

Article

# Fishing Community Sustainability Planning: A Roadmap and Examples from the California Coast

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**Abstract:** Fishing communities are facing a variety of challenges including declines in participation, reduced access to fish resources, aging physical infrastructure, gentrification, competition from foreign imports, the “graying” or aging of their fleets, along with a host of environmental stressors. These factors can represent threats to the continued viability of individual fishing communities. Such communities are clearly in need of tools that will enable them to plan strategically and to be more proactive in charting a sustainable future. This manuscript provides a roadmap for how to engage fishing communities in a bottom-up strategic planning process termed “fishing community sustainability planning” by describing implementation efforts in four diverse California ports: Morro Bay, Monterey, Shelter Cove, and Eureka. The process draws from the literature on sustainability and community development to assess fishing community sustainability around four broad categories: economics and markets; social and community; physical infrastructure and critical services; environment and regulation. Process steps included developing a project team and community coalition, analyzing baseline data, conducting interviews with waterfront stakeholders, hosting public workshops, and drafting a Fishing Community Sustainability Plan (FCSP) that includes concrete recommendations for how a community’s fishing industry and waterfront can be improved. Experiences from the four ports reveal that fishing community sustainability planning can be adapted to a variety of contexts and can contribute tangible benefits to communities. However, there are limitations to what community-scale planning can achieve, as many regulatory decisions that affect communities are enacted at the state or national level. Combining community-level planning with scaled-up fishing community sustainability planning efforts at the state and federal level could help overcome these limitations. FCSP planning is one tool fishing communities should consider as they seek to address threats and plan for their long-term viability.

**Keywords:** fishing community; sustainability; seafood; strategic planning; port; California

## 1. Introduction

Typically, conversations about seafood sustainability focus on the status of fish stocks and resources. However, a conversation about seafood sustainability might also consider the status of communities who rely on fish resources for a variety of economic, social, and cultural purposes. Food resources from the sea cannot be sustained if the communities and individuals who harvest the resources are not also maintained [1,2]. Research shows that fishing communities in the U.S. and globally are increasingly confronted with threats to their long-term sustainability. Challenges

include rising operational costs, stagnant market prices, competition from foreign imports, shifts in consumer preferences, shifts in the labor market, aging physical infrastructure, gentrification, declines in participation, and reduced access to fish resources, along with environmental stressors that can affect fish resource health [3–9]. Many fishing communities are also experiencing a “graying of the fleet” where the average age of a commercial fisherman (The term fisherman is used throughout the paper as it is the preferred term among community members we spoke to. It is meant to denote individuals of any gender who participate in fishing.) is rising as there are fewer new, younger entrants into the industry [10–12]. The combination of these factors leads to concerns about the long-term viability of commercial fishing communities in the U.S. and beyond. Fishing communities are clearly in need of tools that can enable them to be proactive and to strategize for a more sustainable future.

Scholarship in the field of community development and sustainability consistently emphasizes the importance of community-based strategic planning and future-thinking as a means to guide communities toward a more sustainable path [13–16]. A key pillar in the maritime port sustainability management system presented by Kuznetov et al. [15] (p. 67) is “strategic planning for the future.” In an assessment of 57 rural communities who participated in community development activities, Fey et al. [13] (p. 16) found that communities who “write a strategic plan to begin community economic development efforts” and who “articulate a long-term, unifying vision” are likely to perform “higher” in terms of achieving tangible development outcomes. This research also emphasizes the importance of conducting strategic planning with a bottom-up approach that is inclusive of a variety of community perspectives, rather than relying on input from a few elites [13,14]. Sustainability frameworks developed for seafood systems, ports, and fishing communities have also highlighted the importance of community organization, governance, or planning [2,15,17–19]. This research can be brought to bear on the experience of fishing communities to ask: What should strategic planning for fishing communities look like and what is the best method for engaging fishing community constituents in a bottom-up visioning process related to the future of their communities?

This paper describes the design and implementation of a process to engage fishing communities in strategic planning for the future called “fishing community sustainability planning”. The paper draws from experiences implementing community-level planning efforts with four diverse California fishing communities: Morro Bay, Monterey, Shelter Cove, and Eureka. The paper will detail fishing community sustainability planning processes in four sections by presenting:

1. A review of the literature related to sustainability and fishing communities along with a simple, actionable framework that we utilized to assess and plan for fishing community sustainability. The framework draws from the relevant literature and is set in the context of U.S. fishery policy.
2. A description of the four case-study communities where fishing community sustainability planning was implemented and the planning methods that were utilized in each community.
3. A description of steps of and findings from an inclusive, bottom-up planning process that the authors used to engage the four fishing communities in strategic planning. The process culminated in the production of a Fishing Community Sustainability Plan (FCSP) for each community.
4. An overview of the outcomes and/or benefits that have been documented in the four communities who engaged in FCSP processes.

The goal of this paper is to introduce the concept of fishing community sustainability planning and to provide a roadmap for communities and planners who may be interested in engaging in similar efforts. The planning processes involved the collection of over 200 interviews with waterfront stakeholders, the hosting of 10 public workshops, and 20 presentations to local government entities across the four ports. This analysis will incorporate data from the interviews, meetings, and plans in the description of the process steps, findings, and outcomes.

## 2. Literature and Framework

### 2.1. U.S. Fisheries Policy Context

The 1996 reauthorization of the United States federal fisheries act, the Magnuson-Stevens Act (MSA), included a provision called National Standard 8 directing federal fisheries managers to “take into account the importance of fishery resources to fishing communities by utilizing economic and social data that are based upon the best scientific information available in order to: (1) Provide for the sustained participation of such communities; (2) To the extent practicable, minimize adverse economic impacts on such communities” (50 CFR § 600.345(b)(3)). While the policy only directed managers to consider community concerns, it did create the idea of a fishing community as an important unit of analysis. Additionally, by directing attention to the “sustained participation” of fishing communities, the standard directs researchers and managers to better understand the factors that underlie fishing community sustainability as well as to manage with an aim of maintaining or increasing that sustainability.

In United States fisheries, the Magnuson-Stevens Act (MSA) (16 U.S.C. § 1801 et seq.) sets the fishing community definition used by governments and many researchers. The MSA ties communities to place and defines a fishing community as “a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such a community” (50 CFR § 600.345(b)(3)). The MSA definition is important because it makes a regulatory link between the management of fisheries and their connection with the communities that rely on them for their livelihoods [20].

The notion of a “community sustainability plan” (CSP) in relation to fishing emerged out of text from a different part of the MSA from the 2006 reauthorization of the law. The MSA states, “to be eligible to participate in a limited access privilege program to harvest fish, a fishing community shall . . . develop and submit a *community sustainability plan* [emphasis added] to the Council and the Secretary that demonstrates how the plan will address the social development needs of coastal communities . . .”. According to the law, fishing communities that wish to participate in limited access fisheries need to develop and present a CSP to the regional fishery management council. However, commercial and recreational fishing communities and civic leaders also began to view the CSP as an opportunity to develop a strategic planning document for the entire local fishing industry that could produce multiple benefits for the community. They added the term “fishing” to the document title to create fishing community sustainability plans (FCSPs). The ports of Morro Bay and Monterey undertook CSP projects to leverage the establishment and strengthening of their community quota funds as well as to remain eligible to participate in the West Coast Individual Transferable Quota (ITQ) Groundfish Trawl fishery (a limited access privilege program). Additional communities have engaged in FCSP processes for the strategic planning benefits without an expressed interest in entering a limited access fishery.

