



MAFAC CBP Task Force SCEE Relationship Flow Mapping Exercise DRAFT Summary Memorandum



November 4, 2019



ACKNOWLEDGMENTS

MAFAC CBP TASK FORCE MEMBERS

Jennifer Anders, State of Montana
Paul Arrington, Idaho Water Users Association
David Doeringsfeld, Port of Lewiston
Tom Dresser, Public Utility District No. 2 of Grant County
Mike Edmondson, Idaho Governor's Office
Ben Enticknap, Oceana
Randy Friedlander, Colville Tribes
Brent Hall, Confederated Tribes of the Umatilla Indian Reservation
Liz Hamilton, Northwest Sport Fishing Industry Association
Marla Harrison, Port of Portland
Scott Hauser, Upper Snake River Tribes
Justin Hayes, Idaho Conservation League
Heath Heikkila, Coastal Conservation Association
BJ Kieffer, Spokane Tribe
Nancy Leonard, Northwest Power and Conservation Council
Joe Lukas, Western Montana Electric Generating and Transmission Cooperative
Steve Manlow, Lower Columbia Salmon Recovery Board
Debrah Marriott, Lower Columbia Estuary Partnership
Rob Masonis, Trout Unlimited
Liza Jane McAlister, 6 Ranch, Inc.
Jim McKenna, State of Oregon
Guy Norman, State of Washington
Mike Okoniewski, Pacific Seafoods / MAFAC Member
Zach Penney, Columbia River Inter-Tribal Fish Commission
Kevin Scribner, Salmon Safe
Paul Ward, Yakama Nation
Jim Yost, State of Idaho

MAFAC CBP TASK FORCE AUDIENCE

Mark Bagdovitz, U.S. Fish and Wildlife Service
Mac Barr, Oregon Department of Fish and Wildlife
Lance Hebdon, IDFG
Tom Iverson, Yakama Nation Fisheries
Tucker Jones, Oregon Department of Fish and Wildlife
Jim Kramer, Kramer Consulting
Walter Larrick, KRD
Bob Lessard, Columbia River Intertribal Fish Commission
Erica Maltz, Burns Paiute Tribe
Dan Rawding, Washington Department of Fish and Wildlife
John Simpson, WDI
Adam Storch, Oregon Department of Fish and Wildlife
John Warinner, Aspect Consulting
Justin Zeucner, Pioneers of Sustainability - The PNW Wave

NOAA FISHERIES PROJECT TEAM

Katherine Cheney, West Coast Region
Patty Dornbusch, West Coast Region
Pat Frazier, Affiliate
Jennifer Lukens, NOAA Fisheries and MAFAC Designated Federal Officer
Michael Tehan, West Coast Region
Barry Thom, West Coast Region

KEARNS & WEST CONSULTANT TEAM

Debra Nudelman, Principal & Senior Mediator
Abby Cheskis, Associate

SERA CONSULTANT TEAM

Tim Smith, AIA, AICP, Principal
Erin Reome, AICP, Senior Associate
Emma-Quin Smith, Project Assistant

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Upper Columbia River

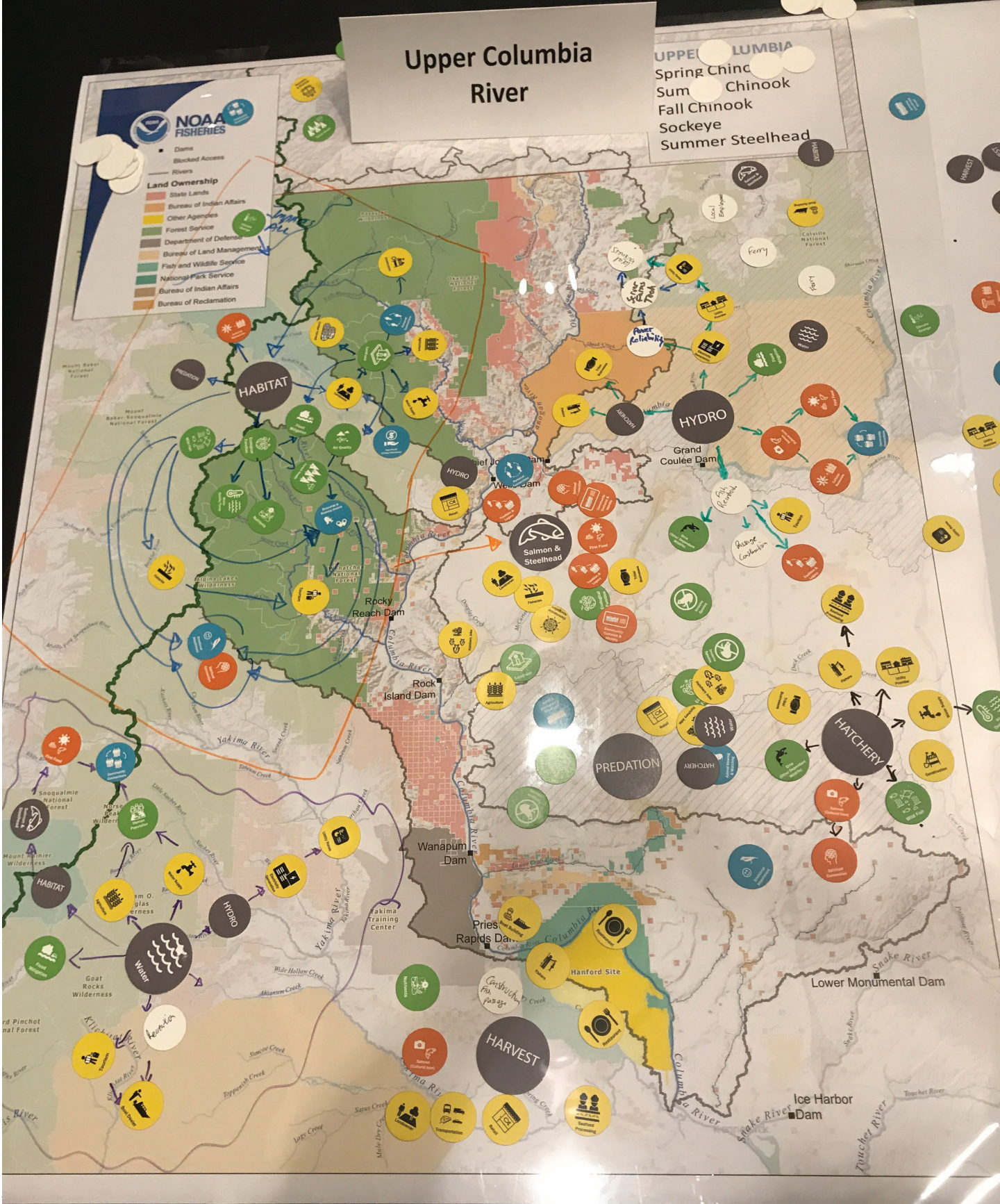
UPPER COLUMBIA
Spring Chinook
Summer Chinook
Fall Chinook
Sockeye
Summer Steelhead

NOAA FISHERIES

- Dams
- Blocked Access
- Rivers

Land Ownership

- State Lands
- Bureau of Indian Affairs
- Other Agencies
- Forest Service
- Department of Defense
- Bureau of Land Management
- Fish and Wildlife Service
- National Park Service
- Bureau of Indian Affairs
- Bureau of Reclamation



THE COLUMBIA BASIN PARTNERSHIP TASK FORCE AND RELATIONSHIP FLOW MAPPING

The Columbia Basin Partnership (CBP) Task Force was convened in 2017 by NOAA Fisheries and the Marine Fisheries Advisory Committee to develop shared goals and a comprehensive vision for the future of Columbia Basin salmon and steelhead. In Phase 1 the CBP Task Force developed qualitative goals and provisional quantitative goals for each of the 24 salmon and steelhead stocks in the Columbia Basin. In Phase 2, the CBP Task Force is developing scenarios for how the goals could be achieved. In addition, consistent with its Qualitative Goal #4, the Task Force is exploring social, cultural, economic, and ecological considerations related to those scenarios.

The CBP Task Force engaged SERA Architects to assist with the exploration of these social, cultural, economic, and ecological (SCEE) considerations. Relationship flow mapping is a tool developed by SERA Architects for mapping complex systems relationships and impacts within a community, institution or watershed. Relationship flow mapping is a visual exercise that literally lays the elements of a system out on the table, allows participants to see the myriad of variables that could be impacted by changes in the system, and helps them identify what factors might be involved in those changes.

CBP Task Force members were asked to work in groups to identify SCEE variables within a sub-region of the Columbia Basin, to think about the directionality and significance of the relationships they identified, and to link those ideas to the Columbia Basin as a whole in order to deepen the understanding of SCEE considerations within the basin. This report summarizes the various SCEE considerations and systemic relationships identified by the CBP Task Force to enrich future work on scenarios and achieving the goals for salmon and steelhead in the Columbia Basin.

RELATING SCEE CONSIDERATIONS TO SALMON RECOVERY STRATEGIES

Recovery of salmon and steelhead involves implementing various biological strategies and actions across the landscape and life-cycle of salmon and steelhead to improve survival. These biological strategies and actions are targeted at reducing specific threats to fish survival and thereby reducing mortality associated with a particular threat to achieve an overall increase in survival. The CBP Task Force has employed a tool (a simple life-cycle model) that can be used to explore how reducing these threats in various combinations could improve salmon survival and achieve the provisional goals. This simple life-cycle model, also known as “the slider” – has a user interface that displays each of these threats as a “dial” that could be turned to increase or decrease the magnitude of that threat and its associated mortality.

