Meeting Summary

Kootenai River Habitat Restoration Program
Meeting to Identify Meander Reach Restoration Opportunities

June 27, 2017 – 10 AM to 4 PM
Kootenai Tribal Headquarters, Bonners Ferry, ID

Meeting attendees

Matt Daniels (RDG), Sarah Flynn (Geum), Ryan Fosness (USGS), Ryan Hardy (IDFG), Greg Hoffman (USACE), Charlie Holderman (KTOI), Genny Hoyle (KTOI), Sue Ireland (KTOI), Kevin McDonnell (IDFG), Norm Merz (KTOI), Tom Parker (Geum), Ryan Richardson (RDG), TJ Ross (IDFG), Doug Smith (GBI), Scott Soults (KTOI), Alison Squier (Ziji), and Shawn Young (KTOI).

1. Meeting purpose and overview

The purpose of the meeting is to collect information from a small group of individuals with a great deal of on-the-ground knowledge of the Meander Reach of the Kootenai River, to help inform design and selection of Kootenai River Habitat Restoration (KRHRP) projects. Prior to this meeting the Tribe's KRHRP design team also met with Fish and Wildlife Department staff and some Tribal Council members in a variety of settings to gather and share information about the Meander Reach (e.g., habitat conditions, knowledge from other Tribal projects, fish use, anecdotal knowledge, and landowners).

Outputs from this meeting, and other coordination efforts, will be compiled and used to inform development of preliminary concept designs and documentation of background information about the Meander Reach for an October 2017 Peer Reviewer Advisory Team (PRAT) and Co-Manager and Agency Review Team (CMART) workshop.

2. Meander Reach overview

Matt Daniels and Tom Parker presented the following overview of the Meander Reach including previous PRAT and CMART input:

Meander Reach Restoration Opportunities

Limiting Factors Addressed by Meander Reach Projects

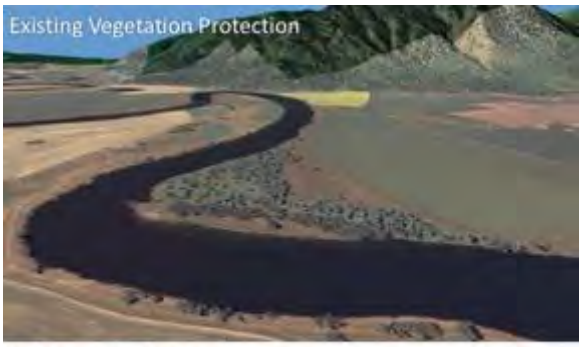
Existing Conditions

- Sand levees along river
- Former glacial lake—floodplain is low relative to river channel
- Alluvial fans extend into floodplain; influence tributary morphology
- Wetlands drained and converted to agriculture
- Backwater effect results in reservoir-like conditions
- Limited nutrients

Aquatic Habitat Restoration / Enhancement

- Increase aquatic habitat complexity
- Revegetate banks
- Excavate bank notches
- Increase point bar roughness and enhance backwater areas

Existing Vegetation Protection

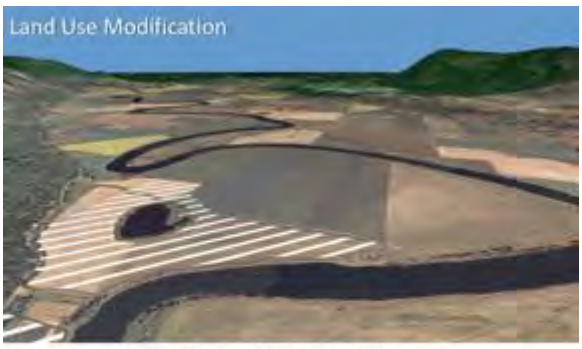


- Install exclosure fencing
- Supplemental planting
- Control weeds

Floodplain Restoration / Enhancement

- Lower floodplain surfaces adjacent to river
- Revegetate and add roughness
- Control weeds
- Exclude livestock; temporarily exclude wildlife

Land Use Modification



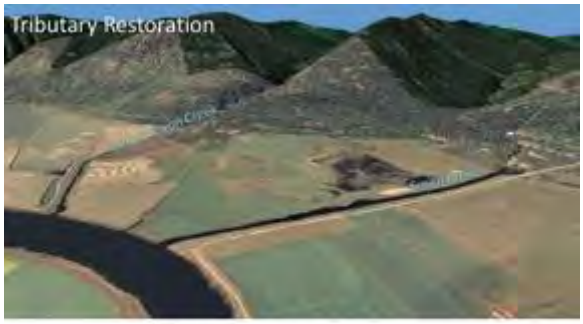
- Leave some fields fallow at certain times of the year
- Revegetate irrigation/drainage ditches
- Explore conservation measures

Off-channel Wetland Enhancement

- Modify agricultural use, working with landowners
- Supplement existing vegetation
- Control weeds
- Enhance connection with Kootenai River where possible

- Restore historical wetlands and lakes where possible
- Revegetate floodplain areas
- Evaluate potential conservation measures

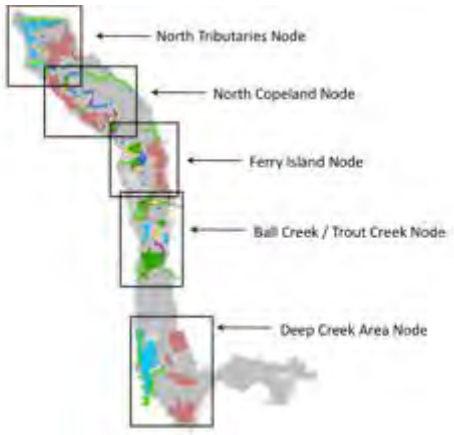
- Add roughness elements to promote deposition
- Place instream fill to expand depositional surfaces
- Enhance existing vegetation through planting & seeding
- Exclude wildlife & livestock to eliminate browse pressure



