Wasson Creek Watershed Restoration and Monitoring

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COOS BASIN COHO PARTNERSHIP
ESTABLISHED IN 2023
BCP

South Slough Reserve
EST. 1974

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

STATE OF OREGON
OREGON DEPARTMENT OF STATE LANDS


Jenni Schmitt
(Monitoring Lead)


Ryan Scott
(Restoration
Technician)


Jen Kirkland
(GIS and UAS)


Shon Schooler
(birds &
salamanders)

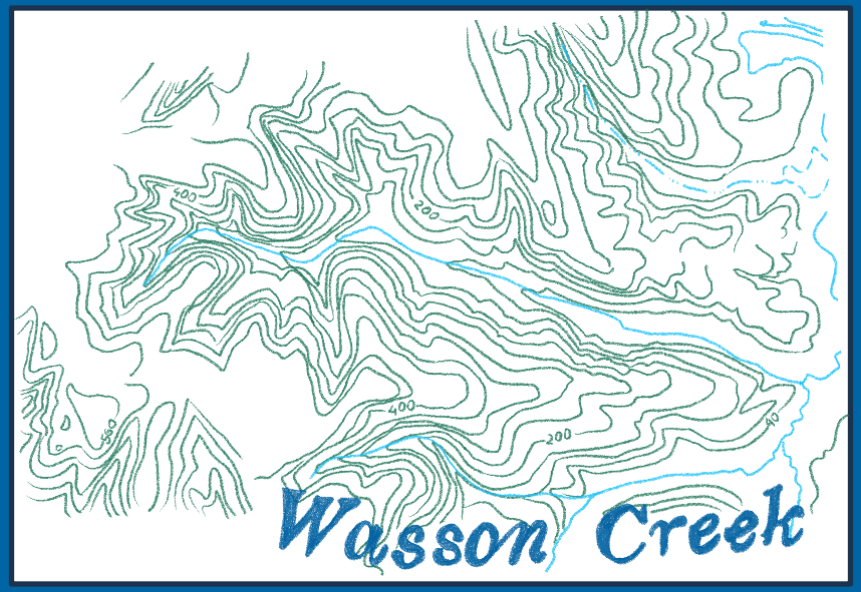

Ali Helms &
Adam DeMarzo
(water quality)

Partners and Advisory Team

South Slough Reserve
Coos Watershed Association
Coquille Indian Tribe
Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI)
Bureau of Land Management (BLM)
OR State University Extension
OR Department of Forestry (ODF)
OR Department of Fish & Wildlife (ODFW)
US Fish & Wildlife Service (USFWS)
US Forest Service (USFS)
Private consultants (Yankee Creek Forestry and Aplondontia Services)

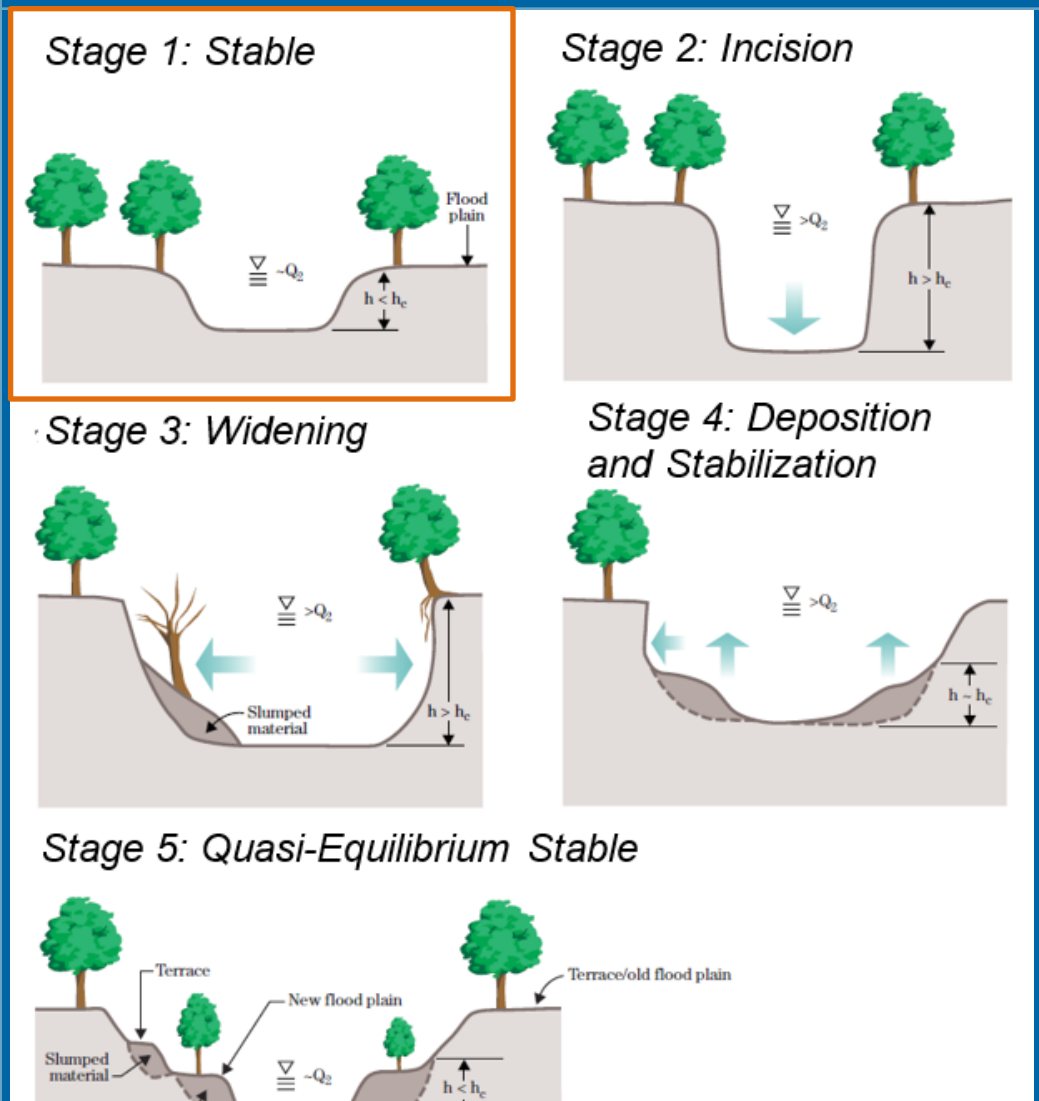
Wetland-Stream Restoration

1. Background and project development
2. Restoration implementation
3. Monitoring



Original channel evolution model

(Schumm et al. 1984)

