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COMMUNITY SUSTAINABILITY COOPERATIVES IN CENTRAL CALIFORNIA: CONTINUED FISHERY PARTICIPATION THROUGH QUOTA SHARE HOLDINGS IN THE PACIFIC COAST GROUND FISH FISHERY

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Community Sustainability Cooperatives in Central California: Continued fishery participation through quota share holdings in the Pacific Coast Groundfish Fishery

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Abstract

This report evaluates the importance of the federally-managed Pacific Coast groundfish fishery to the fishing communities of Morro Bay, CA and Monterey and Moss Landing, CA through data collected from in-person interviews with community members. We offer insight into how Community Sustainability Cooperatives (CSCs) provide for the sustained participation of these small, coastal communities in the groundfish fishery by attempting to "anchor" or fix quota share in these communities. Our research reveals some key objectives and operational differences between the Morro Bay Community Quota Fund (MBCQF) and the Monterey Bay Fisheries Trust (MBFT). This includes the MBCQF's primary focus on generating local groundfish landings by subsidizing a local fishing fleet, with the objective of increasing profitability for fishers. In contrast, the MBFT is focused on tackling a broader suite of issues including generating market demand for locally-sourced fish and decreasing the cost of participation in the fishery.

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1 Introduction

1.1 Study overview

In 2014, a group of fishing community stakeholders in the Morro Bay area of California began operation of the Morro Bay Community Quota Fund (MBCQF), a non-profit entity created to hold and manage individual fishing quota (IFQ) from the Pacific Coast groundfish fishery. In 2015, community stakeholders in the Monterey Bay area (California) formed the Monterey Bay Fisheries Trust (MBFT), a non-profit entity that was also created to manage groundfish quota. A driving force behind formation of these entities was concern that the individual transferable quota system, implemented for groundfish in 2011, would result in groundfish landings flowing out of their communities. Our study seeks to better understand the history and governance of these non-profit entities as well as explore the methods by which the cooperatives generate social, economic, and ecological benefits for their communities.

Our study collected data on the history, objectives, and operational procedures of MBCQF and MBFT through extensive semi-structured interviews with a broad array of fishing community stakeholders connected to the ports of Morro Bay, Moss Landing, and Monterey, CA. We augmented our data collection with interviews of selected groundfish fishery stakeholders in four additional communities who, in 2015-2016, were in the process of forming Community Sustainability Cooperatives: Santa Barbara, Half Moon Bay, and Fort Bragg, CA; and Ilwaco, WA. The purpose of this report is to detail the methods used and data collected in our study. A secondary goal of this report is to pair results from interviews with existing data in order to highlight emerging research topics of interest.

In recognition of the fact that these organizations have similar goals (i.e., retain quota in the community) but differ in subtle ways (e.g., operational protocols), we use the term 'Community Sustainability Cooperative' (CSC) to refer to both the MBCQF and MBFT. The defining feature of these Community Sustainability Cooperatives is the direct participation of the fishing community in the groundfish fishery through ownership of quota share. The term is meant to convey that, although their methods and priorities may differ somewhat, the broad goal of these organizations is to sustain the community's access to traditionally important fisheries through cooperative involvement of a variety of community stakeholders.

1.2 Motivations and goals of the study

Our study examines how two communities addressed changes in local access to groundfish stocks that were brought about by a change in the regulatory regime. We hope to nest these results in the context of the broader literature on understanding how fishing communities adapt to changes in local resource abundance. The nature of resource access among coastal

communities is evolving due to a combination of social, economic, ecological, and regulatory factors. In terms of ecological shifts, from [1, p.512],

“Climate change is altering the distribution, abundance, and diversity of marine species globally. On a local scale, conditions will become more favorable for some species and less favorable for others, which will ultimately alter the mix of species available for harvesting in any given coast ecosystem.”

In addition to ecological shifts, many port areas and coast communities are already experiencing social and demographic shifts. Gentrification and general long-running decline of the fishing industry is causing some water front areas to become more focused on uses other than commercial fishing (recreational fishing, tourism, residential development), which can limit the availability of necessary fisheries infrastructure. Changing consumer preferences for seafood products is altering the marketability of certain locally harvested species. As these changes occur, coastal communities are increasingly faced with difficult choices about whether to subsidize local commercial fisheries in order to maintain the viability of traditionally important industries or whether to plan a managed transition away from certain commercial fisheries or commercial fishing altogether. Also, in subsidizing the fishing industry, coastal communities will be faced with the challenge of how best to incentivize innovation among fishers as the nature of commercial fishing changes. MBCQF and MBFT are two examples of collective action involving community stakeholders meant to subsidize local commercial fishing fleets in order to maintain industry viability in the face of adverse local economic, ecological, and regulatory conditions.

In the case of the Morro Bay area and Monterey area, the nature of groundfish access was fundamentally altered with the implementation of the groundfish IFQ program. This regulatory change was the most recent in a string of events that have been degrading the conditions that historically defined the Morro Bay and Monterey areas' locational advantages in the commercial fishing industry. Other factors contributing to the persistent decline in groundfish activity in port of Morro Bay and ports of Monterey and Moss Landing include:

- Overfishing declarations throughout the late 90s and 2000s led to lower catch volumes by constraining access to relatively abundant species.
- Declining catch volumes and inconsistent landings eroded access to markets.

We contend that when ecological or regulatory change erodes a fishing industry's locational advantage (such as changing local abundance of key target species would do) there are three broad courses of action:

1. Pursue a goal of minimizing changes to the local commercial fishing fleet by subsidizing historically important forms of fishing effort.
2. Help commercial fishers restructure portfolios to better match current and anticipated future comparative advantage (help fishers move into other fisheries).
3. Manage a transition away from commercial fishing and invest assets in other industries that better leverage existing comparative or locational advantage.

MBCQF and MBFT allow us to observe two organizations that were formed by fishing community stakeholders in order to help their local commercial fishing industries adapt to a major regulatory change. This regulatory change was implemented in response to long-run bioeconomic trends in the fishery. The environmental and economic changes that motivated the move to catch share management in the groundfish fishery are likely to persist in the future. We are interested in examining whether the formation and operation of MBCQF/MBFT contain lessons that might benefit other coastal communities likely to face ecological, economic, and regulatory changes to important commercial fisheries in the future.

Specifically, our study was designed to investigate three phenomenon resulting from cooperative action among diverse groups of fishing community stakeholders:

1. Transferable quota in fisheries implements a market based system for allocating landings. Market based systems encourage the revelation of individual values through willingness to pay which can be reflected in market prices. Our study examines whether the direct participation in the market for groundfish quota by fishing community members can shed light on cultural, historical, or ecological value that community members may place on local fisheries.
2. MBCQF and MBFT include representation from a diverse group of fishing community stakeholders: direct fishery participants (fishers and fish buyers and processors), conservationists from environmental non-profit groups, members of the local science community, and civic leaders. Our study investigates how the environmental (conservation), economic, and social objectives of the CSCs are balanced. We also placed a particular focus on evaluating how objectives were prioritized in the event of a conflict.
3. Possibly because of the diversity of community members involved in the CSCs, these groups manage quota for the benefit of a diverse group of fishery participants and stakeholders. Our study examines the operational methods of MBCQF and MBFT and analyzes how those methods generate benefits for different stakeholder groups.

1.3 Outline

The remainder of our report is organized as follows: Section 2 provides necessary background on the study subjects and study area. Section 3 discusses our study methods. In Section 4 we present results of the study. It is important to note that Section 4 focuses on reporting information gained through semi-structured interviews as that information was presented to us. In Section 4 we attempt to organize anecdotal information into themes. While we do, in some cases, supplement these personal communications with data from other sources in order to provide context, we try not to draw inferences or discuss the implication of information relayed through interviews. Section 5 is reserved for analysis and discussion of results. In Section 5 we

draw extensively on external data to examine themes present in interview results relative to existing fisheries and socio-economic data.

2 Study Area Background

In this section, we provide two important types of background materials. The first is a summary of our study subjects: The Morro Bay Community Quota Fund and Monterey Bay Fisheries Trust. The second is a brief background on the commercial Pacific Coast groundfish fishery and the study area, California's Central Coast. This background provides important context for understanding the motivations and operations of the study subjects. As this fishery has been studied extensively by regulators [2] and academics [3, 4], we focus on providing a brief regulatory history and providing some background on the importance of this fishery to the areas including the ports of Morro Bay, Avila, Monterey, and Moss Landing, California.

Our study pertains primarily to human actors with a social rather than precise geographical interpretation of a fishing community. The CSCs under study here focus their commercial fishing related activities on precise, well defined fishing ports but adopt a looser, informal understanding of who may be considered a fishing community stakeholder for the purposes of participating in the CSCs. We have attempted to reflect this ambiguity in our nomenclature. Our report will use the term "Morro Bay area" to refer to the primary area of influence for the Morro Bay Community Quota Fund. This includes the groundfish ports of Morro Bay and Avila, CA as well as surrounding communities which may be understood to comprise the Morro Bay fishing community. In order to avoid possible confusion resulting from the fact that Morro Bay is both a city and a natural embayment we will reserve use of "Morro Bay" for the city of Morro Bay and use "the port of Morro Bay" to refer specifically to the port. Similarly, we will use "Monterey area" to refer to the area of influence for the Monterey Bay Fisheries Trust. This designation includes the ports of Monterey and Moss Landing, CA as well as surrounding communities. We will reserve use of the term "Monterey Bay" to specifically reference the bay.

2.1 Introduction to the Community Sustainability Cooperatives (CSCs)

This section provides a short background on the two CSCs in our study. We focus here on a brief discussion of what these institutions are, based on publicly available information [5, 6]. Since the motivations for their formation were an important focus of the study we present the motivations, goals, and objectives as part of our Results section.

2.1.1 Morro Bay Community Quota Fund (MBCQF)

The Morro Bay Community Quota Fund was established as a 501(c)(3) nonprofit organization in 2014. The organization's primary purpose is to own "legally recognized and enforceable fishing privileges" such as quota shares and fishing permits, and lease quota pounds, from the Pacific Coast groundfish fishery, in an effort to maintain local, community access to this fishery [7]. MBCQF purchased their initial quota portfolio from The Nature Conservancy at a price below the prevailing market rate for quota. MBCQF generates revenue for its operations primarily by leasing quota pounds to vessel owners who use that quota to land groundfish. MBCQF has been leasing quota pounds since 2014.

The MBCQF prioritizes the lease of target species quota pounds to "qualified fishermen¹ in the Morro Bay/Port San Luis area", followed by "other qualified fishermen participating in the Risk Pool", and "any other legal participants in the fishery" [7]. The risk pool referred to is the California Groundfish Collective [8]. The MBCQF's bylaws also incentivizes the use of "selective lower impact gear such as hook and line and trap" towards reducing the "fishing footprint" in the Morro Bay/Port San Luis area and reducing bycatch of overfished species.

The MBCQF is led by a six-member Board of Directors and a general manager (executive director). The bylaws articulate that five of the Board members represent the following: two individuals from the fishing industry including at least one who is active in the Morro Bay Commercial Fishermen's Organization; two individuals from "conservation organizations and/or academia"; and one individual with experience working for a "California Governmental Agency". Currently, the Board is comprised of one environmental consultant, a harbor director, two commercial fishers, and two academics.

2.1.2 Monterey Bay Fisheries Trust (MBFT)

The Monterey Bay Fisheries Trust was formed in 2014 as a 501(c)(3) nonprofit organization, a "direct result" [9] of a 2013 Fishing Community Sustainability Plan prepared by the City of Monterey. One of the plan's recommendations included the development of a community quota fund for the local commercial groundfish fishery. This was supported by the City Council of Monterey [10]. Like the MBCQF, this organization was formed primarily for the purpose of owning quota shares and leasing quota pounds from the Pacific Coast groundfish fishery, and to provide local fishermen with continued access to commercial groundfish harvesting activities.

¹ Throughout this report we have attempted to use the inclusive term "fisher" to refer to direct commercial fishery participants. However, the term "fisherman" was used extensively by interview respondents and appears in communications from both the Morro Bay Community Quota Fund and the Monterey Bay Fisheries Trust. As a result, the terms "fisher" and "fisherman" are used to describe direct commercial fishery participants. In general, we have attempted to limit our use of "fisherman/fishermen" to instances of reporting back interview responses or sentiments as they were expressed to us.

“Local fishermen” are defined as fishermen who paid property tax on their fishing vessel in Santa Cruz County or Monterey County in the previous year [11].

Like MBCQF, the majority of the quota shares held or managed by the MBFT came from The Nature Conservancy, who in 2015, were required by law to divest much of their quota share holdings [12]. Additional quota shares have been purchased from local fishermen. Funding sources, including loans, to purchase quota shares and permits came from the California Fisheries Fund. The City of Monterey purchased \$225,000 in quota shares and permits in 2015 [13], and an additional \$583,000 was appropriated in 2017 for the purchase of additional shares from a “long-time local Monterey angler” [14]. These shares are managed by the MBFT. In 2018, quota share holdings by the MBFT and the City of Monterey amounted to approximately 5.6 million and 226,000 quota pounds (QP), respectively [15].

The MBFT’s 2018 Lease Policy describes which entities such as local fishermen, groundfish collectives, or the open market, are prioritized for leasing quota pounds. The Policy also states that the “Trust aims to support local fishermen by offering below market lease rates” [11]. Though the MBFT generates revenue through quota leases, in contrast to the MBCQF, it also receives substantial funding for its operations from grants and donations from other non-profit organizations (e.g., The David & Lucille Packard Foundation [16, 17]). MBFT’s 2015 IRS Form 990 Part VIII lists \$1,176,237 in line f: *All other contributions, gifts, grants, and similar amounts not included above* [18].

The MBFT is led by a six-member Board of Directors and executive staff (e.g., executive director, quota manager) [19]. The current Board membership is comprised of two commercial fishermen, two individuals from conservation organizations, a retired harbormaster, and one academic.

2.1.3 Relationship with other CSCs

In addition to the MBCQF and MBFT, there were three other commercial fishing focused CSCs in California which held or plan to hold quota share in the Pacific Coast groundfish fishery at the time of our interviews. These are the Fort Bragg Groundfish Association, the Half Moon Bay Groundfish Marketing Association, and the Commercial Fishermen of Santa Barbara.² Like the MBCQF and MBFT, these organizations have, or aim to procure, groundfish quota share from The Nature Conservancy to provide local fishers continued access into this fishery.

Generally, all of these organizations manage and allocate target species quota pounds to fishers. In the case of the MBCQF, management of overfished (non-target or bycatch) species quota pounds is shared with a risk pool, the California Groundfish Collective [7]. Coast-wide, risk pools have been formed by fishery participants to pool limited overfished species quota and

² We understand that groundfish fishery stakeholders in the port of Ilwaco, WA also considered establishing something like a community quota fund as early as 2013. To our knowledge however, no entity had been formed in Ilwaco to hold community groundfish quota at the time of our interviews.

make them available to all risk pool participants [4]. Doing so can reduce an individual's financial risk and transactions costs, transferring that risk to the collective. The purpose of the MBCQF's participation in the California Groundfish Collective (or similar entity) is to reduce overfished species interactions, create "a more efficient [f]ishery", and maximize "the economic and conservation performance of the [f]ishery through adaptive management". Similarly, the MBFT participates in the California Groundfish Collective (or similar entity) that is "designed to reduce OFS [overfished species] interactions, rebuild OFS stocks and protect sensitive habitat" [11].

2.2 Fishery background

2.2.1 Regulations and sectors

1994 - 2010

The federally managed commercial Pacific Coast groundfish fishery is prosecuted in federal waters (3 to 200 nautical miles from the coastline) and extends from the U.S.-Canada border in the north to U.S. – Mexico border in the south. The Pacific Fishery Management Council (PFMC) is one of eight regional fishery management organizations in the United States established by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson). The PFMC is responsible for developing policies and regulations associated with the Pacific Coast groundfish fishery. The Secretary of Commerce and the National Marine Fisheries Service (NMFS or NOAA Fisheries Service), respectively, are responsible for approving and implementing these policies and regulations.

Groundfish harvesters are organized into sectors according to species targets, gear use, and location of fishing effort. The Pacific Fisheries Information Network (PacFIN) warehouses data on West Coast commercial fisheries and uses 21 distinct codes (Dahl Groundfish Codes [20]) to define sectors within the groundfish fishery. We provide a simplified overview of groundfish sectors based on the regulations governing different types of activity.

From 1994 to 2010 the PFMC regulated groundfish fishing with a combination of output constraints (known as 'trip limits'), input constraints (such as gear restrictions), and time and area closures (e.g., Rockfish Conservation Areas).