- Realign channels and separate agricultural uses
- Restore floodplain and enhance riparian buffers
- Improve mainstem connectivity to maintain fish passage at key flows

Meander Reach Feasibility Issues

- Large number of potential projects over a large geographical area
- Predominantly agricultural land use and private land ownership
- Coordinating existing conservation management plans with KRHRP goals for existing conservation lands (Wildlife Management Area, USFWS National Wildlife Refuge, Nature Conservancy)
- Water rights, Boundary County levees, privately constructed floodplain berms and irrigation infrastructure
- Identifying projects that provide habitat and food web benefits to sturgeon, burbot, kokanee, and trout
- Evaluating ecosystem benefits of smaller, disconnected projects
- Funding opportunities and implementation timeframe



2013 PRAT / CMART
Restoration Opportunity Rankings

1. Deep Creek
   - *Good potential for tributary enhancement and Refuge wetland reconnection that would increase productivity*
2. Ball Creek/Trout Creek
   - *Good opportunity for collaboration with TNC; A lot of planning work has gone into potential restoration activities on Ball & Trout Creeks*
3. North Tributaries
   - *Boundary Creek WMA reconnection potential and productive tributaries; downstream portion of river to Kootenay Lake delta supports large population of juvenile sturgeon & burbot*

2016 PRAT / CMART
Meander Reach Input

Food Web:

- Preliminary data: lack of food sources (zooplankton) for larval burbot – may be limiting for sturgeon & other species
- Nutrient loss associated with loss of riparian forest and wetlands
- Restore riparian forest for primary production and habitat value
- Find ways to deliver food sources in off channel wetlands to the river
- Increase kokanee production in tributaries

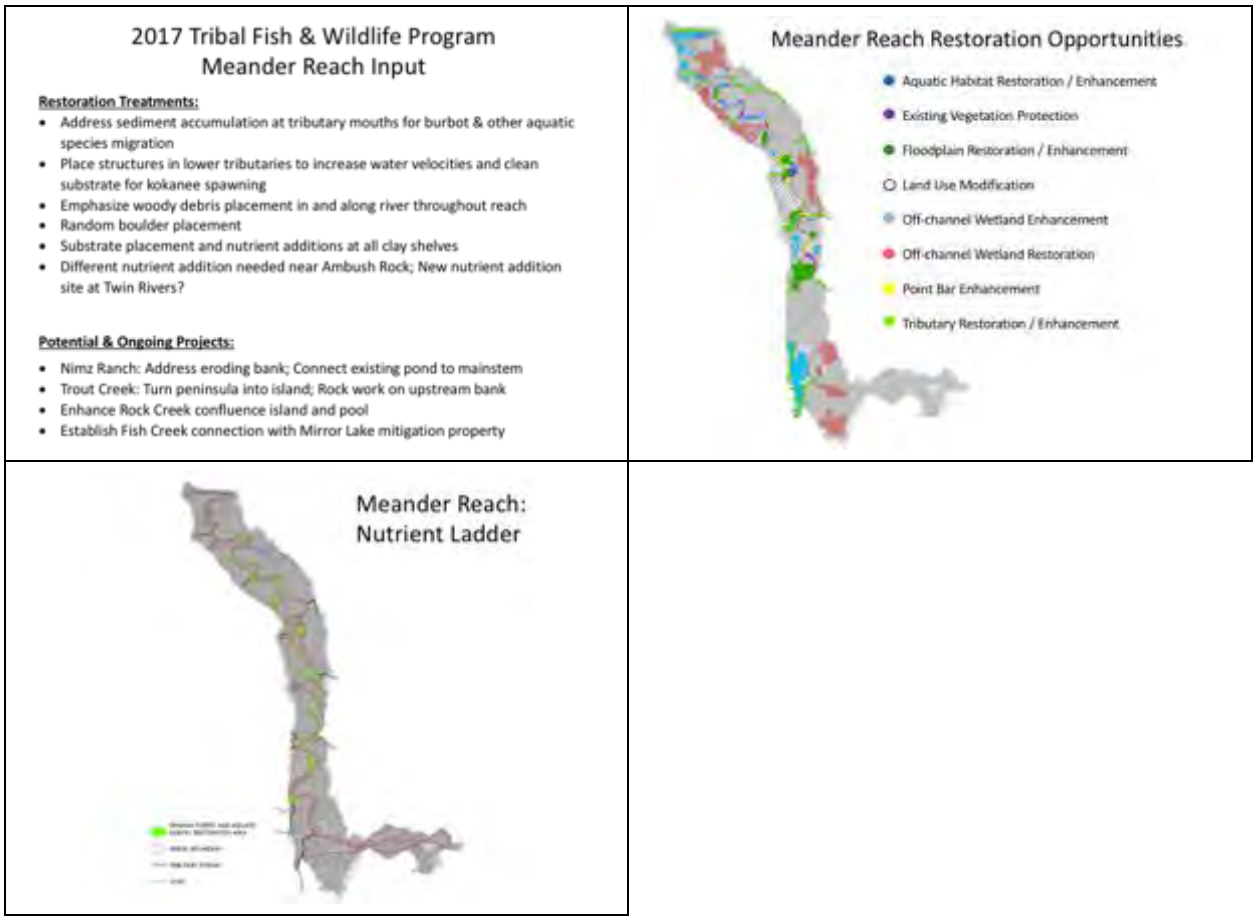
2016 PRAT / CMART
Meander Reach Input

Morphology:

- Current morphology out of sync with the water supply
- Consider different configurations (single thread, cutoffs, bifurcated channel)
- River too deep to grow algae – create shallow areas in the channel for aquatic vegetation growth

Restoration Strategies:

- Create alternative ways for the river to interact with the land & floodplain
- Increase habitat complexity in as many ways as possible e.g., wetlands, setbacks, wood structures, drainage ditch use, riparian plantings
- Look for opportunities for levee setbacks, conservation easements, etc.