The MSA policy text does not explicitly define “sustainability” and does not provide any more details about what is to be included in CSPs, leaving fishing communities and planners with the latitude to make choices about how they want to approach the concept of sustainability and what they want to include in planning efforts. We, the authors of this manuscript, worked with fishing communities and consulted the literature to develop a framework and process to assess fishing community sustainability and produce a strategic plan that would be accessible to and actionable by waterfront stakeholders.

### 2.2. Fisheries, Fishing Communities, and Sustainability

Sustainability is notoriously difficult to define and the theory and thinking behind the concept has developed considerably over the past few decades [21,22]. Original conceptions emphasized the sustainability of environmental systems [23], but the concept has branched into myriad types of sustainability as it has been adopted by other disciplines [24]. One sustainability framework that is

popular and applied to a wide range of situations is known as the Triple Bottom Line (TBL). Tracing back to the Bruntland Report [25], the TBL framework attempts to assess or manage for sustainability through social, economic, and environmental lenses [26–28]. Scholars have critiqued the TBL for its clear ties to a business setting and because the approach can seem vague or hollow in application [15,29]. However, the TBL has opened the door for a more holistic approach to the sustainability concept.

There have been several efforts to develop frameworks that specifically connect sustainability concepts to seafood systems, ports, and fishing communities. Micheli et al. [2] present a framework for assessing Seafood System Sustainability (SSS). Their approach incorporates 30 indicators across the three broad categories of governance, socioeconomic, and ecological. Anderson et al. [30] created a Fishing Performance Indicators (FPI) assessment tool grounded in the TBL approach to include community, economics, and ecology indicators. Kuznetsov et al. [15] developed and implemented a Port Sustainability Management System (PSMS) for smaller ports in the UK. They conceive port sustainability around nine “pillars” which are linked to a variety of topics including safety, assets, environment, stakeholders, and planning. While a fishing community is intricately connected to its port and that port’s sustainability, it encompasses a somewhat different set of components and needs from an entire port system. Adrianto et al. [19] attempt to develop a sustainability framework for fishing communities, using the example of Yoron Island, Japan. They stress the importance of developing “local accepted” (LA) sustainability indicators that conceptualize the community in a way that community members would understand. They outline four components of fishing community sustainability—ecology, economy, community, policy—and break these components into specific indicators.

The literature on community development, which draws predominantly from case studies of rural, natural-resource dependent communities, can also contribute to thinking about fishing community sustainability. The community capitals framework (CCF) separates a community’s assets into seven interdependent capitals: social, human, cultural, political, financial, built, and natural [31]. Scholars posit that a solid foundation in all capital areas can contribute to a “healthy ecosystem, vital economy, and social well-being” [13] (p 11). Empirical research suggests that strategic investment in some capital areas can lead to a rise in other capital areas, causing a community to “spiral up” to a more sustainable and economically viable state [16].

### *2.3. Fishing Community Sustainability Framework*

We structured our strategic planning efforts around a sustainability framework that drew from the literature and applied those concepts to issues specific to fishing communities. Our fishing community sustainability framework included four broad categories: economics and markets; social and community; physical infrastructure and critical services; environment and regulation. Table 1 outlines each of the categories, describes what aspects of fishing communities they include, and shows how they are connected to other sustainability concepts and frameworks from the literature. Infrastructure is not a commonly-used dimension in sustainability frameworks like the TBL. But our work and other research efforts showed that infrastructure and critical services were essential to the basic functioning and sustainability of a port or fishing community [15,32]. We used this basic framework to assess baseline conditions of the fishing communities and to develop recommendations to improve community sustainability.

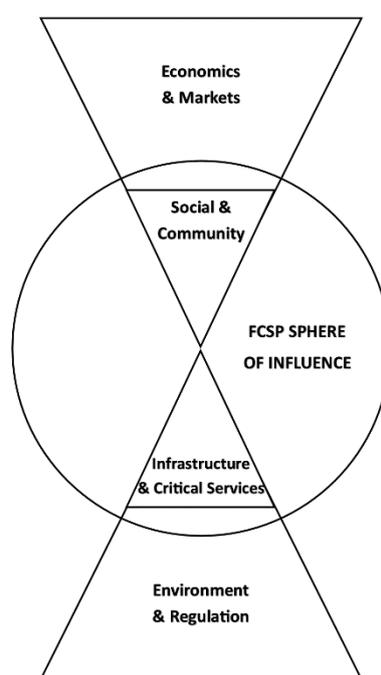
**Table 1.** Fishing community sustainability planning framework used in the planning processes for this paper and its connection to sustainability indicators or metrics from the literature.

Component	Definition in Community Context	Connection to Frameworks from Literature <sup>1</sup>
Economics and Markets	The nested financial systems related to fishing and the waterfront which range from the financial relationship between captain and crew on a fishing boat to the fish buyers and processors, local markets, regional markets, and global markets for fish products. Includes the diversity and number of seafood buyers and processors; the prices, landings, and total value of products being landed in a port a given year; the local, regional, and international markets for various marine resource products; product marketing strategies; the recreational/charter fishing tourism economy.	TBL: Economic CCF: Financial Capital PSMS: Business Planning and Management SSS: Socioeconomic FPI: Economics LA: Economy
Social and Community	The people who make up the social networks with a connection to fishing in a specific location. Includes the cultural context; the state of the workforce; social networks, relationships and trust; political organization.	TBL: Social CCF: Social Capital, Human Capital, Cultural Capital, Political Capital PSMS: Stakeholder Engagement, Proactive Partnerships, Effectiveness of Management Processes SSS: Socioeconomic, Governance FPI: Community LA: Community, Policy
Infrastructure and Critical Services	Includes the infrastructure and services necessary to support fishing activities such as docks, piers, marinas, moorings, fish processing plants, cranes, fuel stations, cold storage, ice facilities, ramps/launch facilities, haulout facilities, repair shops, gear shops, and gear storage areas. Also includes dredging of waterways, jetties and shoreline armoring which maintain shorelines and access to bodies of water, and transportation infrastructures such as roads, airports, and rail. Land use and zoning related to the waterfront and rents and wharfages are also part of this category.	TBL: N/A CCF: Built Capital PSMS: Asset Management and Maintenance, Safety Management SSS: N/A FPI: N/A LA: N/A
Environment and Regulation	Includes the marine resources to be harvested and the ecological conditions necessary to sustain them such as habitat, food webs, ocean conditions, water quality, and human impacts. Also includes the physical geography of the port and potential influences from ocean hazards and sea level rise. Includes factors that are very local to a fishing community as well as regional and global systems such as meta-ocean conditions, weather patterns, and global environmental change. The category also includes the regulatory framework linked to fishery and environmental conditions. The regulatory processes contribute to the protection of the marine environment as well as dictate a fishing community's level of access to marine resources for harvest.	TBL: Environment CCF: Natural Capital, Political Capital PSMS: Environmental Knowledge and Awareness, Environmental Management SSS: Ecological, Governance FPI: Ecology LA: Ecology, Policy

<sup>1</sup> TBL = triple bottom line [26]; CCF = community capitals framework [13]; PSMS = Port Sustainability Management System [15]; SSS = Seafood Systems Sustainability indicators [2]; FPI = Fisheries Performance Index [30]; LA = locally accepted fishing community indicators [19].