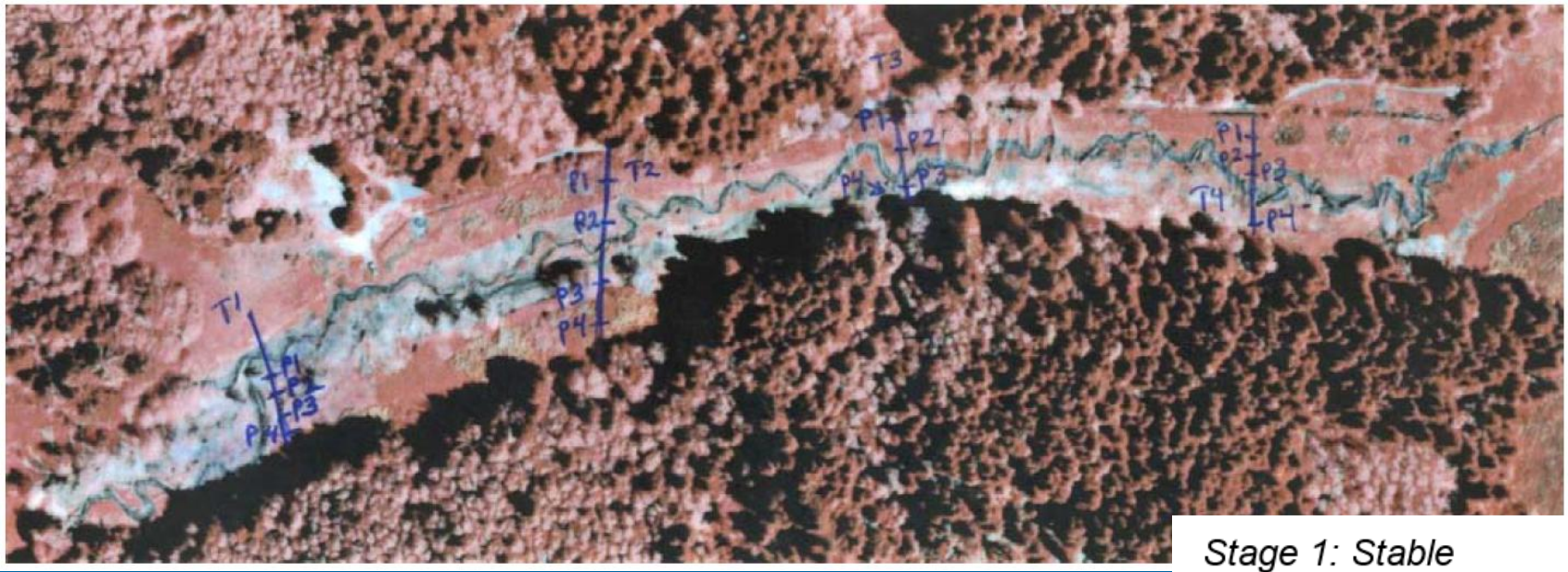


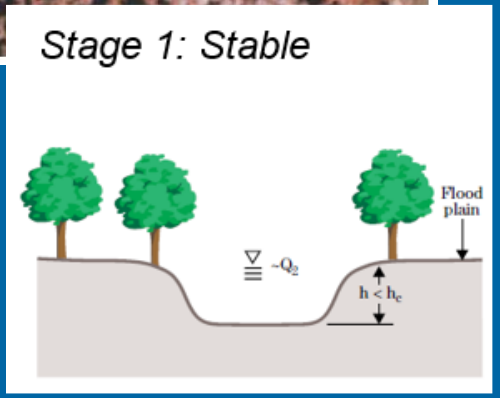
Main guidance for stream restoration designs and objectives

Schumm SA, Harvey MD, Watson CC. 1984. Incised Channels: Morphology, Dynamics, and Control. *Water Resources Publications: Littleton, CO*.

Modified figure: Yochum S. E. & Reynolds L. V. 2020. Guidance for Stream Restoration. *Forest Service, BLM*

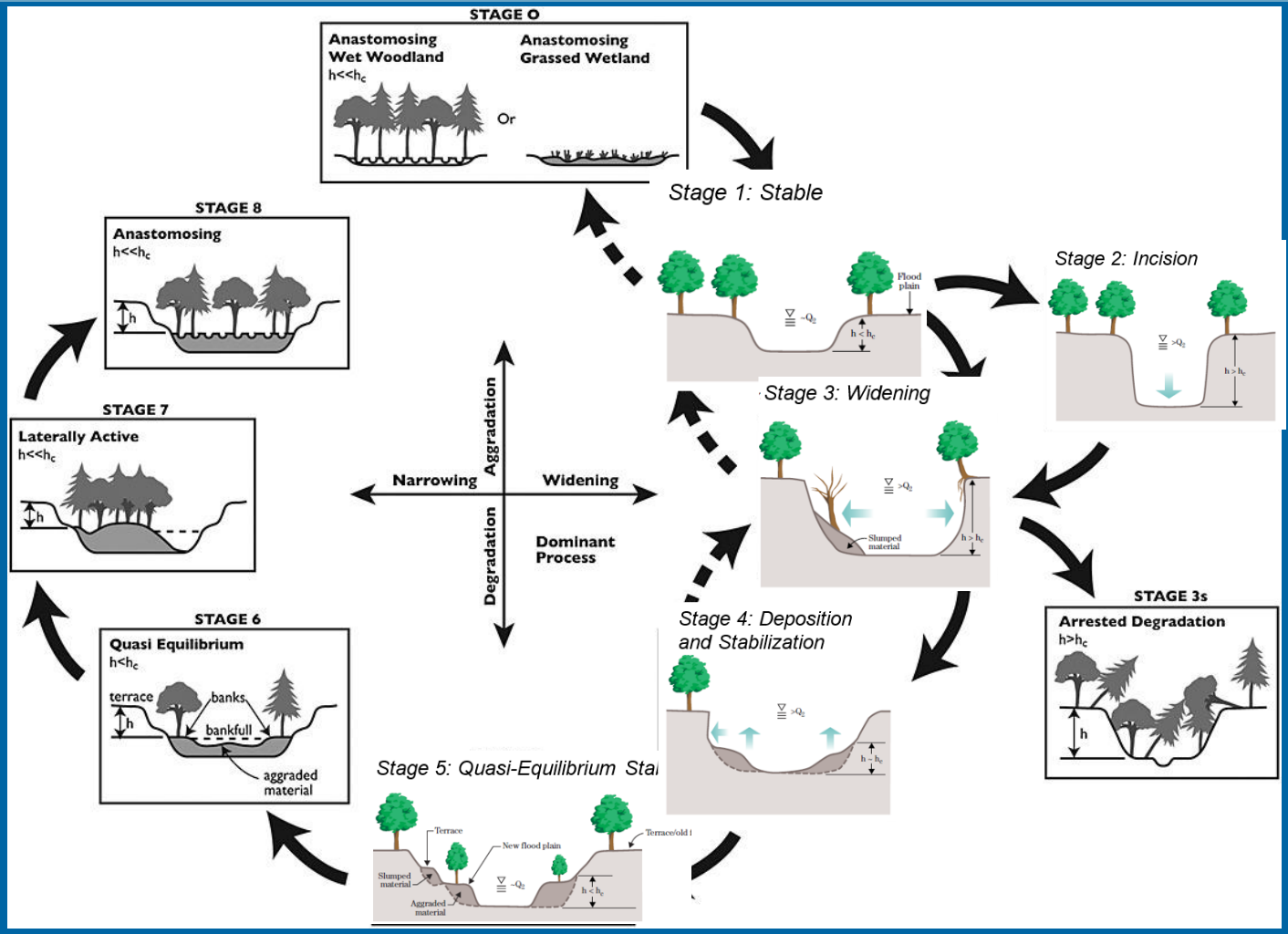
Example restoring to Stage 1: Anderson Creek (restored 2003)





