Northwest Power and Conservation Council

November 1, 2006

MEMORANDUM

TO: Council Members

FROM: Peter Paquet, Manager, Wildlife and Resident Fish

SUBJECT: Briefing on display and use of subbasin planning data

Phil Roger of the Columbia River Inter-Tribal Fish Commission will be briefing the Council on recent efforts to collect, compile and archive the numerous fish and wildlife data sets that were produced during the subbasin planning process. Following the completion of the subbasin planning process the Council approved funding for this work. This effort was carried out by the Subbasin Workgroup of the Northwest Environmental Data-Network (NED) and is of significance to the Council in that it provides the baseline data set for future subbasin planning efforts.

The briefing will provide a demonstration of how the information can be displayed and analyzed using geographic information systems and will provide an illustration of how it can be linked to specific projects and their intended functions. Additionally, it will focus on what was learned through the subbasin planning process about data development and management and will provide some suggestions on how to improve data collection and management for future subbasin planning efforts.

Subbasin Planning Data:

Putting the pieces together to meet management needs

Many efforts in common

One common effort

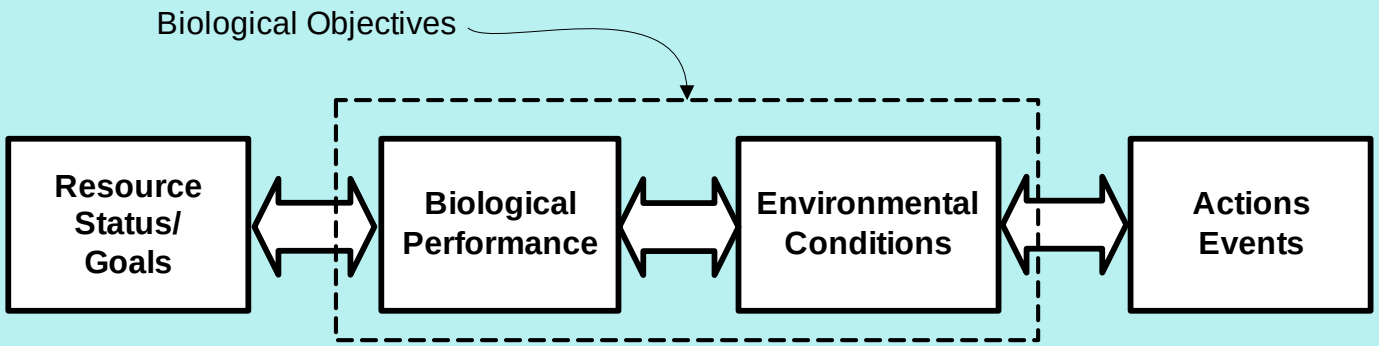
Summary of Data Management Problems

- Data Collection
  - Inconsistencies in what is collected
  - Inconsistent data quality
- Data Sharing
  - No inventory of what is available
  - Difficult to access data
  - Data generated with public funds are not always readily available
- Data Usage
  - No way to synthesize and communicate the data that do exist
  - Support regional efforts such as subbasin planning (and provide baselines for future updates)
  - Significant gaps in existing data

Source: ISRP, ISAB, SAIC reports

Biological Basis of Management

- Fish and Wildlife Populations
- Watersheds in Which They Live



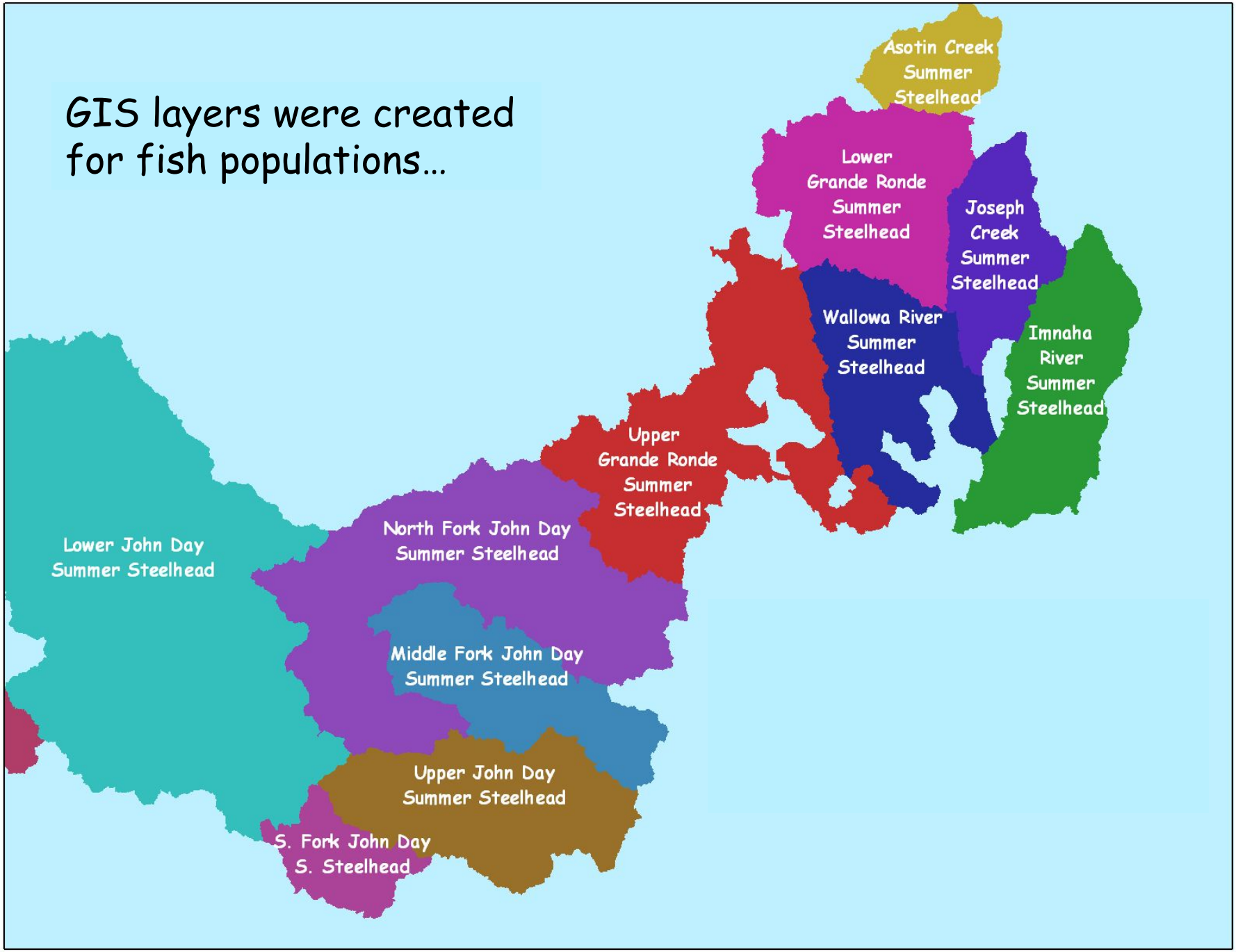
The basic conceptual framework for relating restoration actions to environmental conditions, focal species responses, and subbasin goals or vision.

Source: NPCC 2000 Fish and Wildlife Program – Scientific Foundation

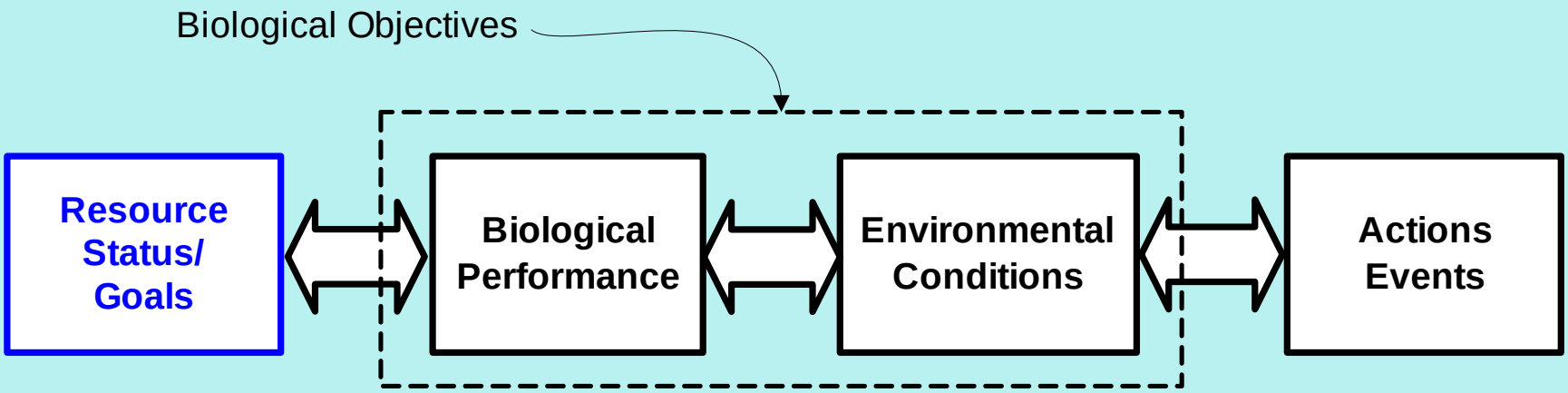
Archiving Watershed Assessment Information from Subbasin Plans

