

LOW-TECH PROCESS-BASED RESTORATION OF RIVERSCAPES

VIRTUAL WORKSHOP Module 1 - Synthesis August 11, 2020



Workshop by:

Utah State University
RESTORATION CONSORTIUM



United States
Department of
Agriculture

Natural Resources Conservation Service

Sponsored by:



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Facilitation by:



A Reminder... Where We've Been

Module 1: Introduction to Low-Tech Process-Based Restoration

Tuesday, Aug 11: 10:00 AM - 4:00 PM (Mountain Time)



- Logistics, learning objectives, and introductions

- Background and purpose



- **Break** ~ 11:00 to 11:15

- Panel Discussion ~ 11:30 to 11:45



- Introduction to low-tech tools



- **Lunch** ~ 12:35 to 13:35

- Guiding principles

- Panel Discussion ~ 14:15 to 14:30



- **Break** ~ 14:30 to 14:45

- Partnering with Beaver & Beaver Ecology

- Panel Discussion ~ 15:35 to 15:50



- Wrap Up – Preview of Remaining Workshop Modules

B. Background & Why we're Here

Jeremy Maestas



Ecologist



United States Department of Agriculture

Natural Resources
Conservation Service

Shared Vision:
Resilience



~ 10:20 to 10:35

Next up: Scope of Problem

Workshop by:



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Facilitation by:



C. Scope of Problem

Joe Wheaton



Fluvial Geomorphologist
Associate Professor of Riverscapes



~ 10:35 to 10:45

Next up: Missing
Reference Condition



Webinar Hosting &
Facilitation by:



D. Missing Reference Condition – Stage Zero

Colin Thorne



Fluvial Geomorphologist
Professor of Physical Geography

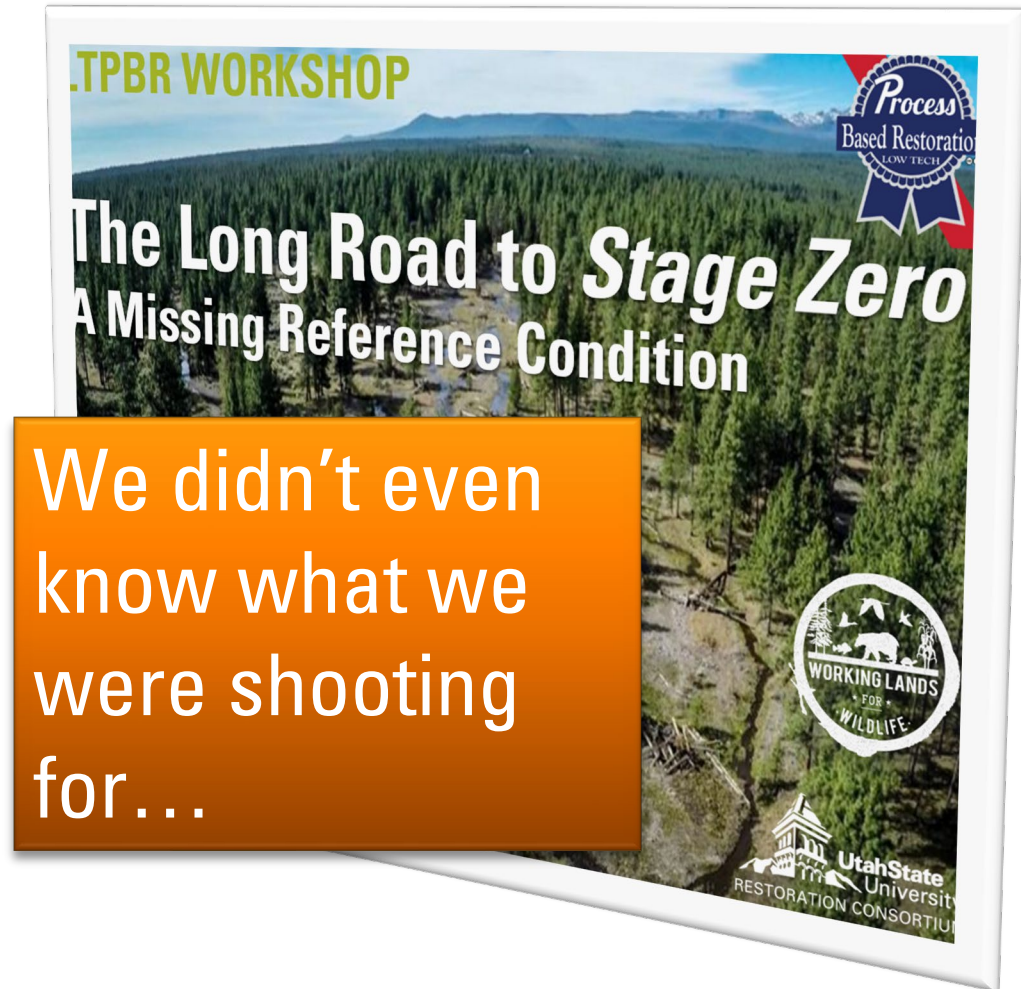


The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

~ 10:45 to 11:00

Next up: Break!



We didn't even
know what we
were shooting
for...



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Facilitation by:



E. Reimagining what riverscapes could be

Mark Beardsley



Ecologist



Stream and Riparian Monitoring, Assessment and Restoration

Soup... mmm



~ 11:15 to 11:30

Next up: Panel Discussion



Webinar Hosting & Facilitation by:



F. What you came for: Parking Lot BDAs

Joe Wheaton



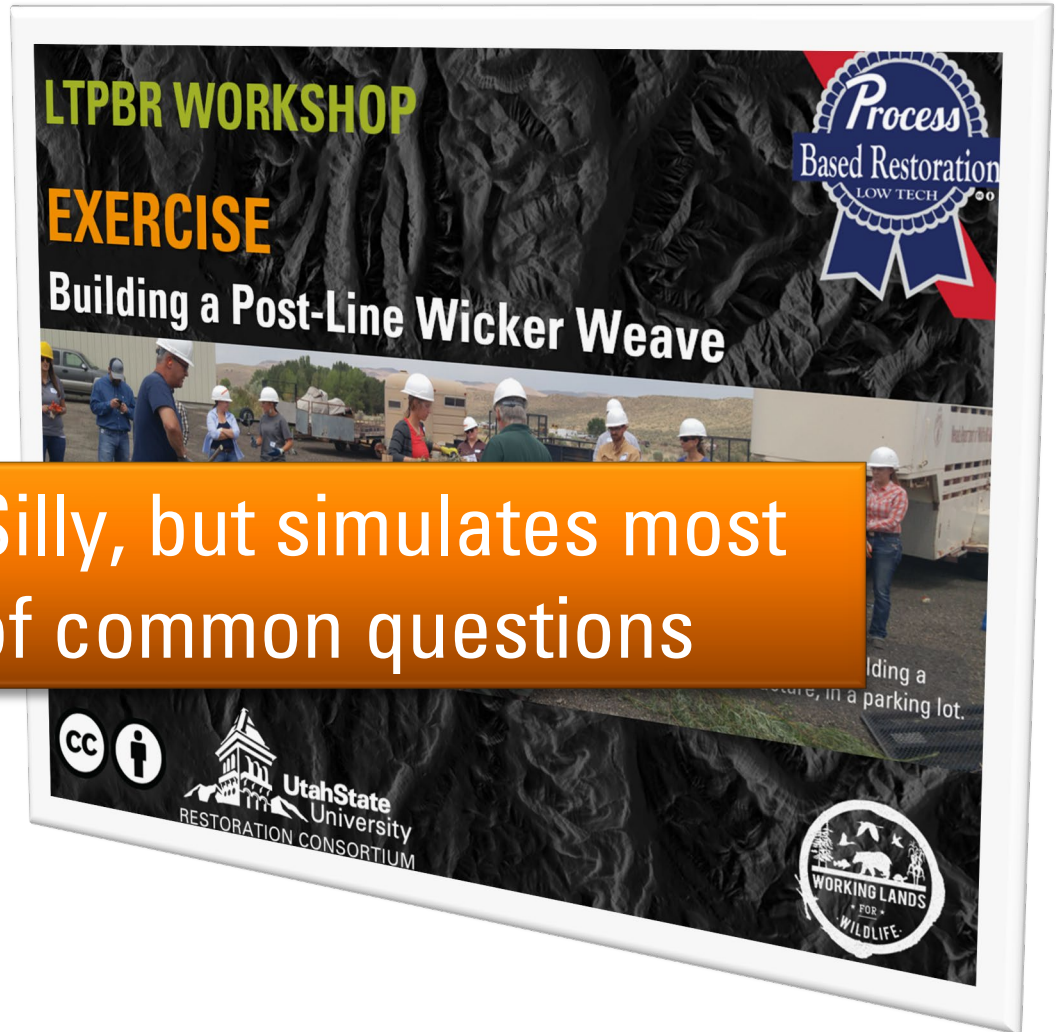
Fluvial Geomorphologist
Associate Professor of Riverscapes



