What the heck is Stage 0?

Cluer & Thorne, 2013
Historic Floodplain Condition in Depositional Environments

- Vegetation diversity
- Elevational diversity
- Multiple flow paths
- Downed wood
- Future wood supply
- High water table
- Beaver dams
- Frequent floodplain wetting
- Maximum patch complexity
Locations of Forest Service Stage 0 projects in Oregon

- Dog Cr, FreWin NF – 2013
- Grizzly Cr, FreWin NF - 2013
- Lost Cr, OCH NF – 2013
- Dick Cr, OCH NF – 2014
- Toggle Cr, OCH NF – 2014
- Wooley Cr, FreWin NF - 2014
- Whychus Floodplain, DES NF - 2014
- Fivemile Bell, Phase 2, SIU NF – 2016
- Deer Cr, WIL NF – 2016
- Staley Cr, WIL NF – 2017

Lower South Fork McKenzie Floodplain Enhancement, Phase 1, 2018, 150 acres
A process-based approach to restoring depositional river valleys to Stage 0, an anastomosing channel network

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Abstract
Stream restoration approaches most often quantify habitat degradation, and therefore recovery objectives, on aquatic habitat metrics based on a narrow range of species needs (e.g., salmon and trout), as well as channel evolution models and channel design tools biased toward single-threaded, and “sediment-balanced” channel patterns. Although this strategy enhances perceived habitat needs, it often fails to properly identify the underlying geomorphological and ecological processes limiting species recovery and ecosystem restoration. In this paper, a unique process-based approach to restoration that strives to restore degraded stream, river, or meadow systems to the premanipulated condition is presented. The proposed relatively simple Geomorphic Grade Line (GGL) design method is based on Geographic Information System (GIS) and field-based analyses and the development of design maps using relative elevation models that expose the relic predisturbance valley surface. Several case studies are presented to both describe the development of the GGL method and to illustrate how the GGL method of evaluating valley surfaces has been applied to Stage 0 restoration design. The paper also summarizes the wide applicability of the GGL method, the advantages and limitations of the method, and key considerations for future designers of Stage 0 systems anywhere in the world. By presenting this ongoing Stage 0 restoration work, the authors hope to inspire other practitioners to embrace the restoration of dynamism and diversity through restoring the processes that create multifaceted river systems that provide long-term resiliency, meta-stability, larger and more complex aquatic habitats, and ecological processes.
Lower South Fork McKenzie River
Floodplain Enhancement Phase I

Phase I Summary

- Phase I - 150 acre project area in lower South Fork floodplain (upstream from confluence)
- Diverted entire South Fork (330 cfs) into relic side channel (USACE flow coordination)
- Significant fish salvage effort with ODFW and volunteers
- Removed ~ 85,000 cubic yards of sediment material from 16 acres of floodplain
- Aggraded 0.7 linear stream miles 1-10 feet with redistributed material
- Placed ~ 3,000 pieces of large wood throughout disturbed areas and relic floodplain channels
- Funders: USFS, OWEB, BPA (PSMFC)
- 12-weeks project period from June 1 – August 15

Partners
Mainstem Diversion
Fish Salvage
Floodplain Cut Area
Filling the Mainstem South Fork
Large Wood Placement
Project Completion
Implementation Sequence 1
## Phase I Project Cost

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<th></th>
<th>OWEB</th>
<th>USFS In-kind</th>
<th>USFS</th>
<th>BPA (PSMFC)</th>
<th>MWC</th>
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Cost per acre ~ $13,000
350% Increase in Base Flow Wetted Area
Mean Velocity (ft/sec)
Geomorphologic Features

Pre-project T3

Post-project T3
SUBSTRATE SIZE CLASSES

TRANSECT 3 - Pre-project

TRANSECT 3 - Post-project
QUESTIONS?

2016 PRE-PROJECT

2018 POST-PROJECT