Commercial Fishing in Monterey Bay

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Introduction

In this paper, I reflect on the research conducted throughout my experience as a teacher's assistant in the 80S special studies course. I chose to create a project focusing on commercial fishing that would answer several personal questions that I had. As someone who has enjoyed seafood for my entire life, I wondered about the source of my seafood. I wondered if the fish prepared for me at local restaurants were really as 'sustainable' as marketed to be. Here in California-- and many coastal states throughout the country in general-- the seafood supply chain has recently been under scrutiny by curious seafood customers, and local organizations who want to shed light on the lack of traceability and overall sustainability of local seafood markets.

I set the scope of my study to include only commercial fishermen within Monterey Bay. There are just three harbors located in this area, each almost equidistant of each other along the coast of the bay. Santa Cruz Small Craft harbor is located between Twin Lakes area and Seabright area, Moss Landing harbor is located in the center of the bay at the opening of Elkhorn Slough, and Monterey harbor is at the southernmost point of the bay adjacent to Cannery Row in the city of Monterey. I began with contacting the harbor masters of each port to collect more information about the demographic of the harbors.

I felt that the most efficient way to answer my questions was to go straight to the source, and reach out to the commercial fishermen who fish out of one or more of the three harbors I described. I wanted a personal and realistic perspective, so I worked to design an interview that would elicit honest answers with which I could draw conclusions about current commercial fishing practices in Monterey Bay.

I asked commercial fishermen a set of questions that I felt would reveal the true status of sustainability in Monterey Bay commercial fisheries. I began the project with a clear idea of what responses I would receive. I made the assumption that most commercial fishermen had their own agenda, and sustainability was not a top priority to them. My initial set of questions remained consistent throughout the entire interview process, but the responses that I received and the conversations that came along with them were pleasantly, and unexpectedly diverse. I played the role of a detective to sort through those responses, and decided if sustainability was indeed a goal of our local commercial fishermen. What I found through my conversations with these men was that it was less an issue of sustainability, and more an issue of discordance between fishermen and their regulatory counterparts.

Methods:

At the start of this project, I spent time researching and educating myself on the history of fishing in Monterey Bay. I learned about the status of current fish stocks and the nature of commercial fisheries in order to gain a solid background for the rest of my research project.

The next step I took was reaching out to the harbormasters of three harbors in Monterey Bay-- Santa Cruz Small Craft Harbor, Moss Landing Harbor, and Monterey Harbor. I asked for three pieces of information from each harbor: the total number of commercial fisheries, the total number of occupied boat slips, and the total number of commercial vessels operating out of the harbor. I then took those numbers and computed percentages to compare the amount of commercial fishing vessels to non-commercial vessels in each harbor (Table 1).

My next task included developing a list of interview questions intended to extract information about the practices of commercial fishermen in Monterey Bay. My goal was to

pose the questions in a way that encouraged honest responses but also provided the information that I was looking for. By interviewing commercial fishermen, I could gain a realistic and behind-the-scenes perspective on commercial fishing in Monterey Bay on a few areas of interest to me-- current commercial fishing regulations, what sustainability means to commercial fishermen, and where do current commercial fishing practices fall on the scale of sustainable fishing methods.

After carefully drafting the nine interview questions, I conferred with Brenden Pini-- a local hook and line commercial fisherman out of Santa Cruz Small Craft Harbor. I asked him to look over my questions and give any feedback that might augment my interview process. Brenden shared five commercial fishermen's contacts with me that he believed would be willing to answer my questions. I successfully scheduled and completed five interviews in total-- three in person, and two over the phone. The interviews lasted one to three hours on average. To conduct the interviews, I brought with me a pen and notebook, and my laptop with the list of interview questions. As each fisherman answered my questions, I jotted down general notes and quoted certain phrases that I felt were important to take down word-for-word.

After each interview, I reviewed both the specific answers and side notes that I recorded, and created comprehensive summaries that I could refer back to as a profile for each of the fishermen. With this compiled information, I compared the fishermen's collective answers by question. This allowed me to analyze the overall message to be taken away from each of my questions. For certain interview questions, the answers were short enough to reduce to one or more bullet points, so I created a table for easier display of the information

(Table 2). For longer questions, I summarized the most important ideas and opinions using quotations from the fishermen's exact words.

My Interview Questions and Rationale

Q1. What is your target species?

The purpose of this first question was to serve as a low-pressure ice breaker. I also wanted to get some baseline data to be used for later analysis of fishing methods from fisherman to fisherman.