A joint effort by NPCC, CRITFC, and NHI

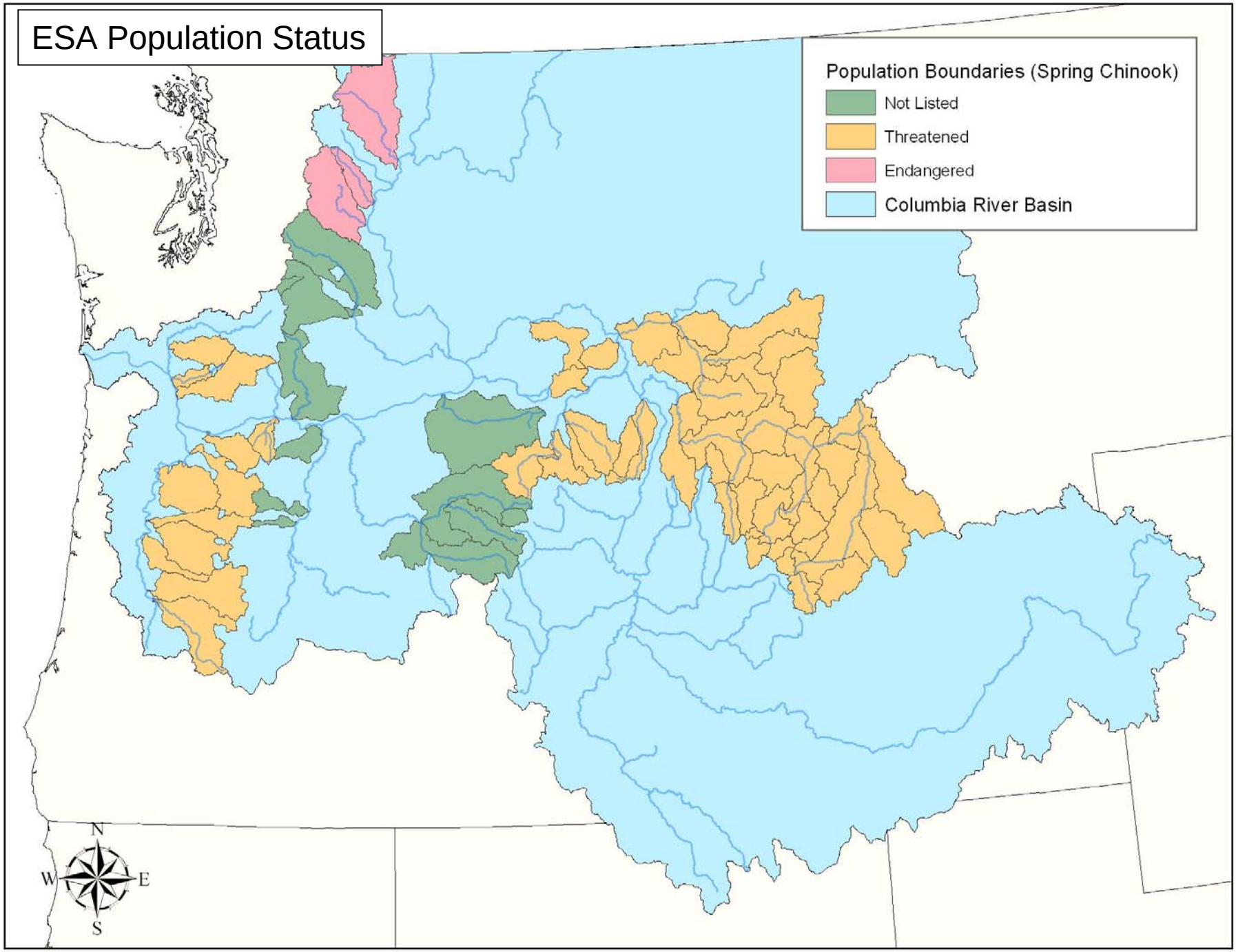
GIS layers were created for fish populations…

