Northwest **Power** and **Conservation** Council

December 5, 2017

MEMORANDUM

TO: **Fish and Wildlife Committee Members**

FROM: **Council staff**

SUBJECT: **Atlas: Strategic Prioritization of Habitat Restoration Actions**

BACKGROUND:

Presenter: Dave Kaplowe, Prioritization and Strategic Planning Lead for Bonneville Power Administration.

Summary: Bonneville has worked collaboratively with partners in the Grande Ronde, Imnaha, Clearwater, and John Day subbasins to develop and implement a strategic, evidence-based habitat restoration prioritization framework known as Atlas.

Atlas is a multi-criteria decision analysis framework that utilizes the best available fish and habitat data, peer-reviewed published research, and local knowledge to determine the highest priority areas and actions for habitat restoration within a group of watersheds. The local team of biologists, geomorphologists, and engineers then identifies, maps, and prioritizes hundreds of restoration opportunities throughout each watershed for implementation during a period of 20 or more years. This long term, strategic action plan maximizes biological benefit for fish species, increases the return on the financial investment, enhances adaptive management, and attracts additional funds.

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Atlas – Evidence Based Prioritization Framework

December 12, 2017

Objectives

- Provide Atlas summary
- Discuss Atlas evolution and adaptation

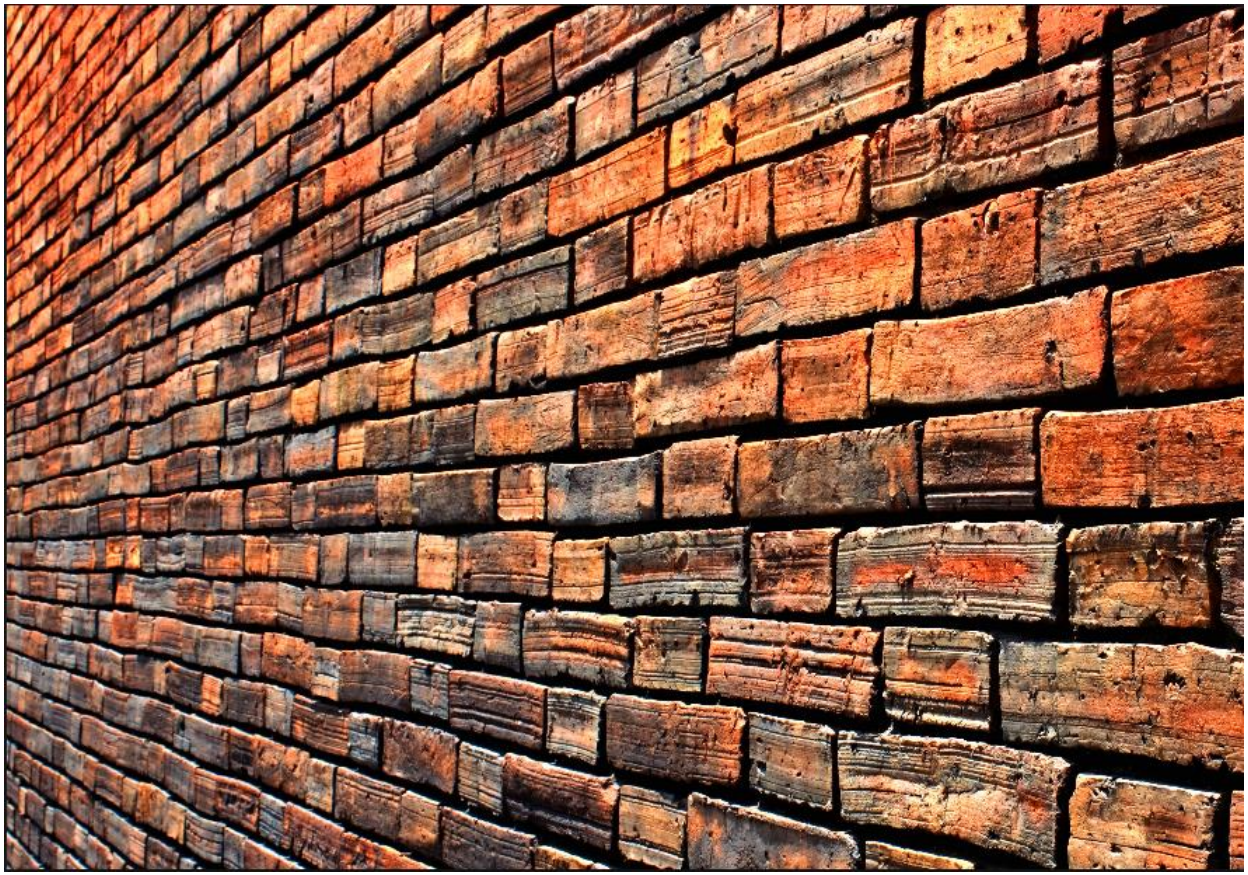
BPA 75 YEARS 1937–2012 SERVING THE NORTHWEST

Atlas Emergence

Improve opportunistic approach

Improve use of evidence

Implementation



Research

Improve collaboration

Expenditures vs. biological benefit, ROI

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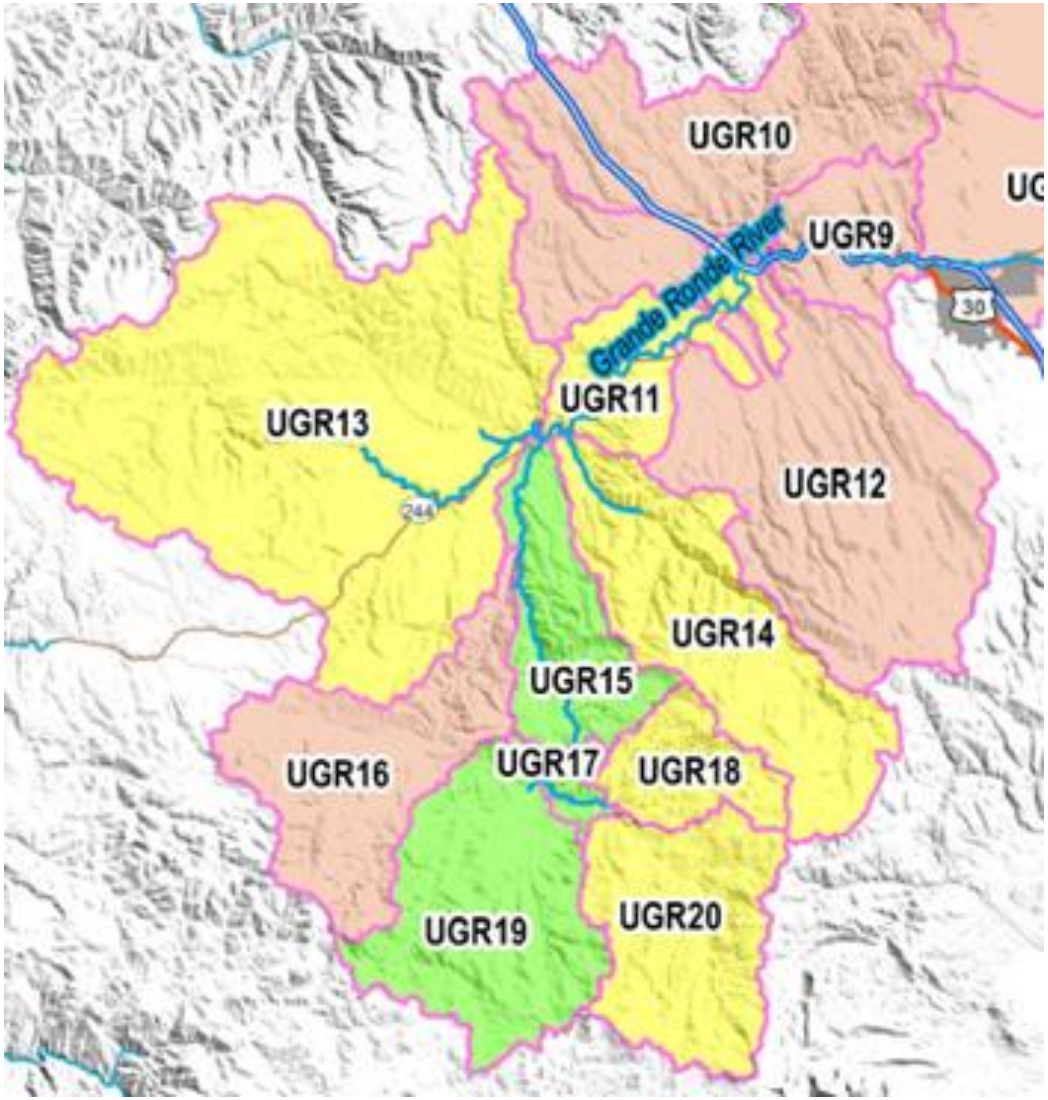
BPA 75 YEARS 1937–2012 SERVING THE NORTHWEST

