
- Beaver present, no dam building
- Treatment: 40 PALS and BDAs

Restoration Objective: Increase Instream Complexity and summer pool habitat



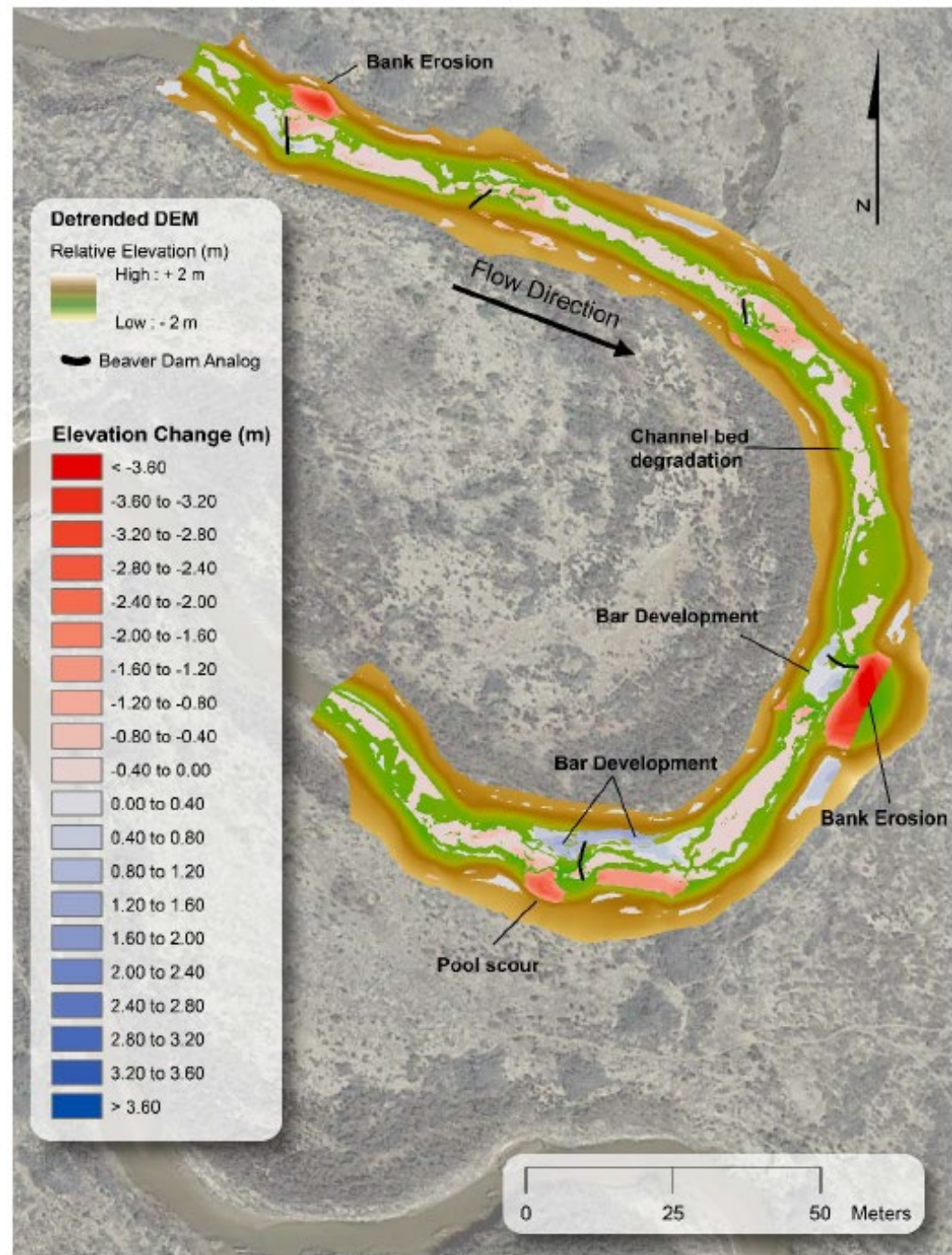
San Rafael River

- 1-2 year increase in complexity (bars, pools, cover)
- 3+ year – slight decrease in complexity
- Vegetation establishing on newly formed bars