3. Meander Reach biological/ecological objectives

The group reviewed the KRHRP overarching objective, which is:

- Restore and maintain Kootenai River habitat conditions that support all life stages of Kootenai River White Sturgeon, Burbot, Kokanee, Trout, and Whitefish.

At the 2015 joint PRAT and CMART workshop, participants identified working hypotheses, success criteria, and means to monitor Braided Reach KRHRP projects and the Substrate Enhancement Pilot project (SEPP).

Participants at this workshop were asked to help identify and clarify the Meander Reach biological and ecological objectives in the following exercise.

Each participant was asked to write biological and/or ecological objectives along with success criteria (if they could think of success criteria). Participants helped to sort the objectives to combine like with like, etc. Following is the roughly sorted list of participant's objectives, and where identified, success criteria.

FLOODPLAINS / WETLANDS / SHALLOW INUNDATED HABITAT	
Objective:	Provide functioning floodplain interface
Success Criteria:	Thermal regime normalization in/on inundated surfaces
Objective:	Provide functioning floodplain interface
Success Criteria:	Thermal regime normalization in/on inundated surfaces
Objective:	Establish floodplain connections at intervals along reach

Success Criteria:	N/A
Objective:	Increase connections to near-bank off-channel wetland habitat at a range of flows on both inside and outside meanders
Success Criteria:	Inundation at observed flows
Objective:	Increase connections to near-bank off-channel wetland habitat at a range of flows on both inside and outside meanders
Success Criteria:	Inundation at observed flows
Objective:	Improve shallow aquatic habitat conditions to support habitat and nutrient production
Success Criteria:	N/A
NUTRIENTS / FOODWEB	
Objective:	Restore conditions in Meander reach to provide self-sustaining food web
Success Criteria:	N/A
Objective:	Provide functioning floodplain interface
Success Criteria:	Self-sustaining nutrient/food web.
Objective:	Increase floodplain connections
Success criteria:	Increased nutrients
Objective:	Increase wetland area connected to river to support nutrient exchanges
Success Criteria:	N/A
Objective:	Increase zooplankton production through floodplain and off channel habitat
Success Criteria:	Increase in zooplankton densities
Objective:	Create shallow, inundated habitat to support algae, zooplankton
Success Criteria:	Lower trophic diversity, abundance
Objective:	By 20__, increase zooplankton biomass by X% from current levels (X?) with emphasis on X zooplankton species
Success Criteria:	N/A
Objective:	Increase foodweb diversity
Success Criteria:	Sample (pre/post)
Objective:	Maximize zooplankton and benthic invertebrate production
Success Criteria:	Increase in zooplankton and benthic invertebrate densities

Objective:	To increase food web complexity, i.e., species diversity, overall biological connections
Success Criteria:	Substantial increases in species present
Objective:	Improve nutrients to support lower trophic levels
Success Criteria:	Measurable increase in zooplankton
Objective:	Restore natural inputs to the food web
Success Criteria:	Self-sustaining
Objective:	By 20__, increase woody debris component within river by X% - or other ways to increase algae growth surfaces
Success Criteria:	N/A
Objective:	Improve riparian connection (increase nutrient load)
Success Criteria:	Monitor nutrient concentrations
Objective:	To increase overall habitat and ecological productivity in the reach
Success Criteria:	Substantive and sustained increases in biomass and abundance across trophic levels
RIPARIAN	
Objective:	Support/Establish connected riparian vegetation communities with diverse structure along the river
Success Criteria:	N/A
Objective:	Create conditions to support diverse riparian plant communities. Cottonwood forest. Deep emergent
Success Criteria:	Cover/species composition. Diverse structure
Objective:	Establish riparian buffer along river (cottonwoods)
Success Criteria:	Varying age classes of established cottonwood communities
Objective:	Establish riparian forest along drainage ditches
Success Criteria:	N/A
Objective:	By 20__, increase riparian leaf litter drop into water/verial zones by X%
Success Criteria:	N/A
LIMITING FACTORS	
Objective:	Determine limiting factors for all native species of concern
Success Criteria:	Life history models for KRWS, Burbot, RBT and Whitefish
ALL FOCAL SPECIES	
Objective:	Restore habitat conditions to support all life stages of focal species

Success Criteria:	Natural recruitment
BURBOT	
Objective:	Improve burbot spawning habitat
Success Criteria:	VPS triangulation to show increased numbers
Objective:	Improve burbot spawning habitat (awesome alcoves!)
Objective:	Increase rearing habitat for larval burbot (outside river bends)
Success Criteria:	Capture of larval burbot in said habitat
Objective:	Roughness on Meander Bends
Success Criteria:	Increased burbot larval occupancy on bends
Objective:	Restore Westside tributary habitats
Success Criteria:	Document burbot movement into said tributary and kokanee
Objective:	Increase areas with warmer temperatures in [season/month] (e.g., floodplain, near bank, alcoves to support larval burbot feeding)
Success Criteria:	Successful Burbot recruitment
STURGEON	
Objective:	Increase available sturgeon spawning habitat
Success Criteria:	N/A
Objective:	Increase larval sturgeon hatching success
Success Criteria:	Increase larval catch in monitoring
Objective:	Increase rearing habitat for larval KRWS
Success Criteria:	Capture of larval KRWS in said habitat
Objective:	Increase inundated areas at larval dispersal periods
Success Criteria:	N/A
Objective:	Maximize off channel juvenile sturgeon habitat
Success Criteria:	Juvenile sturgeon occupying new off-channel habitats
KOKANEE	
Objective:	Kokanee spawning channels (need egg supply, need to jump start at magnitude)
Success Criteria:	N/A
HABITAT AND RELATED (GENERAL)	
Objective:	Quantify existing habitats used by native species of concern

