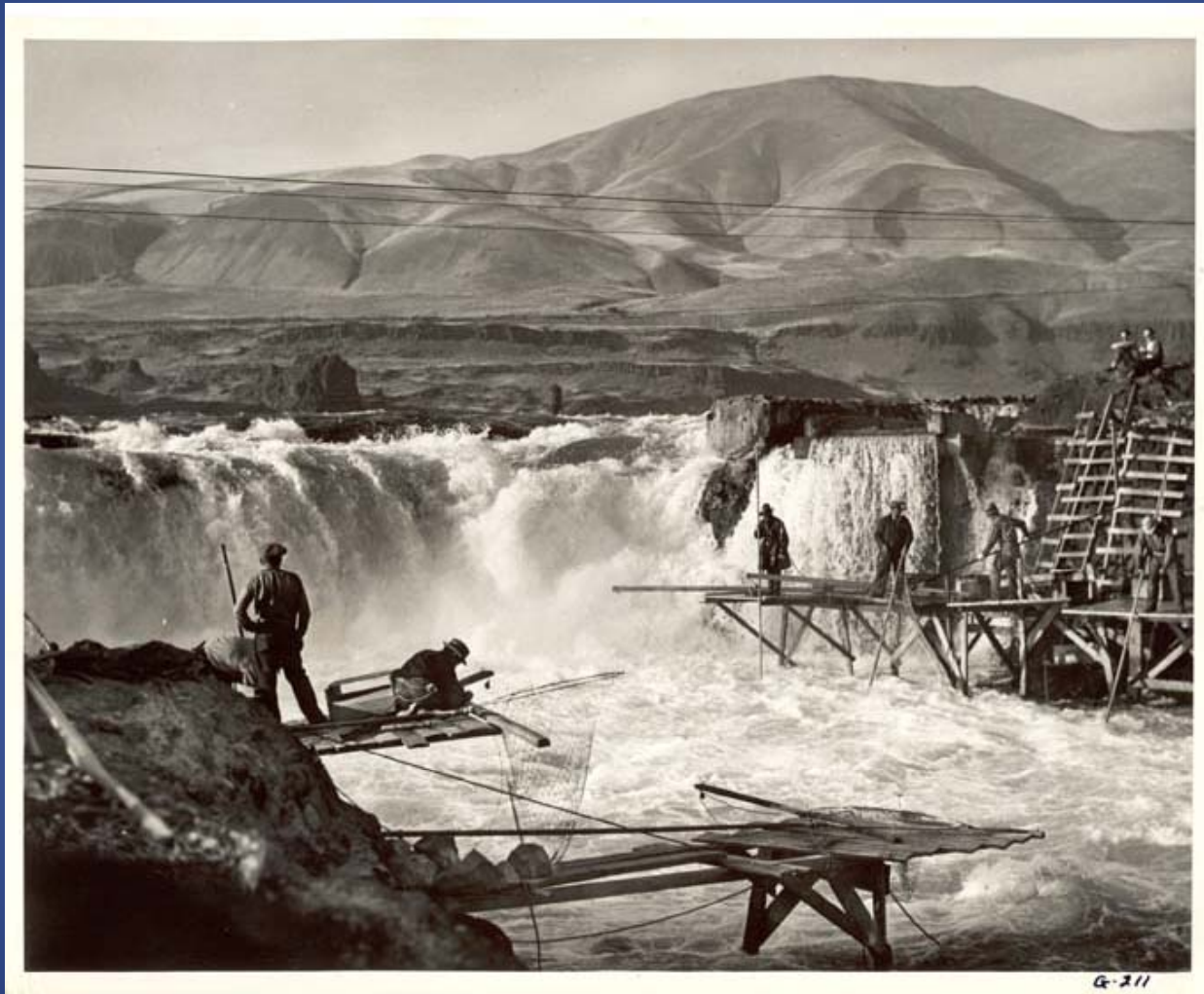


Towards sustainable fisheries: Assessing co-management effectiveness for the Columbia River Basin



Oregon State Archives, Dept. of Transportation

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Columbia River Salmon Fisheries