Trip limits were output constraints that defined the maximum amount of each groundfish species group that a vessel could land in a specified two-month period. The PFMC defined trip limits for five groundfish sectors: limited entry whiting trawl (LE whiting), limited entry non-whiting trawl (LE non-whiting), limited entry fixed gear (LE fixed gear), open access trawl, and open access fixed gear.

In addition to output constraints, gear restrictions, area restrictions, and species size limits applied within each sector. These regulations changed frequently year-to-year (and sometimes within a year known as in-season management) and are difficult to summarize for the period 1994-2010. Below we have attempted to provide a concise accounting of the major regulatory interventions in the 1994-2010 period.

During the late 1990s several species of rockfish (*Sebastes spp.*)³ were declared overfished by the Secretary of Commerce, with NMFS then implementing stringent controls on fishing effort. These controls came in the form of drastically reduced trip limits for various rockfish species. In 2000 the Pacific Coast commercial groundfish industry was declared an economic disaster by the US Department of Commerce due to precipitously low groundfish landings. In 2003 a capacity reduction program, the West Coast Groundfish Trawl Vessel Buyback Program, was implemented that permanently removed 91 vessels from the fleet. The buyback was initiated with a federal loan which was to be paid back by the industry by establishing a fee on landings made with a federal groundfish trawl permit. Also beginning in 2003, spatial closures such as the Rockfish Conservation Areas (RCAs) were put into place to reduce or eliminate groundfish trawl activities in certain areas along the west coast. Figure 1 shows commercial landings for each of seven groundfish sectors from 1994 to 2010.

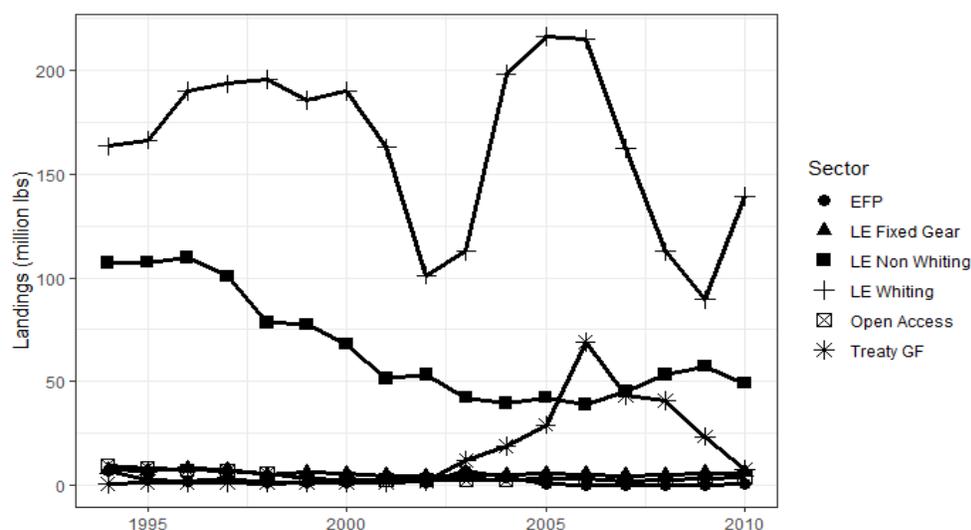


Figure 1. West Coast commercial groundfish landings by sector, 1995-2010⁴.

³ During this period, Widow Rockfish (*Sebastes entomelas*), Pacific Ocean Perch (*S. alutus*), and Yellowtail Rockfish (*S. flavidus*) were declared overfished by the Secretary of Commerce.

⁴ The sectors used in Figure 1 correspond to the numerical sector designations in [19] as follows: “EFP” is short for exempted fishing permit and corresponds to sectors 13 and 14; “LE Fixed Gear” is limited entry fixed gear groundfish (sectors 5, 7, 9, and 20); “LE Non whiting” is limited entry non-whiting groundfish trawl (sector 4); “LE Whiting” is limited entry whiting (sectors 1, 2, and 3); “Open Access” is all open access groundfish (sectors 6, 8, 10, 11, and 12); “Treaty GF” is treaty groundfish (sectors 16, 17, 18, and 19). PacFIN also uses a designation “XX” to indicate landings that could not be assigned to a sector. We have omitted these landings from Figure 1.

2011 – present

In 2011, a management system based on individual transferable quota (or individual fishing quota or IFQ) was enacted. This system was known as ‘catch shares’ and represented a fairly major reorganization of the fishery. The catch shares system applied to the limited entry whiting and limited entry non-whiting trawl sectors of the fishery.

Under the catch shares system, each limited entry trawl permit holder was allocated a percent of the total allowable catch of each managed species. The percentages were based on permit holders’ historical landings. Annual catch allowances in the IFQ managed whiting and non-whiting fisheries are made as follows: each year a total allowable catch (TAC) of 27 groundfish species groups (Table 1) is allocated to each sector. For permit holder i in year t and species j the catch allowance is $TAC_{jt}^s * share_{ij} = C_{ijt}^s$, where TAC_{jt}^s is the total allowable catch of species j in year t allocated to sector s , $share_{ij}$ is permit holder i 's share of species j , and C_{ijt}^s is the total amount of species j in sector s that permit holder i is permitted to landing in year t . Since vessels and permit holders affiliated with MBCQF and MBFT do not participate in the directed whiting fishery, the amount of quota pounds of each species that a permit holder is allocated annually derived simply from total species pounds allocated to the *Non-Hake (non-whiting) IFQ Trawl and Fixed Gear Sector* and the permit holder’s quota share of that species.

It is important to emphasize that two types of quota transfers are possible under the catch share system. A quota owner may sell their quota share to another interested party. This is a permanent transfer. A second type of transfer is a quota pound lease which is a temporary transfer. Quota pound leases occur when a quota owner receives his individual allocation (based on the annual TAC and the owner’s quota share) and leases that allocation (or some portion thereof) to a fisher for use during the current season.

An additional feature of the catch share program that was referenced extensively by interview respondents is the managerial practice of cost recovery. Fishers participating in the West Coast Groundfish Trawl Catch Share Program were required to have a fishery observer on-board each trip at their expense. Cost recovery, a process that allows NMFS to recover some of the cost for management, data collection, and enforcement of the catch shares program, is an additional cost to participate. Costs are recovered through fees which amount to a proportion of the ex-vessel value of landed catch. In 2017, the fee percentage was 3.0% for the Shorebased IFQ Program (i.e., non-hake IFQ sectors) [21].

The implementation of the catch share program also introduced a new variable cost to fishers’ balance sheets: onboard observer costs. The catch share program required observers aboard all IFQ trips, the cost of which was collected from the vessel owner.

Finally, as a matter of nomenclature, the West Coast Groundfish Observer Program (WCGOP) labels limited entry non-whiting permit holders participating in the IFQ regulated fishery as the “Non-hake IFQ trawl and fixed gear sector.” This designation recognizes that, following the allocation of individual fishing quota, harvesters were allowed to fish their quota using trawl or fixed gear.

Table 1. Species regulated in the non-whiting IFQ Trawl and Fixed Gear Sectors

IFQ species or species group
Arrowtooth flounder
Bocaccio rockfish South of 40°10' N.
Canary rockfish
Chilipepper rockfish South of 40°10' N.
Cowcod South of 40°10' N.
Darkblotched rockfish
Dover sole
English sole
Lincod North of 40°10' N.
Lincod South of 40°10' N.
Longspine thornyhead North of 34°27'
Minor shelf rockfish North of 40°10' (bronzespotted rockfish, pink rockfish)
Minor shelf rockfish South of 40°10' N.
Minor slope rockfish North of 40°10' N. (aurora rockfish, bank rockfish)
Minor slope rockfish South of 40°10' N.
Other flatfish (rex sole, rock sole)
Pacific cod
Pacific halibut North of 40°10' N.
Pacific ocean perch North of 40°10' N.
Pacific whiting
Petrale sole
Sablefish North of 36
Sablefish South of 36
Shortspine thornyheads North of 34°27'
Shortspine thornyheads South of 34°27'
Starry flounder
Widow rockfish
Yelloweye rockfish
Yellowtail rockfish North of 40°10' N

2.2.2 History of landings and fishing activity

The volume and value of groundfish landed has historically been an important contributor to the commercial fishing industry at many ports along the West Coast. Additionally, the fishery is prized for the year round harvesting opportunities it provides. Groundfish are managed to provide and sustain commercial fishing related economic activity in port communities at times when other highly seasonal fisheries like Dungeness crab and salmon are not generating activity.

Figure 2 shows total pounds of limited entry non-whiting groundfish landed in each port area from 1994 to present. Port area landings are expressed relative to total sector landings. Table 2 shows the individual ports included in each port area aggregate⁵. Historically, most of the activity in the limited entry groundfish fishery has been concentrated in the Northern Oregon – Southern Washington Area and the Central Oregon Area. Additionally, the dominant trend in the fishery has been toward consolidation of landings in the Central and Northern Oregon areas. The major groundfish ports of Astoria and Newport, Oregon now account for around 60% of total coastwide landings in the IFQ groundfish fishery.

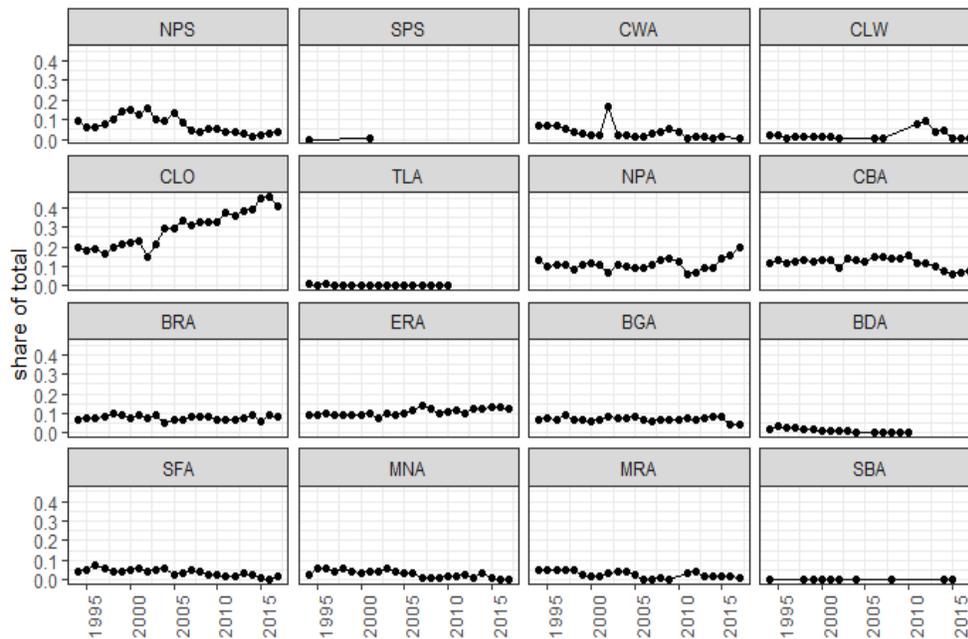


Figure 2. Limited entry non-whiting groundfish landings by port area, 1994-2017. Landings are expressed as total pounds landed in each port area relative to total pounds landed in the catch shares sector and its predecessor, the limited entry groundfish trawl sector.

⁵ We use the port area aggregates from [22].

Table 2. West Coast groundfish port areas and individual ports.

Port Area [22]	Major Ports
NPS	Bellingham Bay, Port Townsend, Port Angeles, Anacortes, Sequim, La Conner, Neah Bay, Friday Harbor, Blaine, other north Puget Sound ports
SPS	Seattle, Olympia, Everett, Shelton, Tacoma
CWA	Westport, La Push, Willapa Bay, Grays Harbor, other Washington Coastal ports
CLW	Ilwaco/Chinook, other Columbia River ports
CLO	Astoria, Cannon Beach, Seaside, Gearhart
TLA	Tillamook/Garibaldi, Pacific City, Netarts Bay, Nehalem Bay
NPA	Newport, Depoe Bay, Waldport, Siletz Bay
CBA	Winchester Bay, Charleston, Bandon, Florence
BRA	Brookings, Port Orford, Gold Beach, Crescent City, other Del Norte county ports
ERA	Trinidad, Eureka, Fields Landing, other Humboldt county ports
BGA	Fort Bragg, Albion, Point Arena, other Mendocino county ports
BDA	Bodega Bay, Bolinas, Point Reyes, Tomales Bay, other Sonoma and Marin County ports
SFA	Princeton/Half Moon Bay, San Francisco, Berkley, Richmond, Oakland, Sausalito, Alameda, other SF Bay and San Mateo County ports
MNA	Santa Cruz, Moss Landing, Monterey, other Santa Cruz and Monterey County ports
MRA	Morro Bay, Avila, other San Luis Obispo county ports
SBA	Santa Barbara, Port Hueneme, Oxnard, Ventura, other Santa Barbara and Ventura County ports

2.2.3 Commercial groundfish fishing in the Morro Bay area and Monterey area

Our study focuses on organizations working in two port areas along California's Central Coast: The Morro Bay area (including the groundfish ports of Morro Bay and Avila) and the Monterey area (including the groundfish ports of Monterey and Moss Landing). In this section we provide background on the contribution of groundfish to overall commercial fishing activity in these two areas.

Neither the Monterey area nor the Morro Bay area receive high volumes of groundfish relative to other port areas coast wide due primarily to a limited number of local groundfish permits, and commercial groundfish-related port and community infrastructure (e.g., processing facilities). However, within the ports of Monterey and Moss Landing and with the port of Morro Bay, groundfish landings are a significant source of commercial fishing revenue.

Figure 3 shows ex-vessel revenue at the combined ports of Monterey and Moss Landing, organized by species management group from 1994 to 2017. Most of the commercial fishing revenue coming into the ports of Monterey and Moss Landing come from the Coastal Pelagic species group. Groundfish revenues historically accounted for a significant portion of total port area commercial fishing revenue. However, groundfish revenues as a share of total commercial fishing revenues have declined substantially since the groundfish disaster declaration in the early 2000s.

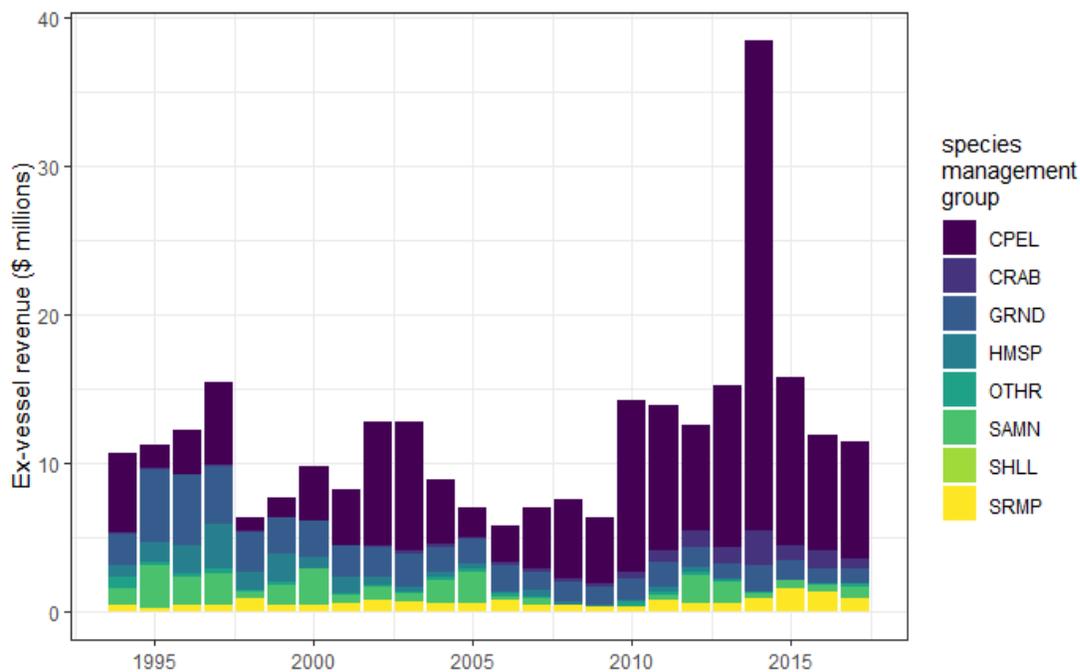


Figure 3. Commercial fishing revenue in Monterey and Moss Landing, 1994-2017.⁶

In Figure 4 we show ex-vessel revenue at the combined ports of Morro Bay and Avila Beach, organized by species management group from 1994 to 2017. Most of the commercial fishing revenue coming into the ports of Morro Bay and Avila come from groundfish. It is important to

⁶ Species management groups are defined by the Pacific Fisheries Information Network (PacFIN) as: CPEL: coastal pelagic species (mainly anchovies and sardines); CRAB: Dungeness crab; GRND: groundfish; HMSP: highly migratory species (mainly tunas such as albacore, Bluefin, and yellowtail); OTHR: other; SAMN: salmon; SHLL: shellfish; SRMP: shrimp.

note that the figure shows revenue from all groundfish sectors. This includes open access groundfish, limited entry sablefish, and Non-hake IFQ trawl and fixed gear/limited entry trawl.