Success Criteria:	Spatial database of current habitat types by species and life stage
Objective:	Larger confluences for tributaries (i.e., Ball Creek, Myrtle Creek, Boulder Creek)
Success Criteria:	N/A
Objective:	Restore biological and physical processes that create habitat
Success criteria:	Habitat supports recruitment and early rearing
Objective:	Identify diking districts where groundwater pumping can cease
Success Criteria:	Natural groundwater hydrology

STRATEGIES / TACTICS / OTHER

Nutrients
Barge down FB to K. Lake delta or multiple stations

WMA access!!!
Reconnect ecosystem level

In channel substrate (spawning hiding)
Nutrients (planktons)

Do we need to expand the SEPPs?

River corridor (ladder of patches, sections of continuous, as much as possible, riparian vegetation and adjacent floodplain, adjacent off channels)

4. Review initial Meander Reach concepts

Tom Parker and Matt Daniels reviewed the following group of initial rough concepts for the Meander Reach. In addition, some Meander Reach and Braided Reach concepts and/or projects that have previously been presented at PRAT and CMART meetings were also included in the following presentation.

Meander Reach Treatments

- Point bar expansion & enhancement
  - Placement of fill along existing point bar margins to expand connected floodplain surface area; woody debris placement
- Floodplain creation
  - Placement of instream fill along other bank margins or existing instream surfaces to create connected floodplain surfaces that support diverse riparian vegetation species and age classes
- Floodplain lowering
  - Lowering existing floodplain to create connected floodplain surfaces; woody debris & microtopography; riparian revegetation
  - Excavated material can be used in point bar expansion and floodplain creation treatments
- Bank revegetation
  - Re-sloping existing bank materials to support riparian planting and vegetation establishment
  - Bank structures and potential fill placement along toe of slope

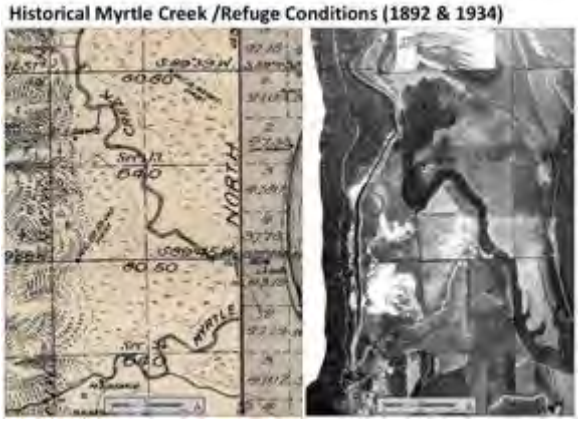
Meander Reach Treatments

- Off-channel wetland enhancement
  - Enhance potential of existing wetlands through revegetation and/or land use modification to allow natural development
  - Establish tributary or mainstem connectivity with existing wetland features to support nutrient transfer
- Shallow aquatic habitat enhancement
  - Placement of woody debris or substrate in existing shallows or backwater areas
  - Grading or fill placement to create or expand shallow water habitat areas in association with point bar expansion and enhancement
- Tributary restoration
  - Treatments vary based on stream condition and aquatic species priorities
  - Potential treatments include: channel realignment, riparian buffer revegetation, bank treatments, gradient modification to support sediment transport

Meander Reach Treatments

- Levee modification
  - Levee setback to increase connected floodplain area and establish vegetated riparian area along banks
  - Levee breaching to establish connectivity with existing or potential off-channel wetland areas
- Wood introduction
  - Placement of large wood and woody habitat structures throughout Meander Reach
  - Release of wood at specific locations during high flows to promote instream accumulation
- Reed canarygrass control
  - Employ various methods to eradicate existing stands, and reduce potential for colonization of new or restored floodplain surfaces
- Nutrient addition
  - Expand existing program and/or explore opportunities to pump from drainage districts

Historical Myrtle Creek /Refuge Conditions (1892 & 1934)

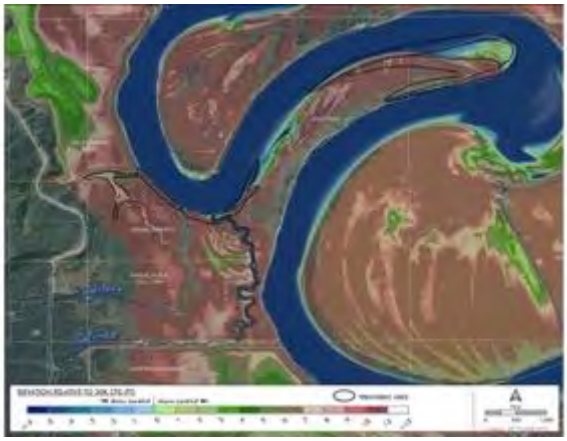


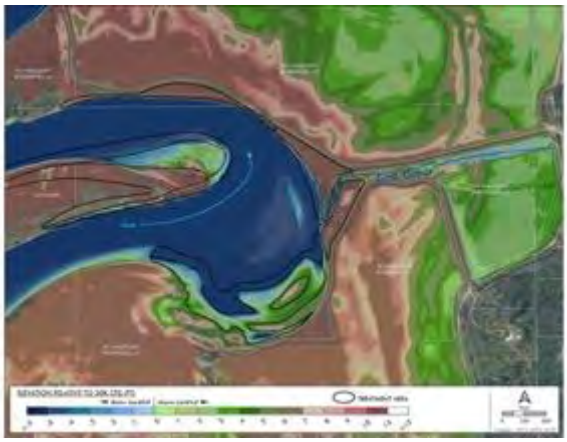
Myrtle Creek Realignment
Alternative 3

- Divert majority of Myrtle Creek flows into new channel based on historical channel alignments
- Establish floodplain/riparian zone adjacent to new channel alignment
- Create/maintain smaller spawning channel in existing Myrtle Creek alignment
- Modify interior dikes to create open wetland system in northern portion of Refuge