- The Columbia drains 259,000 sq mi, 15 times the amount of water as the Colorado.
- Estimated 11-16 million fish before European settlement (Columbia River Intertribal Fish Commission).
- Currently, over 1 million, including hatchery fish (Oregon & Washington Departments of Fish & Wildlife). ESA listings for wild stocks, mid 1990's.
- Occupied from 8,000 to 9,000 years ago (Tenino) Basalts form lava flows, narrow & rapids form best fishing places



Past to Present Day – Dam Construction



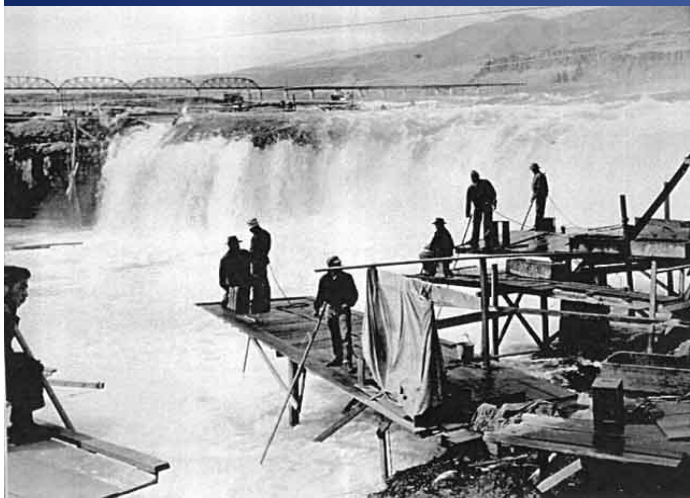
Oregon Historical Society

Platform fishing at Celilo Falls c. 1940.

Up to 2,000 people fished the falls up to the 1950s. About 18 million pounds of fish were harvested annually by Columbia River Indians. (Aguilar)

“When the fish were coming in good, I could catch one ton of salmon a day. And, it didn't take a lot of fancy gear or expensive boats to fish. For the cost of one or two balls of twine, about 6 to 12 dollars, I could make the fishing gear necessary for me to catch enough fish to supply my family and many others for a whole year.”
-- Delbert Frank, Sr., Warm Springs (CRITFC)

Past to Present Day



After The Dalles Dam submerged the falls (1957).
Lead canoe of Puyallup Canoe Family approaches
Celilo Park, 2007.



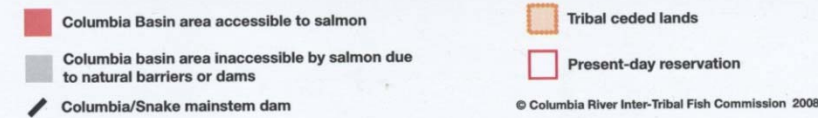
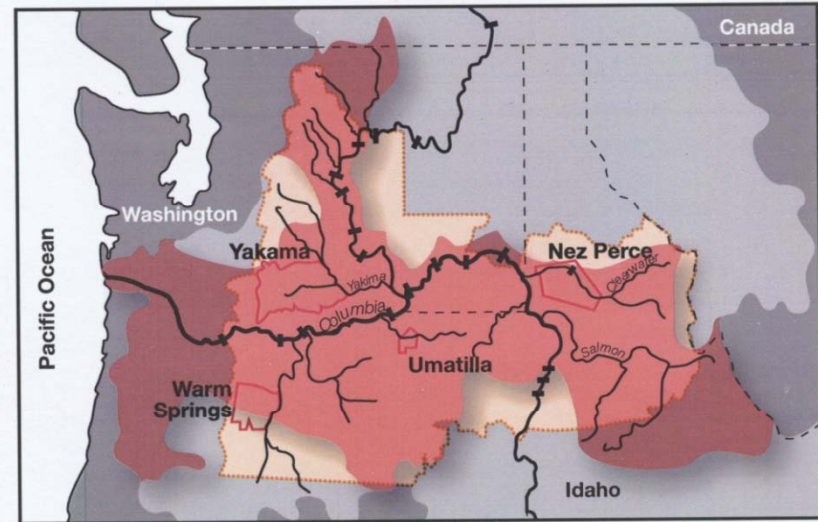
Over 400 Dams... Yet Salmon Remain...

Columbia Basin Dams



Army Corps of Engineers, 2003

Current Salmon Accessible Areas (Red)



The majority of the area still accessible to salmon in the Columbia Basin lies within the ceded lands of the Yakama, Umatilla, Warm Springs, and Nez Perce tribes.