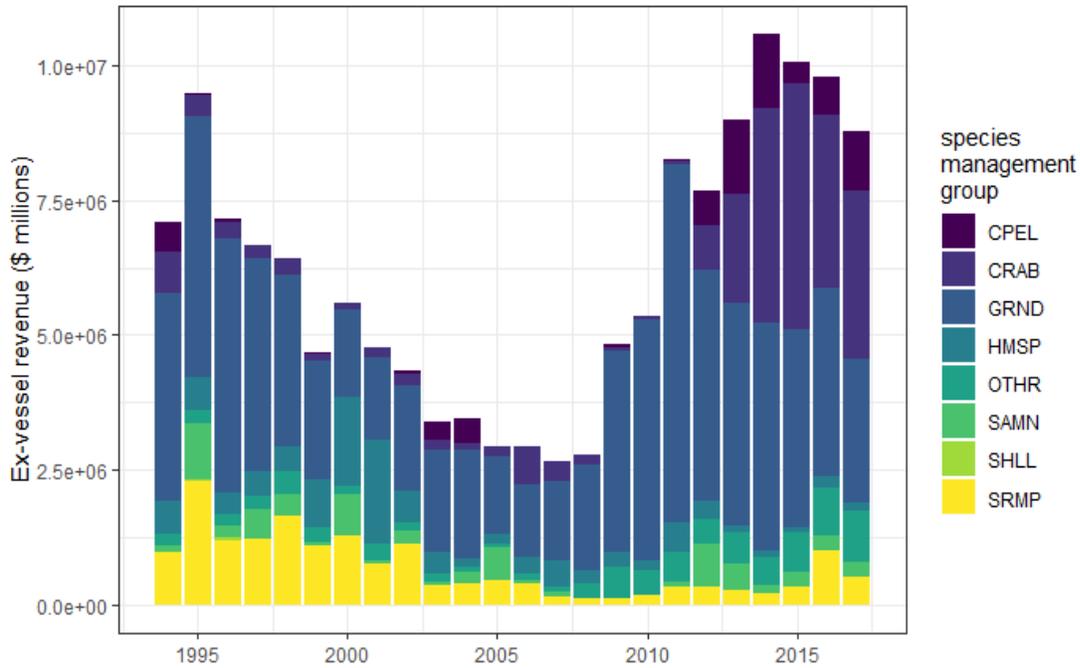


Figure 4. Commercial fishing revenue in the Morro Bay Area, 1994-2017.

Figure 5 shows the contribution of different groundfish sectors to total groundfish revenue in the ports of Morro Bay and Avila in the pre-catch shares era. Between 1994 and 2010, the limited entry trawl sector (which became the Non-hake IFQ trawl and fixed gear sector in 2011) accounted for roughly 30% per year of total groundfish revenues in these ports.

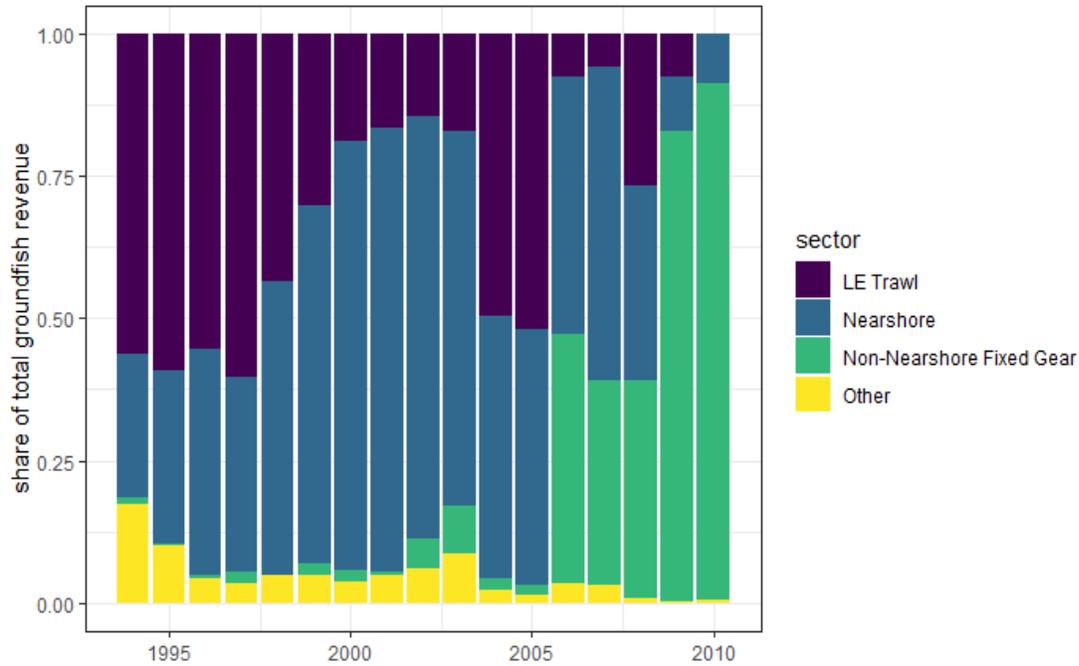


Figure 5. Morro Bay non-whiting groundfish revenue by year and sector.⁷

In Figure 6 we show the contribution of different groundfish sectors to total commercial groundfish revenue in the ports of Monterey and Moss Landing in the pre-catch shares era. The limited entry trawl sector historically accounted for around half of all commercial groundfish revenues, although limited entry trawl revenue share declined between 2005 and 2010 as the non-nearshore fixed gear sector began to make up a greater share of groundfish revenues.

⁷ Groundfish sectors shown in Figure 5 are defined as in Figure 1.

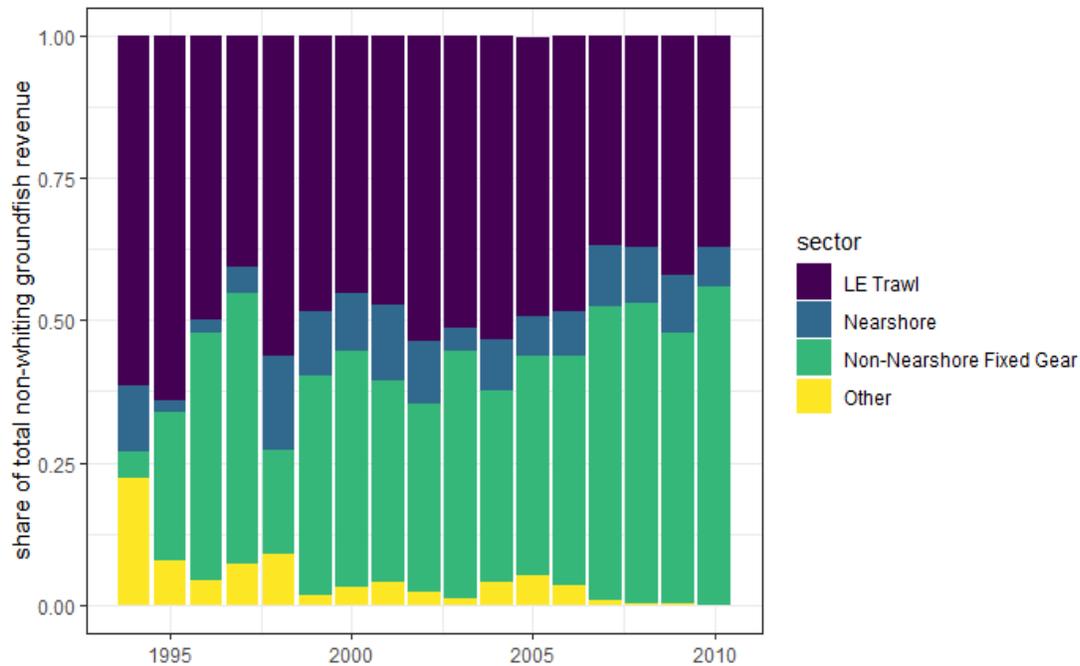


Figure 6. Monterey and Moss Landing non-whiting groundfish revenue by year and sector.

3 Methods

Our primary method of investigation for this study is semi-structured interviews with fishing community stakeholders in the California communities of the Morro Bay area and the Monterey area. We identified the following distinct groups of fishing community stakeholders:

- Fishers – this group included mostly groundfish fishers who participate in the IFQ groundfish fishery or had previously participated in the limited entry groundfish trawl fishery.
- Fishing related businesses in the Morro Bay, CA area and Monterey, CA, area – this group included groundfish processors and groundfish buyers as well as other dockside businesses.
- Individuals directly involved in the administration of the MBCQF or MBFT – this group included members of the Boards of Directors, Executive Directors, and quota managers.
- Civic Leaders – this group included Harbormasters, City Council Members, and other high profile members of the Morro Bay area and the Monterey area.

We developed a separate questionnaire for each group of stakeholders in order to capitalize on the unique perspectives of the different groups. In addition to the members of the Morro Bay and Monterey Bay area fishing communities we conducted semi-structured interviews with one stakeholder in each of four other west coast fishing communities: Ilwaco, WA, Fort Bragg, CA,

Half Moon Bay, CA, and Santa Barbara, CA. At the time of our study these four communities were in the process of forming CSCs to hold and manage groundfish quota. The interview prompts used for each group are presented in the Appendix. However, it is important to note that many respondents' volunteered additional information and a number of questions and responses prompted follow-up discussion.

We completed 31 semi-structured interviews with stakeholders during the spring and summer of 2015. The distribution of participants is provided in Table 3.

Table 3. Number and distribution of interviews across stakeholder groups in each community.

Group	Community	Response
Civic Leaders	Morro Bay	3
Civic Leaders	Monterey Bay	3
Board Member	MBCQF	3
Board Member	MBFT	4
Board Member	Fort Bragg, Ilwaco, Half Moon Bay, Santa Barbara	4
Executive Director	MBCQF	1
Executive Director	MBFT	1
Fishing related business	Morro Bay	3
Fishing related business	Monterey Bay	3
Commercial fisher	Morro Bay	3
Commercial fisher	Monterey Bay	2

Interviews were conducted by Lisa Wise Consulting LLC and interview field notes were provided to the study authors. Each one-on-one interviews was conducted either by phone, in person, and in a few cases, by e-mail correspondence. Follow-up interviews were also conducted in a few cases when further insight was needed to understand a response.

4 Results

The remainder of our report explores the results of our surveys and presents some discussion of those results. In the Results section we restrict our presentation to an accounting of interview results and attempt to organize these results according to some themes that emerged. In some subsections we will include observations from other data sources in order to add context to interview results, however we attempt to minimize the amount of supplemental analysis. Section 5 consists of inferences we have made and analysis undertaken related to some of the salient themes reported in this section.

4.1 Motivations of CSC formation

This section addresses the motivations among community members for forming a CSC. Here, we consider the question, “what perceived problems are the CSCs trying to address?”

Our surveys specifically asked individuals involved in the operation of the CSCs what the primary motivations were for their formation. The overwhelming sentiment of this group was a fear that the newly implemented transferable quota system would result in fishing activity moving out of the Morro Bay and Monterey areas.

Our interview script asked CSC organizers and Board Members about the factors motivating formation of the CSC. All of the CSC Boards Members and Organizers indicated that fear of losing groundfish landings was the primary motivating factor. A sample of representative responses are included below (Table 4).

Table 4. Interview responses: factors motivating quota fund formation.

Group	Question	Response
MBCQF board member	<i>What were the top three major factors motivating your community to form a quota fund?</i>	Without the QF, Morro Bay would have NO access to valuable ITQ groundfish resource... no one in Morro Bay had quotas or permits in 2011
MBFT board member	<i>What were the top three major factors motivating your community to form a quota fund?</i>	Kept/secured quota in the community and available for leasing by local and regional groundfish fishermen, quota that would have otherwise likely migrated away from the Monterey/Moss Landing/Santa Cruz and Central Coast
MBFT board member	<i>What were the top three major factors motivating your community to form a quota fund?</i>	<ol style="list-style-type: none"> 1. Risk/fear of losing access to important GF resource 2. Potential impacts of losing a steady/year-round fishery and the income and jobs it has historically represented in Monterey 3. Opportunity to access discounted quota from TNC (motivated partner), an organization with similar/shared values on environmental stewardship

We also found that stakeholders with direct involvement in the CSCs favored the language of ‘anchoring’ quota to describe the fundamental contribution of the CSCs to the community.

In 6 out of 9 responses from the CSC group, these two questions contained some form of the word ‘anchor.’ Representative responses are summarized in the table below (Table 5).

Table 5. Interview responses: "anchoring quota".

Group	Question	Response
MBFT board member	<i>How would you describe the importance of the MBCQF/MBFT to your city?</i>	Anchors 5 million pounds of quota in Monterey Bay, which might otherwise migrate
MBCQF board member	<i>How would you describe the importance of the MBCQF/MBFT to your city?</i>	The MBCQF first and foremost anchors quota and permits (5) in the community that would have otherwise likely migrated to another port, and will provide opportunities for the City in the groundfish trawl fishery for decades, particularly new and returning entrants....
MBCQF board member	<i>Since formation of the MBCQF/MBFT, what, in your opinion, are the top five accomplishments of the organization?</i>	Anchor quota in the community (that was otherwise at risk of consolidation).
MBFT board member	<i>How would you describe the importance of the MBCQF/MBFT to your city?</i>	The MBFT anchors quota and permits in the community and preserves opportunities for local fishermen and local fishery-related businesses.

The nature of stakeholder concerns about fishing activity leaving the Morro Bay and Monterey areas should be examined in light of each location's specialized circumstances.

4.1.1 Fishing activity leaving the region

In the case of the Morro Bay area, the fear of fishing activity leaving the region under the ITQ system was motivated largely by the fact that groundfish vessels traditionally homeported in Morro Bay were not allocated any quota under the ITQ system. This was due to an interesting artifact of history where The Nature Conservancy purchased groundfish permits around the time of the Groundfish Trawl Vessel Buyback.

In 2004, in response to declining stock abundance and concerns about over capacity, NOAA Fisheries executed a vessel buyback program where they retired 91 vessels from the Pacific Coast Groundfish Trawl Fishery. Around this time The Nature Conservancy pursued separate arrangements with fishers in the Morro Bay area to buy their groundfish permits [23]. These fishers continued to use (lease) The Nature Conservancy's permits to land groundfish from 2004 to 2010. When quota shares were allocated prior to the 2011 fishing season, they were allocated to permit holders based on the historical fishing activity associated with each permit. Because The Nature Conservancy owned the groundfish permits associated with most of the

groundfish landings at the port of Morro Bay, they were allocated quota share rather than the fishers who produced those landings. When the ITQ system went into effect in 2011, there were no fishers from the traditional Morro Bay area groundfish fleet who owned quota share for the fishery. From 2011 to 2013 (just prior to the start of MBCQF operations) all the groundfish landed in the port of Morro Bay in the non-hake IFQ trawl and fixed gear sector was landed by fishers with no quota allocation of their own.

4.1.2 Quota leaving the region

The case of the MBFT differs from MBCQF in the sense that some groundfish vessels traditionally homeported in the ports of Monterey or Moss Landing did receive a quota allocation in 2010. Individuals involved with the administration of the MBFT primarily expressed concern that groundfish vessels in their area were less profitable overall than vessels from other areas. And that inferior relative profitability would inevitably lead to Monterey or Moss Landing vessels selling their quota to more efficient operations in other ports.

In the case of MBFT the goal of ‘anchoring’ quota meant trying to mobilize capital to acquire quota from Monterey/Moss Landing groundfish permit owners who might consider selling their quota out of the area, and to acquire quota from other sources to hold in trust for the community.

4.1.3 Viability of groundfish fishing in the Morro Bay and Monterey areas

Although the specific concerns in the Morro Bay area and Monterey area were somewhat nuanced -- fishing activity leaving the region because fishers didn't have their own quota allocation and couldn't afford to lease (MBCQF) versus fishing activity leaving the region because fishers had a quota allocation but still couldn't afford to fish (MBFT) -- the overall sentiment was similar: participation in the IFQ groundfish fishery imposes costs that are financially untenable for Monterey and Morro Bay area fishers.

Concerns about cost of participation in the IFQ groundfish fishery were evident in interviews with MBCQF and MBFT personnel and Monterey area and Morro Bay area fishers.

4.1.3.1 Fisher perspectives on the viability of local groundfish fleets

In interviews with fishers, the cost of paying for onboard observers was a frequently cited hardship on their operations

1. Have you purchased or leased quota from MBCQF/MBFT? Why or why not?
2. How would you describe the importance of MBCQF/MBFT to your city?