The threats (“dials”) that the slider evaluates are:

- Hydro
- Predation
- Habitat (habitat, estuary, blocked)
- Harvest (fishery)
- Hatchery

Qualitative Goal #4:

Make decisions within a broader context that reflects, and considers effects to, the full range of social, cultural, economic, and ecosystem values and diversity in the Columbia Basin.

THE ICONS

The relationship flow mapping was based on a set of icons representing a variety of important SCEE considerations within each region of the Columbia River Basin. The icons were created based on individual task force member feedback regarding the impact turning each of the dials might have on SCEE considerations. The icons are not an exhaustive representation of the SCEE consideration in the basin, however, so blank icons were provided for task force members to fill in with other SCEE considerations their group identified.

The icons were color coded to aid in identifying which SCEE category they pertain to, however the colors are not definitive. Many of the icons could fit into multiple SCEE categories; color-coding enables icons to be easily located and differentiated within the exercise process and on final maps. A balance of icon colors is one of the desired outcomes of this exercise, as that may indicate a balanced consideration of social, cultural, economic, and ecological elements.

Additionally, the pictorial symbols on the icons are not meant to be a definitive representation of a SCEE element, only representational and conceptual; each person involved in the workshop may have interpreted the pictures and elements differently. The purpose of this workshop was not to determine which SCEE category or picture with which to represent each element impacted by the dials, but to identify and map the relationships between those elements.



Above: Sample SCEE icons. A full list of icons and a color code key is located in Appendix 2.

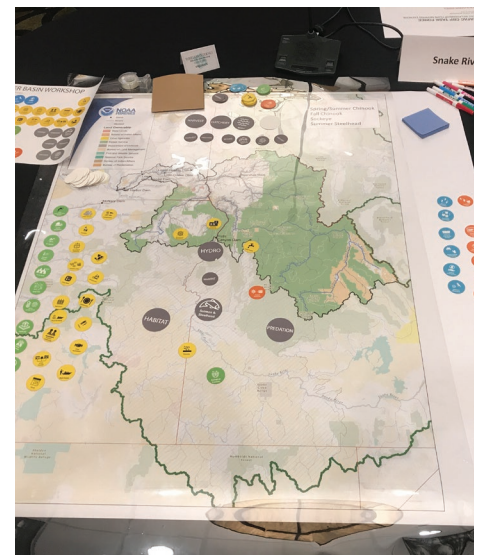
SET UP

MAFAC task force members selected a sub-region of the basin to focus their discussion around for round one of the workshop. The Columbia Basin sub-regions identified were: Lower Columbia River/Willamette River; Middle Columbia River; Upper Columbia River; and Snake River. Each sub-region was represented on a large physical map, which table groups worked on top of to create relationship flow maps. There was also a table that mapped relationship flows in the Columbia River Basin as a whole.

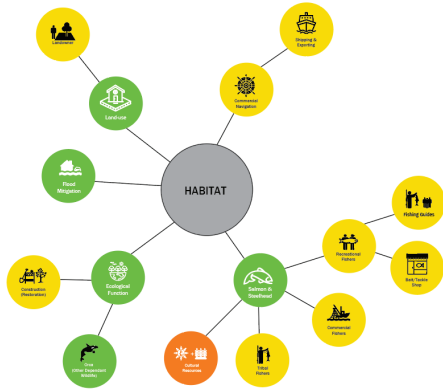
FLOW MAPPING

Relationship flow mapping took place on top of physical maps of each sub-region. Table groups could choose to georeference their flow mapping by placing icons on the map where they are geographically relevant, or the maps could be used as a only a reference and source of inspiration for the groups. Several tables took a hybrid approach to icon placement, geolocating the most important icons and conceptually placing the rest. More discussion on this is included in each sub-region section.

To begin, task force members were asked to identify the SCEE elements (icons) most pertinent to each of the dials in their sub-region. In round one, the goal was to identify primary, secondary, and tertiary levels of relationships to the dials and the fish.



In round two, task force members changed tables and checked the work of other groups. The primary goal of this round was to provide more diversity in viewpoints informing each relationship flow map. This round allowed relationship maps to be built out and refined, ensuring that all applicable SCEE elements were on the table and being considered.



Above: A pre-populated sample relationship flow map for the habitat dial in the Columbia Basin as a whole.

Round three of the workshop dug deeper into the relationships identified in rounds one and two. Task force members returned to their original sub-region tables and worked to identify several deeper characteristics about the relationships present. First, the directionality of the relationship; which element was being impacted, which element was the impacting force. Second, the level of impact or intensity of the relationship. Third, what was flowing between the relationship. Finally, identify whether the potential impacts of the relationships were positive or negative.

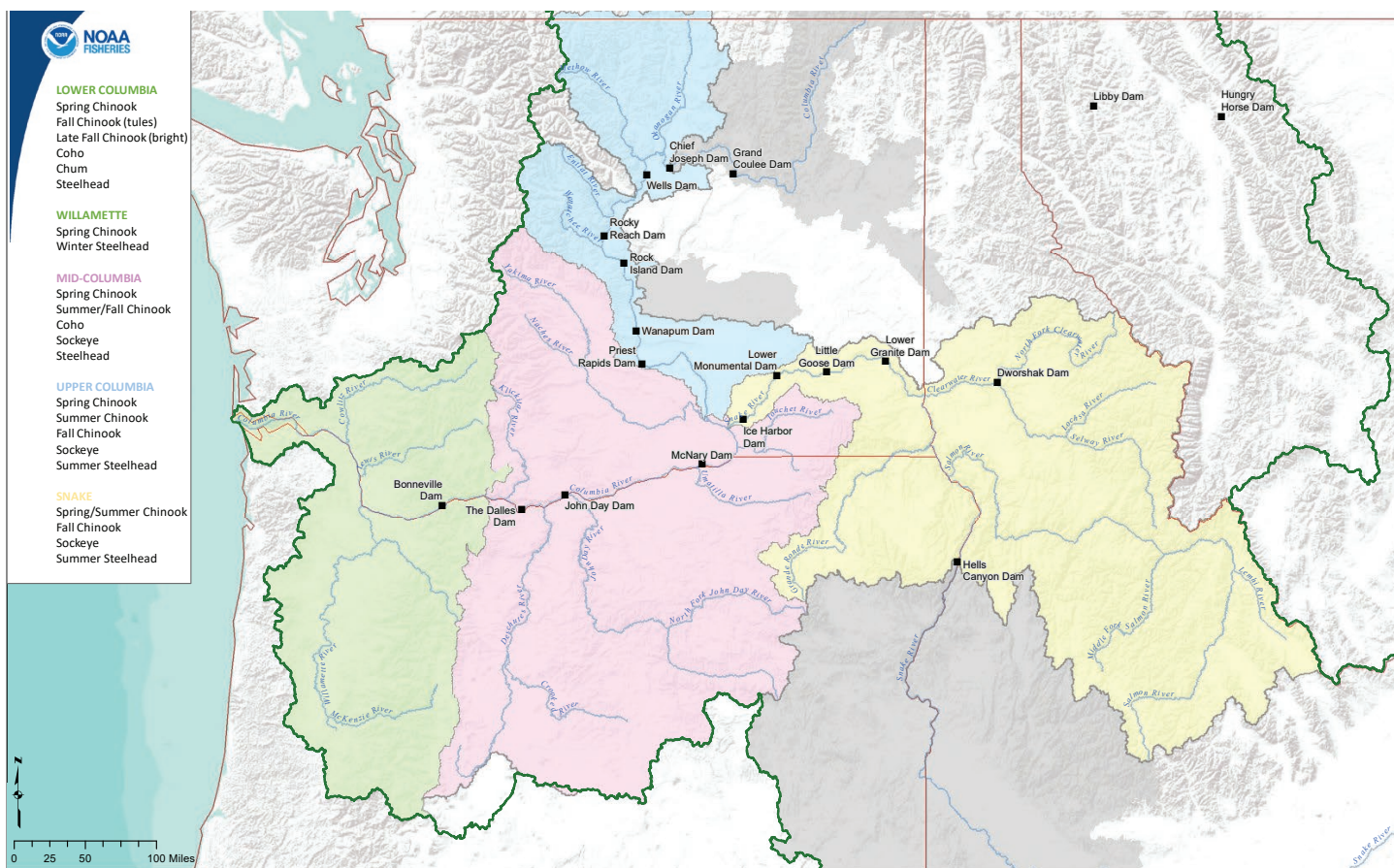
Identifying the specific impacts and outcomes were outside of the scope of this exercise.

Below: Task Force members work to map primary relationships in the Middle Columbia River Basin sub-region.