Q2. When did you enter the commercial fishing industry and why?

Although it is somewhat of a personal question, I think that this is an important one to ask. I wanted to get a general idea of why people choose to become involved in the commercial fishing industry, and see if it can be attributed to an underlying motive of moving towards a future of sustainable fishing practices. By asking this question, I showed interest in the fisherman's career, and assumed passion. This helped me engage the fisherman in the interview while also allowing me to obtain a more intimate picture of the fisherman as a person.

Q3. What does the word sustainable mean to you, and do you believe your practices are sustainable?

With the first part of this question, I raise the stakes and ask the fishermen to evaluate their practices. I understood when I drafted this question that it might be confrontational, or even offensive, for me to ask the fishermen to define and discuss the meaning of sustainability in such basic terms. In my experience prior to this project, I noticed a negative stigma surrounding anything related to environmental concern among some fishermen. It is an interesting topic

that I will go into later in the results section of the paper, but with this being said, I was equally as uncomfortable to ask this question as the fishermen were to answer it. This was a question that I decided to ask because I was simply curious to see how commercial fishermen would answer it. I think it is important to know how the people who are responsible for catching our local and 'sustainable' fish define a term that is being used so indiscriminately in today's world. The second part of this question might seem trivial, and I predicted that the response would almost indubitably be positive, but it seemed necessary to ask the question in order to reveal the true perspective of fishermen on the state of commercial fishing at this point in time.

Q4. Can you describe for me the sustainable 'practices/methods' you have in place currently?

This question serves as a follow-up of the previous question. I wanted to gather more 'baseline data' as I referred to before-- about what species are being fished, what gear is being used to fish them, and how that varies by fisherman. I also included this question as a way to filter the response from the last question, and give the fishermen a chance to explain why and how they believe their practices are sustainable based on their own definitions of the term sustainable.

Q5. What do you think about fishing regulations such as catch limits, restricted areas... (What do you think about the current emergency crab closure/ the future of crab fishing?)

This was another challenging subject of discussion, but an important one nonetheless. I wanted to hear about the fishermen's thoughts on the fishing regulation scene, and why they feel the way they do. This was another question that I had personal interest in, and felt that this would be a perfect question to open the theoretical Pandora's box of insight into commercial fishing culture.

Q6. Do you feel as though you can't compete with competition by strictly following all regulations?

Many of my interview questions are aimed at creating a true representation of commercial fishermen through asking questions that otherwise would be left to the imagination. This is another example of an uncomfortable question-- but it was one that I was curious about. By asking this question, I hoped to gain an accurate consensus on the interconnectedness of the various commercial fisheries and how they may or may not impact each other.

Q7. How big of a problem do you think bycatch is in your target species fishery?

Bycatch is of understandably huge concern right now among environmentalists/ ocean conservationists, so I wanted to include this question in the interview to find out about bycatch here in Monterey Bay. I believe that many of the stereotypical notions or ideas that the general public (that is unfamiliar with the commercial fishing industry) might have about commercial fishermen have most likely stemmed from fictional films, particularly aggressive ocean conservation videos/ articles on the internet, or possibly even conversation on the street. I hope to debunk these preconceived ideas about certain unspoken topics, and replace them with facts and honest feedback from the fishermen themselves.

Q8. Are there any other fisheries that indirectly and/or directly impact your fishery?

The motive behind this question was personal curiosity-- it was designed to solicit a fairly straight-forward answer. By asking this question, I hoped to gain an accurate consensus on the interconnectedness of the various commercial fisheries and how they may or may not affect each other.

Q9. Do you have any ideas on how to make further change in commercial fishing practices that would benefit both fishermen and the marine environment?

This last question was designed to give the fishermen I interviewed an opportunity to respond after our full conversation with some personal ideas. I wanted to call on the people who have first-hand experience in the commercial fishing industry for their insight into the current issues in the sustainability of commercial fishing in Monterey Bay. At the same time, I hoped to instill in them the idea that fishing methods and regulations can always be improved, and that their efforts and ideas are just as (if not more) valid as anyone else's.

Results:

The data collected from the three harbors of Monterey Bay (as mentioned in the introduction section) revealed telling demographics. Percent commercial fishers in the harbors at the time of data collection was highest at Monterey harbor, and lowest at the harbor in Santa Cruz (Table 1). These results are interesting considering that Monetery had the lowest variety of fisheries, and the lowest boat occupancy--the total number of boats and percent of commercial boats appear to be inversely related (Table 1).

