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Acknowledging the Voice of Women: Implications for Fisheries Management and Policy

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Commercial fishing research often focuses on ecological (gear, stock-assessment, traceability) or economic factors or indicators. Truly understanding the social-ecological system requires considering the social, cultural, historical, and legal/policy aspects as well. Although regulatory bodies now include human dimensions in their management plans, there are still challenges to integrating social science into the decision-making process. There is a national and international understanding that if resource managers are to understand and develop strategies for coastal resilience, a holistic approach is needed that includes an understanding of the intersection between the dynamics of fisheries management and women's participation within fishing. The objective of this study was to collect oral history data related to past and current strategies for addressing fishing family and community resilience over time. Literature has documented ways in which limited access and catch share programs affect fishing community resilience and sustainability, but have few data that look at how these management systems may be affecting women's roles and participation within the industry. The results from this research adds to the literature on women's roles in the US and provide needed attention to their contribution to the well-being, resilience, and adaptive capacity of Oregon's evolving commercial fishing industry.

Keywords: Fishermen, Wives, Resilience, Social networks, Fisheries management, Local knowledge

1. Introduction

Currently, the Magnuson-Stevens Fishery Conservation Management Act (MSA) (16 U.S.C. §1851(2)(8)) requires a fishery impact statement (FIS) for all management actions to document potential and realized ecological, social, and economic impacts to fishing communities. This legal framework requires managers to go beyond addressing ecological impacts independent of its human components to include human dimension analysis, or social impact assessments (SIA)¹. SIAs look at how communities are or could be affected by changes in management by predicting changes in well-being of the individual, family, or community [1]. SIAs have been conducted using a variety of mixed methods including both quantitative and qualitative approaches. A remaining challenge is how to communicate critical qualitative findings to managers and policymakers in a way that can be interpreted for policy needs [2]. The following case study identifies additional social measures of vulnerability and resilience that can be included in SIAs to create a more comprehensive picture of the community's needs and values.

One method of expanding the knowledge and applicability of human dimensions in fisheries is through the use of oral histories and semi-structured interviews [3,4]. Oral history methods are a way to collect data that can be used to document extensive information, including changes over time. They can be used to provide contextual information for quantitative results derived from community impact assessment surveys to help guide management and policy [3]. Through the use of oral histories, scientists can gain a better understanding of well-being at the individual, family, and community level as a result of changing regulations [4]. Semi-structured

¹ Guidelines and Principles for Social Impact Assessment. (n.d.) Retrieved May 21, 2015, from http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm

interviews share similarities with the oral history methodology, but encourage the participant to focus their story around a specific topic or issue.

The concept of fishing community well-being is often defined by fisheries social scientists as an indicator of job satisfaction and integral to the fisheries SIA model [1]. Well-being frameworks have also been more thoroughly defined to include the physical, social, and political environments that lead to one's way of life or personal identity [6,7]. Blount et al. [5] conceptualized well-being as a function of resilience and vulnerability levels (i.e., communities with low resilience and high vulnerability have lower well-being). Significant attention has been provided by fisheries social scientists in defining vulnerability and resilience (e.g., [8–17]). Tuler et al. [9] defines vulnerability as “a function of the stresses people experience and their ability to cope with them.” Those ‘stresses’ are constructed via institutions, gender, ethnicity and class, and labor relations [8], which vary by individuals and communities and require place-based research. Social resilience, defined by Adger [18], is “the ability of groups or communities to cope with external stresses and disturbances as a result of social, political, and environmental change.” Understanding how communities adapt to change and what tools may lead to resilience can help resource-managers minimize impacts to resource users when implementing new policies.

A recently understudied yet important factor is women’s contribution to commercial fishing at the family and community level. There is a national [13,14,19,20] and international [21–25] understanding that if resource managers are to understand and develop strategies for coastal resilience, there is a need for a holistic approach that includes an understanding of the intersection between the dynamics of fisheries management and women’s participation within fishing industry. This research directly addresses this intersection by helping fill gaps in the

literature around women's participation in US West Coast fisheries. The objective was to collect oral history data related to past/current strategies for addressing fishing family and community resilience over time.

