

Measuring Socio-Cultural Values Associated with Salmon in the Quinault Indian Nation



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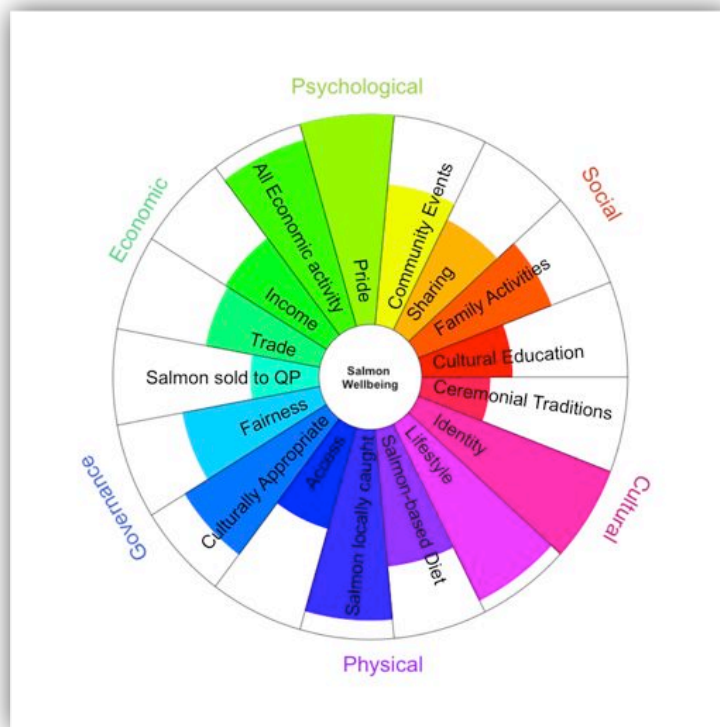
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Executive Summary:

Quinault culture is deeply tied to the health and abundance of local salmon. To enhance abundance, the Quinault Indian Nation is pursuing strategies such as hatchery development and engineered log jams to support fish habitat. While we can measure the extent to which these projects enhance fish, we may also be interested in understanding how such projects enhance Quinault culture and wellbeing related to salmon. This project sought to identify Quinault socio-cultural values related to salmon and their appropriate measures.

We interviewed eighteen adults in the Quinault Indian Nation and two high school classrooms to better understand the diverse values associated with salmon by men and women, youth and elders. Data from the interviews were coded into six value types: Cultural values, Social values, Economic values, Psychological health, Physical health, and Governance associated with fisheries management, identified on the outer edges of the image below.

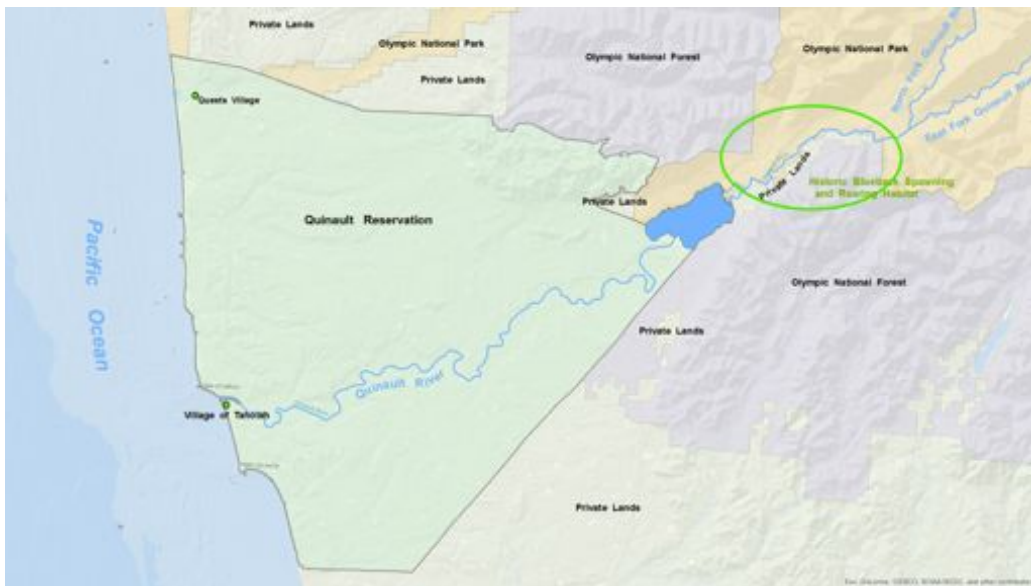


Based on these identified values, we then developed potential questions to measure the status of each socio-cultural value, represented as the petals in the image to the left. We tested these questions in a community workshop, an online survey and an in-person household survey. A total of 26 people responded to the survey questions. The length of the petals in the image represent the relative status of different aspects of wellbeing related to salmon for these respondents. **NOTE: The survey respondents were not necessarily from a representative sample of QIN members. Thus, these exact measures might not be accurate for the entire community.**

The purpose of identifying values and creating questions to measure their status is to help understand how salmon enhancement projects influence Quinault culture and wellbeing. If we ask these questions every few years, we can see changes in socio-cultural relationships to salmon and distinguish whether such changes are a result of increasing salmon abundance, or whether they are actually due to other factors. Additionally, we can use these measures to consider the potential socio-cultural impacts of different salmon enhancement strategies. Ideally, we would try to find a solution that enhances the diversity of all values associated with salmon so as to maintain socio-cultural, ecological and economic health.