TASK FORCE SCEE WORKSHOP OUTCOMES

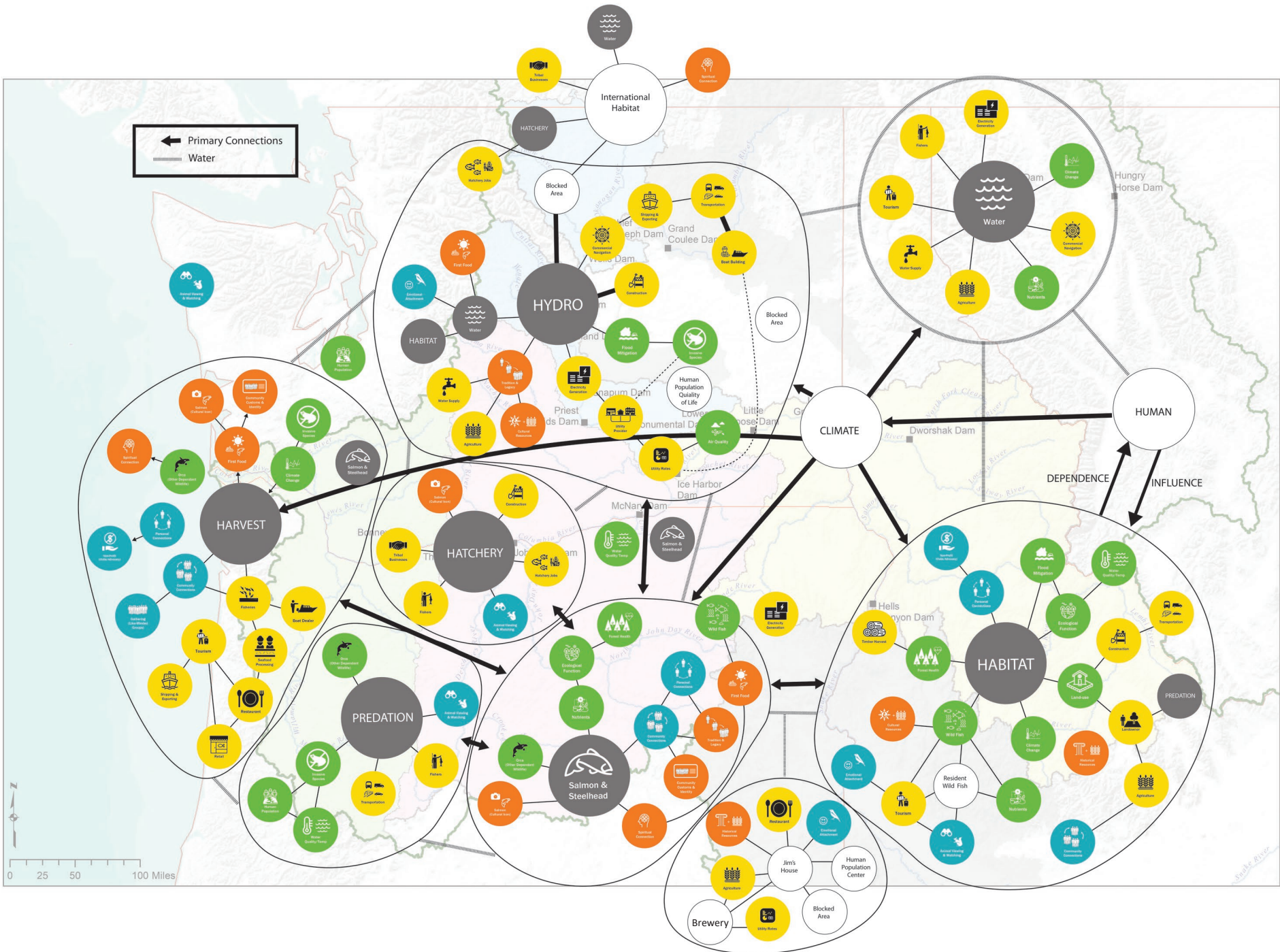
COLUMBIA RIVER BASIN-WIDE



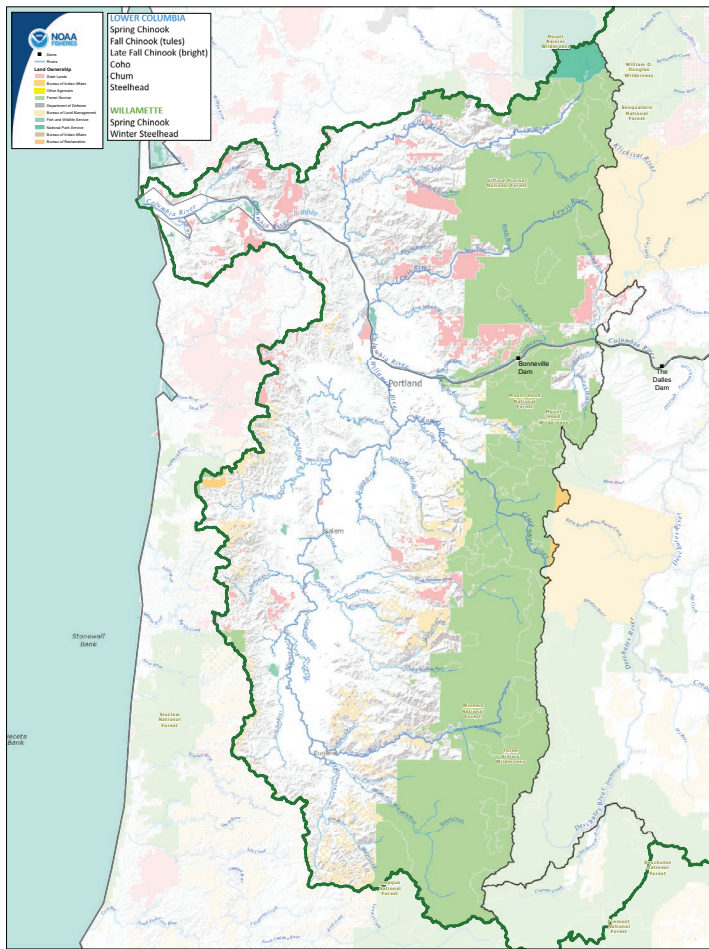
GROUP COMMENTS & INSIGHTS

- Climate change affects everything
- Harvest has strong social and cultural ties; as well as ties into economics, habitat, and hydro
- Within a particular community, there may be things happening outside of the area that are impactful.
- Everything is connected in different ways.
- Humans influence and at the same time are dependent upon the environment.
- Salmon and steelhead were at the center of the map in round one, but ultimately the larger conversation revolved around water. Water connects everything. One participant notes the direct connection between water and tribal culture, as every meal begins and end with water.





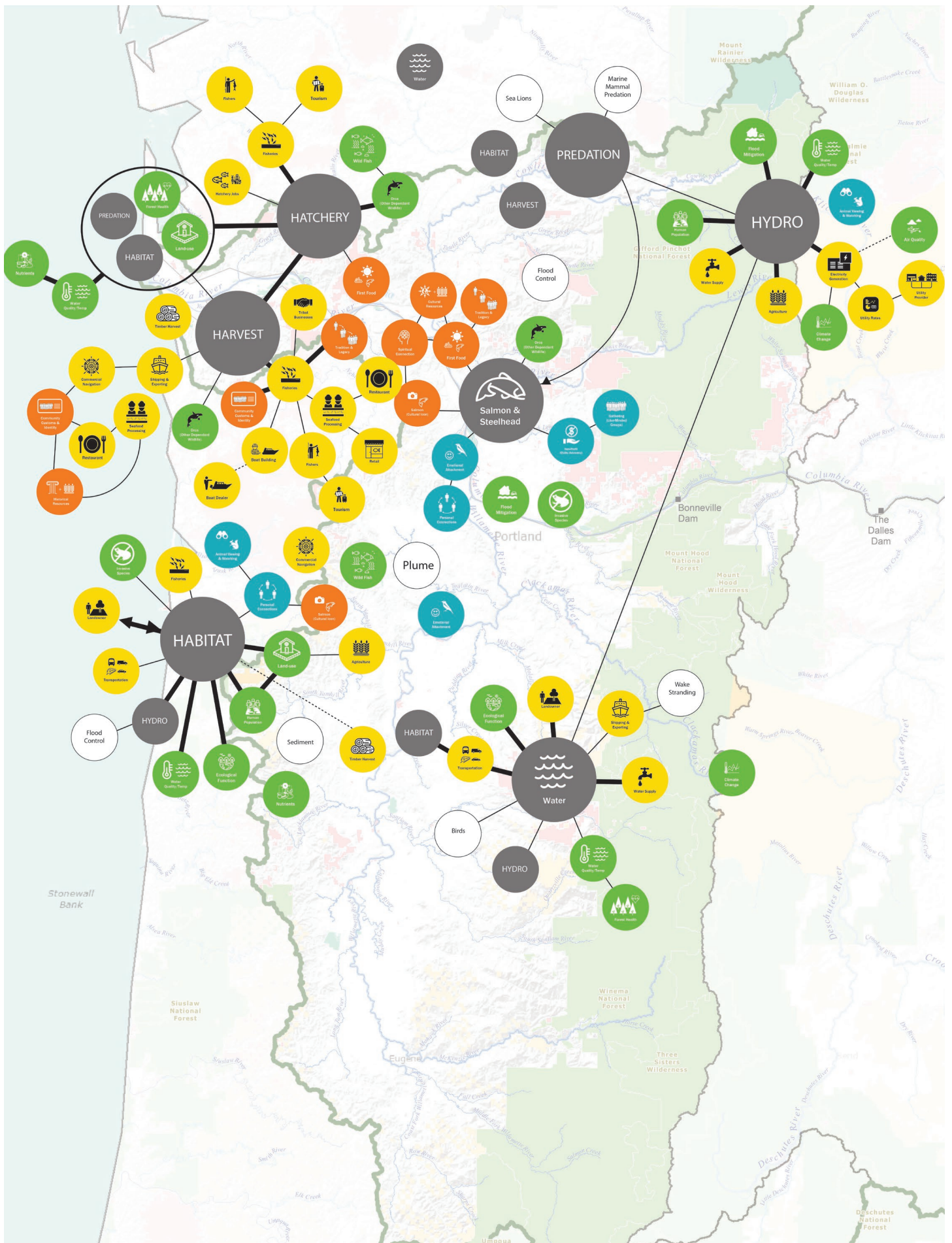
LOWER COLUMBIA RIVER/WILLAMETTE RIVER



GROUP COMMENTS & INSIGHTS

- Habitat impacts are different in the mainstem and tributaries. They also vary by stock.
- There are challenges associated with habitat improvement in heavily populated areas of the Lower Columbia/Willamette area.
- Hatcheries have social and cultural implications.
- Predation is closely tied to mainstem hydro. Predation can be acted upon quickly, and we can see results quickly.
- Everything is connected to the mouth of the Columbia and the community of Astoria: transportation, shipping, birds (predation), and ecosystems.
- This table noted that they were missing tribal representation and important cultural considerations.
- Discussed spill and flows and demonstrated both positive and negative impacts.
- Flood control is closely related to dams, and drives access to habitat.
- Recognized the transformative power of water.