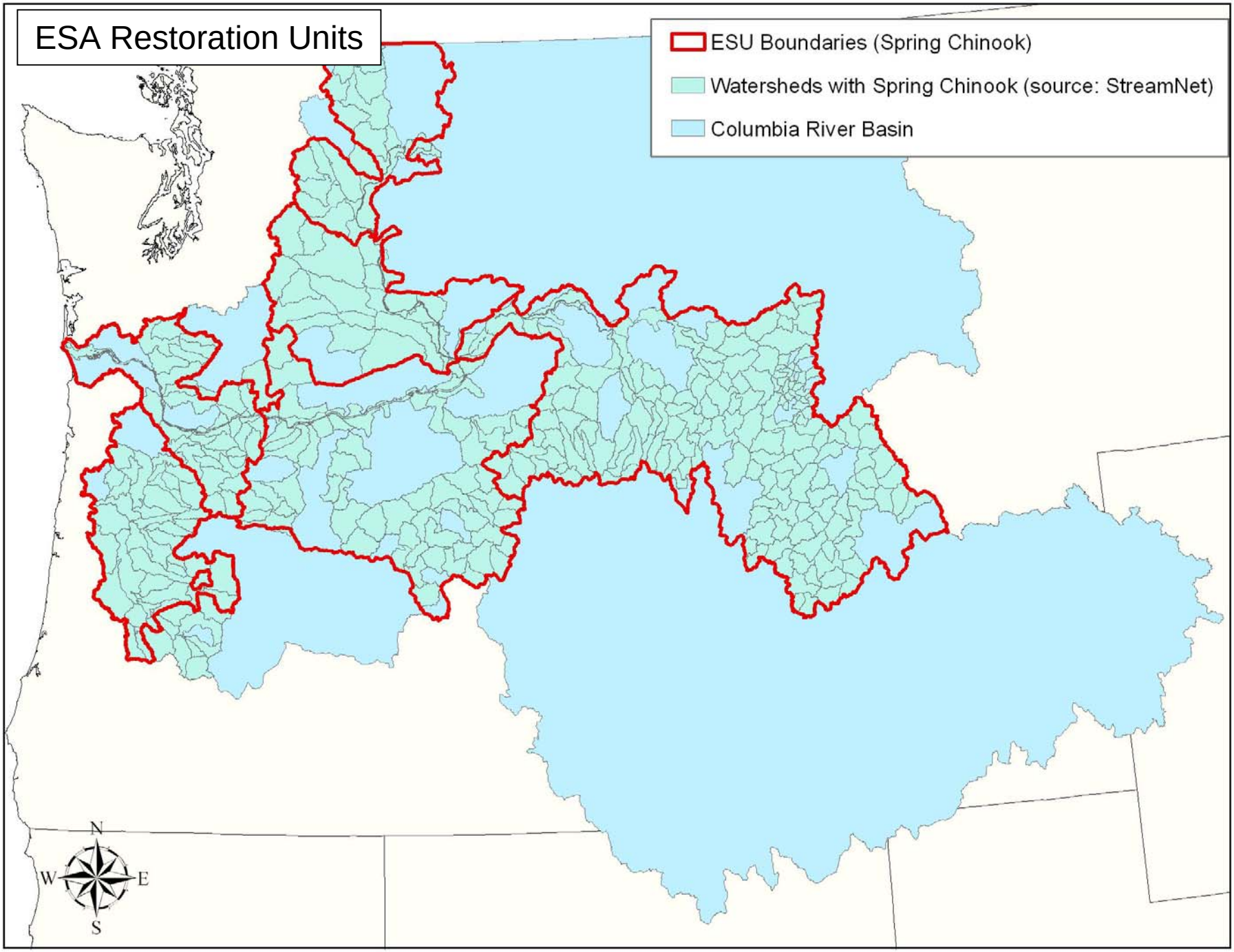


Populations Were Associated With Important Management Programs

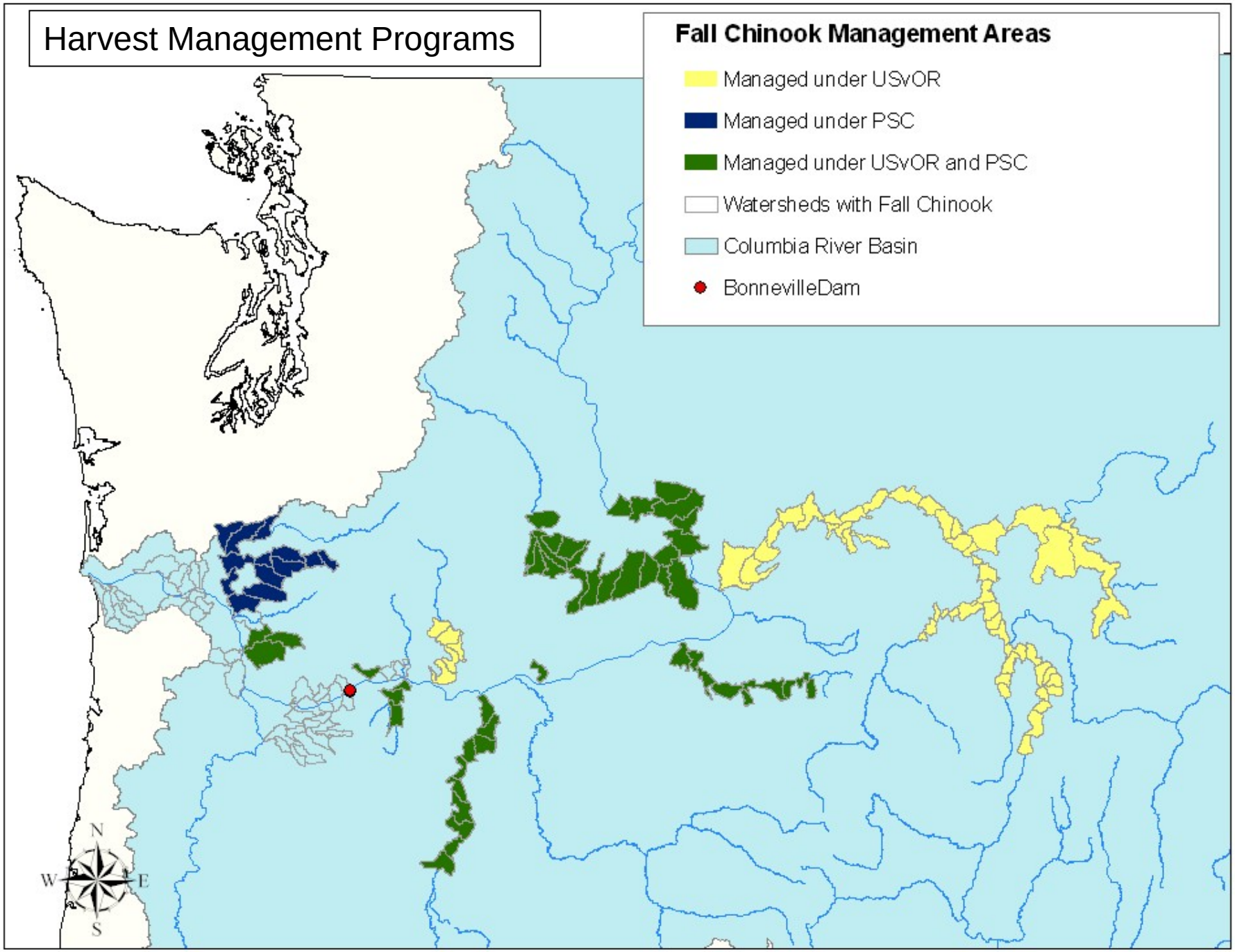


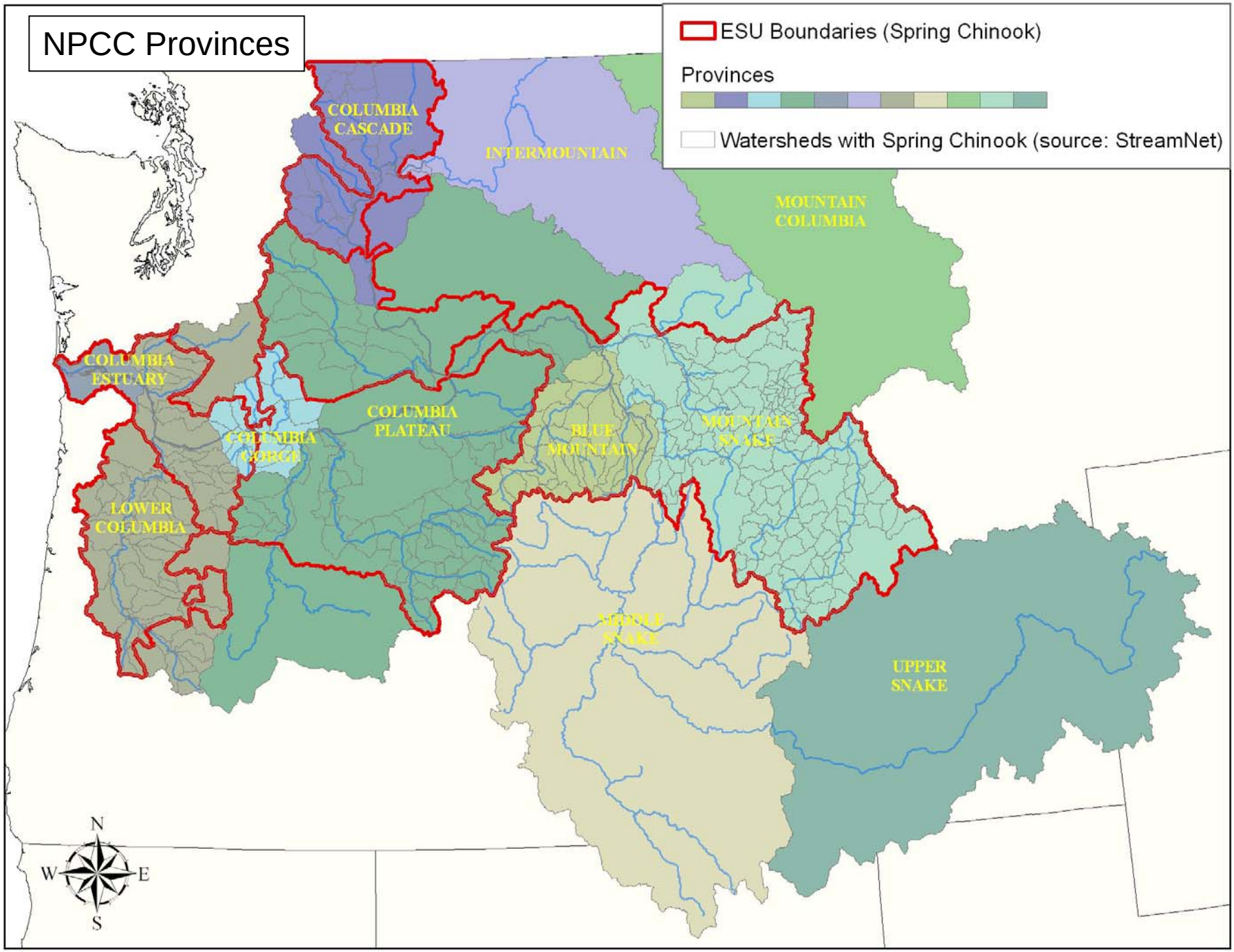
ESA Population Status



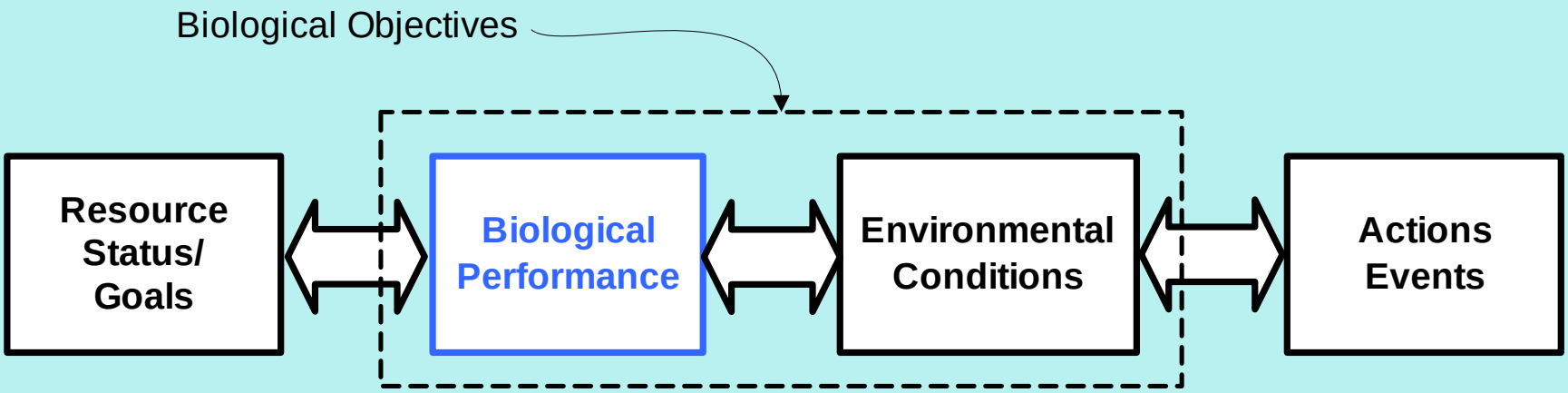

ESA Restoration Units
ESU Boundaries (Spring Chinook)
Watersheds with Spring Chinook (source: StreamNet)
Columbia River Basin
N
W
E
S

Harvest Management Programs

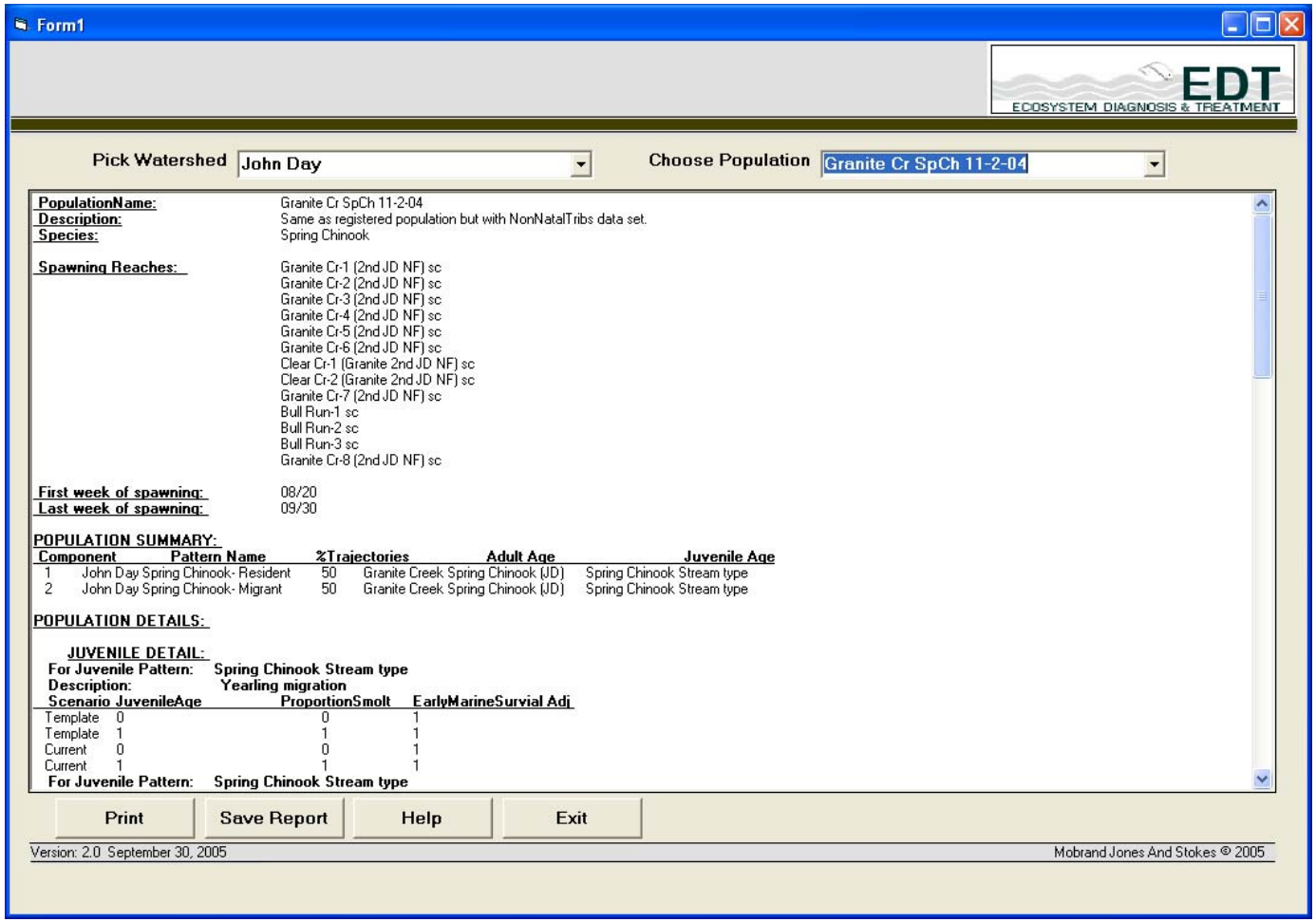



NPCC Provinces
ESU Boundaries (Spring Chinook)
Provinces
Watersheds with Spring Chinook (source: StreamNet)
COLUMBIA CASCADE
INTERMOUNTAIN
MOUNTAIN COLUMBIA
COLUMBIA ESTUARY
COLUMBIA PLATEAU
COLUMBIA GORGE
BLUE MOUNTAIN
MOUNTAIN SNAKE
LOWER COLUMBIA
MIDDLE SNAKE
UPPER SNAKE
N
W
E
S