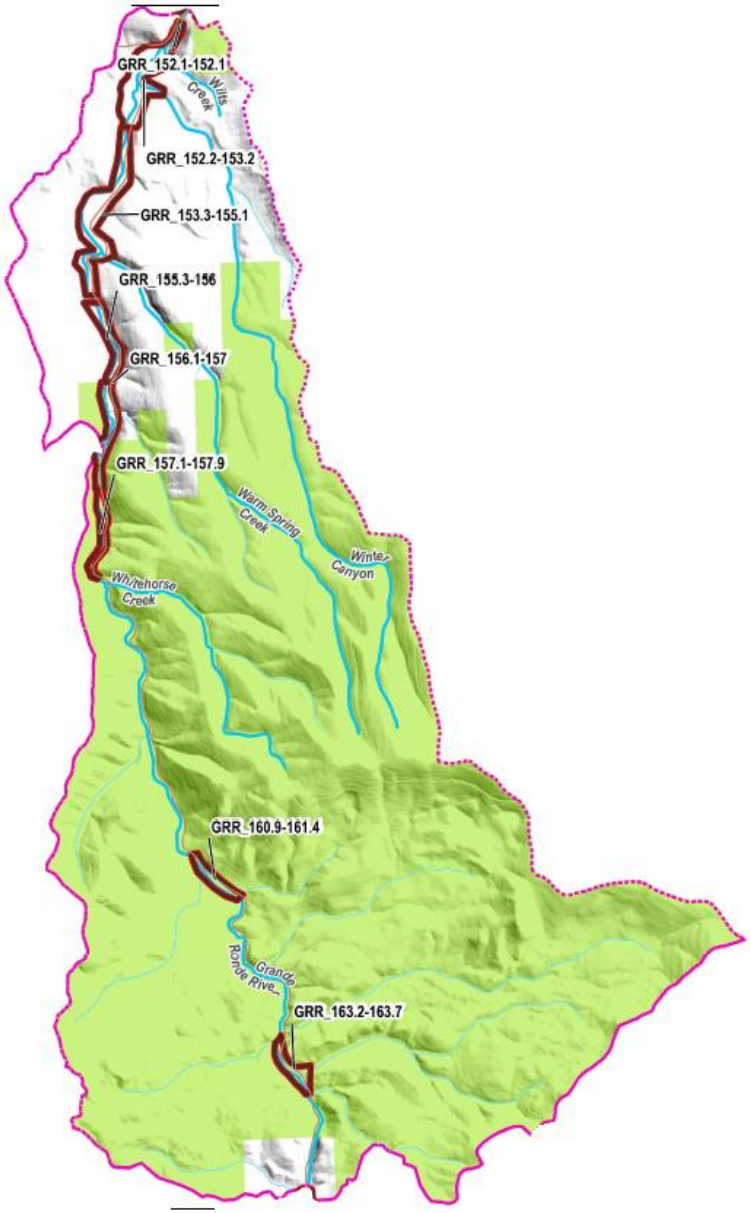
Atlas Definition

Evidence Based Prioritization Framework

Determine priority areas



Determine priority actions



Score, rank actions

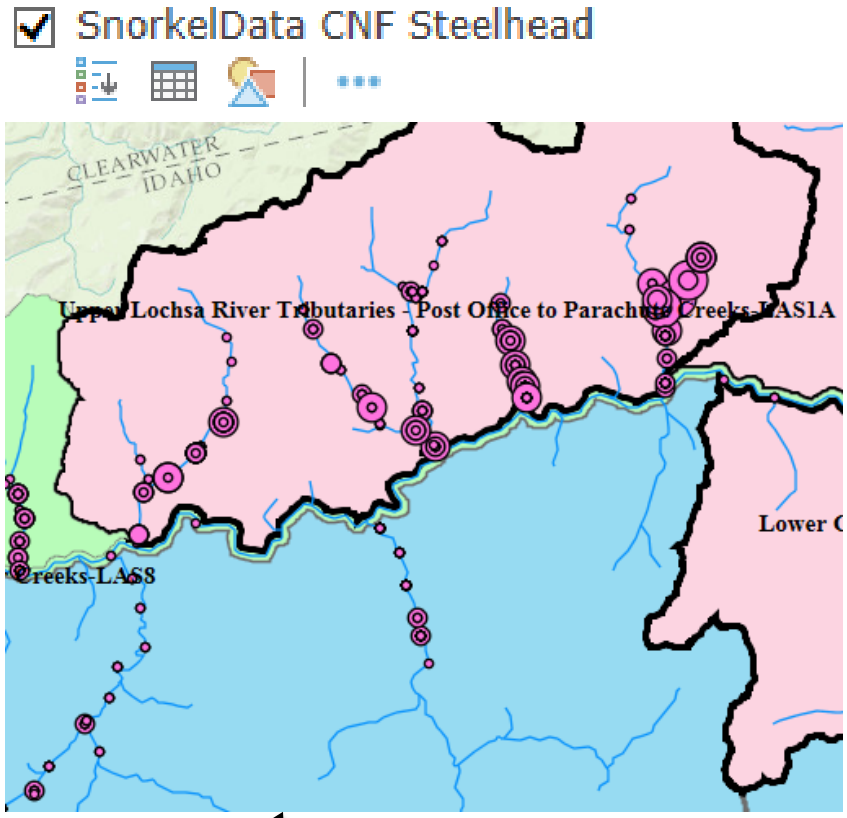
BSR	BSR ranking	Limiting Factors (Priority & Quantity Addressed)	Restoration Action Priority	Climate Change	Natural Process (Beechi et al)	Total Biological Benefit Score
BSR: LAS-1a	Tier I	1	1	0	5	7
BSR: LAS-1a	Tier I	5	1	1	5	12
BSR: LAS-1a	Tier I	1	1	0	5	7
BSR: LAS-1a	Tier I	1	1	1	5	7

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.