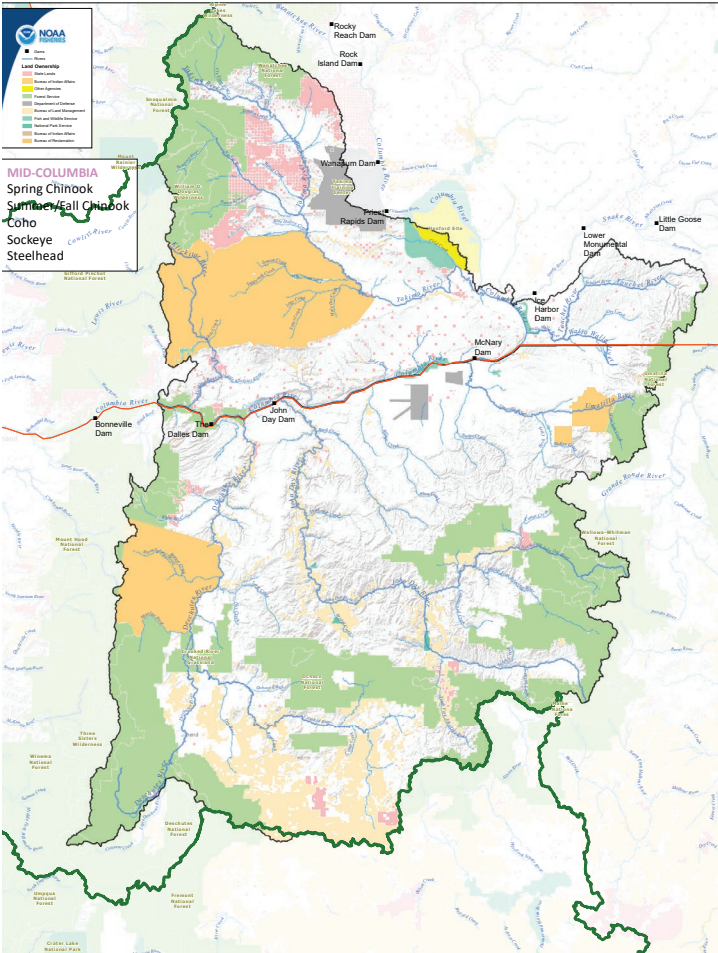


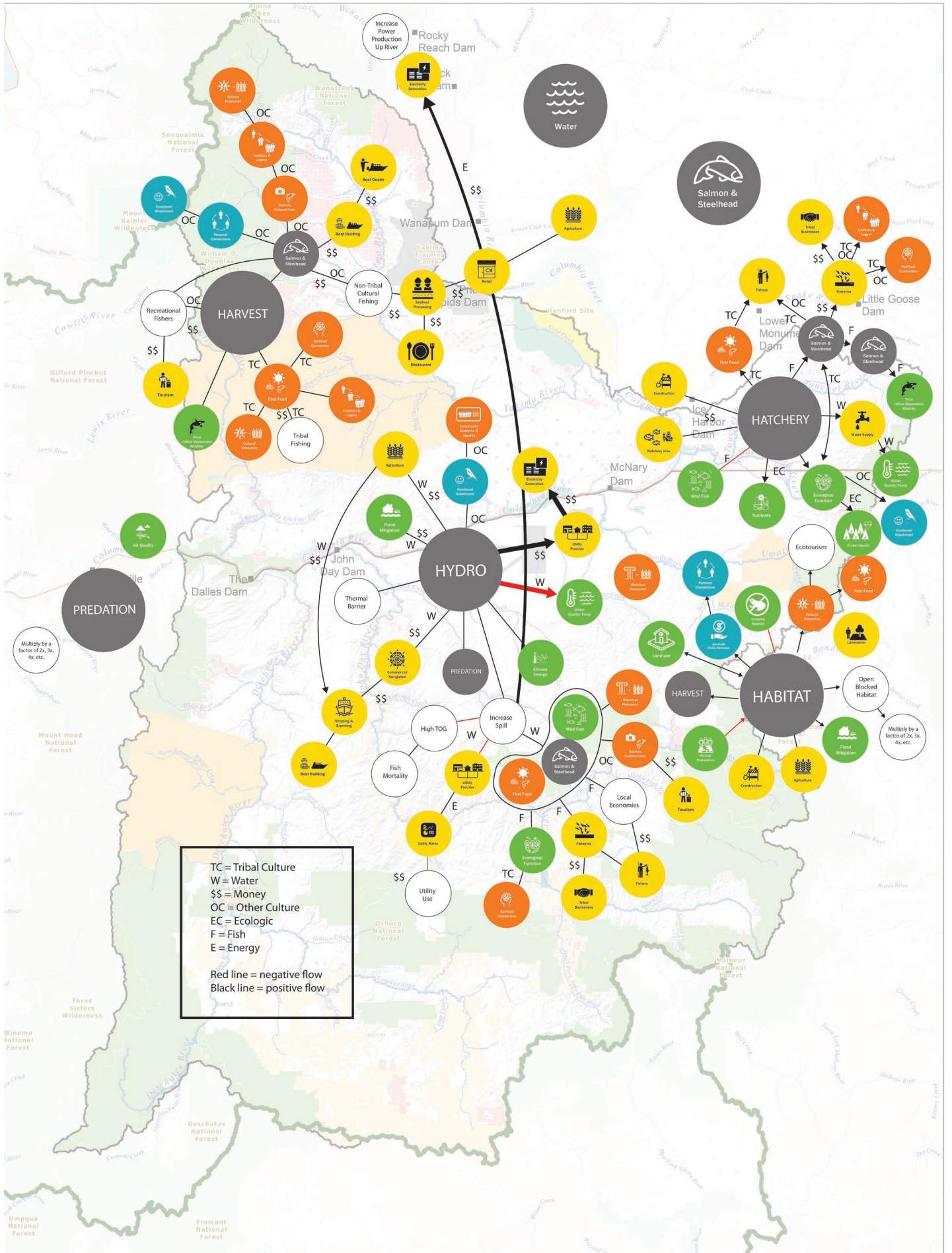


MIDDLE COLUMBIA RIVER

GROUP COMMENTS & INSIGHTS

- The group identified several relationships between water, money, energy, tribal culture, other culture, and fish.
- Increasing habitats may have a positive impact on ecological function but a negative impact on land owners and land use.
- Water is at the top of the map. Everything depends on water quality and quantity.
- It was one thing to identify the relationships but it is more challenging to characterize the magnitude of impact.