1.1. Sociocultural impacts of catch share programs

To deal with the issue of overexploitation of ocean resources and the increase in industrialized fishing practices, global fisheries management has transitioned to the neoliberal model or “market-based resource regulation” [26] of economic efficiency and privatization of ocean resources [27,28]. The most common form of privatizing fishing rights is that of individual quotas or ‘catch shares’, created by dividing a federal stock assessment measure or ‘total allowable catch’ (TAC) of a specific species into smaller allocations, which are distributed to participants in the fishery [27]. How the catch shares are distributed varies by fishery and is determined by the regional Fisheries Management Council, but often results in numerous ecological and social impacts [29].

Catch share programs are implemented to achieve biological goals and increase economic profitability and efficiency through consolidation of fishing fleets. Although they have indeed generated wealth for the recipients of fishing rights [28], they have also led to shifting social relationships, and substantial barriers to entry [28,30,31]. Literature continues to document the ways in which limited access and catch share programs affect fishing community resilience and sustainability [25,28–30,32]. Few have looked at how these quota systems may be affecting women's roles and participation within the industry; even fewer document impacts in the Pacific Northwest.

A recent example of this type of regulatory change was the implementation of the West Coast Groundfish Trawl Catch Share Program in 2011. Current research is being conducted by

NOAA Fisheries to evaluate social impacts from the transition to catch shares management in the groundfish fishery [31]. This research takes a closer look at the role of women in adapting to this impact and other market- and management-driven changes on the Oregon coast.

1.2. Women's roles in an evolving industry: A review

Most of the recent literature on women's roles in the fishing industry addresses gender issues of visibility in the Global South [7,33,34]. The Asia Fisheries Society and Global Symposium on Gender and Fisheries has brought increased attention to fisherwomen in the Global South and their economic and cultural contribution to the value chain [22,34–37]. Continued research attempts to analyze post-harvest and household support activities when addressing gender issues of visibility, but there is still additional need “to increase women's voice in the sector in general, and their participation in fisheries governance” [33]. This remains true for women involved in US commercial fishing industries.

A vast majority of the literature on women's roles in the industrialized maritime industries occurs from mid-1980 to late-1990 [20,38–48]. Furthermore, a diverse set of literature on this topic has come from fishing communities in Newfoundland and Nova Scotia [32,39–41,48–52], and is now outdated. Common themes focused on caring for the maritime household, the family, and handling the financial aspects of the fishing business. As a result of regulatory changes in the northeast fisheries, an increase in women's advocacy roles led them further into the political sphere.

More recent studies have come from regions such as Northern Europe [13,21,25] and can be used as guiding frameworks for recognizing the role of women in US fisheries as regulations evolve. However, much of the this literature focuses on women in the processing sector,

becoming participants in the extractive sector, and taking on other occupational roles within the industry.

Although some research has addressed the impacts of catch share policies on women's roles, a place-based approach is needed as management programs vary and individuals and communities are affected differently. In the case of Northern England, Zhao et al. [25] mention a "renegotiation of roles between men and women" due to impacts of a quota system, which caused women to take on additional jobs to provide for the household. Another trend documented by Zhao et al. supports previous research from the Northwest [53] that fishermen's wives are becoming more politically involved as regulations increase in complexity. In a study of the US halibut fishing community, Carothers [54] showed trends of women taking on ownership roles in the fishery by purchasing quota. As women become empowered through active participation within these management programs their roles are likely to continue to change. It then becomes increasingly important to look beyond the simplistic view of women as housewives and incorporate women's experiences and knowledge into the decision-making process.

Ultimately, there is a need for more research around shifting regulations and its potential impacts on women's involvement in state, regional, or national commercial fisheries over time. There are current gaps in knowledge about how women's roles have evolved with the implementation of individual transferable quotas (ITQ's) and other market- and management-driven changes. One way to contribute to this set of knowledge is through the use of oral history data, which contribute to fisheries social science through an innovative approach that strengthens the "voice of women" in a subset of Oregon's coastal fishing communities.

