



TETRA TECH

Watershed Planning

to Support Local Restoration Efforts

Chris James, CWM, CERP



Presentation **Overview**



Our TEAM |



Planning

Prioritization

Technical Assistance



Planning

Watershed Planning
to Support Local Restoration Efforts



Goal is to accomplish something

Stay on track

A good base plan allows you to see where you are on- or off-track and make timely corrections

Adapt

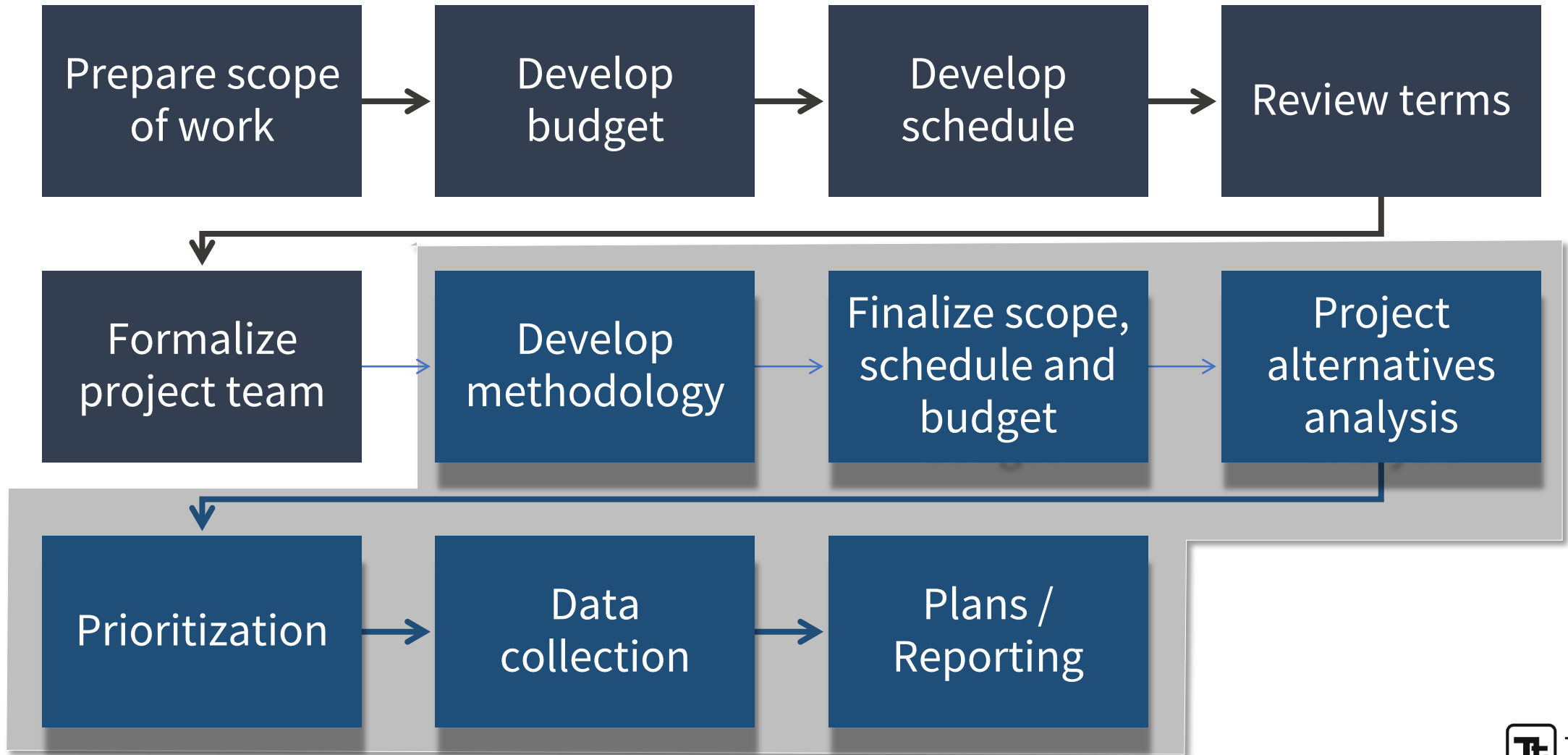
Helps you anticipate and prevent issues, and deal with them when necessary

Money

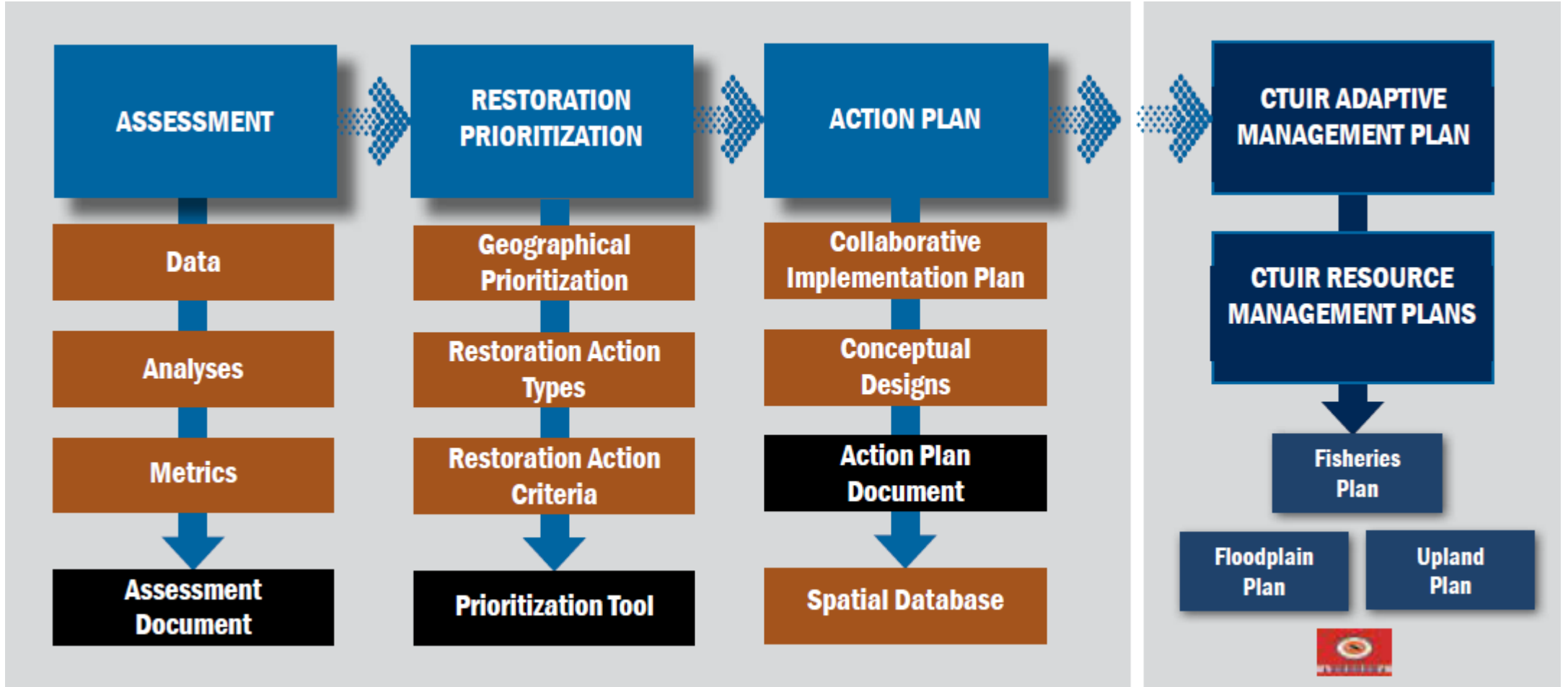
Doing things costs something! It is easier to change things on paper