Harbor	Total # of fisheries	Total # of commercial vessels	Total # of occupied boat slips	% commercial
Santa Cruz Small Craft Harbor	8	30	1000	3%
Moss Landing Harbor	8	50	605	8.2%
Monterey Harbor	5	47	413	11.4%

Table 1. Occupancy rates at the three harbors of Monterey Bay 2019

Question 1 and 2

For Q1 and Q2, I compiled the data into tabular form. To address Q1, each fisherman had about three to six target species, with the exception of Hans Haveman. Haveman is the founder of H & H Fresh Fish, and usually works in the wholesale department of his company. However, when he does decide to go out to fish for his business, his sole target is Salmon. Every other fisherman I interviewed generally had a handful of target species, which of course vary by season (Table 2).

The majority of the responses for Q2 are a reflection of passion and tradition (Table 2). Two of the men I spoke with-- Alan Lovewell and Ian Cole-- have backgrounds in research,

fisheries management, and the marketing aspect of the commercial fishing industry. Their responses to Q2 reflect their individual backgrounds. When asked why he began fishing commercially, Cole touched on his past involvement as an intern in fisheries research and how that led him to a career in providing sustainable seafood to Santa Cruz through his CSF program Ocean 2 Table. Lovewell has a similar background in environmental policy, and founded his CSF program called Real Good Fish with the goal of reconnecting the community to the ocean through providing sustainable seafood.

Interview:	Q1 (pt. 1): Target Species	Q1 (pt. 2): When did you enter the commercial fishing industry and why?
1: David Toriumi	Crab, Salmon, Halibut, Ling Cod, Sand Dabs	2008- Began fishing in Alaska as a young teenager and fell in love with it.
2: Hans Haveman	Salmon	When he was 11yo- Began crabbing, salmon and albacore fishing with family and fell in love with it.
3: Ian Cole	Halibut, Ling Cod, Sea Bass, Rock Fish	2013- Began as an intern at Long Marine Lab, wanted to get involved with seafood supply chain and learn about its problems/ find solutions
4: Skylar Campbell	Crab, Salmon, Halibut, Ling Cod, Rock Cod, Hagfish	2011- Became the last career option available

5: Alan Lovewell	Rock Fish, Ling Cod, Kelp Greenling	2017- interested in fish marketing and providing sustainable local fish

Table 2

Question 3: What does the word sustainable mean to you, and do you believe your practices are sustainable?

The responses I received for Q3 were all very standard for the most part. I was impressed with the scholarly definitions that I received. Haveman defined sustainability as taking a species from the environment "in a way that doesn't interfere with the ability to reproduce and repopulate." Campbell offered a definition aimed at regulatory forces, rather than the fishermen: "Sustainability should mean that if a species is monitored and regulated appropriately" it will be "replenishable and harvestable indefinitely." I received a well-rounded definition of the term from Lovewell that covered a number of areas of concern: "not extracting more than the ecosystem can replenish, not compromising future generations, and not damaging the ecosystem and surrounding habitat." Some definitions were more casual-- David Toriumi defined sustainability in commercial fishing as "being able to harvest seafood forever." When I asked the second part of Q3, (if the fishermen believe their practices are sustainable based on their definitions), every single fishermen responded affirmatively (Table 3).

Interview:	Q3: How would you define sustainability?	Do you believe your practices are sustainable?	Q4: What sustainable practices do you have in place?
1: David Toriumi	"It means being able to harvest seafood forever."	Yes	-Following the rules/ regulations already in place - size limits for crab -MPAs - barbless hooks for salmon

			- circle hooks for tail/fin fish
2: Hans Haveman	"The true definition is being able to take target species from the environment in a way that doesn't interfere with its ability to reproduce and repopulate."	Yes* *He mainly works in wholesale. (Doesn't do as much commercial fishing as in the past)	- small boat size - single hook-and-line method
3: Ian Cole	Sustainability is a "constantly evolving term." It has to do with "impact while out on the water, and also as a business"-- we have to make sure to keep stocks healthy by "not taking from stocks that are hurting."	Yes	- hook-and-line method - long line method
4: Skylar Campbell	Sustainability can be a "buzz word" used to manipulate people/ ask for a better price on products. "It *should* mean if a species is monitored and regulated appropriately, it will be harvestable indefinitely."	Yes	- hook-and-line method for salmon - trapping for rock crab and hagfish (not a lot of bottom contact)
5: Alan Lovewell	"Not extracting more than the ecosystem can replenish, not compromising future generations, and not damaging the ecosystem and habitat during extraction."	Yes	-trapping method

Table 3

Question 4: Can you describe for me the sustainable 'practices/methods' you have in place currently?