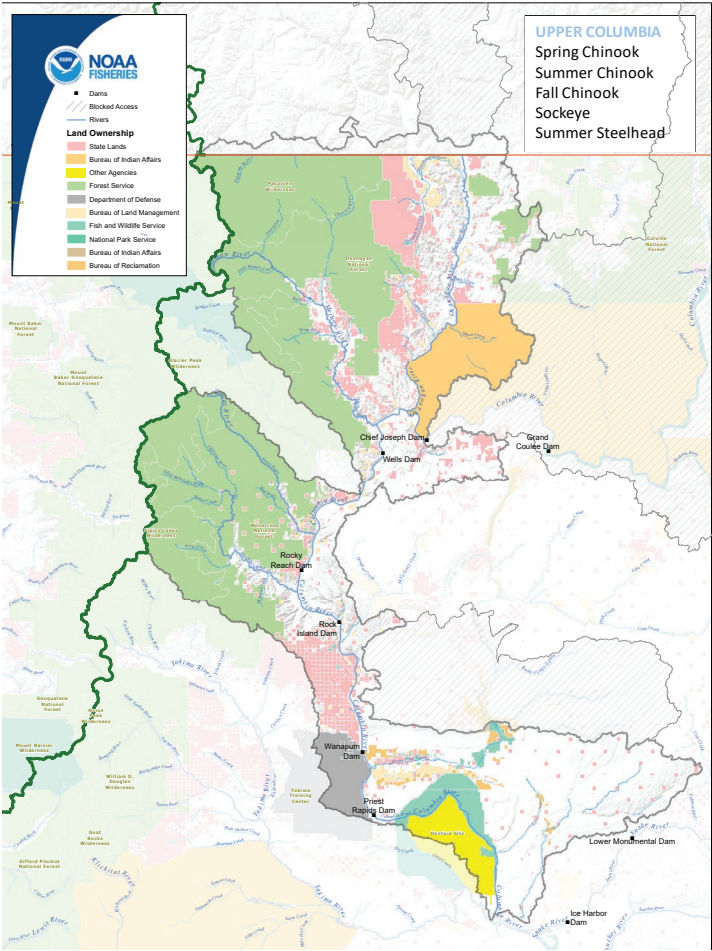


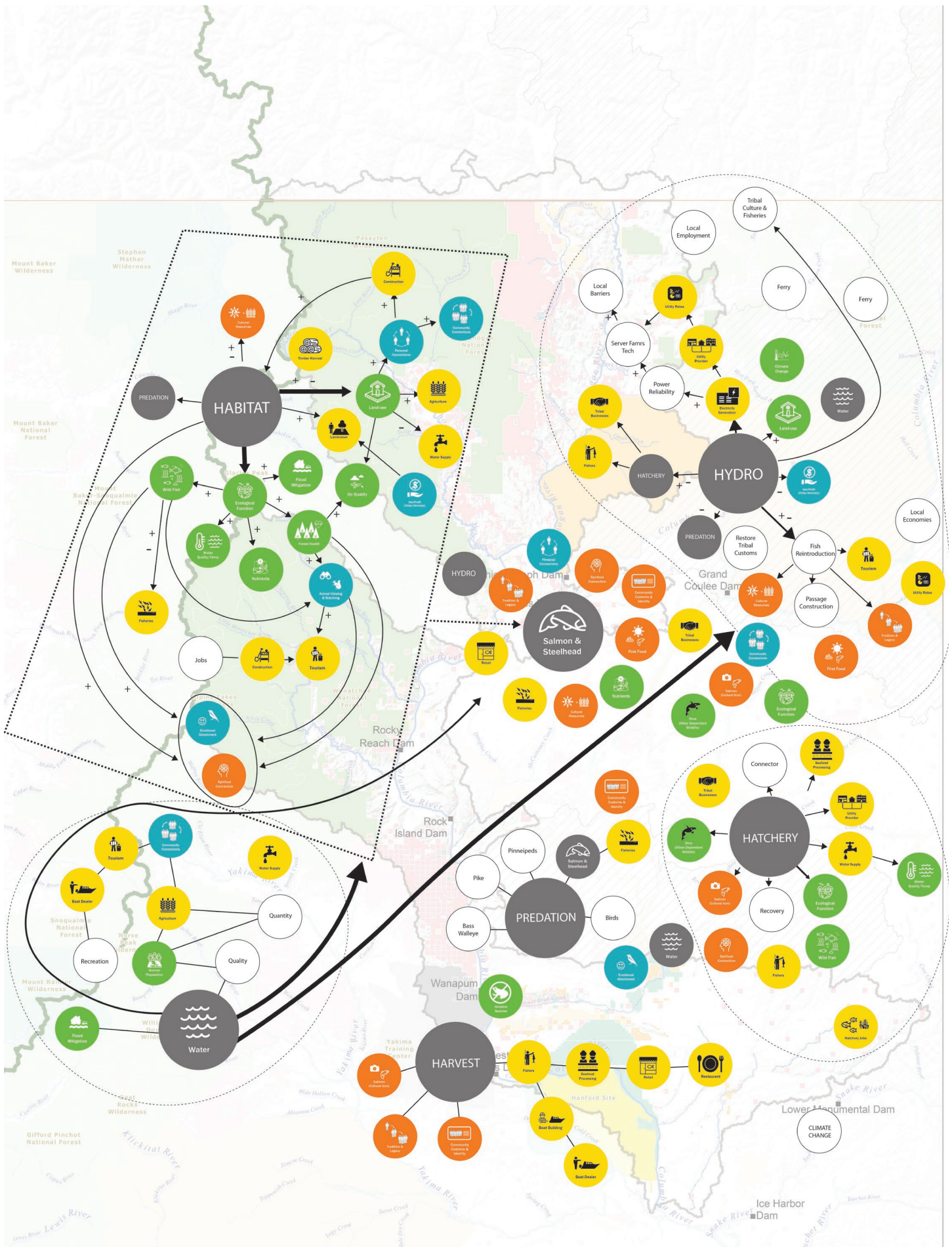


UPPER COLUMBIA RIVER

GROUP COMMENTS & INSIGHTS

- Hydro around the Grand Coulee dam is very significant; started there and built relationships out. Grand Coulee is critical for regional electricity generation and flood control. Related considerations are utility rates and community businesses dependent on electricity.
- At the same time, the effects of Grand Coulee dam construction on tribal culture were devastating to several tribes and First Nations in Canada. Grand Coulee also blocked habitat and that's why its important now to discuss reintroduction.
- The group discussed the impacts of hatcheries. Hatchery impacts vary by type. Related considerations include ecological interactions with wild fish in particular. Hatcheries also have an impact on tribal culture by supporting fisheries.