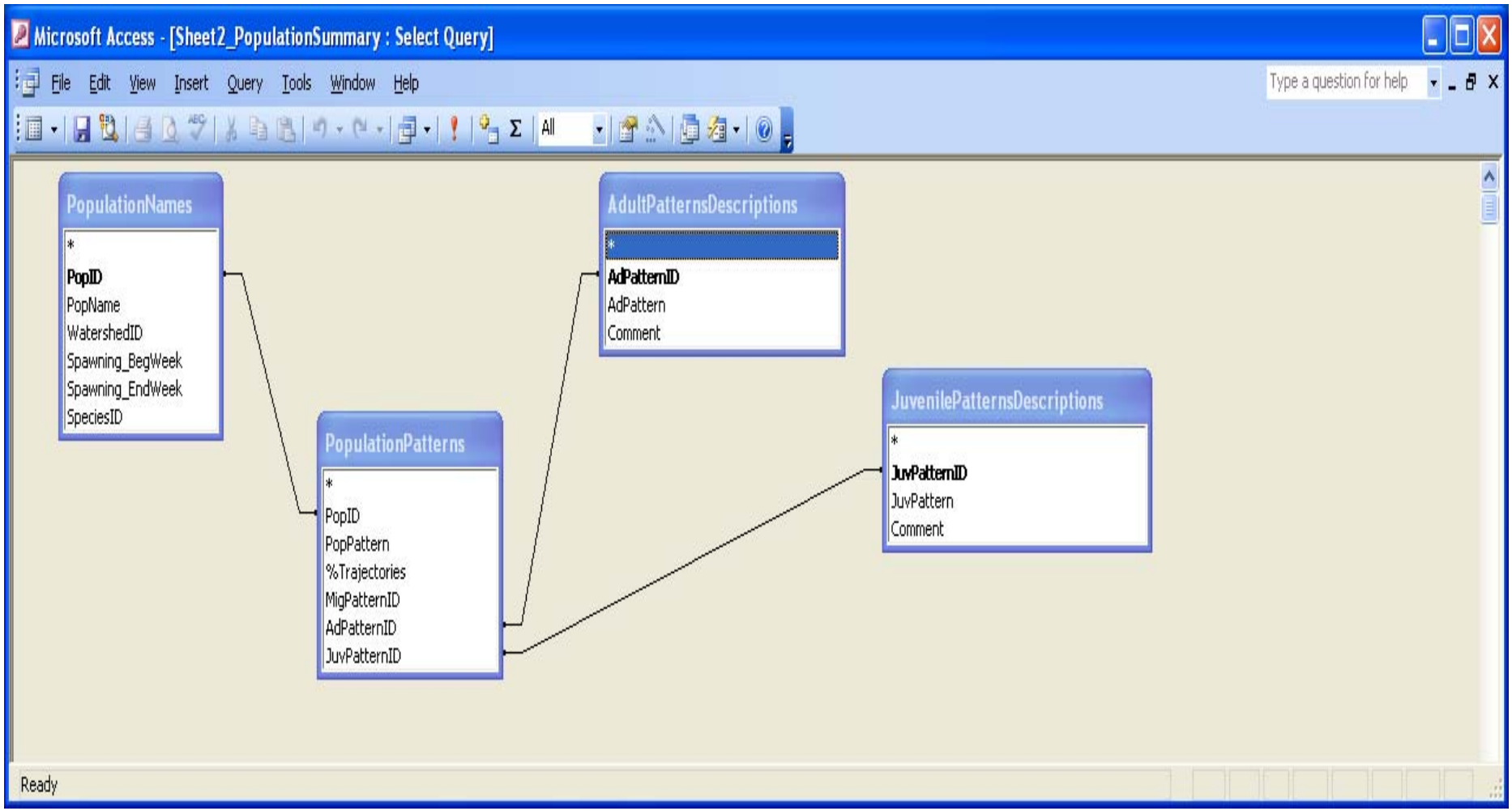
Biological Information Was Assembled for Each Population



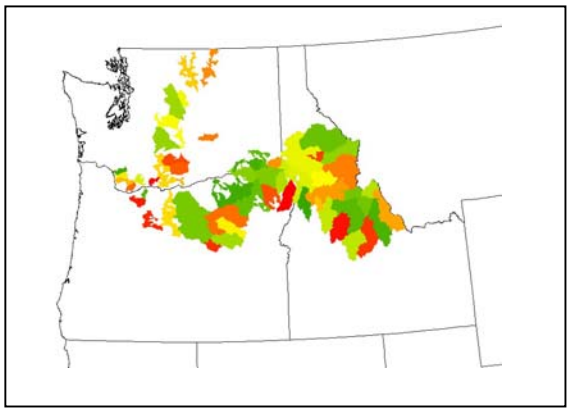
Fish population information was assembled…

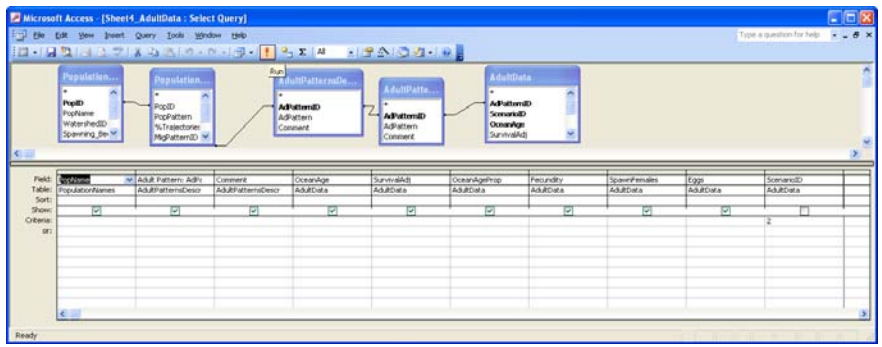


And organized into a relational database…



The fish population GIS layer was then linked to….



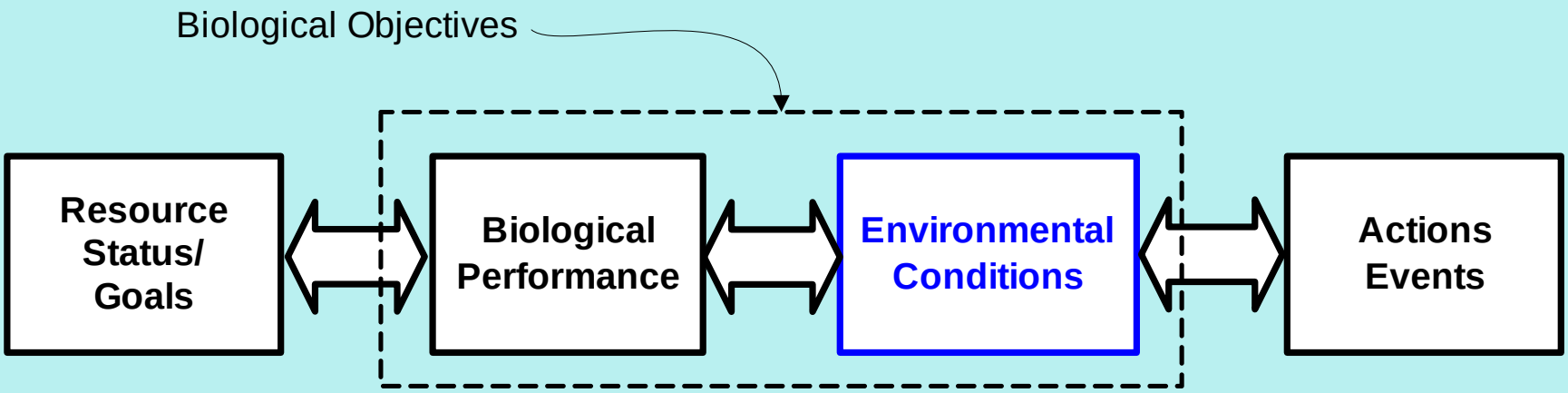


The fish population database

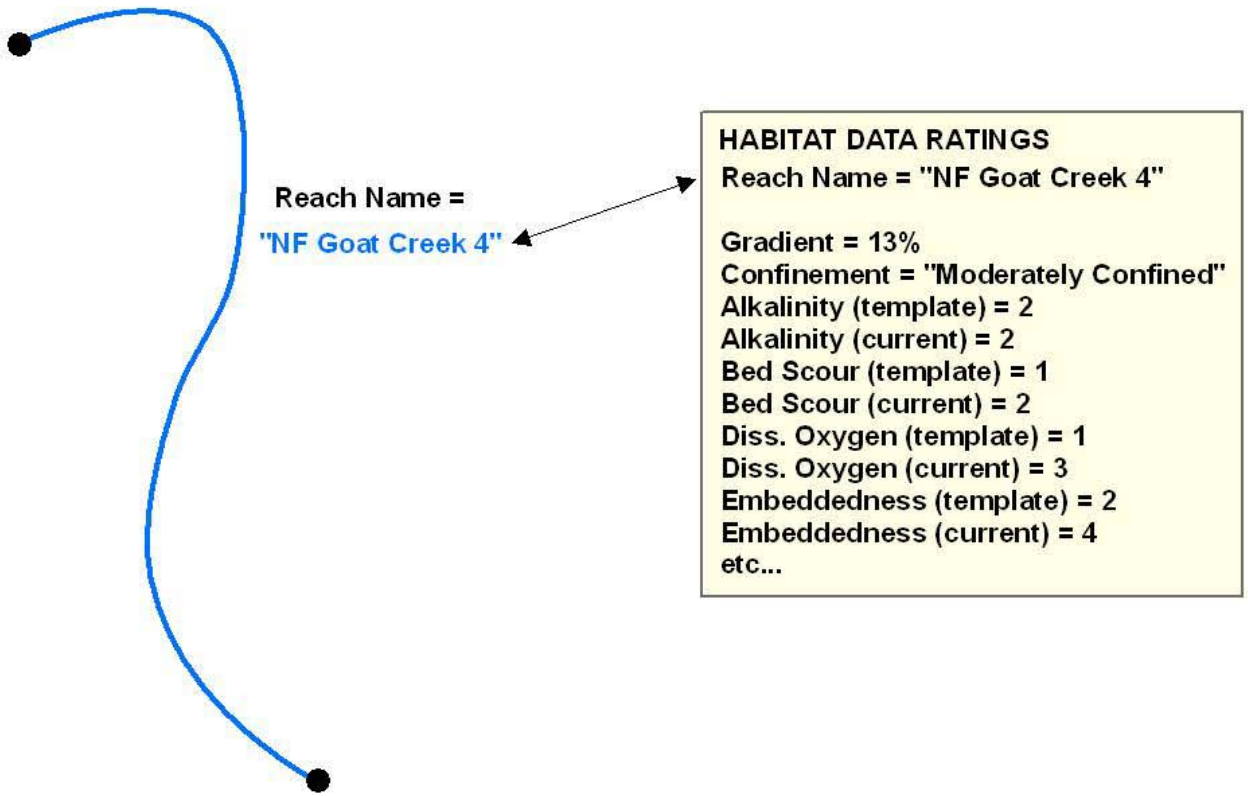
From these data we can create summary reports for each population…

Subbasin: John Day
Province: Columbia Plateau
ESU: Middle Columbia River
ESU Status: Threatened
Managed under USvOR? Yes
Managed under PSC? No
Spawning Timing: March through May
Population Status: Native
Genetic Fitness: No historic stocking or hatchery origin fish, but hatchery strays may interbreed in some areas.
Age/Sex Composition: Data attached in separate table
Harvest (in watershed): Fishery on wild fish limited to catch and release since 1996
Empirical Abundance: 4747 fish (1992-2003 return estimates)
EDT (modeled) Abundance: 1292 fish
EDT (modeled) Historic Abundance: 10108 fish
EDT (modeled) Productivity: 2.8
EDT (modeled) Diversity: 18%
Comments: Redband populations are sympatric with summer steelhead and also occupy areas above steelhead barriers.