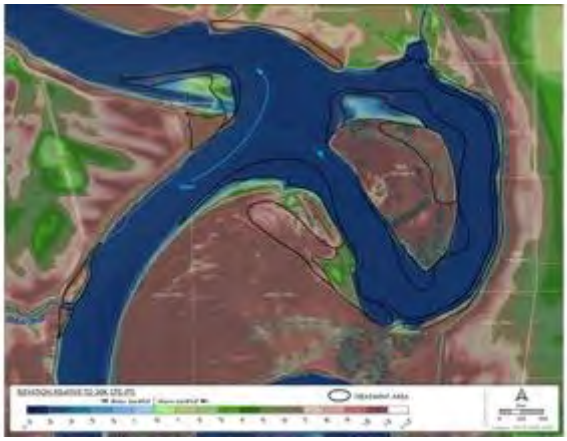
Alternative 3 Infrastructure Modifications

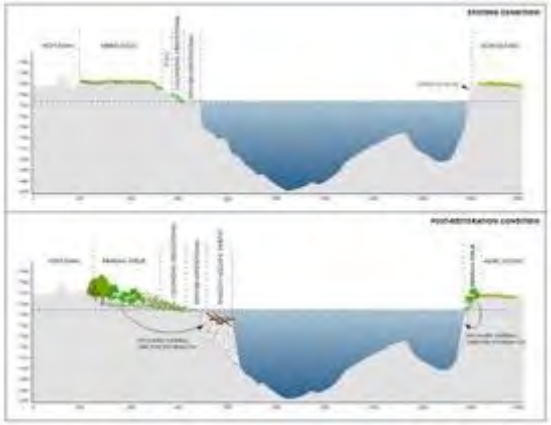
- Remove internal dikes in northern portion of Refuge
- Enhance existing dikes protecting southern portion of Refuge
- Potentially relocate northern portion of Tour Route
- Construct new dike protecting Refuge HQ
- Install new pump to facilitate water management between northern and southern areas





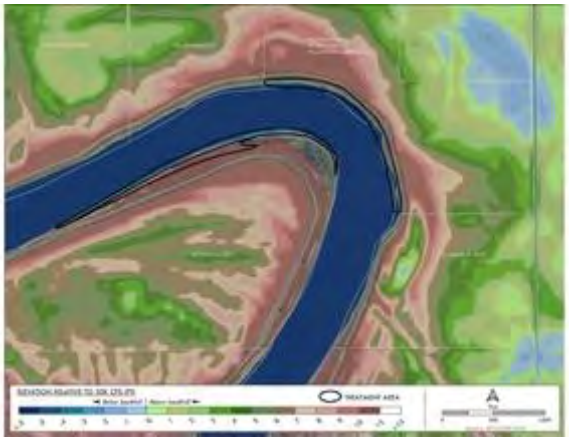

FERRY ISLAND



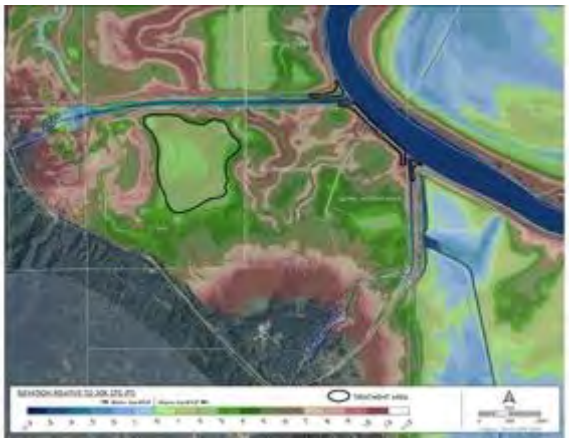



BELOW COPELAND


TRIBAL PARCEL



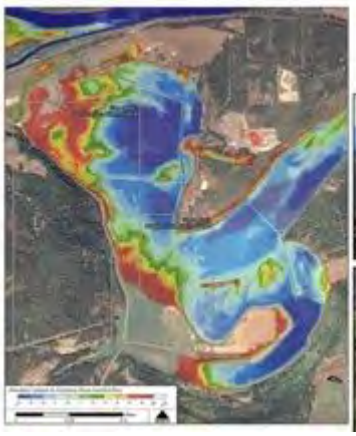

SMITH & LONG CANYON CREEKS




BOUNDARY CREEK

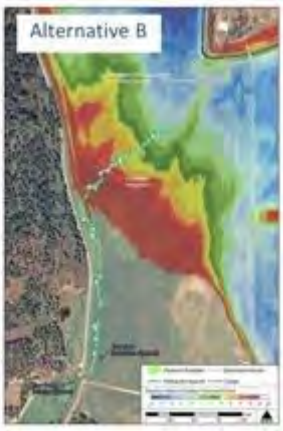

Braided Reach 1 Project Index


Braided Reach 2 Project Index




Cow Creek
Tributary Restoration


Alternative A


Alternative B

Discussion

- Which Meander Reach project areas would provide the greatest aquatic habitat benefit? Are we missing any key project areas?
- Which Meander Reach restoration treatments would provide the greatest habitat benefit? Are there other potential treatments we should include?
- Revisiting the Braided Reach projects, are there any we should reconsider, based on high aquatic habitat and fish use benefit?