3. In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?
4. What have the three greatest challenges been regarding your participation in MBCQF/MBFT?

In answering these questions fishers mentioned observer costs explicitly and also alluded to burdensome observer costs by speaking in general about the high cost of participation in the IFQ fishery (Table 6).

Table 6. Interview responses: fishers' perspectives on viability of commercial groundfish fleet. Names of fishery participants in responses are redacted for confidentiality considerations.

Group	Question	Response
MBCQF fisher	<i>Have you purchased or leased quota from MBCQF/MBFT? Why or why not?</i>	When prices were higher on SABL, the most attractive of the species for a small hook & line boat (\$3.40-\$3.60 in 2013), it was possible to make money fishing MBCQF quota but due to a glut in the market and currency/economic pressures in export markets like Japan, ex-vessel value (EVV) has been pretty much cut in half. Under the current economic conditions, it is infeasible for a small boat/operation (like mine) to participate. Morro Bay is made up of small boats [REDACTED] is able to make it work because he has bought a bigger boat and is dropping a lot of gear.....smaller boats can't make it with 1) low/dropping prices (EVV), 2) high costs (observer coverage, 5% buy back, 3% program fee (8% of EVV total) and 3) having to compete with the bigger boats from WA and OR that flood the market and hammer our fishing grounds.

Group	Question	Response
MBFT fisher	<i>How would you describe the importance of MBCQF/MBFT to your city?</i>	The MBFT is important but there are so many restrictions associated with fishing the in the ITQ fishery as a trawler; with closures, and excessive costs (particularly observer coverage and having to pay “upfront” for quota...whether you catch it or not), that fishing MBFT quota is almost impossible. There is only one guy fishing quota now....hook and line boat which can target “Large” SABL and only one hook& line boat in Morro Bay. Only the “Large” SABL can recoup the MBFT lease rate (which is the same as the open market)....a trawler cannot always target “Large” SABL particularly when they are by catch from other target species. A trawler needs to be able to access the RCA for chillipeppers and without the fear of catching our limit (handfull) of cowcod.
MBFT fisher	<i>In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?</i>	Difficult to say, not much fishing activity yet. We need to solve some problems (feasibility) before MBFT participants will be able to provide benefit to the community (quantity of quota available and costs associated with the ITQ fishery). I guess all of this attention on catch shares has created jobs in research and science....but not much on the docks and not much on the decks.
MBFT fisher	<i>What have the three greatest challenges been regarding your participation in MBCQF/MBFT?</i>	Making ends meet. It has been difficult to impossible to pay for quota, pay for crew, make my boat payments, pay the observer and motor my fish all over and make money. THE OBSERVER MAKES MORE \$\$ THAN MY CREW.

4.1.3.2 CSC personnel perspectives on viability

Individuals involved in the operation of the MBCQF and MBFT work closely with local fishers and, in the case of MBCQF, some local fishers serve on the Board of Directors. Therefore, it is not surprising that some of the key themes present in interviews with fishers were also present in interviews with CSC personnel.

The theme of high cost of participation in the IFQ groundfish fishery for Morro Bay area and Monterey area vessels was evident in CSC personnel responses to a variety of questions.

A selection of responses from CSC affiliated individuals who explicitly mentioned observer fees and high costs as a constraint on the ability of the CSCs to lease quota to local fishers are shown below (Table 7).

Table 7. Interview responses: CSC board member perspectives on viability of commercial groundfish fleet.

Group	Question	Response
MBCQF board member	<i>In what ways does the MBCQF/MBFT need to improve?</i>	<ol style="list-style-type: none"> 1. Need to reduce the cost of participation (in the ITQ program) and generally, hassle of managing quota, owning/leasing permits...relative to other fisheries. 2. Need better, more effective marketing locally, create greater presence and awareness, could focus on more/better communication with: County Board of Supervisors, Harbor Advisory Board, etc. 3. Improve effectiveness of participation in the regulatory process, with focus on: change observer requirements, control limit, etc.
MBCQF board member	<i>What do you perceive to be the three biggest factors limiting quota availability for local vessels?</i>	<ol style="list-style-type: none"> 1. High cost (relative to other fisheries), obligations paying for observer, leasing quota, leasing permits, managing quota... translates to less participants, less potential income and less demand. Less demand means less resources/potential income for the QF and reduced ability to buy more quota. 2. Accommodating human observers, particularly on small vessels, often difficult social dynamics and potentially dangerous, also needs to carry insurance(s) for observer. This discourages participant, particularly new participants, which translates into less vibrancy for the QF....lessened ability to buy more quota. 3. Complexity of operating in the ITQ trawl fishery discourages participants, means less demand, less income for QF...less ability to grow.

Group	Question	Response
MBCQF board member	<i>In what ways does the MBCQF/MBFT need to improve?</i>	We need better recruitment of fishermen in Morro Bay willing and able to fish in the ITQ groundfish fishery...but the entire West Coast ITQ fishery will not be able to reach its potential unless the Federal regulators acknowledge shortcomings and make adjustments, most importantly reducing or eliminating the cost of observer coverage and coming up with a reasonably simple and inexpensive alternative.
MBFT board member	<i>In what ways do you think the MBCQF/MBFT is performing well?</i>	Representation: developing and representing community needs in the context of smart solutions for small communities, such as easing the cost of observer coverage through EM, making observers more readily available by investing in training a local observer and researching ways to improve connections between the fishery and the local supply chain and community purchasers. This research being sponsored by the MBFT for Fish Hub.

Additionally, several responses appeared to mention high cost implicitly rather than explicitly.

“Could be leasing more quota but, presently there is a small pool of local fishermen that are capable and/or interested.”

While this response does not mention the high cost of participation explicitly, from context it is highly likely that, “...there is a small pool of local fishermen that are capable and/or interested,” is a reference to perceived high participation costs limiting the extent of the local market for quota.

In sum, almost all CSC organizers we spoke to were highly motivated by the expectation that commercial groundfish fishing in their community was not sustainable without the CSC. A dominant belief among all study participants was that the unsustainable nature of groundfish fishing in the Morro Bay area and Monterey area was driven by high cost of participation in the fishery. Since the examples of burdensome regulatory costs (buyback and cost recovery fees, on-board observer costs) are generally similar for all vessels in the fishery, it is worth discussing why study participants believed these cost items specifically disadvantaged their local fishers.

The assumption of locational disadvantage stems from the perception among stakeholders that i) local fishers would have to lease quota in order to be profitable and ii) local fishers could not afford to acquire quota (either through lease of quota pounds or purchase of quota share) at

market rates. The first assumption is driven by the observation that groundfish operations homeported in Morro Bay were allocated no quota share⁸ and the belief that vessels operating out of the ports of Monterey and Moss Landing were allocated too little to be profitable. Therefore, without some form of assistance, fishers with no quota would not fish and fishers with some quota would be unable to profitably fish and so would sell or lease whatever quota they had.

The second assumption is driven by a belief that Morro Bay area and Monterey area groundfish fishers are generally less profitable⁹ than vessels in other areas of the fishery. Since vessels outside of the Morro Bay and Monterey areas are more profitable, they can afford to absorb higher quota lease rates and still break even. Since prices in the quota lease market are set by the highest bidder, quota lease rates are priced out of reach of Morro Bay and Monterey area groundfish fishers.

4.2 Operational strategy

In the previous section we discussed the primary problems the CSCs and fishing community members see the CSCs addressing: that they expected the groundfish ITQ system to result in the severe restriction or complete elimination of participation in the ITQ groundfish fishery by Morro Bay and Monterey Bay area fishing vessels.

In this section we discuss the main methods by which the CSCs work to address this problem. The primary goal of the CSCs is to subsidize local commercial groundfish fishers by purchasing quota share and leasing discounted quota pounds to local harvesters. In this section we discuss how the quota portfolios were acquired and the terms under which quota pounds are leased. We also discuss the secondary goals of the CSC to reduce the cost of fishery participation by lobbying and promote profitability of local fishers through research and innovation.

4.2.1 Buying quota

The MBCQF and MBFT were set up in order to acquire and manage fishing quota for the benefit of fishing communities. We discuss how much quota shares were purchased and from who they were able to acquire it.

⁸ As was previously mentioned, The Nature Conservancy owned the limited entry groundfish permits used by Morro Bay area fishers. Because of this ownership, when catch shares were implemented, quota share associated with Morro Bay area historical groundfish landings went to The Nature Conservancy rather than the vessels making those landings.

⁹ The difference in landings and revenue profiles for Morro Bay area and Monterey area groundfish harvesters versus groundfish harvesters in other areas will be discussed in more detail in Section 5.

4.2.1.1 CSC quota purchases

Below is a table of the quota share holdings and corresponding 2016 quota pounds for each species or species group owned by the Morro Bay Community Quota Fund, Monterey Bay Fisheries Trust, Half Moon Bay Community Fishermen's Association, and the Fort Bragg Groundfish Conservation Trust (Table 8).

Table 8. Quota share holdings for selected California CSCs and 2016 quota pounds associated with each quota share¹⁰.

IFQ Species	Sector Quota Pounds	MBCQF		MBFT Share		HMBCFA		FBGCT	
		QS	QP	QS	QP	QS	QP	QS	QP
Arrowtooth flounder	6,687,458	0.319	21,333	1.693	113,219	0	0	1.694	113,286
Bocaccio rockfish South of 40°10' N.	187,437	13.2	24,742	7.243	13,576	0	0	7.242	13,574
Canary rockfish	98,062	0	0	0	0	0	0	0	0
Chilipepper rockfish South of 40°10' N.	2,637,280	3.91	103,118	3.895	102,722	2.401	63,321	1.925	50,768
Cowcod South of 40°10' N.	3,175	17.7	562	4.473	142	0	0	4.474	142
Darkblotched rockfish	645,536	0	0	0.476	3,073	0	0	0	0
Dover sole	101,370,312	2.6	2,635,628	2.566	2,601,162	0.315	319,316	2.312	2,343,682
English sole	14,631,287	3.447	504,340	1.724	252,243	0.228	33,359	1.724	252,243
Lingcod North of 40°10' N.	2,388,422	2.5	59,711	0.743	17,746	0.677	16,170	0.743	17,746
Lingcod South of 40°10' N.	929,491	2.5	23,237	0.198	1,840	1.617	15,030	0.198	1,840
Longspine thornyheads North of 34°27' N.	6,206,189	3.28	203,563	2.112	131,075	0.063	3,910	1.64	101,781
Minor shelf rockfish North of 40°10' N.	2,417,413	1.399	33,820	0.699	16,898	0	0	0.699	16,898
Minor shelf rockfish South of 40°10' N.	423,993	9	38,159	0	0	0.056	237	0	0
Minor slope rockfish North of 40°10' N.	2,711,554	1.751	47,479	0.742	20,120	0	0	0.742	20,120

¹⁰ Quota share holdings, species specific sector allocations, and resulting quota pound allocations were obtained from the National Marine Fisheries Service's public online *Pacific Coast Groundfish Individual Fishing Quota* portal [24].

IFQ Species	Sector Quota Pounds	MBCQF		MBFT Share		HMBCFA		FBGCT	
		QS	QP	QS	QP	QS	QP	QS	QP
Minor slope rockfish South of 40°10' N.	937,516	6	56,251	3.679	34,491	0.276	2,588	3.68	34,501
Other flatfish	13,922,412	7.608	1,059,217	5.914	823,371	1.084	150,919	3.804	529,609
Pacific cod	2,273,870	1.827	41,544	0.913	20,760	0	0	0.913	20,760
Pacific halibut (IBQ) North of 40°10' N.	199,954	0	0	0.447	894	0	0	0	0
Pacific ocean perch North of 40°10' N.	273,704	0	0	0	0	0	0	0	0
Pacific whiting	310,867,464	0.436	1,355,382	0	0	0.004	12,435	0	0
Petrale sole	5,805,653	1.95	113,210	2.088	121,222	1.579	91,671	1.176	68,274
Sablefish North of 36° N.	5,315,874	0.684	36,361	1.052	55,923	0.541	28,759	0.694	36,892
Sablefish South of 36° N.	1,736,140	10	173,614	3.194	55,452	0	0	3.139	54,497
Shortspine thornyheads North of 34°27' N.	3,446,795	2.561	88,272	2.348	80,931	1.117	38,501	2.061	71,038
Shortspine thornyheads South of 34°27' N.	110,231	6	6,614	6	6,614	0	0	6	6,614
Splitnose rockfish South of 40°10' N.	3,634,827	5.254	190,974	2.627	95,487	0.033	1,199	2.627	95,487
Starry flounder	1,674,080	3.859	64,603	3.859	64,603	0	0	0	0
Widow rockfish	3,131,931	0	0	0	0	0	0	0	0
Yelloweye rockfish	2,381	0	0	0	0	0	0	0	0
Yellowtail rockfish North of 40°10' N.	9,648,906	1.39	134,120	0.672	64,841	0.026	2,509	0.672	64,841
Total Pounds			7,015,853		4,698,405		779,924		3,914,593

4.2.1.2 How the CSCs purchased quota

The MBCQF and MBFT worked closely with The Nature Conservancy to set up their quota portfolios (Table 9). This is partially because The Nature Conservancy had quota holdings in excess of the allowable limit¹¹ and was legally obligated to divest a substantial amount of quota.

Table 9. Interview responses: initial quota purchase¹².

Group	Question	Response
MBFT board member	<i>What were the top three major factors motivating your community to form a quota fund?</i>	<ol style="list-style-type: none"> 1. Risk/fear of loss of access to important GF resource 2. Potential impacts of losing a steady/year-around fishery and the income and jobs it has historically represented in Monterey 3. Opportunity to access discounted quota from TNC (motivated partner), an organization with similar/shared values on environmental stewardship.
MBCQF board member	<i>What were the top three major factors motivating your community to form a quota fund?</i>	<ol style="list-style-type: none"> 1. A QF was necessary to keep CF in the community. “If we don’t form a quota fund, it is likely the small commercial fishermen and industry will disappear from Morro Bay” 2. “If quota is purchased by big corporations up north (not even in California), we’ll lost it” Quota fund keep small ports viable.... 3. The Nature Conservancy had to divest some of the quota and forming a Quota Fund seemed like a good solution to keep that quota local.
MBFT board member	<i>How did MBCQF/MBFT raise money to initiate the organization and buy quota?</i>	Funding and in-kind contributions from City of Monterey (funding and in-kind from Steve Scheiblaue and Mike McCarthy on the Board), TNC (funding and advisor/staff time from Melissa Mahoney), Monterey Bay Aquarium (funding and in-kind from Margaret Spring and Barbara Meister), EDF grant, discounted services from law firm CWL, Packard Grant (Conservation & Science Program) and there are plans in place for on-going fundraising

¹¹ The Catch Shares program in the West Coast groundfish fishery included strict rules on the amount of quota share that any single owner could own. These rules were meant to prevent the consolidation of quota ownership in the hands of a few large entities.

¹² Each row of the table represents a distinct respondent.

Group	Question	Response
MBFT board member	<i>How did MBCQF/MBFT raise money to initiate the organization and buy quota?</i>	1. Grants from NGO community (EDF, TNC) 2. Some money from the City 3. Foundation grants (Packard, Moore, NFWF...etc.) 4. Loan from California Fishery Fund
MBFT board member	<i>How did MBCQF/MBFT raise money to initiate the organization and buy quota?</i>	Loan from the California Fisheries Fund and money from the City (for quota the City owns and the MBFT manages)
MBFT board member	<i>From where did MBCQF/MBFT buy quota</i>	TNC and two local fishermen
MBFT board member	<i>From where did MBCQF/MBFT buy quota</i>	TNC and individual fishermen
MBFT board member	<i>From where did MBCQF/MBFT buy quota</i>	TNC and the open market
MBFT board member	<i>From where did MBCQF/MBFT buy quota</i>	Local fishermen
MBFT board member	<i>From where did MBCQF/MBFT buy quota</i>	Quota owners from the Central Coast

Both MBCQF and MBFT purchased almost all of their quota share from The Nature Conservancy. Our interviews with MBCQF and MBFT personnel revealed that MBCQF purchased their quota portfolio from TNC with a \$250,000 loan from the California Fisheries Fund. We confirmed this quota portfolio purchase amount using the publicly available IRS form 990-EZ [25] which indicates a \$250,000 liability in Part II Line 26, in an item marked, “Unsecured notes and loans payable.”

The MBFT also took out a loan from the California Fisheries Fund, which it used to purchase quota from TNC. MBFT also purchased some quota from California Central Coast groundfish fishers. The portion of the MBFT portfolio coming from TNC purchases versus open market transactions is unclear. Responses to our interview questions about the origin of the quota portfolio indicate varying degrees of understanding among MBFT personnel regarding where their quota came from. For example, though it is clear that TNC was a key contributor to the MBFT quota portfolio, two MBFT personnel made no mention of TNC in their answers to the question.