1.3. Voices from the West Coast

Voices from the West Coast (VFWC) was created in 2013 to add to NOAA's 'Voices from the Fisheries'² oral history database by contributing stories from Washington, Oregon, and California. VFWC is a collaborative project with the National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center (NOAA/NWFSC), Oregon State University (OSU), and Newport Fishermen's Wives (NFW).

This research contributes to the larger VFWC project by adding a subset of interview questions specifically related to women's roles in Oregon's fishing communities. This study, therefore, is an example of how various thematic components that emerge from a broad history provided by Voices from the Fisheries can be used to address specific issues and reveal common themes within a community of interest.

2. Research methods

Data was collected using a blend of oral history and semi-structured interview methodology [55,56]. The primary goal of collecting oral histories is to let the participant tell their story fully and completely without excessive probing from the interviewer. However, to address specific thematic areas, a series of semi-structured questions were used to collect data directly related to the research questions around women's roles in the fishery.

² Voices from the Fisheries: About the Project. (n.d.). Retrieved May 21, 2015, from http://www.st.nmfs.noaa.gov/voicesfromthefisheries/about_the_project.html

"The Voices from the Fisheries Database is a powerful resource available to the public to inform, educate, and provide primary information for researchers interested in our local, human experience with the surrounding marine environment"

In total, 26 interviews were conducted in five communities on the Oregon Coast: Newport, OR; Port Orford, OR; Garibaldi, OR; Astoria, OR; and Warrenton, OR. One interview was conducted in Morro Bay, California (Table 1 and Figure 1).

[Table 1 here]

[Fig 1 here]

Interviews, ranging from 30 minutes to 2.5 hours in length, were audio-recorded and transcribed for the VFWC project³. All transcriptions were completed verbatim by the principal researcher to ensure consistency and allow for open-coding analysis [57]. Oral history interviews were used in this study as a way to gather data around what was most important to the participants involved. Questions were intentionally broad to allow the participant to direct the conversation around what was important to them.

Qualitative data analysis was conducted through the help of a computer assisted coding program, MAXQDA. Using Auerbach and Silversteins's [58] method of grounded-theory coding, an inductive approach was used to generate common themes. By using a grounded-theory approach, this study provided multiple avenues of exploration, which allowed for theory generation based on the participant's voice and potential hypotheses for future studies. Initial groupings of relevant text were created according to original indicators of analysis (i.e., management, markets, economics, family dynamics, ocean conditions). The second round of groupings was a result of refining the preliminary codes according to grounded theory discovery [59].

³ Subject signatures were obtained for all oral histories collected and published to the VFWC website. Participants have the right to choose anonymity or remove their associated oral history data from the record at any time.

3. Results and discussion

To best reflect the results collected for this study, direct quotes from interview transcripts are used to accurately represent the participant's voice and collective experiences of the community. Some data have been collected indicating changes in the extraction, processing, and distribution sectors, which is supported by the literature and could benefit from further analysis. However, focus here will remain on the fishing 'way of life' for families and communities. The majority of the data looks at the roles of fishermen's wives in Oregon's fishing industry.

3.1. Women's individual roles in Oregon's commercial fishing industry

The role of fisherman's wife in the home, taking care of the family and maritime household, is perhaps the most recognized role of women in the fishing sector. Although this role too has changed over time, in duties and precedence, one fisherman's wife claims, "*The fundamentals of being a fisherman's wife have not changed.*" It was common to hear about traditional logistical roles of cooking for the crew, distributing paychecks, picking up parts, and taking care of the financial side of the business. One fisherman spoke very fondly of his wife's contribution beyond taking care of the children and the family:

"Obviously, with the children and the family, but there are times I've had her call fish markets up and down the coast to find the price of fish so I can figure out where I was going to go and sell my fish. So she does a lot of legwork and keeps in touch with the boat owner for me. Lets him know what's going on, or vice versa. He'll let her know, 'hey this is where (husband) is at' ... go grocery shopping for me or with me... She'll cook food on the boat, or cook food at home and package it up and bring it out fishing so we can just heat it up in the microwave... Plus she's just a good ear, a good person to talk to. She does quite a bit. She's like the unsung hero."