Background

The Olympic Peninsula of Washington State is home to eight recognized tribes. The Quinault Indian Nation (QIN) has the largest reservation and its membership includes the Quinault and Queets tribes as well as descendants of five other coastal tribes: Hoh, Quileute, Chinook, Cowlitz, and Chehalis tribes (Storm and Capoeman 1990). Less than 1000 residents live in the tribal center of Taholah and approximately another 200 in the town of Queets. The reservation currently encompasses 208,000 acres of land (Hartrich 2013) (Figure 1). Adjacent landownership is Olympic National Forest, Olympic National Park and Washington State Department of Natural Resources as well as private industries including Weyerhaeuser and Rayonier. Within the reservation lies the 68 mile long Quinault River, which flows from Mt. Anderson in Olympic National Park to Lake Quinault before draining into the Pacific Ocean near Taholah (Storm and Capoeman 1990).



Map created by Tony Hartrich, 2014

The blueback salmon (*Oncorhynchus nerka*) is a unique sockeye that returns primarily to the Quinault River system and is genetically distinct from all other coastal sockeye populations (QIN 2008). It is also at the center of Quinault culture and wellbeing. Along with elk, deer, sea lions, shellfish, and a variety of plants, the salmon was and continues to be a primary source of food for the Quinault people. Historically, they fished with a variety of methods including river traps, trolling, line fishing, nets and spearing (Gunter 1927). Because of the high oil and fat content of the blueback, the Quinault would allow the majority of the salmon to travel up to Lake Quinault to spawn. This made it easier for the salmon to be smoked and preserved for the winter, because they would have less fat content and would not spoil as easily. The Quinault would also prepare salmon for immediate consumption such as roasting it on a stick over a fire. These preparation techniques are still popular today (James 2002).

Historical estimates of blueback run into the millions but as of 2007 the National Park Service estimated that the number returning to the river was less than 5,000 (National Park Service 2013).

The Quinault fisheries suffered heavily from the impacts of poor logging practices that occurred when the Bureau of Indian Affairs, then the land managers, contracted logging to local timber companies. The clear cutting of forests caused log jamming, which reduced the capability of streams to support the fish habitats and as a result decimated the number of returning salmon (James 2002).

The QIN is working diligently to revitalize the salmon population, however. Since the early 1900's it has managed its fisheries using policies developed by the tribe and approved by BIA management. The 1974 Boldt decision affirmed the continuation of QIN fisheries management policies. No other tribe in Washington State controls their fisheries management. To fulfill these policies, the Quinault Department of Natural Resources has a variety of fish enhancement projects to restore the salmon population to its historic levels. There are two hatcheries currently owned by the QIN: a pen-rearing facility in Lake Quinault for the Quinault River and the Salmon River Culture Facility, to benefit the Queets River (James 2002), as well as a federal facility on Cook Creek that is managed by QIN. The QIN produces 5-10 million juvenile salmon and steelhead annually (Ruby *et al.* 2010), but unfortunately, the blueback populations are still low.

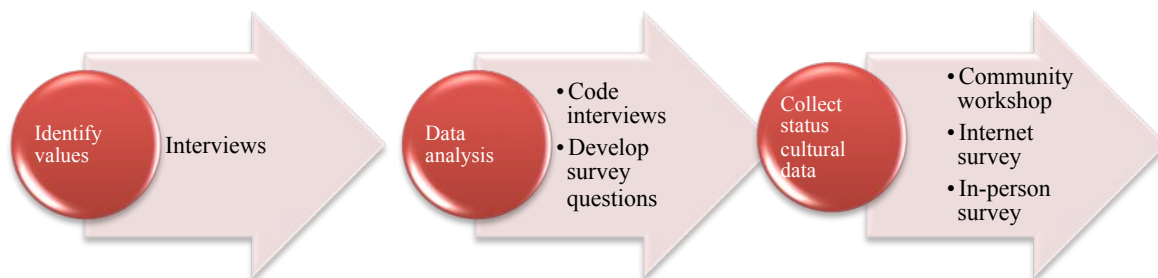
In order to enhance blueback populations, the QIN has collaborated with a non-profit conservation NGO in the Upper Quinault River, above Lake Quinault, to create salmon habitat through engineered log jams and shoreline stabilization. While similar restoration projects often measure success based on ecological and financial returns, there is growing interest in understanding whether the return of culturally important species can actually benefit socio-cultural health. This is part of a growing effort in natural resource management that aims to incorporate a greater understanding of health and wellbeing into policy development and program evaluation.

The QIN Socio-Cultural Values of Salmon project identified tribally held socio-cultural values associated with salmon and developed measures that could be used to monitor the changes of salmon-related socio-cultural health over time. Such measures, also known as indicators, can also be used to select salmon enhancement projects that are most likely to result in ecological, economic and socio-cultural benefits.

Methods

The research team first met with the QIN's Cultural Resource Specialist to design the most culturally appropriate research methods. The Cultural Resource Specialist is a well-respected member of the QIN community and is the author of many documents related to the importance of salmon to the QIN. He served as a collaborating researcher throughout the entire process, providing background materials, commenting on the research materials and methods, setting up interviews, and clarifying tribal views of salmon.

Based on our discussions, we decided that in-person interviews with adults were the most appropriate methods for understanding diverse values, and that a community workshop would be best for getting feedback and measuring their status (Figure 2). For the interviews, we targeted a range of demographics from the QIN population to make sure that the findings were not biased towards one particular gender or age group (Table 1).