Next, in Q4, I ask the fishermen to elaborate on their responses to the previous question, and describe what makes their practices sustainable. All responses to this question described methods of extraction to include only trapping and hook-and-line fishing (See Table 3). Haveman offered me an additional sustainable method, explaining how operating a "small boat" yields the "smallest carbon footprint." Toriumi interestingly included "following the rules already in place," as a sustainable practice.

Question 5: What do you think about fishing regulations such as catch limits, restricted areas... (What do you think about the current emergency crab closure/ the future of crab fishing?)

The results for Q5 were, for the most part, in support of regulatory forces. In the words of Toriumi, regulation is "necessary for sustainable harvesting." I received similar input from the responses of the remaining fishermen. Each of them agreed that, although regulations and restrictions on commercial fishing are important, they have some contempt towards regulatory agencies because "there is no compromise" when it comes to the threatening of fishermen's livelihood (Lovewell). Many of the fishermen also felt similarly about lack of inclusion of the "actual stakeholders in conducting research" behind the regulations and restrictions (Campbell). Fishermen have revealed that, for reasons that will be discussed later in this paper, they have a "natural distrust" for commercial fishing researchers and regulatory agencies (Cole).

Question 6: Do you feel as though you can't compete with competition by strictly following all regulations?

Q6 invoked a variety of responses-- some revealed the relevant information that I wanted, while others were slightly off topic. Haveman admitted that "there seems to be a very little amount of people cheating the system in the U.S." Campbell confirmed this: "Fisheries on the West Coast don't have any 'pirates' so to speak . . ." Some responses that strayed from the initial question I asked included comments on the difficulty of competing with "cheap, farmed salmon" (Cole), and "sport fishermen" (Toriumi).

Question 7: How big of a problem do you think bycatch is in your target species fishery?

Toriumi's response to Q7 about the issue of bycatch was, "it is not a problem with my methods." Campbell responded similarly, offering that the species he fishes are "super targeted, and fished with basic technology." Lovewell claimed that, in his experience, there is "not much bycatch," and "99 percent" of what is caught as bycatch is "released live." The last two responses were simple as well-- reassuring that bycatch is not a very big problem.

Question 8: Are there any other fisheries that indirectly and/or directly impact your fishery?

In response to Q8, Haveman claimed that he has no problems with other fisheries impacting his work. Lovewell also claimed that "no other fisheries have big impact" on his work, but "recreational fishing does." Campbell revealed that the dungeness crab fishery interferes specifically with his hagfish catch. Cole spoke about "cheap unsustainable seafood" as a source of impact on his work as well as large squid boats. Toriumi's salmon catch was affected by the squid fishery, as well as the anchovies fishery.

Question 9: Do you have any ideas on how to make further change in commercial fishing practices that would benefit both fishermen and the marine environment?

Q9 solicited a range of responses. Toriumi gave a simple, yet meaningful statement regarding to ideas about how to increase the sustainability of commercial fishing: "to keep doing what I'm doing-- catch seafood here, sell seafood here." Campbell, interested in policy as a tool to make change, believes that "educating the public, and shifting public focus" is the next step to "rebuild fisheries." Haveman claimed that "education of the public on fisheries," and "communication" between researchers/ regulators and commercial fishermen is the key to positive change that benefits both fishermen and the marine environment. Lovewell and Cole both offered similar ideas involving "dynamic fisheries management" (Lovewell). This essentially means, in Cole's words, "focusing on increasing the demand for underutilized fish".

Discussion :

Question 1: What is your target species?

The amount of overlap in species fished is very significant. This most likely points to the fact that all of these fishermen fish primarily in Monterey Bay. Most fishermen target salmon, which reflects the specific markets for locally caught salmon here in the bay. Lovewell is the only outlier in the group who fishes only near-shore fish-- specifically rockfish-- that require trapping. Many of these fishermen are competing for the same species so it is important to consider the interconnectedness of the entire fishing community.

Question 2: When did you enter the commercial fishing industry and why?