Planning Process Overview



Watershed Planning Example



Prioritization

Watershed Planning
to Support Local Restoration Efforts



Goal is to focus on what is important

Efficient use of time

Prioritization ensures you are working towards the things that will move things forward

Locations

Identifies where is the highest potential to achieve **goals**, **objectives**, and **priorities**

Evaluates

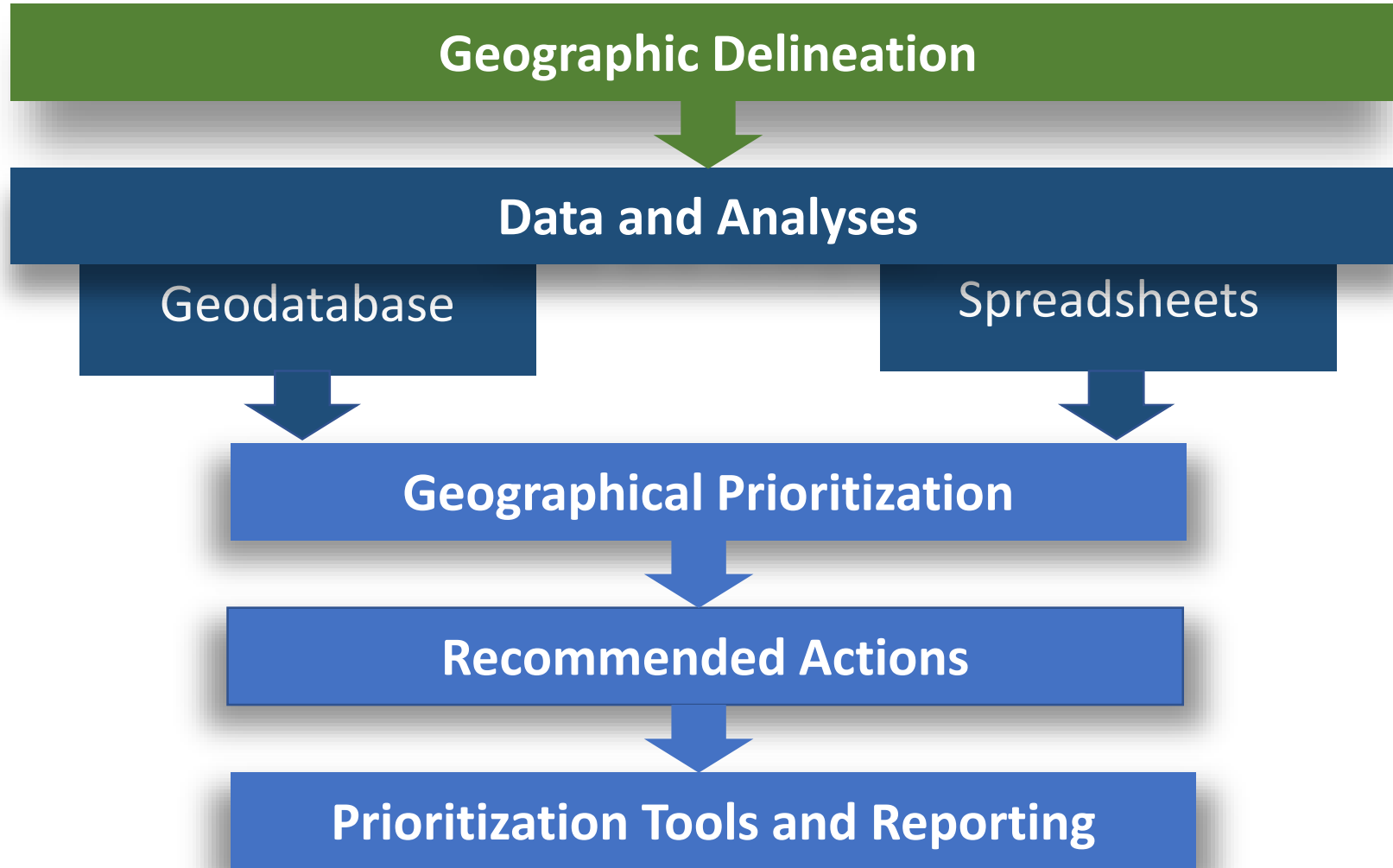
Doing things costs something! It is easier to evaluate things on paper