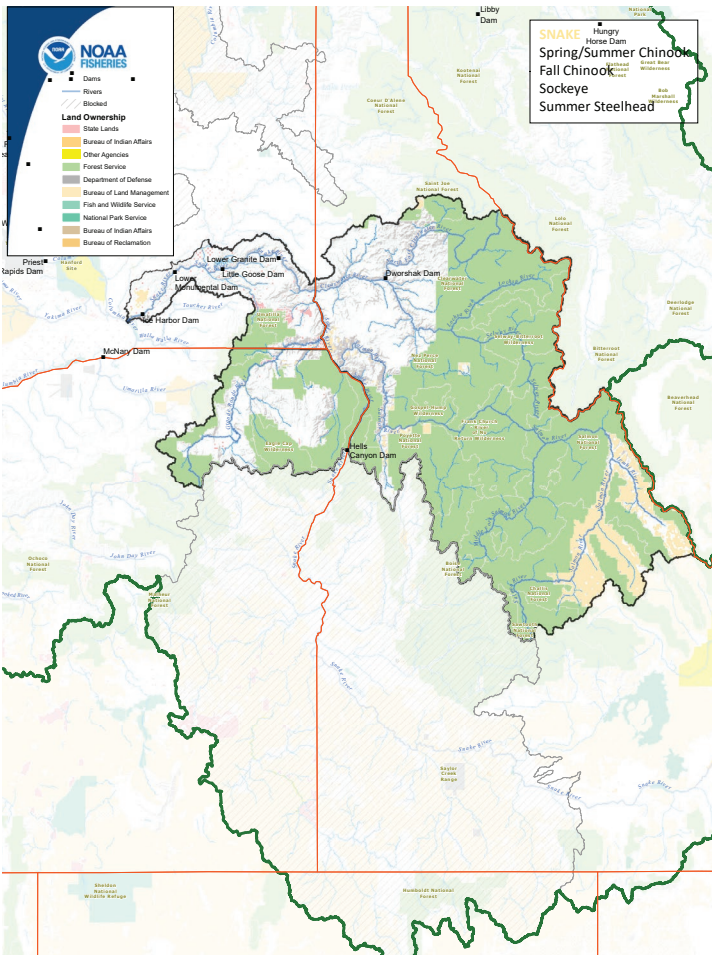


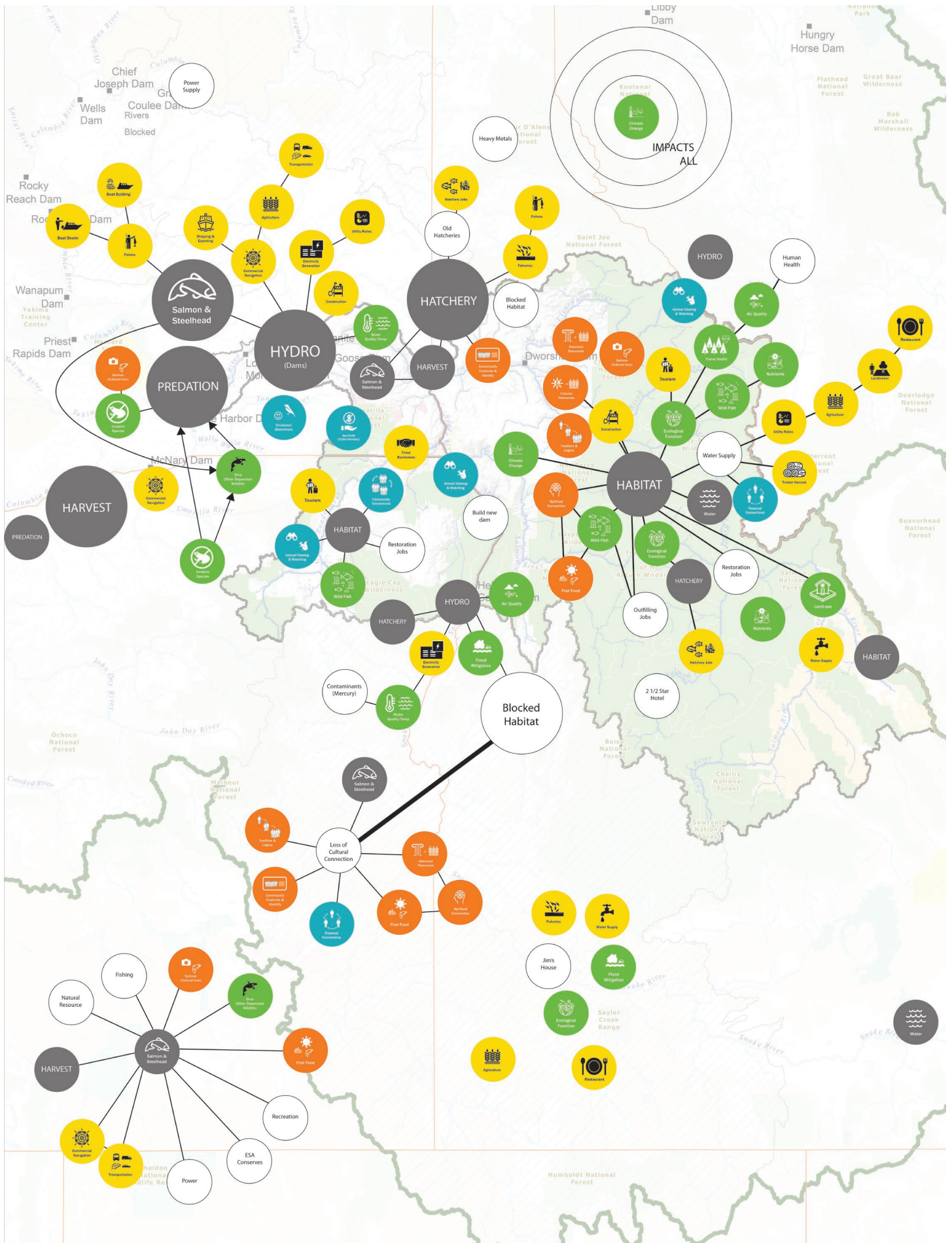


SNAKE RIVER

GROUP COMMENTS & INSIGHTS

- The group noted the community of Lewiston, Idaho, near Lower Granite Dam and clustered economic, fishing, and tourism icons there.
- Blocked habitat at the south of the sub-region has unique features
- Focusing on hydro rather than dams led to identifying positive Impacts on: Transportation, Power and water supply
- Negative Impacts identified were: Water quality, loss of habitat, salmon and steelhead impacts, predation, and tribal culture and economy
- Some impacts of hydro were more neutral/ balanced such as recreation, tourism, available money for mitigation. For example, because of the dams, there is mitigation money for restoration. Without the dams, power rates would go up.

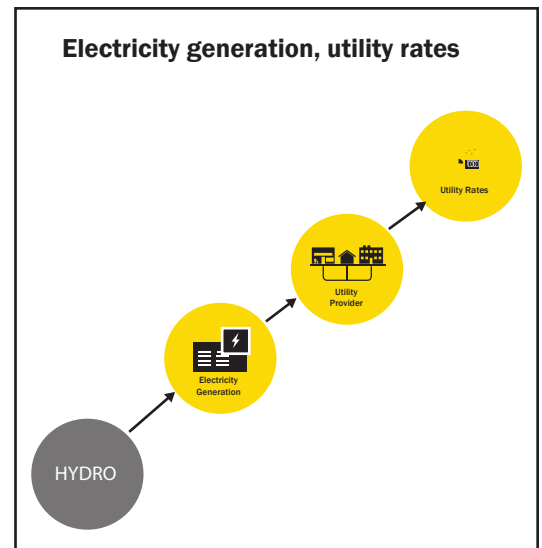
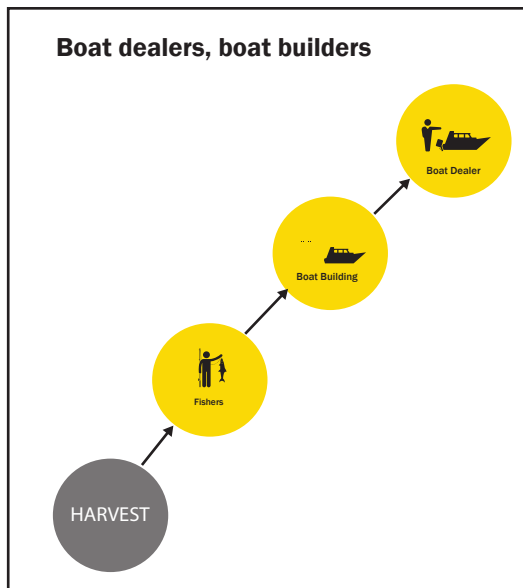
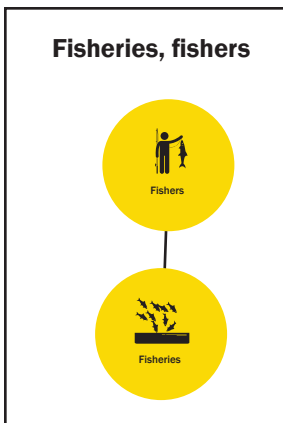
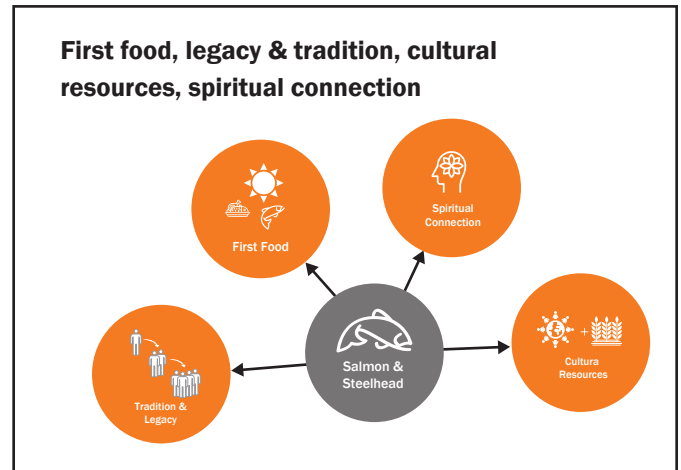
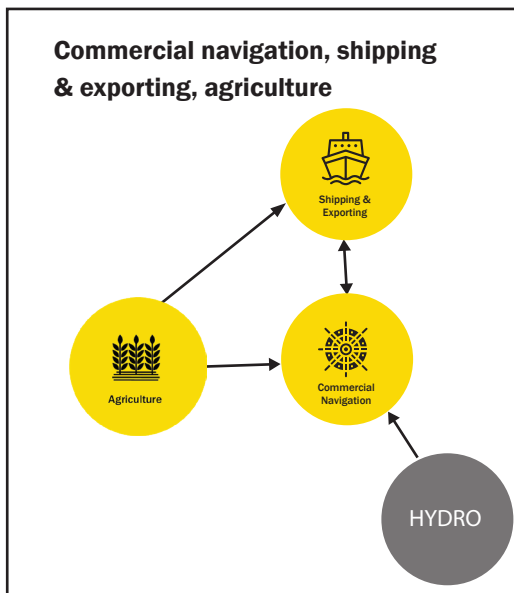




RELATIONSHIP FLOW MAP FINDINGS

FOUNDATIONAL RELATIONSHIPS

The relationships drawn between SCEE elements mapped in this exercise are the basic building blocks of systems. However, some SCEE elements are more closely related to one another and appear more frequently in relation with other elements than others. These patterns of relationships will be important to recognize when engaging in scenario planning. The recurring relationships create the foundation of the flow maps and help deepen the understanding of the system in which these relationships exist. Each dial has a specific set of foundational relationships that will be discussed in the following sub-sections. The following figures show the relationships that recurred across each of the flow maps and represent the foundational relationships for the Columbia River Basin as a whole.



Though it is of primary importance to consider SCEE elements as pieces of a larger system, several individual elements appeared frequently throughout a variety of systems. The most frequently appearing individual SCEE elements included were:

Wild fish



First food



Ecological function



Fishers



Land use



Agriculture



Emotional attachment



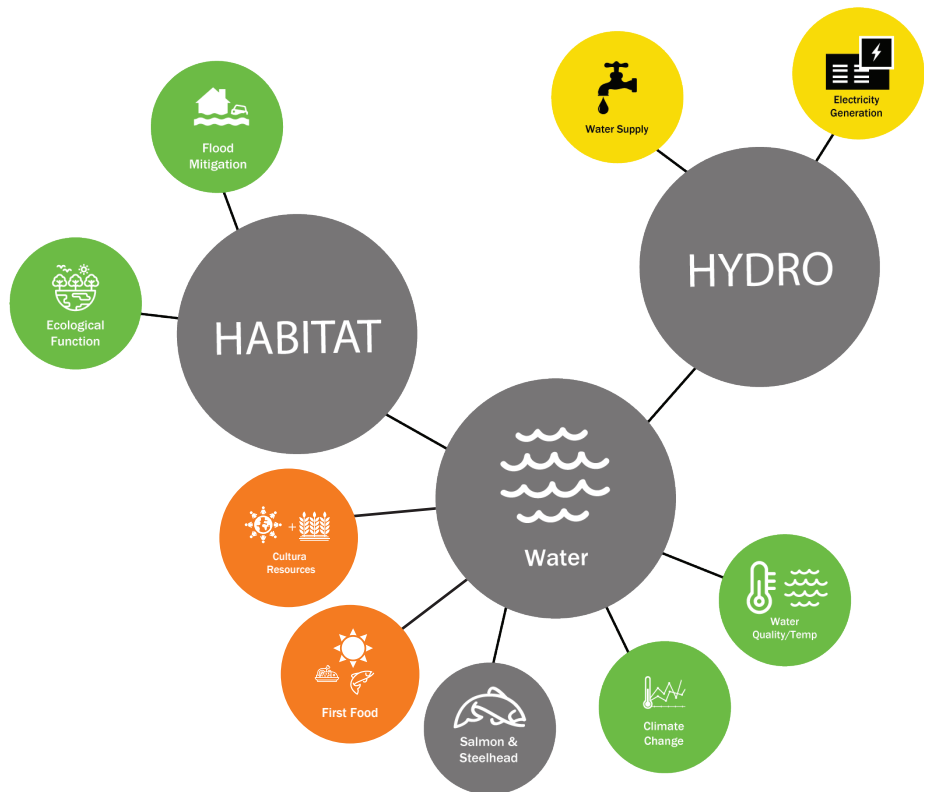
Fisheries



“Every meal starts and ends with water.”