We believe that sustainability in all four of the categories is essential for the long-term viability of fishing communities and the strategic plans should seek to generate improvements, expansion, or investments in all the areas. We found that the different categories were connected to and reliant on one

another in specific ways when it came to fishing communities. Figure 1 shows the conceptual model of fishing community sustainability that drove our planning efforts. The model shows environmental systems—and the regulatory frameworks that guide their protection—at the base because a functioning fishing community is reliant on a healthy and sustainable resource to harvest. Without resources and without access to those resources, a fishing community could not exist. Infrastructure is shown above the environment, as a fishing community is similarly dependent on infrastructure to function and obtain landings at the port. Without basic infrastructures such as working vessels, docks to store boats, dredged channels, boat launches, hoists, ice, and fuel, fishermen cannot catch fish. The community or social system is depicted on top the environmental and infrastructure components—this includes attributes of the human community itself, social relationships, level of participation, the state of the workforce, and cultural ties. Finally, economics and markets are shown above the community as this is where fishermen, processors, and others take the resources they have harvested and exchange them outward to markets, local and global, to bring economic revenue to the community.



**Figure 1.** A conceptual diagram of fishing community sustainability that informed FCSP processes in this manuscript.

We also discovered that strategic planning on the community scale might not be capable of influencing all of the factors relevant to a fishing community as some factors occur at scales outside the sphere of the individual community influence. The circle in Figure 1 depicts the FCSP sphere of influence. Community-based FCSP efforts can influence most aspects of infrastructure and the community's social system which are more local in origin and operation. However, some aspects of environmental regulatory processes and seafood markets occur at scales and scopes well beyond the community, so FCSP planning may not be able to fully address all concerns in those areas. The greater the distance between the fishing community and a decision-maker in either geographic distance or political echelon, the less leverage a single FCSP is likely to have on the outcome.

### 3. Materials and Methods

#### 3.1. Case Study Communities

This paper draws from planning processes conducted with fishing communities connected to four ports in California (Figure 2). These ports vary substantially in terms of their size, landings, and available infrastructure (Table 2).



**Figure 2.** Location of study ports in California that engaged in fishing community sustainability planning efforts (by Lisa Wise Consulting, Inc.).

**Table 2.** Comparison of the ports where fishing community sustainability planning projects were conducted.

Port	# Comm. Vessels 2014 <sup>1</sup>	Landings (lbs) 2014 <sup>1</sup>	EVV 2014 <sup>1</sup>	Top Species	# CPFV 2014 <sup>1</sup>	Mariculture Operations 2018
Morro Bay	157	6,751,323	\$7,887,699	Coastal pelagic species (CPS), Spot prawn, salmon, groundfish	3	Oyster; 2 businesses
Monterey	124	67,673,187	\$20,137,268	CPS, squid, groundfish, Dungeness crab	6	Abalone; 1 business
Shelter Cove	24	84,580	\$332,938	Dungeness crab, salmon, nearshore finfish	3	N/A
Eureka	163	14,785,049	\$13,017,412	Dungeness crab, groundfish, shrimp, salmon	7	Oyster and clam; 6 businesses

<sup>1</sup> Number of vessels, landings, ex-vessel value (EVV), and number of Commercial Passenger Fishing Vessel (CPFV) operators; data from California Department of Fish and Wildlife, California Fisheries Data Explorer.

Shelter Cove is the smallest, and likely most vulnerable of the four ports. Shelter Cove is rural and isolated geographically and politically. Shelter Cove is unincorporated so development in the area is overseen by the county, whose seat is in Eureka about two hours away. The community has a

Resort Improvement District that is primarily responsible for managing utilities and fire protection as well as overseeing a few recreational areas in the community. In addition, the Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD), also based in Eureka, has responsibility for overseeing aspects of port infrastructure including the jetty and boat launch site. None of the three government entities with authority in the Shelter Cove area have asserted primary responsibility for the waterfront and as a result, some aspects of waterfront management have been neglected over time. At the beginning of the FCSP process, Shelter Cove did not have an active fishing association. The community lacks the basic infrastructure found in most ports; there are no docks or marinas and boats must be launched via an unreliable tractor service. There is no ice, cold storage, nor processing facilities and only one buyer who comes to the community. Most fishermen must truck their catch out to markets hours away on their own. In 2014, 24 commercial vessels fished out of Shelter Cove, but in recent history that number has dropped to as low as seven. Shelter Cove engaged in FCSP planning as an opportunity to plan strategically about how they could maintain their status as a fishing community and keep commercial and recreational fishing activities viable.

Morro Bay is a small to medium-sized port by California standards. The port contains a mix of smaller-scale, community-based vessels, and one or two active trawlers. Tourism is also an economic driver in the Morro Bay waterfront. The port of Morro Bay falls entirely within the City of Morro Bay and port and waterfront activities are overseen by the City's Harbor Department. At the time of FCSP implementation, Morro Bay had an active fishing association—the Morro Bay Commercial Fishermen's Organization—which was formed in 1974 and has had fluctuating membership between 80–120. The organization played a strong role throughout the FCSP process. Due to environmental, regulatory, and market challenges, the industry took a significant downturn and between 1990 and 2007; the total value of landings at the port dropped from approximately \$8.5 million in 1990 to \$1.9 million in 2007. However, in 2012 earnings at the dock in Morro Bay rebounded to over \$6.3 million. In 2014, when the FCSP was completed and accepted by the Morro Bay City Council, earnings were over \$7.8 million. The community engaged in FCSP planning as a necessary step for their community quota fund and "to assess current baseline conditions and plan strategically for a stable and vibrant fishing industry and waterfront infrastructure" [33] (p. v).

Eureka is one of the largest ports in California, consistently within the top 10 in the state for landings. The fishing community encompasses fishing and mariculture activities throughout Humboldt Bay. Key port infrastructure and development is managed by a patchwork of local government entities including the City of Eureka, Humboldt County, and the HBHRCD. The fishing fleet has an active fishing association—the Humboldt Fishermen's Marketing Association (HFMA)—which was founded in 1955, is managed by a board of directors and has had a fluctuating membership of 65 to 150 fishermen. Members of HFMA have been politically engaged at the local, state, and federal level on behalf of the area's fishing interests. In 1992 there were 445 active fishing vessels in Eureka and that number dropped to 143 by 2006, but between 2006–2014, there has been a stabilization and even slight increase in the number of vessels [34]. Eureka has important amenities such as four fish buyers and/or processors, marinas and docks, and two boat haulout facilities. However, the port faces challenges including lack of cold storage, unreliable dredging, encroachment on the waterfront by other uses, graying of the fleet, and overreliance on a single fishery (Dungeness crab). Humboldt Bay, where Eureka is located, has an active mariculture industry that produces an estimated 70% of the state's oysters. Eureka engaged in FCSP activities to help promote broader community understanding of the benefits from the working-waterfront as well as to identify key needs and to help secure funding and political support to address those needs.

Monterey has a similar number of active vessels to Eureka and Morro Bay, but the value of the landings tends to be higher, with over \$20 million in earnings in 2014. Monterey supports a diverse array of fisheries including nearshore fisheries such as crab and rockfish, trawl fisheries, squid, and coastal pelagic species (CPS) such as sardine and anchovy. Most of the fishing community infrastructure and activities are within the City of Monterey. Port management is overseen by a harbormaster who

is appointed by the Monterey City Council. At the time of implementation, Monterey did not (and still does not) have a fishing association specific to the port; however, fishermen from Monterey were involved in several regional, state, or West Coast fishing organizations. Additionally, the harbormaster has been politically engaged on behalf of fishing community interests. Currently, the harbormaster holds a seat on the Pacific Fishery Management Council, which is the body that makes decisions about federal fisheries off the West Coast. The city of Monterey is a mid-size, relatively affluent city and tourism has become an important driver of activity in the waterfront. This has led to the ghettoization of commercial fishing, now limited to Municipal Wharf II, and concerns about additional encroachment of tourism and other activities into space designated for working-waterfront activities. The port has the potential for continued and improved relationships with marine conservation entities including the Monterey Bay Aquarium and Monterey Bay National Marine Sanctuary [35] and Moss Landing Marine Lab.