Funding

Required to get money...show your **work!**



Prioritization Process Overview



Geographic Prioritization Example

WARM SPRINGS RESERVATION SUBWATERSHED RANKINGS												
Watershed Name	Subwatershed Name	Fish Use Scoring			Geomorphic, Habitat, and Water Quality Scoring			Change Impact Scoring			RESULTS	
		Score Based on Historic Number of Life Stages	Score Based on Current Number of Life Stages	Score based on Potential Number of Restored Life Stages	Score Based on Geomorphic Potential	Score Based on Habitat Potential	Score Based on Water Quality Potential	Score Based on Fish Limiting Life Stage Use	Score Based on Climate Change Resiliency Potential	Score Based on Potential Fish Production	Cumulative Score	Ranking (Tier I,II,III)
Beaver Creek	Coyote Creek	2	2	0	5	15	5	2	13	10	53	Tier III
	Lower Beaver Creek	18	18	0	15	15	8	11	20	15	119	Tier I
	Middle Beaver Creek	18	18	0	15	15	10	11	10	15	112	Tier I
	Quartz Creek	0	0	0	15	20	3	0	10	5	53	Tier III
	Upper Beaver Creek	15	15	0	15	20	10	11	10	15	110	Tier I
Lower Metolius River	Lower Metolius River	18	6	12	0	5	3	5	8	15	71	Tier III
	Middle Metolius River	18	8	9	0	3	3	5	8	15	69	Tier III
	Upper Metolius River	18	8	9	0	5	3	4	8	15	70	Tier III
	Whitewater River	15	5	9	0	5	3	2	3	10	51	Tier III
Mill Creek	Lower Mill Creek	20	20	0	0	3	5	8	13	10	78	Tier II
	Middle Creek-Boulder Creek	5	5	0	15	20	8	3	3	10	69	Tier III
	Upper Mill Creek	20	20	0	15	18	3	10	10	20	115	Tier I
Seekseequa Creek-Deschutes River	Box Canyon	5	0	5	0	10	3	0	10	5	38	Tier III
	Lake Simtustus - Deschutes River	18	3	15	0	3	3	1	13	10	65	Tier III
	Seekseequa Creek	9	0	9	10	13	3	0	13	15	71	Tier II
Shitike Creek-Deschutes River	Dry Creek	2	2	0	10	18	3	2	13	5	54	Tier III
	Lower Shitike Creek	20	20	0	10	18	18	11	13	20	129	Tier I
	Pelton Dam - Deschutes River	18	9	12	0	10	8	3	13	15	87	Tier II
	Upper Shitike Creek	20	16	4	15	13	5	8	10	20	111	Tier I
	Webster Flat - Deschutes River	18	18	0	0	10	8	7	13	15	88	Tier II
Upper Metolius River	Jefferson Creek	15	9	9	0	3	3	2	8	15	63	Tier III
Warm Springs River	Badger Creek	15	15	0	20	20	5	6	13	10	103	Tier I
	Bunchgrass Creek - Warm Springs River	20	16	4	5	13	3	8	3	15	86	Tier II
	Dry Creek - Warm Springs River	5	5	0	20	13	5	2	15	15	80	Tier II
	Hehe Butte - Warm Springs River	20	20	0	15	8	3	10	15	15	105	Tier I
	Indian Head Canyon - Warm Springs River	17	17	0	0	13	5	9	13	15	88	Tier II
	Kahneeta Hot Springs - Warm Springs River	17	17	0	5	13	13	9	15	20	107	Tier I
	Mill Creek Canal	0	0	0	15	10	3	0	10	5	43	Tier III
	South Fork Warm Springs River	15	11	4	20	13	5	7	10	15	99	Tier I
White Horse Rapids-Deschutes River	Big Cove - Deschutes River	16	16	0	0	13	5	7	18	10	84	Tier II
	Eagle Creek	5	5	0	0	13	15	3	18	15	74	Tier II
	Little Cove - Deschutes River	16	16	0	0	10	5	7	15	10	79	Tier II
	Nena Creek	5	5	0	0	20	10	3	13	15	71	Tier II
	Rice Creek	5	5	0	15	15	10	3	13	15	81	Tier II

Prioritizing Actions Example

Series 1 Name	RPB Group	RPB Value (0-3)
Restoration Potential Benefit (RPB)	Chinook Area Score	2
	Bull Trout Area Score	0
	Steelhead Area Score	3
Series 2 Name	Freshwater Life History Stage Improved	Fish Use Identified In Distribution Layer For The Project Area (Yes=1, No=0)
Freshwater Life History Stage	Chinook Spawning	0
	Chinook Migration	0
	Chinook Juvenile Rearing	0
	Steelhead Spawning	1
	Steelhead Migration	
	Steelhead Juvenile Rearing	
	Bull Trout Spawning	0
	Bull Trout Migration	
Bull Trout Rearing	0	
Series 3 Name	Limiting Factors	Limiting Factor Identified In This Reach (Yes=1, No=0)
Limiting Factors Analysis	Degraded Floodplain Connectivity and Function	1
	Degraded Channel Structure and Complexity	1
	Degraded Riparian Areas and LWD Recruitment	1
	Altered Hydrologic Processes	1
	Degraded Water Quality (Temperature)	1
	Altered Sediment Routing	1
	Impaired Fish Passage	1
Series 4 Name	JDR Watershed Restoration Action Groups	Project Restoration Actions (1=Yes, 0=No)
JDR Watershed Restoration Actions Rank	Acquisition/Conservation Agreements	
	Acquisition of Water Rights	
	Best Management Practices of Land Uses	
	Best Management Practices of Water Uses	1
	Education and Outreach	
	Fish Passage (Main and Off-Channel)	1
	Connect Main Channel to Floodplain	
	Provide Bedload/Large Wood Transport Connection	
	Restore Native Plant Communities	
	Restore Natural Hydrologic Regime	
	Restore Riverine Processes	
	River Channel Modifications and Complex Structures	1
	River Bank Stabilization	1
	Side Channel Enhancement	