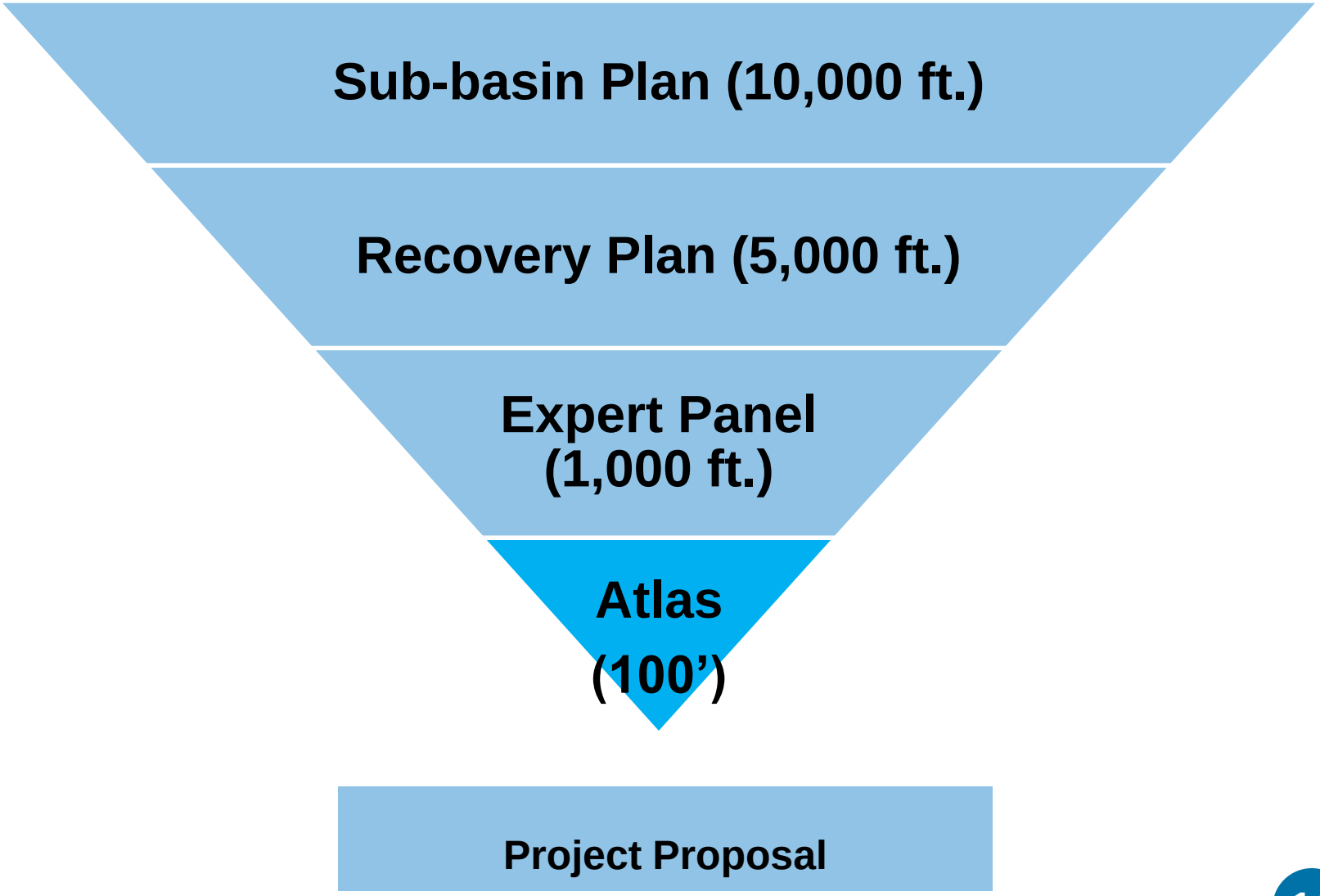


Utilizes existing data
Incorporates new data

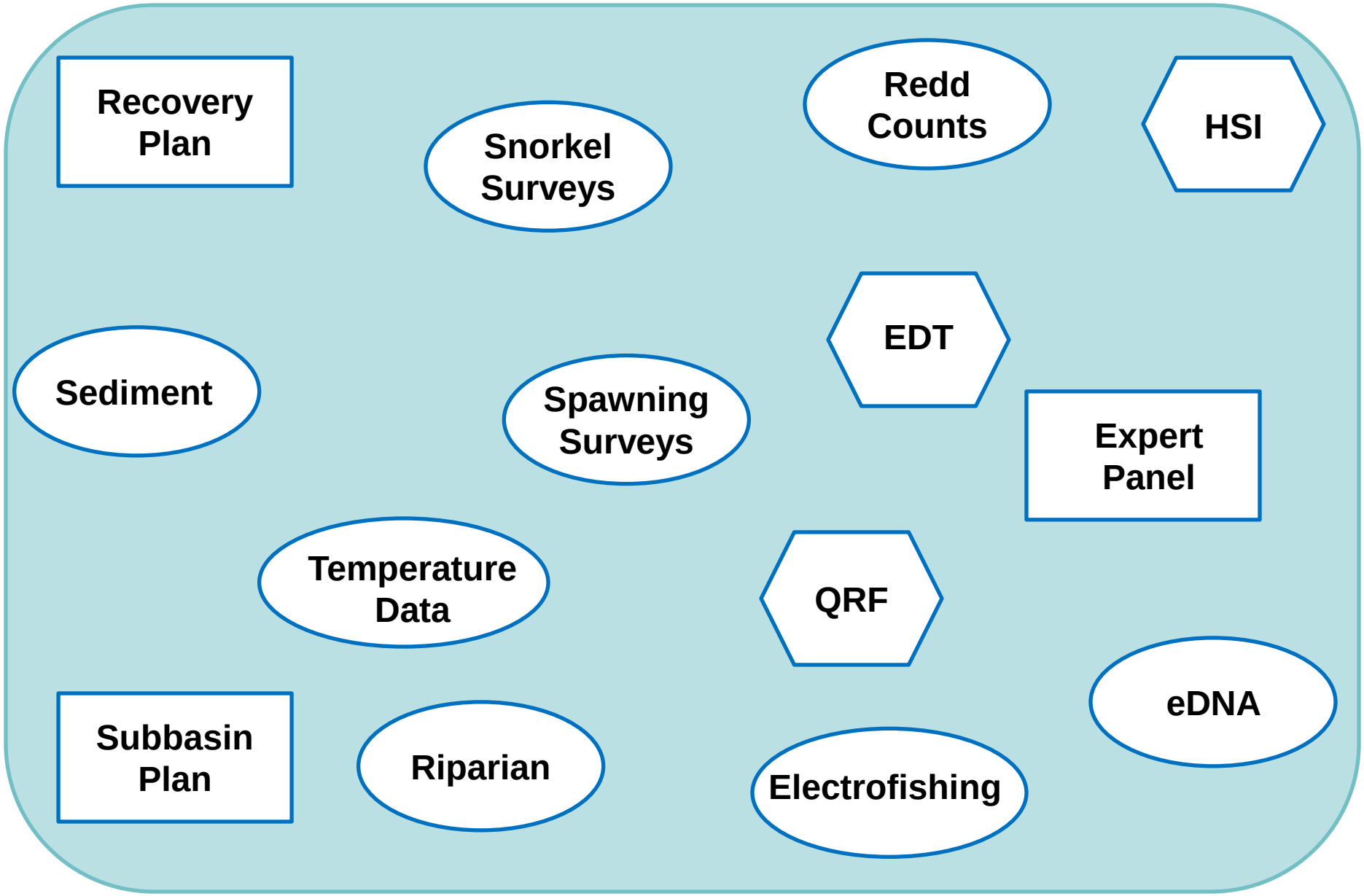
Not data collection

Inform future data collection

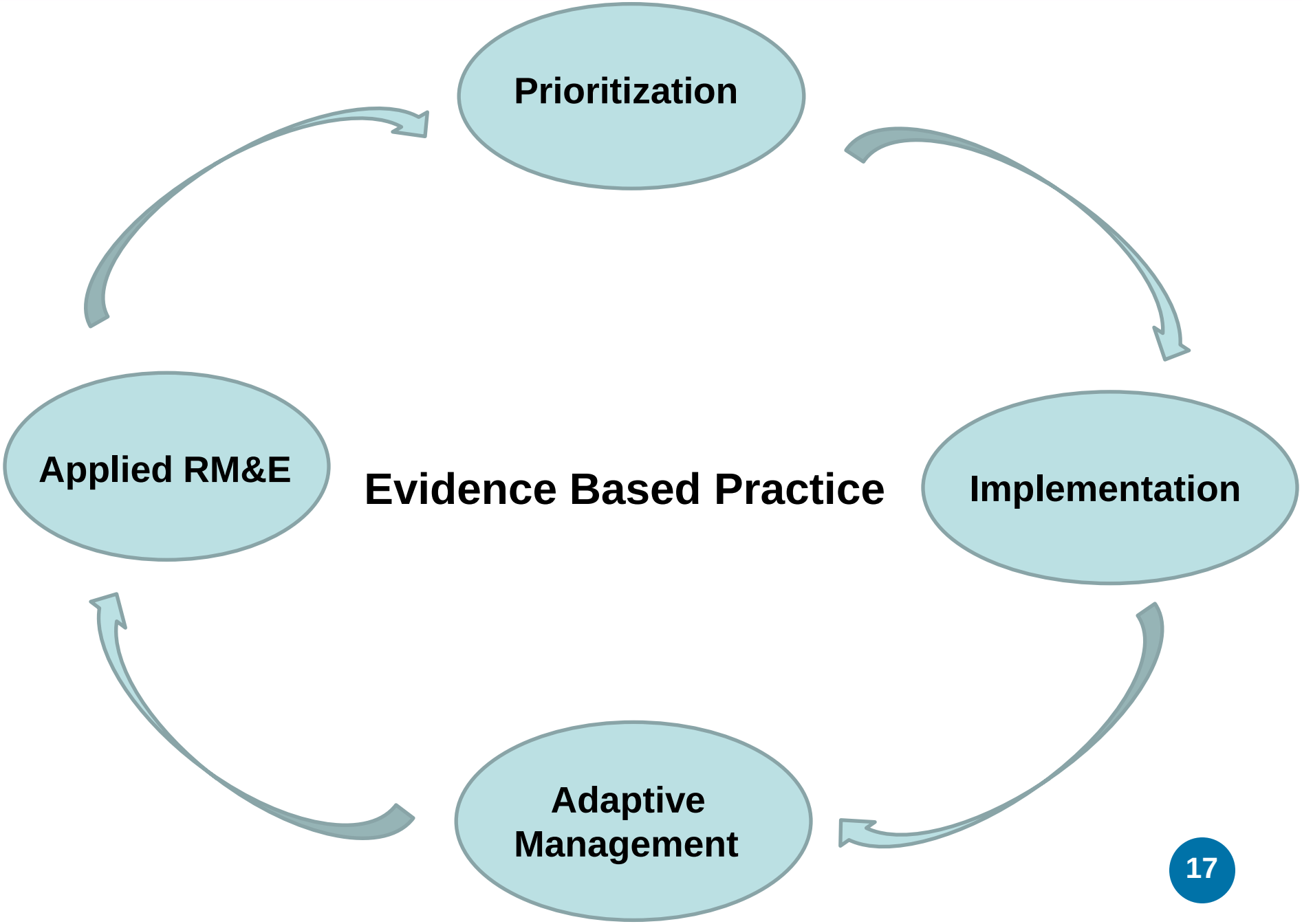
Supplementation of Existing Plans



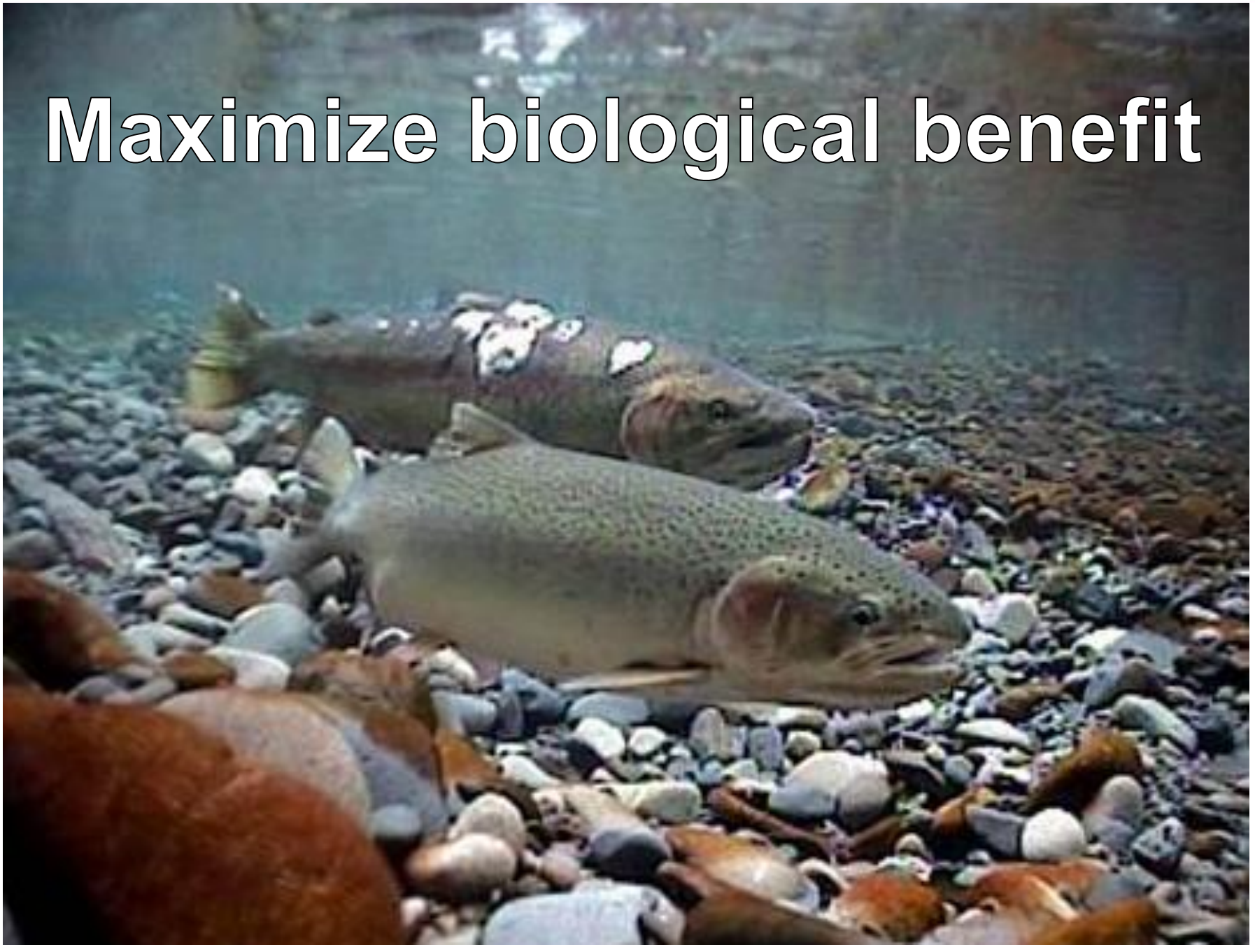
MCDA


Recovery Plan
Snorkel Surveys
Redd Counts
HSI
EDT
Sediment
Spawning Surveys
Expert Panel
Temperature Data
QRF
eDNA
Subbasin Plan
Riparian
Electrofishing

Atlas Objectives


Prioritization
Implementation
Adaptive Management
Applied RM&E
Evidence Based Practice

Maximize biological benefit



Increase return on investment

Enhance adaptive management

Attract cost share

BPA 75 YEARS 1937–2012 SERVING THE NORTHWEST

Atlas Development

Partner Outreach

- ✓ Atlas explanation
- ✓ Discussion

The Freshwater Trust
Changing the course of conservation.

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

NRCS

CAYUSE - WALLA WALLA - UMATILLA
CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
Treaty of 1855

NEZ PERCE TRIBE
