



# Atlas – Evidence Based Prioritization Framework

February 8, 2018



# Objectives

- Provide Atlas summary
- Discuss Atlas evolution and adaptation





# Atlas Emergence



# Improve opportunistic approach



# Improve use of evidence

Implementation



Research

# Improve collaboration



# Expenditures vs. biological benefit, ROI





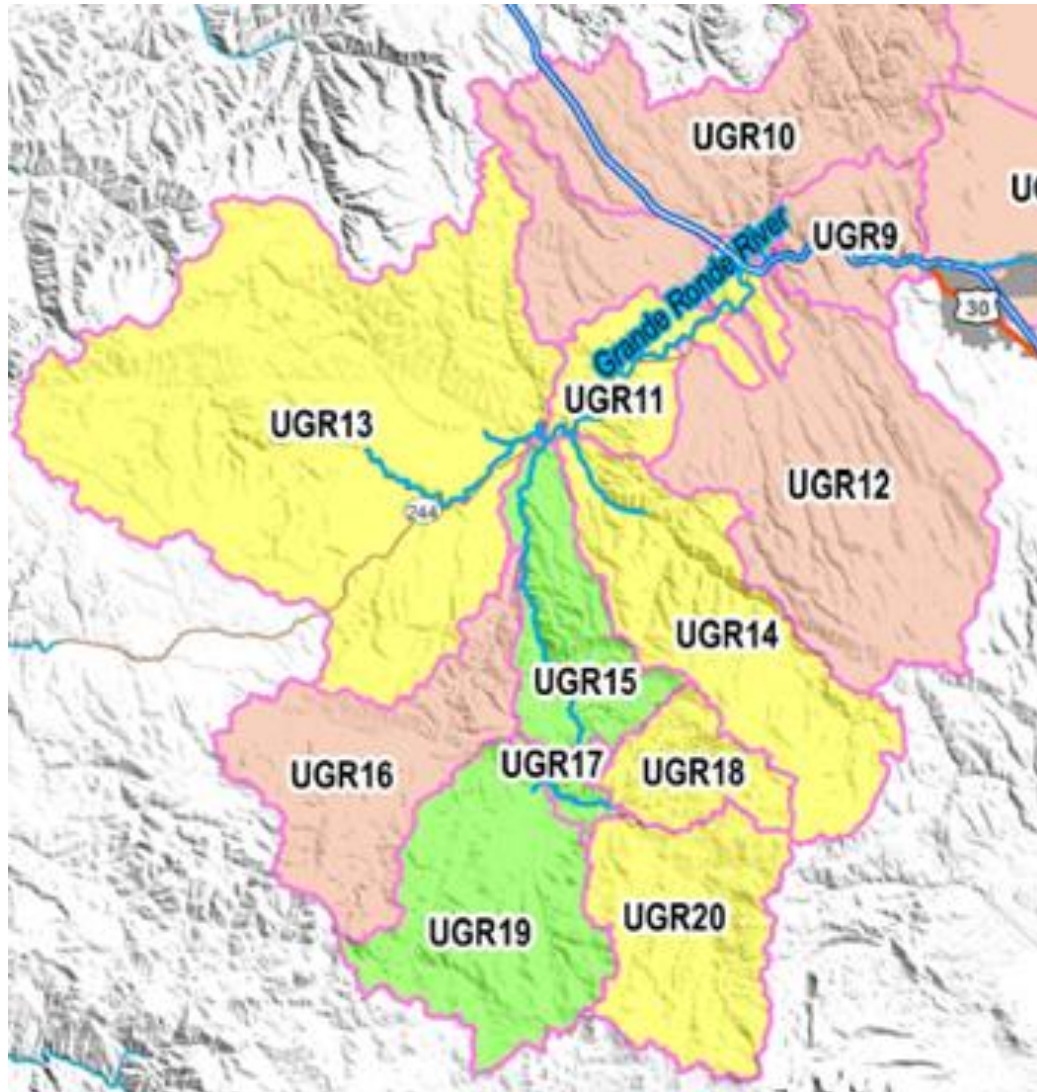
# Atlas Definition



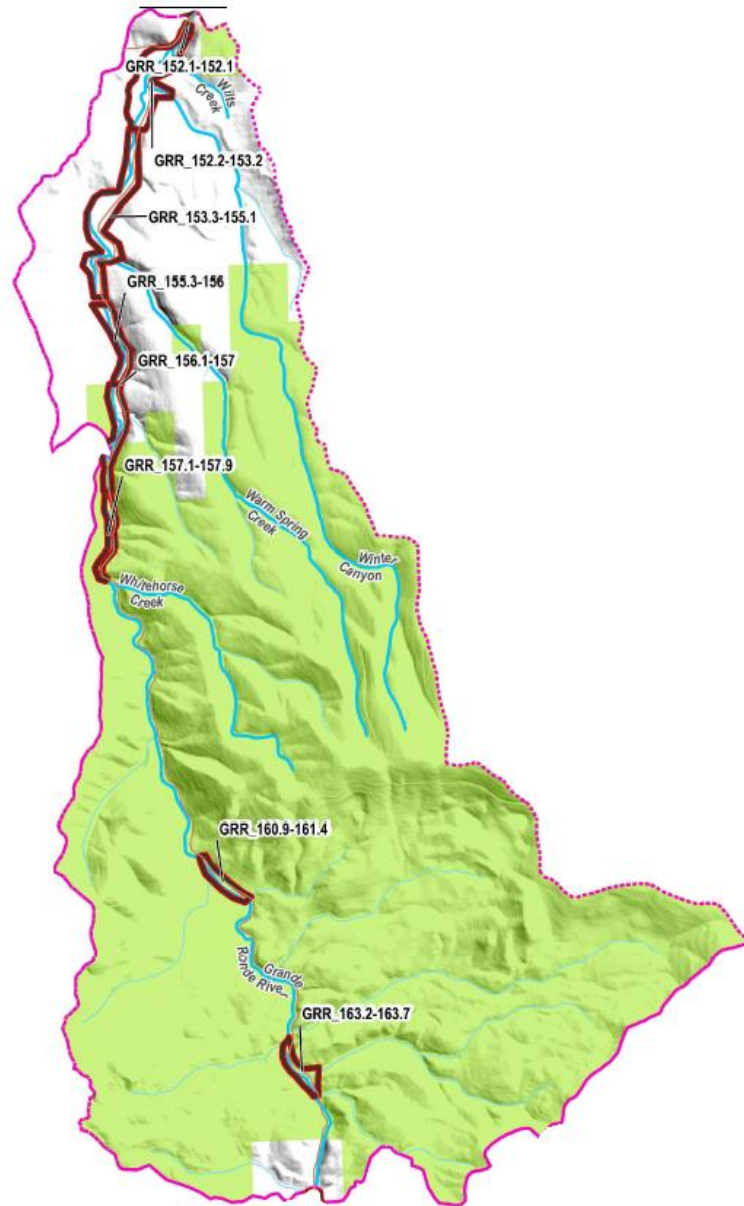


# Evidence Based Prioritization Framework

## Determine priority areas



# Determine priority actions



# Score, rank actions

<b>BSR</b>	<b>BSR ranking</b>	<b>Limiting Factors (Priority &amp; Quantity Addressed)</b>	<b>Restoration Action Priority</b>	<b>Climate Change</b>	<b>Natural Process (Beechi et al)</b>	<b>Total Biological Benefit Score</b>
BSR: LAS-1a	Tier I	1	1	0	5	7
BSR: LAS-1a	Tier I	5	1	1	5	12
BSR: LAS-1a	Tier I	1	1	0	5	7
BSR: LAS-1a	Tier I	1	1	1	5	7