Many traditional fishermen's wives roles have not changed over time, as documented by both younger and older fishermen's wives participants. On the individual level, some roles change as family obligations evolve allowing for other interests to take precedence. This is often due to a general shift in the direct family's needs, such as caring for young children. Many

women talked about changes in their daily roles as the kids grew and took on responsibilities themselves or became involved in other activities:

“Before, I was pretty busy with soccer and football and gymnastics, school. The kids are older now so I have more time. I think that’s why, when I first got to town, I joined (local fishing association). I just had more time, is why I’m more (politically) involved now.”

Some participants mentioned an increase in women’s roles in science, fisheries management, policy, and the decision-making process. Although participants recognized these changes in women’s roles over time, they also claimed it was part of general societal change and not necessarily indicative of changes in the fishing industry.

“I used to go to groundfish management team meetings 25 years ago, and if there was one woman scientist in the groundfish management team it was a big deal. And now you see women are the chairs of the groundfish management team. So seeing changes, growth of women in both management and in science. Although I know those areas are still a challenge too. And then the rise of women participating in the decision-making process.”

Other women that came from fishing families chose not to fish as an occupation, but instead chose other opportunities to remain a part of the fishing industry.

“I also am involved at the state level for policymaking... policy for the state-managed fisheries, as well as other kinds of task forces and commissions that are involved in various aspects in seafood, be it marketing or policy or research.”

Another common role for women in fishing is in the processing sector [20,22,25,43,48,60–63]. Although only two individuals from the processing sector were interviewed for this study (and this topic deserves more attention to address changes in women’s roles directly related to processing on the Oregon coast over time), some of the data collected for this project does provide a glimpse of what the processing sector was like in the past and how it may have shaped some relationships among women.

“The girls would routinely beat the guys as far as pounds per hour, unloaded, and things of that nature. And they kind of took over the butchering operation for crab,

you know, removing the shell and splitting the crab. A lot of the physical work, which was really interesting and very productive for the company as far as I was concerned. So, it might be one of the earlier involvements in direct production in West Coast fisheries for women.”

“And never being a fisherman, of course I wouldn't have been involved with fishermen's wives because they wouldn't want a processor in there with them.”

Multiple women commented on the changing role of processor-fishermen relationships as a result of catch share programs:

“The other thing that has happened is processors, now, don't just own vessels but they own quota... some processors are able to now control a larger ownership of fish. And fishermen are concerned about becoming serfs; sharecroppers... processors will own quota and fishermen will simply fish for them. So infrastructure, markets, access to fish; processors are playing an increasing role in all of those.”

One participant described her role in this relationship:

“I work with our processor directly, they have a role in whether or not we... they find quota for boats. Also people who are competing for your fish, they'll call and I think if you take an active role in the business then they'll realize if they can't reach the husband they'll get you or they'll try for you. Then if they see you are an active participant then they'll reach you first sometimes. I don't find that they discriminate if there's a sale or an advantage to be made.”

Oregon's commercial fishing community is primarily composed of small fishing businesses [43,64] that require effort from the entire family to keep the business running successfully:

“The whole family is part of that because we support one another. The money earned supports a lot of what the family does, and having emotional support and logistical support from home enables the fishing activity.”

Despite efforts from each individual, many things impacting the fishing business are out of the family's control (e.g., weather, markets, fluctuating fish stocks, regulations, etc.).

Women's roles at the individual and family level require an ability to be flexible to changing conditions and many claim to understand this risk when choosing to become a fishing family. As

Britton [21] states, “women understand how changes in the fishing industry are intimately linked to the well-being of their families and communities.” The continually evolving structure of the commercial fishing industry shapes the way individuals and communities choose to cope with complex changes.