Columbia River Inter-tribal Fish Commission, 2008

Traditional Fishery Continues... Treaty Fishing Rights



Present day dip net fishing scaffolds, Dalles Dam.
(<http://wholecommunitiesradio.org/salmon>)



Tribal fisherman Bobby Begay, New Celilo Village (Sibyl Diver)

Treaty fishing right holders (Stevens Treaties of 1855) :

- Confederated Tribes and Bands of the Yakama Nation
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Confederated Tribes of the Umatilla Indian Reservation
- Nez Perce Tribe

Road Map

- Co-management definition
- Research methods & objectives:
 - 1) What is the role of traditional ecological knowledge versus western science in co-management?
 - 2) What are the effects of co-management from a social, economic, and ecologic perspective?
 - 3) What are barriers to co-management implementation?



Road Map

- **Co-management definition**
- Research objectives:
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Co-management Definition

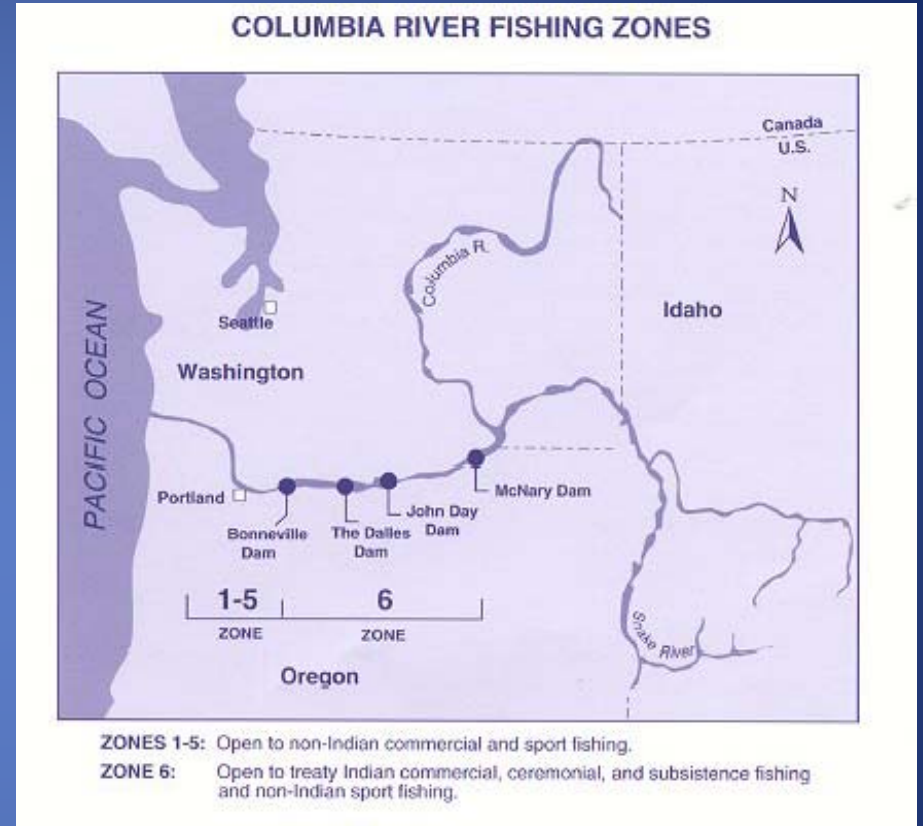
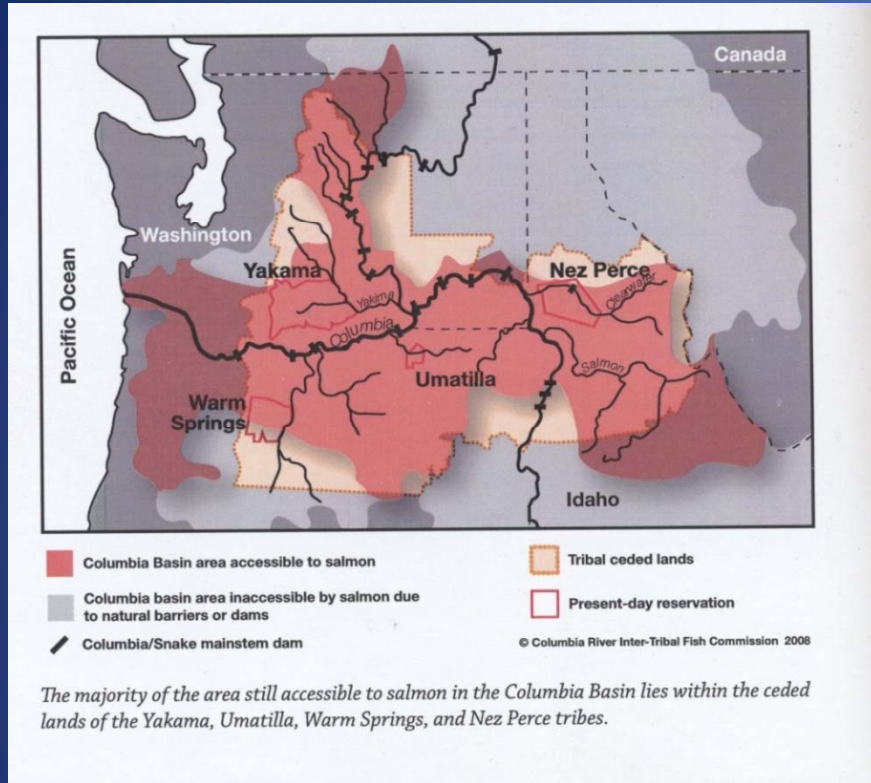
- Co-management - the sharing of management power and responsibility between governments and local people. (Berkes & Turner 2006)
- First used with tribes in 1970s - U.S. treaty tribes in western Washington State, describing the relationship they aspired to have with state managers
- Recognized examples: Maine lobster fishery, Japanese fishing cooperatives, Alaska's Community Development Quota Program (groundfish)