### 3.2. Planning Methods

We conducted extensive community-planning activities in each of the four study ports. A detailed description of the planning process and data analysis approaches can be found in Section 4.1 which outlines the Roadmap or process used to guide our planning efforts. Riggs and Pontarelli [36] also provide an overview of the Morro Bay and Monterey processes. Overall, we conducted semi-structured interviews with 211 stakeholders connected to the study communities; 10 planning meetings or workshops; and 20 presentations to local government entities such as City Councils, Harbor Commissions and County Boards of Supervisors (Table 3). We also conducted regular site visits in each study community and conducted a review of existing documents and secondary data related to each port. Interview data will be cited with an abbreviation of the port where conducted and the year.

**Table 3.** Timing and FCSP planning activities conducted in each of the study ports.

Port	Year (s)	Interviews	Public Workshops	Advisory Committee Meetings	Local Government Presentations
Morro Bay	2013–2014	24	2	0	6
Monterey	2012–2013	80	2	0	6
Eureka	2017–2018	61	1	2	6
Shelter Cove	2017–2018	46	1	2	6
TOTAL		211	6	4	20 <sup>1</sup>

<sup>1</sup> Total number of local government presentations lower than the sum of individual port presentations as during some single presentations multiple FCSP processes were discussed.

## 4. Results and Discussion

### 4.1. Roadmap

The goal of the FCSP process is to develop bottom-up, constituent driven plans focused on creating sustainable futures for fishing communities. This FCSP process has been refined through implementation experiences in four different communities. The planning process will differ from community to community depending on their unique needs and context. However, we have found that the broad set of steps below represent an effective approach for engaging fishing communities in long-range strategic planning. Below is an outline of the seven broad steps that we took in our FCSP planning approach including a description of the implementation processes and findings from the four featured FCSPs, as well as recommendations for future planners and communities who may wish to conduct similar processes. Table 4 provides an overview of the process steps as well as the primary actors involved in each step.

**Table 4.** Process steps for FCSP implementation and primary actors involved in each step.

#	Step	Primary Actors <sup>1</sup>
1	Develop Coalition and Project Team	LGOV, PROJ, FISHCOM
2	Assess Baseline Conditions	PROJ
3	Host Meetings and Public Workshops	PROJ, FISHCOM, PUBL
4	Semi-structured Interviews and Site Visits	PROJ, FISHCOM
5	Data Analysis and Recommendations	PROJ, FISHCOM
6	Draft Plan, Review, and Final Plan	PROJ, FISHCOM, PUBL, LGOV
7	Outreach and Implementation	FISHCOM, LGOV, PROJ

<sup>1</sup> LGOV = local government officials and staff, elected leaders; PROJ = Project team responsible for carrying out planning activities (often planning consulting firm or members of academia); FISHCOM = members of the fishing community; PUBL = members of the general public.

#### 4.1.1. Develop a Coalition and Project Team

The first step of our FCSP efforts was to ensure that members of the fishing community—with fishermen at the core—were invested in the process. Our FCSP processes have taken different approaches to project organization. In three of the ports, the process was truly grassroots as members of the fishing community approached local government officials, planning consulting firms, or academics directly to ask them to help develop FCSPs. In Shelter Cove, a smaller, more rural port, the fishing community was unaware of the FCSP process, so project team leaders approached community members about engaging in such an effort. Only when the community agreed did the project team consider the pursuit of funding. Fishermen and community members can also play a role in helping to define their fishing community and to determine key participants. Three of the ports included mariculture operations, and fishermen decided to include those interests in the FCSP planning process as they felt that fisheries and mariculture were stronger combined, and viewed as a concerted industry could make a greater appeal for priority investments and partnerships.

Once the interest and involvement of the fishing community were established, our project team worked to develop a coalition of support for the FCSP project. We found it was important to involve local civic leaders and elected officials as they ultimately approve the final FCSP and represent crucial partnerships for implementation of final recommendations. In the FCSP processes the authors engaged city, county, and port/harbor government officials during the early stages of project development and regularly presented project updates and gathered feedback at public meetings. Future planners may want to consider involving city councilmembers, county supervisors, congressional representatives, state legislators, locally-based environmental NGOs, fishing associations, regulatory agency staff, businesses leaders (Chamber of Commerce), local educational institutions and others.

After engaging a broader coalition, we developed a core project team that was responsible for overseeing the planning process. On the Morro Bay and Monterey FCSPs, the City of Morro Bay applied for and received the grant to fund both FCSP processes. Once the City was awarded the grant, they posted a public Request for Proposals (RFP). Through a public process, the city selected Lisa Wise Consulting, Inc. (LWC) (with co-author Pontarelli as the lead), an economics and urban planning firm with extensive fishing community and waterfront experience, to lead the FCSP process. LWC then worked closely with city and harbor staff to develop FCSPs for Morro Bay and Monterey. In Shelter Cove and Eureka, a university professor (co-author Richmond) was the principal investigator on the project and she worked in collaboration with planning consultants from LWC to manage the planning process and develop final plans. In the academic model, graduate students played a large role in collecting and analyzing data.

The structure of the project team and coalition may vary with context. For example, because the ports of Morro Bay and Monterey are completely within their respective city boundaries, it made sense to have the Cities play a leading role in overseeing and implementing FCSP processes. Since the fishing communities of Shelter Cove and Eureka are both managed by a patchwork of different local government entities, with no one entity having sole authority, it made more sense to have the

planning effort sit outside of any one specific government entity and instead be overseen by researchers from a local academic institution. FCSP planning provides a great opportunity for members of local government, academia, industry and the private consulting world to work together and learn from one another.

Developing FCSPs is a labor-intensive process and communities or local governments will need to obtain funding to support the development of the documents. The National Fish and Wildlife Federation Fisheries Innovation Fund and the National Oceanic and Atmospheric Administration (NOAA) Saltonstall-Kennedy Grant program funded these FCSP processes. These are potential funding sources for future planners in the U.S. Local government entities can also choose to finance the project with their own budgets and there may be additional local, state, or federal economic development and/or coastal protection funds available for this type of work.

#### 4.1.2. Assess Baseline Conditions Through Analysis of Existing Data

The second step of the process was to gather together existing data, plans, and reports in order to collate and synthesize archival information so it could be leveraged to inform the analysis and reporting. We retrieved and analyzed government documents, academic reports, county assessor data, census data and landings/logbook data to provide a clear assessment of the baseline conditions of the fishing community. We presented summaries of the fisheries data and statistics at public workshops and planning meetings so that members of the community could use the data to discuss port strengths, weaknesses, and areas for investment. We aimed to develop clear and accessible materials that summarized the existing data; materials included PowerPoint presentations, posters, and the text of the plans themselves. Not all members of the fishing communities had access to computers or the internet, so a key goal of this step was to provide fishing communities with access to existing data and information that could be useful to them. We recommend that future planners keep in mind that obtaining fisheries data at the port or community scale may require forming memoranda of understanding or non-disclosure agreements with government entities, a potentially time-consuming process. As such, it may be important to begin this step as early as possible in the planning process.