In addition to the California Fisheries Fund, MBFT received loans and grants from other private sources¹³. The IRS 990-EZ form for MBFT shows that they have approximately \$422,000 in debt from loans and notes. The IRS 990-EZ form also provides a valuation of quota assets. The MBFT portfolio is valued at \$1.57 million while the MBCQF portfolio is valued at \$1.98 million.

¹³ The Packard Foundation made grants to MBFT for operational expenses [16].

The origin of MBCQF and MBFT quota is relevant to our study because it helps illustrate the nature of the relationship between the fishing community at large, the CSC, and the fishing industry. Unlike Community Supported Fisheries (CSFs) or other familiar direct marketing arrangements in fisheries (where community members generally pay directly to support individual local fishers or local cooperatives), these entities were formed in order to take on debt that was used to facilitate the block transfer of quota from a benevolent supplier.

4.2.2 Leasing Quota

MBCQF and MBFT strive to provide benefits to their fishing communities by leasing quota to groundfish fishers. Both entities have adopted a policy for leasing quota that is designed to support a fishery that contributes to economic, social, and environmental objectives.

In this section we discuss the quota lease policy of each organization and highlight some salient differences.

4.2.2.1 MBCQF quota lease policy

MBCQF's prioritization structure is reflected in their bylaws [7] as well as their objectives (Figure 7). As mentioned in section 2, the MBCQF prioritizes their quota pound leasing following the following rank ordering: 1) "qualified fishermen in the Morro Bay/Port San Luis area", 2) "other qualified fishermen participating in the Risk Pool", and 3) "any other legal participants in the fishery" [6].

PRIMARY OBJECTIVES		ACTIVITIES
I. Establish the CQF as a financially viable community quota fund.	▶	1. Acquire fishing privileges to hold for the Morro Bay community 2. Lease quota, generating revenues to: - Repay debt obligations - Cover operational expenses
II. Support the local, small boat groundfish industry, to ensure a viable port in Morro Bay.	▶	3. Provide lease discounts to small boat, groundfish fishermen, allowing them to operate.
SECONDARY OBJECTIVES		ACTIVITIES
III. Create viable opportunities for new entrants	▶	4. Provide incentive, through lease discounts, to help new entrants in the fishery.
IV. Improve local inputs into science and management	▶	5. Build local decision-making for local resource-use. 6. Support a research fund focused on local and regional stocks
V. Incentivize innovation in fishing practices and marketing, to achieve resiliency in volatile markets.	▶	7. Use leases to incentivize a broad portfolio of species and gears 8. Contribute quota to the regional Risk Pool
VI. Build local stakeholder leadership in fishery management	▶	9. Form a Community Fishing Association, creating links with other fishing communities 10. Inform local stakeholders

Figure 7. Primary and secondary objectives of the Morro Bay Community Quota Fund. This figure has been reproduced from the MBCQF website (see [4]).

4.2.2.2 MBFT quota lease policy

MBFT's quota lease policy reflects similar goals to those of MBCQF (i.e., prioritize local fishermen and fishermen committed to conservation programs like the risk pool). MBFT's 2018 lease policy [11] describes a priority ordering for leasing quota to fishermen:

1. Local fishermen who land MBFT quota pounds in Monterey Bay ports (Monterey, Moss Landing, Santa Cruz);
2. Groundfish Collective and/or partner community quota fund fishermen who land MBFT quota pounds in Monterey Bay ports;
3. Any fisherman who lands MBFT quota pounds in Monterey Bay ports;
4. Local fishermen who land MBFT quota pounds in any California port;
5. Groundfish Collective and/or partner community quota fund fishermen who land MBFT quota pounds in any California port;
6. Open market.

4.2.2.3 Lease policy comparison

The key mechanism by which MBCQF and MBFT use quota to support their local groundfish fleet is by offering quota pound leases at a discount (compared to market rates) to local fishers. This is evident from Table 10 where the second primary objective of MBCQF is to “support the local small boat groundfish industry” and the activity identified with this objective is to “provide lease discounts to small boat groundfish fishermen...”

Similar language appears in the MBFT lease policy, “[t]he Trust aims to support local fishermen by offering below market lease rates. The degree of discount offered depends on: (1) the financial viability of the Trust in a given year; (2) the degree to which a lessee meets the Trust’s criteria, as describe in the annual lease policy.”

Relating to the quota lease policy, the MBCQF appears unique in two notable areas (Table 10):

1. Lease policy explicitly mentions/prioritizes financial solvency of the CSC and interview responses reinforce this objective.
2. Lease policy and interview responses indicate that considerable thought has been given to operating the quota fund as a ‘bridge’ in the sense that an explicit goal of MBCQF is to have local groundfish fishermen develop the ability to purchase their own quota share.

Table 10. Interview responses: encouraging new entrants.

Group	Question	Response
MBCQF board member	<i>From your perspective what are the optimal number and types of vessel and fishing participants for the MBCQF/MBFT</i>	Depends on the portfolio of fish and amount of organization’s debt. The MBCQF’s push is to get fishermen to participate in the Quota Fund and then eventually be viable enough to buy his own quota, or wean himself from the majority of his quota [coming from the Quota Fund]. This would allow new entrants to come in. If fishermen never make any progress [toward quota ownership], you’ll never get new entrants in unless you get more quota.

In general, the lease policies of both MBCQF and MBFT reflect financial, social, and ecological goals. The financial and social goals are straightforward and are a direct result of leasing quota

to local fishermen. Ecological goals are promoted through leases by prioritizing vessels with a history of participation on conservation activities. This is laid out in the second section of MBFT's lease policy in [11] which states:

The Trust also considers the following:

1. The fisherman's history in the West Coast groundfish trawl fishery.
2. The diversity of groundfish species landed/leased by the lessee.
3. The fisherman's involvement with any of the following activities:
 - Proven gear innovations and/or selective lower impact gear to reduce bycatch, habitat impacts, and post-release mortality of non-target species and protected species
 - Overfished species (OFS) bycatch risk reduction through membership in the California Groundfish Collective or similar collective agreement designed to reduce OFS interactions, rebuild OFS stocks and protect sensitive habitat that has been identified by fishermen and scientists
 - Use of electronic reporting technology such as eCatch to record the catch and spatial components of fishing activity, resulting in improved data on stocks
 - Fishing methods that target abundant, underutilized stocks and avoid reliance on, and possible depletion of, single species
 - Participation in research aimed at improving the environmental and economic performance of the fishery
 - New entrants to help ensure future fishery access for the Monterey Bay community
 - Other projects that support the goals of the Trust, as determined by the Board

MBCQF's lease policy provides for the advancement of ecological goals by prioritizing fishermen with a history of participation with the California Risk Pool or other entities focused on reducing bycatch.

4.2.3 A Stronger voice

Several interview respondents indicated that the ability to advocate or lobby on behalf of the local fishing industry was a benefit of the CSCs (Table 11).

Table 11. Interview responses: “stronger voice”.

Group	Question	Response
MBFT board member	<i>How would you describe the importance of the MBCQF/MBFT to your city?</i>	Greater and more concerted voice: the city values commercial fishing and the related cultural heritage benefits and has invested in and supported MBFT, and as such the Trust will have a greater representation and voice in the civic realm.
MBCQF board member	<i>In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region</i>	There is clearly greater power in the network of quota funds; Morro Bay, Half Moon Bay, Fort Bragg, Santa Barbara, enabling a stronger and more coordinated voice on regional commercial fishery issues.
MBCQF board member	<i>In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?</i>	The MBCQF assures long-term opportunities for fishermen in nearby ports like Port San Luis and Monterey to enhance their fishing business by participating in the valuable ITQ groundfish fishery. The MBCQF is part of a network of 4-5 QFs on our coast that is ultimately more capable than one port on its own as a voice in the regulatory arena, and in the local and national press

4.2.4 Research

Both CSCs list “research” as part of their goals and strategies for supporting commercial fishing. Interview responses regarding the research agenda can generally be categorized as emphasizing support for conservation/ecological/biological research and support for socio-economic research.

As part of their objectives and activities (Table 10), MBCQF lists, “Support a research fund focused on local and regional stocks.” Our interviews did not produce any detail on research projects that may have been supported with MBCQF funds.

Although nearly all interview respondents did not speak directly about this program, MBFT has helped to establish an on-board observer pilot program [26]. The goal of the program appears to be reducing the expense to groundfish fishers associated with carrying on-board observers.

4.2.4.1 Research in conservation, ecology, and biology

General support for science and research was evident among a range of respondents. However, on the topic of conservation/biological research, we did not uncover any detail on specific projects the CSCs might be funding or supporting (Table 12).

Table 12. Interview responses: support for science and research.

Group	Question	Response
Morro Bay civic leader	<i>What do you think are the greatest contributions to the commercial fishing industry has made to your region within the past five years?</i>	Advancing Science: the fleet contributes to the greater regional and coast wide scientific knowledge pool on fish stocks/behavior, results of closures (MPAs), effects of climate change, etc. by participating in collaborative research with Cal Poly, TNC, MBNEP, and federal and state regulators...
MBCQF board member	<i>Since the formation of the MBCQF/MBFT, what, in your opinion are the top five accomplishments of the organization?</i>	<ol style="list-style-type: none"> 1. Formalization/formation after many years of hard work, strategizing, collaborating...struggle. 2. Acquiring quota in a very competitive market and complex system 3. Attracting sufficient funding to acquire quota and establish a viable business model 4. Successfully, though incrementally, working to increase and maximize utilization of quota and permits 5. Contributes to greater community benefit by granting money for scientific research
MBCQF board member	<i>In what ways do you think the MBCQF/MBFT is performing well?</i>	The Quota Fund has funded two grants, including one for research that benefits the fishery.
MBFT board member	<i>Since the formation of the MBCQF/MBFT, what, in your opinion, are the top five accomplishments of the organization</i>	<ol style="list-style-type: none"> 1. Anchor quota in the community (that was otherwise at risk of consolidation) 2. Achieved financial viability, operate in the black, currently have a fully funded 6 month operating reserve 3. Provide a platform to make valuable species available in Morro Bay and leverage species not currently used in Morro Bay by leasing to fishermen from other ports (as far as Newport and Seattle). 4. Attracted a diverse and involved board (smart, dedicated, hardworking and have interest of the community at heart) 5. Made grant funding available for scientific research and a community event (\$15-\$20k)

In addition to these responses emphasizing the role of the quota funds in supporting conservation research, in 2015 the MBCQF issued a request for proposals to fund scientific research. Examples of desired research topics that were given included improving understanding of the status of fish stocks, reducing bycatch, and gear or gear deployment innovations [27].

4.2.4.2 Socio-economic research

In contrast to the conservation, ecological, and biological research that was mentioned previously in general terms, respondents spoke specifically about a number of socio-economic research projects the CSCs were actively engaged in. The high cost of participation in the IFQ fishery due to onboard observer requirements and the unreliable nature of local groundfish markets were two examples stakeholders provided as areas where CSC-supported research could be beneficial to the community (Table 13).

Relative to the first of these examples, MBFT has invested in pilot programs to lower operational barriers created by on-board observer requirements:

Table 13. Interview responses: lowering fishery participation costs.

Group	Question	Response
MBFT board member	<i>What are the strategies your organization uses to promote viability at the vessel level?</i>	The MBFT has assisted vessel owners various ways: negotiating, on behalf of vessel owners, with the observer companies to schedule coverage and consider alternative payment plans; providing business support such as website development and communications with prospective buyers; initiating program like Fish Hub; working with observer companies (Saltwater) pilot testing a program that would make it easier and cheaper for local fishermen to fulfill observer coverage requirements...

Relevant to the second of these examples, throughout our interview process, CSC organizers and fishers expressed concern about supply chain and marketing issues (Table 14).

Table 14. Interview responses: local groundfish markets.

Group	Question	Response
MBCQF board member	<i>What do you think are three characteristics or behaviors of a successful MBCQF/MBFT fisher participant?</i>	1. Willingness to work under a restrictive and often onerous management scheme 2. Financial and marketing savvy, ability to make participation “pencil”...undertake fishing a more structured and innovative business approach.
Fish buyer/processor	<i>Do you think MBCQF/MBFT is effective in marketing/promoting itself to the community?</i>	Could be better, most buyers, except those very close to the operation like us have no idea.
Fisher	<i>What do you think are the greatest contributions that the commercial fishing industry has made to your city in the past five years?</i>	Commercial fishing has provided jobs and wealth in Monterey and is a strong link to our history, but in the last 15 years, it has become increasingly difficult to be a successful fisherman because of closures (MPA, RCA particularly), soft markets caused mainly by negative perceptions generated by NGOs (like Seafood Watch and Oceana’s efforts) that for decades have painted commercial fishing and commercial fishermen as bad guys...particularly trawlers. Another huge factor limiting our potential for success is an ITQ program that exacts excessive costs on the fisherman...combined, these issues have made it all but impossible to be successful or profitable. The market for us has gone soft because the closures, regulations and reduction of the fleet disrupted our ability to supply to our buyers and consequently, we have lost access to most of our traditional markets, we lost our ability to be consistent...

A common concern that was voiced in our interviews was the belief that Morro Bay area and Monterey area groundfishers were vulnerable to supply chain disruptions because of their relatively small scale of operations. The implication made here is that groundfish species have many substitutes in the market. So if, for example, Morro Bay and Monterey area fishers are unable to consistently supply primary product like Dover sole, buyers/processors will find alternative supply channels. Once buyers establish alternative supply channels (groundfish from Alaska, Canada, or even other areas of the West Coast) they may no longer demand any primary product from local fishers.

While Morro Bay area fishers and community members exhibited awareness and concern over groundfish supply chain issues, at the time of our interviews the MBCQF was not directly involved in specific efforts to strengthen local groundfish markets. In contrast, MBFT has devoted considerable resources to scoping a “Fish Hub.” The Fish Hub, though still an abstract concept, has been proposed as way to strengthen local/regional markets by i) aggregating catch in order to establish supply consistency and ii) increasing demand for local groundfish through product differentiation.

This important distinction between operational strategies of MBCQF and MBFT will be explored further in Section 4. One important preliminary observation is that MBCQF appears to have been almost singularly focused, since 2014, on the goal of getting local groundfish boats active and using as much quota as possible to generate groundfish landings in the port of Morro Bay. We believe this is an example of their very “fishing industry focused” strategy. That is, while they understand that an array of issues (observer costs, soft markets, fuel costs) are making commercial groundfish fishing in the Morro Bay area difficult, they clearly believe that the best way forward in the short run is to focus on the commercial fishers. MBFT, perhaps because of their more diverse board or access to a greater cash reserve, clearly believes they need to pursue a comprehensive approach from the start.

4.3 Performance

4.3.1 Quota leases by the CSCs

Our interviews with CSC personnel revealed that the MBCQF leased about 1.7 million lbs. of groundfish quota in 2014, 2.05 million lbs. in 2015, and approximately 2 million lbs. at the time of our interview in 2016. By examining the IRS 990 EZ forms for each CSC we were able to determine that MBCQF generated \$102,716 in gross revenue from quota leases in 2014 and \$123,000 in 2015.

The MBFT indicated leasing 720,000 lbs. of quota between September of 2015 and August of 2016. Interviewees estimated gross revenue from quota sales of \$81,000 in 2015 and \$27,000 for 2016¹⁴ (Table 15).

¹⁴ Interviews were conducted in the summer of 2016 so this 2016 number is a year-to-date figure.

Table 15. Revenue from quota leases.

Entity	Year	Lease Revenue ¹⁵
MBCQF	2014	\$102,716
	2015	\$123,000
	2016	\$124,108
MBFT	2015	\$81,603
	2016	\$129,130

4.3.1.1 Local and non-local landings and quota leases

Monterey/Moss Landing

In Monterey/Moss Landings in 2015 and 2016 a total of 532,139 lbs. of IFQ groundfish was landed, all of it landed by “local¹⁶” vessels (Table 16). Additionally, approximately 400,000 pounds of this total was landed by a local fisher who did not lease quota from MBFT. This leaves, at most, approximately 100,000 pounds of IFQ groundfish landed in Monterey/Moss Landing with MBFT quota. Since MBFT reported leasing approximately 720,000 lbs of quota between September 2015 and August 2016, this suggests that approximately 620,000 lbs. of MBFT quota was leased to fishers landing groundfish at other ports.

Table 16. Monterey/Moss Landing IFQ groundfish landings.