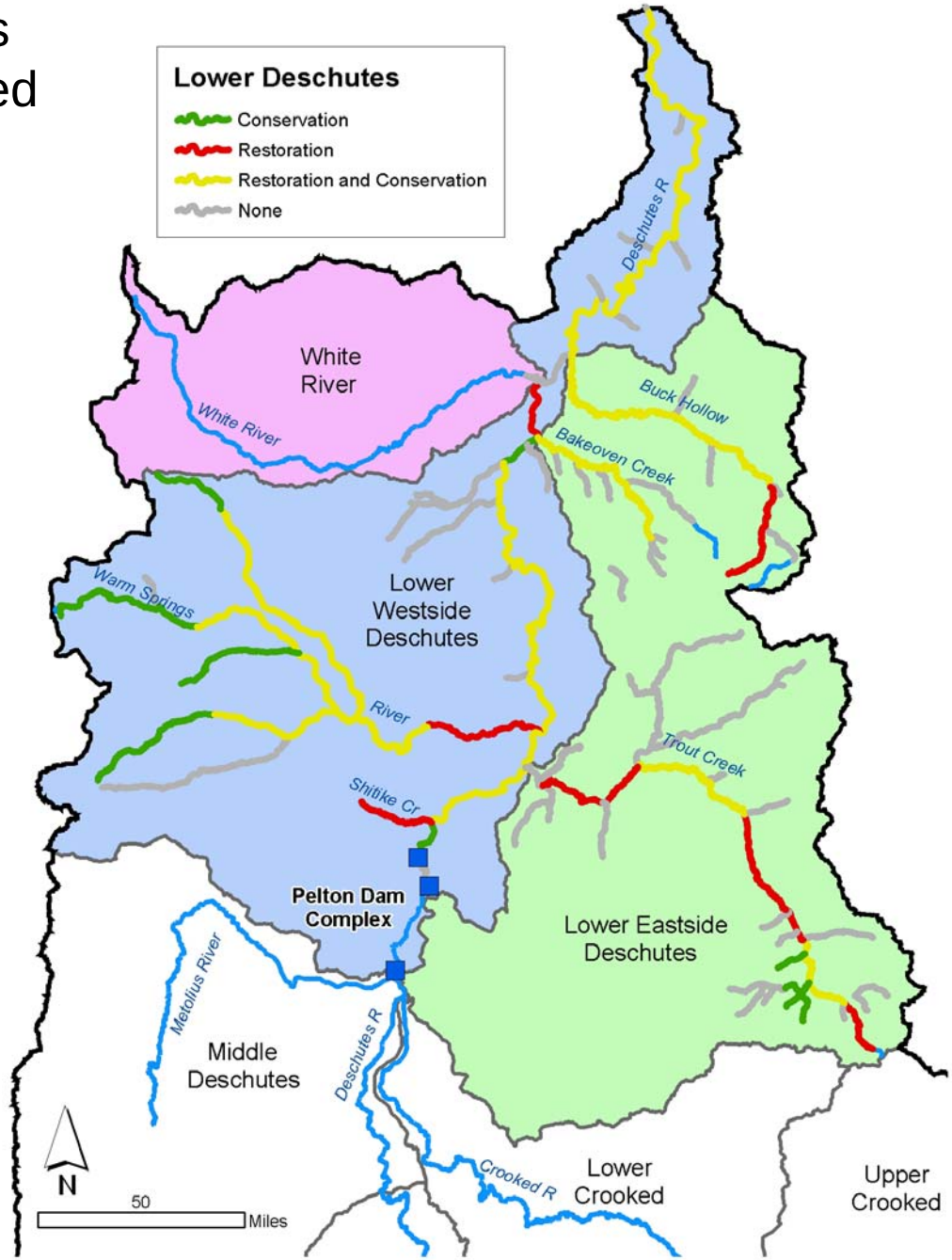
Habitat Assessments Were Then Linked to Fish Populations



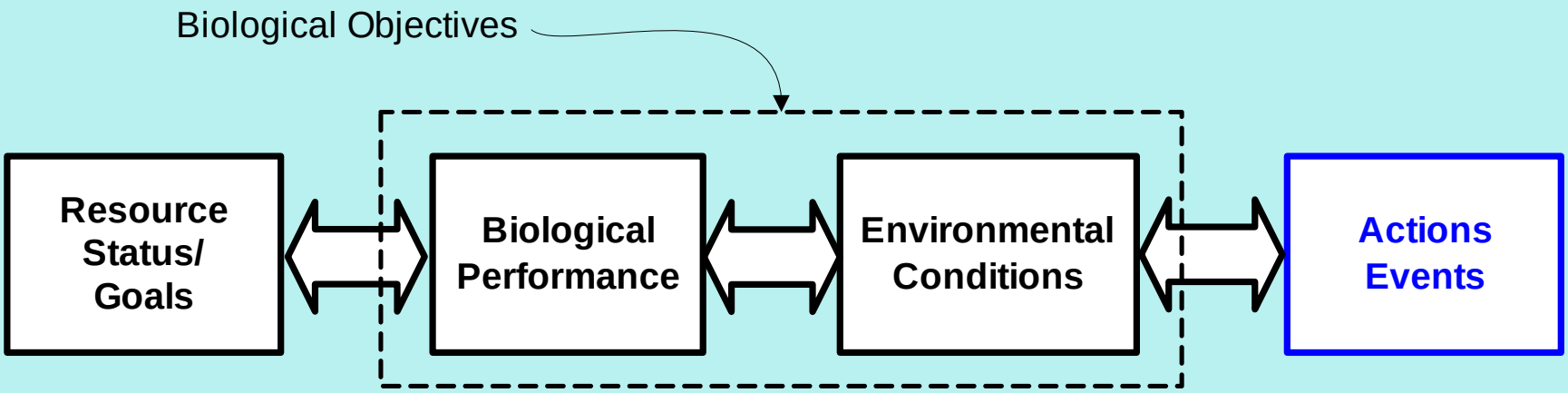
Habitat Database Organization



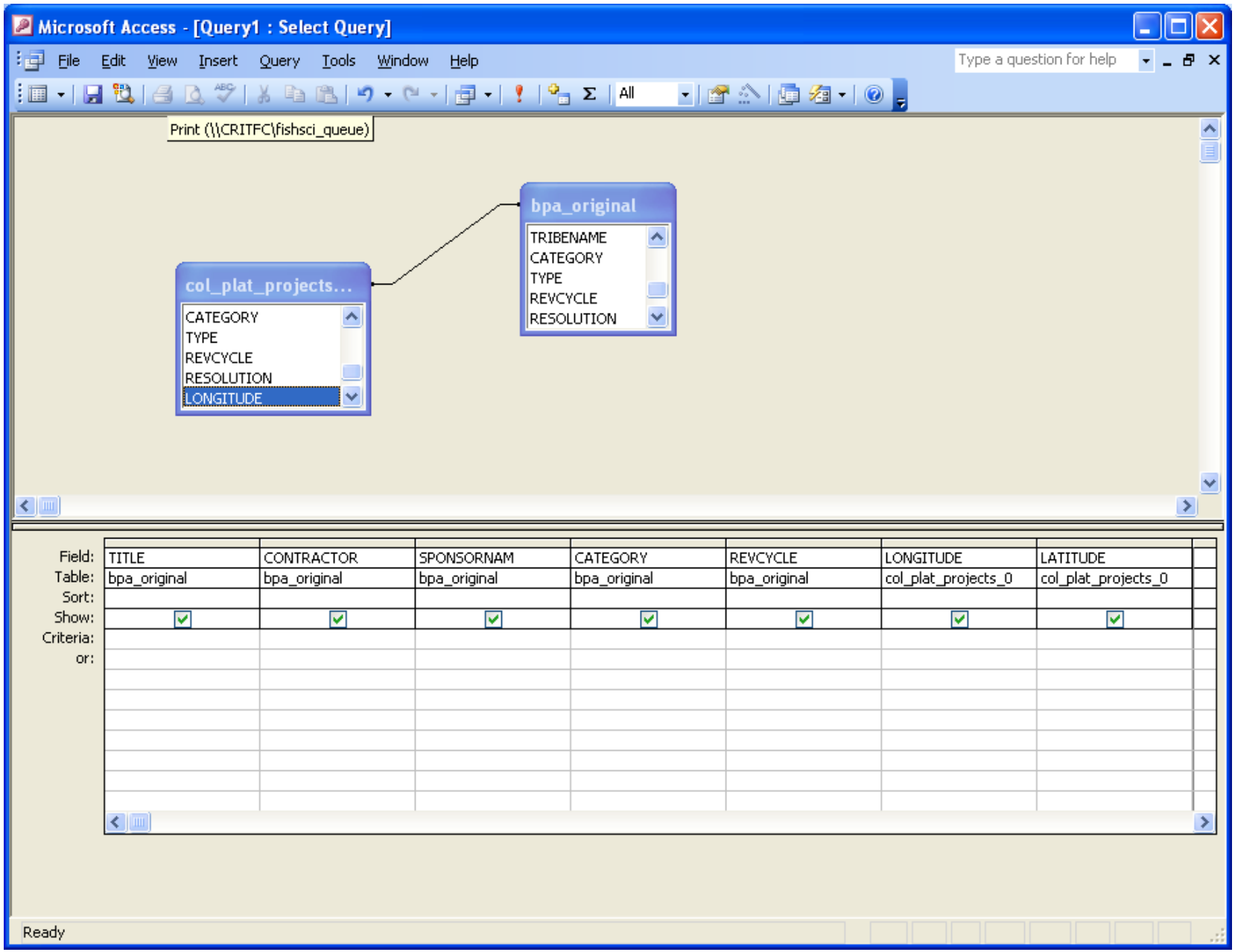
Stream reaches were categorized by priorities for protection, restoration, or both