3.2. Resilience and the adaptive capacity of fishermen’s wives

Fishing is an extractive activity that is considered cyclical and evolving which requires the ability to deal with changing conditions. Most participants mentioned huge management changes over the years that affected individual roles and participation within the industry. These increases in complexity of fisheries regulations and markets had a variety of impacts on women’s participation in the industry. For example, a fisherman’s wife talks about the challenges of catch share management for small boat fishing families, including her own, which opened up a new avenue of involvement for her:

“I got involved in the politics of fishing in 1994, when our Pacific Fishery Management Council really made its first move into catch share management or what we called then ‘individual quota management’. It was really obvious that our boat and our community was going to be entirely left out of it, that we weren’t at the table to participate in the really finer details of the design of the program, and so that’s when I got involved.”

A fisherman’s wife from a different community mentioned a similar situation for her family, which led them to pursue another fishing opportunity outside of Oregon.

“My husband was a skipper of fishing vessels the ten years prior to the IFQ going into effect. So when they allocated quota to fishing vessels, we didn’t get any quota because he was just a skipper, he wasn’t the owner. The owner’s of the boats, or the corporations of the boats got the quota and skippers didn’t get anything. So I think that’s a huge flaw in the IFQ system.”

Increased complexity of regulations, including the catch share program, caused one fishing family to question whether or not they would remain in the business.

“I don't know what the future holds for that, but it's certainly something, I think as wives and daughters and others involved in the industry where they sort of stay in or get out as these people age and get out, it is a role that many of us have to take on. And it's not an easy one. Because management is really complicated, quotas are really difficult to deal with; there are a lot of rules around how you can manage them.”

Fishermen's wives also claimed to spend more time at Pacific Fisheries Management Council (PFMC) meetings to be the 'ear' and, at times, the 'voice' for their husbands while they were out at sea. One fisherman's wife spoke of encouraging her daughter to follow the same path in order to understand regulations that might affect the family business. Another fisherman's wife stated the importance of staying up to date on regulatory changes and the increase in this role over time:

“I think that one of the things that has changed is that more women and fishermen's wives are much more aware of the regulatory issues than they were 20 years ago, and are much more active. Whether it's self-educating or attending the meetings or pushing their husbands out the door and telling them 'you need to go to this'.”

Complexities of the fishing industry, especially complexities of fisheries management and markets, have shaped women's participation within the industry and family business. There are clear differences of impacts to individuals and communities depending on level of participation. Regardless, to deal with increases in complexity – whether it's markets, regulations, family dynamics, or ocean conditions – some fishing families have acquired needed skills to cope with change.

Some of the ways resilience surfaced in the data was through changes in the way individuals deal with uncertainty and risk of ocean conditions, fluctuating markets, and regulatory changes. Many of these changes have led to challenges endured by the fishing family, but also lead to increased adaptive capacity over time. Adaptation strategies that were mentioned as beneficial to the community, and therefore a positive indicator of well-being, included

collaboration in research, development of community networks, innovative market opportunities, and increased skill sets for managing the family business.

One of the younger fisherman's wives spoke of increased collaboration between fishermen and scientists and how it might be opening up additional space for women's roles:

“I think, because of the scientific and fishermen collaboration, it has opened up more roles for women. Because you already have that basis of ‘yeah, we do book work and whatnot,’ but now it’s more accepted for you to attend meetings and show an interest. Where before, when it was just a ‘boys club,’ you weren’t accepted, you weren’t wanted there. I don’t feel like we have fully carved out our niche, but I think it’s getting there... I think that’s what I like about it; you can see the generational difference we’re making as women.”