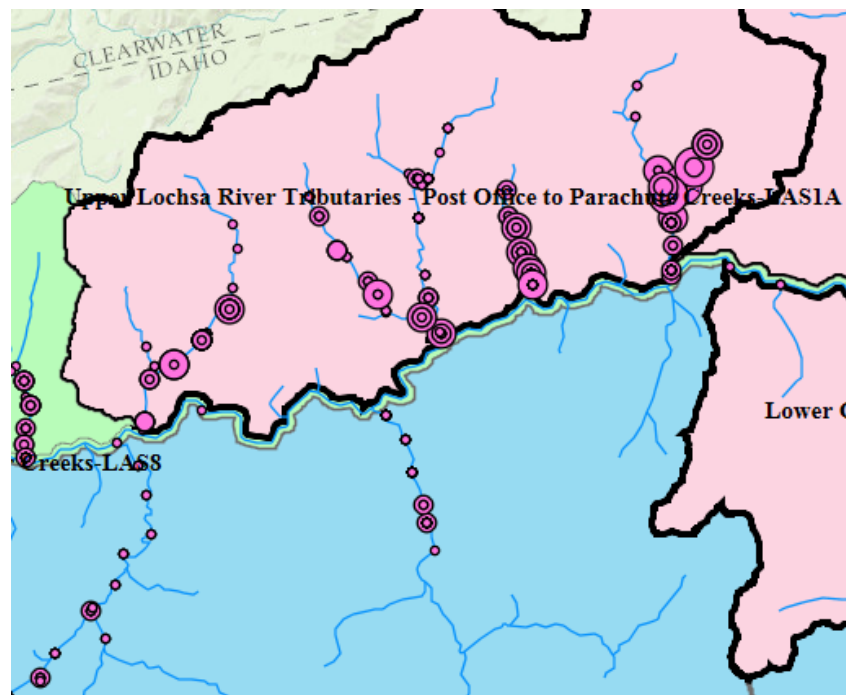
# Adaptive Management

## Process-based Principles for Restoring River Ecosystems

TIMOTHY J. BEECHIE, DAVID A. SEAR, JULIAN D. OLDEN, GEORGE R. PESS, JOHN M. BUFFINGTON, HAMISH MOIR, PHILIP RONI, AND MICHAEL M. POLLOCK

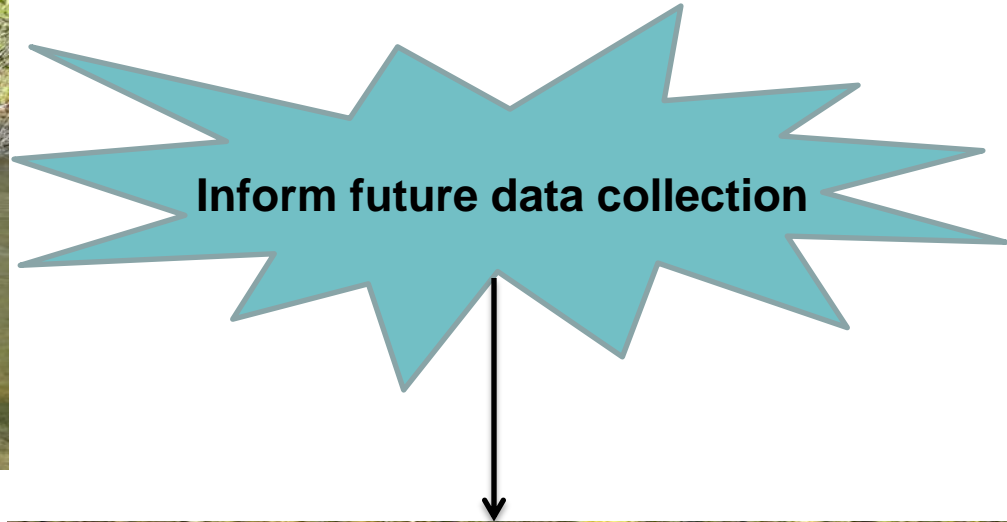
*Process-based restoration aims to reestablish normative rates and magnitudes of physical, chemical, and biological processes that sustain river and floodplain ecosystems. Ecosystem conditions at any site are governed by hierarchical regional, watershed, and reach-scale processes controlling hydrologic and sediment regimes; floodplain and aquatic habitat dynamics; and riparian and aquatic biota. We outline and illustrate four process-based principles that ensure river restoration will be guided toward sustainable actions: (1) restoration actions should address the root causes of degradation, (2) actions must be consistent with the physical and biological potential of the site, (3) actions should be at a scale commensurate with environmental problems, and (4) actions should have clearly articulated expected outcomes for ecosystem dynamics. Applying these principles will help avoid common pitfalls in river restoration, such as creating habitat types that are outside of a site's natural potential, attempting to build static habitats in dynamic environments, or constructing habitat features that are ultimately overwhelmed by unconsidered system drivers.*