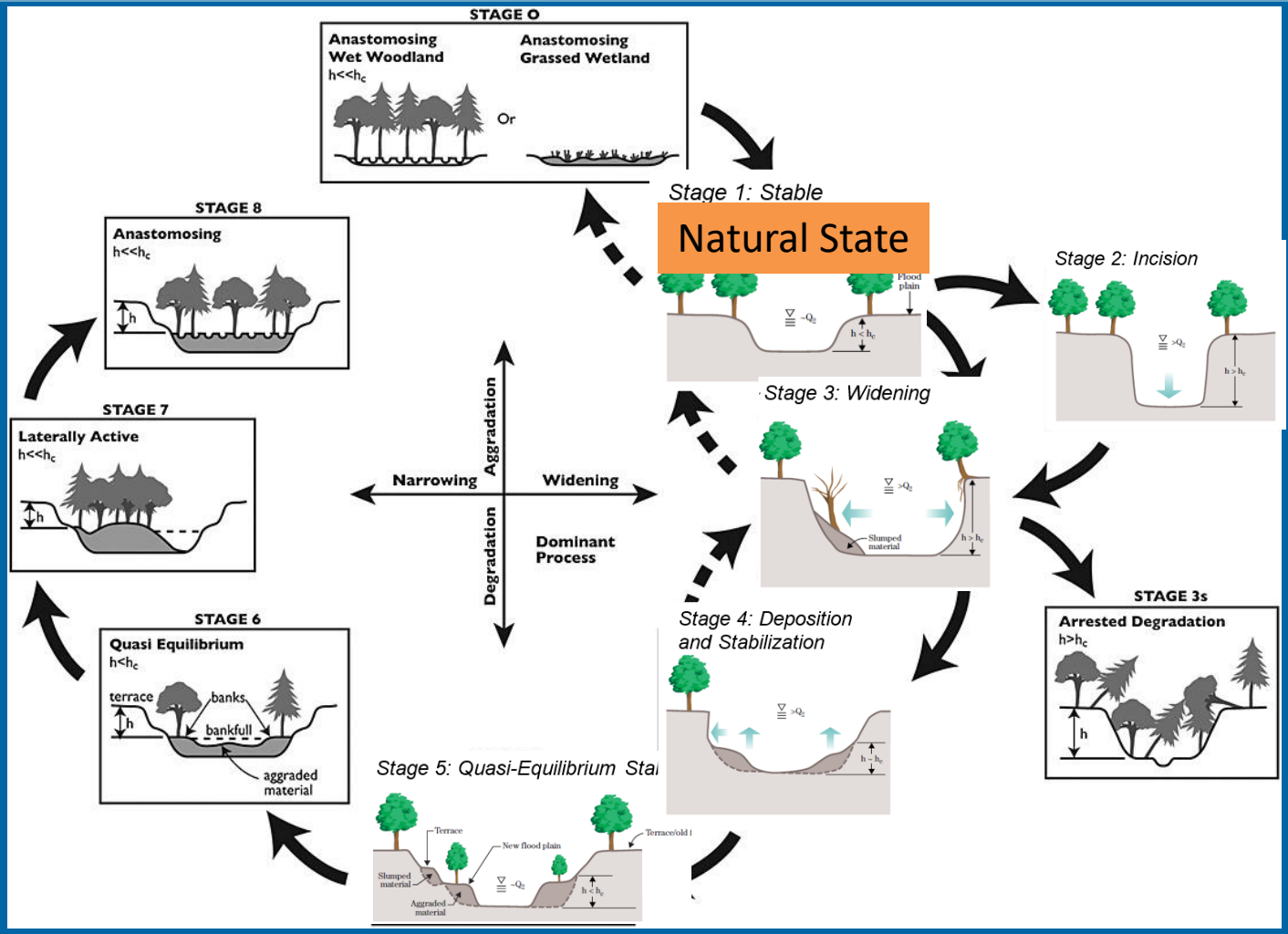
Researchers started challenging the concept that single-thread, sinuous (meandering) channels are the natural pre-disturbance condition in depositional valleys

Updated stream evolution model
(Cluer and Thorne 2013)



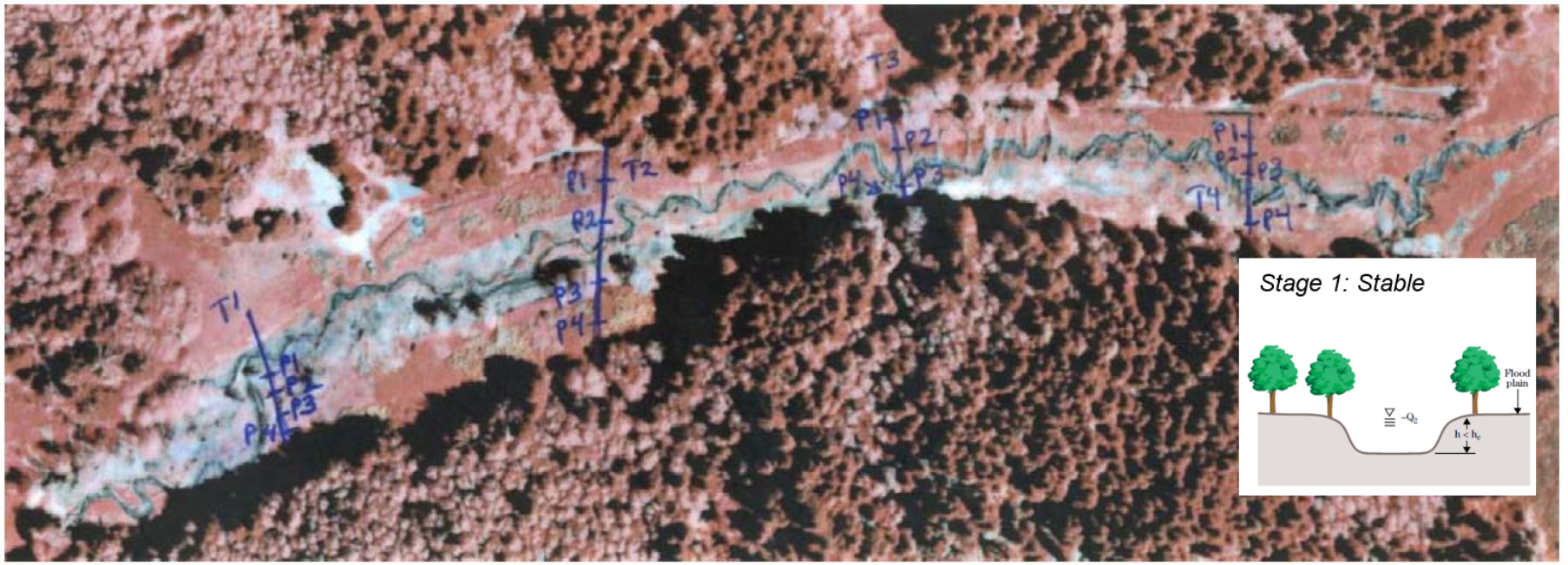
Cluer and Thorne (2013) A Stream Evolution Model Integrating Habitat and Ecosystem Benefits. *River Research and Applications* **30**:135-154