Another participant shared her family's adaptive strategy when transitioning to a new fishery and a new community in a different state:

“So my husband rigged up the boat with totes and circulation and salt and started targeting live fish. We would get 800-1200 pounds of live fish. With live fish you have to make shorter trips. So he goes and he gets the live fish and he comes in. So he makes shorter trips, and more valuable fish, so that we get more money. It costs less fuel. It costs less quota lease. So that's how it has changed. We're learning how to fish differently and how to fish within the rules of the IFQ system.”

Other fishermen's wives described how they've adjusted to regulatory complexities by creating individual adaptive strategies when managing the family business. Some roles involved more investment towards learning new skill sets, while others required more space and simple willingness to adapt. Regardless of the level of commitment towards managing the family business, these women have made personal adjustments to remain successful with the fishing business. The following quotes describe some of the impacts catch share programs have had on the individual roles of fisherman's wives:

“Looking at who's going to loan what to who and who's going to trade this. I'm looking at the National Marine Fisheries Service, the website for quota share... how do I open a quota share account, how do I trade quota, how do I transfer it from account to account... that's the kind of constant learning as regulations

change, the continued learning. And I think that the learning curve – as opposed to 20 years ago – it's grown exponentially.”

“It seems like the paperwork is a lot more than it used to be... there are economic reports that you have to do now, your vessel accounts and your quota share, everything has to line up and so we work hard together to maintain and keep the business running smoothly with all of the extra rules and regulations and areas that we've had to adapt.”

It is important to recognize variations in experience between individuals and communities, not only along the Oregon coast, but in national and international fisheries as well. For managers and decision-makers to take into account these differences in impacts and capacity to adapt, there is a need for acceptance of social science results where researchers are provided the opportunity to “prioritize and honor the participant’s voice” [59,65] as credible sources of information.

“There isn't enough ability of the state and feds to, in terms of their resources, engage in the communities as much as I think needs to be done. I don't fault them, I understand they're under restricted time constraints and budgets, but they're not hearing from enough people about how regulations can affect the (fishing industry).”

Another strategy for resilience is through the formation of supportive social networks like that of fishermen’s wives groups or other ‘women-in-fisheries’ associations [16,21]. Regardless of the recognized contributions these groups have on individual and community levels of well-being, their existence is not always lasting. Many wives groups have been established over the years for various reasons (e.g., community fishing festival organization, emotional support, regulatory advisement, advocacy, etc.), but only a few remain broadly active today, most notably Newport Fishermen’s Wives (NFW) and Gloucester Fishermen’s Wives [20,64]. Hall-Arber [20] listed a number of factors (e.g., “the economic environment of their city, the existence or absence of active fishermen’s organizations, and individual personalities”) that can interfere with social organization and hinder recognition of women’s roles and contributions. Data from this research

contributes to the understanding of this web of connections created within a fishing community of place: Newport, OR.

3.3. Fishermen's wives groups contribute to local knowledge

Connections between and among fishing communities of place creates the framework of social capital [66], which can lead to social and economic resilience within the entire fishing community. Some of the ways these connections are built are through common interests, shared knowledge, and at times through crisis. Woolcock & Narayan [66] define social capital as the norms and networks that enable people to act collectively, which leads to an ability to confront issues of vulnerability. Membership in informal and formal associations, such as NFW is a common measure of positive social capital.

NFW has provided a supportive social network for the Newport fishing community in a number of ways. They provide guidance to new wives marrying into a fishing family, financial support for families that have lost someone at sea, and serve as a general support group for raising kids and dealing with the complex dynamics of a being a fishing family. NFW has also played the role of 'advocacy group' by participating in decision-making platforms, promoting seafood, and participating as leaders in the stationing of the United States Coast Guard (USCG) Newport Rescue Air Facility. NFW is an example of community organization that can lead to adaptive capacity and social capital. Social learning, or the passing of local knowledge, can help to build social networks and ultimately lead to community resilience [16].