Year	Dahl Sector 20 (lbs.)	Dahl Sector 4 (lbs.)	Total IFQ groundfish (lbs.)
2011	48,733	758,939	807,672
2012	34,212	1,006,390	1,040,602
2013	95	497,444	497,539
2014	652	1,270,745	1,271,397
2015	3,390	425,465	428,855
2016	29,015	73,269	102,284
2017	138,542	0	138,542

Morro Bay

IFQ groundfish landings in the port of Morro Bay in the first two years of MBCQF operation (2014, 2015) were approximately 770,000 and 580,000 lbs. respectively (Table 17).

¹⁵ Lease revenue comes from publicly available IRS 990 EZ forms, Part VIII, item 2a [18, 25].

¹⁶ For these calculations we consider a vessel’s homeport to be the port where the vessel made 50% or more of its groundfish landings prior to 2011. A Monterey Bay or Morro Bay “local” vessel is defined here to be a vessel whose homeport is Monterey, Moss Landing, or Morro Bay.

Table 17. Morro Bay IFQ groundfish landings.

Year	Dahl Sector 20 (lbs.)	Dahl Sector 4 (lbs.)	Total IFQ groundfish (lbs.)
2011	855,005	362,432	1,217,437
2012	325,414	1,220,178	1,545,592
2013	201,857	626,935	828,792
2014	312,470	457,893	770,363
2015	171,828	412,919	584,747
2016	300,202	403,395	703,597
2017	149,893	119,216	269,109

Observed IFQ groundfish landings at the port of Morro Bay during the first two years of MBCQF operation can be broken out into three classes (Table 18):

1. Landings by Morro Bay locals known to be leasing quota from MBCQF
2. Landings by Morro Bay locals not leasing quota from MBCQF, and
3. Landings by non-local vessels.

In the case of group #1 we assume that these vessels are leasing quota from MBCQF for all of their IFQ groundfish landings. In the case of group #3 we cannot observe how much quota they lease from MBCQF but, since these vessels had no prior consistent history of making commercial fish landings at the port of Morro Bay, we assume that they would not do so in 2014/2015 unless they were fishing MBCQF quota.

Table 18. Morro Bay groundfish landings by local and non-local fishers.

Year	Local Quota Fund landings (lbs.)	Local non-Quota Fund landings (lbs.)	Morro Bay landings ¹⁷ by non-local vessels (lbs.)
2014	555,456	3,167	214,907
2015	445,997	0	138,684

In 2014, there were approximately 770,000 total lbs. of IFQ groundfish landed at the port of Morro Bay in 2014, most of it landed by local vessels leasing from MBCQF. In 2015, there were 580,000 lbs. of IFQ groundfish landed at the port of Morro Bay, most of it by local vessels leasing from MBCQF. Here it is worth noting that the MBCQF portfolio includes a 0.436% share in the Pacific whiting harvest. In 2014 this would have generated a quota pound allocation from MBCQF of just over 1,000,000 lbs. of whiting. In 2015 this share would have generated roughly 1.1 million lbs. of whiting for MBCQF. Pacific whiting generally is not fished south of Eureka, CA and one would not expect this quota to generate local landings. From these figures it is clear that, in the first two years of operation, most of MBCQF's non-whiting quota was used to generate landings in the port of Morro Bay, either through quota leases to local vessels or through quota leases to non-local vessels who landed groundfish at the port of Morro Bay.

¹⁷ This includes 1 vessel with no fishing history prior to 2014. Records show the vessel owner location to be Astoria but from 2014 – 2017 the vessel has exclusively landed IFQ groundfish at the port of Morro Bay. This participant is distinct from another well-know groundfish fisher that relocated to the Morro Bay area in order to fish MBCQF quota.

It is important to note that, although we have reported on landings and quota leases for the first two years of operations for MBCQF and MBFT, any attempts at comparing outcome for the two organization should be done with extreme caution. First, MBCQF was leasing quota for the entire 2014 – 2015 period while MBFT was still in the process of forming the fisheries trust in 2015. Second, the Morro Bay area fishing community has had a close relationship with The Nature Conservancy since at least 2003 when TNC negotiated a buyout of Morro Bay area fishing permits. Because of this pre-existing relationship with TNC, MBCQF was likely able to ‘hit the ground running’ in their first year of formal operations in 2014. Since we observe that TNC purchased groundfish permits from local fishers in 2003 but many of those fishers continued participating in the groundfish trawl fishery from 2003 – 2010, we conclude that there was likely some existing arrangement between Morro Bay area groundfish fishers and TNC to lease limited entry permits. In light of this, it should have been relatively easy for Morro Bay area fishers to transition from leasing permits from TNC to leasing quota from MBCQF (which took over TNC quota). We are not aware of any such pre-existing arrangement between the Monterey/Moss Landing fishing community and TNC.

4.3.2 Induced innovation and access to credit

Our interviews also asked respondents to provide any examples of innovation they related to quota fund management that they could think of. The language of ‘innovation’ is visible in how several entities describe the benefits and goals of community held quota. The MBFT uses this keyword in several places in their leasing policy, stating that quota leases may prioritize fishermen who:

- Have pursued gear innovations such as those that lower bycatch, reduce habitat impacts, or limit post-release mortality of non-target species.
- Have participated in use of electronic reporting technologies
- Have participated in research efforts aimed at improving the environmental and economic performance of the fishery.

The MBCQF also lists, as one of its objectives to, “Incentivize innovation in fishing practices and marketing, to achieve resiliency in volatile markets.”

The Nature Conservancy, the primary supplier of quota for the CSCs, describes the benefits of partnering directly with fishing communities as follows [23]:

The partnerships established through this project among fishermen, community leaders, managers, and NGOs has broken ground on how collaborative relationships can develop innovative and adaptive solutions to support economically viable and productive fisheries, healthy ocean ecosystems, and resilient fishing communities.

We asked respondents for examples of ‘innovation’ in order to develop a better idea of what respondents thought it meant to pursue innovative fishing/business practices. At the time our interviews were conducted MBCQF had only been in operation for a little over 2 years and the MBFT had been in operation about a year. There was a general sense that MBCQF/MBFT had not been in existence long enough for operations to have heavily influenced fishers’ business practices, fishing techniques, or access to credit. There were however, three examples of fisheries innovations influenced by MBCQF/MBFT activities.

4.3.2.1 Innovation in business practices

When talking about innovation, innovative fishing practices, or innovative business strategies there was a general perception among respondents that ‘rethinking the supply chain’ is important for smaller ports with smaller vessels such as the ports of Morro Bay, Monterey, and Moss Landing (Table 19). Multiple fishing community stakeholders we interviewed pointed to the example of one Morro Bay area groundfish fisher who had increased revenues by processing some of his own catch and engaging in direct sales to get a premium price as well as altering his fishing strategy to target high value fish.

Table 19. Interview responses: innovative business practices. Names of fishery participants in responses are redacted for confidentiality considerations.

Group	Question	Response
MBCQF board member	<i>Please give us up to three examples of induced innovation (fishing techniques, business models, financing) that fishermen have adopted since the inception of MBCQF/MBFT</i>	Direct marketing and greater participation in the value chain (processing, filleting, packaging, and smoking) that the trawler skipper (██████████) has engaged in is an amazing example of innovation in a fishing business model. ██████████ as rented a location on the waterfront and invested heavily in refrigeration/freezing/processing/packaging and promotional equipment to better appeal to the boutique retail, farmer’s markets, and restaurants. Also, ██████████ is keeping between 800-1800 pounds of SSTH live (and fresh) and selling for up to \$5.50/pound, shifting a typically high volume lower value model (trawl) to a lower volume/higher value model. ██████████ is fishing MBCQF quota and leasing MBCQF permit.
MBCQF board member	<i>Please give us up to three examples of induced innovation (fishing techniques, business models, financing) that fishermen have adopted since the inception of the MBCQF/MBFT.</i>	The best example of innovation is ██████████, our trawler skipper’s approach to position his operation to focus on a higher value/lower volume; shorter tows, and shallower tows targeting live fish, getting more money at the dock as well as investing in a processing, packaging, smoking operation and direct retail & farmer’s markets to take greater control of the value chain.

4.3.2.2 Regulatory innovation

Respondents also emphasized what they perceived as the importance of regulatory innovation. Although this wasn’t the intended focus of the question, it remains an important issue. Responses to multiple questions indicated that stakeholders saw one important function of the CSCs being to lobby for changes they felt would benefit their local groundfish fleet. Specifically, electronic monitoring to reduce the cost of on-board observers and the possibility of opening portions of the RCA to fishermen using special gear were referenced (Table 20).

Table 20. Interview responses: supply chain and gear innovations. Names of individual fishery participants in responses are redacted for confidentiality considerations.

Group	Question	Response
MBFT board member	<i>What are the strategies your organization uses to promote viability at the vessel level?</i>	The MBFT has assisted vessel owners various ways: negotiating, on behalf of vessel owners, with the observer companies to schedule coverage and consider alternative payment plans; providing business support such as website development and communications with prospective buyers; initiating programs like Fish Hub; working with observer companies (Saltwater) pilot testing a program that would make it easier and cheaper for local fishermen to fulfill observer coverage requirements; and exploring options for partnering with local community economic development organizations to help secure loans and business support for commercial fishing businesses.
MBFT board member	<i>In what ways do you think the MBCQF/MBFT is performing well?</i>	...developing and representing community needs in the context of smart solutions for small communities, such as easing the cost of observer coverage through EM, making observers more readily available by investing in training a local observer and researching ways to improve connections between the fishery and the local supply chain and community purchasers. This research being sponsored by the MBFT for Fish Hub.
Monterey dockside business	<i>Is there anything else you would like to add</i>	REASONABLE ACCESS: We need reasonable access to the resource, DGN is dead because of potential interaction with turtles or whales, nearshore permits are limited, ITQ is keeping all but the big players “out”. Salmon is a river problem; albacore have moved north (no one’s fault). The MPAs and RCA are cutting off the rest of the opportunity. How about opening a couple areas in the RCA? We can use gear that has 0 bycatch and no habitat disruption.... shrimp fly gear. Name redacted tried but he is not an expert with the gear.... I have a couple guys who can fill their boat in an afternoon with this kind of gear. We need access to the resource. How about a staggered East/West orientation of RCA closure, not North/South.

4.3.2.3 Innovation in markets

Interview respondents from MBCQF and MBFT expressed a belief that groundfish fishers and fishing communities would need to address issues with the current/traditional supply chain in

order to be sustainable into the future (Table 21). MBCQF respondents did not offer specific projects that the quota fund had initiated or intended to initiate in order to address supply chain issues. They did however, point to the experience of a local fisherman who was trying to use local markets and product differentiation to extract more value from groundfish catch. This was generally viewed as an achievement of the quota fund. By ensuring that local fishers would have consistent access to affordable quota, MBCQF empowers/encourages fishers to invest in new business practices.

MBFT, in contrast, has addressed the issue of “soft local groundfish markets” by funding a business consultant to research the feasibility of a Monterey Fish Hub. The Fish Hub, though still an abstract concept, has been proposed as way to strengthen local/regional markets by i) aggregating catch in order to establish supply consistency and ii) increasing demand for local groundfish through product differentiation. At the time of our interviews the “Fish Hub” was still in a scoping phase but MBFT had committed considerable financial resources to research this potential solution.

Table 21. Interview responses: rebuilding, rethinking local groundfish markets.

Group	Question	Response
MBFT board member	<i>In what ways does MBCQF/MBFT need to improve</i>	MARKETS: in many ways the market connection challenges of the West Coast IFQ program is bigger than Monterey or the MBFT (publicly available analyses makes this clear), but the organization needs to identify ways the community can educate/improve/affect the supply chain and increase demand and financial return for locally-caught and landed sustainable seafood. MBFT hopes to 1) hold and lease quota, 2) promote sustainable fisheries, 3) provide a platform that bring together diverse concerns and capabilities and 4) generate demand for sustainably harvested and locally landed fish. We will work with fishing interests to ensure landings can help meet needs and expectations and generate more awareness of environmental stewardship in our fishery, so that the product is more attractive to local and broader markets.
MBCQF board member	<i>From your perspective, what are the optimal number and types of vessels and fishing participants for the MBCQF/MBFT?</i>	As many as possible given the limited quantity of fish available to a Quota Fund. Also, we can expand the number of participants even further if we find/create markets for a greater diversity of (underutilized) species within the ITQ groundfish fishery.
MBCQF board member	<i>Please give us up to three examples of induced innovation (fishing techniques, business models, financing) that fishermen have adopted since the inception of the MBCQF/MBFT</i>	1. Continued use of selective trawl gear 2. Investment and increased participation by fishermen in the value chain through processing (filleting, smoking), packaging and direct sales (farmer's markets).

4.4 Governance

Our interviews attempted to elicit information on how governance issues such as how potential conflicts were resolved. The intent of these questions was to discern how the quota would be allocated in the event that demand for quota among local vessels exceeded supply. The lease policy of each CSC provides some formal guidance on how characteristics of each quota bidder would map to a priority ordering. Related to governance issues we were specifically interested in the hypothetical case where two identical local vessels were vying for a small amount of quota. In cases like these, we were interested in how the CSCs would resolve conflict, for example:

- Would the Board of Directors need to meet and take a formal vote?
- Would the two fishers be engaged in discussion and asked to find a compromise among themselves?
- If there was a tie-breaking rule, how did the CSCs establish such a rule?

Ultimately, this line of questioning was not very fruitful. This is because in both the Monterey and Morro Bay areas there are very few prospective fishers interested in the IFQ groundfish fishery. The high cost of participating in this fishery was frequently cited as a reason why few local boats were able to lease quota from the CSCs. Since there are few prospective fishers in each location, the issue of establishing a framework for resolving conflicts not resolved by adherence to the lease policy was not important to consider.

5 Discussion

In Section 4 we present perspectives from fishing community members familiar with MBCQF and MBFT as those perspectives were relayed to us. Although we have grouped responses by some salient themes, we have attempted to avoid drawing too much inference from responses. In this section we focus on using the data from Section 4 to make some of our own observations. Our observations relate to the primary research question,

Are there any lessons from the experiences of MBCQF/MBFT that might be transferable to other fishing communities considering investing in community held fishing quota?

5.1 Overall sentiment towards MBCQF and MBFT

An important observation from the interview responses in Section 4 is that diverse groups of stakeholders in the Morro Bay and Monterey areas appear to have similar perspectives regarding the economic/financial viability of their local commercial groundfish fleet. Groundfish harvesters from the ports of Morro Bay, Monterey, and Moss Landing expressed the opinion that their businesses were not viable (without some outside help) in the prevailing market, environmental, and regulatory conditions. In this context, they were generally complimentary towards MBCQF and MBFT as they saw these organizations trying to provide some financial help to the fleet that they feel is critical if commercial groundfish harvesting is to continue in the Morro Bay and Monterey areas. Other community stakeholders also perceived the local groundfish fleet to be teetering on the brink of insolvency. In this context, they also were generally complimentary towards MBFT and MBCQF operations and they believe that local groundfish harvesting would not exist without the subsidy provided by these organizations.

It is important to emphasize here that these perceptions are supported by the available empirical evidence. Specifically,

1. According to available data, groundfish fishers from the Morro Bay and Monterey areas are less profitable on average than vessels from other areas, and
2. Fleet consolidation has been a trend in the groundfish fishery coast wide. Since Morro Bay and Monterey area vessels are less profitable, it is logical to expect that, without some intervention, Morro Bay and Monterey area vessels will continue to exit the fishery, or at least reallocate significant amounts of effort away from groundfish and towards other commercial fisheries. This will likely lead to the further consolidation of coastwide groundfish landings in the relatively profitable ports of Astoria, Eureka, Fort Bragg and the disappearance of commercial groundfish landings from ports like Morro Bay, Monterey, and Moss Landing.

Figure 8 shows revenue net of variable cost by homeport area. These data come from NOAA Fisheries Northwest Fisheries Science Center’s Economic Data Collection Program [28]¹⁸. For clarity only a selection of West Coast groundfish ports are shown.

