Lost in Plain Sight:
The Evolution of Oregon's Nearshore Groundfish Trawl Fleet

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Executive Summary

The West Coast groundfish industry collapsed in 2000, but it recovered through the efforts of regulators, scientists and the fleet. Now it is working to rebuild the market and reconnect with a formerly active fishing ground along Oregon's nearshore. In this report, we define nearshore as the shelf that extends seaward to a depth of 110 fathoms (660 feet).

The nearshore is of particular value to flatfish groundfish as a nursery and as settlement habitat. It's also an important area for the recruitment of many other species of groundfish, which tend to settle within the region, making it a desirable spot for Oregon's groundfish trawlers (1, 2, 3). Despite this, little research has been conducted on the shallow portions of the shelf (around 30 fathoms – or 180 feet – deep). Many of the details of the ecology, health and processes in these habitats remain poorly understood.

The knowledge of people who fish within this region, the challenges they face, and the opportunities they can glean from the reopening of nearshore fishing grounds are also insufficiently explored. With this in mind, our study aimed to gather

and synthesize the experiential knowledge of nearshore commercial fishermen into a comprehensive and insightful picture of this place, the fishery and the people who engage with it. Connecting narratives and information on fish stocks, their management and the fleet presents an opportunity to holistically understand the health, value and future of this nearshore fishery.

We began by gathering data from commercial trawl logbooks and fish tickets. We also conducted semi-structured interviews with industry participants. Our work provides an opportunity to use this local ecological knowledge (LEK) to enhance scientific ecological knowledge (SEK) and inform regional management, users and citizens about Oregon's nearshore.

Above: Sea lions sunbathe alongside the Tauny Ann in Newport. The boat is owned by a fourth-generation fishing family. (photo by Angee Doerr)

Below: Pacific cod are a groundfish that can be found from the Bering Sea to Southern California and in the Sea of Japan. They can grow to 6 feet. (photo courtesy of Patricia Puerta)

Left: Lingcod can grow up to 5 feet and 80 pounds and can live more than 20 years. (photo courtesy of ODFW)

Introduction and Context

Oregon's nearshore

In 2006, the Oregon Department of Fish and Wildlife (ODFW) introduced a new chapter in its marine resource management efforts by creating a strategy for nearshore resources that had not been consistently addressed. The strategy outlined goals to improve communication and partnerships, generate stronger science and information, and construct a better decision-making process to promote participatory efforts for the sustainability of these resources. Under this agenda, the nearshore ocean includes all areas from the coastal high tide line to a depth of 30 fathoms (3).

The Tauny Ann departs Newport. (photo courtesy of Taunette Dixon)

The strategy was created because of the importance of the nearshore. Coastal communities, businesses, outdoor enthusiasts and local economies all have a stake in it. It's also home to a wealth of enduring ecosystem services that are of key concern to managers and stakeholders (4).

The Oregon coast was home to 960 commercial fishing vessels in 2019. Together, they sold $160 million of seafood that year. Dungeness crabs made up $68 million of that. Groundfish and pink shrimp followed with sales of $28 million and $20 million, respectively. The estimated number of fishermen in 2019 varied from a high of 1,607 in August to a low of 548 in November (5).

Research on the offshore whiting groundfish fleet has been growing partially because of the volume and economic impact of the whiting fishery (6, 7, 8). In contrast, the nearshore sector of the non-whiting groundfish fleet, the surrounding market fluctuations, and varied use of the habitat and fishery over time

remain poorly understood. Much of this is due to a lack of persistent monitoring and management of the Oregon nearshore region that's shallower than 30 fathoms. Additionally, larger sectors of the groundfish trawl fleet have overshadowed the small, specialized group of commercial fishermen who have been harvesting nearshore groundfish for over 40 years.

Our study was designed to explore whether the commercial fishing community, fisheries managers and scientists could help us understand the ecological and human aspects of trawling on Oregon's nearshore. We also wanted to see if the experiences of the nearshore fleet might enhance our knowledge of the ecology of this understudied habitat. Additionally, we wanted to understand what has shaped the experiences and behavior of this subset of the groundfish trawl fleet.

What and where are groundfish?