TREATY OF 1855

OREGON
Fish & Wildlife

BONNEVILLE
POWER ADMINISTRATION

OREGON WATERSHED ENHANCEMENT BOARD
OWEB

U.S. FISH & WILDLIFE SERVICE

GRANDE RONDE MODEL WATERSHED

Union Soil & Water Conservation District

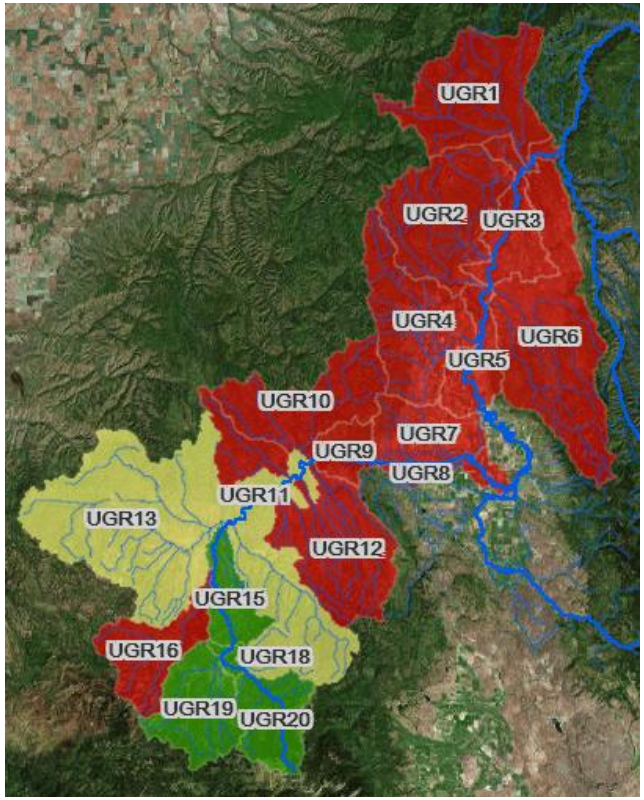
Data Organization + Schedule

- Data consolidation
- Conversion to GIS visual format

Determine meeting schedule

January	February	March	April	May
Meeting #1 (BSRs, Periodicity, Utilization)		Meeting #2 (Limiting Factors, Restoration Actions)	We are here Meeting #3 (BSR Prioritization)	Meet (IT – Sc… ctions within…

Determine Subwatersheds → **Fish Periodicity** → **Limiting Life Stage**

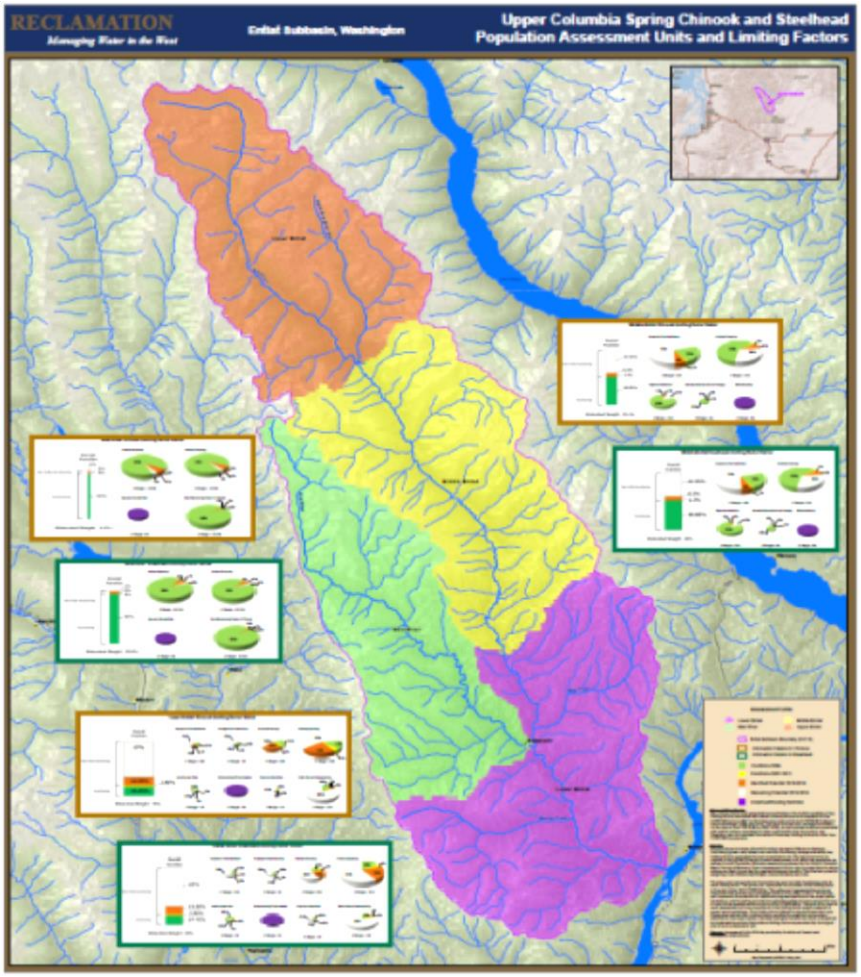


Species	Life Stage	Jan 1-15	Jan 16-31	Feb 1-15	Feb 16-28	Mar 1-15	Mar 16-31
Steelhead (Summer)	Adult Immigration						
	Adult Holding						
	Adult Spawning						
	Incubation						
	Emergence						
	Juvenile Rearing						
	Juvenile Emigration						
Spring Chinook Salmon	Adult Immigration						
	Adult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