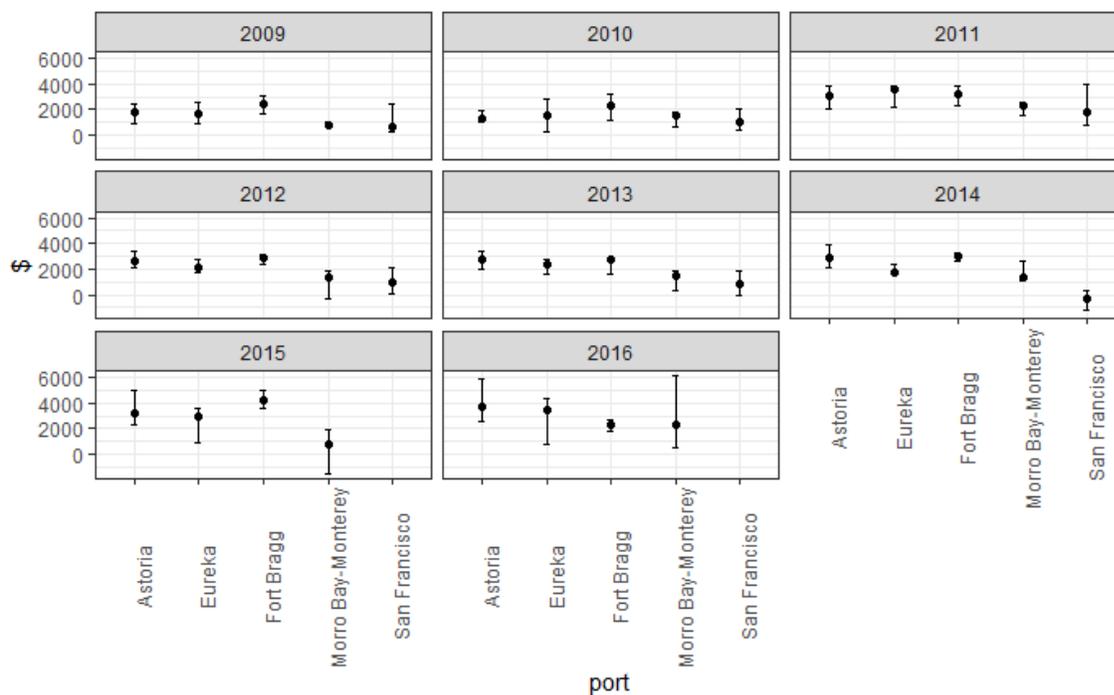


Figure 8. Revenue net of variable cost per day by homeport area. Circles mark the median revenue net of variable cost per day and bars extend from the 25th to the 75th quartile.

¹⁸ These data were accessed using the FISHEyE application [29] and plots were created by the authors.

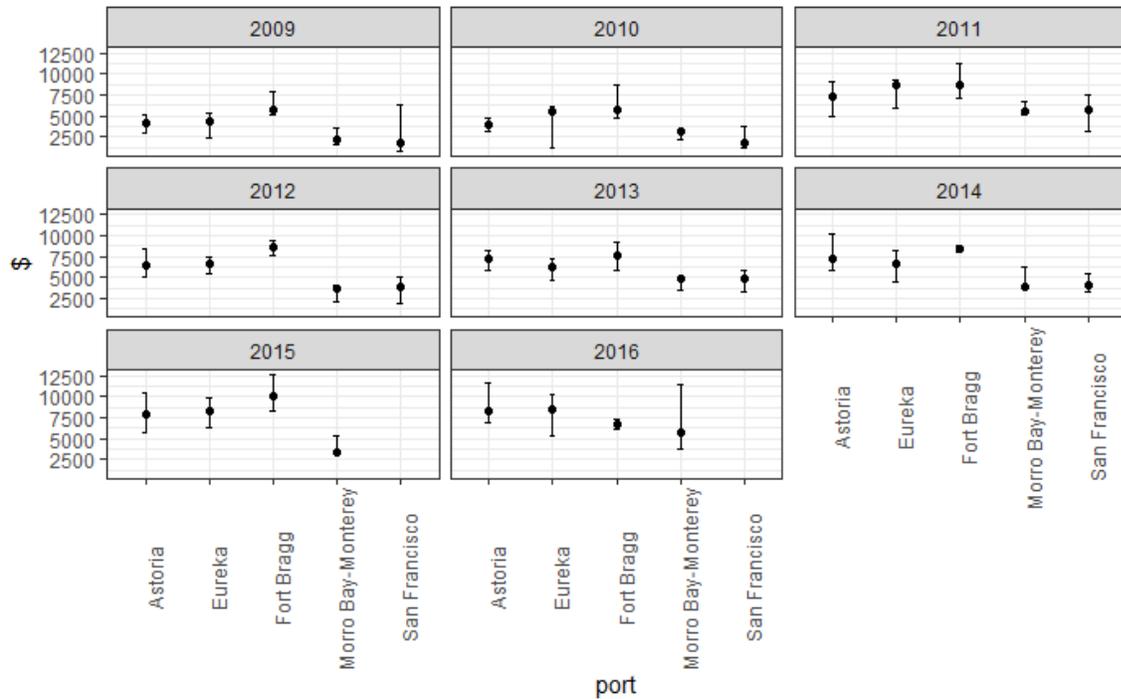


Figure 9. Gross revenue per day for groundfish catch share vessels by home port area. Circles mark the median gross revenue per day and bars extend from the 25th to the 75th quartile.

Regarding item #2 above, Figure 2 in Section 2.2.2 illustrates the long-running trend of consolidation in the Pacific Coast groundfish fishery. Figure 2 shows that the share of total coastwide limited entry trawl groundfish landed in the Morro Bay and Monterey areas declined from 5% in 2005 to 2% in 2015. Over this same period, the share of coastwide limited entry trawl groundfish landed in Astoria, OR increased from 30% to 45%. So the expectation that, without some intervention, Morro Bay and Monterey area groundfish activity would continue to decline under catch shares was supported by the historical trends in the fishery.

Onboard observer costs were repeatedly referenced in our interviews as a specific threat to the economic and financial viability of the Morro Bay and Monterey area groundfish fleets. It is difficult to conclude, based on the limited data available, that on-board observer costs are generally higher for Morro Bay area and Monterey area vessels than for vessels in other West Coast port areas. Table 22, which has been reproduced from Table 3-35 in [2], shows average observer costs in the Morro Bay area and Monterey area to be slightly higher than other ports in 2014 but generally in line with coast-wide per day observer costs in most years. However, since Morro Bay area and Monterey Bay area vessels tend to land lower volumes of fish per day and generate lower revenue (Figure 9) the same per day observer costs leads to a higher variable cost per pound of fish for Morro Bay and Monterey area fishers.

Table 22. Average onboard observer costs per day (2015\$) fishing in the catch share fishery by vessel homeport. Triple asterisks (***) indicate observations not reported in order to protect confidentiality.

Homeport	2011	2012	2013	2014	2015
Puget Sound	49	96	150	206	278
South and central WA Coast	***	91	143	211	152
Astoria	48	99	193	249	393
Tillamook	***	***	***	***	***
Newport	54	99	174	243	209
Coos Bay	62	72	160	313	390
Brookings	41	84	164	250	431
Crescent City	57	98	155	202	***
Eureka	41	89	187	234	412
Fort Bragg	46	113	224	264	389
San Francisco	65	94	155	357	***
Morro Bay-Monterey	40	103	186	351	***

In the remainder of Section 5 we will try to highlight similarities and differences in the way MBFT and MBCQF approach their goal of making local groundfish fleets economically viable, with the intention of providing information that fishing communities might leverage in the future in deciding whether or how to subsidize their local commercial fishing fleet.

5.2 Contrasting operational strategy of MBCQF and MBFT

In Section 4.2.4.2 we observed that MBCQF and MBFT appeared to have diverging views on the role of CSC in addressing groundfish supply chain issues that many respondents agreed disadvantaged groundfish harvesters from the Monterey area and Morro Bay area.

We claim that in general MBCQF has a more “fisher first” approach to operations. We want to be clear they we don’t present this as a normative statement. Both organizations are clearly dedicated to supporting their local groundfish industry and fishing community. MBCQF believes that the best way to accomplish this is to channel all of their resources into direct, targeted support for local groundfish fishers. MBFT clearly believes that the best way to support the industry and community is to simultaneously address all of the stressors acting on the local groundfish fishery.

This section has 3 objectives. First, we provide some support for our claim that MBCQF and MBFT have different perceptions regarding the role of the CSC in promoting a sustainable local groundfish fishery. We also offer two possible explanations for this difference. Second, we discuss the different philosophies in the specific context of ‘innovation.’ Finally, we comment on a possible outcome of the operational strategies: quota leasing.

5.2.1 MBCQF has a “fisher first” approach

Respondents from both the Morro Bay area and the Monterey area generally highlighted the same stressors on their local groundfish fisheries,

1. It is costly to fish because of the need to purchase/lease quota
2. It is costly to fish because of the need to get observers
3. It is difficult to fish profitably because of complications with local markets for catch.

MBFT has initiated projects that directly address all three of these stressors. MBCQF in contrast has focused operations very tightly on addressing #1.

In addition to subsidizing quota pounds for local groundfish fishers, MBFT has devoted considerable resources to i) lower observer costs for Monterey area fishers, and ii) scooping a “Fish Hub.” The Fish Hub, though still an abstract concept, has been proposed as way to strengthen local/regional markets by i) aggregating catch in order to establish supply consistency and ii) increasing demand for local groundfish through product differentiation.

While, Morro Bay area fishers and community members exhibited awareness and concern over groundfish supply chain issues, at the time of our interviews the MBCQF was not directly involved in specific efforts to strengthen local groundfish markets.

The conclusion that we draw from this observation is that MBCQF has a step-wise approach to dealing with the array of complex stressors putting pressure on the local groundfish fleet, which, in the immediate term is more fishing industry focused than MBFT. MBCQF understands that an array of issues (observer costs, soft markets, fuel costs) are making commercial groundfish fishing in the Morro Bay area difficult but they clearly believe that the best way forward in the short run is to focus on the fishers. They want to focus in the immediate term on stabilizing the fishery (using quota to generate landings and get local boats fishing consistently). Then, pursue projects or strategies that can help address the issues underlying the financial/economic difficulties of the local industry.

In short, most individuals from both organizations that we interviewed agreed that lots of innovations are necessary in order for commercial groundfish fishing to be sustainable in the Monterey area and the Morro Bay area: local markets need to be rebuilt, fishing practices and business approaches need to evolve, regulations need to be re-examined. MBCQF believes the best path forward is to get fishers fishing first and fix the rest later. MBFT appears to believe that strategies addressing all the issues are necessary in the immediate term.

We propose two explanations for this conclusion. The first is that the leadership composition of the two organizations is very different. MBCQF’s Board of Director’s includes commercial fishers, a Harbor Director, and representation from the academic community. Notably, the MBCQF board does not include individuals with strong ties to conservation NGOs. MBFT’s board also includes strong representation from the commercial fishing community (commercial

fishers and Harbormasters) but also includes individuals from the conservation NGO community. Additionally, MBFT receives significant funding from the Monterey Bay Aquarium Foundation and the David and Lucile Packard Foundation.

The second potential explanation for the divergent strategies of MBCQF and MBFT is a matter of philosophy. It is clear that both fishing communities perceived their local groundfish industries to be in a state of crisis at the time of the formation of MBCQF and MBFT. MBCQF's step-wise approach could stem from a belief that the best way to fix a system broken in many places is to identify the most important elements and fix those first. Similarly, MBFT's all-in approach could stem from a perception that the problems plaguing the fishing community are too numerous and too severe to be addressed one-by-one.

5.2.2 Implications of MBCQF's "fisher first" approach

In Section 4.3. we presented some evidence that MBCQF i) leased a lot more quota in their first two years of operation than MBFT and ii) generated more local groundfish landings from leased quota. It is clear that MBCQF had some organization advantages (a long, pre-existing relationship with TNC) that probably allowed them to 'get up to speed' faster than MBFT. It is also true that comparing MBCQF 2014/2015 and MBFT 2015/2016 is imperfect since MBFT wasn't leasing quota throughout the entire 2015 calendar year. However, it is also very possible that the difference in fishing activity generated by quota transactions is, at least, in part due to operation strategy and philosophy. MBFT organizers and Monterey area Civic leaders were more diverse in their responses to questions about the role of the CSC: some prioritized the idea of fixing local markets through the "Fish Hub", some prioritized the ideas of "re-building demand for locally caught fish", while others spoke primarily about observer costs. MBCQF respondents (board members and civic leaders alike) in contrast appeared more uniform in their perception that single most important function of the CSC is to get as much discounted quota in the hands of local fishers as possible.

5.2.3 Different perspectives on innovation between MBCQF and MBFT

When asked about innovation several MBCQF affiliated respondents relayed an anecdote about the same Morro Bay area fisherman who was experimenting with new business practices and leasing MBCQF quota. It was clear that "top-of-mind" for MBCQF affiliates was that innovation comes from within the industry. MBCQF appears to view innovation as something the fishers are incentivized/empowered to undertake themselves as long as they are solvent and have some tenure in the fishery. Under this view of innovation, it appears the MBCQF views its primary responsibility as ensuring the financial solvency of the fishing fleet. And that, if fishers are assured some consistency in operations (in this case, access to affordable quota), they will then have the flexibility (bandwidth) to explore profit enhancing strategies.

MBFT has taken a different approach by inserting themselves directly into the innovation pipeline. They clearly believe that large changes are critical for the survival of the local groundfish industry. And driving large changes such as reorganizing a local/regional supply chain requires coordinated action. Transactions costs can make it difficult for individual fishers to establish the type of coordinated actions capable of making large changes in regional markets. In this case, one could view MBFT as playing to their comparative advantage in the sense that large cooperative organizations are better positioned than individual players to drive large changes (Table 23).

Table 23. Interview responses: benefits of scale.

Group	Question	Response
MBFT organizer	<i>In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?</i>	...The MBFT also brings what individual fishermen or loose groups of individuals cannot do, would find impossible, to operate in a concerted/strategic manner. Larger businesses can think strategically and for the long term; smaller operators don't have that luxury.

A possible practical explanation for the diverging views on industry innovation is that MBFT has a lot more money than MBCQF. MBFT takes grants and donations from a variety of charitable organizations and has a lot more cash on hand than MBCQF. This larger bank roll puts them in a better position to take on large projects.

However, the difference in financial position could itself be a function of philosophy. If MBFT perceives coordinated action from a cooperative aimed at multiple points of weakness (industry practices, wholesale buyers, consumer demand) as the best path towards a sustainable local groundfish fishery, then they would also prioritize solicitation of lots of outside capital. If MBCQF perceived the best path forward in the immediate term to be focusing on the local fishing fleet and putting them in a position to innovate, then they would be comparatively less interested in getting lots of outside cash.

- MBCQF would clearly rather use all of their resources to get cheap quota in the hands of local fishers and address the supply chain issues, partially, by making sure there is a consistent volume of groundfish landings coming into the port of Morro Bay. And that consistency in landings should create some consistency in markets
- MBFT, in contrast, is also looking to get quota out to fishers but they clearly do not believe that just establishing consistency in landings will solve the supply chain issues. They clearly believe they need to spend a good chunk of their money directly addressing the issues with local markets.

5.3 Civic engagement

There is an important distinction between MBCQF/MBFT and other forms of Community Supported Fisheries (CSFs) [30] that have arisen in many fishing communities recently. CSFs generally support local fishers through direct contributions from within the community: individuals agree to pay a premium price for scheduled deliveries from local fishers.

CSFs were modeled on similar arrangements between community members and farmers (CSAs). CSAs were initially conceived of as a means to provide farmers with income stability and to spread the risk of short-run fluctuations in production: members payed in advance for a 'share' of a farm or farming cooperative's harvest. Since the share price was generally fixed, the risk of a poor production year was distributed among the shareholders.

It is worth noting that the major CSFs currently operating along the West Coast function primarily as a means to extract a 'local' premium from consumers. They do not generally operate as risk-sharing programs¹⁹.

In contrast to CSFs, which support local fishers through direct payments from community members, CSCs provide a means to support Morro Bay area and Monterey area fishers with money from outside the community. Both organizations were set up with loans and grants from national NGOs as well as with heavily discounted quota from The Nature Conservancy. Importantly, MBFT has recently received direct financial support from the City of Monterey.

It is clear that respondents of all types believe commercial fishing contributes tremendous value to their local communities (Table 24).

¹⁹ There are a number of different CSFs currently in operation in California and Oregon. In Appendix Table 5, we provide some information on a small sample of these. These are representative of most West Coast CSF in that they supply a consistent quantity of fish to members based on membership type. While the species supplied will fluctuate with the season and fishing conditions, shareholders are generally not exposed to the risk of poor fishing conditions in form of reduced or zero quantities. In the case of Reel Good Fish (a Monterey-based CSF), when fish from traditional capture fisheries are not available (either because of inclement weather or other poor fishing conditions), shareholders are often supplied with oysters from one of the many oyster farms along California's Central Coast. See [30] and [31] for more detailed academic discussion of direct marketing arrangements and CSFs in the U.S.

Table 24. Interview responses: value of commercial fishing to the community.