RELATIONSHIPS TO WATER

Relationships to water were ubiquitous across all of the relationship flow maps. Though water is not one of the dials, it is of central importance ecologically, culturally, socially, and economically in the Columbia River Basin. As such, it was the center of many of the relationship flows mapped in this exercise. Several foundational patterns with primary relationships to water included: **agriculture, tourism, water supply, hydro, salmon & steelhead, first food, cultural resources,** and **habitat**. Water was fundamentally connected to the hydro and habitat dials, which created a pattern of relationships to electricity generation, climate change, water supply, ecological function, flood mitigation, water quality, and tourism.



HYDRO DIAL RELATIONSHIPS

Ecological and economic considerations were the most prominent categories represented in relation to the hydro dial. Each of the maps were generally lacking in culture and social related icons. Cultural elements were only present in the Basin wide map as a primary connection; they were included in the secondary and tertiary levels of relationships on the Upper Columbia and Middle Columbia sub-region maps. This indicates that the cultural and social systems of relationships to hydro may be harder to draw out in some of the sub-regions, and therefore, special attention should be paid to these elements in future scenario planning.

Recurring SCEE element relationships to be aware of when considering the hydro dial in scenario planning include:

Electricity generation or utility rates

Flood mitigation

Commercial navigation and shipping & exporting

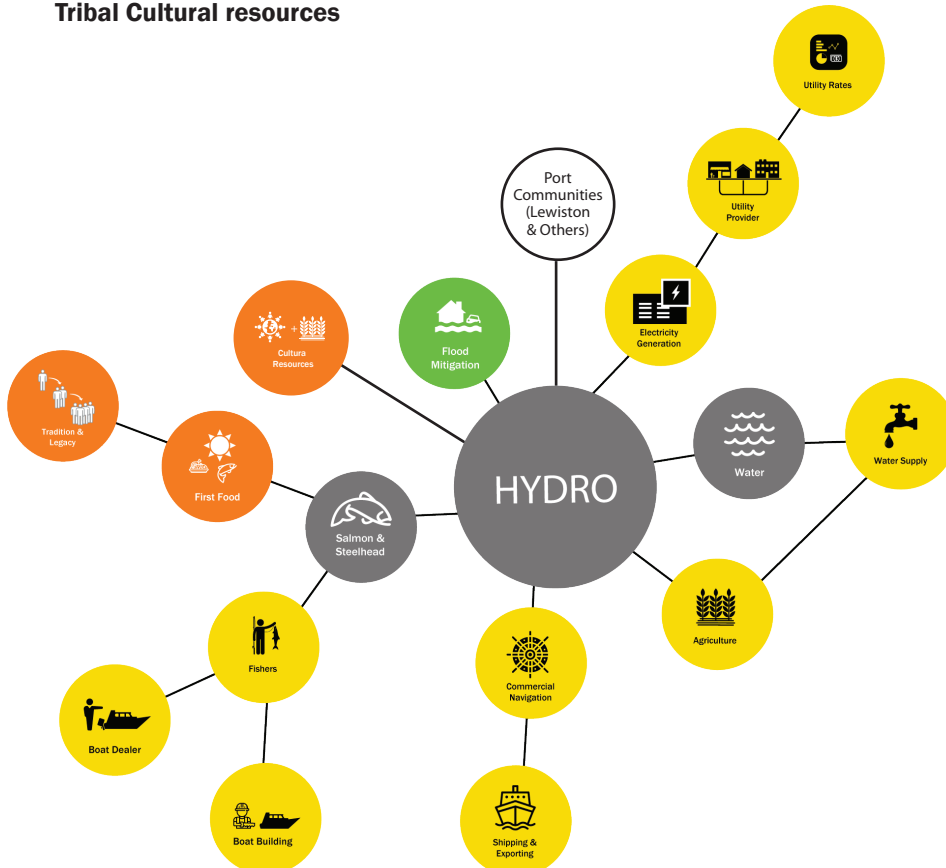
Agriculture

Salmon & steelhead and First Food

Water

Lewiston & other port communities

Tribal Cultural resources



HABITAT DIAL RELATIONSHIPS

The ecological, cultural, and social recurring relationships of the habitat dial were frequently mapped across the Basin, so it may be of particular importance to pay attention to economic impacts of changes to the habitat dial in future scenario planning exercises. When measuring the impact of the habitat dial in future scenarios, the following relationships between SCEE elements are important to be aware of:

Cultural Resources

First Food

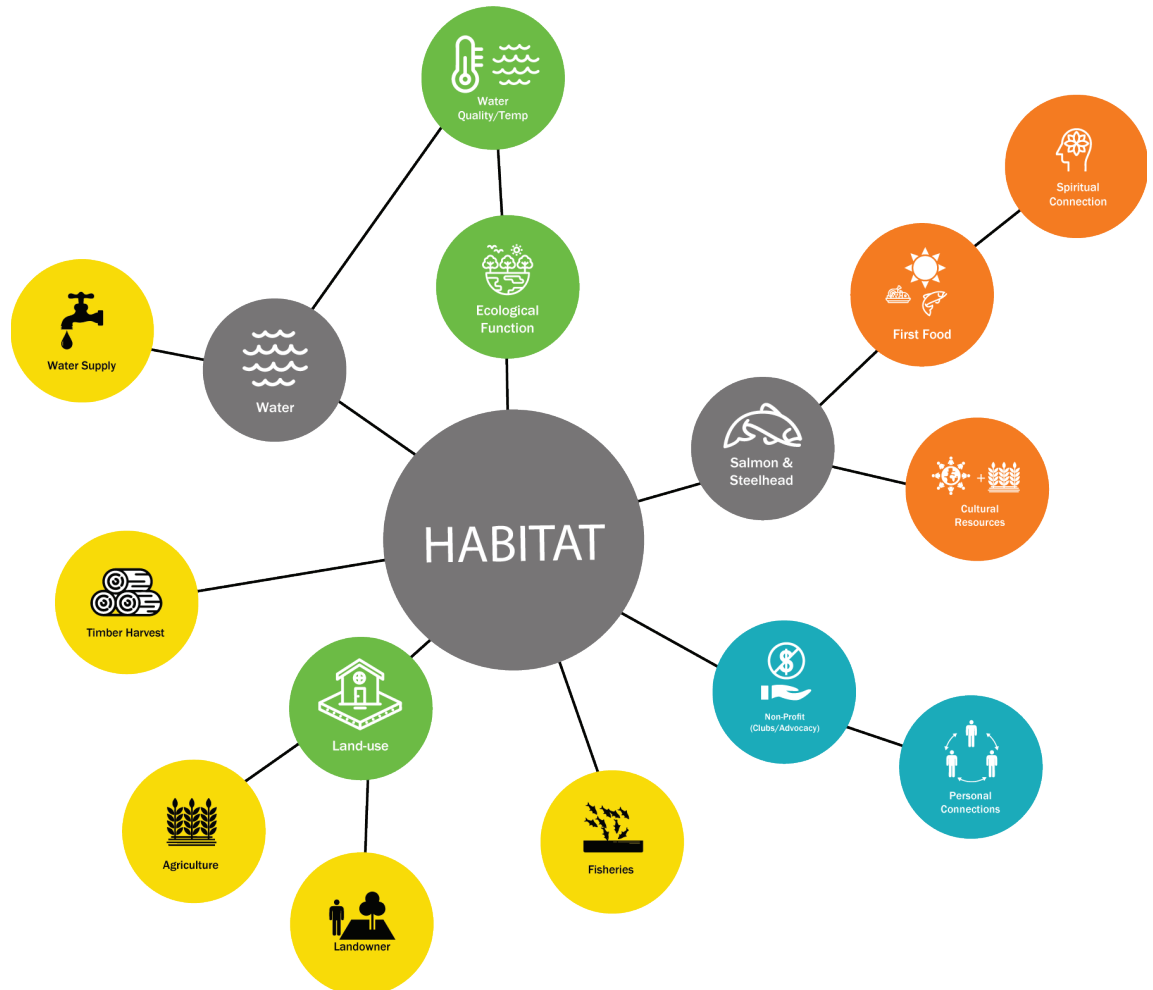
Land Use

Ecological Function

Salmon & Steelhead

Water

Secondary and tertiary relationships to the habitat dial include timber harvest and land owners. Other dials were indirectly related to habitat including predation, hatchery, harvest, hydro.