~ 11:45 to 12:00

Next up: Broad
Umbrella of Low-Tech

Silly, but simulates most
of common questions



Webinar Hosting &
Facilitation by:



G. Broad Umbrella of Low-Tech Jeremy Maestas



Ecologist



United States Department of Agriculture

Natural Resources
Conservation Service

This low-tech
stuff isn't new!



~ 12:00 to 12:10

Next up: PALS

Workshop by:



Sponsored by:



Webinar Hosting &
Facilitation by:



H. PALS

Steve Bennett



Ecologist
Adjunct Professor



~ 12:10 to 12:20

Next up: Broad
Umbrella of Low-Tech



Webinar Hosting &
Facilitation by:



I. BDAs

Scott Shahverdian

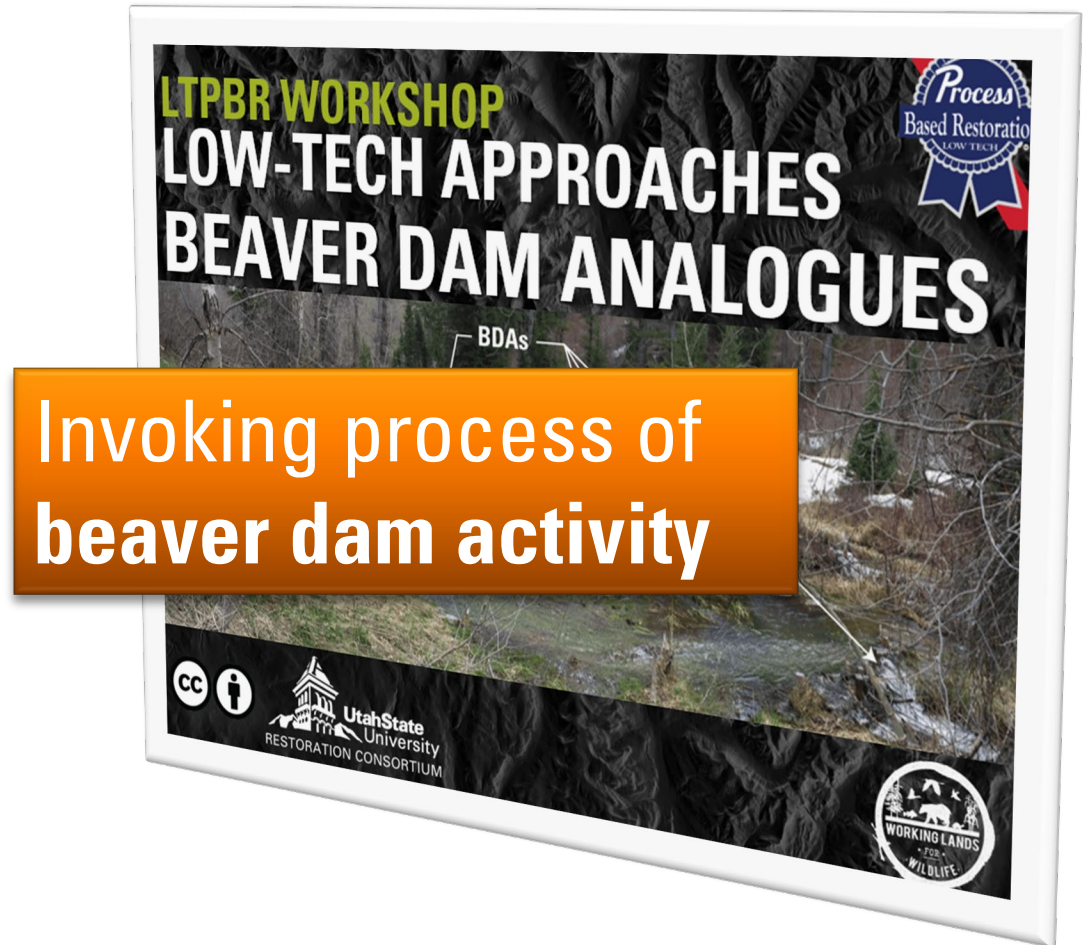


Fluvial Geomorphologist
Designer



~ 12:20 to 12:30

Next up: Panel
Questions



Webinar Hosting &
Facilitation by:



J. Guiding Principles

Joe Wheaton



Fluvial Geomorphologist
Associate Professor of Riverscapes



~ 13:35 to 14:15

Next up: Panel Q&A



Webinar Hosting &
Facilitation by:



K. Beaver History & Biology

Ben Goldfarb

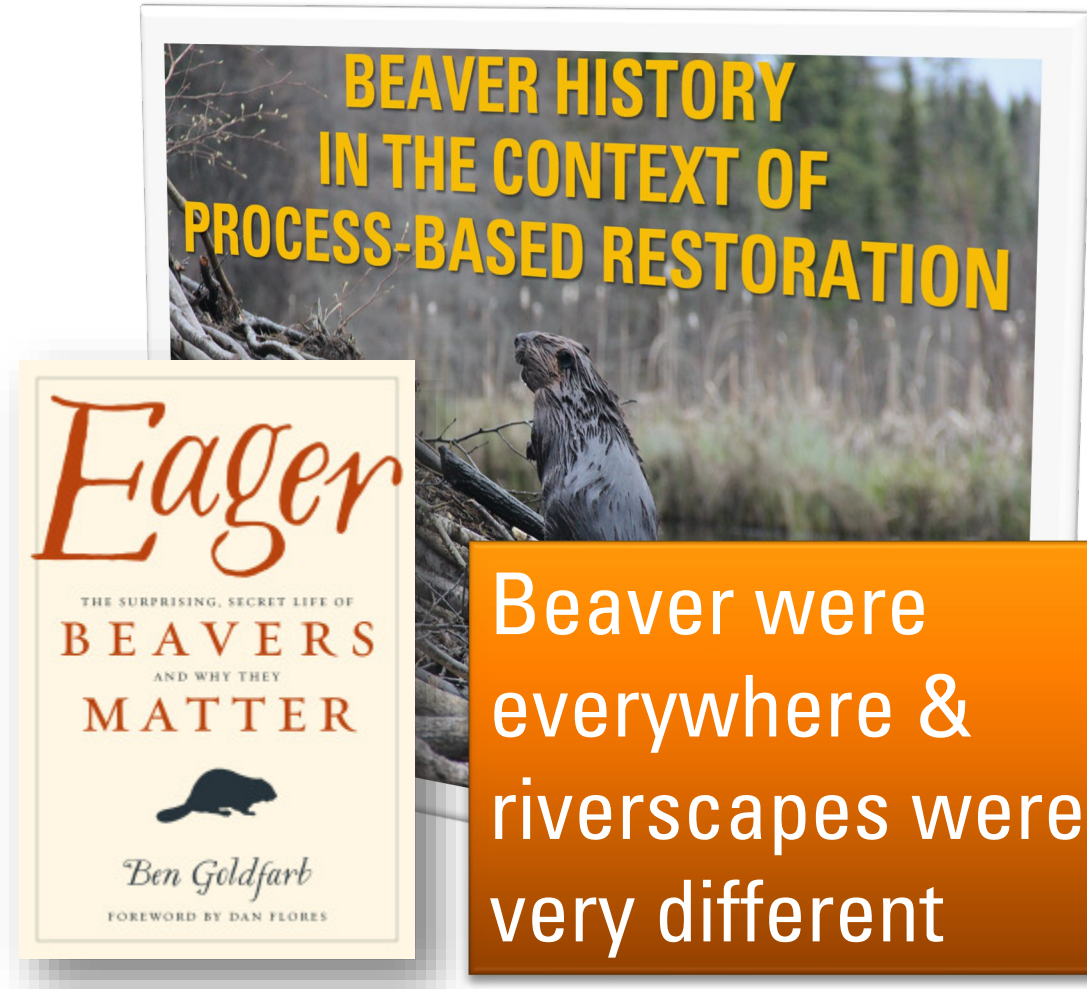


Environmental Journalist
Award-Winning Author

WINNER of the 2019
*PEN/E.O. Wilson Literary
Science Writing Award.*

~ 14:45 to 15:10

Next up: Beaver
Ecology & Dam Building



Beaver were
everywhere &
riverscapes were
very different

Workshop by:



Sponsored by:



Webinar Hosting &
Facilitation by:



L. Beaver Ecology, Beaver Dam Activity

Nick Bouwes



Aquatic Ecology
Adjunct Professor



~ 15:10 to 15:30

Next up: Why partner with beavers?

LTPBR WORKSHOP

BEAVER ECOLOGY,
BEAVER DAM ACTIVITY,
BEAVER MANAGEMENT



To work with a rodent... you need to think like one



CARL SPACKLER

"I have to laugh, because I've often asked myself, my foe, my enemy, is an animal. In order to conquer him, I have to think like an animal, and whenever possible to look like one. I've got to get inside this dude's pelt."

Workshop by:



Sponsored by:



M. Why Partner with Beavers?

Jeremy Maestas



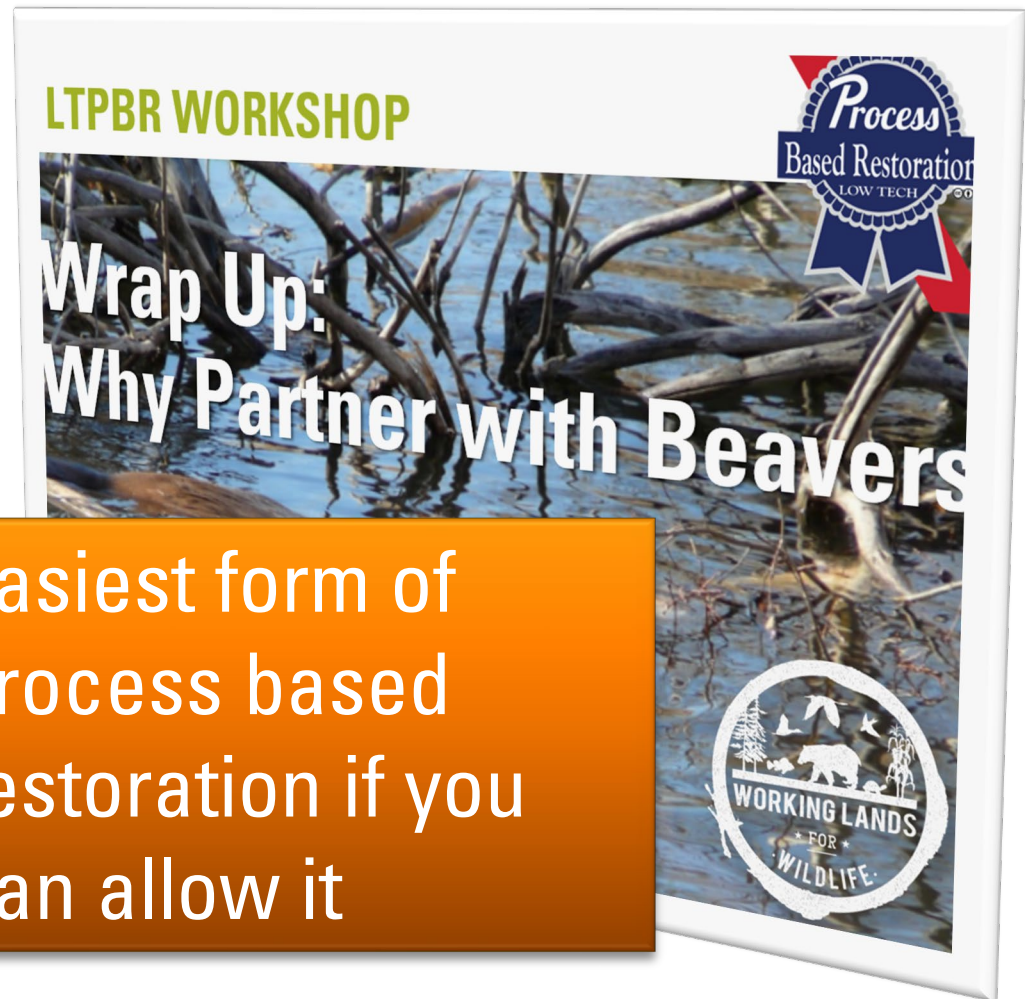
Ecologist



United States Department of Agriculture

Natural Resources
Conservation Service

Easiest form of
process based
restoration if you
can allow it



~ 15:30 to 15:35

Next up: Panel Discussion

Workshop by:



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Course Structure - Pick and Choose



Tuesday, Aug. 11 (10 AM – 4 PM MT)

- **Module 1: Introduction to Low-Tech Process-Based Restoration** (3/4 day)

Wednesday, Aug. 12 (9 AM – 4:30 PM MT)

- Module 2: Underlying Science & Case Studies for Low-Tech (morning, ½ day)
- Module 3: Planning Low-Tech Process-Based Restoration (afternoon, ½ day)

Thursday, Aug. 13 (10 AM – 3:30 PM MT)

- Module 4: Designing Low-Tech Process-Based Restoration (3/4 day)

Friday, Aug. 14 (9 AM – 12:30 PM MT)

- Module 5: Implementing Low-Tech Process-Based Restoration (morning, ½ day)

LTPBR Website

<http://lowtechpbr.restoration.usu.edu>

The screenshot shows the LTPBR website interface. At the top, navigation links include RIVERSCAPES, RC TOOLS, RC SCIENCE, RC DATA, and RC HELP. The main header features the 'Process Based Restoration' logo and the title 'LOW-TECH PROCESS-BASED RESTORATION OF RIVERSCAPES DESIGN MANUAL, RESOURCES, WORKSHOPS'. Below this is the Utah State University Restoration Consortium logo. A yellow callout bubble points to the 'Workshops' link in the 'SITE CONTENTS' menu, stating: 'Click here to get to the workshop pages right away.' Another yellow callout bubble points to the 'Manual' link in the same menu, stating: 'Click here for manual... and pocket guide'. A third yellow callout bubble points to the 'Register for Virtual LTPBR Workshop - FREE August 11-14, 2020' banner, stating: 'Click here to get to the workshop pages right away.' The 'Manual' section is expanded, showing a description of the design manual's purpose and a list of resources. A QR code is visible in the bottom right corner of the website screenshot.

LOW-TECH PROCESS-BASED RESTORATION OF RIVERSCAPES DESIGN MANUAL, RESOURCES, WORKSHOPS

Utah State University RESTORATION CONSORTIUM

Click here to get to the workshop pages right away.

SITE CONTENTS

- Home
- Design Manual
- PBR Resources
- Low-Tech PBR Workshops

Subscribe to the Low-Tech PBR mailing list

Email Address

First Name

Last Name

Subscribe

Manual

The purpose of this **design manual** is to provide restoration practitioners with guidelines for implementing a subset of low-tech process-based restoration (LT-PBR) in riverscapes. While the concept of process-based restoration in riverscapes has been advocated for at least two decades, details and specific examples on how to implement it remain sparse. Here, we describe 'low-tech process-based restoration' (LT-PBR) as a practice of using simple, low unit-cost, structural additions (e.g. wood and beaver dams) to riverscapes to mimic functions and initiate specific processes. Hallmarks of this approach include:

- An explicit focus on the processes that a low-tech restoration intervention is meant to promote
- A conscious effort to use cost-effective, low-tech treatments (e.g. hand-built, natural materials).