#### 4.1.3. Host Meetings and Public Workshops to Facilitate Community Engagement

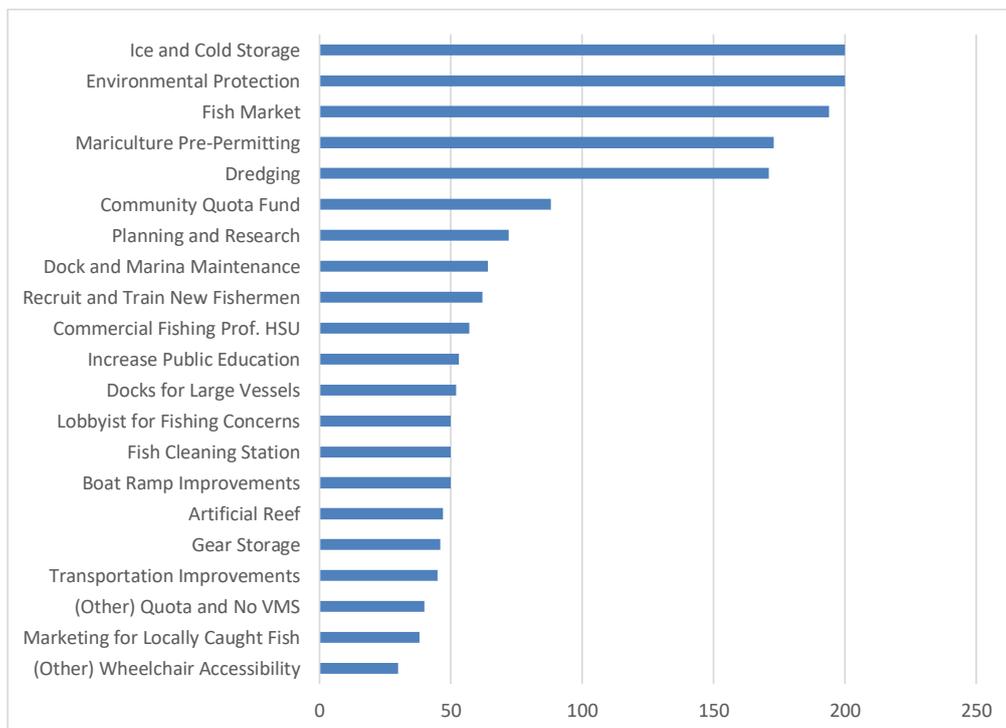
To facilitate a community-driven process, our project teams met with representatives of the community regularly for input and guidance and to inform the community of the progress of the project. We found it helpful to schedule regular meetings with a small number of fishing community representatives who were committed to the process, worked well with others, and represented the range of interests on the working waterfront. In the ports of Shelter Cove and Eureka, we took an additional step to formalize community involvement by establishing an Advisory Committee in each port. The Shelter Cove committee consisted of 12 members and Eureka, 16. The Advisory Committees met formally two times during the process: (1) to introduce the project, present background data, help with introductions to key participants, and to begin brainstorming and (2) to present preliminary findings and discuss possible plan recommendations. We worked closely with fishing community representatives to schedule meetings at appropriate times and times of years so that meetings did not conflict with important fishing windows or other relevant events. Additionally, in Shelter Cove and Eureka, advisory committee members were provided with a small stipend to compensate them for their time commitment to the project.

In addition to meetings with a small group of community representatives, we hosted at least one public planning meeting or workshop in each community, where any interested community members could provide their input related to a vision for the future of the port. The public workshops also provided an avenue to educate the broader community about the value of the working waterfront. The format for public workshops varied. The ports of Morro Bay and Monterey each hosted two public workshops related to their FCSP processes. The workshops began with a formal presentation and ended with an opportunity for the public to provide input. The Shelter Cove and Eureka

workshops were conducted in a charrette-style where members of the public could mingle and examine posters displaying port data as well as interact at different stations and write their ideas for community improvement on butcher paper, post-it notes, or dictate to a project representative (Figure 3). In addition, when attendees entered the venue, they were given 50 “play” dollars and asked to distribute the money among their highest priority investments. After the event, the project team tallied the amount of money that went to each hypothetical investment. The results from the Eureka exercise can be seen in (Figure 4).



**Figure 3.** Shelter Cove public meeting workshop hosted in 2017. In the background, participants debate how to invest their “Shelter Cove Bucks” in potential port projects and place the play money in the labeled manila envelopes of their choosing. In the foreground, participants sit at a station with a facilitator where they brainstorm ideas on butcher paper (photo: Robert Dumouchel).



**Figure 4.** Results from activity at the Eureka public workshop where participants were given 50 “play” dollars and asked to put the money into the projects in which they would invest.

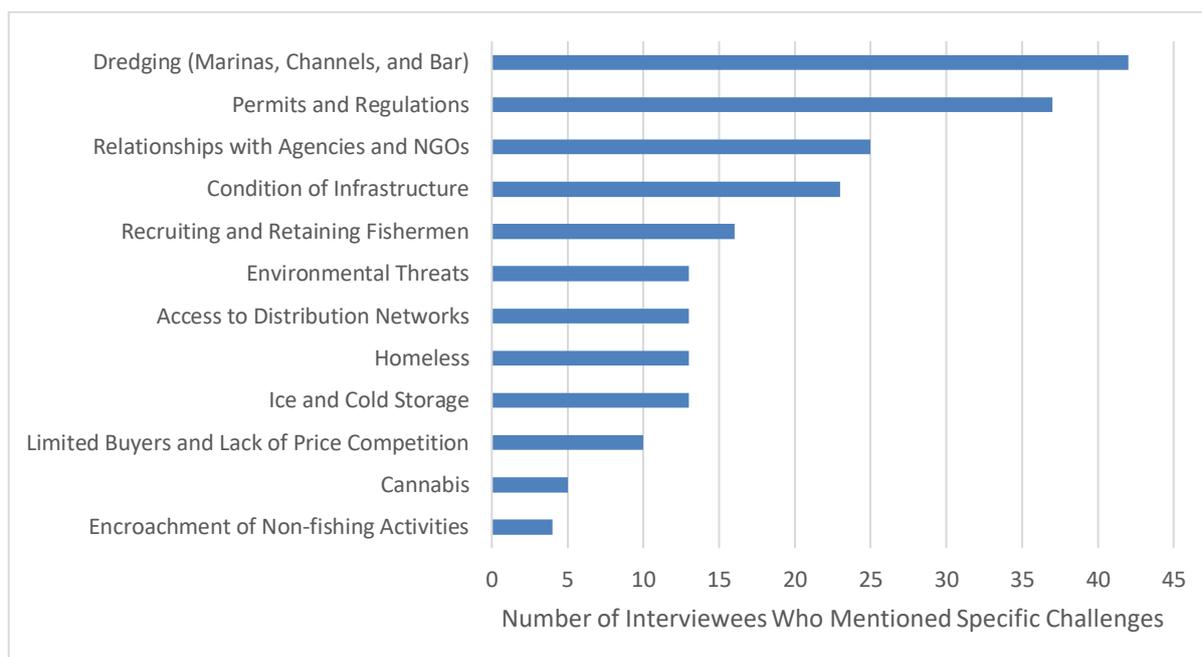
#### 4.1.4. Semi-Structured Interviews and Site Visits

The primary method for ensuring that the FCSP reflects the community's view of the port was the conduct of semi-structured interviews with waterfront stakeholders. For this process, we conducted interviews with open-ended questions that enabled respondents to drive the interview process in a conversational style. The survey instrument consisted of four key questions, In your opinion: (1) What is going well in the port? (2) What are the challenges that the port is facing? (3) What have you seen done in other ports that worked well? (4) If you had \$5 million to make improvements to the local fishing industry how would you invest it? Interviews ranged from 20–90 minutes. We often had two team members at each interview, one to ask questions and the other to take notes. The goal of the interviews was to gain an insider's perspective on the strengths and weaknesses of the port and potential avenues for improvement and investment. This data formed the basis for research and the foundation of recommendations. We targeted individuals to make sure all user groups in the waterfront were represented. The goal of the interviews was to achieve saturation, rather than a statistically representative sample. The combination of targeted interviews with public workshops and advisory committees allowed us to hear from a variety of individuals associated with each fishing community rather than just hearing from the most vocal or engaged.

