Kootenai River Habitat Restoration Project Master Plan: A Framework for Implementation of an Ecosystem-based Restoration Program

Kootenai Tribe of Idaho

Funding:

Presentation by: Matt Daniels
Presentation Outline

• Provide project overview and discuss purpose

• Describe existing ecological conditions and limiting habitat factors

• Introduce project partners and collaborative process

• Present the Master Plan framework
Subbasin Characteristics

- Drainage Area
  - 16,180 mi²
- River Length – 55 miles
- Geology
  - Terraced Alluvial
  - Glacio-lacustrine
- Stream Types
  - C4, D4, F4, C5, E5
- Mean Annual Peak Q
  - Pre-dam 65,000 cfs
  - Post-dam 30,000 cfs
- Channel Width
  - 500 to 700 ft
- Decreasing Gradient
  - 0.00065 to 0.00002
Project Purpose

• Restore and enhance ecosystem resilience by addressing ecological limiting factors.

• Restore and maintain habitat conditions that support all life stages of focal species including endangered Kootenai River white sturgeon (*Acipenser transmontanus*); and

• Restore the landscape in a way that sustains the local culture and economy.
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Kootenai People and Culture
Existing Conditions
Altered Landscapes

Timber and Mining

Levees and Dikes
Existing Conditions
Development and River Management

Agriculture and Grazing

Bank Armoring

Transportation Corridors

Altered Regimes
Altered Regimes

![Graph showing discharge over time with labels Pre-Dam and Post-BiOp.](image)

- **Pre-Dam**
- **Post-BiOp**
Loss of Floodplain Connection
Existing Conditions
Geomorphology and River Response
Vegetation Conditions

- Lack of Roughness
- Levee Maintenance
- Altered Hydroperiod
- Weeds and Disturbance

Wetland Loss

1880 lakes and wetlands
1928 perennial wetlands
1990 perennial wetlands
Kootenai River White Sturgeon
*(Acipenser transmontanus)*

**Status**

- Aging population and virtual lack of natural recruitment
- Federally listed as endangered
- Sustained by Kootenai Tribal hatchery conservation aquaculture program

**Recruitment Failure Hypotheses**

- Egg suffocation/incomplete incubation
- Altered flow and temperature regimes
- Larval food limitation/starvation
- Over-wintering energy deficiency
White Sturgeon: Endangered

Bull Trout: Threatened

Westslope cutthroat: Petitioned

South Arm Kokanee: Functionally Extinct

Burbot: Petitioned
Master Plan Process

• One year timeline

• Collect, compile and summarize large amounts of data

• Peer review

• Multiple workshops with design team and project collaborators
Kootenai Tribe of Idaho

Holistic
Science Based
Community-supported
Collaborative
Adaptive
Project Collaborators

• Bonneville Power Administration
• U.S. Army Corps of Engineers
• U.S. Fish and Wildlife Service
• Idaho Fish and Game
• British Columbia Ministry of Environment
• Montana Fish, Wildlife and Parks
• Confederated Salish and Kootenai Tribes
• State of Montana
• State of Idaho
• USGS
Chapter 1 – Introduction

• Project Overview
• Goals and objectives
• Links to other restoration programs in the basin

Goals and Objectives
Statements that express the desired conditions in measurable terms
Project Goals

• **Morphology.** Restore physical habitat by reducing the negative effects to river and floodplain ecological processes caused by river response to the altered landscape.

• Riparian vegetation. Restore native vegetation by establishing stream bank and floodplain conditions that sustain plant community development processes.

• Aquatic habitat. Restore aquatic habitat conditions that support all life stages of native fish and promote sustainable populations.

• River stewardship. Create opportunities for river and floodplain stewardship in the community.
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Chapter 2 – Kootenai River Ecosystem and Limiting Habitat Factors

• Overview of ecosystem response

• Summary of limiting factors

Limiting Factors & Constraints
Conditions that limit ecosystem resilience and habitat for focal species
Chapter 3 – Restoration Strategies, Treatments and Habitat Actions

‘Toolbox’ of restoration strategies, restoration treatments and habitat actions for addressing the limiting habitat factors

**Restoration Strategy**
A general approach for overcoming limiting factors in a reach

**Restoration Treatment**
A practical concept for implementing a restoration strategy

**Habitat Action**
The set of restoration treatments that address the limiting factors within a reach
Chapter 4 – Implementation Scenarios

• Spatial application of habitat actions ‘toolbox’ based on data about limiting factors and other resources.

• Minimum, moderate and maximum implementation scenarios represent potential levels of restoration effort.

**Implementation Scenario**
A spatial application of a habitat action, i.e., a conceptual restoration project
Chapter 5 – Adaptive Management and Monitoring

• Overview of the decision making framework used to determine restoration project effectiveness, maintenance needs, and necessary modifications of treatments or designs.

Chapter 6 – Environmental Compliance & Consultation

Adaptive Management and Monitoring Program
A long term decision making framework

Environmental Compliance
Overview of anticipated permitting requirements
Chapter 7 – Estimated Costs

• Cost development followed standard and accepted industry practices for a project of this type and size.

• Established cost methods for eight categories, i.e., design, permitting, construction, monitoring, etc.

• Developed cost estimates and calculated unit costs for restoration treatments, i.e., bank structures, wetland construction, revegetation, etc.

• Calculated estimated costs based on minimum, moderate and maximum implementation scenarios representing potential levels of restoration effort.

• Addressed cost factors such as phasing, inflation, escalation and economy of scale.
Chapter 8 – Funding Strategy

• Established a conceptual funding strategy.
• Identified potential funding and grant sources.
Chapter 9 – Next Steps

• Established project management framework.

• Identified future project phases.

• Summarized data collection needs for design.
Summary

The Kootenai River Master Plan:

- Provided a summary of large amounts of existing and new information related to the Kootenai River.

- Identified measureable goals and objectives.

- Established a framework to guide ecosystem restoration in a large, complex watershed.

- Was developed collaboratively by a diverse, international partnership of tribal, federal, state and provincial stakeholders.
Acknowledgements

Citation:
www.kootenai.org/fish_restoration.html

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