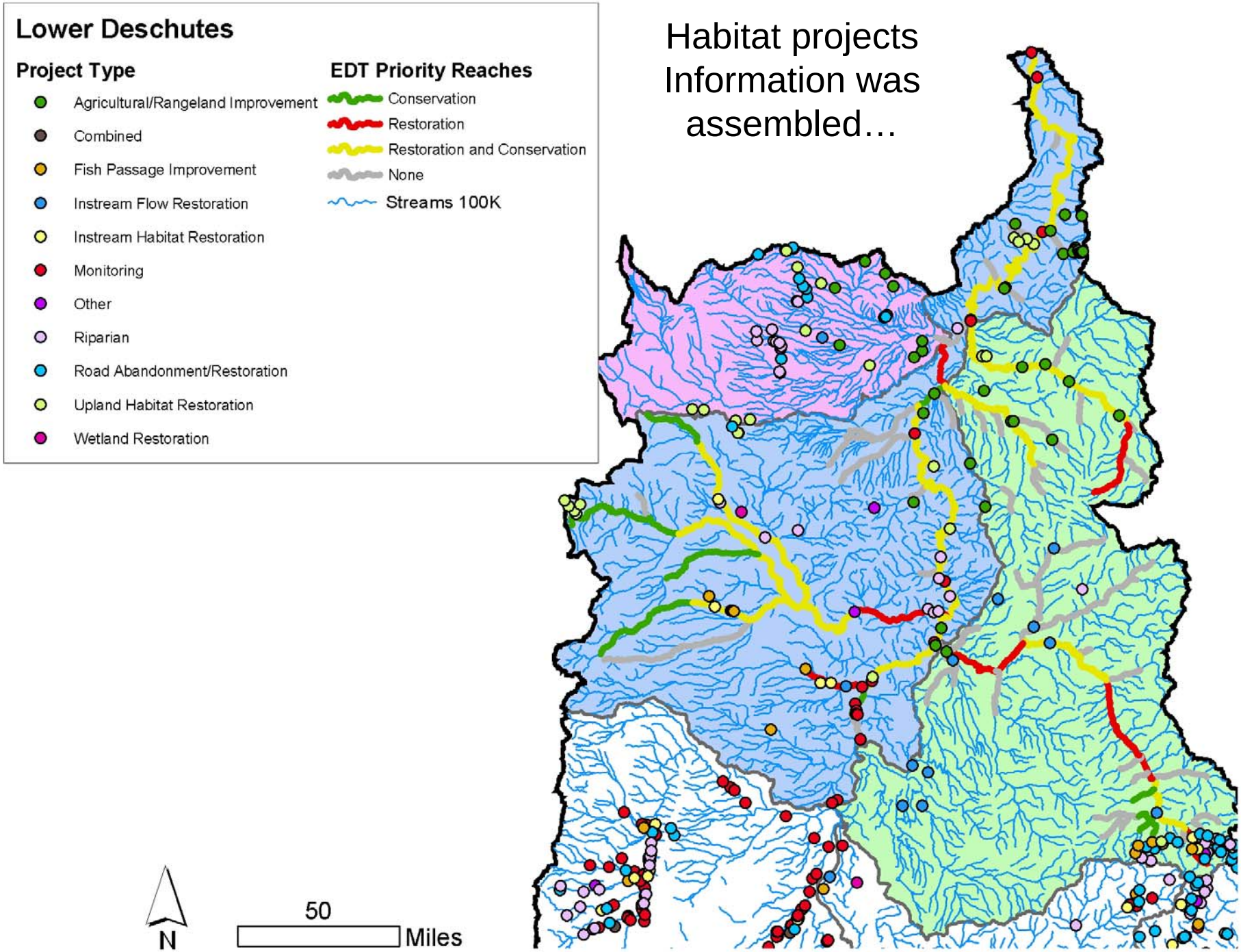


Habitat Project Information Can be Organized in a Similar Manner

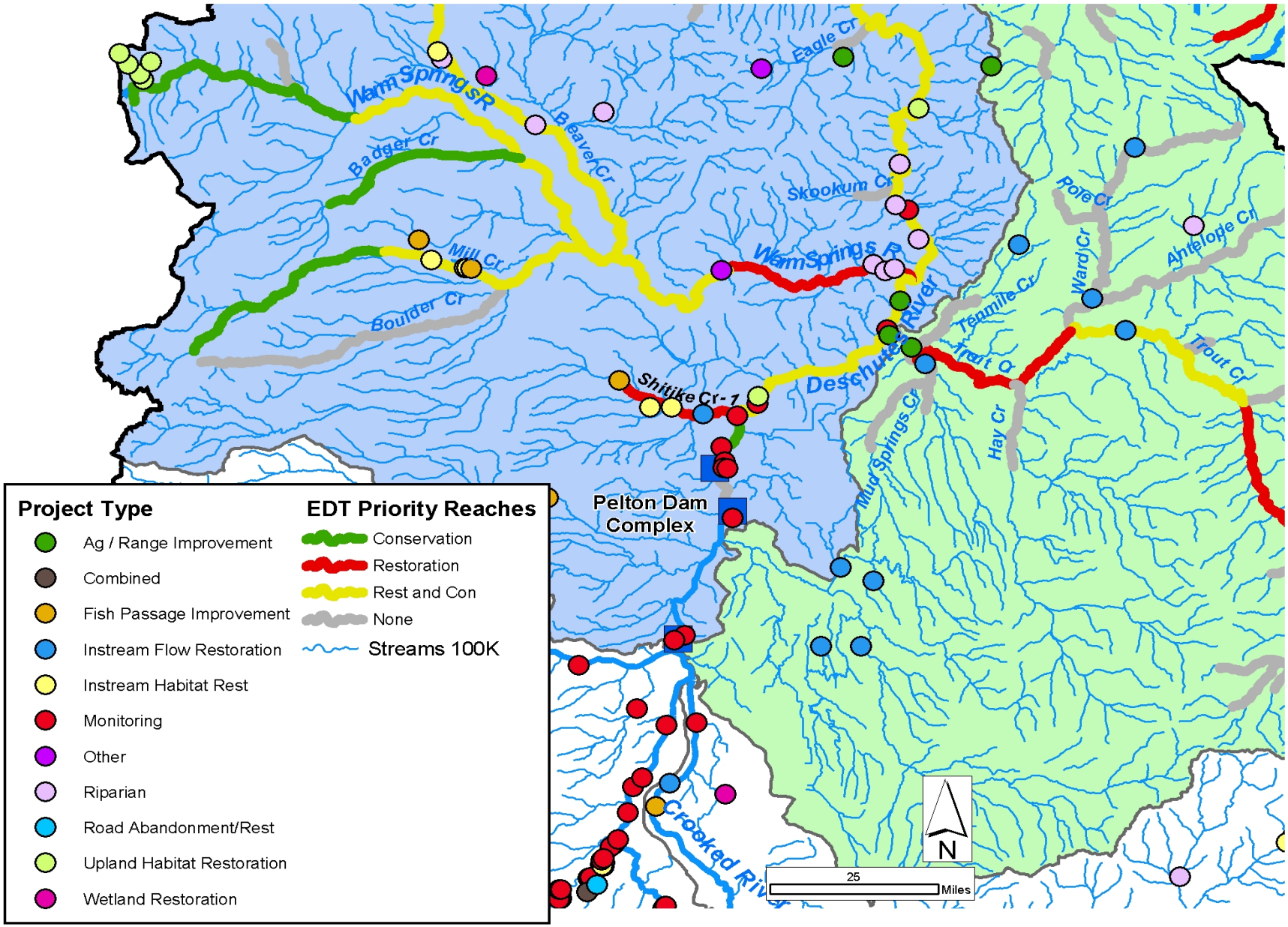


And organized in a database…




Lower Deschutes
Project Type
Agricultural/Rangeland Improvement
Combined
Fish Passage Improvement
Instream Flow Restoration
Instream Habitat Restoration
Monitoring
Other
Riparian
Road Abandonment/Restoration
Upland Habitat Restoration
Wetland Restoration
EDT Priority Reaches
Conservation
Restoration
Restoration and Conservation
None
Streams 100K
Habitat projects Information was assembled…
N
50
Miles

We can then relate habitat problems to proposed remedies



Geographic Area:	Shitike Cr-1			**Stream:**	
Reach:	From mouth at Deschutes R to headworks in section 17			**Reach Length (mi):**	8.70
				Reach Code:	Shitike Cr-1
Restoration Benefit Category:1/	A	**Productivity Rank:1/**	1	**Potential % change in productivity:2/**	33.3%
Overall Restoration Potential Rank:1/	1	**Average Abundance (Neq) Rank:1/**	1	**Potential % change in Neq:2/**	23.1%
(lowest rank possible - with ties)1/	18	**Life History Diversity Rank:1/**	4	**Potential % change in diversity:2/**	0.0%
Preservation Benefit Category:1/	A	**Productivity Rank:1/**	3	**loss in productivity with degradation:2/**	-19.8%
Overall Preservation Rank:1/	3	**Average Abundance (Neq) Rank:1/**	3	**% loss in Neq with degradation:2/**	-26.0%
(lowest rank possible - with ties)1/	21	**Life History Diversity Rank:1/**	3	**% loss in diversity with degradation:2/**	-20.1%

Life stage	**Relevant months**	**% of life history trajectories affected**	**Productivity change (%)**	Life Stage Rank	**Change in attribute impact on survival**															
					Channel stability	Chemicals	Competition (w/ hatch)	Competition (other sp)	Flow	Food	Habitat diversity	Harassment/poaching	Obstructions	Oxygen	Pathogens	Predation	Sediment load	Temperature	Withdrawals	Key habitat quantity
Spawning	Sep	25.3%	-10.9%	6							●							●		○
Egg incubation	Sep-Apr	25.3%	-26.6%	3	●												●	●		○
Fry colonization	Mar-May	36.9%	-20.8%	1	●				●	●	●					•				●
0-age active rearing	Mar-Oct	73.6%	-8.2%	2			•			•	●									●
0-age migrant	Oct-Nov	16.7%	-3.3%	7							●					•		•		●
0-age inactive	Oct-Mar	5.4%	-38.1%	5	•				●	•	●									●
1-age active rearing	Mar-May	5.4%	-5.8%	8			•		•		●									●
1-age migrant	Mar-Jun	14.4%	-0.5%	9							●					•				○
1-age transient rearing																				
2+-age transient rearing																				
Prespawning migrant	Apr-Aug	100.0%	-0.1%	10							•									•
Prespawning holding	May-Sep	25.3%	-18.8%	4					•		●							●		●