Group	Question	Response
Morro Bay fisher	<i>How would you describe the importance of MBCQF/MBFT to your city?</i>	<ol style="list-style-type: none"> 1. Keeps valuable groundfish landings local, better assuring earnings for local fishermen, and deckhands, offloading fees, ice and fuel purchases 2. Preserves access to the groundfish resource for the next generation of new fishermen 3. Maintains the connection between the marine resource and the community, through its structure/by-laws 4. Assures a supply of high quality, fresh protein for Morro Bay seafood consumers, without reliance from “outside” ...makes food supply more secure and of higher quality
MBFT organizer	<i>What do you think are the greatest contributions that the commercial fishing industry has made to your city in the past five years?</i>	<ol style="list-style-type: none"> 1. Feeding people 2. Annual Festa Italia Santa Rosa, produced in collaboration with the Sicilian community. Includes the blessing of the fleet, bring in a lot of tourism. 3. Collaboration with local researchers – e.g. provides vessels and advice for ocean research 4. Assistance and advisory positions to groups like the Monterey Bay National Marine Sanctuary – e.g., working with the Monterey Bay National Marine Sanctuary to agree on a change to Essential Fish Habitat locations.
MBFT organizers	<i>What do you think are the greatest contributions that the commercial fishing industry has made to your city in the past five years?</i>	<ol style="list-style-type: none"> 1. Generates employment and wages 2. Generates money and investment for local businesses and the Port 3. Makes seafood available for the nation – food security 4. Makes locally-caught seafood available in school lunch programs, Bay to Tray program 5. Perpetuates and strengthens the link to cultural heritage and history 6. Provides a draw for tourism.

Group	Question	Response
Morro Bay civic leader	<i>What do you think are greatest contributions the commercial fishing industry has made to your city in the past five years?</i>	<p>1. ECONOMIC – commercial fishing brings diversity and stability to Morro Bay’s working waterfront and economic base (through employment, earnings at the dock, fees to the city). This is particularly evident, and has risen to more importance as we have lost the revenue from the power plant.</p> <p>2. CRITICAL CONNECTION WITH TOURISM - the authenticity and vibrancy that commercial fishing brings to Morro Bay’s working waterfront is a major part of our identity and attracts people from all over the world. Additionally, the quality of seafood that commercial fishing generates is another powerful connection with and draw for tourism and economic and cultural vibrancy and has attracted a whole new group of “fans” ...foodies that contribute to a valuable and more sophisticated tourism in Morro Bay.</p> <p>3. OCEAN STEWARDSHIP – the benefits that quality seafood brings especially as it is so closely aligned with the fleet’s efforts at marine conservation is extremely important for the City and contributes and fortifies another critical aspect of our identity.....a City within a healthy and robust eco-system.</p> <p>4. HISTORY & CULTURE – commercial fishing perpetuates who we are, is an active link to our heritage and contributes to the vibrancy and identity of the City. All of these attributes elevate the awareness and perception of importance of commercial fishing and influences decision makers at the City to continue to support commercial fishing and invest in the working waterfront. We are fortunate to have all of these elements working together to prepare the City for the future.</p>

It is possible that fishing community members see the lack of direct financial support from the community at large as a short-run reality that the CSCs can alter with outreach and education (Table 25).

Table 25. Interview responses: involving the broader community.

Group	Question	Response
MBFT organizer	<i>Is there anything else you would like to add?</i>	We understand that the community wants to help and they are generally supportive of sustainable commercial fishing and understand its cultural and economic significance but they don't know what they can do to contribute/participate. The MBFT is a "boundary organization" or sorts, working as a bridge between the community, its perceptions and capabilities and the managers, market and other communities.

Respondents expressed some optimism that, as a "bridge", the CSCs could promote civic engagement with the fishing industry in the long run by i) educating people on the value that the local fishing industry brings to the broader community and ii) informing community members on ways they can contribute to the long-run sustainability of the industry (Table 26).

Table 26. Interview responses: promoting CSCs to the broader community.

Group	Question	Response
MBFT organizer	<i>In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?</i>	...The MBFT can provide the capability to focus on a strategy that links individual efforts in a way that contributes to a shared goal, and greater awareness for the community and for the industry.
MBFT organizers	<i>In what ways does MBCQF/MBFT need to improve?</i>	Markets: again, in many ways the market connection challenges of the West Coast IFQ program is bigger than Monterey or the MBFT (publicly available analyses make this clear), but the organization needs to identify ways the community can educate/improve/affect the supply chain and increase demand and financial return for locally-caught and landed sustainable seafood. MBFT hopes to 1) hold and lease quota, 2) promote sustainable fisheries, 3) provide a platform that brings together diverse concerns and capabilities and 4) generate demand for sustainably harvested and locally landed fish. We will work with fishing interests to ensure landings can help meet needs and expectations and generate more awareness of environmental stewardship in our fishery, so that the product is more attractive to local and broader markets
Monterey civic leader	<i>Since the inception of MBCQF/MBFT, has your awareness of commercial fishing activity increased?</i>	The MBFT has added another element to the “dialogue” about fishing...added another pixel to the screen. It has raised the awareness in the community of what it takes to protect and preserve access to fishing rights.
MBCQF organizers	<i>Since the formation of the MBCQF/MBFT, what in your opinion, are the top five accomplishments of the organization?</i>	<ol style="list-style-type: none"> 1. Keeping CF in the community 2. Keeping CF’s employed 3. Being the first quota fund of the West Coast and having been replicated 4. Educating the community about fishing and how it is important to the wider community – largely manifested via press exposure – articles, website, social media, radio shows.

To summarize, the operational specifics of MBFT and MBCQF are built on a narrower definition of ‘fishing community’ than the one underlying the business model of direct marketing arrangements commonly known as CSFs. The universe of community members offering direct support to the fishing industry under the Quota Fund model is comprised of a relatively small number of local stakeholders and the financial backing of large NGOs. In simplified terms, MBFT and MBCQF support the fishing industry with large financial contributions from a few benevolent entities and direct in-kind support from a few local stakeholders. In contrast, CSFs

support the industry with many small financial contributions from a large group of local stakeholders.

Though our interviews it was clear that some fishers and fishery stakeholders were aware of this contrast and felt that lack of direct support for commercial fishing from the larger community was an important issue that MBFT and MBCQF were well positioned to address. Some respondents expressed optimism that, with the help of MBFT and MBCQF, they could raise awareness of the local cultural value of commercial fishing within the larger community. In this context, an important ancillary function of MBFT and MBCQF is the outreach and community education that might result in more direct support for commercial fishing from a broader community coalition.

6 Summary

Our study was designed to deepen understanding of two organizations holding and managing individual fishing quota in trust for the benefit of the fishing communities of Morro Bay, CA and Monterey/Moss Landing, CA.

By studying how these specific communities brought diverse groups of community stakeholders together to support a struggling industry we hoped to gain greater insight into how communities can effectively manage ecological, economic, and regulatory changes affecting commercial fishing fleets and coastal communities along the West Coast.

Our interviews focused on generating: i) a detailed understanding of how the CSCs operate, and ii) insight into how the perceptions of fishing community stakeholders drive the strategies employed by MBCQF and MBFT.

Our interviews produced a number of interesting and important insights and helped identify several topics worthy of further socio-economic research.

First and foremost, respondents expressed almost unanimously positive sentiment about the CSCs. A common perspective that our interviews produced was the belief that a number of external adverse factors have been acting against the Morro Bay area and Monterey area groundfish fleets for several years. Respondents generally coupled this with a belief that regulators and other power brokers have consistently ignored their specific circumstances and the factors causing decline of their local groundfish fisheries. In this context the CSCs were seen in an overwhelmingly positive light as many respondents expressed the sentiment that, "finally, somebody is acknowledging our pain and doing something about it."

Relatedly, among fishers, there was a commonly expressed perception that the CSCs were doing admirable work and trying to be a force for positive change in the community but that the problems facing local groundfish fleets were pervasive and long-running. And that the CSCs would always be limited in how completely they could address all of the factors of decline.

Particularly, in the Monterey area, there was a perception among fishers and fishing industry insiders that it was great that there was an entity trying to support local fishers by subsidizing operation through discounted quota, but that even at discounted rates there were still very few fishers who can afford to participate in the fishery.

Our interviews uncovered an important distinction between MBCQF/MBFT and Community Supported Fisheries (CSFs) that have recently gained popularity. Namely, that CSFs survive on direct financial contributions from the broader community while CSCs support the community by serving as an aggregator of outside funding. CSC organizers seemed to express a belief that the broader community would financially support their efforts if the community were more educated about: i) the benefit commercial fishing brings to the broader community, and ii) the ways in which community members can directly support their local fishers.

Finally, our interviews suggested a slightly different outlook between the two CSCs. MBFT has activities spread across a range of issues they believe to be adversely impacting the Monterey/Moss Landing groundfish fishery: soft demand for locally sourced groundfish, high participation cost, and low margins for harvesters. We claim this is a function of: i) MBFT's relatively large cash reserve and ii) the participation in MBFT from diverse corners of the fishing community. MBCQF in contrast appears tightly focused on the singular objective of generating local groundfish landings through subsidization of fishing quota for the local fleet. We claim this is at least partially attributable to the fact that almost all MBCQF board members are intimately connected to the local commercial fishing industry.

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Appendix Supplementary Tables

Appendix Table 1. Interview prompt for quota fund organizers and board members

Question Number	Question	Theme
5	What do you think are the greatest contributions that the commercial fishing industry has made to your city in the past five years?	Perspectives
6	What do you think are the greatest contributions that the commercial fishing industry has made to your region in the past five years?	Perspectives
7	How would you describe the importance of MBCQF/MBFT to your city?	Perspectives
8	In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?	Perspectives
9	Since the formation of the MBCQF/MBFT, what, in your opinion, are the top five accomplishments of the organization?	Perspectives
10	What were the top three major factors motivating your community to form a quota fund?	Quota Fund Formation
11	What were the top three greatest obstacles your community faced in forming the MBCQF/MBFT?	Quota Fund Formation
12	How did the MBCQF/MBFT raise the money to initiate the organization and buy quota?	Quota Fund Formation
13	From where did the MBCQF/MBFT buy quota?	Quota Fund Formation
14	What is your understanding of the City's involvement in the formation of MBCQF/MBFT (monetary or non-monetary)?	City-Quota Fund Relationship
15	What is your understanding of the City's ongoing support for MBCQF/MBFT (monetary or non-monetary)?	City-Quota Fund Relationship
16	From your perspective, has City or municipal support for fishing -related infrastructure maintenance and improvements changed from before and after the establishment of the MBCQF/MBFT	City-Quota Fund Relationship
17	In what ways do you think the MBCQF/MBFT is performing well?	Performance
18	In what ways do you think the MBCQF/MBFT needs to improve	Performance
19	What do you think are three characteristics or behaviors of a successful MBCQF/MBFT fishery participant?	Performance
20	From your perspective, what are the optimal number and types of vessels and fishing participants for the MBCQF/MBFT?	Performance

Question Number	Question	Theme
21	In your opinion, is there any evidence that the MBCQF/MBFT has made financing (for fishermen) easier to obtain?	Performance
22	Please give us up to three examples of induced innovation (fishing techniques, business models, financing) that fishermen have adopted since the inception of MBCQF/MBFT?	Performance
23	What do you perceive to be the three biggest factors limiting quota availability for local vessels?	Other
24	Is there anything else you would like to add?	Other

Appendix Table 2. Interview prompt for civic leaders

Question Number	Question	Theme
5	What do you think are the greatest contributions the commercial fishing industry has made to your city within the past five years?	Perspectives
6	What do you think are the greatest contributions the commercial fishing industry has made to your region within the past five years?	Perspectives
7	To the best of your knowledge, please describe how the MBCQF/MBFT works	Perspectives
8	How would you describe the importance of the quota fund to your city?	Perspectives
9	In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?	Perspectives
10	Since the inception of MBCQF/MBFT has your perspective of the local commercial fishing industry changed? Has the local government become more or less engaged in the endeavors of the local commercial fishing industry?	MBCQF/MBFT
11	What is your understanding of the City's involvement in the formation of the MBCQF/MBFT (monetary or non-monetary)?	MBCQF/MBFT
12	From your perspective, has City or municipal support for fishing-related infrastructure maintenance and improvements changed from before and after the establishment of the MBCQF/MBFT?	MBCQF/MBFT
13	What is your understanding of the City's ongoing support for the MBCQF/MBFT (monetary or non-monetary)?	MBCQF/MBFT
14	What are the City's plans to support MBCQF/MBFT in the future?	MBCQF/MBFT
15	How would you describe the current level of commercial fishing activity in your city: i) optimal ii) more than optimal iii) less than optimal?	MBCQF/MBFT
16	Is there anything else you would like to add?	Other

Appendix Table 3. Interview prompt for fishers.

Question Number	Question	Theme
5	What do you think are the greatest contributions that the commercial fishing industry has made to your city in the past five years?	Perspectives
6	What do you think are the greatest contributions that the commercial fishing industry has made to your region in the past five years?	Perspectives
7	To the best of your knowledge, please describe how the MBCQF/MBFT works	Perspectives
8	How would you describe the importance of the MBCQF/MBFT to your city	Perspectives
9	In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?	Perspectives
10	What type of gear do you use to prosecute the groundfish fishery?	Experience with MBCQF/MBFT
11	What other fisheries do you participate in?	Experience with MBCQF/MBFT
12	Have you purchased or leased quota from the MBCQF/MBFT?	Experience with MBCQF/MBFT
13	Have you been able to get sufficient quota from the MBCQF/MBFT?	Experience with MBCQF/MBFT
14	How do lease rates for quota from MBCQF/MBFT compare to open market rates?	Experience with MBCQF/MBFT
14a	How do lease rates for quota compare to your cost of operations?	Experience with MBCQF/MBFT
15	What type of negotiations (if any) go on between MBCQF/MBFT and fishermen regarding the lease rate?	Experience with MBCQF/MBFT
15a	Do you feel like MBCQF/MBFT considers your cost of operation when setting up a QP lease rate?	Experience with MBCQF/MBFT
16	What are the top three advantages that participation in MBCQF/MBFT has afforded your business?	Experience with MBCQF/MBFT
16a	What are the top three advantages that participation in MBCQF/MBFT has afforded other dockside businesses?	Experience with MBCQF/MBFT
17	Has access to MBCQF/MBFT quota increased your fishing revenue?	Experience with MBCQF/MBFT

Question Number	Question	Theme
17a	If so, were you able to invest in business-related goods or services, increase savings or other spending, which might not have been possible without involvement in MBCQF/MBFT?	Experience with MBCQF/MBFT
18	What have the three greatest challenges been regarding your participation in MBCQF/MBFT?	Experience with MBCQF/MBFT
19	What improvements, if any, do you think MBCQF/MBFT could make to operations?	Experience with MBCQF/MBFT
20	Is there anything else you would like to add?	Other

Appendix Table 4. Interview prompt for dockside businesses and other fishery stakeholders.

Question Number	Question	Theme
5	What do you think are the greatest contributions the commercial fishing industry has made to your city within the past five years?	Perspectives
6	What do you think are the greatest contributions the commercial fishing industry has made to your region within the past five years?	Perspectives
7	To the best of your knowledge, please describe how the MBCQF/MBFT works	Perspectives
8	How would you describe the importance of the quota fund to your city?	Perspectives
9	In addition to its importance to the city, can you discuss ways in which you think MBFT/MBCQF benefits the region?	Perspectives
10	What advantages has MBCQF/MBFT afforded your business	Experience with the Quota Fund
10a	What advantages has it afforded dockside businesses in general	Experience with the Quota Fund
11	Since the inception of the MBCQF/MBFT has your relationship with the local commercial fishing industry changed?	Experience with the Quota Fund
12	Since the inception of the MBCQF/MBFT has locally-caught seafood become more available to you?	Experience with the Quota Fund
13	Since the inception of the MBCQF/MBFT has your awareness of commercial fishing activity increased?	Experience with the Quota Fund
14	Do you think the MBCQF/MBFT is effective in marketing/promoting itself to the community of Morro Bay/Monterey?	Experience with the Quota Fund
14a	How do you think it could improve if at all?	Experience with the Quota Fund
15	Is there anything else you would like to add?	Other

Appendix Table 5. Community Supported Fisheries (CSFs) on the West Coast.

CSF	Harvest Area	Delivery Area	Website
Get Hooked	Santa Barbara Area	Santa Barbara Area	https://gethookedseafood.com/how-it-works/
Reel Good Fish	Central California	Northern California	https://www.realgoodfish.com/
Port Orford Sustainable Seafoods	Southern Oregon	State-wide	https://www.posustainableseafood.com/caught-in-oregon/csf/
Sea Foragers	San Francisco Area	San Francisco Area	https://www.seaforager.com/welcome-sea-forager
Ocean2Table	Monterey Bay Area	State-wide	https://www.getocean2table.com/faqs
Garibaldi Community Supported Fishery	Central Oregon Coast	Pick-up and mail order only	http://www.communitysupportedfishery.com/new-products/csf-charter-membership