✓ SnorkelData CNF Steelhead

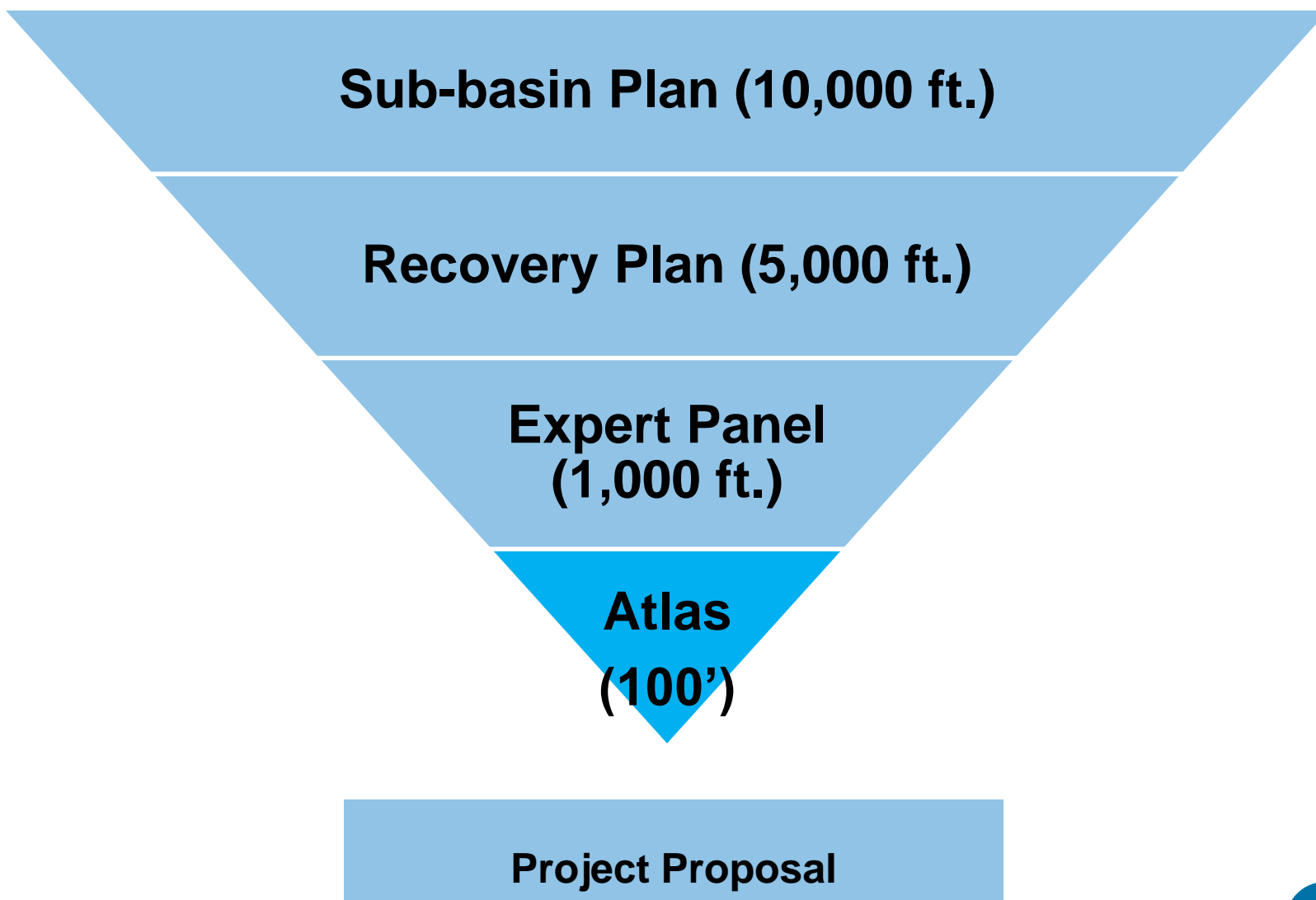


Utilizes existing data  
Incorporates new data

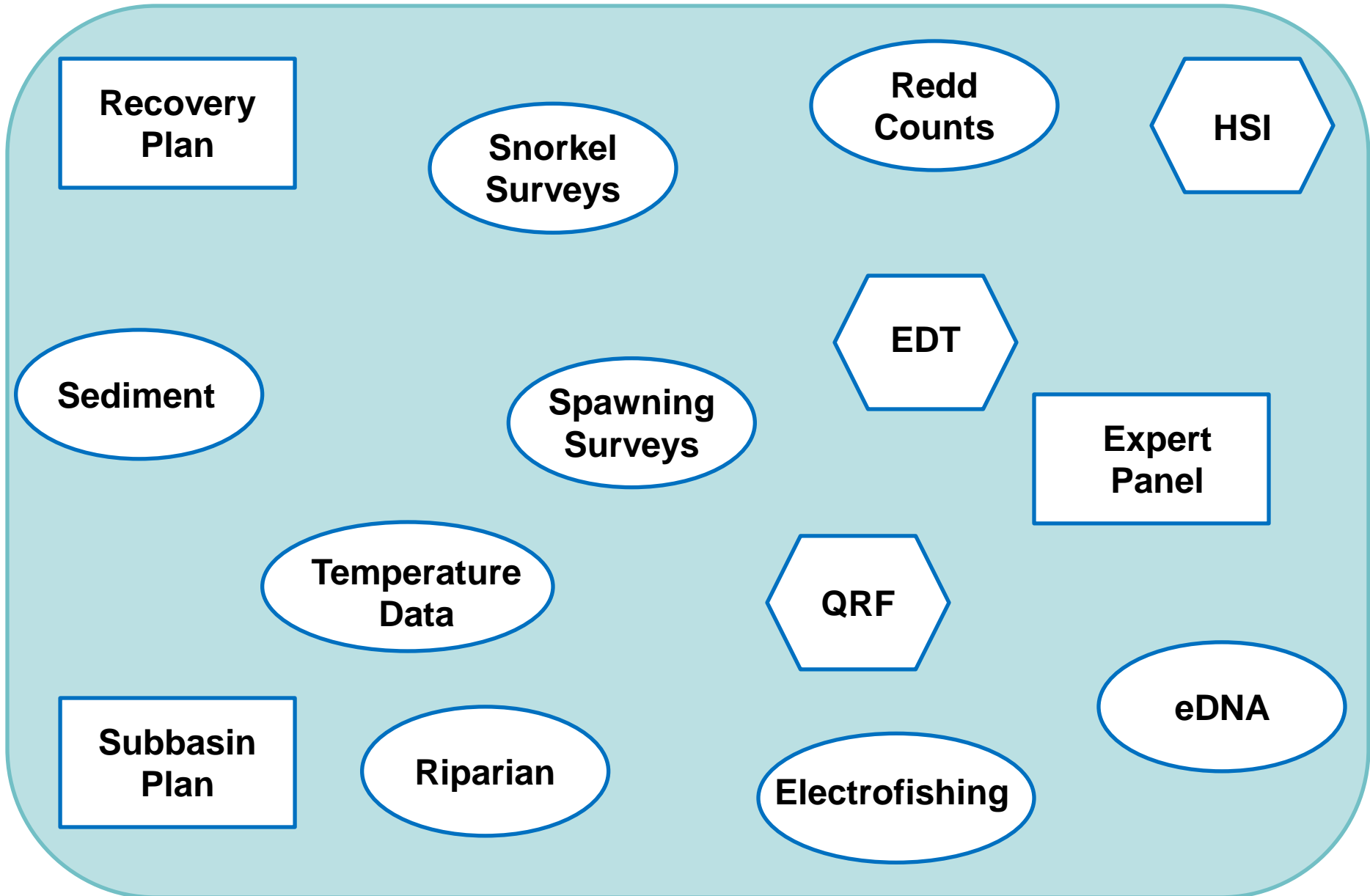
# Not data collection



# Supplementation of Existing Plans



# MCDA

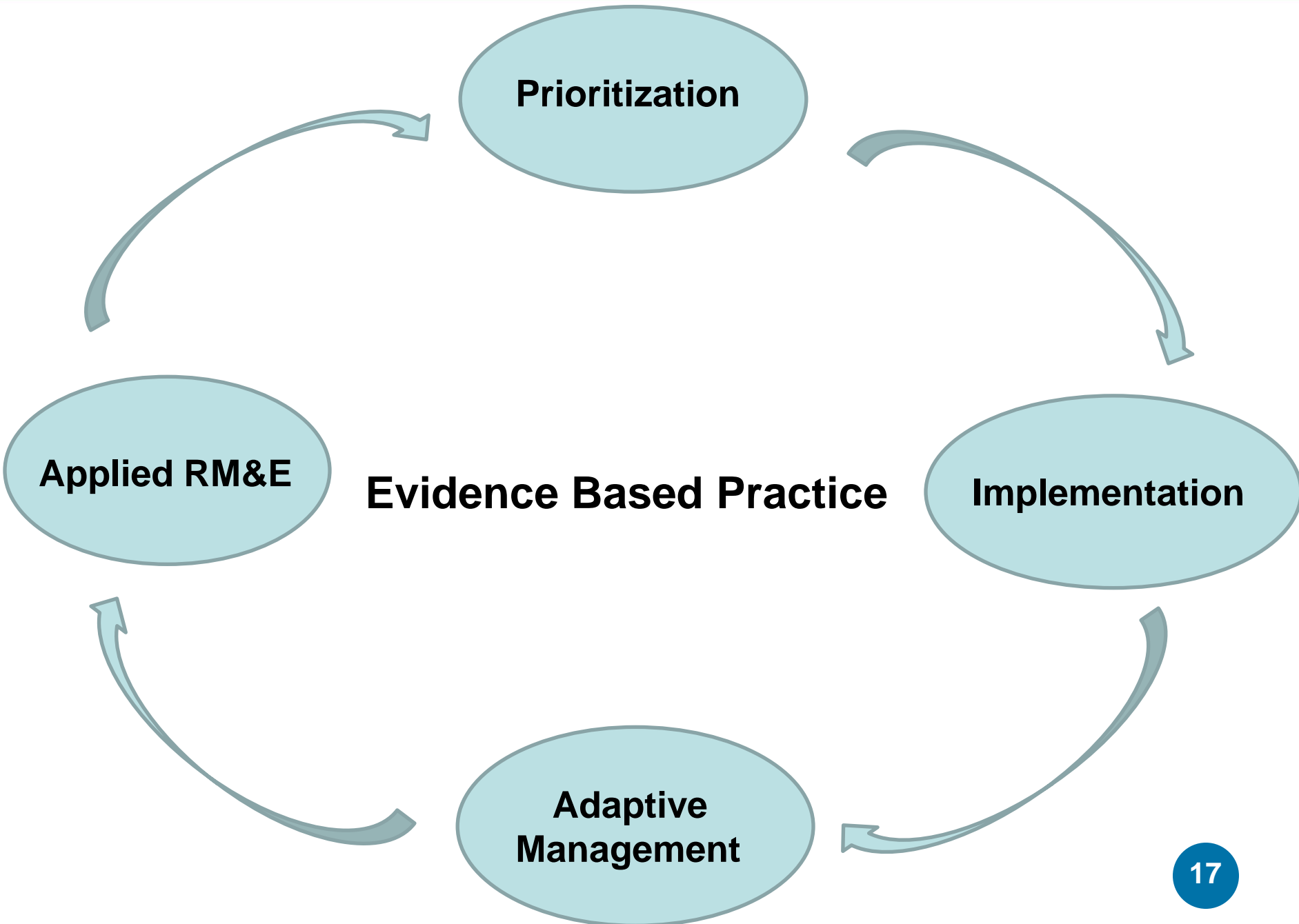




# Atlas Objectives







# Maximize biological benefit



# Increase return on investment



# Enhance adaptive management



# Attract cost share



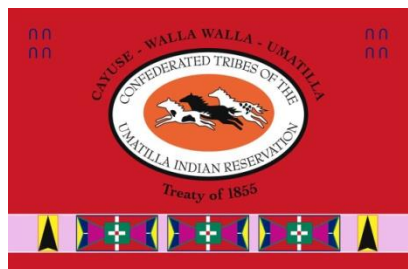


# Atlas Development



# Partner Outreach

- ✓ Atlas explanation
- ✓ Discussion



**GRANDE  
RONDE  
MODEL  
WATERSHED**



**Union Soil & Water  
Conservation District**

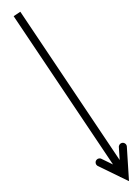


# Data Organization + Schedule

- Data consolidation
- Conversion to GIS visual format



Determine meeting schedule



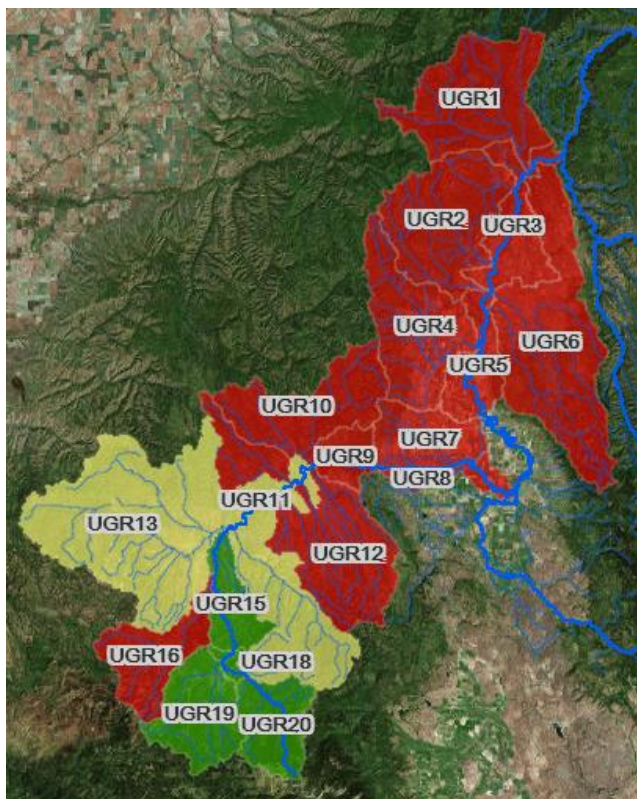
January	February	March	April	May
<p>★ Meeting #1 (BSRs, Periodicity, Utilization)</p>		<p>★ Meeting #2 (Limiting Factors, Restoration Actions)</p>	<p>We are here</p> <p>★ Meeting #3 (BSR Prioritization)</p>	<p>★ Meeting #4 (IT - Science Actions within...)</p>