The tribal liaison was present for all interviews in order to make the subjects more comfortable as well as to assist the researchers with navigating cultural appropriateness. We prepared four general questions for the interviews: 1) What was the person’s role in the community pertaining to salmon, 2) How or why salmon was important to them and the community, 3) How does salmon influence culture, and 4) What do they think when they think of a healthy river. The latter was included to get a sense of the relationship tribal members associated between healthy rivers and fish. Five interviews focused primarily on these questions. Due to the continuous mention of the economic value of salmon and of logging as an additional income generating activities, we added questions about how salmon is important to the tribal economy and how logging affects salmon. Each interview subject gave their consent to be interviewed and all interviews were recorded on a digital audio recording device. The identities of the interview subjects remain confidential.

The interviews were transcribed and data were coded into six types of socio-cultural values and wellbeing: governance, economics, cultural, psychological, physical, and social.

Table 1. Number of interviews conducted by age group.

Age	20-50	51-80	80+	Total
Male	2	7	2	11
Female	2	4	1	7
Total	4	11	3	N=18

From the specific values, we then developed 29 questions that we hoped would measure the status of all six value types. We tested these questions using three formats: a community workshop, a Web-based survey, and an in-person household survey. The community workshop was held in Taholah and 12 people attended (Table 2). At the workshop, we used an interactive method in which participants received clickers (much like a remote control) to respond to multiple-choice questions that were projected on the wall (see Appendix II for questions). After participants selected the most appropriate answer on their clicker, a receiver immediately tabulated all data so we could share everyone’s anonymous responses after each question.

The Web-based survey was distributed through Tribal government and 6 people responded. The in-person surveys were conducted in Queets by a Tribal staff member who was making house visits. A total of 24 people responded to the survey questions.



Table 2. Number of participants in baseline data collection by format.

	Community Workshop	Internet survey	In-person Survey	Total
Male	6	2	1	9
Female	6	4	5	15
Total	12	6	6	N=24

Results

Interview Results: Socio-Cultural Values Related to Salmon

The following table presents 23 attributes associated with the 6 value types that were coded from the interviews. The column to the right shows how many people mentioned something about each attribute. The attributes of salmon-based values most mentioned by participants were from the cultural domain, including ceremonial traditions, traditional values, food preparation and preferred foods. In the economic domain, income was the primary attribute and was associated with seasonal as well as full time employment in the fields of guiding, working at the hatchery, and selling caught fish. Comments associated with the governance domain were fairly evenly spread across issues of access to fishing locations, enforcement of policies associated with fishing, transparency of fisheries managers, and the general stewardship of fisheries. Nutrition was the only obvious attribute of the physical domain while the psychological domain was dominated by comments associated with pride. Both participation in communal events that feature salmon as well as the sharing of fish with family members, elders or neighbors were important attributes of the social domain.

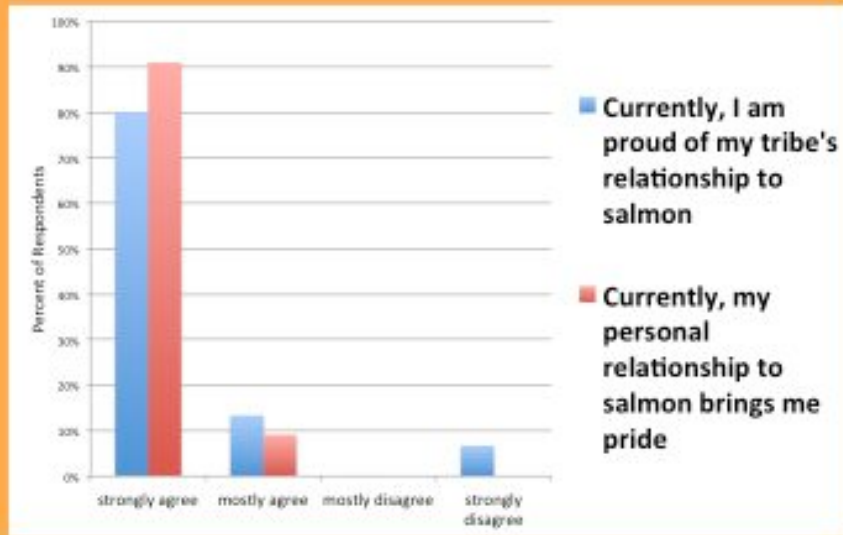
Domain	Attribute	Example Quote	# of People
Psychological	Nostalgia	I still feel bad because my children won't see what I saw.	3
Psychological	Pride	So that's the best fish that I've ever ate. Ours is the native fish. And so that's like the best fish. Native.	10
Psychological	Satisfaction	Well, yeah. I always tell people I'm kind of glad things changed in a way, even though I really enjoyed fishing, and I always felt kind of, like I'm my own boss when I'm fishing, even though it gives you...I don't know, well you don't have to answer to somebody.	4
Psychological	Security	I got some friends out there that have been, you know, they were fishermen, but they never set money aside for when they get old, so what do you do when you don't have an income anymore? That's a sad situation.	4
Social	Communal Events	When people have their family dinners that's this time of year and later in the spring and early summer you know that is the fish that we go to. They want to put their best foot forward and have a nice family community dinner. When I was younger Grey's canoe club and others would do salmon bakes to fundraise for their different things. Still to this day we get different community groups who have done during treaty days	9
Social	Giving	Most of the time I get fish and just give to the elders down here. They'll either smoke it or can it or just munch on it.	9
Cultural	Beliefs	The praying for fish	3
Cultural	Ceremonial Traditions	They are always big celebration with the blueback and the king salmon. Especially the king salmon.	17
Cultural	Food Preparation	They'll go down on the beach and we'll have the fires. That's how we cook the fish, and it's...we all look forward to that.	11
Cultural	Identity	If we didn't have salmon we wouldn't have us.	7
Cultural	Preferred Lifestyle	It gives me a little more time in the summertime with my family and my kids.	7
Cultural	Preferred food	My family and friends try to get them to eat salmon whenever we get it. Everybody has their own taste and cant really force it on them	10
Cultural	Traditional Knowledge and Practices	I think it's probably just how that person's been raised and taught how they are fishermen. If they were taught your first meal you should give away, and it's usually to an elder. I think it was just how they were taught, brought up, I think	9
Cultural	Traditional Values	We could only have one fish and it can only be this fish and blah blah. I am thinking why would need more? Unless you are putting it away for good why would you need more?	14