Harper et al. [22] bring up the use of traditional ecological knowledge (TEK) passed from mothers to daughters during fishing activities in small-scale fisheries. This type of knowledge is extremely valuable in developing countries where environmental monitoring is limited and resources for conservation lacking. Although local knowledge (LK) is often referenced in terms

of ecological knowledge, it has broader applications in the community as described by Kliskey and Alessa [67]:

“TEK and LK may serve not only to illuminate potential ecosystem indicators but to articulate the intimate relationships that cultures have with their marine environment. Such relationships include not only rules and guidelines for the use and conservation of resources, but also those for social interactions, traditions, and community building.”

Women’s knowledge, while still possibly underutilized, could prove beneficial to management initiatives. This appears to be the case for Oregon’s commercial fisheries where there has been an increased presence of women at Council meetings as biologists, fishermen, managers, or wives (on-shore business partners) representing their fishing family business interests while their husbands are out at sea. When women become informed, communicate, and their opinion is acknowledged, their confidence is raised, which can lead to higher levels of participation in decision-making and positive impacts on socioeconomic conditions for the entire community [33,37].

Fishermen’s wives mentioned the support of older generations in helping manage the fishing business, dealing with fluctuating markets, increasingly complex regulations, and the day-to-day tasks of caring for the fishing family.

“Because on your own, I don't think you can figure out the best way. And on our own we can't figure out how to make things work because there's so much changing and there's just so much going on all the time.”

NFW can provide insight into social and economic analyses by describing changes in the business, community, and well-being of the fishing family. Those involved with selling seafood may also provide knowledge about markets, fish availability, and customer needs. Local knowledge goes beyond the ecological expertise often provided by fishermen and includes the

community knowledge that may be strengthened and passed on within women's fishing associations. One Newport fisherman talked about the importance of NFW and how they benefit the community:

“Oh I think they're fantastic... I know that they were responsible for getting the Coast Guard here on the coast. They do a lot, you know. The Fishermen's Appreciation day. They do blessing of the fleet. They have a cook off... Whenever something happens to somebody, a boat goes down, somebody gets hurt, somebody dies; they have a fund to help the families get through... We're very, very lucky to have them because there are a lot of communities that don't have them.”

Other communities mentioned having access to fishermen's wives groups, but not in the formal sense of NFW. These types of groups also contributed to transferring local knowledge and (potentially) improving community resiliency. A fisherman's wife in another location mentioned the usefulness of fishermen's wives groups in learning how to deal with the complexities of being a fishing family:

“It was a struggle. But there again, the network that was good is the fishermen's wives with the children. We all had each other, you know, in our own little group, knowing that our men are at sea. We would have playtime with our kids and do things together and we could compare notes on how it is to be a fisherman's wife.”

In some communities there is an absence of these types of women's social networks even though they have been referenced as a strength of the fishing community:

“In different situations, in different communities, there's very tight-knit fishermen's wives groups. And I think that would be very, very much an asset for the fishing community to have... that culture of the tight-knit, information sharing, nurturing, advice-giving... that type of thing. But I can't say that that's how it was here.”

NFW has been used here as an example of a supportive social network that contributes to the shared knowledge and resiliency of a particular fishing community. By focusing on women's roles, social scientists can better understand the type of local knowledge transfer occurring on the

shore side of the industry. Other studies have referenced a dependence of the fishing industry on social networks for continued longevity of the industry [68].

4. Conclusion

The results of this small study in Oregon should be considered one thread of a larger dialogue around human dimensions of the fisheries, fisheries management, and the fishing industry; they are transferable and informative but not generalizable. This study could, however, inform choices related to policy, management, or future research; for example, the design of a new or larger study around women's roles in US fisheries or expand to include other aspects of the fishing industry (such as intergenerational family business transfer). As fisheries regulations evolve into increasingly complex systems, analysis could benefit from addressing economic and sociocultural vulnerability and well-being at all levels of the fishing community. Women are very much a part of the human dimensions of fishery systems even though it is still primarily thought of as a male-dominated industry.