Updated stream evolution model
(Cluer and Thorne 2013)

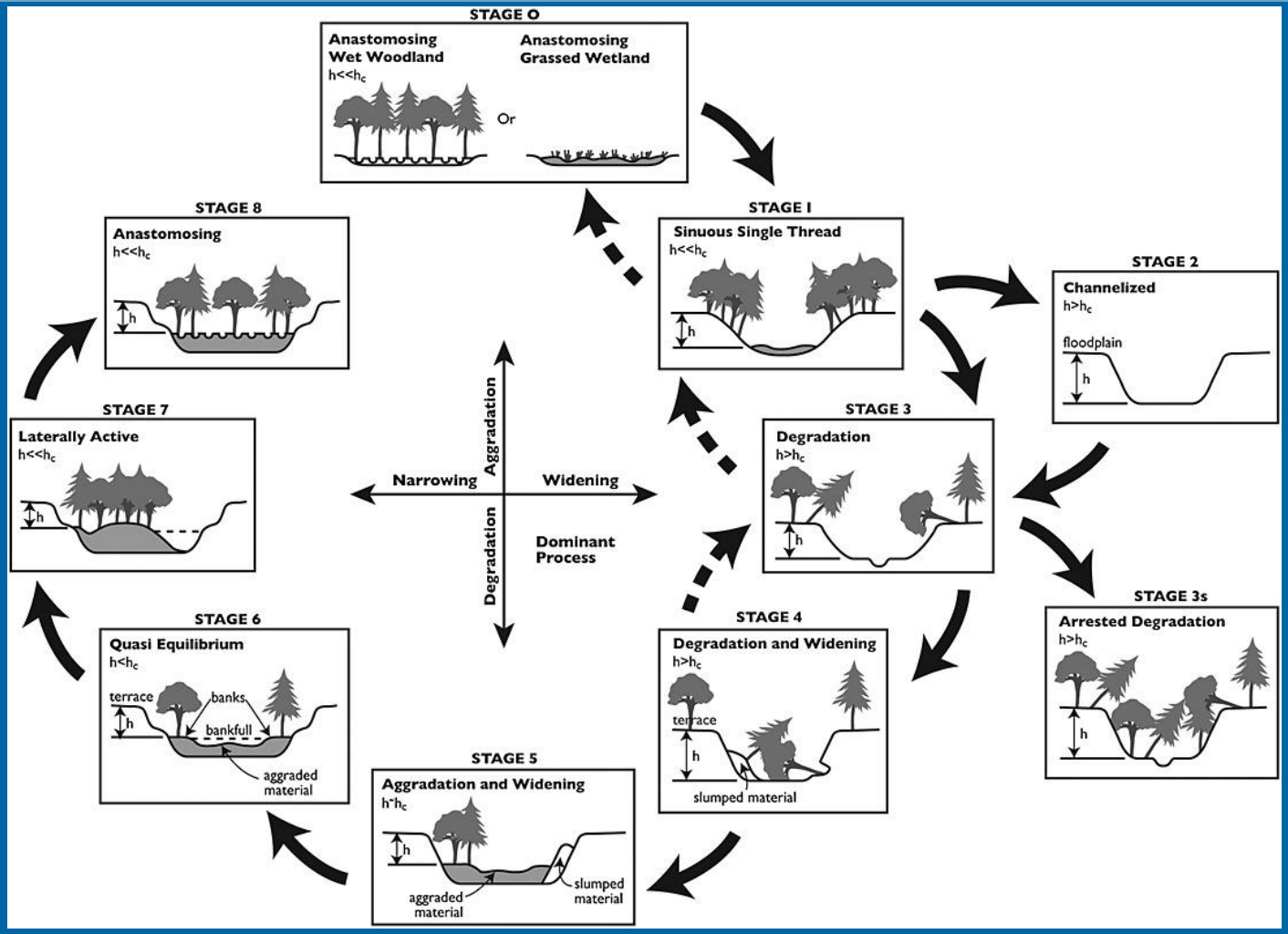


Cluer and Thorne (2013) A Stream Evolution Model Integrating Habitat and Ecosystem Benefits. *River Research and Applications* **30**:135-154