Physical	Nutrition	But that is another fish that our elders use for medicine and stuff. In the soups mostly because of all the minerals and stuff that are in the ocean.	7
Governance	Access	See each one of them on this river is about 125 fishing locations and each one of them locations continues to be passed down the family. That is changing.	8
Governance	Enforcement	You can see the stats and the changing of the river, and they have set boundaries in the tribal lots, but they don't enforce them. The only thing is lack of teeth to enforce them.	8
Governance	Stewardship	Taking out culverts, making little fish channels and you know. So it's very important on the work that we do to keep that fish alive	6
Governance	Transparency	Well they change it [rules] whenever they want and however they want.	6
Governance	Trust	So most of the problem from these gill-nets right here. And the problem comes from our committee there, fish and game committee.	5
Economic	HH Consumption	That is the life the way we survive there without having hardly any jobs. Fish and clams were our life.	9
Economic	Income	Well a lot of them make their living off it. You got fish guides up the river who fish. This is how they survive.	13
Economic	Trade	We traded fish. Our closest neighborhood was 5 or 6 miles. So we would trade, barter, only take what you need.	4

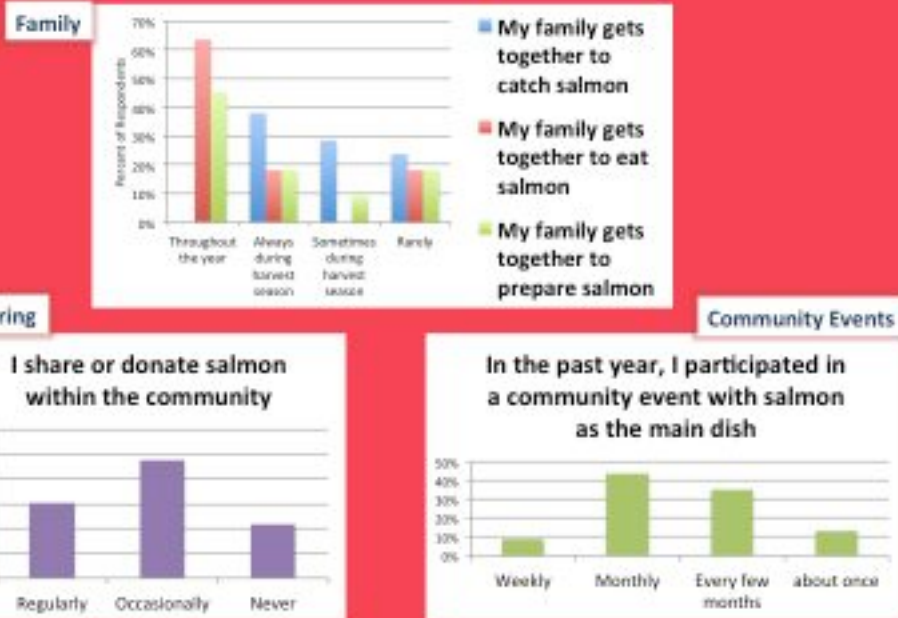
Survey results

For each of the six value types, we tested questions that could measure the status of socio-cultural values associated with salmon. The charts below share the respondents' answers to each question by domain. ***NOTE: The survey respondents were not from a representative sample of QIN members (see Table 2). Thus, these exact measures might not be accurate for the entire community.***

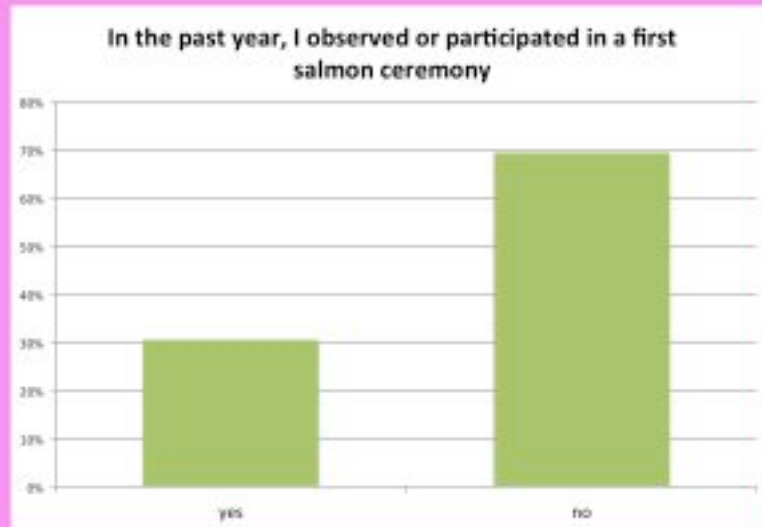
Psychological: How is Quinault pride?