Columbia River Treaty Fishing Rights

- **1855** - Columbia River tribes signed treaties ceding lands, but reserving rights to fish at "all usual and accustomed fishing places...in common with citizens."
- **1905** - Supreme Court, *U.S. v. Winans*, right to fish at "usual and accustomed" places and treaties are to be interpreted as Indians had understood them.
- **1938** - Congress passed the Bonneville Project Act. Dams would inundate Indian fishing places and block salmon migration to some 2,800 miles. Mitchell Act passed to provide mitigation for lost fish with hatcheries.
- **1969** - *Sohappy v. Smith/U.S. v. Oregon* (Belloni decision)--tribes were entitled to a "fair share" of the fish runs and the state has limited in its power to regulate treaty Indian fisheries
- **1974** - In *U.S. v. Washington (Boldt decision)*, Judge Boldt mandated that a "fair share" was **50 percent** of the harvestable fish destined for the tribes' usual and accustomed fishing places. Belloni then applied the 50/50 principle to Columbia.
- **1977** - The federal court, under *U.S. v. Oregon*, approved a five-year plan that set up an in-river harvest sharing formula between non-Indian and Indian fisheries.

- Adopted from Columbia River Intertribal Fish Commission, www.critfc.org

How does tribal fisheries co-management work?



Army Corps of Engineers, from Mighetto & Ebel 1994

Zone 6: Inter-tribal fisheries co-management (ceremonial, subsistence, commercial)
Ceded territories: Individual tribal fisheries co-management

Zone 1-5: Non-Indian commercial gillnet fishery, below Bonneville Dam
Throughout: Sportfishing

Columbia River Co-management structures (*selected*)

U.S. v. Oregon framework (tribes, federal govt, state), legally defined as hatchery & harvest, 50/50 principle

- Estimating run size

- U.S. v. Oregon Technical Advisory Council (consensus based)
- Projected forecast (age data), Revised forecast (fish ladder counts minus catch)

- Harvest allocations

- Pacific Salmon Treaty Commission (US/Canada)
- Endangered Species Act (incidental catch, wild fish)
- U.S. v. Oregon Policy Committee (tribes, state, federal – joint plan)

- Columbia River Inter-tribal Fish Commission (4 treaty tribes)
- Columbia River Compact (WA/OR, consensus, 30-40 hearings/yr)