5. Meander Reach small group review and discussion

Meeting participants split into small groups of four to discuss the following questions:

1. *Meander Reach challenges and opportunities.* What should we know about specific habitat conditions, limiting factors, fish use, nutrients, or other, to help inform design and selection of Meander Reach treatments and/or projects?
2. *Pros and cons of initial concepts.* What concepts, specific treatments would best meet Meander Reach biological and/or ecological objectives?
3. What are we missing? What else should we consider and/or include?

Each group was provided with an approximately 10-foot-long map of the Meander Reach, which incorporated information about burbot and sturgeon hatchery releases, the locations of the Meander Reach restoration concepts, and other relevant information. Participants were invited to draw on and annotate the maps as part of their discussions. Participants rotated multiple times to engage in these discussions with different subgroups of meeting participants.

The recommendations and feedback received through these individual group discussions is presented in Attachment A (or inserted here).



6. Meander Reach large group debrief

The group reconvened after the small group discussions and provided responses to the following questions.

Question 1: What's the most exciting/intriguing thing you talked about?

- Look at the Trout Creek/Rock Creek confluence. Force avulsion to occur in order to mimic Ferry Island conditions. Ferry Island is productive and is used by burbot.
- Construct small side channels at base of levees where there's a finger jutting out. Create seasonal or perennial flow through.
- Look at MacArthur Lake and Boundary Wildlife Management Area.
- Spawning substrate could also provide places to grow algae.
- Importance of channel margins. They provide places for larvae to get hung up, food sources, productivity, and provide complexity.
- Areas between levee and river are grazed, land management is very important too.

Question 2: what's missing? New concepts/treatments?

- Below Ambush Rock to Shorty's add more complexity in the bed habitat. There are other constraints in this reach and therefore limited opportunities, complex bed habitat would benefit sturgeon larvae, etc.
- Don't forget the 47 kilometers from the US border to Kootenay Lake. Burbot and Kokanee use stretch.
- Consider wood recruitment structures similar to the Braided Reach. Maybe sink wood or think about wood releases (however, note concerns with monitoring activities with floating wood).
- Consider micronutrient injections sites in the margins, etc. to boost productivity in this reach especially where you're adding margin habitat.
- Eroding meander bends (e.g., Ball Creek), wood collection, set backs (e.g. Phase 1)
- More trees.
- Synthesize biological and restoration opportunities, interactions, data, etc.

Question 3: What should we know?

- A data gap is kokanee runs and spawning sites. Also, information about tributary use. The KTOI walked streams 2-times a year for the last six years. Don't have success in emergence in spring.
- What are bottlenecks in tributaries or the mainstem? Suggest doing mainstem work first until we know more about tributaries.
- The USACE's new dike vegetation management standards are coming soon.
- USACE levee inspection reports are completed every 2-3 years.
- Meander Reach bathymetry is scheduled (USGS work under KRHRP).

Question 4: What pros or cons stand out?

- Pro is nutrient ladder, longitudinal connectivity.
- Con is lots of monitoring and evaluation activities in the river, also broodstock collection that could be affected by restoration actions.
- Missed opportunities outside dikes, inside the river corridor. These could be very beneficial since there is less permitting, etc. But will require serious earthwork.
- Opportunity to test hypotheses and learn about the system.

Question 5: What else should we ask?

- Look at mitigation purchase opportunities. Be on the lookout, share information.
- What's in it for the landowners (e.g., levee repair and maintenance)? How do we create win wins in the Meander Reach?
- Op Loss shows approximately 90% of dikes are not effective below a 50-100-year event.

7. Concept ranking exercise

Participants were asked to do an initial rough ranking exercise of the restoration nodes/locations, treatments, and concepts. Specifically, they were asked to identify their top three responses to each of the following questions:

Question 1: *Which node/location of the meander reach are likely to provide the greatest benefits (habitat, biological, ecological)? Why?*

Question 2: *Which treatments are likely to provide the greatest benefits (habitat, biological, ecological)? Why?*

Question 3: *Which areas or concepts should we focus on first (if possible)?*

Question 1: Which node/location of the meander reach are likely to provide the greatest benefits (habitat, biological, ecological)? Why?		
First Choice	*Second Choice*	*Third Choice*

• TNC wetland reconnect (5)
  ○ To increase larval sturgeon survival
  ○ Existing wetland with high potential for connection to river
  ○ Closest to known sturgeon spawning grounds
  ○ Longitudinal proximity to Shorty's and Nimz
  ○ Existing fish use
• Trout/Ball/Ferry (2)
  ○ Complexity for early life stages
  ○ Part of food web ladder
  ○ Benefits for larval KRWS and burbot
• Ferry Island (2)
  ○ Best benthic habitat
	• Trout Creek (3)
	  ○ Supports TNC concept
	  ○ Existing cottonwoods with potential for expansion
	  ○ Contribute nutrients
	  ○ Lots of opportunity to create new habitat for burbot and KRWS
	• Ball Creek (2)
	  ○ Increase larval sturgeon and burbot survival
	  ○ Logical downstream progression
	  ○ Wetland potential
	• TNC wetlands (2)
	  ○ Reconnect wetlands to river
	  ○ Ownership and conservation guidance
		• Ball Creek (3)
		  ○ Already scheduled
		  ○ Proximity to Shorty's
		  ○ Near SEPP (Ball Creek mouth)
		• Boundary Creek (3)
		  ○ Zooplankton pumps are good!
		  ○ Large area with high potential to have meaningful connection to river in a reach with little other connectivity
		  ○ Coordination with WMA and Benefit to multiple species
		• Bonners (or Ambush) to Shorty's Island (3)
		  ○ Build on to existing projects