Groundfish are a wide variety of what broadly or culinarily would be considered as "white fish." They tend to live on or near the bottom of the ocean. The Pacific Fishery Management Council (PFMC) manages 64 rockfish species, 12 flatfish species, six roundfish species (cabezon, lingcod, kelp greenling, Pacific cod, sablefish and Pacific whiting, also known as hake), six elasmobranch species (sharks and skates), one species of morid (finescale codling), one species of grenadier (Pacific rattail) and one species of ratfish. The sheer diversity and productivity of

Figure 1. *Yelloweye rockfish can live more than 100 years and grow to 3 feet. Ranging from Alaska to Baja California, they can be found in waters as shallow as 48 feet but are most common at depths between 300 to 600 feet. (photo courtesy of ODFW)*

fish managed within the West Coast groundfish "group" allows for local, fresh fish to be available nearly year-round when the fishery is maintained in a healthy and sustainable manner. In this group, 40 species were present in the area designated for our research and are shown in Table 1.

To maintain this resource, fisheries management has evolved to protect the habitats these fish live in. Oregon's continental shelf comprises various habitat types. Yoklavich and Wakefield (9) described the area from the shore to 1.86 miles out to sea as having "continental shelf" habitats that include patchy distributions of rock outcrops, pinnacles and boulder fields surrounded by low-relief sand, mud and cobbles. Other than a few notable offshore rocky banks (e.g., Heceta Bank and Cordell Bank), the majority of bottom on the continental shelf is sand and sandy mud sediments. All of these features serve as essential fish habitat for critical periods in the lives of these fish (10).

Rockfish species in particular are slow-growing and live for staggeringly long times. Some, such as yelloweye, live for over 100 years (Figure 1) (11, 12). Older rockfish, specifically females, tend to produce stronger broods and have a greater chance of surviving during unfavorable environmental conditions (13). When their numbers plummet below a certain threshold, the remaining population becomes increasingly at risk. After these species' numbers declined alarmingly in the 1990s, seasonally alterable Rockfish Conservation Areas (RCAs) were implemented in 2002. The RCAs protect designated areas on the continental shelf from a variety of trawl gear types in an effort to rebuild eight fish stocks. These areas were bolstered in 2006 by an amendment to the Pacific Coast Groundfish Fishery Management Plan that designated areas as Essential Fish Habitat (EFH).

Table 1. Logbook species codes, common and scientific names and management categories for nearshore groundfish		
Logbook Species Code	**Species Name**	**Management Category**
EGLS	English sole (*Parophrys vetulus*)	Flatfish
RSOL	Rock sole (*Lepidopsetta bilineata*)	Flatfish
PTRL	Petrale sole (*Eopsetta jordani*)	Flatfish
DOVR	Dover sole (*Microstomus pacificus*)	Flatfish
REX	Rex sole (*Glyptocephalus zachirus*)	Flatfish
STRY	Starry flounder (*Platichthys stellatus*)	Flatfish
BSOL	Butter sole (*Isopsetta isolepis*)	Flatfish
SDAB	Pacific sanddab (*Citharichthys sordidus*)	Flatfish
SSOL	Sand sole (*Psettichthys melanostictus*)	Flatfish
CSOL	Curlfin sole (*Pleuronichthys decurrens*)	Flatfish
ARTH	Arrowtooth flounder (*Atheresthes stomias*)	Flatfish
MFLT	Miscellaneous flatfish species (*Pleuronectiformes*)	Flatfish
NSRF	Unspecified nearshore rockfish (*Sebastes spp.*)	Rockfish
SHRF	Unspecified shelf rockfish(*Sebastes spp.*)	Rockfish
SMRK	Small rockfish (pre-2000) (*Sebastes spp.*)	Rockfish
LGRK	Large rockfish (pre-2000) (*Sebastes spp.*)	Rockfish
POP	Pacific ocean perch (*Sebastes alutus*)	Rockfish
DBRK	Darkblotched rockfish (*Sebastes crameri*)	Rockfish
WDOW	Widow rockfish (*Sebastes entomelas*)	Rockfish
YTRK	Yellowtail rockfish (*Sebastes flavidus*)	Rockfish
SBLY	Shortbelly rockfish (*Sebastes jordani*)	Rockfish
BLCK	Black rockfish (*Sebastes melanops*)	Rockfish
BLUR	Blue rockfish (*Sebastes mystinus*)	Rockfish
CNRY	Canary rockfish (*Sebastes pinniger*)	Rockfish
BCAC	Bocaccio rockfish (*Sebastes paucispinis*)	Rockfish
YEYE	Yelloweye rockfish (*Sebastes ruberrimus*)	Rockfish
THDS	Unspecified thornyhead (*Sebastolobus spp.*)	Rockfish
SSPN	Shortspine thornyhead (*Sebastolobus alascanus*)	Rockfish
LSPN	Longspine thornyhead (*Sebastolobus altivelis*)	Rockfish
PCOD	Pacific cod (*Gadus macrocephalus*)	Roundfish
SABL	Sablefish (*Anoplopoma fimbria*)	Roundfish
GRNL	Unspecified greenling species (*Hexagrammos spp.*)	Roundfish
LCOD	Lingcod (*Ophiodon elongatus*)	Roundfish
CBZN	Cabezon (*Scorpaenichthys marmoratus*)	Roundfish
DSRK	Pacific spiny dogfish (*Squalus suckleyi*)	Elasmobranch
SRKFMP	FMP managed shark species	Elasmobranch
	Tope shark (*Galeorhinus zyopterus*)	Elasmobranch
	Leopard shark (*Triakis semifasciata*)	Elasmobranch
SKAT	Skate species (*Raja spp.)*	Elasmobranch
	Big skate (*Beringraja binoculata*)	Elasmobranch
	Longnose skate (*Raja rhina*)	Elasmobranch
GRDR	Pacific grenadier (*Albatrossia pectoralis*)	Other