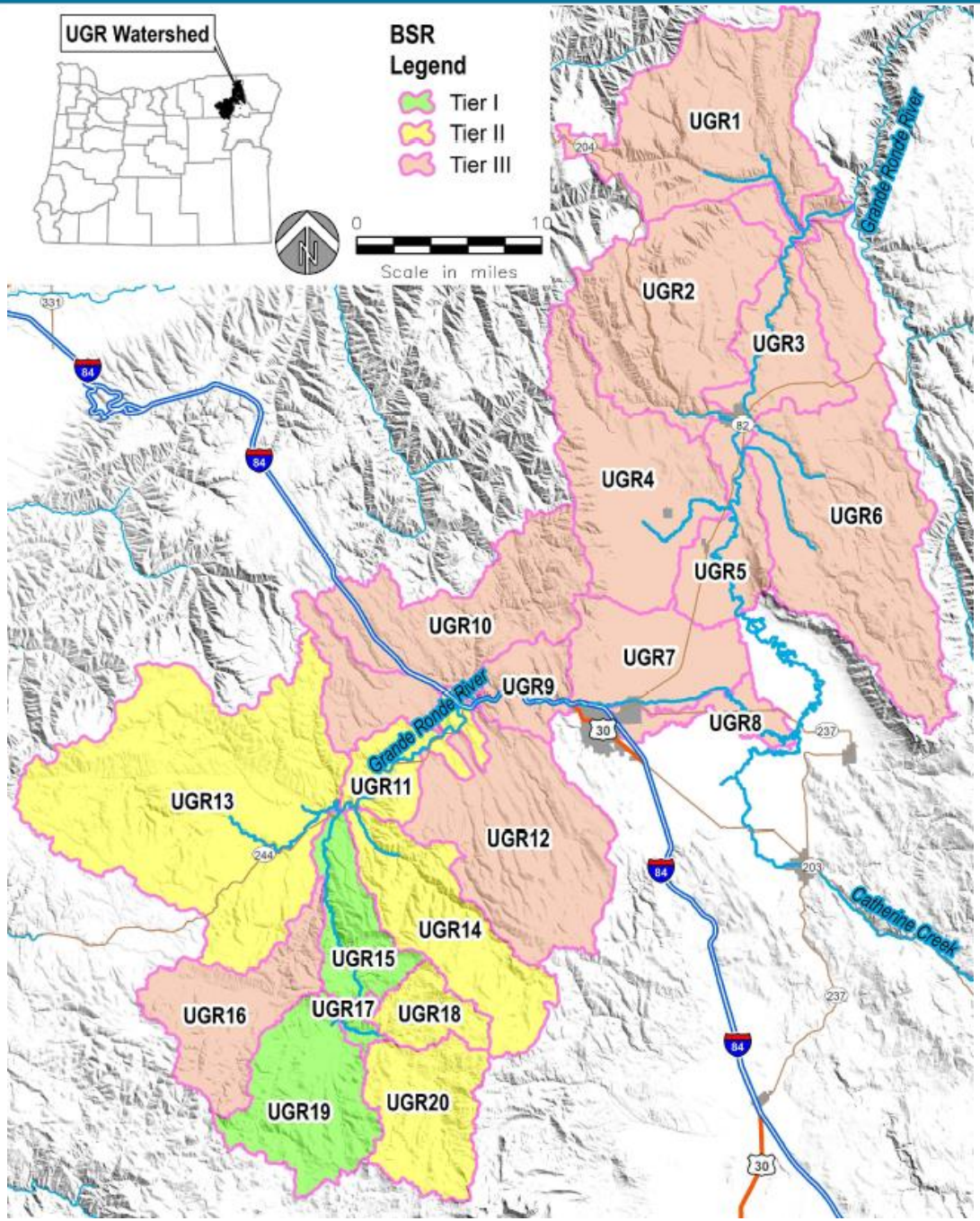
Limiting Habitat Factors

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	Future Condition (Climate Change)	Cummalative Score (Inputs converted to a number then summed)	Ranking (Tier I,II,III)
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	


UGR Watershed
BSR
Legend
Tier I
Tier II
Tier III
0
10
Scale in miles
UGR1
UGR2
UGR3
UGR4
UGR5
UGR6
UGR7
UGR8
UGR9
UGR10
UGR11
UGR12
UGR13
UGR14
UGR15
UGR16
UGR17
UGR18
UGR19
UGR20
Grande Ronde River
Grande Ronde River
Catherine Creek
84
82
30
237
203
244
204
331

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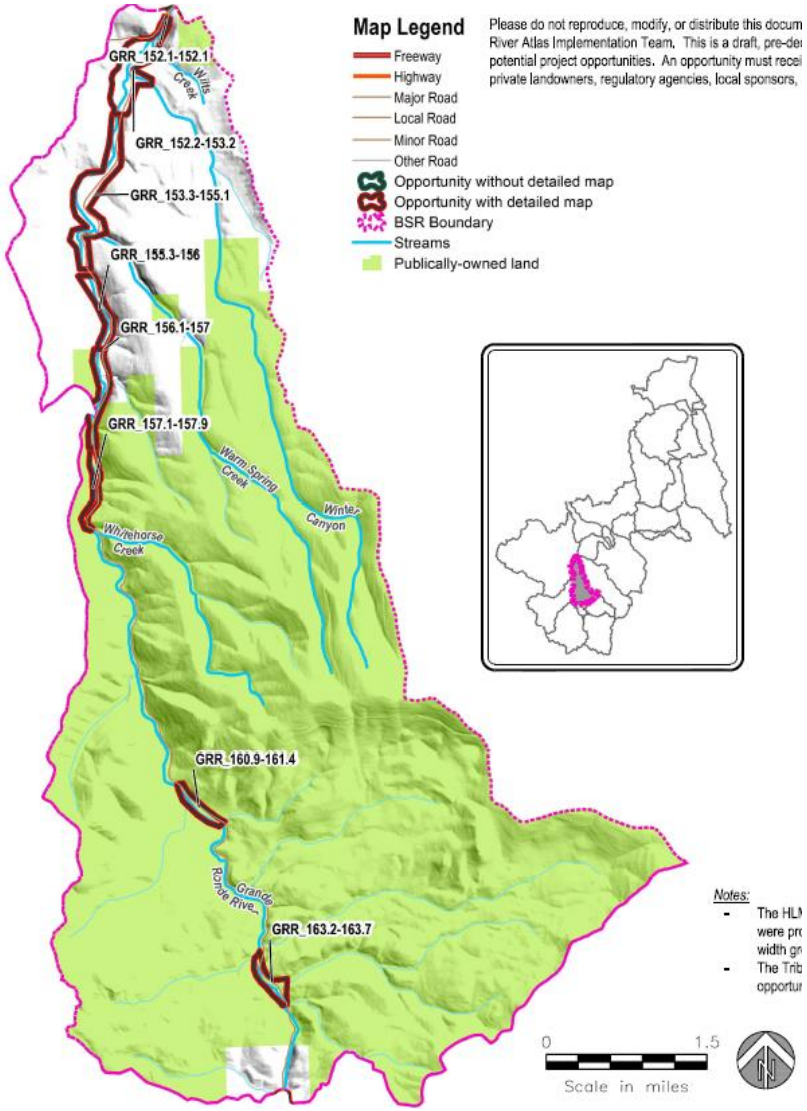
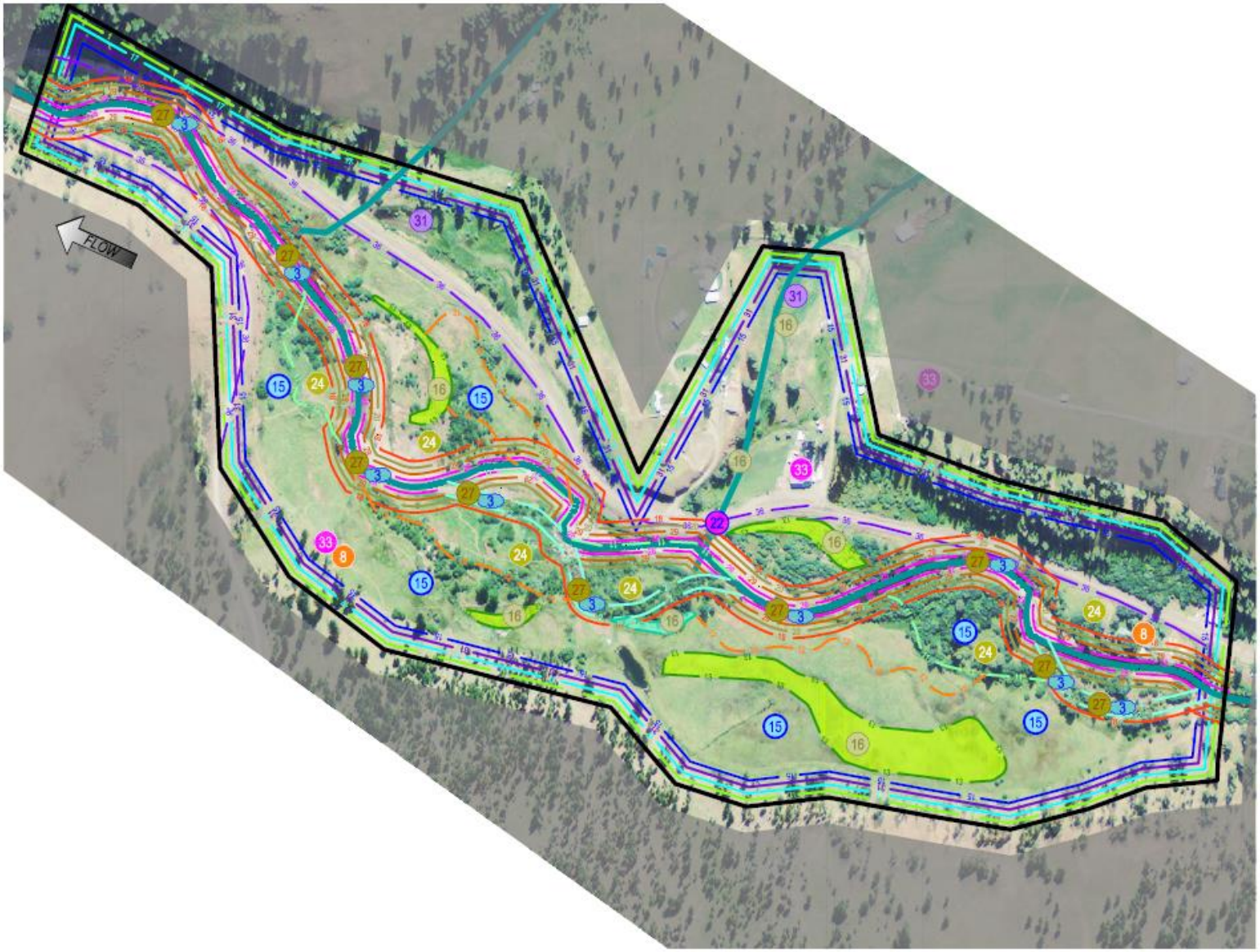
Atlas Implementation