San Rafael River

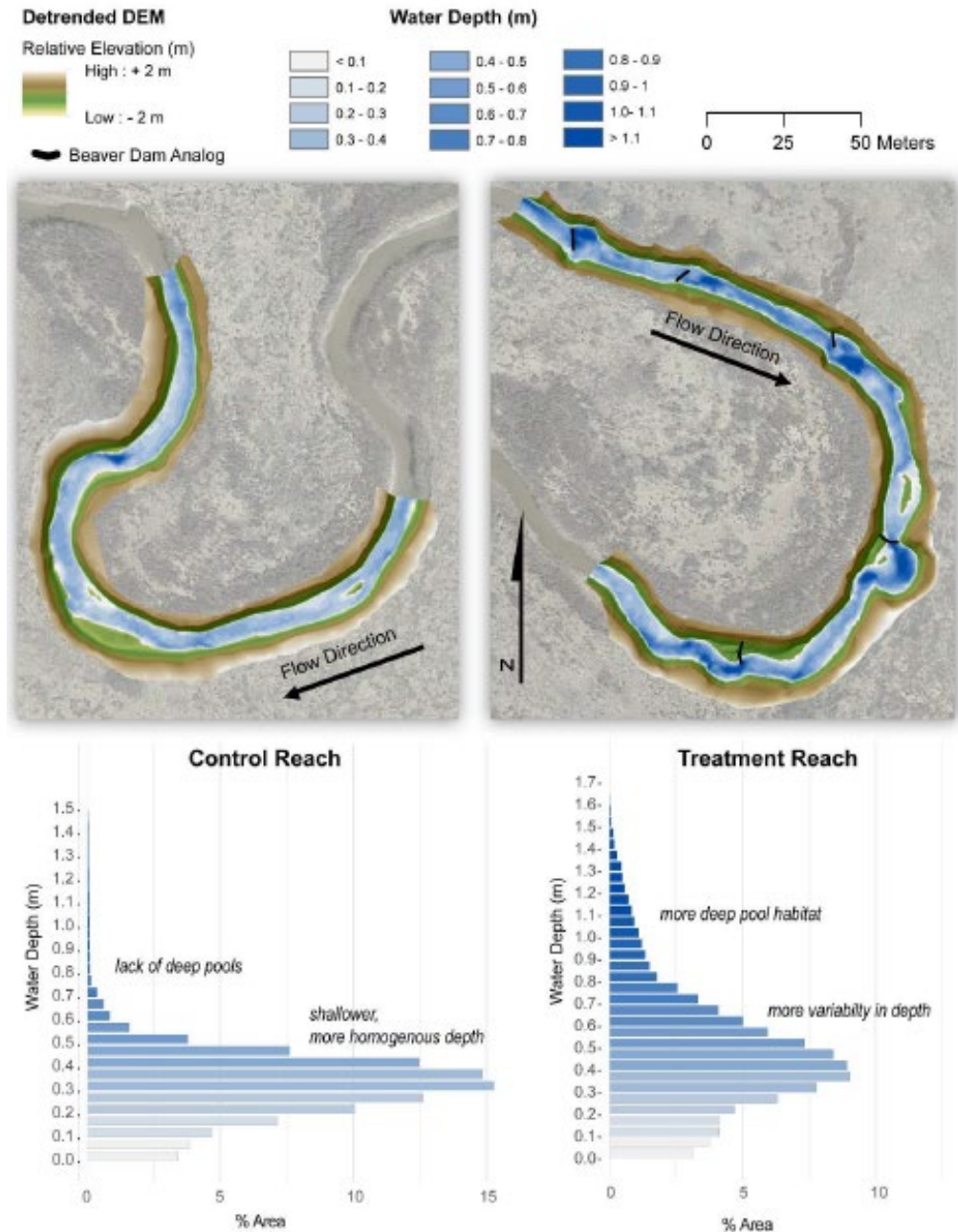
- 1 – 2 year increase in both erosion and deposition



San Rafael River

- 1-2 year diversification of water depths

So, did it work?

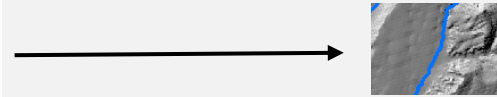


Did It Work: Time and Space Considerations



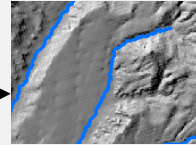
E.g. – pool scour
depth, aggradation at
single structure