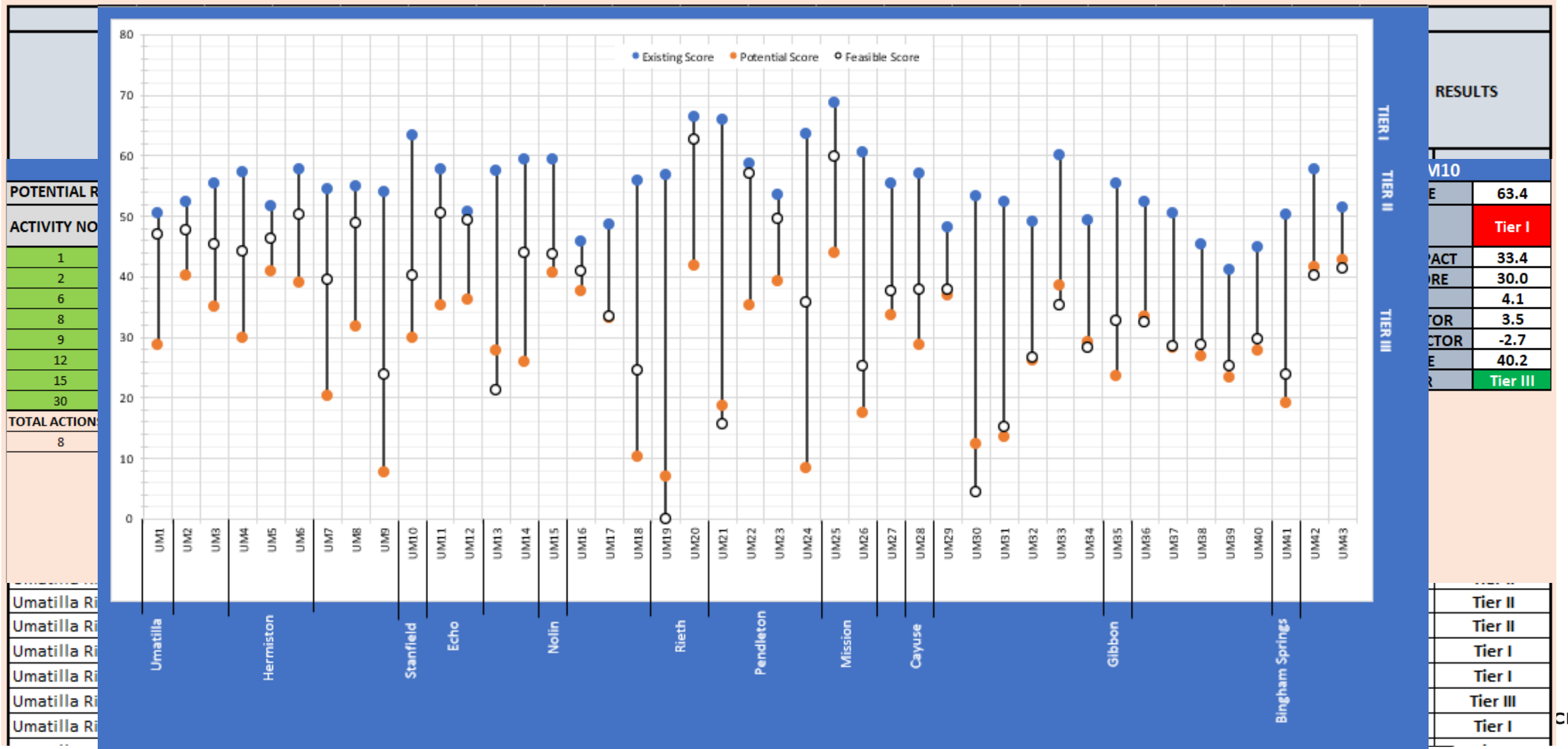
Series 10 Name	Project Types With Landowner Benefit	Project Types (2 = Primary [One Only]; 1 = Secondary; 0 = NA)
Landowner Project Benefits	Irrigation Diversion Improvements	
	Irrigation Diversion Improvements	2
	Consolidating Points of Diversion	
	Water Efficiency Measures	
	Conveyance/Ditch Piping/ Delivery Efficiency	1
	Pivots/Sprinklers/Application Efficiency	1
	Soil Moisture Management	
	Water Measurement Tools	
	Bank Stabilization	
	Streambank Stabilization	1
	Management of Flood Debris	1
	Upland Improvements	
	Juniper Removal	
	Public Lands Pasture Fence	
	Private Lands Pasture Fence	
	Water Source - Spring Development	
	Invasive Weed Control	
	Reseeding/Revegetation	
	Return Flow Cooling System	
	Return Flow Cooling System	
	Road Crossing Improvements	
	Culvert Replacements	
	Ford Improvements	1
	Riparian Improvements	
	Juniper Removal	
	Public Lands Fencing	
	Private Lands Fencing	
	Planting	
	Invasive Weed Control	
	Off-Channel Water Source	
	Sediment/Water Control	
	WaSCB - Check Dams	
	Forest Health	
	Forest Health - Function	
	Water Storage	
Water Storage for Irrigation		
Conversion to Ground Water/Well		
Conversion to Ground water/well		
Cropland Management		
Terraces, Filter Strips, Alternate Crops, Less Tillage		
Wildlife Improvements		
Vegetation Establishment, Aspen		

Prioritizing Projects Example



















Examples Scores													
	Moon	Reynolds	Starr	Rowe Cr	JDR Obrist	Fox	JDR Jacobs	MFJD TNC	Painted Hills	Indian Cr			
Series 1	5	9	5	2	2	5	9	9	6	4			
Series 2	14	23	13	6	14	12	10	36	16	9			
Series 3	12	12	30	30	26	21	11	26	10	9			
Series 4	5	5	15	18	25	25	11	24	14	3			
Series 5	7	7	8	14	10	18	9	18	15	9			
Series 6	10	10	3	14	5	11	9	11	19	12			
Series 7	2	2	2	2	2	2	2	3	3	2			
Series 8	0	0	0	0	0	0	0	0	1	6			
Series 9	0	0	0	0	0	0	5	0	0	5			
Series 10	21	16	16	23	9	14	13	6	15	16			
											Mean	Min	Max
Series 1-6, Biological Score (total possible = 178 points)	53	66	74	84	82	92	59	124	80	46	76	46	124
Series 7-9, Plans, Cost Share, Investment Score (total possible = 25 points)	2	2	2	2	2	2	7	3	4	13	4	2	13
Series 10, Landowner Score (total possible = 71 points)	21	16	16	23	9	14	13	6	15	16	15	6	23
Total Score (total possible = 274 points)	76	84	92	109	93	108	79	133	99	75	95	75	133

Mean biological scores of	Mean total scores of	
61	83	= Diversions, single structures
91	107	= Habitat