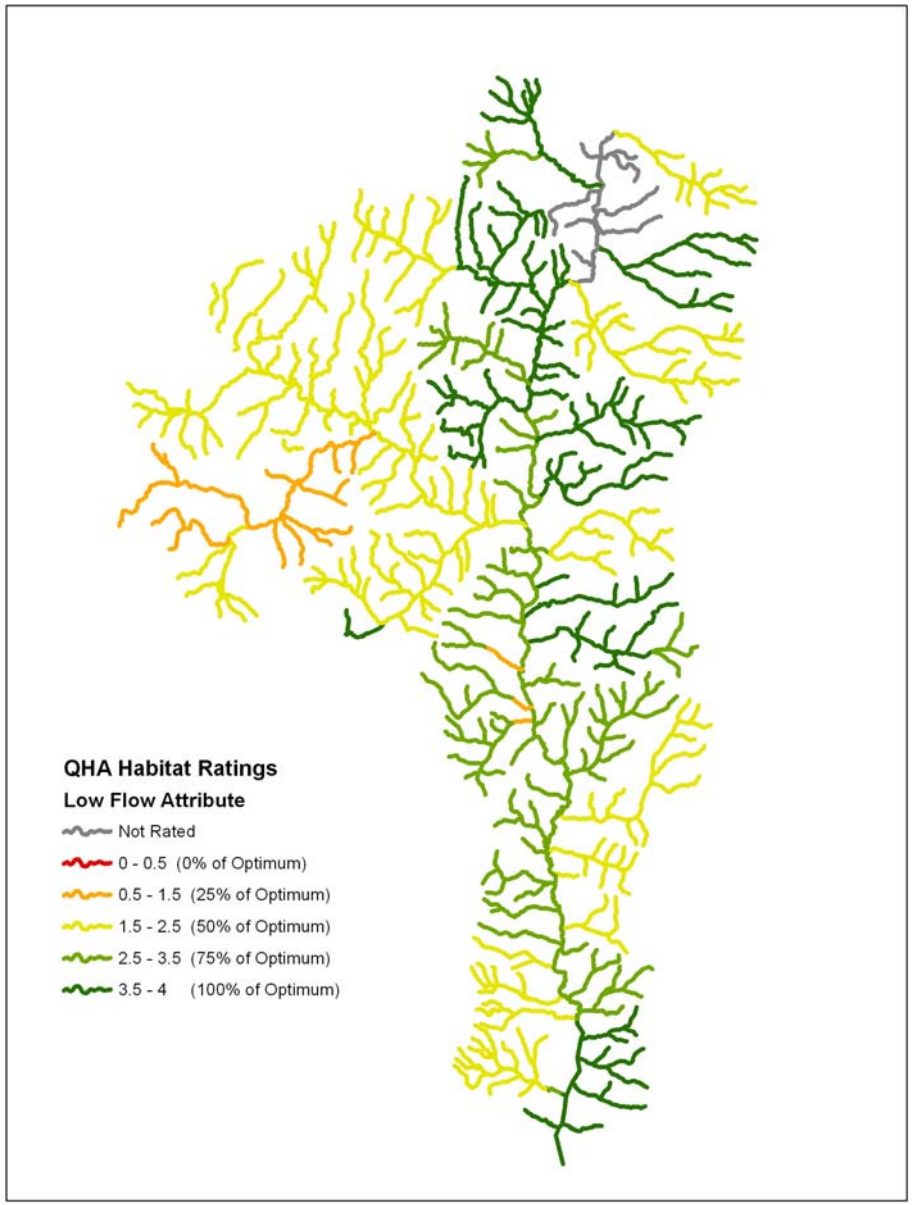
Project Type	Title	Description
Fish Passage Improvement	Shitike Creek Headworks Dam	dam removal
Instream Habitat Improvement	Shitike Creek Lower	instream habitat restoration with structures
Instream Habitat Improvement	Shitike Creek Community	gabion placement
Instream Flow Restoration	Shitike Creek Community Bridge	infiltration gallery to conserve and purify water

Other types of assessments can be organized in a similar manner

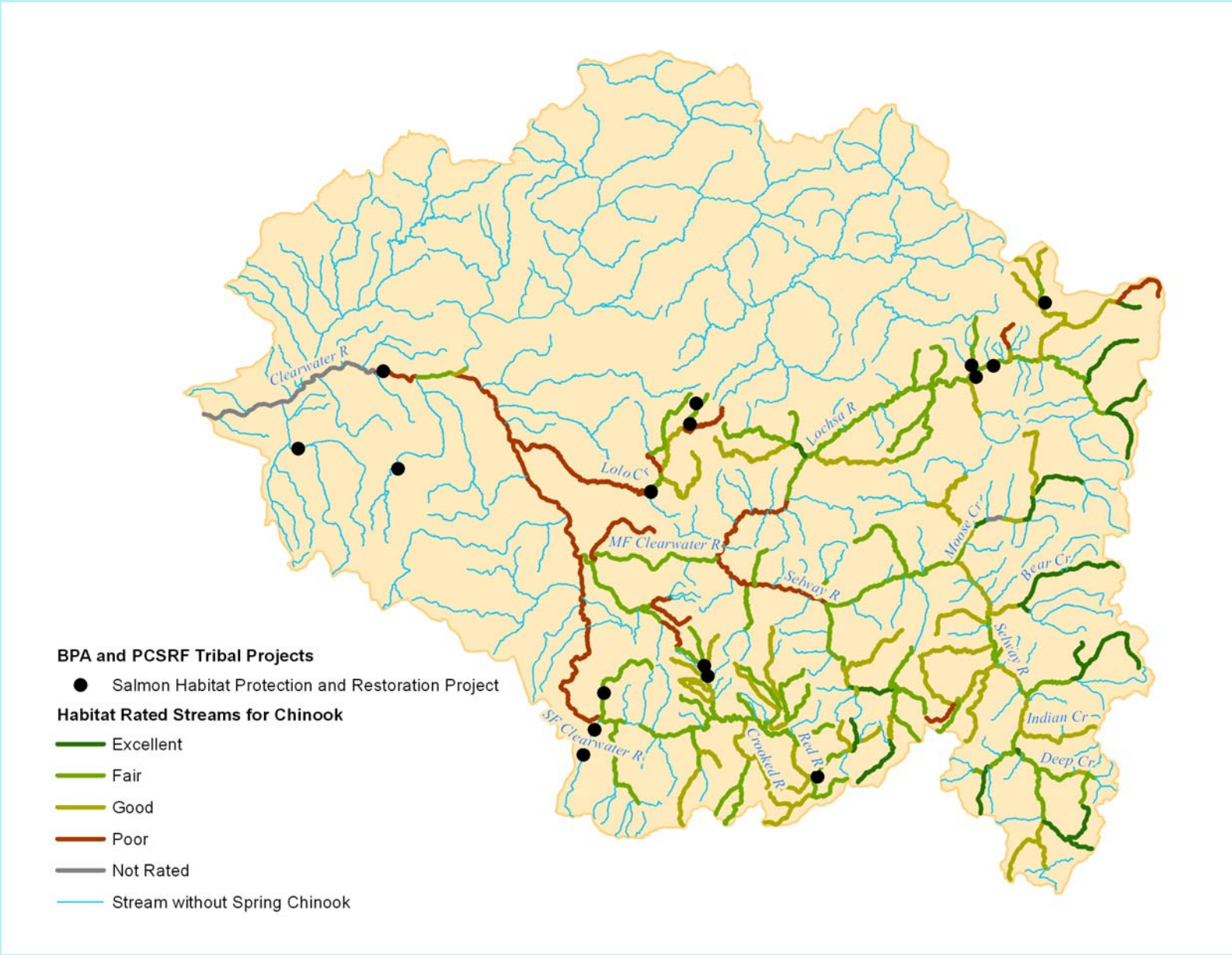
QHA was used for resident fish

Reach Name	Not Rated	Riparian Condition	Channel stability	Habitat Diversity	Fine sediment	High Flow	Low Flow	Oxygen	Low Temperature	High Temperature	Pollutants	Obstructions
Curlew Lake	NR											
Upper San Poil River		0.5	2.0	0.0	0.0	3.0	3.0	2.0	4.0	2.0	1.0	4.0
Golden Harvest Ck		2.0	2.5	2.0	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Granite Ck		3.0	3.0	3.0	3.0	4.0	3.0	3.0	4.0	3.0	3.0	2.0
Scatter Ck		2.0	3.0	2.0	2.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
Lower Ninemile Ck		3.5	4.0	3.0	3.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0
Upper Ninemile Ck		2.0	3.0	3.0	2.0	4.0	4.0	4.0	4.0	3.0	3.0	0.0
S Fk O'Brien Ck		2.0	2.0	2.0	1.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
No Fork/main O'Brien		1.0	2.0	2.0	1.0	2.0	4.0	4.0	4.0	3.0	3.0	0.0
S Fk San Poil		3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
N Fk San Poil		2.0	3.0	3.0	2.5	2.0	4.0	4.0	4.0	4.0	4.0	4.0
Lambert		0.0	0.0	1.0	0.0	0.0	0.0	2.0	2.0	1.0	0.0	2.0
West Fork Trout Ck		2.0	2.0	1.0	1.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
N Fk /Main Trout Ck		3.0	3.0	3.0	2.0	3.0	3.0	4.0	4.0	4.0	3.0	3.0
Mouth to Manila creek		0.0	2.7	0.0	0.0	4.0	4.0	2.6	4.0	2.0	3.5	4.0
Lower Manila Creek (To Falls)		2.5	1.5	0.0	2.5	3.0	2.0	3.3	3.5	2.0	3.7	3.5
Upper Manila Creek (above Falls)		3.0	2.3	1.0	2.0	2.4	1.4	4.0	2.5	2.0	4.0	0.0
San Poil Arm (Transitional)		0.3	1.0	0.0	1.0	4.0	4.0	2.6	4.0	2.0	3.5	4.0
Meadow Creek		3.0	2.8	2.0	2.0	1.4	1.4	4.0	2.5	2.0	4.0	0.0
Jack Creek		3.0	2.3	2.0	1.5	1.4	1.4	4.0	2.5	3.0	4.0	0.0
Brush Creek		3.0	2.3	2.0	3.0	1.4	1.4	4.0	2.3	3.0	4.0	1.0