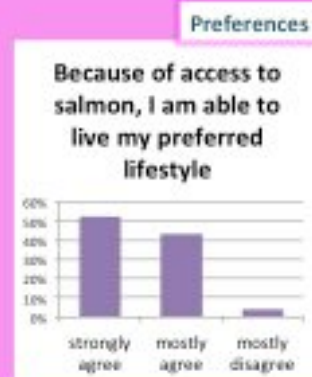
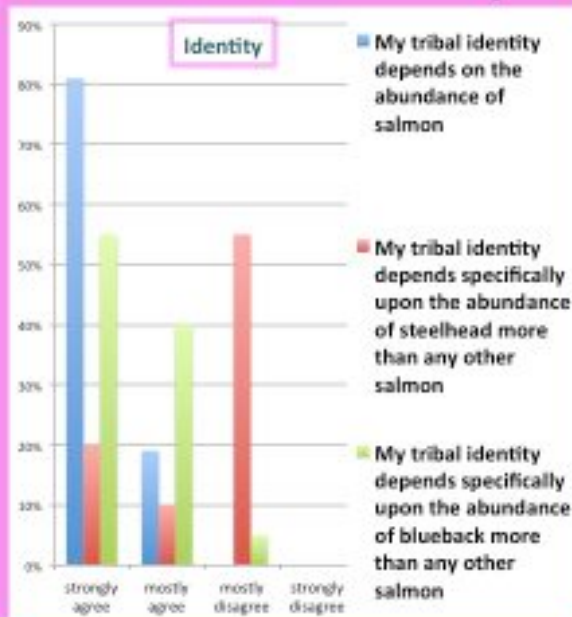
Social: Sharing, Community and Family



Cultural: Who engages in ceremonies?

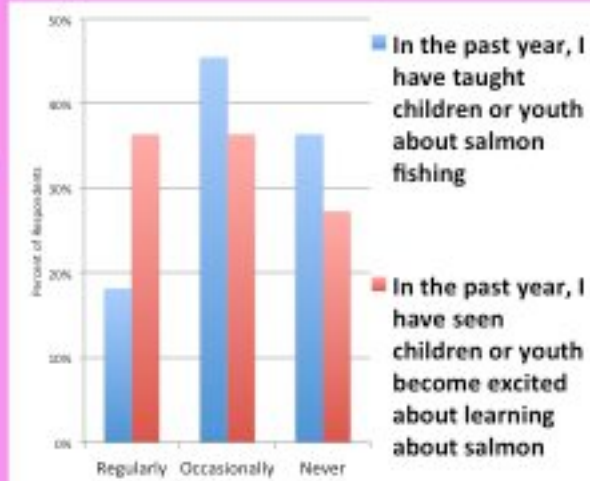


Cultural: Identity & Preferences



Cultural: How is culture passed on?

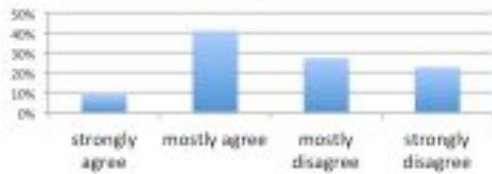
I share or listen to salmon legends



Cultural: What beliefs are associated with salmon restoration?

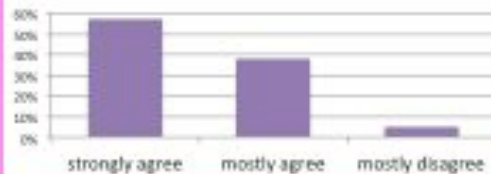
Hatchery vs. Wild Salmon

There is no cultural Difference between wild and hatchery salmon

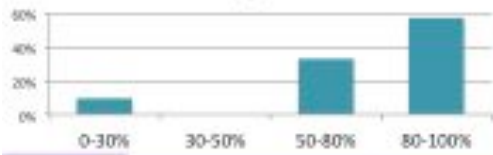


Wood and Salmon

I believe strongly that timber harvesting influences salmon abundance



The percentage of salmon I eat that comes from Quinault territory is:



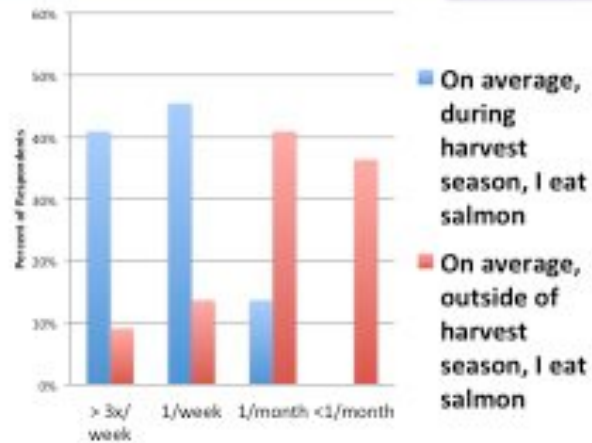
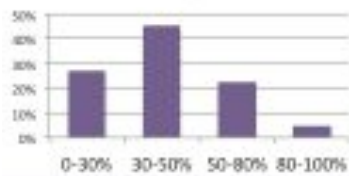
Physical: How does salmon contribute to Diet?