Question 1: Which node/location of the meander reach are likely to provide the greatest benefits (habitat, biological, ecological)? Why?		
First Choice	*Second Choice*	*Third Choice*
○ Already productive ○ Rock Creek/Trout Creek avulsion ○ Larval drift hot spot ○ Riparian revegetation potential • Ball Creek to Ferry Islands (1) ○ Best suited for immediate restoration • Fish Creek Reconnect (new idea) (1) ○ Mitigation site linkage ○ Reduce drainage district water ○ Partial existing channel • Bonners Ferry to Shorty's. Deep Creek node (1) ○ Logical progression downstream ○ Early life sturgeon ○ Early life burbot • Shorty's to Ferry Island (1) ○ Most opportunity • Floodplain (1) ○ Nutrients	○ Existing wetlands and nutrients ○ Ease of project ○ Note: Trout Creek connect to wetland too! ○ Compounding nutrient benefits for Rock Creek? Ferry Island • Copeland to Porthill (2) ○ Lacking habitat ○ Not already productive • Boundary Creek node (2) ○ Benefits for larval KRWS and burbot ○ Complexity for early life stages ○ Part of food web ladder • SEPPS at clay steps (1) ○ If success at Shorty's and Myrtle • Mainstem Kootenai (1) ○ Rearing habitat	○ Not much is proposed in this reach, and it is lacking in habitat complexity ○ Need more habitat ○ More ladder rungs • Ferry Island lobe (2) ○ Increase node size ○ Already hotspot ○ Larval drift roughness ○ Compounding upstream nutrient impact • TNC wetlands (1) ○ Contribute nutrients • Finger lobes outside dikes and various restoration (1) ○ Outside dikes ○ Lower ag importance ○ Existing veg component (usually) • Keep fighting for the Refuge near Deep Creek and Myrtle (1) ○ Tributary access and wetlands • Porthill, Smith and Boundary (1*) ○ Increase number of hatchery sturgeon and burbot stocked and survive here • Tributaries (1) ○ Spawning/rearing ○ Nutrients

Question 2: Which treatments are likely to provide the greatest benefits (habitat, biological, ecological)? Why?		
First Choice	*Second Choice*	*Third Choice*
• Floodplain/wetlands creation/lowering (4) ○ To support more cottonwood establishment ○ May provide largest ecological value (perhaps most limiting) ○ Nutrients ○ Contribute nutrients and food to river	• Wetland creation/connection, off-channel wetland enhancement, flow through wetlands, floodplains (4) ○ Food, temperature ○ Improve quality of existing wetland and nutrient exchange ○ Maybe a source of needed nutrients and	• Woody placement within river, add wood surfaces to low elevation surfaces on floodplain (2) ○ Fast, simple, long term, algae help, structure ○ Cover, food production • Shallow aquatic habitat enhancement (2)

Question 2: Which treatments are likely to provide the greatest benefits (habitat, biological, ecological)? Why?		
First Choice	*Second Choice*	*Third Choice*

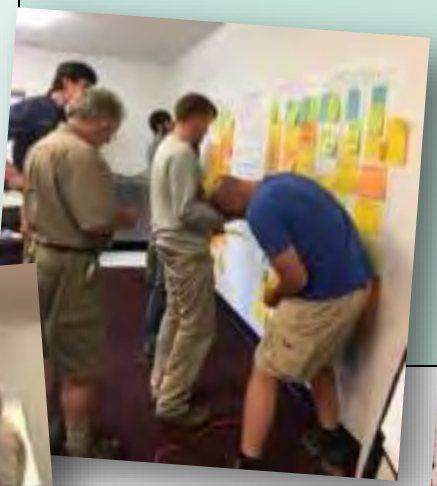
• Trout Creek avulsion (3)
  ○ Huge potential to mimic Ferry Island
  ○ Most impactful for small amount
  ○ Creates a larger version of Ferry Island, which benefits KRWS and burbot larvae
  ○ Provide backwater productive complex rearing area
• Nutrients and food/nutrient pumps (2)
  ○ To increase food for larvae
• Riparian improvements and protection of existing riparian (2)
  ○ Simple, easy, fast
• Point bar expansion and enhancement (2)
  ○ Support riparian forest
  ○ Flow access ease
• FF channel habitat restoration (1)
  ○ Increase food web
• Smith Creek (1)
  ○ Enhance fish stock and create wetlands for nutrients
	zooplanktons and invertebrates
	  ○ Nutrients
	• Boundary Creek WMA reconnect (2)
	  ○ Benefits KRWS and burbot larvae and river productivity and food web
	  ○ To provide productivity and habitat
	• Enhance rocky substrates (2)
	  ○ Food, hiding
	• Shallow aquatic habitat enhancement (1)
	  ○ Support algae
	• Bank revegetation (1)
	  ○ Contribute organic matter to river
	• Levee setback (1)
	  ○ To establish river riparian
	• Breaching levees (1)
	  ○ To allow for larval habitat and food
	• Smith creek (1)
	• Point bar expansion (1)
	  ○ Benefit sturgeon larva
	  ○ Increase algae
	• Alcoves (1)
	  ○ Nutrients, rearing
	• Myrtle Creek (as a treatment) (1)
	  ○ Low hanging fruit
	  ○ No impact to water fowl
	  ○ Warm water issues
	  ○ Tributary importance
		○ Habitat area and nutrient production in river
		  ○ Add roughness for burbot larvae
		  ○ Increase algae
		• Wetland/riparian integration, margins and banks (2)
		  ○ Rearing
		• Off-channel wetland enhancement (1)
		  ○ Zooplankton farm
		• Wetland connection (1), TNC wetlands reconnect (1), Refuge floodplain reconnect (1)
		  ○ Reality is only problem, or would be ranked #1
		  ○ Benefits KRWS and burbot larvae, and river productivity and food web
		  ○ Productivity and food web
		• Riparian habitat improvement (2)
		  ○ To reduce larval predation
		  ○ Stabilize banks, provide riparian habitats
		• Point bar enhancement (1)
		• Larval sturgeon and burbot habitat use (1)
		  ○ Current unknown that may be driving decision process