**Determine Subwatersheds**

**Fish Periodicity**

**Limiting Life Stage**

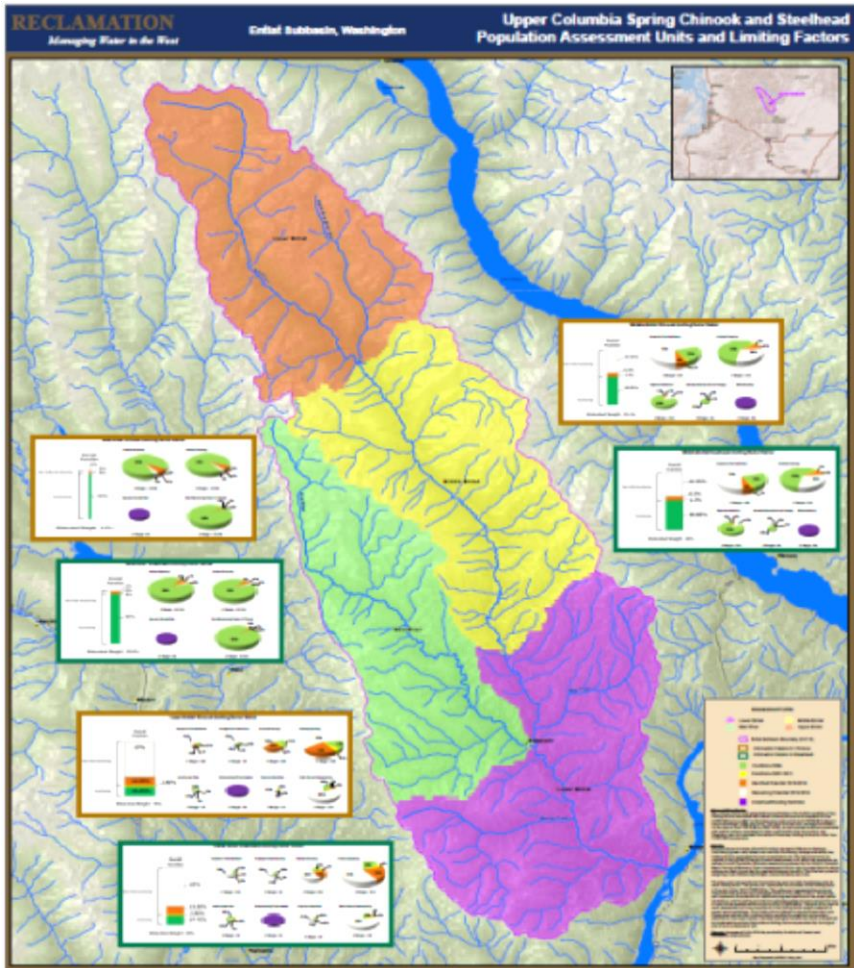


Species	Life Stage	Jan		Feb		Mar	
		1-15	16-31	1-15	16-28	1-15	16-31
Steelhead (Summer)	Adult Immigration						
	Adult Holding						
	Adult Spawning						
	Incubation						
	Emergence						
	Juvenile Rearing						
	Juvenile Emigration						
Spring Chinook Salmon	Adult Immigration						
	Adult Holding						
	Adult Spawning						
	Incubation						
	Emergence						
	Juvenile Rearing						
	Juvenile Emigration Age 0						
	Juvenile Emigration Age 1						
Bull Trout (Fluvial)	Adult Immigration						
	Adult Holding						
	Adult Spawning						
	Incubation						
	Emergence						
	Juvenile Rearing						
	Juvenile Emigration						

Fish Use & Life S				
Fish Utilization	Scores			
	Chinook	Steelhead	Bull Trout	
Adult Immigration	H	L	M	Thermal b
Adult Holding	H	L	L	CHS Pre-sj
Spawning / Incubation / Emergence	H	M	N/A	Some STS
Juvenile Emigration	L	L	M	
Summer Rearing	H	H	N/A	
Winter Rearing	H	H	H	Overwinte