Trawl gear

Trawl gear deployed off of Oregon consists of conical nets towed behind vessels either on or off the ocean floor in the form of "roller," "bottom" or "mid-water" trawls. Trawl gear is typically tailored to individual vessels, fishing depth and the type of seafloor but may have varying levels of complexity to catch or avoid specific species of fish. Since the 1990s, the PFMC has worked with commercial fishermen to test adjustments and innovations to minimize bycatch of juveniles or protected species through the Experimental Fishing Permit (EFP) program. Many of the restrictions on types of trawl gear are in the nearshore and continental shelf regions because six of the eight groundfish stocks that were declared overfished occur in these areas. Large footrope gear was prohibited beginning in 2002. The mandatory use of selective flatfish trawl gear (Figure 2), which is designed to avoid catching rockfish, began in 2005.

Figure 2. *Selective flatfish trawls are the most commonly employed type of gear in the nearshore since the collapse of the groundfish fishery in 2000. (adapted from ODFW, 2016)*

Collapse and recovery of the groundfish fishery

The groundfish fishery has long been of great social and economic value. It has also been exposed to considerable strain over the last 40 years. The presence of foreign fleets subsided after policies to regain domestic control of U.S. fisheries were enacted in 1976. The fishery boomed in the 1980s and 1990s, but as harvests surged and the coast experienced some of the strongest El Niño events in recent history, several groundfish stocks plunged to critically low levels. In 2000, this led the U.S. secretary of commerce to issue an official "disaster" declaration for the West Coast groundfish fishery (14).

During this challenging and controversial period, scientists and managers worked carefully to create plans to rebuild eight different stocks of important groundfish species. Harvests were drastically reduced, gear was modified to minimize contact with habitat, and major spatial restrictions were put in place to protect fish habitat.

Below: This groundfish net has special panels with larger squares (the blue and red ones) to let certain fish out that fishermen try to avoid catching. The net has floats on top to keep it open. (photo by Joanne Rideout)

The ecosystem and the many people whose income and families were dependent on the groundfish fishery reached a point of crisis.

Management efforts further consolidated the nearshore groundfish trawl fleet in an effort to reduce harvest capacity and protect resources (7, 8). The most significant of these was the implementation of a "catch share" program in 2011. Catch shares, also called rationalization or Individual Fishing Quota (IFQ) systems, aim to reduce the total allowable catch and produce a shift toward individual investment and accountability. The process of individual allocation of quotas to members of the fleet is determined by variables such as type of gear, a vessel's historical catch levels, and years of participation within a given fishery (4, 15, 16). For the groundfish fishery, the program required observers on commercial vessels to record how many and what types of fish were caught.

Catch share programs continue to be implemented globally, with many programs reporting positive impacts on income and fisheries (17). However, what is frequently missing from many studies on the successes of catch shares (e.g., on stock rebound, ecosystem impacts and sustainability outcomes) is the human dimension, meaning the highly variable community responses to these management measures (16). Eight years after the transition to IFQs for West Coast groundfish, greater investigation on the longer-term impacts on the fleet and community is underway (18, 19, 15).

Our study highlights the importance of including smaller stakeholder sectors like the nearshore groundfish fleet in these considerations so we can understand their experiences and how they may have been affected. Additionally, understanding who has remained through the major management transitions of this fishery is imperative to addressing the future needs of those involved.