Throughout the project period, our team members conducted regular site visits to key locations on the waterfront; they also sought to attend any public meetings or discussion related to the waterfront that occurred in the study communities during the planning period. This method, often called participant-observation, helped the project team to build relationships and trust with waterfront users as well as to observe how the fishing community functioned—and its potential strengths and weaknesses—in real-time.

#### 4.1.5. Data Analysis and Recommendations

After the public workshops, semi-structured interviews, site visits, and secondary data collection, we began analyzing the data to help inform the development of an FCSP with a list of recommendations to improve the sustainability of the fishing community. We used qualitative analysis techniques to analyze the interview, public meeting, and participant observation data [37]. First, we sought to develop frequency graphs related to responses to interview questions 1, 2, and 4 about community strengths, weaknesses, and priority investments. Members of the project team reviewed all of the interview responses for each question for a given community. The team then developed a master list of the different responses to each of the three questions and sought to group the responses together into themes or bundles. The goal was to develop a list that encompassed all possible responses. The team then developed a Google Forms® instrument that contained a list of the possible responses for each of the three main interview questions. We then filled out the Google Form® for each interview conducted—selecting the various strengths, weaknesses, and priority investments that were brought up in any given interview event. After all the interviews had been analyzed, Google Forms® provided a summary output of the frequency with which different responses were given to a particular question. These frequency graphs (see example in Figure 5), helped the project team identify the top concerns and priorities among waterfront stakeholders. In addition to developing numerical graphs, the project team sought to organize qualitative responses. For this analysis, we coded the interview data based on the four fishing community sustainability categories (which were also chapter headings in the final FCSPs) and we used the coded data to develop a list of representative interview quotes for each of the sustainability categories to integrate into the final FCSP document as well as other published materials. Analysis of secondary data and existing reports supplemented the assessment of strengths and areas of concern in the port.



**Figure 5.** Graph depicting the number of individuals that cited a particular challenge during semi-structured interviews with waterfront stakeholders from Eureka. Based on interviews with 64 individuals.

Figure 5 shows the results of the interview analysis for the community of Eureka, highlighting the top investment priorities provided in response to interview question four. The results show how the immediate context of the port can influence the community response. Dredging was the most common priority for investment. This prioritization is likely related to the fact that during the FCSP project, dredging had been delayed and was reaching a crisis level where several boats were stranded at the marina during low tide. In the year following the interviews, dredging had been completed. While it remained a priority, it may not have dominated interview responses in a different year. Future planners should be aware of the pull of the current context on the planning process and try to ensure that short term emergencies do not overwhelm the long-term vision for the community.

A comparison of Figure 5 with Figure 4, which shows the top recommendations from the public meeting in Eureka, highlights the importance of including both public workshops and stakeholder interviews in the planning process. In stakeholder interviews in Eureka, the top priorities for investment related to items within the fishing community such as infrastructure and permit/regulation requirements. In the Eureka public workshop, attendees introduced new priorities that related to their vantage point as community members who interact with but are not necessarily a part of the working-waterfront community. The top recommendation from the public workshop was environmental protection and the third priority was a fish market as members of the public were concerned that it was difficult for them to purchase locally-caught fish. Another concern from the public workshop related to wheelchair accessibility to ensure that all members of the community are able to access waterfront areas.

After analyzing and organizing data, we developed a draft or a “long list” of plan alternatives. These “alternatives” were actions that the community could take to help reduce vulnerabilities and improve the long-term resilience of their port. The alternatives were selected based on their ability to address the weaknesses or challenges listed by waterfront stakeholders as well as to improve or maintain key port strengths. Alternative ideas came directly from community members in interviews and public meetings. Alternatives were also developed through a consideration of activities in other ports that have been successful in addressing key concerns. We selected alternatives to ensure that all four aspects of sustainability highlighted in the FCSP framework were addressed in each plan.

After developing a long list of alternatives, we met with a group of fishing community representatives to review and prioritize alternatives. Community members reflected on missing items and discussed how they want to organize or prioritize the recommendations in the plan. The port of Morro Bay chose a streamlined list of 10 recommendations. They felt a more targeted list would be easier to achieve as policy-makers and champions in the community would not be overwhelmed and could better focus energy and resources. Monterey decided that all of the 34 alternatives should be included as recommendations in their final plan. Shelter Cove chose 13 key recommendations and included seven other items that deserved further attention. Eureka chose 12 recommendations, but rather than listing them in priority order, they organized their recommendations based on the four categories of sustainability.

Final recommendations for the four plans are included in Appendix A. The 63 recommendations across the four ports are color-coded based on the primary sustainability category, with the acknowledgement that many recommendations could address multiple categories. Appendix A reveals that all the communities included recommendations that addressed all four sustainability categories. Recommendations aimed at Infrastructure and Critical Services were the most common, accounting for 48% of the total. Social and Community recommendations accounted for 22% and Economics and Markets 20% of the total. Environment and Regulation recommendations were the lowest accounting for just 10%.

The high number of infrastructure recommendations as well as infrastructure needs expressed in these planning efforts (Figures 4 and 5; Appendix A) demonstrate that infrastructure development and maintenance is an important priority for fishing communities in California. In efforts throughout the four ports, we consistently noted concerns about declining and missing infrastructure. Infrastructure investment remains a high priority for these communities, as many basic aspects of a fishing community cannot function without working infrastructure. Infrastructure and Social were the most common types of recommendations, and this may also be linked to the fact that, as Figure 1 shows, these are the areas that FCSP planning at the community scale is best poised to address. Environmental recommendations were the least common. This could be linked to the Central and Northern California context, where fisheries are some of the most regulated in the world and where many fisheries once in decline have been listed as recovered [38,39]. Representatives of the fishing community may have felt that environmental sustainability was fairly well-addressed through existing policies and that the long-term sustainability of their fishing community required a greater focus on infrastructure and socioeconomic elements.

Appendix A shows that the recommendations differed from community to community. Each fishing community was able to make the FCSP framework work for their unique context and needs. While the recommendations differed across the ports, there were some commonalities. All four communities included recommendations related to political engagement and organization, increased access to or involvement in fisheries, protection of waterfront uses from encroachment, investment in key pieces of port infrastructure, and efforts to improve market options for seafood. Each of the ports contained recommendations that were linked to short-term emergencies or concerns—for Eureka it was dredging, for Shelter Cove it was developing a sustainable launch system, and for Morro Bay and Monterey it was related to developing community quota funds which were much in discussion during the planning processes. However, the ports also included recommendations that were focused on the long-term sustainability of the port beyond present-day emergencies, with, for example, recommendations related to sea level rise adaptation and the recruitment and retention of new participants in the fishing industry. Overall, the final recommendations show that within the process communities were able to balance their short-term and long-term needs and to develop strategic plans that focused on both.