LOW-TECH PROCESS-BASED RESTORATION OF RIVERSCAPES DESIGN MANUAL

Edited by: Joseph M. Wheaton, Stephen N. Bennett, Nicolaas Bouwes, Jeremy D. Maestas & Scott M. Shahverdian

Find:

- Design Manual
- Pocket Guide
- Other Resources
- Workshop Slides
- Links/Videos/Literature



Navigating the Workshop Pages



PAGE CONTENTS

- 2020 NRCS WLFW Low-Tech Riverscape Restoration Workshop
- 2020 Virtual Workshop
 - Overview
 - Odd 2020 Opportunity
 - Virtual Workshop Description
 - Agenda
 - Registration
 - Course Materials
 - Slides & Handouts
 - Workshop Textbooks
 - More Background
 - Purpose & Need
 - Instruction Team
 - Audience
 - Make it Count
 - Subscribe to the Low-Tech PBR mailing list

All workshop slides, videos, resources, exercises.... etc.

2020 Virtual Workshop

August 11-14, 2020 - Anywhere with Internet

Registration for Virtual LTPBR Workshop - FREE! August 11-14, 2020

Overview



Thanks to the generous support of the Natural Resource Conservation Service's Working Lands for Wildlife, and a grant

INTRO LTPBR WORKSHOP MATERIALS

PAGE CONTENTS

Intro LTPBR Workshop Materials

Day 1 - Intro to Low-Tech Process Based Restoration

1. Logistics and Introductions
2. Background and purpose
3. Build your first Beaver Dam Analogue exercise
4. Introduction to low-tech approaches
5. Guiding Principles

Day 2 - Planning and Designing Low-Tech Riparian Restoration

6. Beaver Ecology
7. Conservation Planning Process
8. Planning in Detail
- Mimicking and promoting wood accumulation and beaver dam activity
 - 9. Case Study: Asotin Creek
 - 10. Case Study: Bridge Creek
9. Design

Below you can find PDFs of the slides we cover in the intro to low-tech process-based restoration workshops. Each is licensed with a [Creative Commons licence](#), so you are free to re-use subject to the terms of the license.

Day 1 - Intro to Low-Tech Process Based Restoration

1. Logistics and Introductions

The workshop kicks off with some introductions and logistics.

- Logistics, Introductions - Slides

A lot of material to get lost in.... navigate to Module and Topic to find what you need...

2. Background and purpose

Resources:

- During workshop
- & Following workshop
- & to share



We will post on slides and in chat windows:

- Links to resources we're *currently* using



Really... Remember the Principles



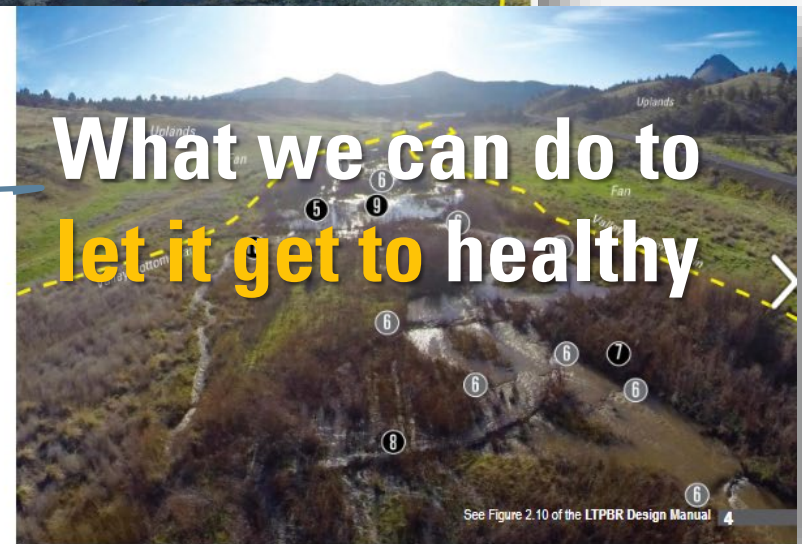
Take some time to pause and focus on health, healing & hope

RIVERSCAPES PRINCIPLES:

- 1 Streams need space. Healthy streams are dynamic, regularly shifting position within their valley bottom, re-working and interacting with their floodplain. Allowing streams to adjust within their valley bottom is essential for maintaining functioning riverscapes.
- 2 Structure forces complexity and builds resilience. Structural elements, such as beaver dams and large woody debris, force changes in flow patterns that produce physically diverse habitats. Physically diverse habitats are more resilient to disturbances than simplified, homogeneous habitats.
- 3 The importance of structure varies. The relative importance and abundance of structural elements are based on each tree's collection, decomposition and structural context. R (similar to form) and
- 4 Inefficient hallmark of damaging baseflow