For those who have remained, the future may be brighter. On Jan. 1, 2020, an amendment took effect that allows trawl access to almost 3,000 square miles of formerly protected habitat off Oregon and California. The reopening allows access to waters between the 100- to 150-fathom lines that have not been fished since the early 2000s. These historically important fishing grounds were reopened thanks to the success of regulations as well as innovations in gear to reduce bycatch.

Research Methods

Our study focused on Oregon's nearshore groundfish trawl fishery, the definition of which was extended beyond the Oregon Nearshore Strategy's definition to include all habitat that spreads from the high tide line to a depth of 110 fathoms, incorporating state and federally managed waters. We used this expanded area for the study because managers, scientists and the fleet lacked consensus on a standard definition of nearshore.

As part of the study, we examined bottom trawl logbooks kept by the commercial groundfish trawl fleet and maintained by ODFW. Logbooks and correlated fish tickets kept by processors are a minimally explored, cost-effective and comprehensive source of detailed monitoring. They offer a strong indication of what happened over time by documenting gear used and species caught. Additionally, they contain a large and continuous sample size dating back to the 1970s, with little seasonal variability in sampling.

We used the logbooks to map important fishing grounds in the nearshore. We then parsed the logbooks into greater detailed inquiries to assess trends in gear, depth and species of value. We also compared catches in logbooks with fish tickets to comprehend the fish assemblages and which species were valuable to the market and fleet from the 1980s to the

Photo right: Pacific ocean perch, lingcod and black cod are all groundfish. (photo by Lynn Ketchum)

Photo left: Quillback rockfish (shown in hand) can grow up to 2 feet in length. (photo courtesy of Positively Groundfish)

present. Our methods allowed us to assess consistencies or inconsistencies in species. We were also able to determine where further information should be gathered to better understand changes in the nearshore environment and social and economic impacts to the groundfish fishery.

We focused solely on bottom trawl gear. This includes the ODFW logbook classifications of large footrope gear, small footrope gear (sole net), unspecified bottom trawl gear, and selective flatfish trawl gear.

To find people to interview, we enlisted the aid of individuals who had an established rapport with people who had experience within the nearshore groundfish trawl fishery (21, 22). The majority of interviewees were members of the commercial fishing community in ports from Astoria to Cape Blanco. Some had been active in the nearshore groundfish fishery before the transition to a domestic fishery in 1976; others had been in it for no more than two years. Other interviews were conducted with members of the following:

- The PFMC, which operates under the Magnuson-Stevens Act's national standards to generate and adapt the regional Fishery Management Plan (FMP).
- The National Marine Fisheries Service, which approves and regulates the FMP.
- State fisheries management, which adheres to the management of federal FMPs and has the authority to exercise species-specific measures when the state finds more conservative approaches necessary (20).

The interviews were conducted in person at a location convenient to the interviewee, or by phone when necessary. Each interview was recorded, transcribed and analyzed for themes. We limited the interviews with fishermen and the analysis of the logbooks to groundfish fishermen and vessels that fished within our study's definition of the Oregon nearshore. We refer to those fishermen as Oregon's nearshore groundfish trawl fleet.

Yaquina Bay is home to Newport's commercial fishing fleet. (photo by Pat Kight)