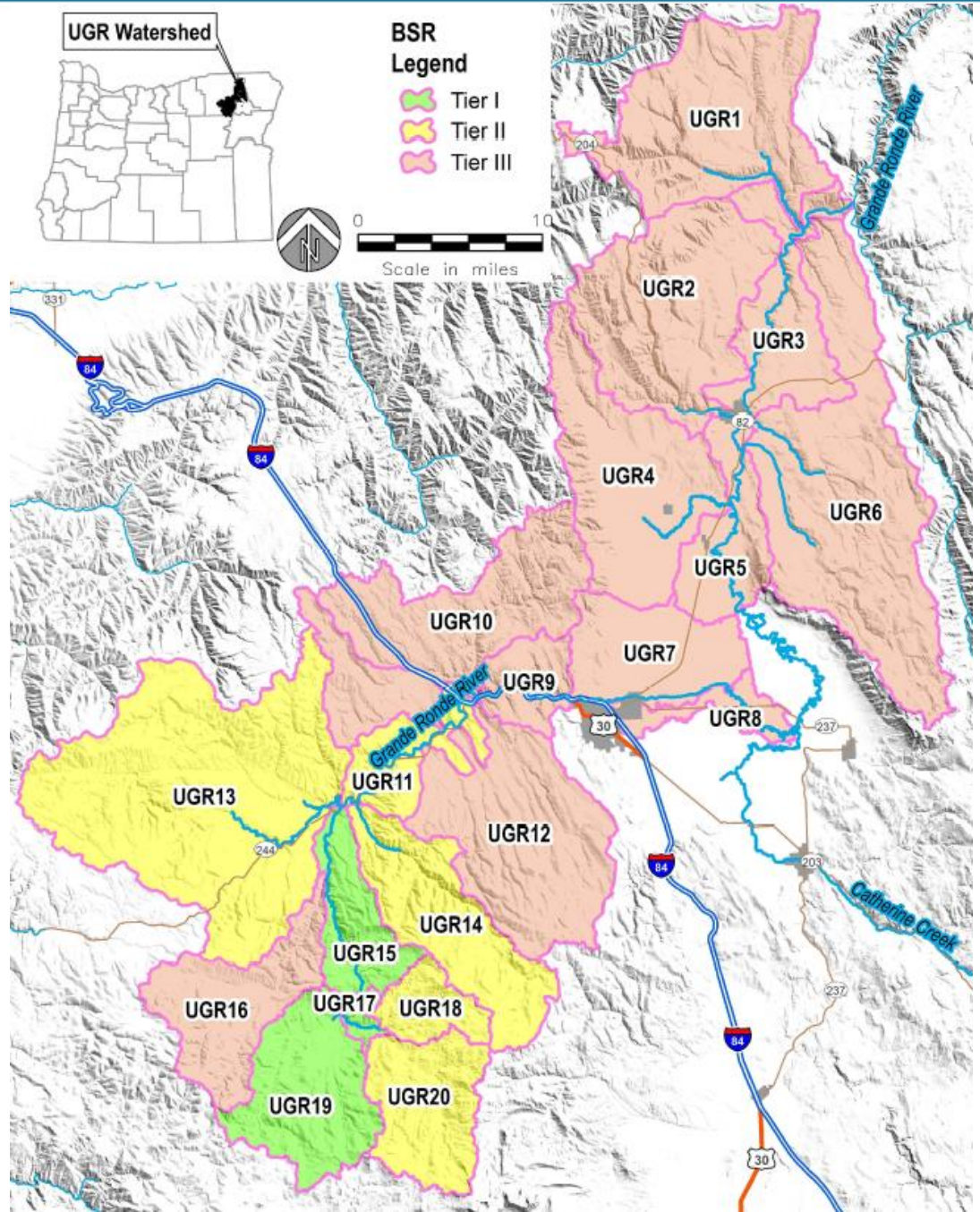
# Limiting Habitat Factors

# Restoration Actions



# Subwatershed Prioritization

	Inputs for Ability to Affect Change			Species Impact Scoring		Ability to Affect Change Scoring				
	Geomorphic Potential Classification	Current Condition Classification	Future Condition (Climate Change)	U-Score (Critical use / limiting life stage, bottleneck)	P-Score (Presence Absence- Current Production Area)	Geomorphic Score (gradient, lateral confinement)	Current Condition Score			
IRC-1	Low	Fair	Poor	5	20	10	20	2.5	58	
IRC-2	Low	Good	Good	5	20	10	15	7.5	58	
BSC-1	Low	Fair	Poor	8	16	10	20	2.5	57	
BSC-2	Low	Fair	Poor	10	20	10	20	2.5	62	
MCC-1	Medium	Fair	Fair	3	9	15	20	5	52	
MCC-2	Low	Fair	Fair	5	19	10	20	5	58	
WRC-1	Medium	Excellent	Excellent	5	19	15	5	10	53	
MRC-1	Low	Good	Fair	4	14	10	15	5	48	
MRC-2	Low	Excellent	Excellent	6	19	10	5	10	49	
DEER	Low	Excellent	Good	4	14	10	5	7.5	40	