STAGE O
Anastomosing
Wet Woodland
h<<hc
Or
Anastomosing
Grassed Wetland

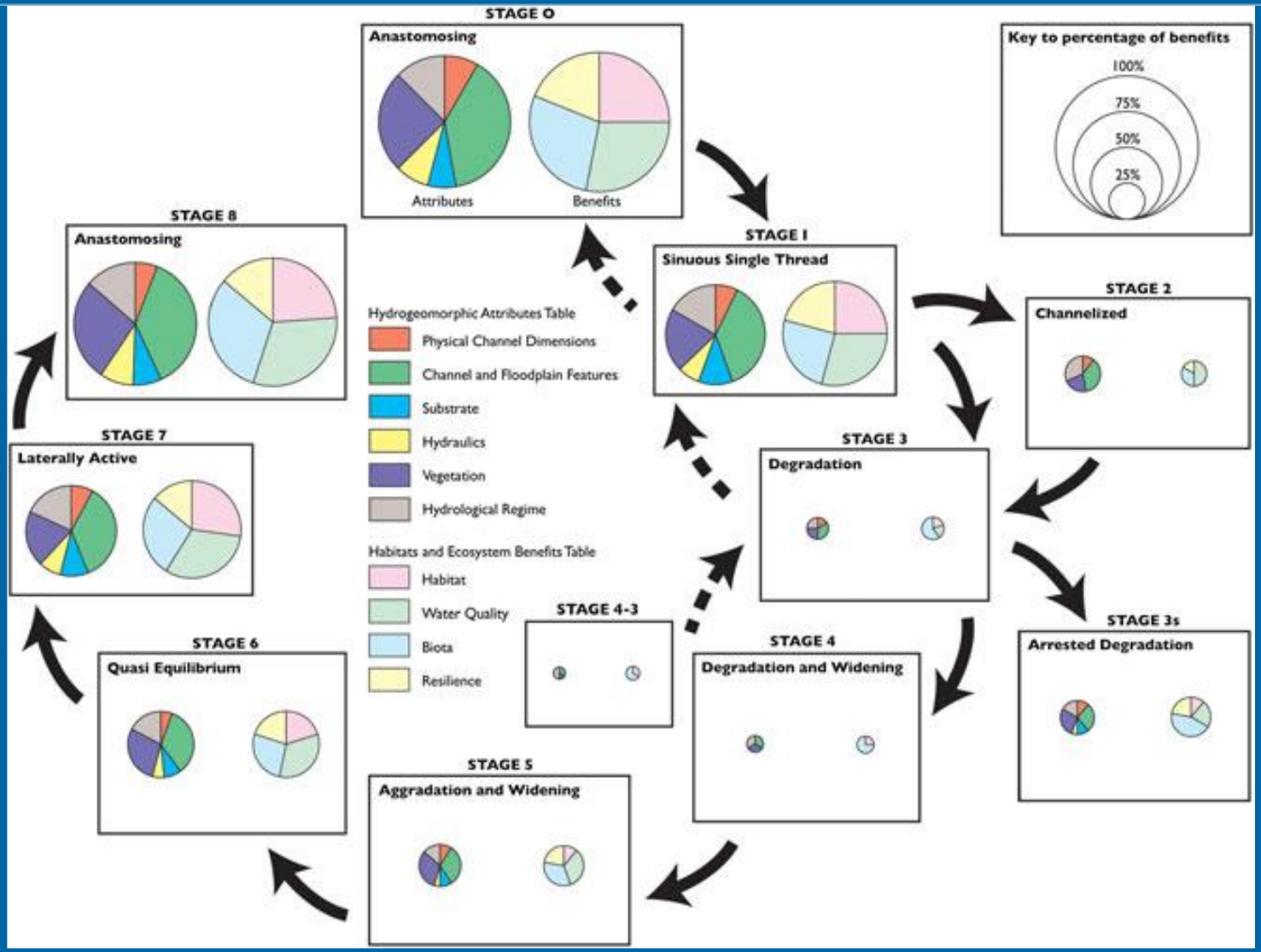

T1
T2
T3
T4
P1
P2
P3
P4
Stage 1: Stable
Flood plain
h < hc

Updated stream evolution model
(Cluer and Thorne 2014)



Cluer and Thorne (2014) A Stream Evolution Model Integrating Habitat and Ecosystem Benefits. *River Research and Applications* **30**:135-154

Evaluated attributes of each stage



Case Study: Wasson Creek

Reference wetland-stream complex (stage zero)

Where is Wasson Creek?

Indigenous Language Map of Oregon

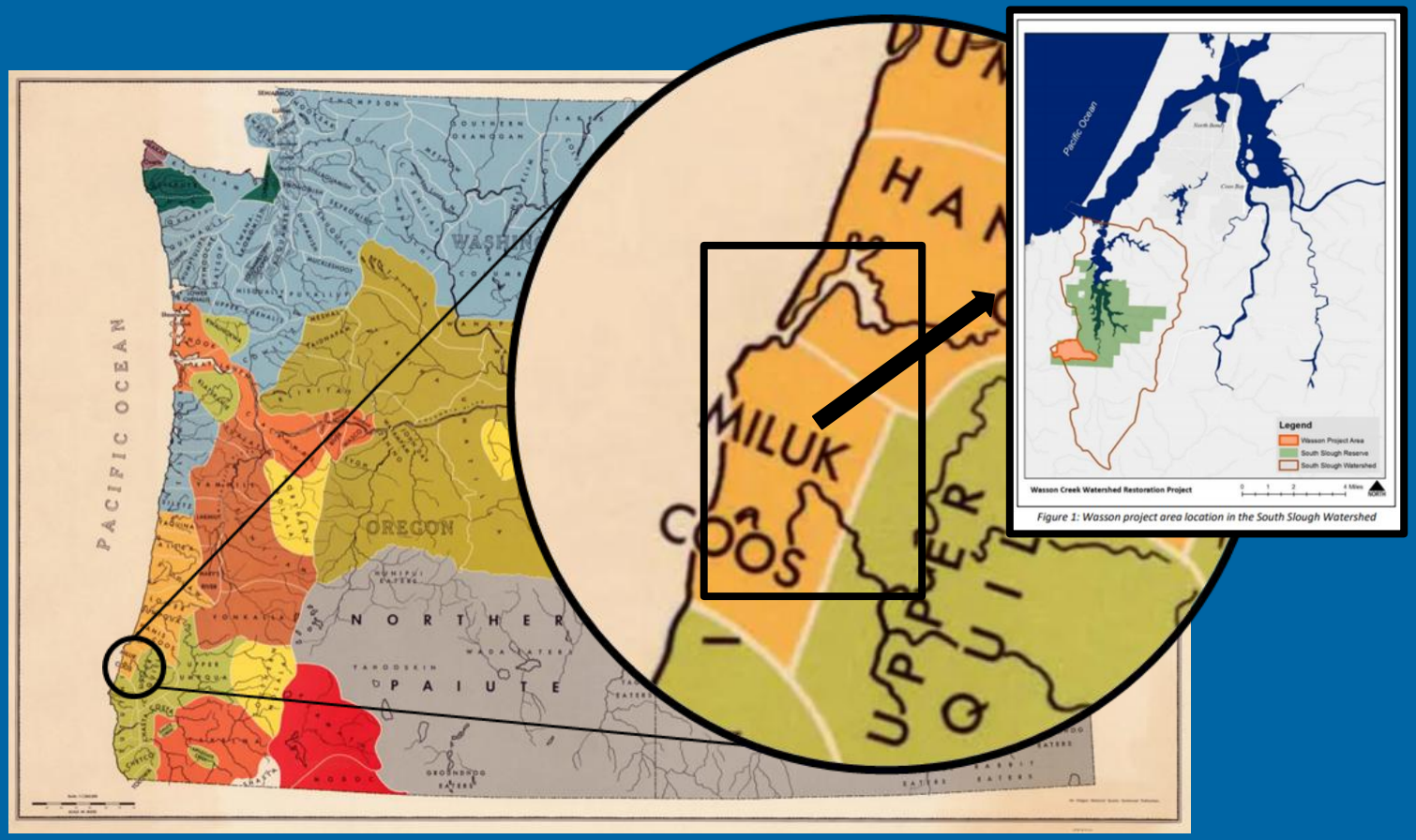
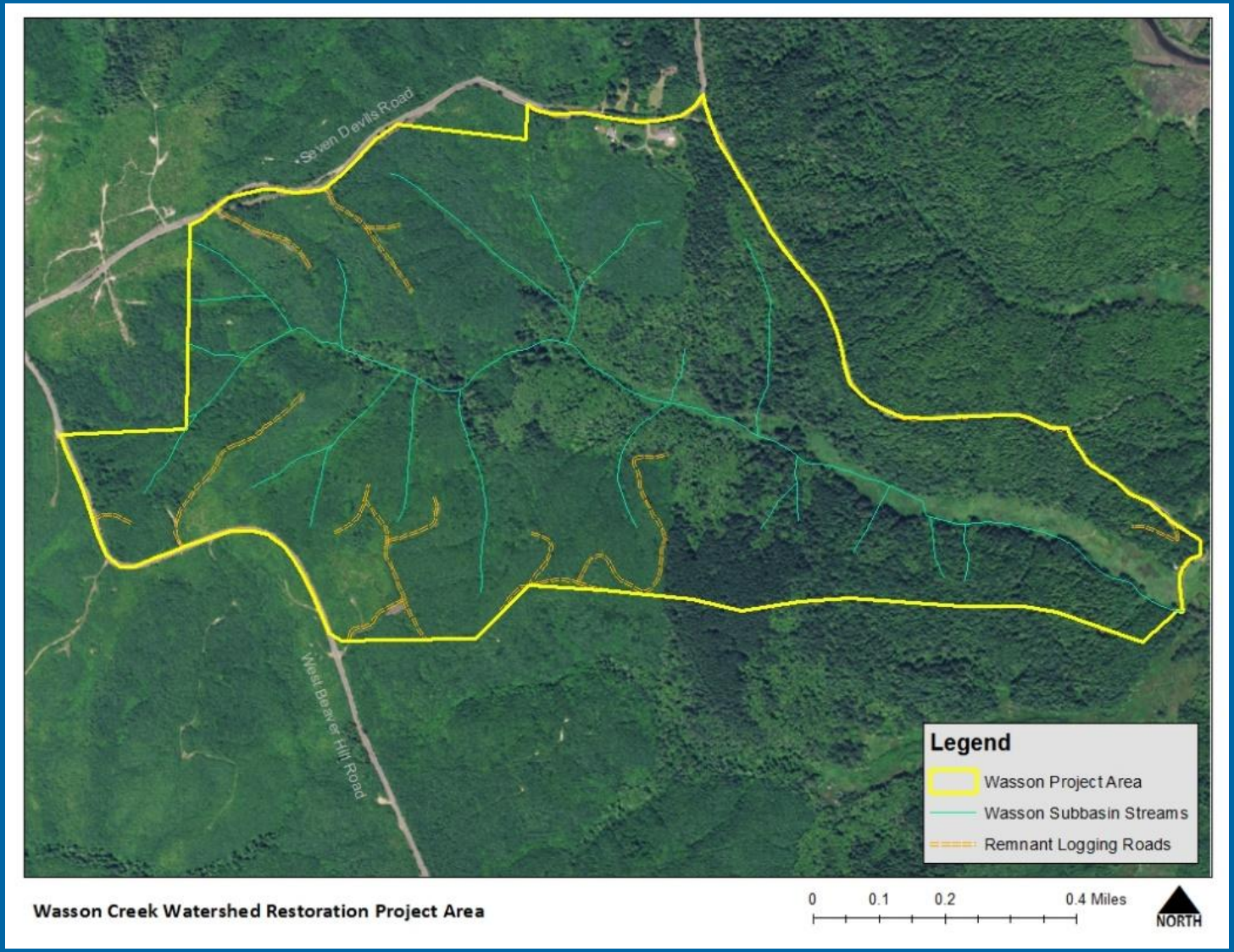