Question 3: Which areas or concepts should we focus on first (if possible)?		
First Choice	*Second Choice*	*Third Choice*

• Food web increase (2)
  ○ Everywhere
  ○ Lacking for early life stages
• Trout Creek (2)
  ○ Nutrients
  ○ Enhance current fish stock habitat
	• TNC wetlands (5)
	  ○ Large, concentrate benefit area
	  ○ Nutrient supply for other projects
	  ○ Existing wetland with good potential to expand
	  ○ TNC ownership
		• Rock Creek (3)
		  ○ Contribute organics/nutrients to open part of Reach
		  ○ Rearing habitat
		• Trout Creek avulsion (2)

Question 3: Which areas or concepts should we focus on first (if possible)?		
First Choice	*Second Choice*	*Third Choice*

• Ferry Island (2)
  ○ Build off already productive area
  ○ Ability to enhance and expand existing habitat
• Rock Creek/Trout Creek avulsion (1)
  ○ Big compounding nutrient/habitat impact
• TNC wetlands reconnect (1)
  ○ Immediate benefits for larval burbot and KRWS seeking zooplankton
• TNC Ball Creek (1)
• Enhance pre-and post-monitoring efforts (1)
  ○ Need to quantify project effectiveness and system learning
• Myrtle Creek (1)
  ○ Upstream best for feeding rest of reach
• Shorty's larval KRWS habitat (1)
  ○ Most beneficial
• Fish Creek (1)
  ○ Connected to wildlife project
  ○ Deep Creek
  ○ Nutrients
	○ No brainer
	• Smith Boundary Creek complex reconnect (2)
	  ○ Nutrients
	  ○ The timing is good and the opportunity is there
	  ○ Immediate benefits for larval KRWS and burbot seeking zooplankton
	• Food web, nutrient growth zones (2)
	  ○ Limiting for early life stages
	  ○ Shelves that slowly get exposed for growth as the flow decreases
	  ○ Increased food for larval burbot near Ferry
	• More actions anywhere from Ambush Rock to Shorty's (1)
	  ○ Sturgeon early life
	  ○ Burbot early life
	• Micro nutrient addition (1)
	• Ferry Island (1)
	• Egg mat monitoring (1)
		○ Downstream from known KRWS and burbot spawning areas
		  ○ Good chance at entraining larvae and zooplankton
		• Wetland contributions to invertebrates and nutrients (2)
		  ○ Limiting for early life stages
		  ○ Would be interesting and valuable information
		• Wood recruitment areas (1)
		  ○ Source of nutrients and hiding habitat
		• Boundary Creek to Porthill (1)
		  ○ Hatchery fish
		• Boundary Creek/WMA (1)
		  ○ Existing wetland with good potential to contribute nutrients to river
		• Ferry Island (1)
		  ○ Already productive
		  ○ Will benefit from upstream Rock/Trout projects
		• Myrtle Creek (1)
		  ○ USFWS owner
		  ○ No duck imports
		  ○ Warm water
		  ○ Passage issue
		• Tributaries (1)
		  ○ Kokanee spawning
		• Tribal Parcel (1)
		  ○ Important rung in the ladder



8. Other updates and information sharing

Scott Soults and Norm Merz gave a brief overview of the Kootenai Tribe's wildlife department projects including the Reconnect project and the Op Loss projects.

Ryan Fosness gave an overview of a planned 2017 experimental USGS Bathymetry/LiDar flight and related dye test and indicated that USGS would like to coordinate with the Tribe, IDFG and others to make sure the timing was right and that there would be no conflicts with other activities (e.g., monitoring, construction, etc.)

9. Meander reach next steps

Alison described the next steps for the Meander Reach project development, selection and design. Using input gathered through the Tribal Fish and Wildlife Department meeting, meetings with Tribal Council members and others, and this small group workshop, the Tribe's design team will refine the concepts for further discussion, refinement, and prioritization at the PRAT and CMART meeting in October 2017.

In addition, the PRAT and CMART meeting will include updates on hydraulic/biological modeling efforts, monitoring and evaluation updates and coordination, and more! The Tribe will initiate landowner outreach after concepts are well-enough developed to support that outreach.

10. Workshop feedback

Participant's provided the following feedback on the workshop, which will be used to help guide and improve future meetings and workshops.

What worked	*What would make it better*
• Big maps (i.e., map of the whole Meander Reach) are really helpful! • Rotation in small groups to have an opportunity to work with lots of people. • Good introduction to the Meander Reach. • More potential actions/ideas generated through the workshop. • Right level of discussion. • Cookies to eat. • Team is working really well together.	• Standard names for nodes and concepts prior to discussion or ranking exercises. • Do ranking while using spatial map. • Add elevation data to map. • Paint markers to markup maps. • Single node lines. • Add RKMs to map, need to have a common designator (note RKM versus RM dilemma, maybe include both)