#### 4.1.6. Draft Plan, Review, and Final Plan

After all of the data had been gathered and analyzed, the project team wrote a draft FCSP. The goals of the FCSPs were two-fold: (1) to educate the greater community about the fishing industry and the

working-waterfront and highlight its value and (2) to deliver a clear set of recommendations which the fishing industry with local government officials and others can implement. We sought to develop plans that were written in clear, accessible language with attractive visuals [33–35,40]. The plans began with an Introduction and then chapters that described the current setting or baseline conditions of the fishing community. The structure tended to adhere to the sustainability framework with chapters about the Social, Economic, Environmental, and Infrastructure conditions. However, communities could make decisions to add additional sections of interest to them. For example, Monterey decided to include an additional section, Rents and Wharfages, as it was an area of critical and universal concern. After describing the setting, the FCSPs included a chapter with the Recommendations. This chapter outlined the community's top priorities and included specific information about the next steps and potential funding sources to implement those recommendations. The plans ended with a chapter about potential Funding Sources or avenues through which recommendations could be implemented. We found that providing clear information about how to fund recommended actions can be crucial to ensuring their implementation. The draft plans were then circulated for review by members of the fishing community and local government officials. The feedback from the review process was incorporated into revisions for a final FCSP.

#### 4.1.7. Outreach and Implementation

Once the final FCSPs were developed, project team leaders and members of the fishing community conducted extensive outreach to make sure that the findings reached a wide audience. Outreach activities included presenting findings at local government meetings (City, County, Port/Harbor) as well as at state and federal fisheries-related meetings. In Monterey and Morro Bay, local government entities such as city councils voted to formally "accept" the contents of the plan, which helped to formalize their commitment to the plan contents [33,35]. We found that outreach was aided by the development of a project website and a social media presence that included updates and the final content of the plans (see e.g., [www.humboldtfishplan.com](http://www.humboldtfishplan.com)). Project leaders also worked with local media outlets to provide the public with information related to the FCSPs.

On all four FCSP experiences from this manuscript it was the intent of the fishing community to make positive change and to achieve implementation; in other words, to "build something" (MOR, 2013). No one wanted a plan that would sit on the shelf. So, once the plans were complete, planners handed off the FCSP to the fishing community from which they could take direction to advocate for the priorities and to make them come to fruition. The Morro Bay and Monterey processes showed that the implementation of plan priorities takes time and requires persistence and leadership from the fishing community. Some plan recommendations, such as the formation of fishing associations or developing better political engagement, fishing communities were able to implement on their own and in a short time. Other recommendations such as those related to infrastructure required partnerships with local government entities, funding, and a longer path to completion. We found that fishing community engagement and persistence to implement the plan after it had been completed was a crucial part of the FCSP planning process.

#### 4.2. Outcomes

Interviews conducted throughout the project, follow-up conversations with planning participants, and an assessment of community activities and progress provide a window into some of the outcomes or benefits that the study communities experienced as a result of participating in FCSP processes.

##### 4.2.1. Implementation of Beneficial Actions

Over time, we have observed that FCSP processes have played a key role in helping fishing communities to implement actions that lead to direct benefits to their overall social, economic, and environmental sustainability. The Monterey and Morro Bay FCSPs were completed in 2013 and 2014 respectively and those communities have already made progress towards implementing several

of their FCSP recommendations (Appendix A). In the Morro Bay FCSP, the number one priority recommendation was a boatyard and haulout facility. The plan was approved by the City Council in 2014, the City funded a Demand Analysis in 2015, conducted a preliminary site plan in 2016 and released a Design Build RFP in 2017. Morro Bay has also taken significant steps to address recommendation five (Political engagement and support of community-based fishermen), by increasing their engagement in political processes and working with the Pacific Fishery Management Council and others to help improve the pathway for smaller community-based vessels to utilize the groundfish quota held by their community quota fund. In 2017, the City of Morro Bay completed a Sea Level Rise Vulnerability Assessment and Policy Framework, which was the ninth recommendation from their FCSP.

Key recommendations in the Monterey FCSPs included the formation of a community quota fund and a fishermen's organization or association. In 2014, the Monterey Bay Fisheries Trust (MBFT) was formed with a mission to "advance the social, economic and environmental sustainability of Monterey Bay fisheries" [41]. The MBFT was in the process of formation as the FCSP was developed. The FCSP fulfilled the federal requirement under MSA which allowed the organization to purchase quota and the FCSP helped the fishing community convince the City Council to purchase \$225,000 in quota for the MBFT to manage. In the years since, the MBFT has acquired additional permits and fish resources, leading to a clear economic benefit for the fishing community. In addition to purchasing quota, the MBFT has played many of the political engagement roles typically associated with a fishing association. They have been active and effective players in policy discussions at the federal (another FCSP recommendation), state, and local level. The Monterey FCSP also included recommendations related to zoning and protection of fishing and working-waterfront industries from encroachment by other uses. In 2016, the City of Monterey issued a Waterfront Master Plan that incorporated several of the FCSP recommendations. The Master Plan specifically references the FCSP and states, "The recommendations [in the FCSP] are consistent with the Waterfront Master Plan Goals, Programs, and Projects regarding preservation of Monterey's fishing heritage" (p 10). The Master Plan includes goals to ensure that use and development in working-waterfront areas "encourages and supports the preservation of the Monterey fishing industry" (p. 65). The Monterey FCSP also included a recommendation for developing local markets for Monterey-based seafood and community supported fisheries (CSF). Since the plan's implementation, a small-scale CSF called Monterey Local Catch expanded their operation and in 2015 rebranded as Real Good Fish, and that company has since expanded to offer CSF subscriptions in several California ports.

The Eureka and Shelter Cove FCSPs were issued very recently, so there has been less time for implementation of recommendations. However, the community of Shelter Cove has already taken steps to implement their top two priorities: form a fishing association and establish a sustainable launch service. In October of 2018, the community began meeting regularly to discuss forming an association and with the assistance of a legal consultant they have developed an organizational structure and filed paperwork to form a non-profit organization called Shelter Cove Fishing Preservation, Inc. (SCFP). In 2018, the Humboldt Bay Harbor District announced that they were no longer going to be responsible for the tractor launch service at Shelter Cove as the Harbor District is based in Eureka two hours away, and it has been difficult to manage the distant operation of services. The newly formed SCFP is in negotiations with the Harbor District to take over the launch operations. This will enable the operations to be maintained and supported by a community-oriented group that may be better positioned to ensure the service's continued operation and reliability.

#### 4.2.2. Building Social and Political Capacity

All of the ports in this study had undergone a period of decline. Between 1992–2006, the number of commercial vessels operating out of each of the ports had dropped by more than half. In 2006, Shelter Cove had seven active vessels, but community members described a fleet of over 100 vessels operating out of the port in the 1970s and 1980s. These declines have all shown a leveling off and after 2006 the

ports all seem to be maintaining a steady or increasing number of participants, suggesting a clear path forward for the industry. But the declines have had serious effects on the morale and capacity of fishing communities. Once strong fishing associations had languished or lapsed, instances of conflict within the fishing community or with government entities were common, and local governments, perhaps guided by the false belief that fishing was a 'dying industry', were less focused on working-waterfront needs. One fisherman from Shelter Cove described the fishing industry as being "out of sight out of mind" (SC, 2017), and another said, "This place is pretty hard to get anyone to do anything" (SC, 2017). Pessimism was common in the ports, with statements such as, "everything [in the port] is on a downhill slide" (EUR, 2017) and "not much is working well in Shelter Cove" (SC, 2017). A Eureka stakeholder summed up this atmosphere of conflict with the following statement, "if you want a friend on the waterfront, get a dog" (EUR, 2017). Fishermen also described how the onslaught of regulatory changes over the past decades has caused the fishing industry to shift to a defensive mode, where they are always looking to prevent or limit damage from potential decisions as opposed to think about their future: "We are not looking forward—we want no net loss—so it is hard to look forward" (EUR, 2017).