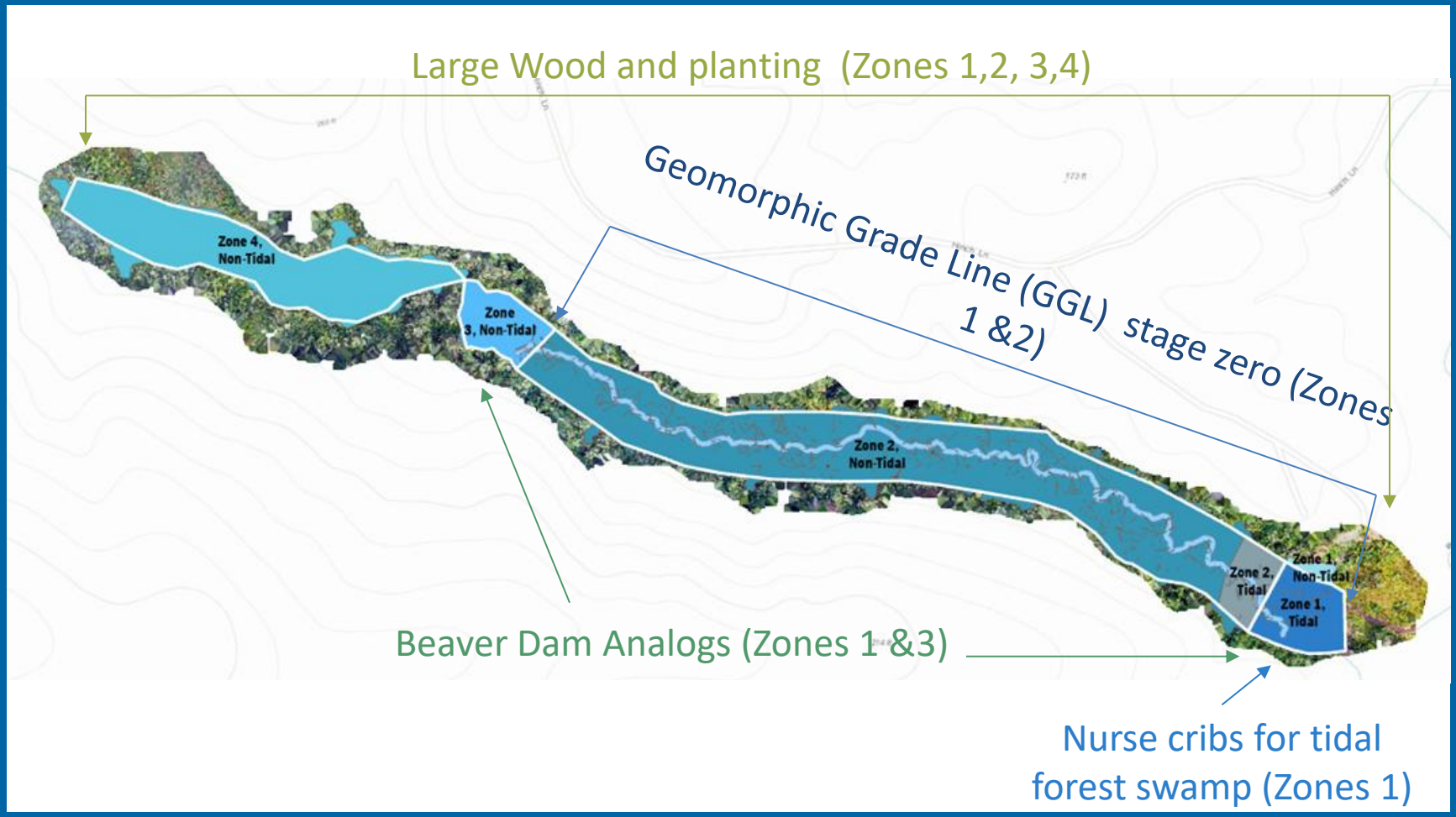
Figure 1: Wasson project area location in the South Slough Watershed

Wasson Creek Watershed



Planning

Management actions influenced by access and site conditions



Examples of data platforms used in planning

NOAA data viewer powered by Digital Coast

Water quality and weather/precipitation data available through the NERR Centralized Data Management Office (CDMO)

Examples of resources used in planning

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RESEARCH ARTICLE

WILEY

Rediscovering, reevaluating, and restoring Entiatqua: Identifying pre-Anthropocene valleys in North Cascadia, USA