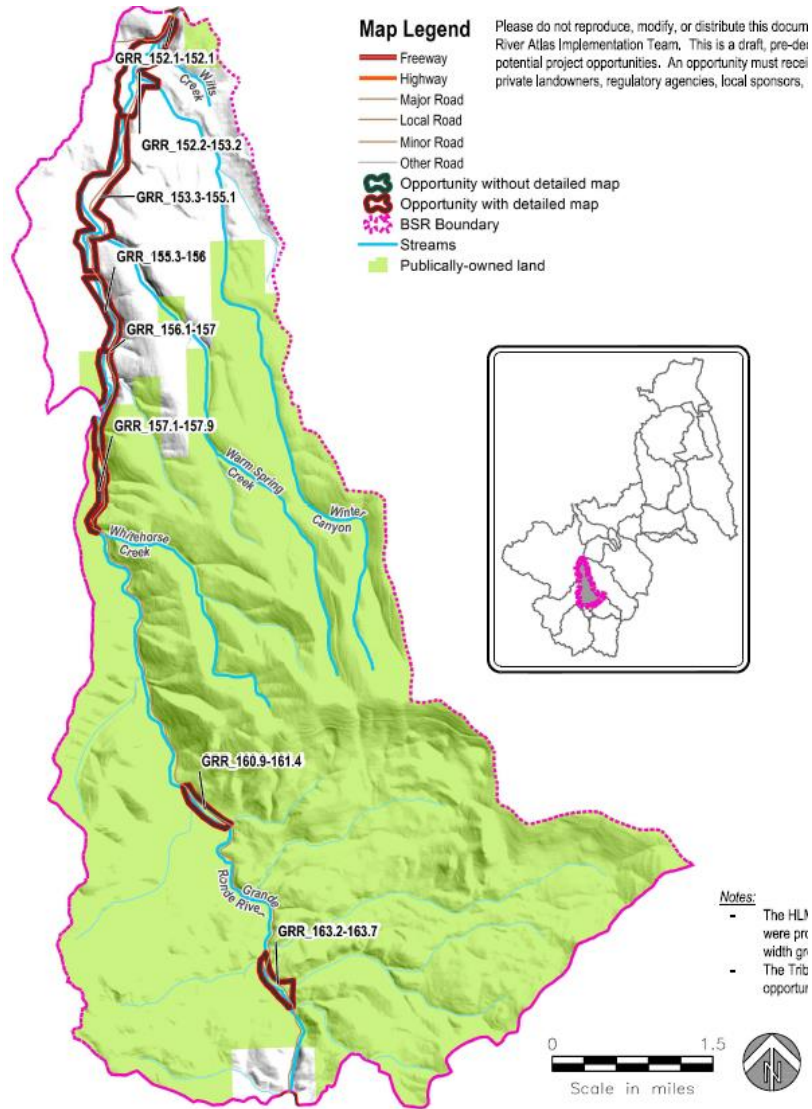




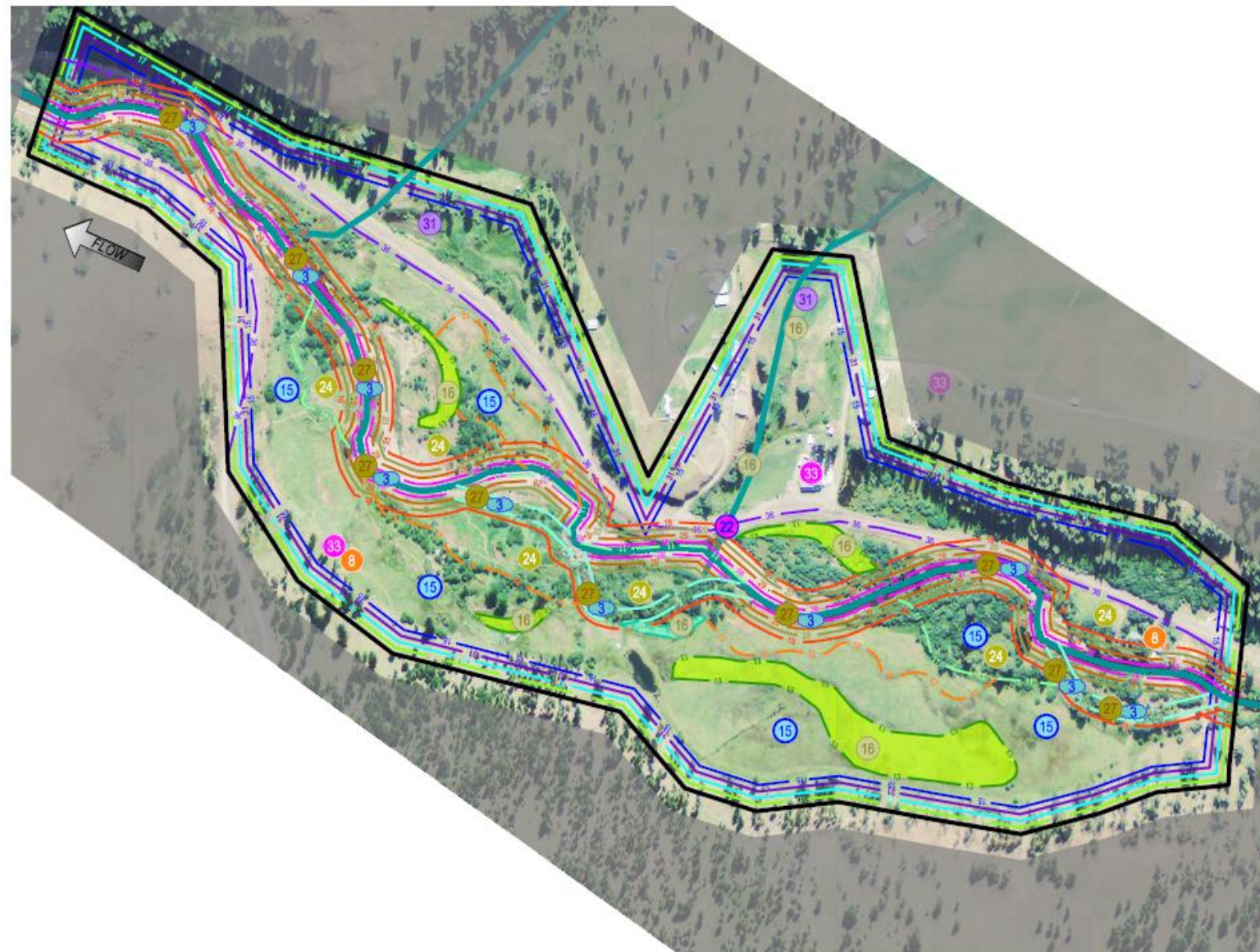
# Atlas Implementation



# Scope + Map Actions



# Restoration opportunities = suites of actions



GRR_152,2-153,2	
TAC #	Restoration Activity
1	Protect Land & Water
2	Channel Reconstruction
3	Pool Development
8	Relocate Infrastructure
11	Perennial Side Channel
12	Secondary Channel
13	Floodplain Pond-Wetland
14	Alcove
15	Hyporheic Off-Channel
16	Beaver Restoration
17	Riparian Fencing
18	Riparian Buffer Planting
20	Remove Non-Natives
22	Barrier or Culvert Repair/Removal
24	Add Nutrients
27	LWD Placement
28	Modify or Remove Armoring
29	Restore Banklines w/LWD or Bio
31	Improve Thermal Refugia (Springs)
33	Reduce - Mitigate Point Sources
36	Road Grading/Drainage Improvement

# Restoration opportunities = suites of actions



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# Rank Opportunities

Basic Information				Biological Criteria				
Opportunity Name	Status	BSR	BSR ranking	Limiting Factors (Priority & Quantity Addressed)	Restoration Action Priority	Climate Change	Natural Process (Beechi et al)	Total Biological Benefit Score
<b>BSR: LAS-1a</b>								
Opportunity: Waw'aa'Iamnime Wood Addition	Not started	BSR: LAS-1a	Tier I	1	1	0	10	12
Opportunity: Music Line Channel Relocation	Not started	BSR: LAS-1a	Tier I	4	1	1	10	16
Opportunity: Doe Creek Wood Addition	Not started	BSR: LAS-1a	Tier I	1	1	0	10	12
Opportunity: Western Pacific Land Acquisition	Not started	BSR: LAS-1a	Tier I	0	1	1	10	12
<b>BSR: LAS-2a</b>								
Opportunity: 111 Road Decommissioning	Not started	BSR: LAS-2a	Tier I	2	3	1	10	16
Opportunity: Walton Creek Hatchery Intake	Not started	BSR: LAS-2a	Tier I	0	0	0	10	11
Opportunity: Beave Ridge Road 368 Improvement	Not started	BSR: LAS-2a	Tier I	1	1	0	10	12
Opportunity: 111 Road Culvert Replacement/Removal	Not started	BSR: LAS-2a	Tier I	2	4	1	10	17
Opportunity: Road 359 and 360 Road Improvement	Not started	BSR: LAS-2a	Tier I	2	3	0	10	15
Opportunity: Elk Summit Road	Not started	BSR: LAS-2a	Tier I	2	3	0	10	15
Opportunity: Western Pacific Land Acquisition	Not started	BSR: LAS-2a	Tier I	0	1	1	10	12
<b>BSR: LAS-2b</b>								
Opportunity: Elk Summit Road Improvement	Not started	BSR: LAS-2b	Tier III	0	1	0	10	11

# Assign Lead





**Feasibility Criteria**

<b>Landowner/Public Willingness</b>	<b>Partnership Capacity</b>	<b>Environmental Compliance (NEPA, ESA, NHPA)</b>	<b>Site Access</b>	<b>Construction Feasibility (Cost, Complexity)</b>	<b>Project Timing (Contract Periods, Planning, Funding)</b>	<b>Probability (Biological Goals and Objectives)</b>	<b>Probability (Public Safety Goals and Objectives)</b>	<b>Overall Feasibility Rating</b>	<b>Comments</b>

# Implement Actions





# Atlas Evolution



# Success

**Historic Request**


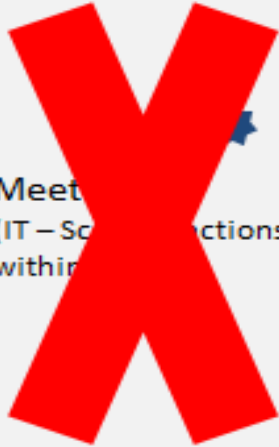


**Historic Collaboration**

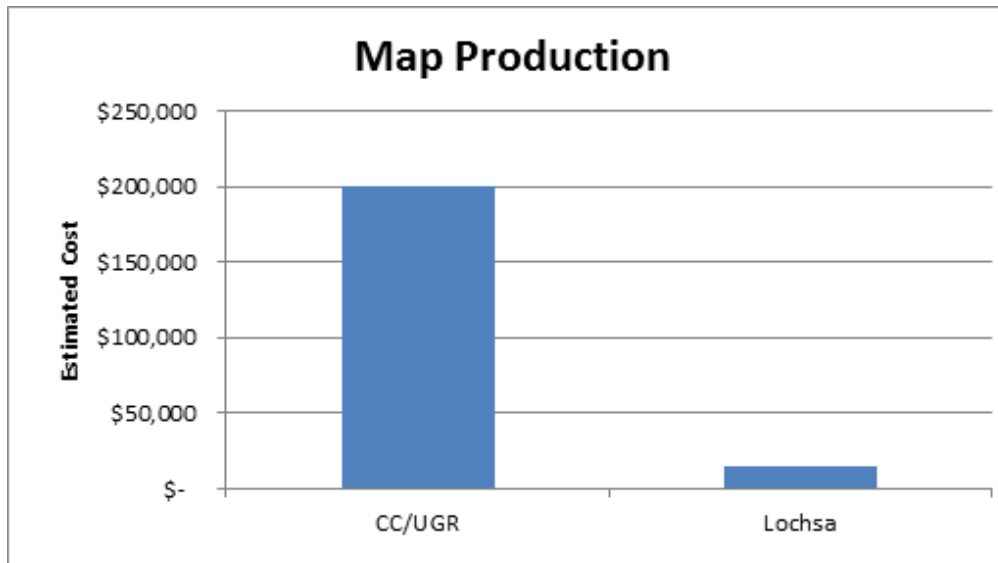
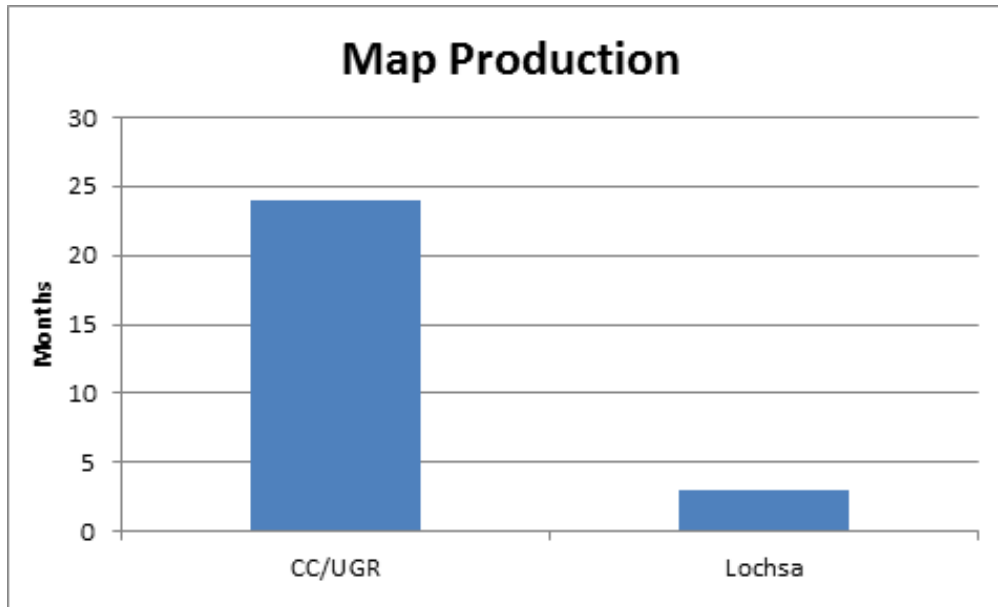
- “We’ve never had all the partners in the same room.” *NPT*
- “I’ve worked with the researchers more in the last three months than I have in 12 years.” *NPT*
- “Collaboration is king.” *USWCD*