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Research Methods

- Qualitative – interviews of co-management partners (tribes, state & federal agencies)
- Non-random & stratified
- Snowball sampling method (referrals)
- IRB approval (May/June '09)
- Completed 6 out of 30 interviews (June/July '09)
~10 hours
- Preliminary results: initial transcript coding

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- Traditional Ecological Knowledge (TEK)
working definition:

“a cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” from Berkes (1993) ,
quoted in Fast and Berkes (1998)

- Temenwit (Sehaptin language) –
“Sense of your values,
your place in the world,
and how you should conduct yourself...
How you should treat the plants & animals.”
- *Tribal fisheries advocate*

Tsagaglatal
“She who watches”
(CRITFC)



Early results: other TEK examples

Respect for animals

- “tribal policy folks don’t like clipping fins, and tagging... don’t like fussing around especially with juvenile fish.”
- Catch and release fisheries not supported– Belief that Creator provided fish for humans to eat & care for, sport fishing as “playing with the fish”

Ecological indicators

- historical record of stock returns, in sync with other natural events that predicted run timing (e.g. fish return when roots are ready, roots later w/snow)

E.H. Olmstead, Oregon
Journal, Oregon Historical
Society

First Foods

- First Salmon ceremony as a management tool for opening, ceremony still held.



Early results: TEK & Western Science?

Columbia River Inter-Tribal Fish Commission keeps then separate

Science: scientific and technical staff

Policy: tribal commissioners

- TEK guides decisions through tribal policy guidance & CRITFC commissioners representing the 4 treaty tribes, not through western science process
- Policy priorities, such as protecting lamprey in addition to salmon, may come from TEK & cultural values – does not claim to be science
- Scientists working for tribe don't like being referred to as "tribal scientists" – they practice science in its "pure, raw" form

Geraldine Jim demonstrates stick-roasting of salmon at Wy-Kan-Ush-Pum Village. (Photo: David Hedges)



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Early Results: Positive Outcomes



- **Better science & increased transparency**
 - More accurate counts, e.g. tracking of ocean fishery
 - Access to information, raw data, e.g. Fish Passage Center
 - Checks & balances (e.g. determining release mortality for gear)
- **Upholds treaty rights**
 - U.S. v. Oregon provides oversight, “It’s fair.”
 - Consensus based decisions - Technical Advisory Committee
 - Regular meeting & negotiation for long-term, increased trust

Early Results: Shifting incentives

Inaction → Action

- Staying out of court -> More timely management decisions (during run)
- Ability to overcome bureaucratic inertia, more creative as opposed to “tunnel vision of doing things the way you’ve always done it. “Dynamic”
- Mutual respect for technical ability, respect for values follows

Sustainability

- “Without the co-management tension there, there would be a lot more pressure to deal with short-term economic issues, thus would make it seem like salmon recovery is just a little too expensive, and these fish really aren’t work it.” (tribal fisheries biologist)
- “More balanced cosmopolitan fisheries” (state manager)
- Results: watershed restoration brings fish back to Umatilla River

Tribal Fisherman Bobby Begay
hosting a salmon BBQ (Sibyl Diver)



Early results: Co-management Challenges

- “There is an enormous weight of maintenance around co-management that many people have shouldered for an awful lot of days.”
- Lack of trust
- Wild fish returns still declining
- “We need to try to get that you can’t put a tribe in a box”
- Politics compromising effectiveness of state agencies
- Lack of full power sharing in decisions (seat at table, no veto power)
- Duplication of efforts & bureaucracy
- Additional stakeholders want in
- Racist rhetoric



Bonneville Dam (Army Corps of Engineers)

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Early Results: Barriers to Co-management

- Power struggles on Columbia adjudication through U.S. v. Oregon
- Different worldview
E.g. While the “technical staff are on an even level...social worlds differ”
- False dichotomy of values
Conservation & possible extinction of salmonids/ Human rights & possible extinction of culture – but it’s BOTH.



Surmounting Barriers

- Tribal fisheries advocate:

“The public has a great awareness of salmon as an icon... parties tend to relate to the salmon. People put salmon at the center of the wheel, at the hub. And agencies & scientists & NGOs and tribes all tend to be spokes, as part of that wheel. And that’s not an unfair way for the public to perceive us...We are not above the resource... We have a responsibility to it. That said, the tribes could argue and often should argue that the treaty, the treaty itself is right there, as well, at the center of the hub, alongside the salmon. Not a spoke of it, but right along side. The right and the salmon itself are two sides of the same coin.”