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[1]USDA Forest Service, Washington, District of Columbia, USA
[2]Forest Service, Pacific Northwest Region, Portland, USA
[3]West Coast Region, NOAA Fisheries, Santa Rosa, California, USA
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Abstract

A maturing body of evidence suggests that anthropogenic impacts on river-wetland corridors (RWCs) are greater and more widespread than previously recognized. Partly, this stems from the difficulty of differentiating between legacy anthropogenic impacts and channel evolution resulting from natural disturbances. Here, we apply the geomorphic grade line (GGL) relative elevation model (REM) method to reveal pre-Anthropocene fluvial features for a 42-km reach of Entiatqua (English translation—the Entiat River) in the North Cascade Mountains, USA. We began by long profiling the entire length of the river valley and defining distinct valley segments based on breaks in profile. Next, we developed models of the valley profile for each segment, known as GGLs, and used them to develop high-resolution REMs by detrending LiDAR-derived digital elevation models. We then used the GGL-REMs to map relict fluvial features in the valley floor. Validating the GGL-REMs using surficial geologic maps, ^{14}Cdated soil profiles, and the identifiable remnants of historic dams

The Beaver Restoration Guidebook

Working with Beaver to Restore Streams, Wetlands, and Floodplains

Version 2.0, June 30, 2017

Photo credit: Worth A Dam Foundation (martinezbeavers.org)

Prepared by

US Fish and Wildlife Service
National Oceanic and Atmospheric Administration
University of Saskatchewan
US Forest Service

Janine Castro
Michael Pollock and Chris Jordan
Gregory Lewallen
Kent Woodruff

Funded by

North Pacific Landscape Conservation Cooperative

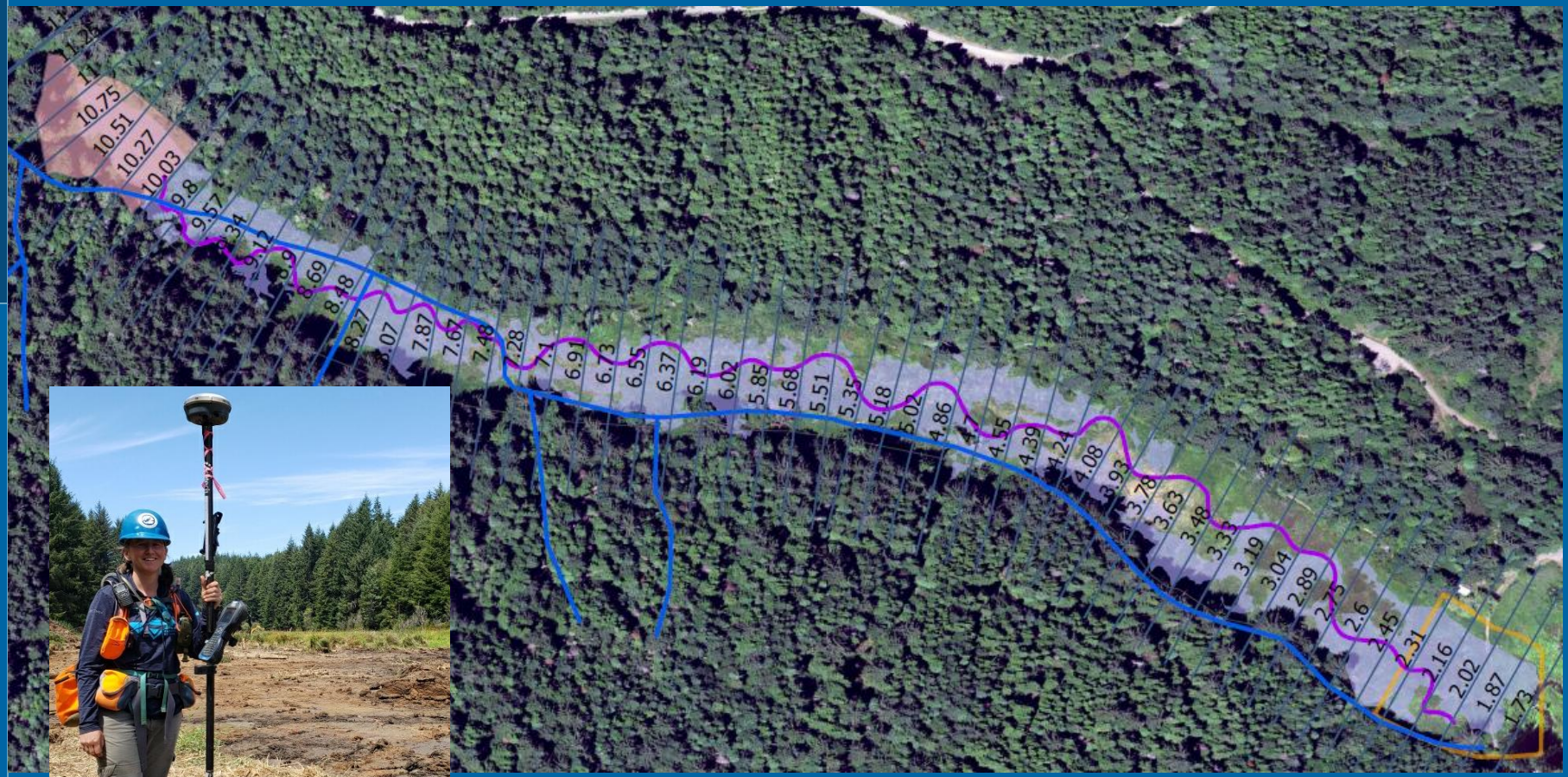
Restoring Tidal Swamps in the U.S. Pacific Northwest: Information for Restoration Practitioners

Fran Recht, Pacific States Marine Fisheries Commission
Laura S. Brophy, Estuary Technical Group, Institute for Applied Ecology
Joan Drinkwin, Natural Resources Consultants

May 2024

Pacific States Marine Fisheries Commission | PMEP Pacific Marine & Estuarine Fish Habitat Partnership | Institute for Applied Ecology

Target elevations based on geomorphic grade line (GGL) relative elevation model (REM) using 1m LiDAR elevation data