Prioritization Tool Example 1

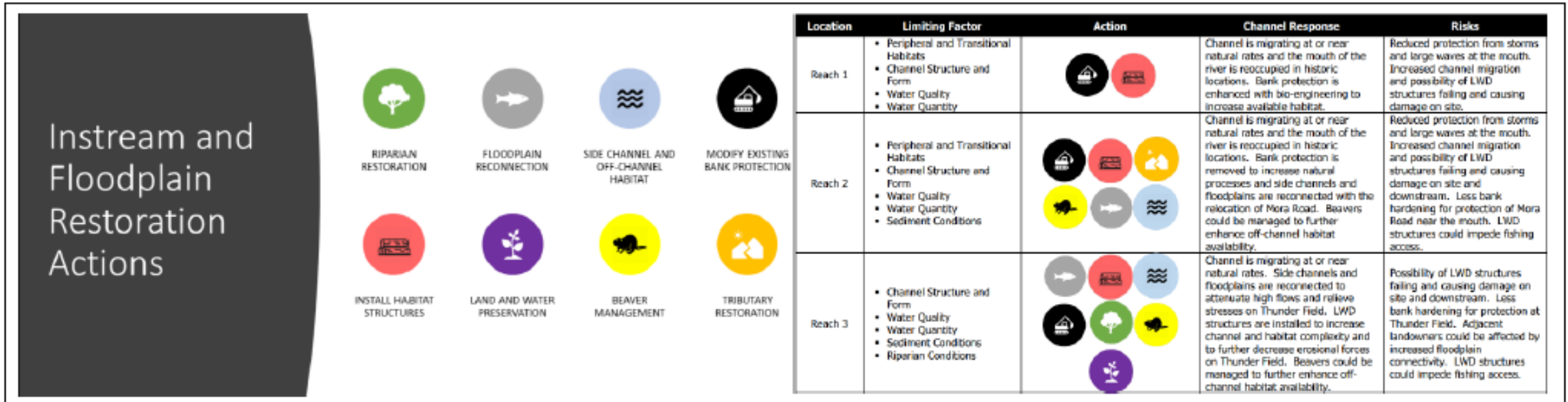


Prioritization Tool Example 2

	Alternative 1	Alternative 2	Alternative 3
Avulsion & Community Safety	 Flow redirection using LWD structures and side channel reactivation; bank laybacks and bioengineering; relocation of Mora Road	 Flow redirection using LWD structures, log revetments, and side channel reactivation; bank laybacks and bioengineering	 Launchable rock revetments
Salmonid Habitat	 In-channel and off-channel habitat; LWD habitat structures; side channels and alcoves; bioengineered banks; passage barrier removal	 Main and side channel habitat; side channel reactivation; bioengineered banks; culvert replacement	 Culvert replacement; does not include restoration or enhancement of aquatic habitat
Flood Attenuation	 Full reactivation of the oxbow; floodplain reconnection; bank laybacks	 Partial reactivation of the oxbow; some floodplain reconnection; bank laybacks	 Channel capacity and floodplain connectivity remain unchanged
Fishing Access	 Creation of fishing access locations; Thunder Field Road improvements; walking trails	 Creation of fishing access locations; Thunder Field Road improvements	 Creation of fishing access locations; Thunder Field Road improvements
Cultural Access	 Flow redirection and stabilization at Thunder Field; Thunder Field Road improvements; fisheries access; restoration of terrestrial and aquatic habitat	 Flow redirection and stabilization at Thunder Field; Thunder Field Road improvements; fisheries access; enhancement of aquatic habitat	 Bank stabilization at Thunder Field; Thunder Field Road improvements; fisheries access
Climate Resiliency	 Use of deformable and bioengineering elements; increase in natural flood attenuation; reconnection of side- and high-flow channels	 Use of deformable and bioengineering elements; some increase in natural flood attenuation; some reconnection of side- and high-flow channels	 Protects Thunder Field and Mora Road with launchable rock revetments