Origin

Frequency

Amount

On average, salmon contributes to % of my diet



Governance: Access and Value-Oriented

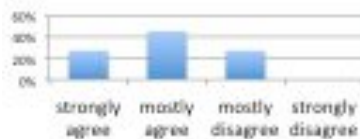
Access

I am able to fish my traditional fishing locations



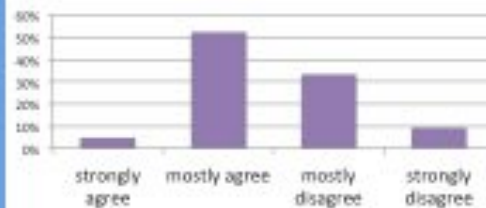
Value-oriented management

The current salmon fisheries management incorporates my cultural values

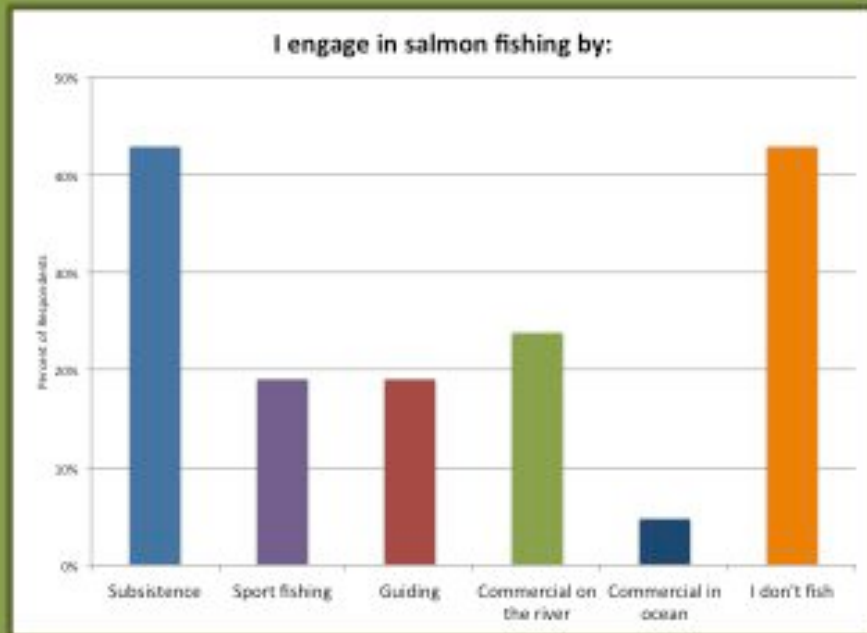


Allocation

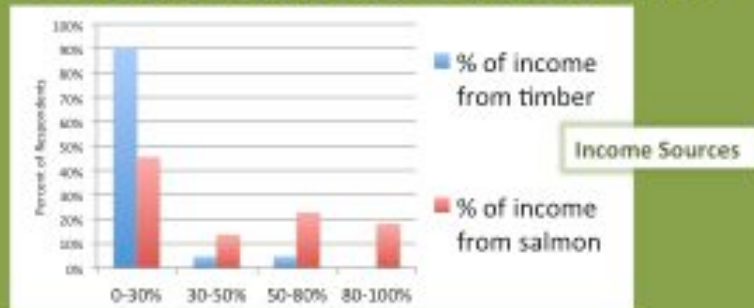
The allocation of fishing grounds is fair



Economic: Who is Fishing?



Economic: Income and Trade



For all questions, there was very little variation in responses across gender and age groups. The two exceptions included:

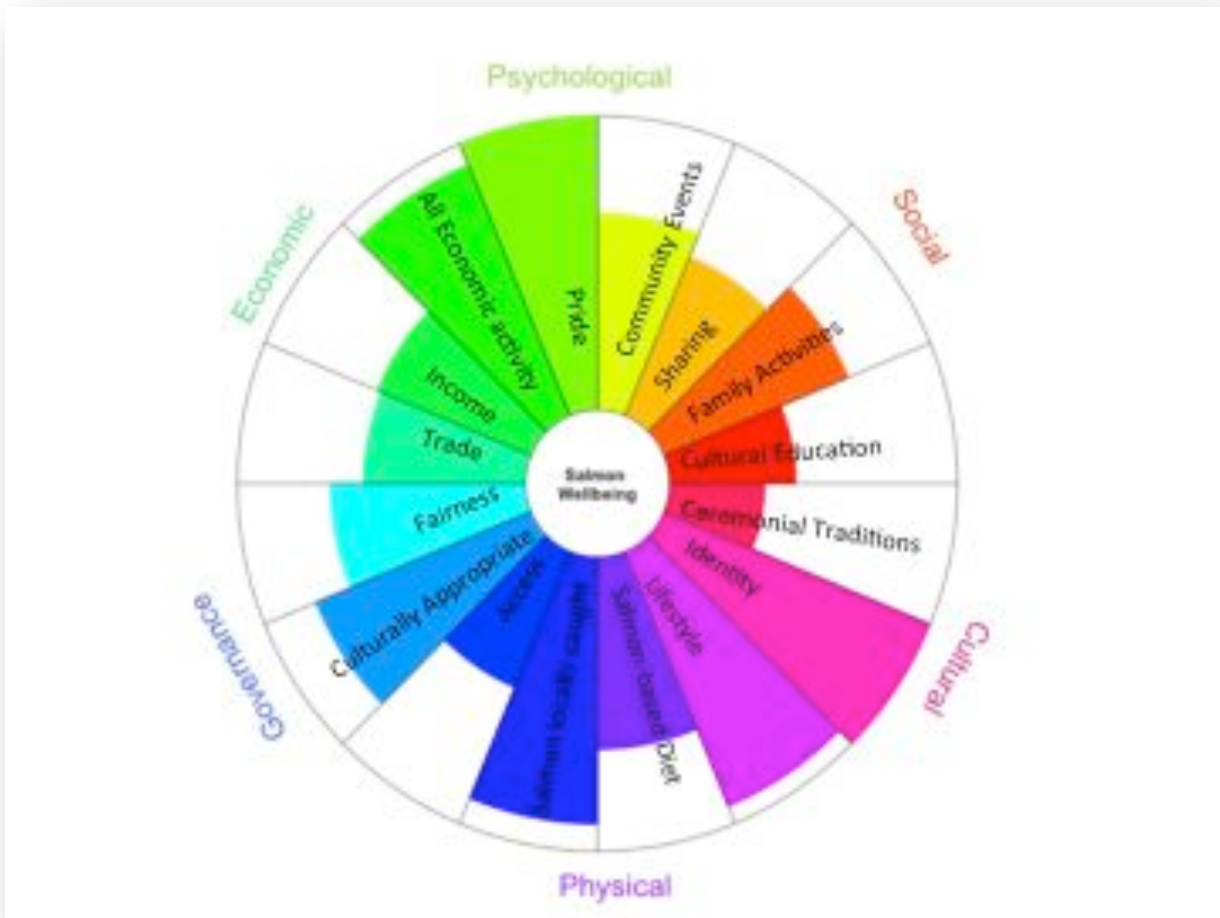
- 1) Women were less likely to have participated in a first salmon ceremony than men.
- 2) Women were less likely than men to eat salmon outside of harvest season.