- State fisheries manager:

“The seventies and eighties, it was really... it was a fight for the fishing rights. An all out fight for the fishing rights. And I think the states misunderstood that... for not really... maybe not caring about the fish. Because they wanted to look out for their fishermen all the time. And what I think was missed. And I’m including myself personally on this. Was that for the tribes, that value was inherent. It was just there... for thousands of years. And I think what they were really fighting for, which we as naïve folks that didn’t appreciate that inherent value that, you know, had been there for thousands of years, was a given.”

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Future Directions: Co-management

- Qualitative - Additional interviews
- Catch Balance issue (different approaches to counting fish, perceived value of hatchery fish)
- Quantitative – Analyze effectiveness of co-management case studies
- Watershed restoration evaluation
- Expand to multiple systems: co-management case studies in Fraser & Klamath (continuum)

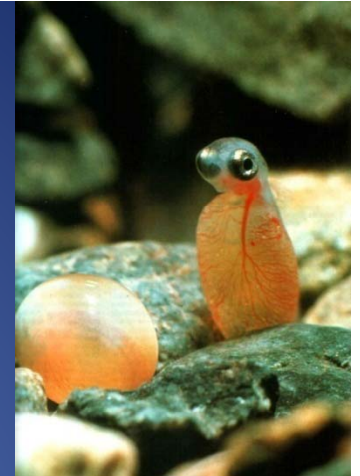


Photo: Sergei Gorshkov

Thank you!



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ESA Traditional Ecological Knowledge Section

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Typology of “co-management”

Sen and Neilson (1996)

- Type A: *Instructive*: There is only minimal exchange of information between government and users. This type of co-management regime is only different from centralized management in the sense that the mechanisms exist for dialogue with users, but the process itself tends to be government informing users on the decisions they plan to make.
-
- Type B: *Consultative*: Mechanisms exists for governments to consult with users but all decisions are taken by government.
-
- **Type C: Cooperative: This type of co-management is where government and users cooperate together as equal partners in decision-making. For some authors, this is the definition of co-management.**
-
- Type D: *Advisory*: Users advise government of decisions to be taken and government endorses these decisions.
-
- Type E: *Informative*: Government has delegated authority to make decisions to user groups who are responsible for informing government of these decisions.
-
- Based on Berkes (1994) (Berkes 1994), (Sen and Raakjaer Nielsen 1996)