# Efficiency

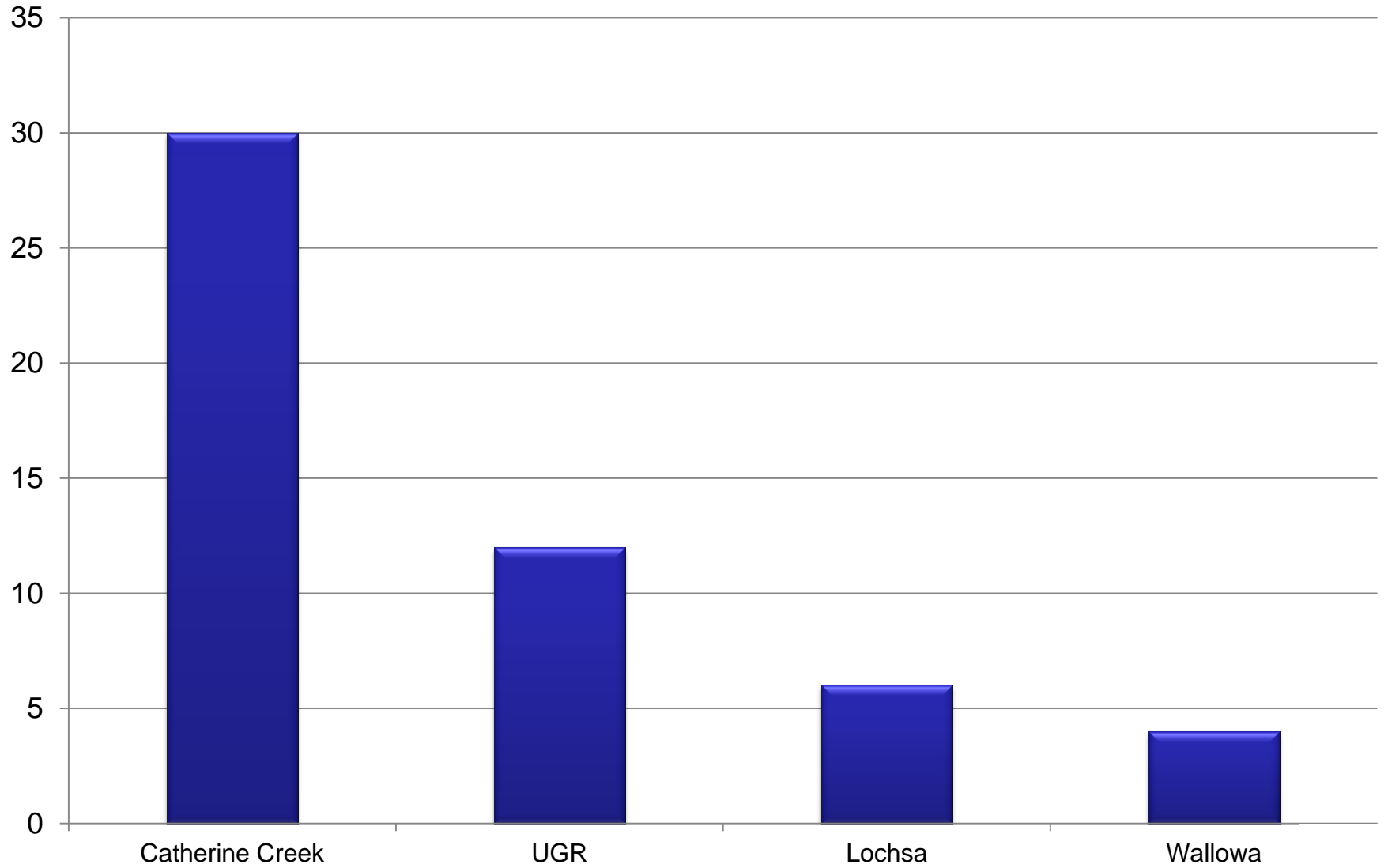
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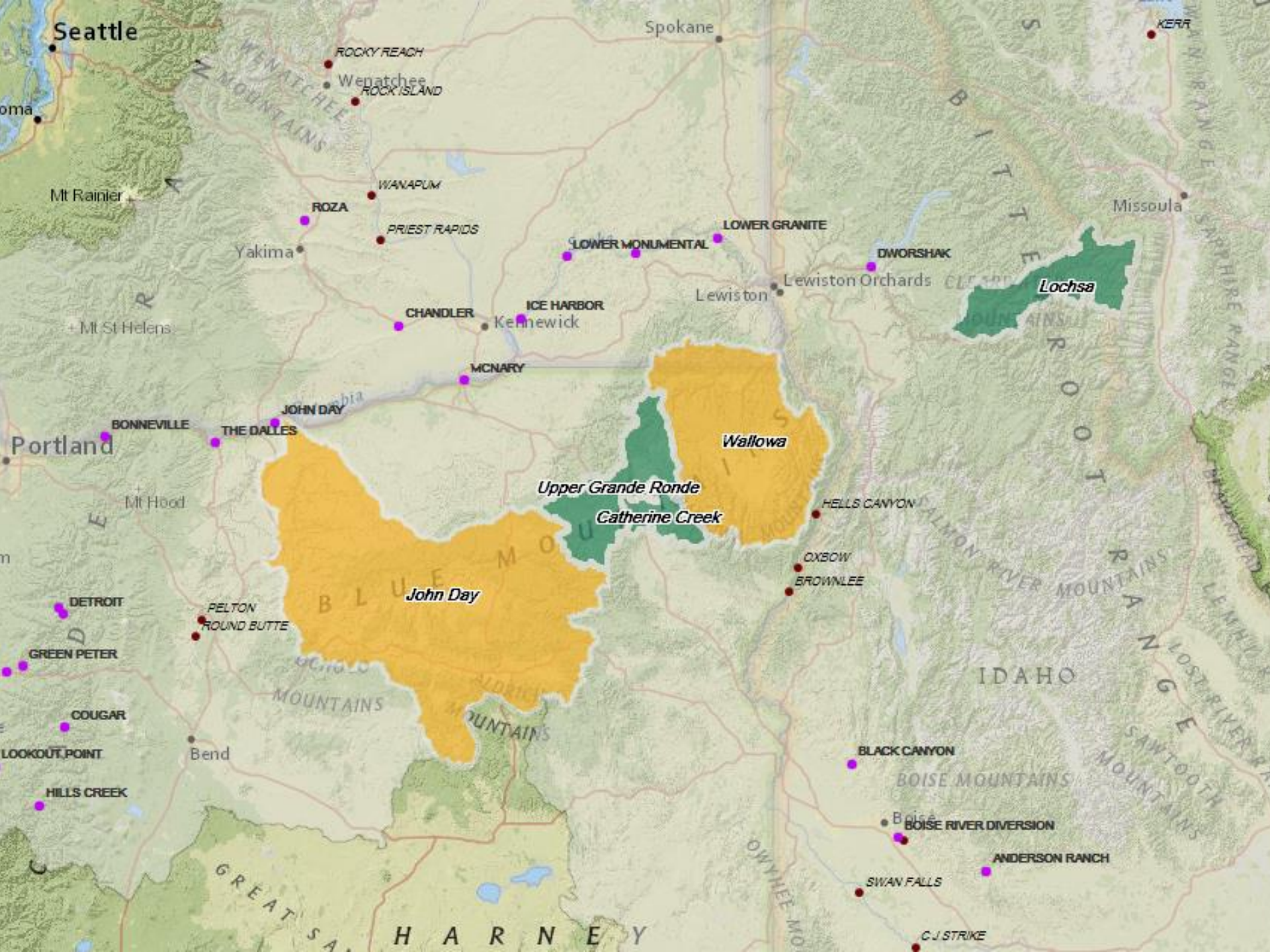
# Time, effort, and financial efficiency