There were also a few differences in responses for the different ways people responded to the questions (workshop, internet survey and in-person survey):

- 1) Workshops participants claimed that more of the salmon they ate came from Quinault territory, were more likely to have been to a community event with salmon as the main dish, and were more likely to believe that timber harvests have a significant detrimental impact on salmon.
- 2) Internet survey respondents were more likely to participate in sport fishing and more likely to consider the blueback the most culturally important salmon than the other participants.
- 3) In-person survey respondents (from Queets) were more likely to believe that the allocation of fishing rights were fair.

Current Status Results: Summary all values for 2013

The subsequent flower diagram presents the sum of each domain in a single diagram. The length of each petal represents the relative score compared to other attributes. A longer petal means better status. For example, both personal pride and cultural identity related to salmon are high for respondents, whereas participation in salmon ceremonial traditions and the sale of salmon to Quinault Pride are low. ***NOTE: this diagram is based off the survey data and thus represents only survey responses, not overall QIN trends.***



NOTE: this diagram is based off the survey data and thus represents only survey responses, not overall QIN trends.

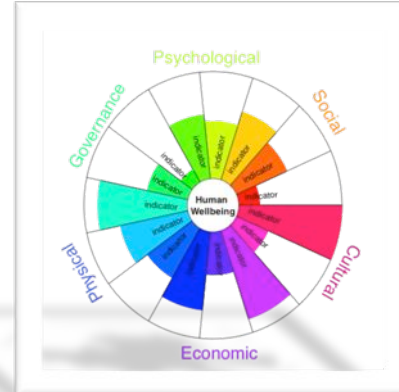
Integrating Values Metrics into Planning

The measurement of socio-cultural values associated with salmon can help resource managers pay attention to their status. We can use such measurements in at least two ways:

1) Comparing measures of Socio-Cultural Wellbeing over time, across communities, or by demographics:



Year 1
or Youth
or Taholah residents



Year 5
Or Elders
Or Queets residents

In the images above, for example, we can see how different measures of economic wellbeing, cultural wellbeing, or governance related to salmon might vary in 2013 compared to 2018. Understanding differences across time can help evaluate if any restoration strategies are actually helping socio-cultural health in the ways we hope they will. This is essentially monitoring the sociocultural impacts of an ecological strategy.

We can also compare the status of socio-cultural values related to salmon in the same year to understand differences across age groups (youth vs. elders). Or how they might be different in the same year across regional location (Queets vs. Taholah). Understanding differences in demographics can help prioritize strategies that enhance socio-cultural health related to salmon for certain tribal members.

2) Choosing a salmon recovery strategy

	Socio-Cultural Impact	Ecological Impact
Salmon Enhancement Strategy A		
Salmon Enhancement Strategy B		

Another way to use socio-cultural values data is in making decisions. In the table above, for example, we might be considering a salmon enhancement strategy (A) that we believe will bring a small number of fish back, but will have significant positive impacts on cultural, economic and physical health related to salmon. The alternative strategy (B) would bring even more fish back, but would be less positive for the tribe's culture, economics and governance. While this table wouldn't provide an answer, it would give a better foundation from which to make a decision that includes both ecological and socio-cultural considerations. The decision would still require the use of decision-science tools and rely on people to implement those tools because quantitative models do not incorporate these diverse data types. For more information on how to consider these data in decisions, see *Structured Decision Making: A Practical Guide to Environmental Management Choices* by R. Gregory et al.

