CTUIR River Vision -
Understanding and Restoring
Natural Floodplain Function

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Presentation Outline

1. Floodplain Basics
   - Definition & function
   - Tribal importance

2. Healthy Floodplain Characteristics and Benefits
   - Watershed, Biological, Social

3. Floodplain Current Condition and Problems
   - Current health and physical changes

4. Floodplain Management Recommendations
   - Land
   - Water

This information should inform chapters of the 2050 Plan (DFC, current conditions, ongoing efforts and additional needs & recommendations)
Floodplain Basic Facts

**Definition:** Valley bottom land adjacent to a river naturally subject to flooding and longitudinal, lateral and vertical connectivity critical for maintaining ecological diversity.

**Function:**

- Floodplains are part of natural river systems which are dynamic, with complex channel networks that access the floodplain, creating diverse habitat for fish production in surface waters and full recharge of interconnected groundwater.

- Healthy floodplains can improve water quality and quantity, reduce flood damage, and support cultural and recreational opportunities for human communities.
“A healthy river capable of providing First Foods that sustain the continuity of the Tribe’s culture. This vision requires a river that is dynamic, and shaped not only by physical and biological processes, but the interactions and interconnections between those processes.”
CTUIR’s First Foods-Based River Vision to Guide Fisheries Restoration

First Foods Serving Order:

1. Water
2. Salmon
3. Deer
4. Cous
5. Huckleberry

River Vision Touchstones:

Hydrology | Geomorphology | Connectivity | Riparian Vegetation | Aquatic Biota

Goal:

Restore Floodplain and Increase First Foods for Tribal Use
Aquatic Biota

Healthy Native Species
Healthy Floodplain Benefits
(Watershed Resources)

Natural Flood and Erosion Control
- Flood storage and conveyance, reducing flood peaks and velocities
- Reduce erosion impacts and sediment loading
- Replenish soils, enhancing riparian vegetation

Surface Water Quality Maintenance
- Filter nutrients and improve water quality
- Enhance surface-to-groundwater exchange and temperature reduction

Groundwater Recharge
- Promote stream access to floodplain for infiltration & aquifer recharge
- Reduce frequency & duration of low surface flows (enhance base flow)
Temperature/Channel Complexity Relationship

Channel Complexity Index

Trend in River Temperature

Distance in River Kilometers

Temperature Trend

River Complexity Index

Floodplain Management CTUIR
River Vision Application

April 3, 2011

Floodplain Management

CTUIR

[Graph showing river flow data with months and CFS values]
Healthy Floodplain Benefits
(Biologic Resources)

Biological Productivity

- Increase habitat complexity
- Maintain biodiversity of plants and animals, abundance of food - integrity of ecosystem
- Increase spawning and rearing habitat by maintaining stream length and access to side channels
Healthy Floodplain Benefits
(Societal Resources)

Harvest of Wild and Cultivated Products
- Increase abundance and harvest of native foods associated with floodplain
- Enhance agricultural productivity by increasing/maintaining groundwater levels
- Enhance and limit loss of agricultural lands by decreasing scour and erosion

Provide Cultural, Aesthetic and Recreational Use Values
- Contain cultural resources (historic and archeological sites)
- Increase recreational opportunities and aesthetic pleasure
Current Condition of Floodplains

Floodplain Health

- Endangered Species Act (ESA) recovery planning efforts determined that “watershed function” for subbasins in NE Oregon and SE Washington ranged from 25-50% due to poor watershed health and floodplain development.

- About 75% of streams in the WW Basin have been channelized which has drastically reduced stream length and floodplain connectivity.

- In the Umatilla and Walla Walla Subbasins, riparian wetland habitat has declined about 90% due to floodplain development over the last century.
Changing Eras and Changing Attitudes

Pre-development Era
- Abundant Water: Walla Walla name = land of many waters
- Abundant Fish: Lewis and Clark journals - Indian encampments

Development Era
- Local town named Freewater – settlement ploy
- Floodplain development - stream channelization
- Granted water rights exceeded instream flows
- Instream flows, floodplain health and salmon went extinct

Partnership Era
- Model partnerships for water management and fish restoration
- Cooperative solutions creating floodplain conditions that provide multiple purpose benefits
Umatilla River near Pendleton – loss of meanders due to floodplain development
Mouth of Walla Walla River – loss of meanders due to channelization
Grande Ronde River State Ditch construction cut off 45 stream miles
Problems in Floodplains

Wrong Management Emphasis
- Priority management goal is often flood loss reduction
- Natural processes in broad floodplains has been a lower priority
- Development-centered uses such as agricultural, municipal and roads have taken precedence over protection of floodplain function

Physical Changes
- Reduced floodplain area and formation of channelized floodway
- Armoring of banks with rip-rap to control erosion (creates incising)
- Reduced stream length, increase in gradient & water velocity
- Loss of instream and substrate habitat diversity
- Disrupted geomorphic processes (channel migration, side channels, islands, sediment transport and sorting and large wood transport)
- Over-appropriation of surface flows and shallow groundwater
- Construction of dams – disrupt fish passage and habitat diversity
Walla Walla River flows at seven management points versus Bi-State project flow targets
Typical Floodplain Development
5-mile ditch-type Nursery Bridge reach is constrained by levees and is deeply incised.