RESTORATION PRINCIPLES:

- 5 It's okay to be messy. When structure is added back to streams, it is meant to mimic and promote the processes of wood accumulation and beaver dam activity. Structures are fed to the system like a meal and should resemble natural structures (log jams, beaver dams, fallen trees) in naturally "messy" systems. Structures do not have to be perfectly built to yield desirable outcomes. Focus less on the form and more on the processes the structures will promote.
- 6 There is strength in numbers. A large number of smaller structures working in concert with each other can achieve much more than a few isolated, over-built, highly-secured structures. Using a lot of smaller structures provides redundancy and reduces the importance of any one structure. It generally takes many structures, designed in a complex to promote the processes of wood accumulation and beaver dam activity that lead to the desired outcomes.
- 7 Use natural building materials. Natural materials should be used because structures are simply intended to initiate process recovery and go away over time. Locally sourced materials are preferable because they simplify logistics and keep costs down.
- 8 Let the system do the work. Giving the riverscape and/or beaver the tools (structure) to promote natural processes to heal itself with stream power and ecosystem engineering, as opposed to diesel power, promotes efficiency that allows restoration to scale to the scope of degradation.
- 9 Defer decision making to the system. Wherever possible, let the system make critical design decisions by simply providing the tools and space it needs to adjust. Deferring decision making to the system downplays the significance of uncertainty due to limited knowledge. For example, choosing a floodplain elevation to grade to based on limited hydrology information can be a complex and uncertain endeavor, but deferring to the hydrology of that system to build its own floodplain grade reduces the importance of uncertainty due to limited knowledge.
- 10 Self-sustaining systems are the solution. Low-tech restoration actions in and of themselves are not the solution. Rather they are just intended to initiate processes and nudge the system towards the ultimate goal of building a resilient, self-sustaining riverscape.

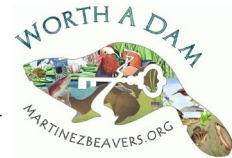


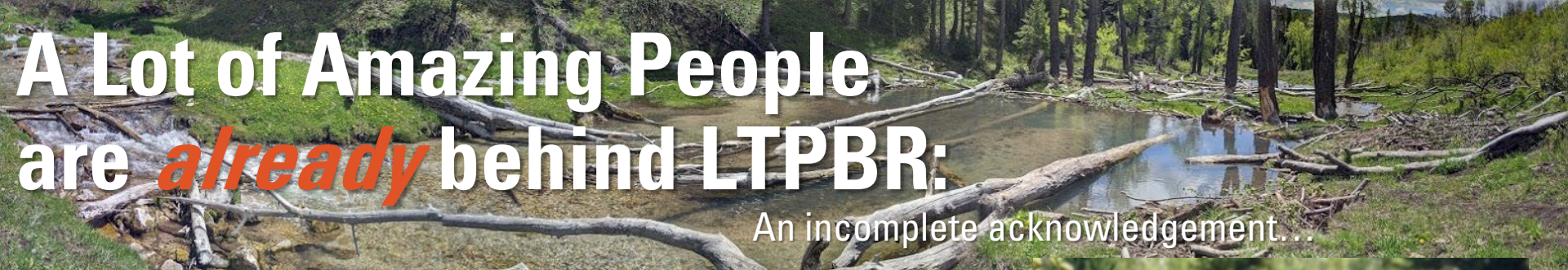
A whole day to say what we cover in 4 pages and a top 10 list...

Free Digitally @: <http://lowtechpbr.restoration.usu.edu>

A Lot of Amazing People are behind LTPBR:

An incomplete acknowledgement...





A Lot of Amazing People are *already* behind LTPBR:

An incomplete acknowledgement...



The
Co

E
C

M
I

ver
Rec

Some of you already are those
amazing people....

The rest of you **could be!**



CC BY Jeremy Maestas

UPPER DESCHUTES
WATERSHED COUNCIL



UTAH's
WATERSHED
RESTORATION
INITIATIVE



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