Scope + Map Actions

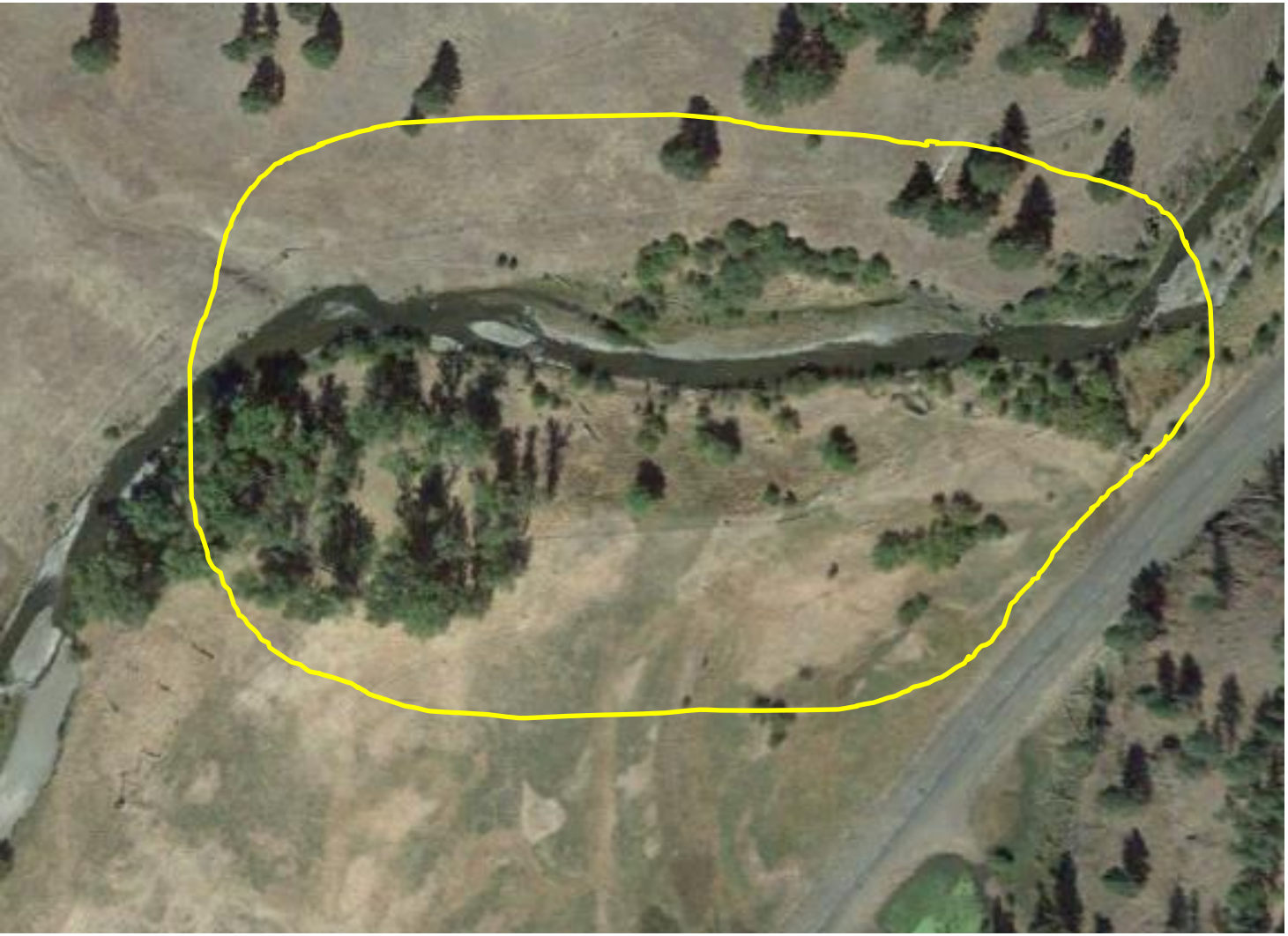


Restoration opportunities = suites of actions



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



GRR_152,2-153,2	
TAC #	Restoration Activity
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31	Improve Thermal Refugia (Springs)
33	Reduce - Mitigate Point Sources
36	Road Grading/Drainage Improvement

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
BSR: LAS-1a								
Opportunity: Waw'aa'lamnime 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
BSR: LAS-2a								
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
BSR: LAS-2b								
Opportunity: Elk Summit Road Improvement	**Not started**	BSR: LAS-2b	Tier III	0	1	0	10	11

Assign Lead

Evaluate Feasibility

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

Implement Actions

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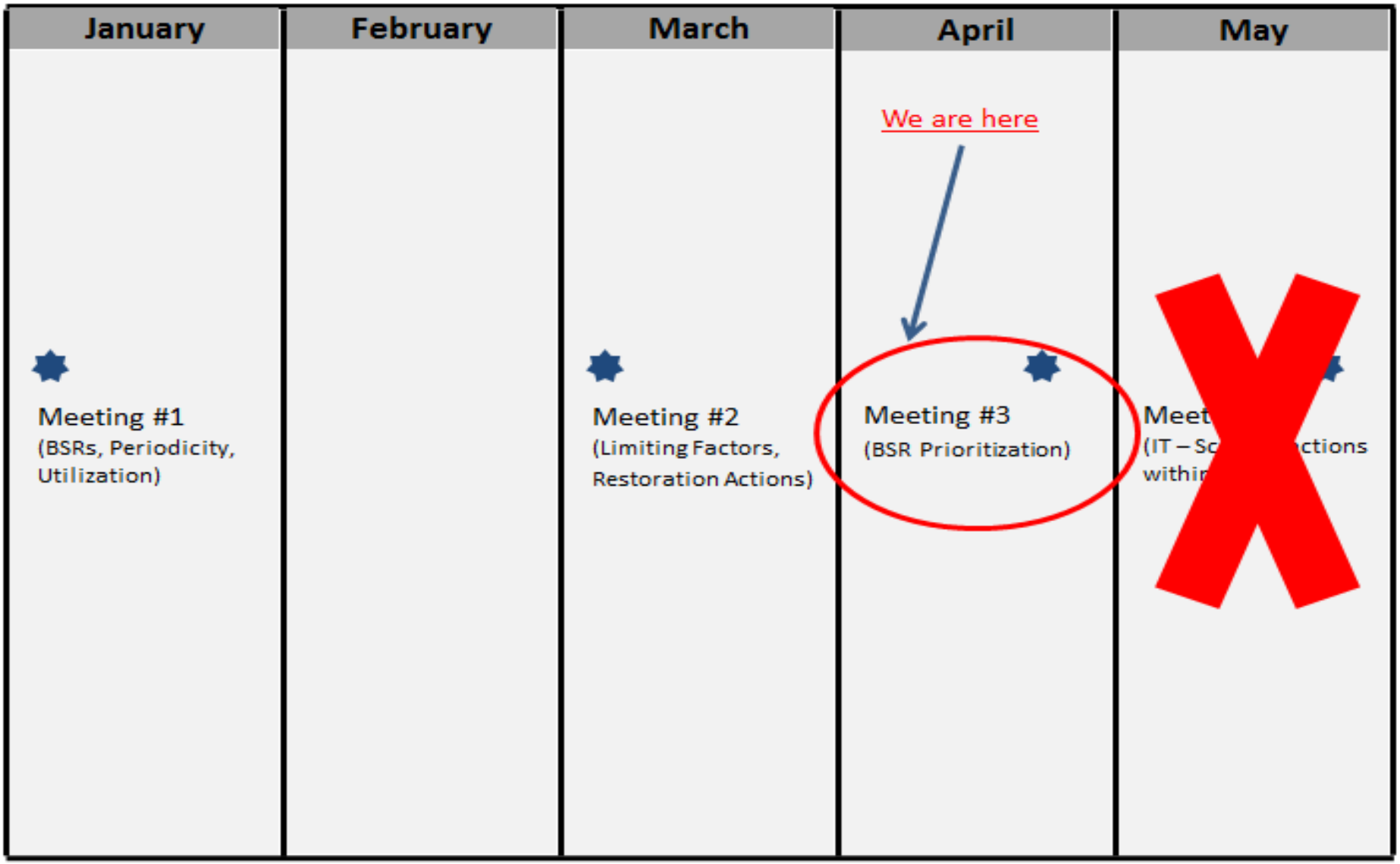
Atlas Evolution