Benefits:  High  Medium  Low

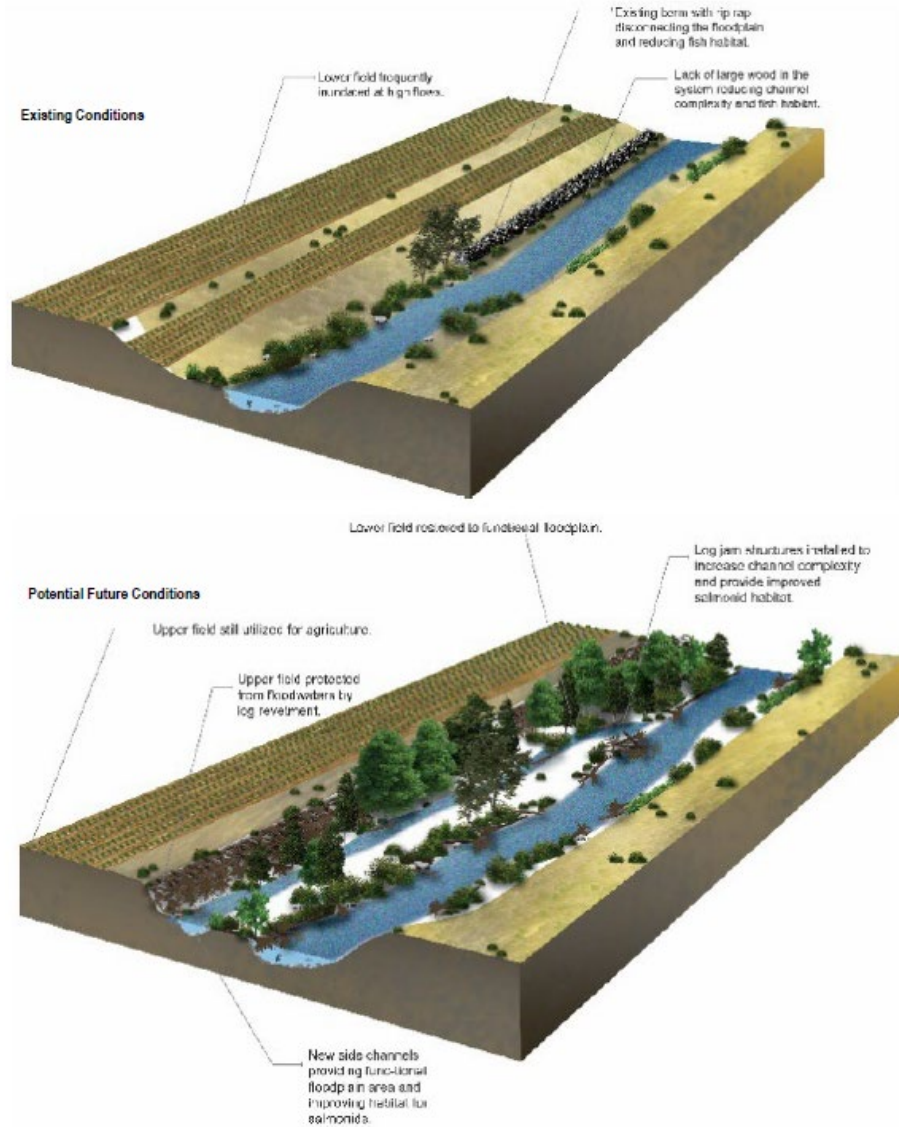
Prioritization Tool Example 3



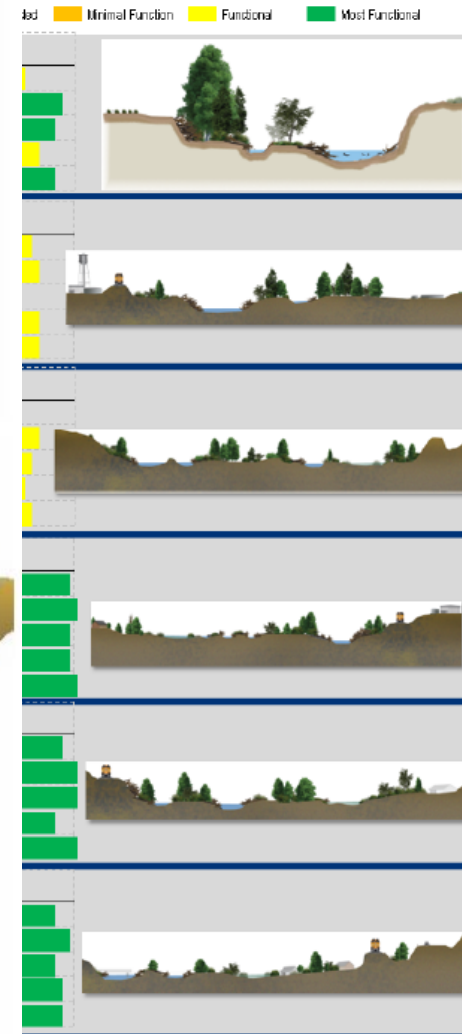
Prioritization Application Example 1

Location

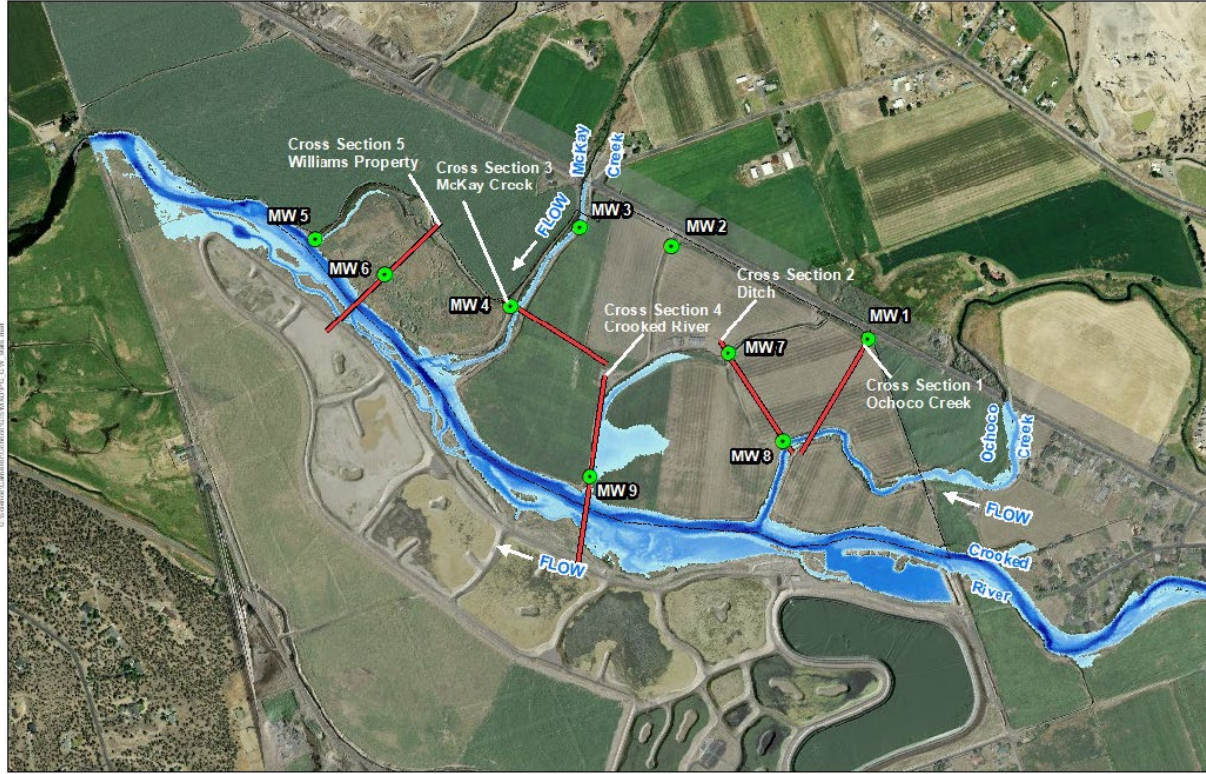
Umatilla River Reach 13 River Mile 27.2—31.5 Between Echo and Nolin Priority: Tier I
Umatilla River Reach 21 River Mile 51.3—52.6 Between Rieth and Pendleton Priority: Tier I
Umatilla River Reach 25 River Mile 57.9—60.1 Between Pendleton and Mission Priority: Tier I
Umatilla River Reach 26 River Mile 60.1—62.8 Between Mission and Gibsons Priority: Tier I
Umatilla River Reach 30 River Mile 68.2—69.9 Between Mission and Gibsons Priority: Tier II
Umatilla River Reach 31 River Mile 69.9—71.3 Between Mission and Gibsons Priority: Tier II