Each of the fishermen I spoke with during this study entered the commercial fishing industry with a purpose. Whether or not their goals were clear at the start, or after several

years in the line of work, depends on each individual's specific path. Haveman, Toriumi, and Campbell got involved with commercial fishing as a result of personal fulfillment-- they began fishing at young ages and fell in love with fishing and the marine environment. Lovewell and Cole both began as academics who went to college specifically to learn about fisheries management, fish biology, and environmental science. They entered the commercial fishing industry with certain questions and similar concerns to mine when I decided to take on this project. With those questions and concerns in mind, Lovewell had specific plans to start businesses that "empowered fishermen" and provided "sustainable local fish" to the community (Lovewell). During his interview, Cole spoke of his passion for learning about the seafood supply chain, and how to overcome the "import/ export conundrum" (Cole). It is inspiring to see these fishermen's passions transform into business models that support local fishing communities at the same time that they tackle the issues that are so prevalent in commercial fishing today. What is important to take away from the collective responses of this question is that regardless of the difference in paths taken, each fisherman has the same goal today. It does not matter where they came from, but it matters where they are going-- it is powerful to see that it is in the same direction. These particular responses reveal the diverse makeup of the commercial fishing community, and how everyone contributes to the industry in their own individual way.

Question 3: What does the word sustainable mean to you, and do you believe your practices are sustainable?

It is important to note that, for this question, I asked for a definition of the term sustainability, but left it open in terms of the sustainability of *what*. Each of the fishermen's

responses naturally reflected the sustainability of their fishing methods. While not all of the definitions seemed as though they were out of an environmental science textbook, I could sense a true understanding from each of the conversations as a whole that the fishermen clearly understood the meaning of sustainability. This of course does not imply that *all* commercial fishermen in Monterey Bay know and practice sustainable methods. The second part of my question yielded responses that I was not expecting. Each fisherman responded yes, they consider their methods to be sustainable. I considered the possibility of response bias, but in analyzing the responses, and thinking back to how I felt during this question in each interview, I decided that the responses were most likely truthful.

Question 4: Can you describe for me the sustainable 'practices/methods' you have in place currently?

The methods of seafood harvesting among the fishermen I interviewed all follow the same traditional theme. The hook and line method used today in fishing-- commercial or sport-- is comparable to the earliest fishing technology. Every single fisherman, with the exception of Lovewell-- who targeted only near-shore fish using traps-- utilizes the hook and line method. As I mentioned, all of the fishermen I spoke with operate small boats-- ranging from 12-20 feet long at most. This realistically only allows for certain fishing methods to be used, and certain catch limits to be implemented depending on the specifications of their individual commercial fishing licenses.

Question 5: What do you think about fishing regulations such as catch limits, restricted areas... (What do you think about the current emergency crab closure/ the future of crab fishing?)

This question sparked the most enthusiastic yet heavy conversation in every interview. I knew it was a controversial question when I chose to include it in my list of interview questions-- but I felt that controversial conversation was exactly what I was looking for. I wanted to ask questions that might not be the easiest to talk about, but would reveal the true feelings of the commercial fishermen in my study. Asking this question led to conversations that were very interesting to me, and added a new dynamic to my study that I was not expecting. The overall message I received from this interview question was that commercial fishermen respect regulatory agencies, and understand the importance of their restrictions. Fishermen have the same goals of maintaining sustainability, but also have their livelihoods on the line.

Question 6: **Do you feel as though you can't compete with competition by strictly following all regulations?**

I asked this question because I wondered about the frequency of breaking or bending the rules with the goal of increasing catch, and how that translates into other fishermen feeling disadvantaged in the situation. I was pleased to hear that commercial fishermen in this part of the world are honest for the most part, and do not (as far as these fishermen answered) disobey laws and restrictions to benefit themselves at the cost of the marine environment. I understand that this would be one of the questions, above any other questions in my interview, where fishermen would be more inclined to lie about the frequency that they break the rules.

Some of the responses to this question addressed slightly different topics than what I was asking for. There are a few possible explanations for this-- one of them being the wording of the question, and the way that each individual considered the meaning of competition in their own personal experience as a fisherman. I also completed some phone interviews, and the

fishermen may have only caught part of my question and responded to that only. Nonetheless, their responses, even if off topic, reveal their true concerns.

Question 7: **How big of a problem do you think bycatch is in your target species fishery?**

In every single interview I conducted, I asked this question, and the response was that bycatch was not a problem. There was no hesitation in the responses, and each answer was offered confidently. This was shocking to me-- as I was under the impression that bycatch was a widespread issue in commercial fishing all over the world. Again, I considered response bias here, but I find it highly likely that these responses are accurate. The methods used by artisanal commercial fishermen, as previously discussed, typically do not allow for large amounts of bycatch. As reinforced by Campbell in his response to this question, the hook and line method is very targeted. The hooks used are designed to do a couple of things: attract a very specific target species, and cause the least amount of damage to the fish's mouth and gills in the case that there is bycatch. I learned in the interviews that bycatch is very rare, but in the event that a fish is caught accidentally, it is able to be released live most every time due to this technology. Bycatch may be low among artisanal commercial fishermen like the people I interviewed, but I unfortunately cannot confirm that this is applicable to every commercial fishermen in the industry.