Success

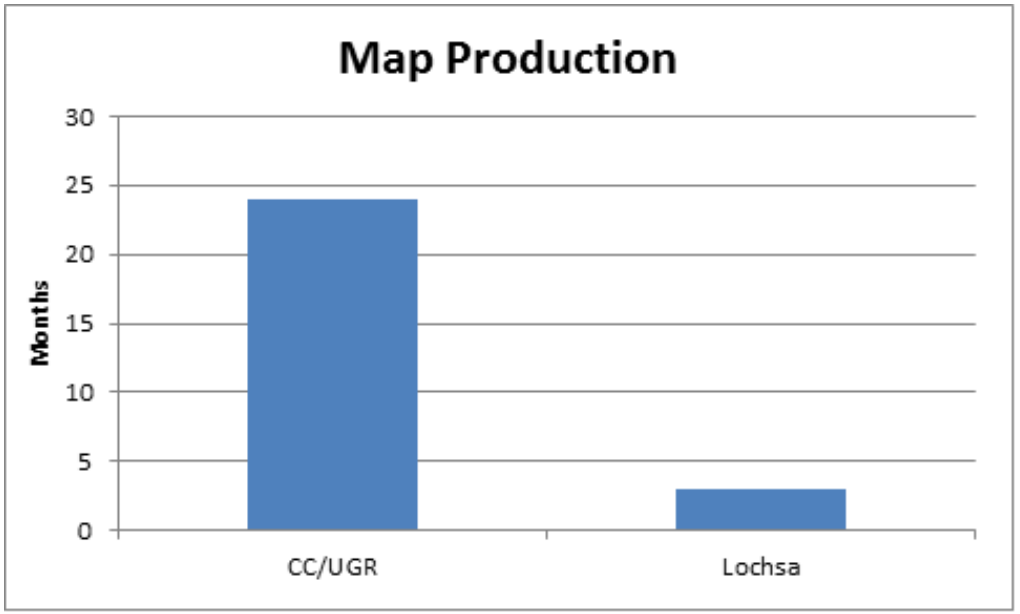
Historic Request → **Historic Collaboration**

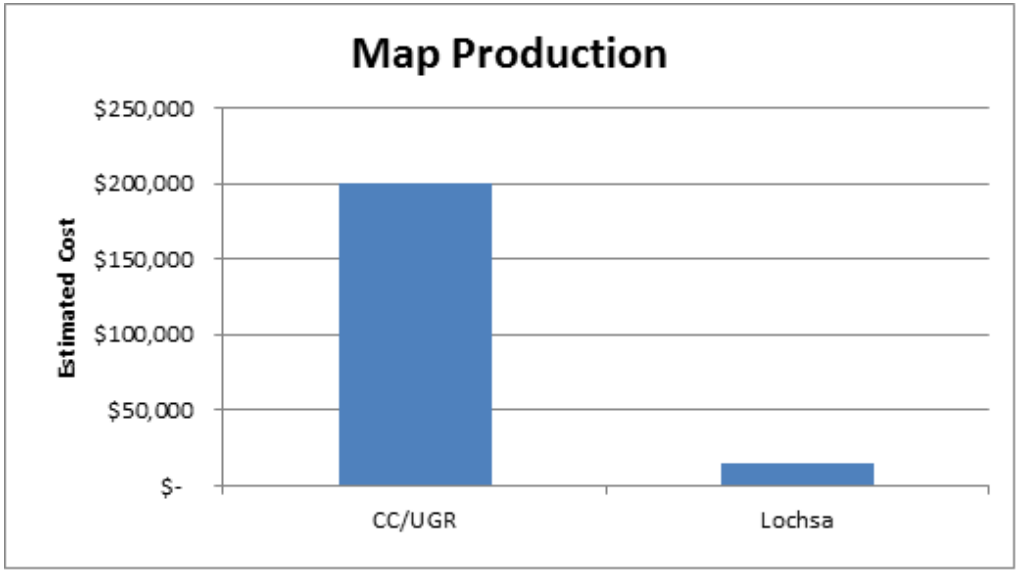
- "We've never had all the partners in the same room." *NPT*
- "I've worked with the researchers more in the last three months than I have in 12 years." *NPT*
- "Collaboration is king." *USWCD*