Did It Work: Time and Space Considerations



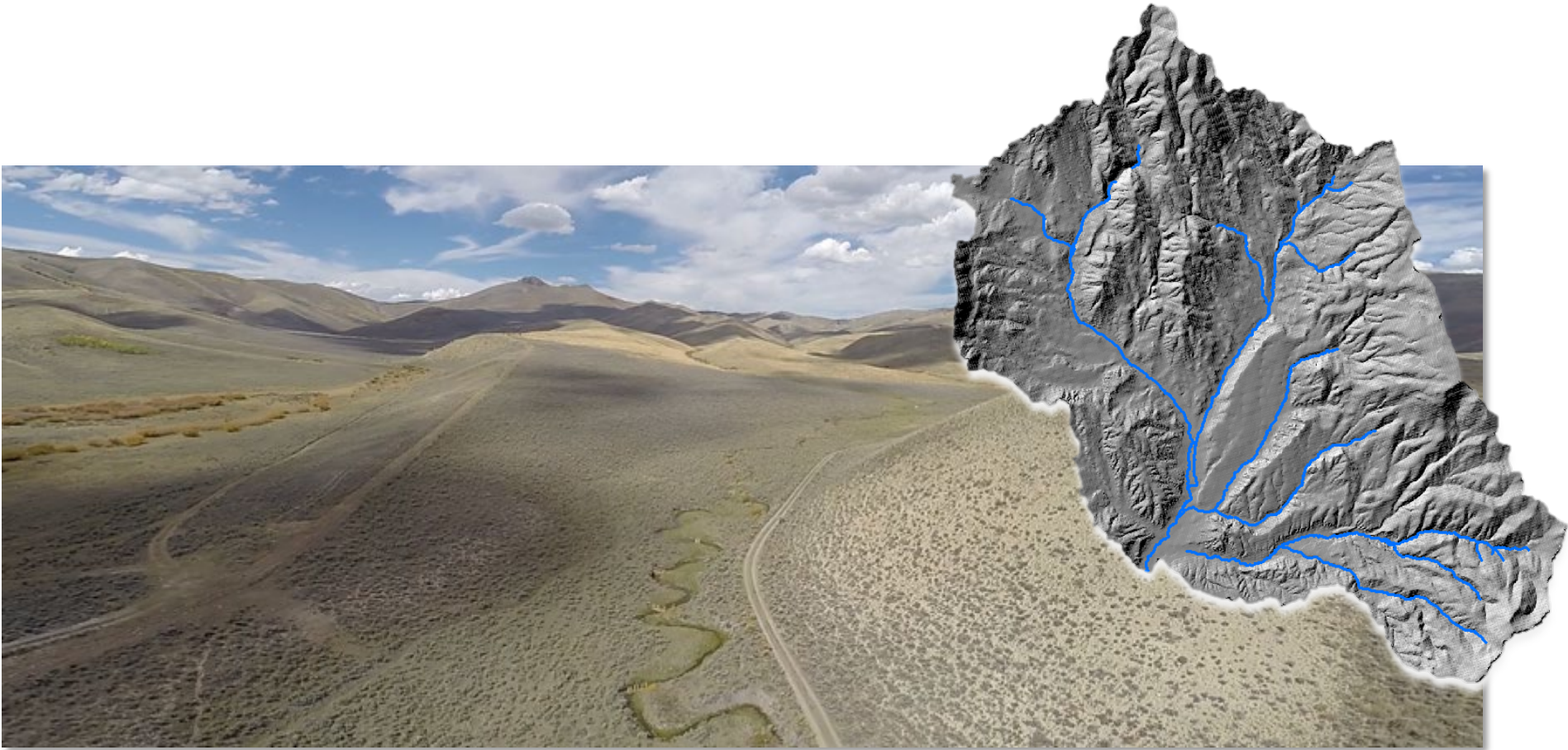
E.g. Number of pools,
average channel width