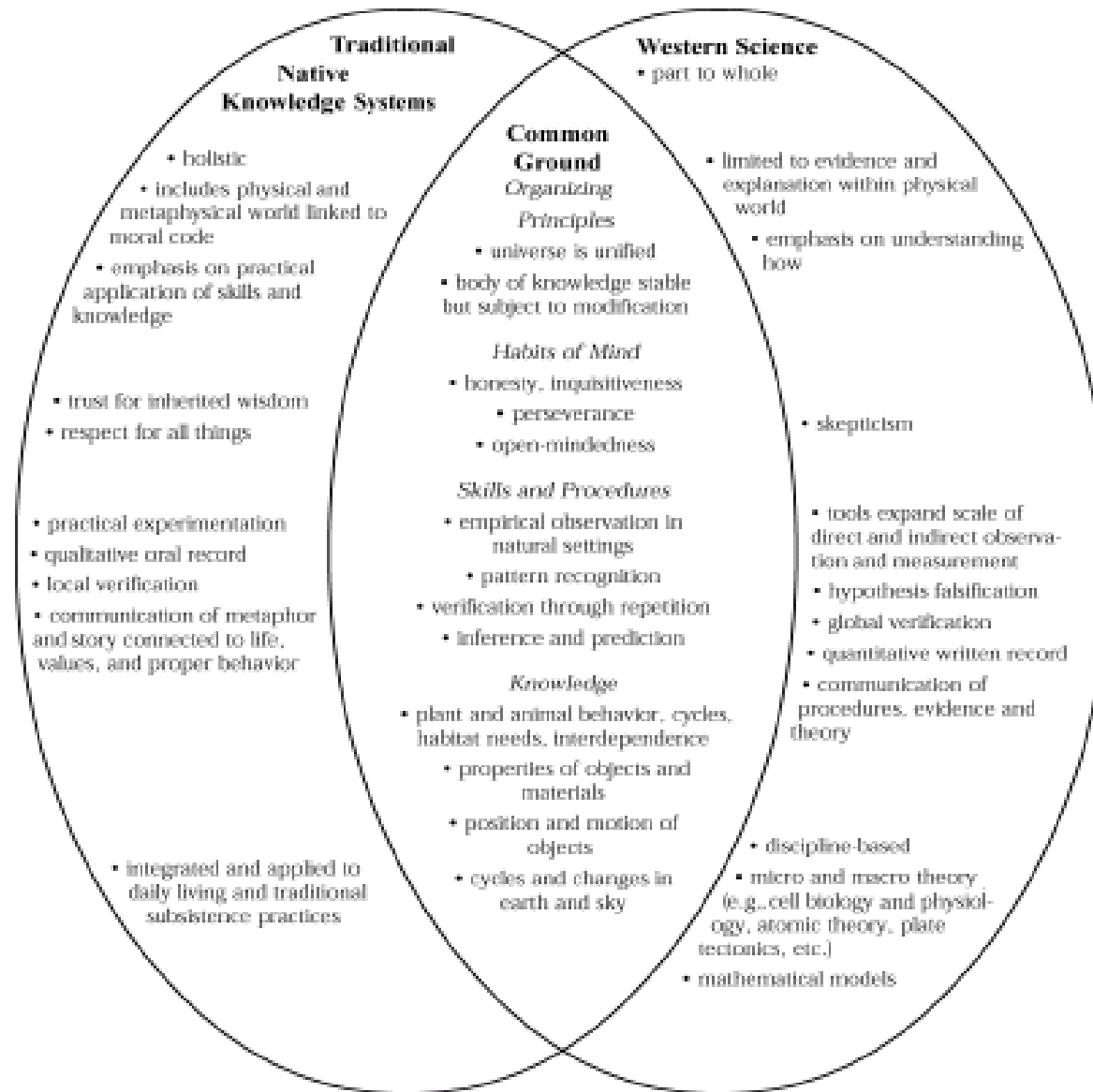


Figure 2.
Qualities associated with traditional (Indigenous) knowledge systems and Western science.

Indigenous knowledge qualities, from Barnhardt & Kawagley (2005).

Western Science

- Part to whole
- Limited to evidence and explanation within physical world
- Emphasis on understanding how
- Skepticism
- Tools expand scale of direct and indirect observation and measurement
- Hypothesis falsification
- Global verification
- Quantitative written record
- Communication of procedures, evidence and theory
- Discipline-based
- Micro and macro theory (e.g. cell biology, and physiology, atomic theory, plate tectonics, etc.)
- Mathematical models

Traditional Native Knowledge Systems

- Holistic
- Includes physical and metaphysical world linked to moral code
- Emphasis on practical application of skills and knowledge
- Trust for inherited wisdom
- Respect for all things
- Practical experimentation
- Qualitative oral record
- Local verification
- Communication of metaphor and story connected to life, values, and proper behavior
- Integrated and applied to dialing living and traditional subsistence practices

from Venn diagram, Barnhardt & Kawagley (2005)

Common ground (TEK & Western Sci)

Organizing principles

- Universe is unified
- Body of knowledge stable but subject to modification
- *Habits of Mind*
- Honesty, inquisitiveness
- Perseverance
- Open-mindedness

Skills and Procedures

- Empirical observation in natural settings
- Pattern recognition
- Verification through repetition
- Inference and prediction

Knowledge

- Plant and animal behavior, cycles, habitat needs, interdependence,
- properties of objects and materials
- cycles and changes in the earth sky

from Venn diagram, Barnhardt & Kawagley (2005)



Indigenous Peoples of the North Pacific, c. 1880

Map by:
Ben Donaldson,
Andrew Fuller,
Charles Steinback

**Atlas of Pacific Salmon:
The First Map-based
Status Assessment of
Salmon in the North
Pacific (Augerot,2004)**



Level 4 Salmon Ecoregions of the North Pacific, 2004

Map by:
Charles Steinback,
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