Question 8: Are there any other fisheries that indirectly and/or directly impact your fishery?

Competition in commercial fishing is very prevalent-- just as it is with any type of business. Fishermen take pride in their work, and as I mentioned already, fishing is many of these people's sole source of income. There is always a race to be the best in the business, catch the most fish, and make the most money. A few of the responses I received confirmed

that there is a bit of interference from other fisheries depending on the fisherman's target species. This is most likely attributable to the interconnectedness of the marine food web as a whole. Every biological community in the ocean relies on others for food and shelter--at the least-- so when fishermen are targeting several of those species at the same time, there is going to be overlap in the fishing space. Not every fisherman may recognize this dynamic happening under the water, but it is important to consider the science behind this competition between marine life and how that reflects into competition between fisheries.

An interesting theme that I noticed coming up in a few of the interview questions was this issue around sport/recreational fishing. With this question, Lovewell responded in regards to sport fishermen impacting his work. Commercial fishermen and sport fishermen have to learn to coexist when there is target species overlap. This often creates pressure for the commercial fishermen, and not many sport fishermen may realize that-- or perhaps they just don't worry about the effects of their impact.

Question 9: Do you have any ideas on how to make further change in commercial fishing practices that would benefit both fishermen and the marine environment?

My final interview question solicited responses that touched on similar topics that I addressed in my Q5 discussion, but went deeper into the possible solutions of the problems with the 'barrier.' I expected to receive ideas about new technology or fishing methods, or possible proposition regarding policy and regulation in commercial fishing, but the responses I received were much more hands-on than that. I find that a similar phenomenon is happening in the current environmental movement that is worth discussing. A majority of the people involved have feelings of hopelessness under current administration-- they feel as though their

voice is not very powerful, and that there is no way to create change if large corporations and governmental policies are not changed drastically to favor environmental health over capitalistic ideals. These thoughts overwhelm many people-- but small change is in fact effective, if support for those efforts can be obtained, and awareness of them spread to as many people as possible. The bottom up approach is sometimes necessary to create change-- and the ideas of the fishermen in response to this question reflect that. Local artisanal fishermen may feel overwhelmed by regulation, and may not always agree with it, but they have alternative, bottom-up ideas on how to tackle some of the concerns they have in their line of work.

Conclusion:

Much of the information I learned throughout this project was surprising, and challenged my initial assumptions about the sustainability of commercial fishing. Much of this contradicting information can be attributed to the specific demographic of the people I interviewed-- including mainly the locality of these fishermen, and the size of each of their operations. I took all of this into account, and realized that while I did not have a large enough (or diverse enough) sample size to draw conclusions about the entire commercial fishing community in Monterey Bay, I *can* draw conclusions about a small community of artisanal commercial fishermen who are underrepresented, underrated, and underutilized.

Community Supported Fisheries (CSFs) are a recently developed type of business models that have been gaining popularity in Santa Cruz. CSFs are, in my opinion (and in the collective opinion of the fishermen I interviewed) the solution to solving the issues with bycatch, lack of traceability, mislabeling seafood, and most importantly-- the importing and exporting of cheap

seafood. Shifting the focus of the public, and creating a demand for local sustainably sourced seafood will tackle many of the concerns that consumers, scientists, and even some commercial fishermen have about the seafood supply chain. Reaching a wider demographic within each community to spread awareness of these issues surrounding large-operation commercial fishing vessels and their impact on local communities and the marine ecosystem in general will help drive that shift.

Listening to these fishermen speak about the interworking of fisheries management, I stumbled upon a phenomenon that I feel is not often addressed in the commercial fishing industry. It is a barrier formed between fishermen and their regulatory counterparts which results from the contemptuous nature of the relationship-- from both sides. I feel that this barrier should be addressed. More research is needed to find the root of this contempt, and how to mitigate the effects of this barrier on the marine environment and also the functionality of the commercial fishing industry as a whole. I take a particular interest in this phenomenon and look forward to taking this knowledge I have gained throughout this study and apply it to future projects.