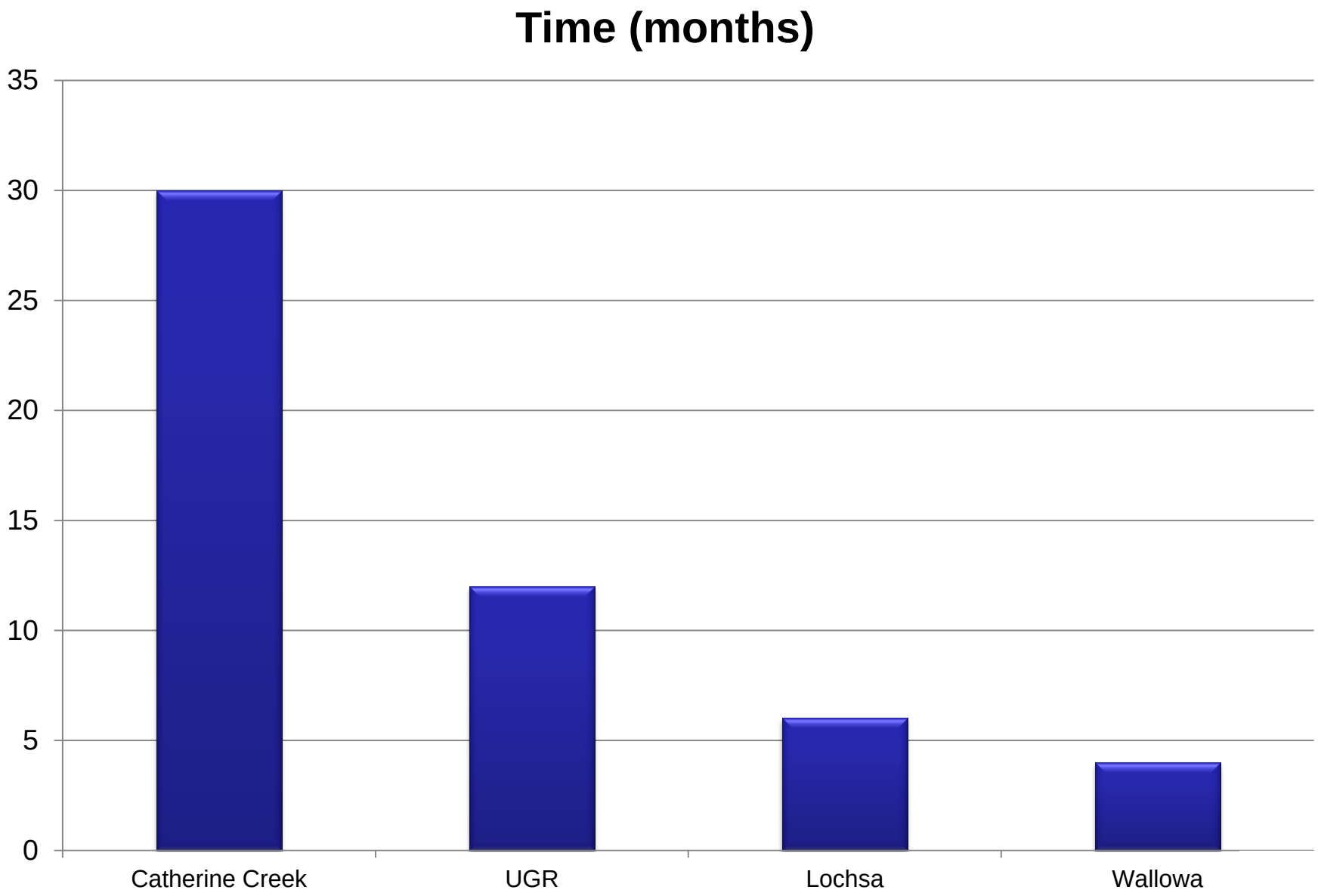
Efficiency

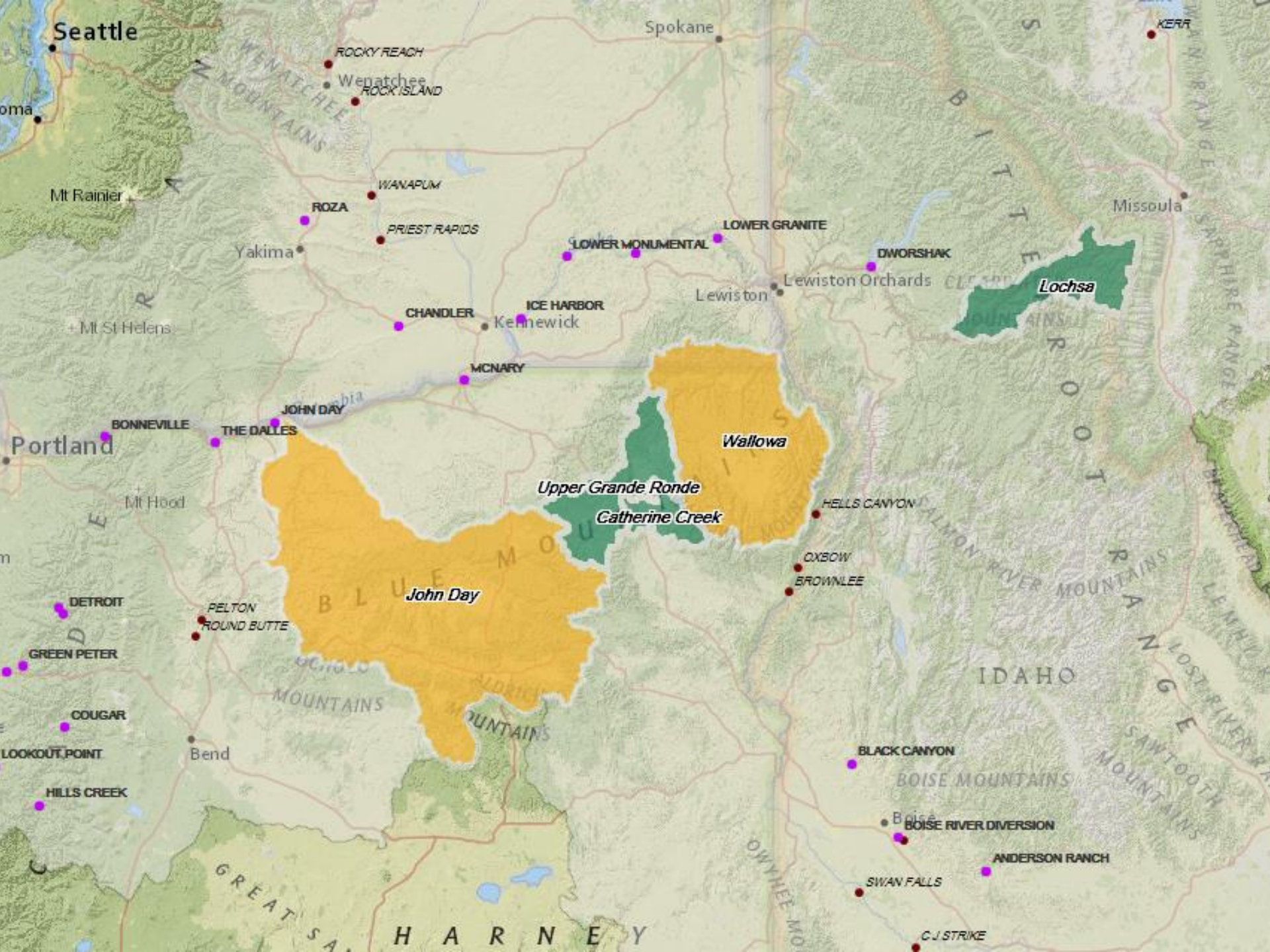

January
February
March
April
May
We are here
Meeting #1
(BSRs, Periodicity, Utilization)
Meeting #2
(Limiting Factors, Restoration Actions)
Meeting #3
(BSR Prioritization)
Meet
(IT – Sc ctions
within

Time, effort, and financial efficiency

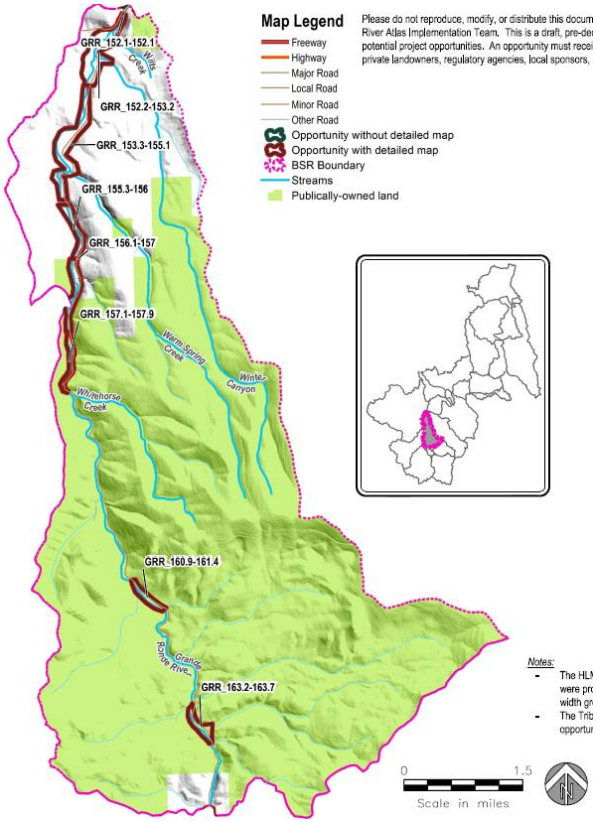


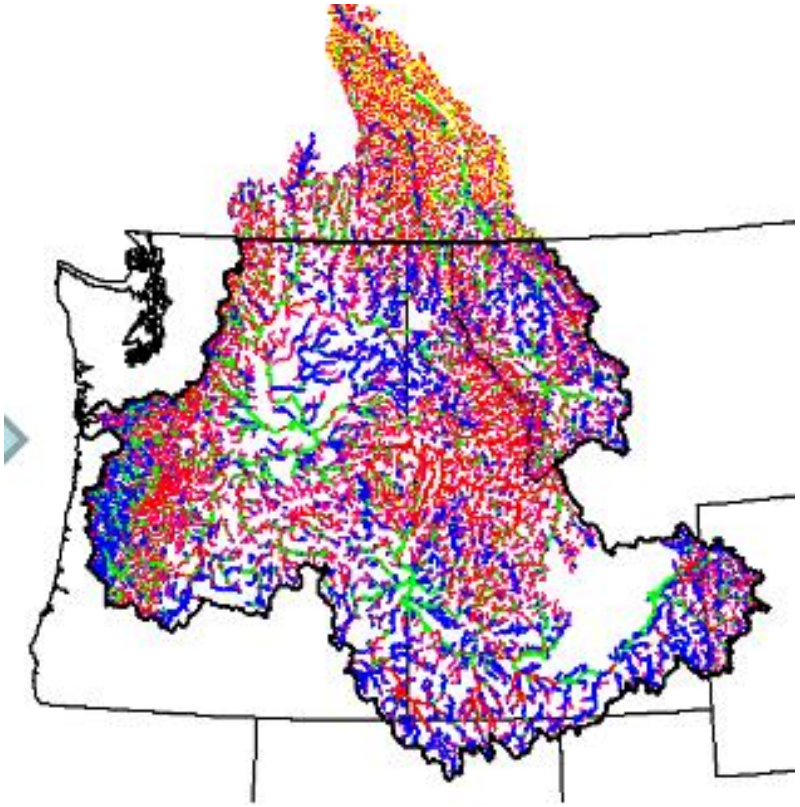



Time (months)
35
30
25
20
15
10
5
0
Catherine Creek
UGR
Lochsa
Wallowa


Seattle
Spokane
KERR
ROCKY REACH
Wenatchee
ROCK ISLAND
WANAPUM
Mt Rainier
ROZA
PRIEST RAPIDS
Yakima
LOWER GRANITE
LOWER MONUMENTAL
DWORSHAK
Missoula
Lewiston Orchards
Lewiston
Lochsa
CHANDLER
ICE HARBOR
Kennewick
Mt St Helens
MCNARY
JOHN DAY
BONNEVILLE
THE DALLES
Portland
Wallowa
Upper Grande Ronde
Catherine Creek
HELLS CANYON
Mt Hood
OXBOW
BROWNLEE
John Day
DETROIT
PELTON
ROUND BUTTE
GREEN PETER
IDAHO
COUGAR
LOOKOUT POINT
Bend
BLACK CANYON
HILLS CREEK
BOISE MOUNTAINS
Boise
BOISE RIVER DIVERSION
ANDERSON RANCH
SWAN FALLS
HARNEY
C J STRIKE

Integration

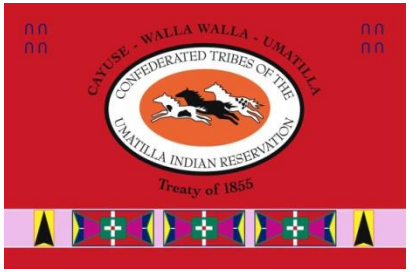


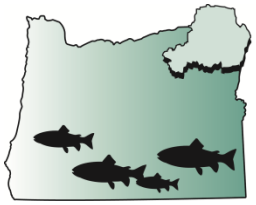


- Consistent use of CB network data
- Adaptable prioritization mechanism across CB
  - Maximum biological benefit
  - Enhanced ROI

Atlas Leadership

Locally led, owned, adapted





GRANDE RONDE MODEL WATERSHED

Union Soil & Water Conservation District


Capacity

Cost


FEDERAL RESERVE NOTE
AE 77665544 B
E5
THE UNITED STATES OF AMERICA
100
AE 77665544 B
THIS NOTE IS LEGAL TENDER FOR ALL DEBTS, PUBLIC AND PRIVATE
SERIES 1996
100
ONE HUNDRED DOLLARS
FRANKLIN

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.

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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.