Tribal Non Point Source Program Management: Accomplishments and Lessons

Chauncey Means
Confederated Salish and Kootenai Tribes
Flathead Indian Reservation

- 1855 Hellgate Treaty
- 1.3 million acres
- 63 percent Tribal
- South half of Flathead Lake
- Wildlife, fish, culture
Outline

- NPS Pollution
- CSKT NPS Program
- Past NPS projects on the Reservation
- Water Quality Monitoring
- Public Outreach
CSKT NPS Program

- CSKT earned TAS in 1997 for Water Quality
- NPS program was established in 2001
- 10 restoration grants implemented
- Monitor the Flathead Indian Reservation for NPS pollution
- Work with other agencies (Tribal and non-Tribal)
- Educate the public
NPS Pollution on the Reservation

- Primary NPS stressors on the Flathead Reservation
  - Sediment
  - Temperature
  - Nutrients

- Primary causes
  - Irrigation diversions and return flows
  - Unregulated grazing
  - Loss of riparian vegetation
  - Channel Modification
EPA Competitive NPS Grants

- EPA competitive grants last 1-5 years
- Competing with other Tribes with TAS
- $100,000 budget
Choosing a NPS Project

- Has to be associated with a natural stream, river, wetland, lake, or groundwater source (irrigation canals do not qualify).
- A project in which success can be measured.
- Landowners who seek assistance.
- Good water quality data (from assessments).
- Working with other Tribal agencies.
5 year grant timeline

- **1\textsuperscript{st} year**
  - Begin water quality monitoring (Once a month for 8 months)
  - Advertise for design contractor

- **2\textsuperscript{nd} year**
  - Continue WQ monitoring
  - Implement project design (advertise if necessary)

- **3\textsuperscript{rd} year**
  - Continue WQ monitoring
  - Complete project BMPs

- **4\textsuperscript{th} year**
  - Continue WQ monitoring
  - Evaluate project BMPs for success and/or failures

- **5\textsuperscript{th} year**
  - Continue WQ monitoring
  - Fix BMP failures if needed, project maintenance
  - Write final report to funding agency

- Submit mid-year and end of year reports to funding agency each year of funding
Measuring Success

- Water Quality Monitoring
- Satisfy EPA/Tribal Water Quality Standards.
- Wetlands Functionality
- Aesthetics
- Benefits to humans, wildlife, fish
Christensen Ranch BMP’s

- Livestock water gap.
- Electrified exclusion fencing.
- Re-vegetation of riparian area.
Electrified Cattle Exclusion Fencing
Re-vegetation
Livestock Watering Gap
Brant Ranch BMPs

- Exclusion fencing of riparian area.
- Armored cattle crossing/watering gap.
- Riparian restoration with native species.
- Restore eroding banks.
McDonald Ranch BMPs

- Install new bridge.
- Exclusion fencing.
- Restore natural meanders and pools to LBR.
- Restore riparian corridor with native species.
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Table 1. Little Bitterroot River upstream of McDonald Ranch.

*note: Start of post BMP monitoring as all BMP’s were completed 10/20/2009.

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Table 2. Little Bitterroot River downstream of McDonald Ranch.

*note: Start of post BMP monitoring as all BMP’s were completed 10/20/2009.
Printz Ranch BMPs

Original BMPs:
- Stabilize eroding stream banks.
- Riparian restoration using native species.
- Exclusion fencing.

Actual BMPs installed:
- Construction of a pig enclosure.
- Install a frost free heated water well.
Figure 1. Jocko Spring Creek project overview
BMP’s

- Stabilize undercut and slumping banks.
- Re-vegetate riparian area with native vegetation.
- Divert stream to original channel.
- Exclusion Fencing.
- Weed Spraying.
- Install bridge.
- Remove irrigation canal.
Woody Debris Jam
Channel Spanning Woody Debris Jam
Stream Diversion Into Original Channel
Mission Creek
Low priority bank treatment
(Construct at engineer’s discretion)

LARGE WOOD DEBRIS JAM
STRUCTURE DETAIL
SHEET MC-12

COBBLE TAILOUT
STRUCTURE DETAIL
SHEET MC-13

VEGETATED WOODY MATRIX
STRUCTURE DETAIL
SHEET MC-11

Bank grading
Point bar grading
Gravel placement
Potential gravel source
Cobble tailout structure

Vegetated woody matrix
Woody matrix
Large wood debris jam

Contours are derived from 2006 LIDAR and may not accurately reflect current elevations in some areas where the channel has migrated.
E. Coli Bacteria Levels
Cottonwood and Valley Creek Projects

- Cottonwood Creek began in 2017 and will be completed in 2022
  - Impairments to stream come from grazing and forest roads
  - Westslope Cutthroat Trout fishery

- Valley Creek began in 2018 and will be completed in 2022
  - Agriculture related impairments
  - Bull Trout fishery
Water Quality Monitoring

- Each project samples 7-8 times per year
- Once per month
- YSI probe collects physical parameters
- Water samples also taken and sent to lab for analysis
- All data is recorded in notepads, on forms, and digitally.
YSI Probe and hand held, courtesy of YSI inc.
Collecting water samples
Public Outreach

- Tool to educate public of pollution
- Also used to identify possible projects
- Environscape
  - River honoring
  - Sci-nation Tent Arlee Powwow
- Augmented Reality Sandbox
Augmented Reality Sandbox

Shaping Watersheds

Topographic map of a connected landscape

In this model, different colors represent different elevations like a topographic map. Contour lines join together points with the same elevation. The distance between the lines (contour interval) shows the steepness of a landscape. The closer the lines are together, the steeper the slope of the hill.

Contour lines are used to show what the landscape looks like on flat maps. Different spacings and shapes of lines indicate three-dimensional features on the surface of Earth.

Where does the water flow?

The mountains and lakes you see represent parts of a watershed or basin — an area of land that is connected by the water that flows over it.

The "virtual" rain that falls on the landscape flows downhill. The steeper the mountain, the faster the water travels down a river until it empties into a wetland, pond, or lake.

try this

- Look at the watershed landscape below.
- Make it rain by holding your hand over the watershed.
- Drain the basin by holding down the yellow button.
- How far apart are the black lines on a steep-sided mound? On a gentler slope?
Augmented Reality Sandbox
Thank You!

Questions?