FCSP processes appear to have played a strong role in helping fishing communities develop their social and political capacity and in bringing local government attention back to the needs of the fishing industry. The FCSPs from these processes were high-quality documents on par with Specific Plans and other local government plans and reports. Experiences in Morro Bay and Monterey suggest that the industry and harbor management's access to these plans helped to elevate the importance of the fishing community and industry in the eyes of local governments, making the working-waterfront an increased area of focus for planning and investment initiatives. Since the FCSP was complete, the City of Morro Bay has worked closely with the fishing community to implement recommendations, such as developing a boatyard and haulout facility. The City of Monterey has similarly taken their port's FCSP into consideration and specifically referenced the FCSP in future planning documents like the Waterfront Master Plan. The FCSP process also provided an opportunity for fishermen, agency staff, local government officials, and other stakeholders to engage with one another outside of controversial issues or area of conflict. Previously, these stakeholders most frequently engaged with one another during emergency or crisis situations, such as the planned implementation of restrictive fisheries policies or conversations about controversial waterfront developments. The FCSP process provided an opportunity for waterfront stakeholders to work together and to understand that they all have a common goal: the long-term sustainability of their port's fishing community.

Perhaps the most dramatic transformation occurred in the community of Shelter Cove—a community that demonstrated pessimism and frayed social relationships at the beginning of the project. Sparked by, and in parallel with, the FCSP process, they worked to develop a fishing association. In the span of three short months of intensive meetings, they had submitted their paperwork to the IRS to form the organization. When a member of the fishing community was asked if things have changed in Shelter Cove over the two years of FCSP planning, he stated that the community has already improved their outreach to and working relationship with local government entities (SC, 2018). At a December 2018 meeting of the HBHRCD, one commissioner stated that he was impressed by the way the Shelter Cove community has "showed real capacity" in their interactions, and how he "can't thank the fishermen enough for stepping up to the plate" (HD, 2018) to work with the HBHRCD on the launch service. When asked to describe how social relationships in Shelter Cove have changed in the past two years, which coincided with FCSP planning, a community member stated that he's seen a "tearing down of walls in the community" where "there's slow but a greater social enlightenment how everybody who wants to be involved in the maritime [area] is in the same boat together." He said the fishing community has started to "rally together in a way that hasn't happened in the past" (SC, 2018).

## 5. Conclusions

We found that FCSP processes can be a great tool to engage fishing communities in strategic planning for the future of their ports and that implementing FCSP processes can produce tangible and

intangible benefits for fishing communities. The planning process can also help to improve community relationships and trust by engaging fishermen, local government, agency staff, and other stakeholders on a task with a common vision: improving the long-term viability of the fishing community. In the four processes we conducted, we found that nearly every interest group and stakeholder was supportive of the FCSP process and plan recommendations. For some fishermen, the experience was revelatory—seeing that local government and agency staff are not always against them and were instead interested in a vibrant future for their industry.

As with any planning or economic plan, FCSPs have their limitations. All of the FCSPs to date have been developed at the community or port scale. This scale of analysis can be helpful for addressing challenges linked to social networks and infrastructure or land use. However, we found that many of the structural challenges facing fishing communities have their roots in decisions that are made at the state and national level. All communities described challenges with access to resources for their small-scale operators and with recruiting and maintaining new and younger participants into the industry. The high cost of permits, limited access to fish resources, and lack of financing or low-interest loans were cited as challenges. These challenges are linked to federal and state policy and allocation decisions. Additionally, funding for infrastructure projects often comes from federal or state sources.

FCSP planning on the community scale alone may not be enough to make the substantive changes necessary to ensure the long-term viability of fishing communities. A next step would involve a scaling-up of the FCSP process—to conduct strategic planning for fishing communities at the regional, state, or national scale. This process could identify consistencies in needs and contributions among ports and give the industry a greater voice. Fisheries management agencies such as the California Fish and Game Commission or the U.S. Regional Fishery Management Councils could sponsor these planning processes. Planners could consider findings from a variety of community-level investigations to develop recommendations that could be implemented at the state and federal level to help ensure the viability of fishing communities. Scholars of natural resource management highlight the importance of incorporating nested scales into effective management regimes [42,43]. This nesting of scales may also be important for strategic planning for natural resource-dependent communities. A combination of community-level and regional planning efforts could contribute to the long-term sustainability of fishing communities as well as the seafood industry overall which is reliant on healthy and thriving fishing communities to harvest the resources.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

**Table A1.** Recommendations contained in the FCSPs for each of the four study ports, in the order they were listed in the plan. Recommendations are color-coded based on the primary sustainability category they seek to address. White = Infrastructure and Critical Services; Light Gray = Economics and Markets; Medium Gray = Social and Community; Black = Environment and Regulation.

#	Morro Bay	Eureka	Shelter Cove	Monterey Part I	Monterey Part II
1	Boatyard/ Haulout Facility	Protected Marine-Dependent Uses	Fishing Association and Political Engagement	Congestion and Improving Truck Access	Support Dialogue to Re-establish Monterey Bay Halibut Trawl Fishery
2	Fuel: Maintain Service and Reduce Costs	Cold Storage and Ice Facility	Reliable, Sustainable Launch System	Improve Safety Features on Wharf II	Establish Zoning for Fishing and Related Uses "By Right"
3	Refrigerated Storage and Deep Freeze	Dredging	Fish Cleaning Station Improvements	Identify and Evaluate Underutilized Sites	Establish a Special District for Working-Waterfront
4	Promotion and Marketing of Working-Waterfront	Mariculture Pre-Permitting and Permit Streamlining	Processing, Cold Storage, and Ice Facilities	Consider Uses for the Monterey Fish Company Warehouse	Greater Flexibility for Sub-tenant and Sub-leases On Waterfront
5	Community Participation, CQF	Gear Storage and Security	Greater Control Over Marina Property	Uses for the North Apron Area	Maintenance and Repairs
6	Increase Berths and Slips for Commercial Fleet	Dock and Marina Maintenance	Traffic, Circulation, and Parking Improvements	Encourage Retail Seafood Facilities: Wharf II	Make Business Planning a Waterfront Tenant Obligation
7	Feasibility Assessment for New Processing Facility	Markets Analysis and Development and Promotion	Maintenance of Boat Ramp	Establish and Independent Source(s) for Ice	Update the FCSP on three- or five-year Intervals
8	Improve Vehicle Access	Access to Commercial Fish Resources and CQF	Market Evaluation and Attract Seafood Buyers	Reduce Fuel Expenses for Fishermen	Develop Alliances with Tourism and the Business Community
9	Managing Sea Level Rise	Leadership and Political Engagement	Road Condition and Maintenance	Facilitate Establishment of A Commercial Fishing Oriented Chandlery	Develop Alliances with Agriculture Industry
10	Implement FCSP and Update	Recruit and Retain New Fishermen	Recruit and Retain New Fishermen	Allow Gear Storage and Mending	Engage in Collaborative Research Seafood Watch Program Involvement and Evolution
11		Habitat Restoration and Protection	Access to Commercial Fish Stocks/CQF	Offloading Hoist	
12		Collaborative Marine Research	Habitat Restoration and Protection	Continue to Support Alliance of Communities for Sustainable Fisheries	Improve Connections with Monterey Bay Sanctuary
13			Promotion of Tourism and Recreational Fishing	Commercial Fisherman's Organization	Employ Web-Based Tools and Social Media For Promotion
14				Pacific Fishery Management Council Participation	Establish a Fishing or Seafood Festival
15				Support the Formation of a CQF	Post Banners and Interpretive Signage
16				Reduce the Burden of Observer Costs	Develop CSF/ Local Markets
17				Support the Refinancing of the Federal Trawl Buy-back Loan	Bring Back the Juvenile Salmon Release Program

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