Some studies focus on the gender dimension of fisheries, especially in developing countries [24,40,63,69], while others have focused on bringing the fishing family into sociocultural analyses [43,45,53]. Whether the role of women lies in the maritime household, the occupational fishing sector, or in the realm of fisheries management, they have been, and continue to be, integrated within the fishing industry in a unique way that has not always been visible [25]. However, over time this visibility has increased, continues to grow with a changing society, and could be considered when making decisions related to fisheries policy or management.

Although variations in women's roles and adaptive capacity within Oregon's fishing industry have been documented in this paper, it is essential to revisit the theoretical discussions of vulnerability to better assess levels of exposure, sensitivity, and resilience to a particular system and place [9]. Recognizing diversity in and among families along the Oregon coast is a way to identify those that are most at risk. While some fishing families and communities benefit from changes in markets and regulations, others are placed at a disadvantage and experience negative effects. Even though participants interviewed for this study reflected various sectors or aspects of the commercial fishing community, additional effort could be placed towards understanding the effects of changing regulations on women's roles in the processing sector or extraction sector.

The majority of participants in this study, especially fishermen's wives, were vessel owners and as such, they may have more access to upper mobility through educational programs; more than those whose household income is significantly lower and requires the women in the family to take on additional employment opportunities, leaving little time for involvement in women's organizations. Thus it is important to not only recognize diversity within the fleet, but also within individual circumstances. Families of crewmembers may have a much different story to tell and may not always have the opportunity to tell it. Different socioeconomic status and access to professional groups leads to differences in vulnerability levels [34].

“And this is why our input... it affects every vessel differently. Sometimes it has some overall effects, how it's going to affect everybody. But every regulatory change affects every fishing vessel differently. So depending on who's at those meetings, telling their story, it's just this waxing and waning and back and forth. And so, the telling of our stories is so important.”

Women not only understand how changes are affecting their families and communities, but are often the ones making sacrifices to their personal well-being to ensure success of their

business or husbands out at sea [13,21,23]. Britton [21] encourages the use of a social well-being approach to demonstrate the reality of what is really important to people and create policies that are informed by societal values. Additionally, Kaplan and McCay [52] claim “failures in the communication process” have resulted in troubled relationships between government agencies and fishing communities. Bringing women’s voices to the decision-making table could alleviate barriers in communication and improve cooperation among stakeholders and government.

For example, safety related policy or management decisions are typically of great interest to the women in fishing family businesses and thus could be considered by decision makers. Structure and function of a community of interest can have varying degrees of resilience and adaptive capacity depending on active social networks and individual values. Women have been shown to contribute to the social capital of their communities and often take the leading role in advocacy efforts on behalf of their families and fishing communities. By integrating women’s roles and adaptive capacity into social impact assessments and ensuring the visibility of their contributions, fisheries managers and decision-makers in both state and federal agencies have a better chance of creating policies that truly minimize adverse economic *and* social impacts to fishing communities.

This research used oral history interviews as a method to provide needed data for fisheries management and the policymaking community, data that could be used in policy and management deliberation and in the making of explicit tradeoffs [3]. VFWC provided the framework and methodology to illuminate women’s roles in Oregon’s fishing communities, but it certainly goes beyond a single thematic component to add to the understanding of human dimensions of fisheries. Today’s opportunity for academics, policy makers, fisheries managers, and industry practitioners alike lies in the ability to work together to gather the optimal depth of

information to assess, and to make, the decisions that balance human well-being and conservation. This research addresses an often overlooked, but important, component of this challenge and opportunity.

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Figure 1 Map of Oregon coast with marked study sites



Table 1**Communities and number of participants interviewed**

Astoria, OR	1 fisherman (female) 1 fisherman (male) 1 fisherman's wife
Garibaldi, OR	1 fisherman's wife 1 processor's wife
Morro Bay, CA	1 fisherman's wife
Newport, OR	7 fishermen's wives 2 fishing daughters/industry involvement 1 fisherman (male skipper) 1 fisherman (male vessel owner) 1 fisherman (male deckhand)
Port Orford, OR	5 fishermen (male) 2 women (fisherman & fisherman's wife)
Warrenton, OR	1 processor (male)