Did It Work: Time and Space Considerations



E.g. Percent of valley bottom length with multiple channels, or overbank flows

Did It Work: Time and Space Considerations



E.g. Percent of basin
with beaver dam
activity

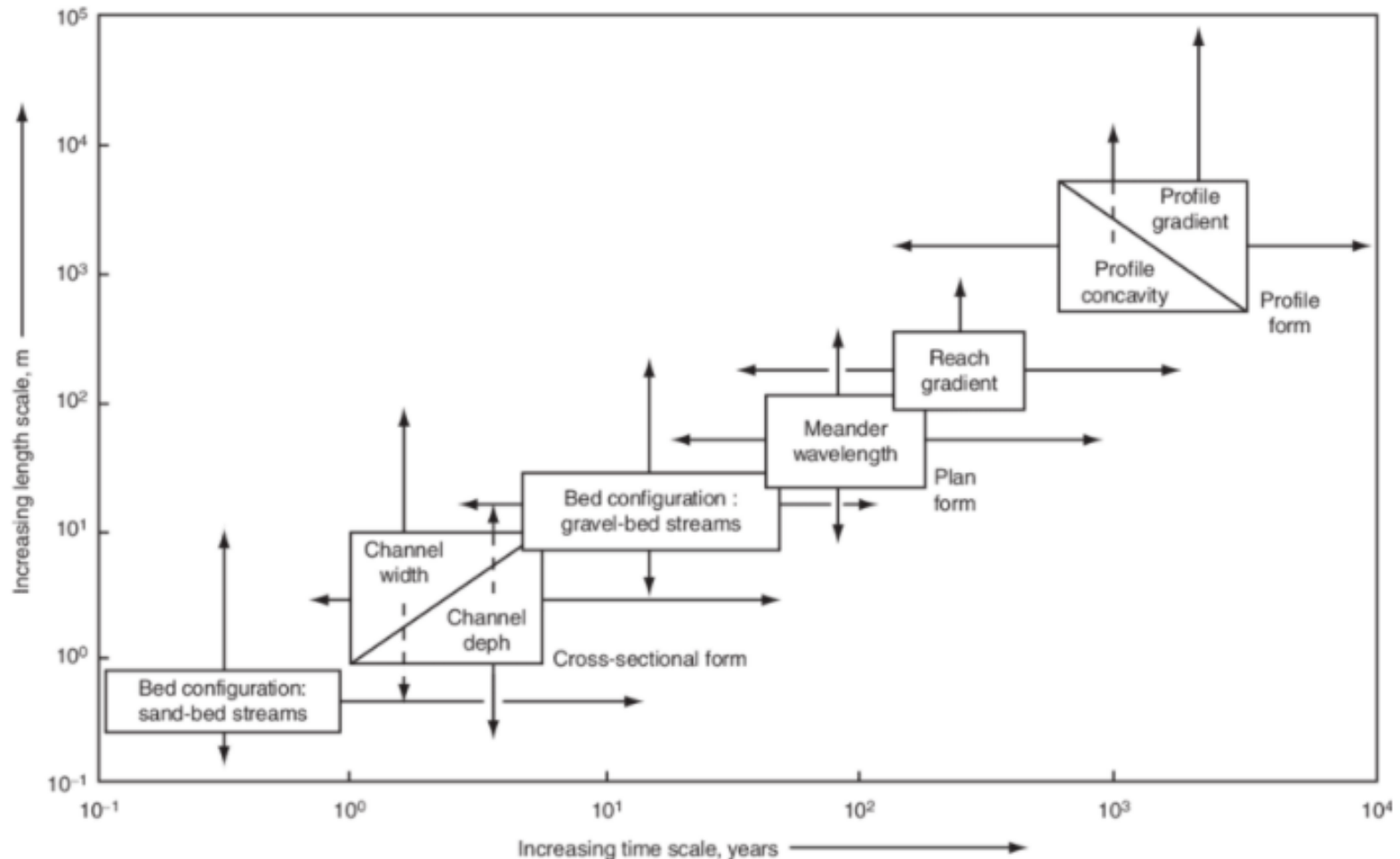
Did it Work: Time and Space Considerations

- Different variables require different monitoring time scales



Riparian development following incision, western CO.

Did it Work: Time and Space Considerations



Schematic diagram of the timescales of adjustment of various channel forms components with given length dimensions in a hypothetical basin of intermediate size (after Knighton (1998)).

Did it Work: Time and Space Considerations

- What counts as success depends on how you define it
- To address the scope of the problem we need to address larger spatial extents and use longer time-frames
- Different variables can be evaluated at and respond at different spatial extents and timescales

Back to the Beginning

Where do we do restoration?

- Areas that need a slight improvement to provide good habitat
- Areas that are long-term employment security (very degraded areas) that could provide high quality habitat in the long-term
- Hail Mary sites – high uncertainty due to invasive species, flow regulation, other
- Our own backyards
- Willing landowners and community involvement



Summary

- There are places that are inappropriate for 1) risk/human reasons and 2) physical setting
- Some are perfect
- Beaver dam activity and wood jams are a part of nearly all streams and rivers – however their ecological importance varies
- The extent to which their additions can achieve restoration objectives in the short term and long-term, given other modifications and for what cost is the major question we have to address
 - This is both a physical, economic, and social question

Questions/Discussion?