# Time (months)





Seattle

Spokane

KERR

ROCKY REACH  
Wenatchee  
ROCK ISLAND

Mt Rainier

ROZA

WANAPUM

PRIEST RAPIDS

LOWER MONUMENTAL

LOWER GRANITE

DWORSHAK

Missoula

Lochsa

Yakima

CHANDLER

ICE HARBOR

Lewiston

Lewiston Orchards

Mt St Helens

BONNEVILLE

JOHN DAY

THE DALLES

Wallowa

Upper Grande Ronde

Catherine Creek

HELLS CANYON

Portland

Mt Hood

DETROIT

PELTON  
ROUND BUTTE

OXBOW

BROWNLEE

John Day

GREEN PETER

COUGAR

Bend

MOUNTAINS

MOUNTAINS

IDAHO

BLACK CANYON

BOISE MOUNTAINS

BOISE RIVER DIVERSION

LOOKOUT POINT

HILLS CREEK

GREAT SA...

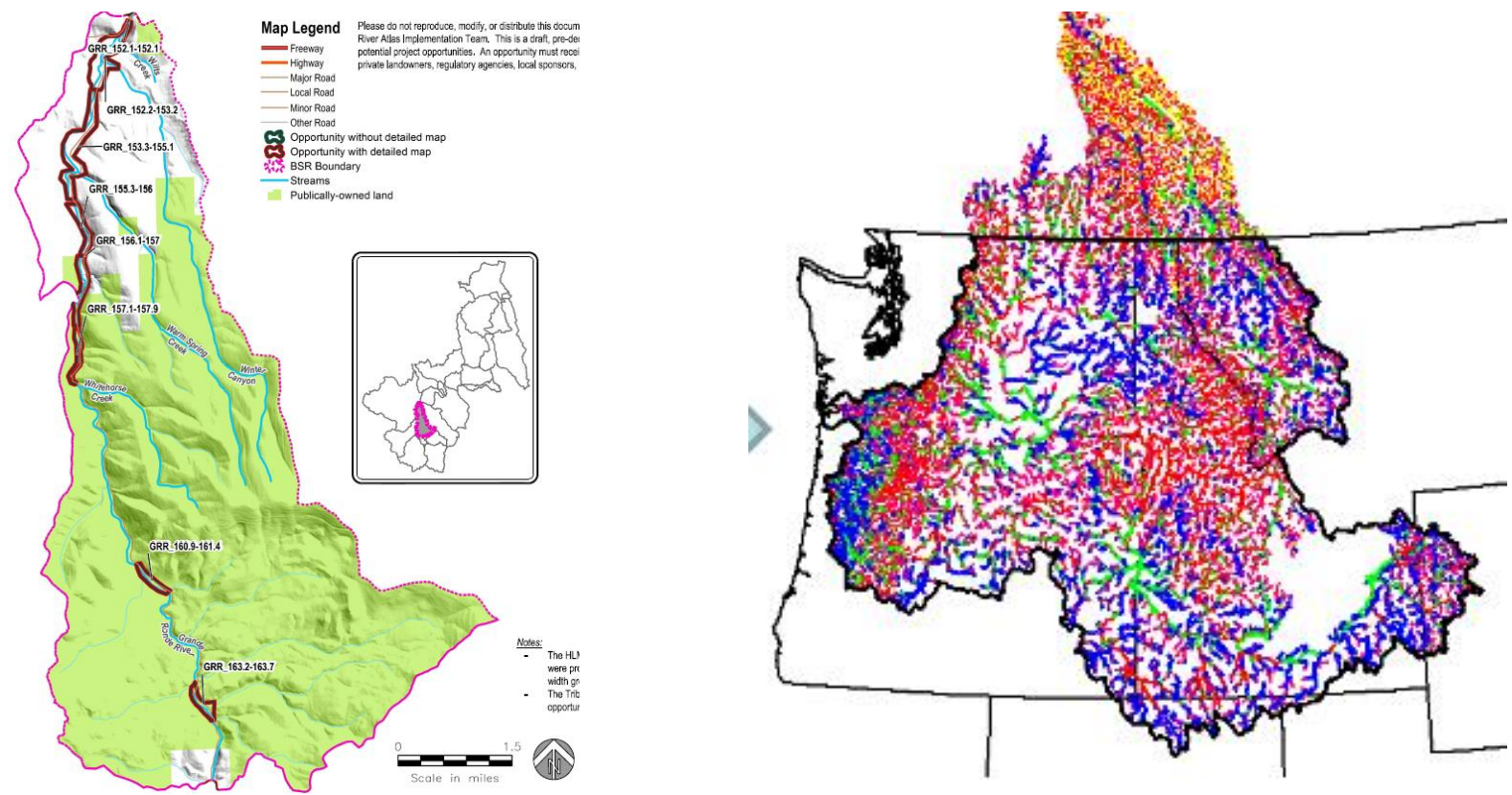
H A R N E Y

SWAN FALLS

C.J. STRIKE

ANDERSON RANCH

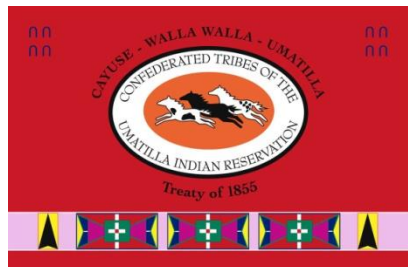
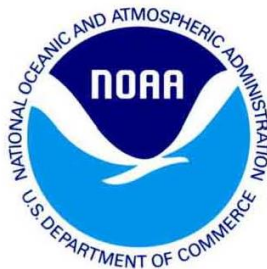
# Integration



- Consistent use of CB network data
- Adaptable prioritization mechanism across CB
  - ❑ Maximum biological benefit
  - ❑ Enhanced ROI

# Atlas Leadership

## Locally led, owned, adapted



GRANDE RONDE MODEL WATERSHED



Union Soil & Water Conservation District



# Capacity



# Cost



# Time



# Questions?

**Dave Kaplowe**  
**(503) 230-5365**





# References

Beechie, T., Imaki, H., Greene, J., Wade, A., Wu, H., Pess, G., Roni, P., Kimball, J., Stanford, J., Kiffney, P., Mantua, N. 2012. Restoring salmon habitat for a changing climate. *River Research and Applications* 29: 939-960.

Beechie, T. J., G. Pess, P. Roni, and G. Giannico. 2008. Setting River Restoration Priorities: A Review of Approaches and a General Protocol for Identifying and Prioritizing Actions. *North American Journal of Fisheries Management* 28:891–905.

Beechie, T., Sear, D., Olden, J., Pess, G., Buffington, J., Moir, H., Roni, P., Pollock, M. 2010. Process-based Principles for Restoring River Ecosystems. *Bioscience* 60: 209-222.

BPA (Bonneville Power Administration). 2015. Atlas Implementation Guidelines - Catherine Creek and Upper Grande Ronde River. June 8, 2015.

Roni, P., Anders, P., Beechie, T., Kaplowe, D. 2017. Review of Tools for Identifying, Planning and Implementing Habitat Restoration for Pacific Salmon and Steelhead. *North American Journal of Fisheries Management* DOI: 10.1002/nafm.10035

Roni, P., T.J. Beechie, R.E., Bilby, F.E. Leonetti, M.M. Pollock, and G.P. Pess. 2002. A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in Pacific Northwest watersheds. *North American Journal of Fisheries Management* 22:1-20.