Model provided by USFS

Implementation

Grade to 1% and place large wood for process-based restoration

Implementation

Fish salvage relocated 9,897 fish and amphibians

Implementation

Beaver Dam Analogs to capture sediment and reconnect floodplain

Implementation

Nurse cribs to re-establish tidal forested swamp

Implementation

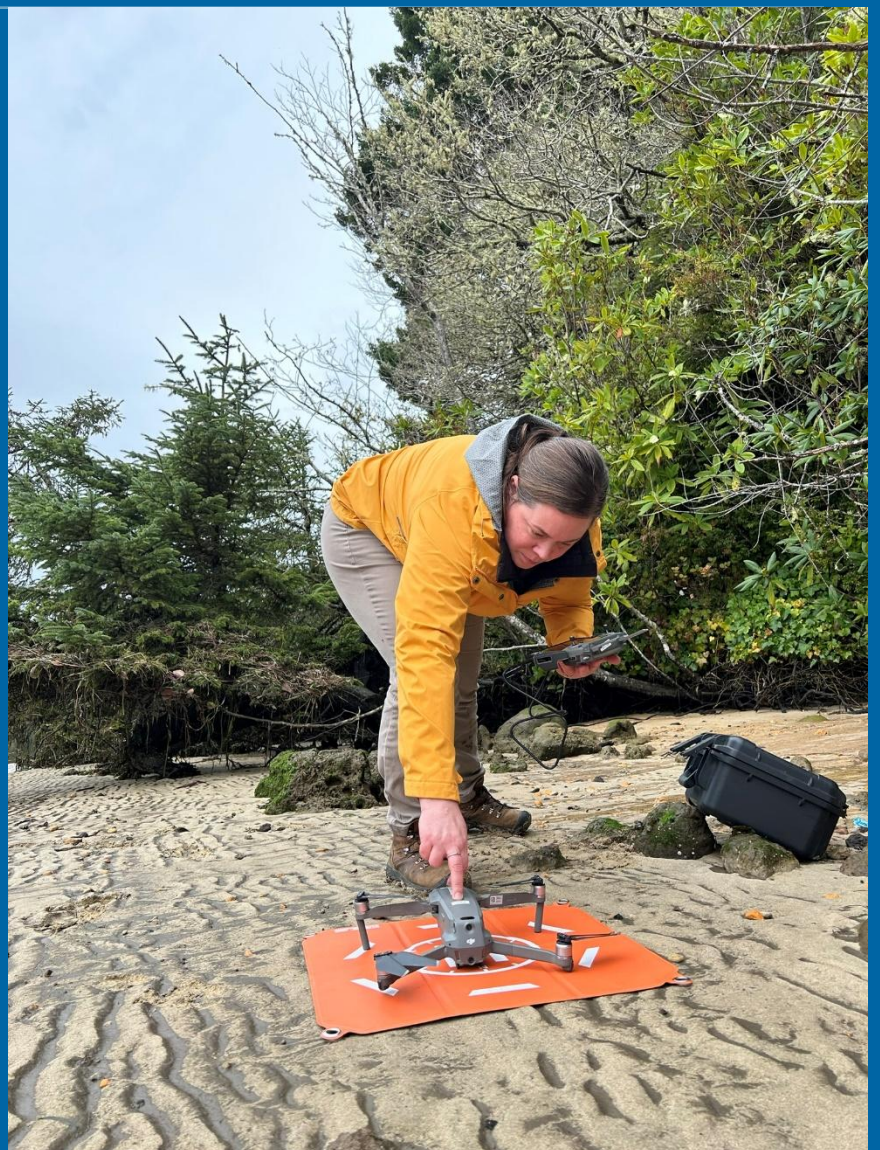
Invasive plant management to reduce reinvasion

Implementation

Planting to re-establish diverse native plant communities, opportunities for co-stewardship and biocultural restoration

Let the processes take over…

Effectiveness monitoring



Monitoring plan: available soon on South Slough Reserve website

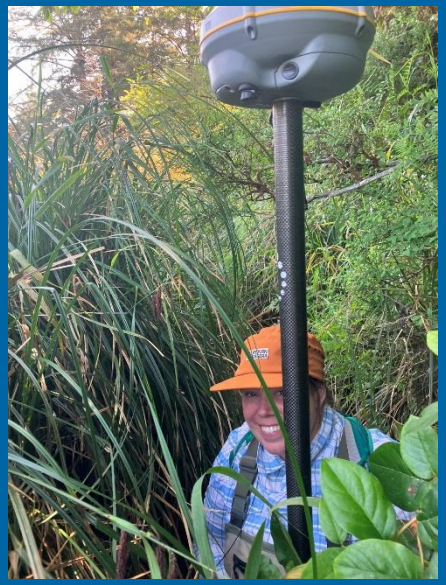
Monitoring plan for the Wasson Creek Ridgetop-to-Estuary Watershed Restoration project

Christopher Janousek[1], Jenni Schmitt[2], Alice Yeates[2], Jennifer Kirkland[2], Trevor Williams[1], Shon Schooler[2], Adam Demarzo[2], Ryan Scott[2], Alicia R. Helms[2]

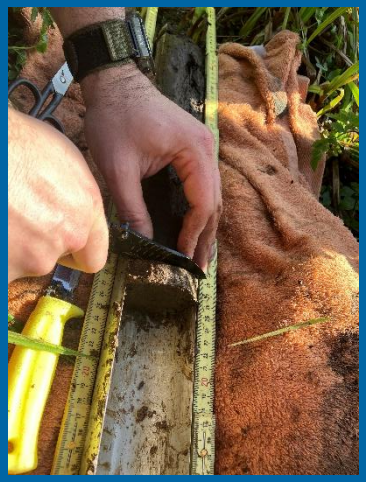
1 - Oregon State University, Corvallis, OR, USA.
2 - South Slough National Estuarine Research Reserve, Charleston, OR, USA.

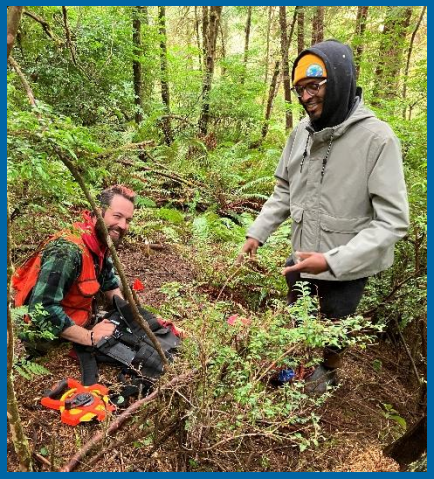
28 April 2025 (Version 1)

Publicly available data



There is going to be lots of data!





Made available by funders

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- Coos Basin Coho Partnership; Focused Investment Partnership (FIP) Funding
- Friends of South Slough; USFWS Coastal Program
- Coquille Tribe Community Fund

...and the hard work of many people









And many more

Adam DeMarzo
AJ Kliewer
Adam Levenson
Ali Grove
Ali Helms
Alicia Matthew
Allison Tarbox
Aloe Gallegos
Amy Borde
Amy Darr
Anna Clark
Anna Liang
Anne Farrell-Matthews
Annaliese Schrandt
Anyah Preston
Ari Arellano
Ashley Russell
Ashtin Bowden
Aspen Werelus
Becky Flitcroft
Brandi Goss
Bree Turner
Brent Ross
Brian Bloodworth
Brilyn Brecka
Caleb Galloway
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Clark McHahon
Clinton Epps
Colin Meston
Collette Yee
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Craig Cornu
Danni Danielson
Daphne Scriven
Daphne stone
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Dominic Librie
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Ed Hughes
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Fiona Carey
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Grady Guerrant
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Grey Wolf
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Jackson Thornburg
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Nathan Gross
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Ryan Singleton
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Shon Schooler
Sophie Segschneider
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Skye Whitney
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Travis Ciotti
Trevor Terry
Trevor Williams
Tristan Huff
Tom Moore
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Vanessa Robertson-Rojas
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Zach Nemeth
Zi Janszen
Zu Sikes