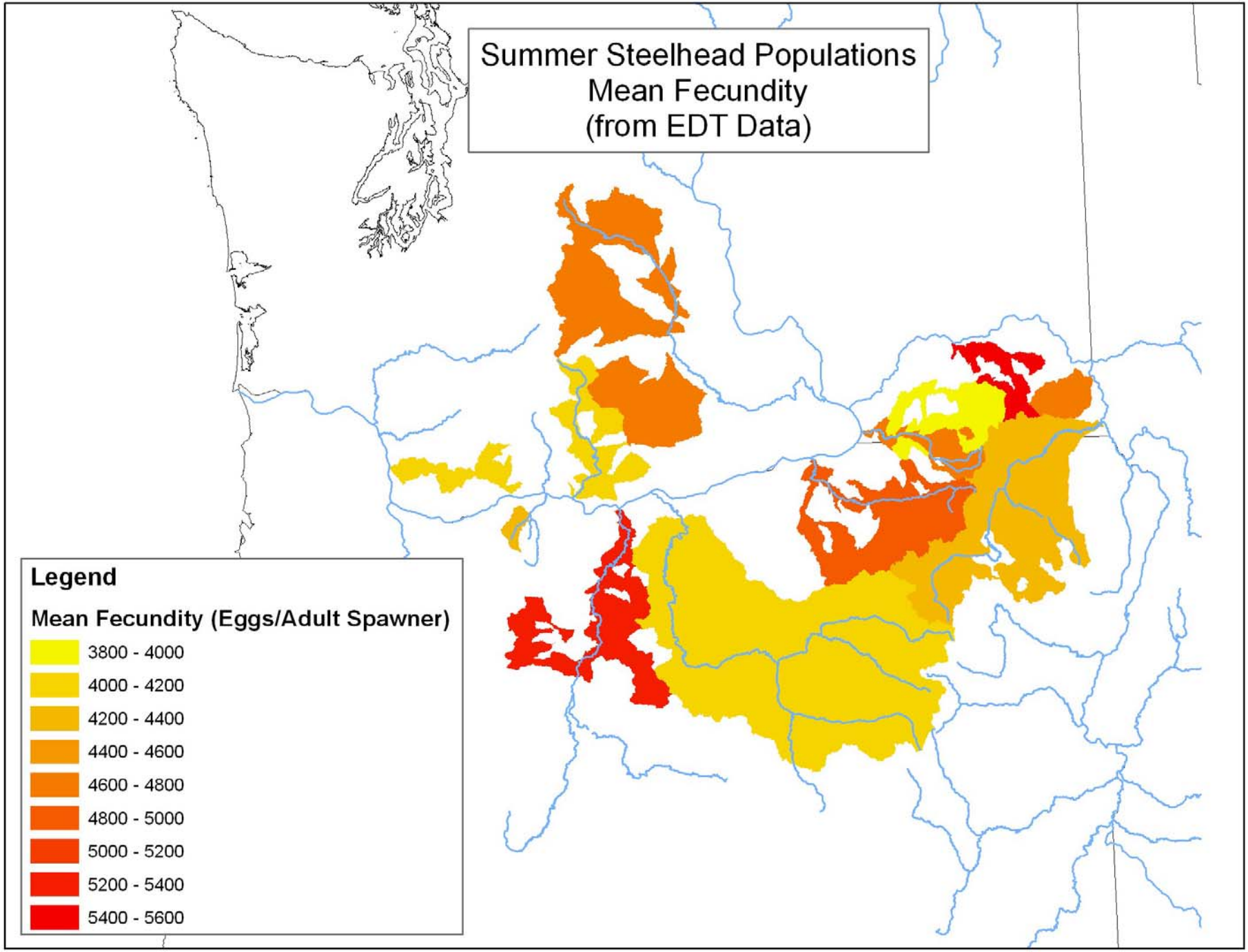
Sanpoil QHA for Resident Redband Trout



Clearwater Subbasin



Databases Can Provide Additional Insights


Summer Steelhead Populations
Mean Fecundity
(from EDT Data)
Legend
Mean Fecundity (Eggs/Adult Spawner)
3800 - 4000
4000 - 4200
4200 - 4400
4400 - 4600
4600 - 4800
4800 - 5000
5000 - 5200
5200 - 5400
5400 - 5600

Habitat restoration programs can be compared

Name	Project Type	Number	%
Lower Deschutes Westside	Agricultural/Rangeland Improvement	24	29.6
	Combined	0	0.0
	Fish Passage Improvement	5	6.2
	Instream Flow Restoration	1	1.2
	Instream Habitat Restoration	5	6.2
	Monitoring	14	17.3
	Other	2	2.5
	Riparian	12	14.8
	Road Abandonment/Restoration	2	2.5
	Upland Habitat Restoration	15	18.5
	Wetland Restoration	1	1.2
	TOTAL	**81**	**100.0**

Name	Organization	# of Projects	%
Lower Deschutes Westside	Bureau of Land Management	20	24.7
	Confederated Tribes of Warm Springs	23	28.4
	Hood National Forest	12	14.8
	OR DEQ	2	2.5
	Oregon Dept. of Transportation	1	1.2
	Portland General Electric	12	14.8
	Sherman Co. SWCD	11	13.6
	TOTAL	**81**	**100.0**

Using This Framework We Can:

- Capture fine-scale biological and physical detail
- Integrate details at larger scales to address management needs
- Provide summary reports at different scales
- Prioritize and implement effective actions
- Gain unexpected insights (accelerate learning)
- Coordinate across programs
- Communicate with, and between, management and stakeholder groups

Lessons Learned

- The whole **IS** greater than the sum of the parts
- Organizational framework is robust and has wide acceptance
- Coordinating and planning ahead for data sharing is cheaper, faster, and provides higher quality data than acting after the fact.
- There are 3 components of effective data sharing
  - What to collect (data collection and content standards)
  - How to share data (IT standards)
  - How to use shared data (creating information for management)
- Consistent data management practices (not just technology) will require policy-level support
- Information management is an ongoing effort, not an episodic task.

Now what?

“It would be best for the proponents, perhaps under the auspices of NED and PNAMP, to agree upon a pilot-scale project to test out the data center concept.”

- First, coordinate with the data generators to bring in coherent data from multiple sources, or provide access to those data in “standard form.”

- Second, demonstrate that the data can feed an “end user group” for productive analysis, so an “emergent product” of value comes out of the pilot project.

What this entails is that the proponents team up with both a data generator group and a data user group (in advance) allowing them to carry a finite (but meaningful) problem through from data generation to data warehousing to data mining to a valuable conclusion.

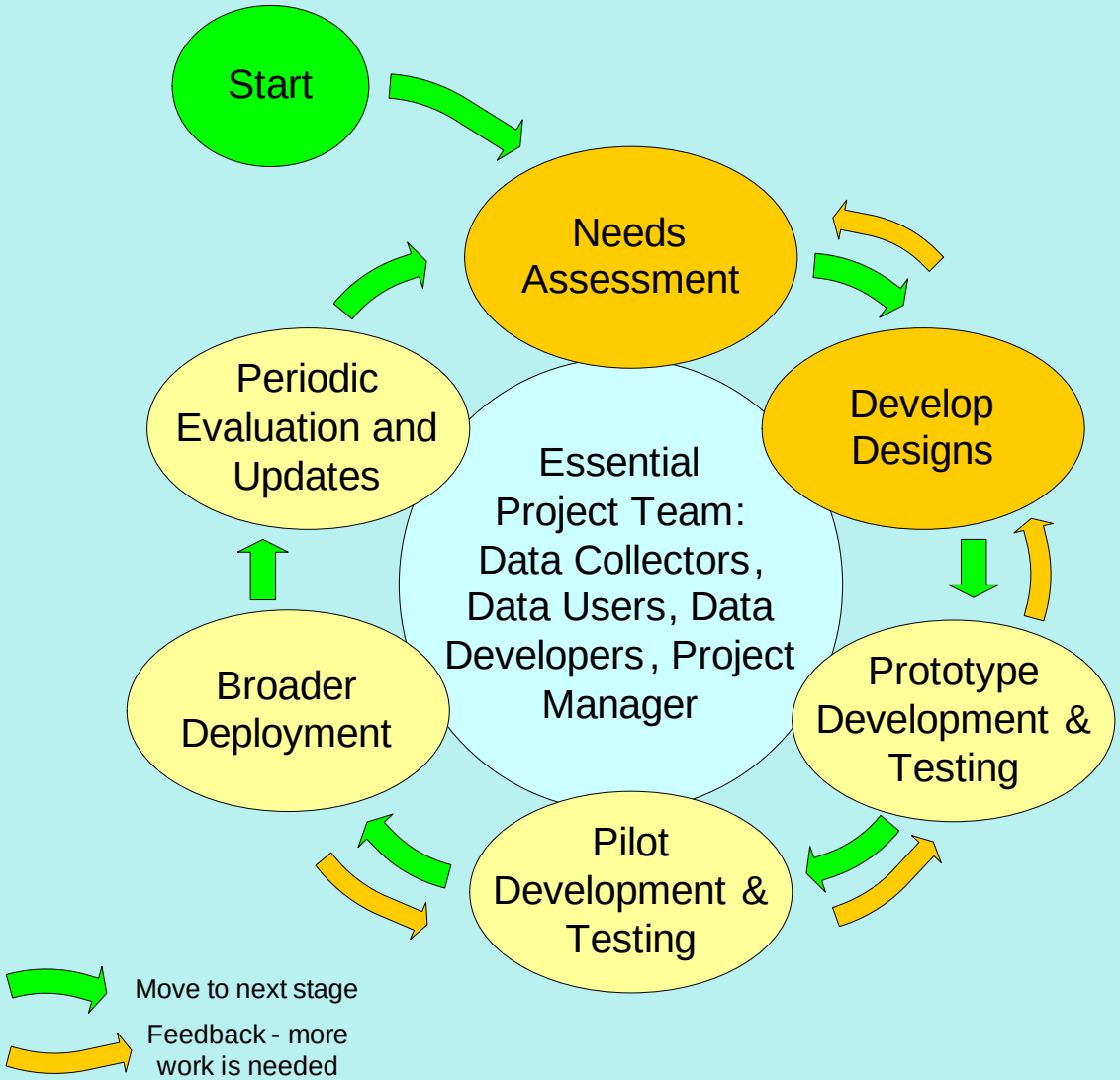
Source: ISAB. 2006. ISAB review of Council proposal for a Columbia River Basin Data Center

We Are Poised to Move

From Independent Efforts

To A Common Direction

NED DATA MANAGEMENT LIFE CYCLE



Use a Core Set of Fish and Habitat Data as a Prototype/Pilot Test

- Data Collection
  - Selected state, tribal, and federal BPA projects
  - ISEMP
- Data Sharing
  - StreamNet, NHI
  - Efficient data pathways
  - Storage
  - Internet searchable and accessible
- Data Usage
  - CBFWA Status of the Resource Report
  - BiOp Progress Report
  - IBIS