HARVEST DIAL RELATIONSHIPS

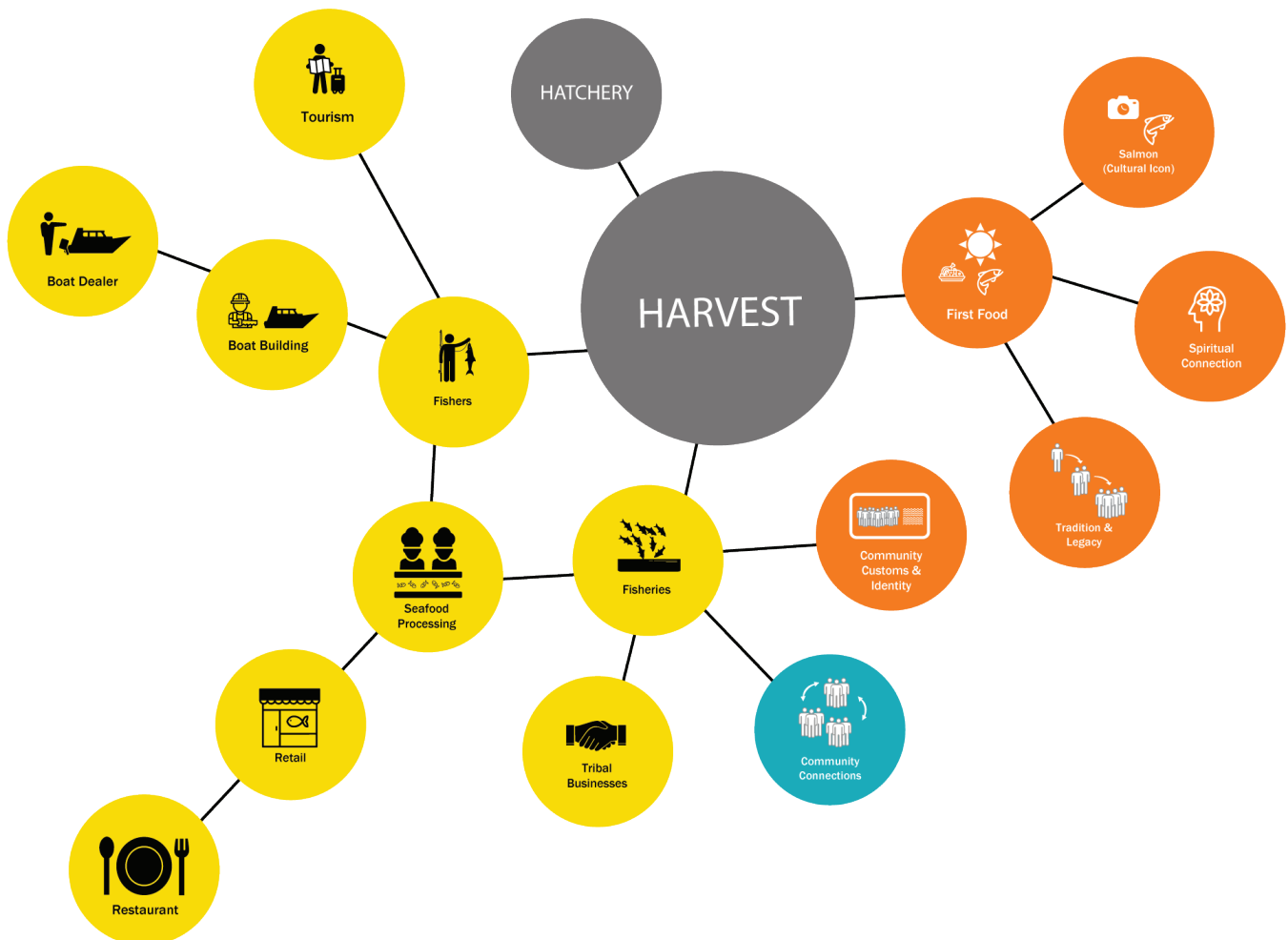
Relationships impacted by the harvest dial to be particularly aware of include:

Habitat

Community (Astoria)

Fisheries and Fishers

Overall, the relationship flows from the harvest dial impacts were focused primarily on economic and cultural elements. The basin-wide map includes some social and ecological relationships. Much of the community identity and economy is impacted by the harvest dial and it is a deeper connection than reflected by the community connections icon alone. In the Middle Columbia sub-region, tribal culture was frequently related to harvest. Impacts of the harvest dial are most robust in the Lower Columbia/Willamette sub-region.



HATCHERY DIAL RELATIONSHIPS

Frequent SCEE elements related to hatcheries on each of the maps include:

Fisheries

Hatchery jobs

Tribal business

Salmon & Steelhead

Hatcheries



PREDATION DIAL RELATIONSHIPS

Overall, the predation dial was the least built out relationship flow of all of the dials. The basin-wide map had the most robust set of relationships to predation. Predation relationships were primarily ecologically concerned. SCEE elements frequently related to predation included:

Orcas

Invasive species

Human population

Human influenced factors like air quality and water quality & temperature were other frequently related SCEE elements.



RECOMMENDATIONS FOR FUTURE SCENARIO PLANNING

The initial relationship flow mapping exercise enabled participants to visualize existing systems relationships within each sub-basin and throughout the Basin. With this baseline information and learning, we recommend the task force use systems thinking to engage in future scenario planning.

Toward this end we suggest the following:

1. Check your work.
 - Make another pass through the slider elements to ensure each element's performance is considering the systemic relationships suggested by the exercise.
 - Make sure that the operationalization of variables that go into the dials are correct.
 - Confirm foundational systems relationships, some of which were identified in this flow mapping exercise.
 - Are there others? Are the relationships identified in the exercise accurately depicted? Are they complete? Are they really foundational or just recurring?
2. Identify systems to strengthen.
 - Identify "good" systems that should be strengthened as part of future scenario planning and that could be central to a scenario. These are likely to be the ones that span multiple dials.
 - Identify weak systems that could be strengthened in service of achieving Basin goals.
 - Identify systems containing conflicting elements.
 - Identify potential new systems of relationships and potentially new elements.
3. Put it all together in scenarios.
 - Build out future scenarios for the Basin based on project goals and considering the systems mapped.
 - Depict each scenario as a systems diagram with supporting text.
4. Engage in a dial turning exercise to identify which scenarios are useful.
 - Evaluate scenarios with dial impacts exercise to map and assess the positive, negative or neutral impacts turning a dial has on social, cultural, economic and ecological systems.

Note: It will be important to leave a graphic trail of all systems and scenario work accomplished in this stage of the project so that future scenario work can start with the same baseline system information. Graphic representations of systems are generally easier to interpret than written descriptions of relationship flow mapped systems.

APPENDIX 1: WORKSHOP AGENDA

MAFAC CBP Task Force

SCEE Relationship Flow Mapping Exercise

9:30 am - 12:30 pm | September 25, 2019

Embassy Suites at the Portland Airport, 7900 NE 82nd Ave. Portland, OR 97220

CIVIC ECOLOGY PRESENTATION

What is Civic Ecology? A brief introduction to the principles, benefits, and process, including community case study examples. [9:30-9:45]

SESSION #1: BUILDING RELATIONSHIPS

Groups identified SCEE elements important to the region of the basin their table represents and begin identifying relationships between them. Identified primary, secondary, and tertiary relationships to the Dials. [9:45-10:25]

SESSION #2: REFINING RELATIONSHIPS

Task force members switched tables and checked the work done on other regions of the basin. Groups identified new relationships and began to discuss the directionality and resource flows of relationships. [10:25-10:45]

ROUND 2 REPORT OUT

Table groups shared their initial process and method of identifying important variables and relationships. Groups also discussed their initial observations for their region and conflicts during their work. [10:45-11:15]

SESSION #3: DEFINING IMPACTS & FLOWS

Returning to their original region/table, task force members defined the directionality and significance of relationships, plus positive and negative impacts. Groups also identified resource flows represented in relationships. [11:15-11:45]

FINAL REPORT OUT, OPEN DISCUSSION + WRAP UP

Groups shared their final relationship findings, including points of agreement and conflict. Task force members asked about moving forward with the results of the exercise and next steps. [11:45-12:30]

APPENDIX 2: COLUMBIA RIVER BASIN SCEE ELEMENT ICON KEY

SOCIAL
 ECONOMIC
 ECOLOGICAL
 CULTURAL
 DIALS/MEGA ICONS

 <p>Personal Connections</p>	 <p>Community Connections</p>	 <p>Gathering (Like-Minded Groups)</p>	 <p>Animal Viewing & Watching</p>	 <p>Emotional Attachment</p>
 <p>Fisheries</p>	 <p>Hatchery Jobs</p>	 <p>Fishers</p>	 <p>Tribal Businesses</p>	 <p>Boat Dealer</p>
 <p>Timber Harvest</p>	 <p>Boat Building</p>	 <p>Electricity Generation</p>	 <p>Agriculture</p>	 <p>Water Supply</p>
 <p>Ecological Function</p>	 <p>Orca (Other Dependant Wildlife)</p>	 <p>Air Quality</p>	 <p>Nutrients</p>	 <p>Flood Mitigation</p>
 <p>Land-use</p>	 <p>Wild Fish</p>	 <p>Water Quality/Temp</p>	 <p>Forest Health</p>	 <p>Invasive Species</p>
 <p>Tradition & Legacy</p>	 <p>Community Customs & Identity</p>	 <p>Spiritual Connection</p>	 <p>First Food</p>	 <p>Cultural Resources</p>