Conclusions

This study was a pilot test to explore methods for identifying socio-cultural values associated with natural resources and ways to measure such values to incorporate into decision-making. For salmon in the QIN, we found six value types: Psychological, Social, Cultural, Physical, Governance and Economic. We identified survey questions that can measure the current status of these values during a community meeting, a Web-based survey, or in-person interviews. The analysis of these questions can be represented in a graphic that demonstrates the relative status of each of the value types. This data can then be used to understand the socio-economic impacts of existing salmon-enhancement strategies or to choose a strategy that considers both the ecological and socio-economic outcomes.

Community Reaction to Domains and Metrics

The QIN community's feedback to the domains and metrics were informally requested at the community workshop after gathering data for the indicators. The participants said the survey questions were representative of Quinault relationships to salmon and the presentation of the information in the color wheel graphic was appealing and appropriate. They also said they enjoyed responding to the questions in the interactive clicker-based format. Our cultural liaison also confirmed that these values are representative of QIN values related to salmon that he has heard over the years.

When presented this study, QIN staff requested further work that would lead to a trade-off analysis of the different management options. This will require gathering socio-economic data about the different scenarios (i.e., cultural and economic values related to forests and rivers) that can then be integrated into a comparison of forest management strategies, river management strategies, and other salmon enhancement strategies.

Appendix I: Project Timeline

Quinault Cultural Values Associated with Salmon

January 2013:	Initial planning meeting with Justine James
March-April 2013:	Interviews with Quinault residents
May 2013:	Community workshop
June-July 2013:	Internet survey and In-person Surveys
May-October 2013:	Data analysis
March 2014:	Presentation to QIN staff

Appendix II: Survey

Cultural Importance of Salmon Household Survey, 2013

Thank you for participating! The information you share will help us consider cultural values in future salmon habitat restoration. This survey will take about 20 minutes to complete. Your comments will remain anonymous.

For further information, feel free to contact:

Kelly Biedenweg, 206-883-5612, kellybiedenweg@gmail.com

Sophia Amberson, 203-984-9561, Amberson@uw.edu

Justine James, 360-276-8215 x 520, jjames@quinault.org

Thank you!

-Kelly, Sophia and Justine

Please circle the best answer:

1. My age is
 - a. Under 20
 - b. 20-50 years old
 - c. 51-80 years old
 - d. Over 80

2. I am
 - a. Male
 - b. Female

3. On average, salmon contributes to ___ % of my diet
 - a. 0-30%
 - b. 30-50%
 - c. 50-80%
 - d. 80-100%

4. On average, ***during*** harvest season, I eat salmon
 - a. More than 3 times per week
 - b. Once per week
 - c. Once per month
 - d. Less than once per month

5. On average, ***outside of*** harvest season, I eat salmon
 - a. More than 3 times per week
 - b. Once per week
 - c. Once per month
 - d. Less than once per month

6. The percentage of salmon I eat that comes from Quinault territory is
 - a. 0-30%
 - b. 30-50%
 - c. 50-80%
 - d. 80-100%

7. My family gets together to catch salmon
 - a. Throughout the year
 - b. Always during salmon season
 - c. Sometimes during salmon season
 - d. Rarely

8. My family gets together to prepare salmon
 - a. Throughout the year
 - b. Always during salmon season
 - c. Sometimes during salmon season
 - d. Rarely

9. My family gets together to eat salmon
 - a. Throughout the year
 - b. Always during salmon season
 - c. Sometimes during salmon season
 - d. Rarely

10. I engage in salmon fishing by (**CHOOSE ALL THAT APPLY**)
 - a. Commercial ocean fishing
 - b. Commercial fishing on the river
 - c. Guiding
 - d. Sport fishing
 - e. Subsistence fishing
 - f. I don't fish

11. I am able to fish in my traditional fishing locations
 - a. All year long
 - b. Always during salmon season
 - c. Sometimes during salmon season
 - d. Rarely

12. I barter salmon for other goods
 - a. All year long
 - b. Always during salmon season
 - c. Sometimes during salmon season
 - d. Rarely

13. I share or donate salmon within the community
 - a. Always
 - b. Occasionally
 - c. Never

14. In the past year, I observed or participated in a first salmon ceremony
 - a. Yes
 - b. No

15. In the past year, I participated in a community event with salmon as the main dish
 - a. Weekly
 - b. Monthly
 - c. Every few months
 - d. About once
16. I share or listen to salmon legends
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. Yearly
17. My tribal identity depends on the abundance of salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
18. My tribal identity depends *specifically* upon the abundance of *Blueback* more than any other salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
19. My tribal identity depends *specifically* upon the abundance of *Steelhead* more than any other salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
20. Currently, I am proud of my tribe's relationship to salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
21. Currently, I am proud of my personal relationship to salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
22. There is no *cultural* difference between wild and hatchery salmon
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
23. The allocation of fishing grounds is fair
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree

- d. Strongly disagree
- 24. Because of my access to salmon, I am able to live my preferred lifestyle
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
- 25. The percentage of my financial income derived from salmon is
 - a. 0-30%
 - b. 30-50%
 - c. 50-80%
 - d. 80-100%
- 26. I believe that timber harvesting influences salmon abundance
 - a. Strongly agree
 - b. Mostly agree
 - c. Mostly disagree
 - d. Strongly disagree
- 27. The percentage of my financial income derived from timber is
 - a. 0-30%
 - b. 30-50%
 - c. 50-80%
 - d. 80-100%

Do you have any other ideas about how we can *measure* cultural health related to salmon?

Do you have any other *comments* you would like to share?

Thank you!!