Figure 11.—Walla Walla River in the 1964 flood showing meanders in a channelized section near Milton-Freewater. (Source: OSU Archives)
Nursery Bridge M-F Water Control District Reach Phase II/Phase III Channel Restoration Project

- Designs ongoing to set back levees and restore floodplain
Concrete Lining and Channelization - Weirs in Mill Creek
The five segments balance consideration of channel type and adjacent land use context:

Segment 1 – RM 0 (mouth) to RM 4.8 (Gose Street). Natural channel with no flood control structures.
Segment 2 – RM 4.8 (Gose Street) to RM 6.7 (just downstream of 9th Avenue Bridge).
Segment 3 – RM 6.7 (just downstream of 9th Ave Bridge) to RM 8.4 (just upstream of Roosevelt St Br). Downtown flume section.
Segment 4 – RM 8.4 (just upstream of Roosevelt Street Bridge) to RM 12.1.
Segment 5 – RM 12.1 (end of MCFCZD) to just downstream of RM 15 (7 Mile Bridge). Characterized by a natural channel.
Floodplain Land Management Recommendations

1. Halt or Minimize New Development in Floodplains and Wetlands

- Strengthen land use regulations to prohibit further development in floodplains, springs & wetlands and historic stream channels.
Feedlot near stream

Concrete backyard stream

Residential and agricultural development

Highway and levee encroachment

Channelization with weirs and summer cesspools
Floodplain Land Management Recommendations

2. Improve Post-Flood Floodplain Processes and Actions

- Improve regulatory processes that provide more flexible re-evaluation and responses to flood-damaged levees and floodplains that provide increased multi-purpose benefits.
- Develop local flood-response plans that bring together regulatory and resource agencies for improved and directed actions instead of independent and often non-permitted reactions.

Walla Walla River below Couse Creek Bridge 2/10/2020
Floodplain Land Management Recommendations

3. Reconnect Streams with Floodplains

- Identify locations to reclaim natural floodplain habitat and function.
- Promote removal or set back of dikes and levees.
- Increase area of riparian conservation easements.
- Promote relocation of flood-damaged development rather than redevelopment in floodplain.
- Implementation of above floodplain restoration actions may be the best preventative action for minimizing anticipated effects of climate change.
- Increase education and outreach to promote understanding of the broad and multiple benefits of healthy floodplains.

Upper Grande Ronde River Before (2016) and After (December 2019)
Meacham Creek floodplain restoration project - before (2011) and after (2013)
Streams Relocated From Straight Property Lines to Former Sinuosity
Increased Stream Sinuosity to Access More Floodplain

Catherine Creek (CC37)
Post-Construction Alignment

Approximate alignment of the pre-construction creek route

Pre-Construction Alignment
Channel Restoration – South Fork Walla Walla River
Conservation Easement Bordering Channel Restoration Project
Floodplain Water Management Recommendations

1. Surface Water Regulatory Statutes

- Increase opportunities or incentives for development of conservation projects such as irrigation efficiency, water transactions, strategically located shallow aquifer recharge (SAR) and restoration of natural floodplains.
- Strengthen water law to identify, quantify and protect increased instream flows resulting from water conservation efforts.
- Encourage and develop legal mechanisms for use of groundwater through recharge efforts (aquifer storage and recovery - ASR), in exchange for protected surface flows.
- Quantify and protect ecological flows from further appropriation (particularly spring/winter flows which are often considered “available”).
Floodplain Water Management Recommendations

2. Groundwater Withdrawal Impacts to Surface Flows

- Strengthen the legal connection and *co-management linkage* between surface water rights and groundwater rights and *increase regulation of groundwater usage* impacting surface flows.

- Identify areas where floodplain groundwater use impacts surface flow and *promote aquifer recharge* to lessen impacts.
Floodplain Water Management Recommendations

3. Monitor, Protect and Enforce Instream Flows

- Strengthen state and local monitoring and protection of quantified instream water rights -- particularly “new conservation project flows” that would otherwise be absorbed by junior water right holders.

- Shift water management focus and funding priorities from developing new consumptive water uses to monitoring and enforcement of existing water rights and protecting new instream water rights.

Stream dewatering from surface diversions

Same reach - increased flow
Dual Land and Water Floodplain Management Recommendations

Integrate Land and Water Management Functions

- Entities that manage both floodplain lands and surface/groundwater must acknowledge the inseparable interrelationships and closely integrate the management of all these to fully realize and protect the benefits of a healthy functioning floodplain.

- There must be close coordination and integration between groundwater and surface water management entities that acknowledges and limits the impacts that groundwater withdrawals have on surface flows.

- Floodplain land or water management entities that have similar responsibilities in neighboring jurisdictional boundaries must have closely integrated and compatible regulatory provisions to fully realize and protect the benefits of a healthy functioning floodplain.
Floodplain Issues Continuing in 2020

- Post 2020 flood responses were very reactionary and not considerate of multiple floodplain resource values.
- Some actions were not necessary for flood risk protection and there was a lack of regulatory presence and compliance.

Bulldozing gravel from floodplain and active stream to recreate soft levees

Re-channelization restricts braiding and channel access to floodplain
Floodplain Issues Continuing in 2020

- Road reconstruction in S Fork WW River to provide access to cabins
- About 4 miles of road in floodplain with 14 stream crossings
- Prime steelhead, bull trout and spring Chinook habitat

- Regulatory agencies need to be more attentive and restrictive to floodplain disturbances
- Need alternative access that can appease both owners and fish
Floodplain Issues Continuing in 2020

- All wood deposits on Touchet River floodplain near Dayton were removed following 2020 flood

- Need increased awareness that wood in floodplain is natural with high ecological benefit

- Regulatory agencies need to be more attentive and restrictive to floodplain disturbances

- Need to stop treating streams as single-purpose water transport “ditches”