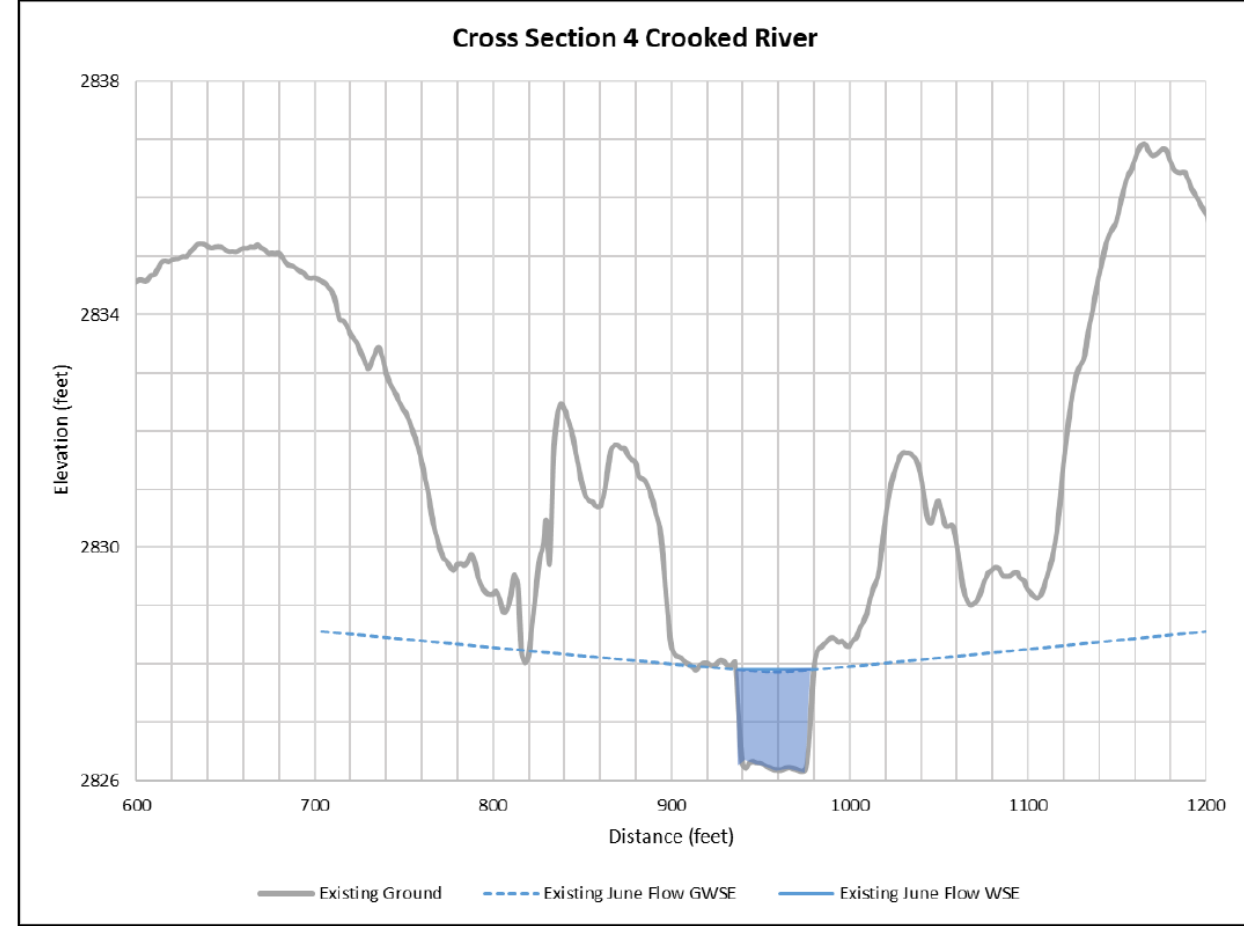
River Conditions



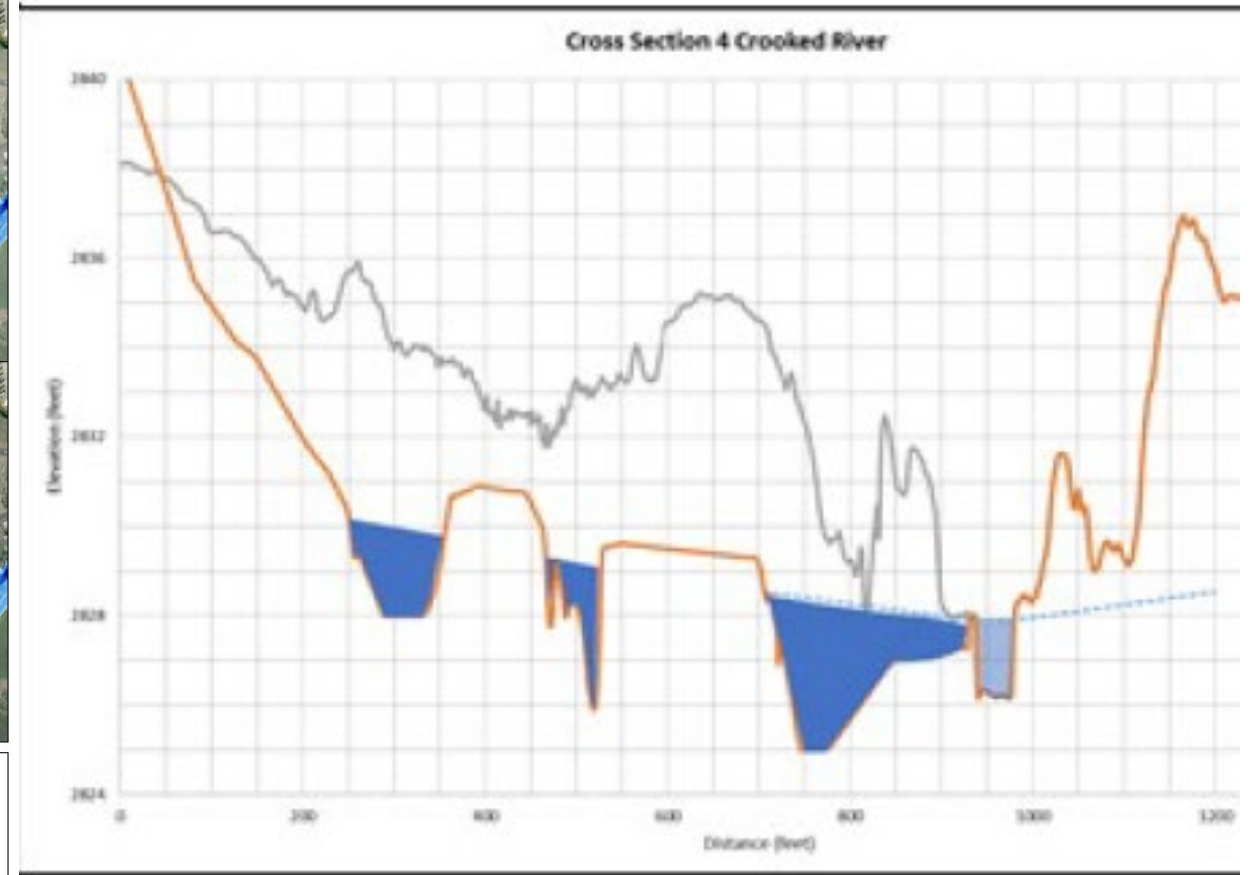
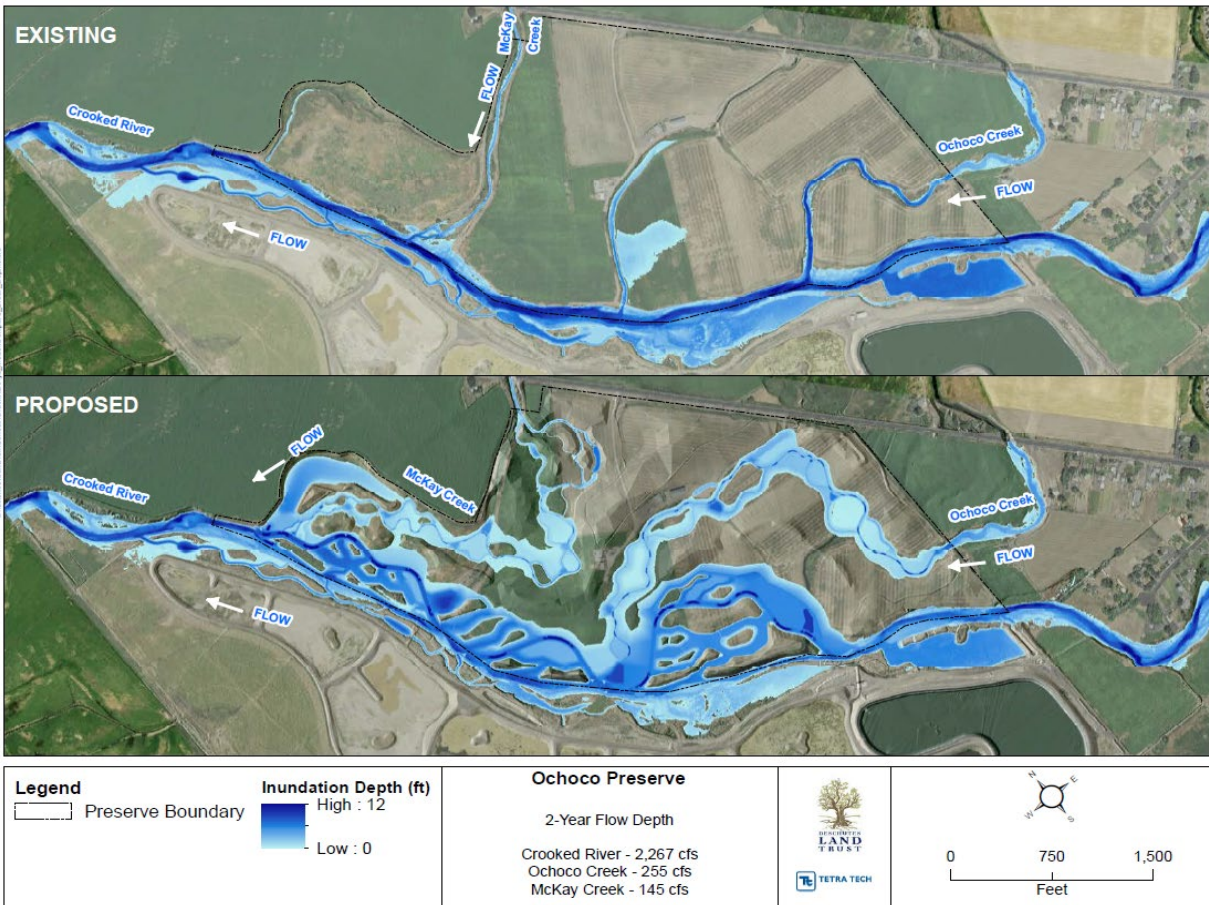
Prioritization Application Example 2 (Before)



Legend Preserve Boundary Monitoring Well Cross Section	Inundation Depth (ft) High : 12 Low : 0	Ochocho Preserve Existing Conditions 2-Year Flow Depth Crooked River - 2,267 cfs Ochocho Creek - 255 cfs McKay Creek - 145 cfs	 	



Prioritization Application Example 2 (After)



Technical Assistance

Watershed Planning
to Support Local Restoration Efforts



Goal is to have additional expertise

Gap in expertise

Missing capabilities, knowledge, relationships, and/or tools that will add value to your organization

Human resources

Have expertise to address issue(s), but lacking in ability to add staff or capacity

Different points of view

Want a different perspective or added perspective



Technical Assistance Overview



**ESTABLISH GOALS
AND OBJECTIVES**



ORGANIZE DATA



**IDENTIFY DATA
GAPS**



**ENGAGE WITH
STAKEHOLDERS**



GET AGREEMENTS



**COMPLETE INITIAL
PLANNING
PROCESS STEPS**



**EVALUATE
ADDITIONAL
EXPERTISE NEEDS**

Technical Assistance Overview

Do we have a need?

- Gaps in expertise
- Human resources
- Different points of view

What are the benefits?

- Expertise
- Specificity
- Cost savings

What are the costs?

- Commitment
- Flexibility
- Longevity

How to decide?

- Scope/Schedule
- Budget
- Control
- Skills Gap
- Dynamics

Conclusion

Watershed Planning
to Support Local Restoration Efforts



Presentation Conclusion



Our TEAM |



Planning



Prioritization



Technical Assistance



Any Questions?