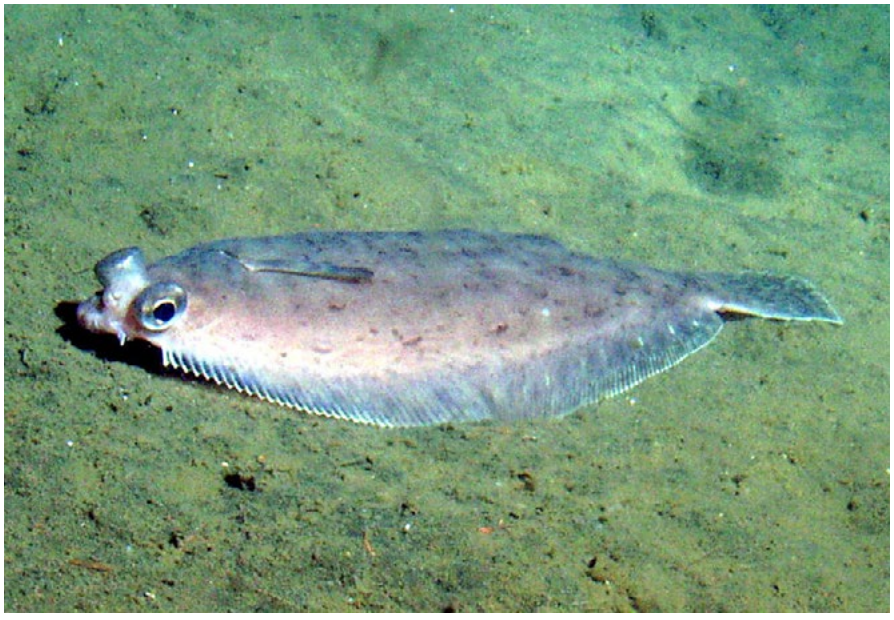
Lessons Learned

The beach fleet

The identity of this nearshore groundfish trawl fleet emerged through interviews and interaction with the industry. Members of this fleet were quick to describe themselves as "the beach fleet." They identified as a unique subset of the broader groundfish trawl fleet that fished with smaller vessels that became largely specialized to flatfish species as fishery management and the fleet evolved.

For most, introduction to the fishery stemmed from familial involvement; many were second- or third-generation fishermen. They described experience with and preference for the beach fishery given familiarity or endemic knowledge of the grounds, the ease of shorter tows, and a less exorbitant set of gear costs than those associated with the deeper-water fishery. Other aspects that made the nearshore favorable were closer grounds and proximity to ports, which also provided a buffer from the often hazardous weather of the Oregon coast, as well as fewer "hang-ups" to encounter (e.g., shipwrecks or high-relief rocky habitats).

Those who inherited boats and knowledge from family members learned how to target species without getting caught on derelict gear, wrecks or habitat. They described remaining in the fishery as an intuitive step but one that is



Dover sole are flatfish, with both eyes located on the right side of their head. Their coloring allows them to blend in with the ocean floor. (photo by William Barss)

becoming increasingly costly for new entrants:

"It was pretty easy for me to get in. My grandpa was a fisherman, and I was the only one in the family that had expressed any interest in it. He helped me out. But it was a lot cheaper and a lot easier to get in. All you had to do then was buy a boat. Now the permits are worth more than the boats. It makes it tough."

Boats, gear and fishing habits

Fishermen who experienced the early days of the nearshore groundfish fishery described the boats and gear as more primitive. The boats were smaller, wooden vessels with no stern ramps. They had menial plotting and navigational technology. Tow durations were longer and the target species were more generalized. A member of the groundfish fleet described early fishing habits:

"They'd do tows that were forever long. I mean, they'd just set the net and all of a sudden 13 hours later, they would bring up whatever. And I think really, because of the groundfish disaster, that fishermen started realizing they couldn't really be fishing the way they were. It wasn't like the fishermen didn't know these things. It was just there were no rules that told them not to do it. The minute the rules came along, they followed the rules. So, regulations saved the fishery because it helped the fishermen change their mindset. My hat's off to the fishermen in this nearshore fishery. They know the bottom, they know the fishery, and they were able to fish cleaner, really, with [modifications to] the same [trawl] gear."

As the gear regulations emerged and the fishery adopted selective flatfish trawl gear – set against a waning availability of processors and an inconsistent market – the fishery shifted its focus to higher-value flatfish (Table 2).

Changes in mesh sizes and engagement with ODFW and EFP programs continued in an effort to reduce bycatch. But the "pineapple trawl," as the selective flatfish trawl net is more casually referred to, was described as the most revolutionary alteration to the fleet's gear.

The fleet transitioned to GPS and navigational plotter systems in the 1980s and 1990s. Weather prediction tools enhanced the safety and timing of fishing. Wooden boats were widened and lengthened and were updated with more powerful winches and hydraulics. Steel boats with larger stern ramps joined the fleet. Still, many of the boats in the modern fleet were described as being the same ones from the early fleet or as having undergone modifications.

The consistency of trawl logbook compliance has also been variable, particularly in the earlier era of evolving management measures and stringency. This could indicate that the species data might reflect only a portion of the harvest that may have occurred in the nearshore (Figure 3).

Table 2 Fleet characteristics
Trends in vessel length, gear, harvested fish species and trawl depths from 1980-2017

Year Block	Average Vessel Length (ft.)	Preferred Gear	Species Target Group	Average Maximum Trawl Depth (fathoms)
1980s	60	unspecified bottom trawl	flatfish & rockfish	62
1990s	64	bottom trawl small footrope (sole net)	flatfish & rockfish	68
2000s	65	bottom trawl small footrope (sole net)	flatfish	57
2010+	65	selective flatfish trawl	flatfish	58

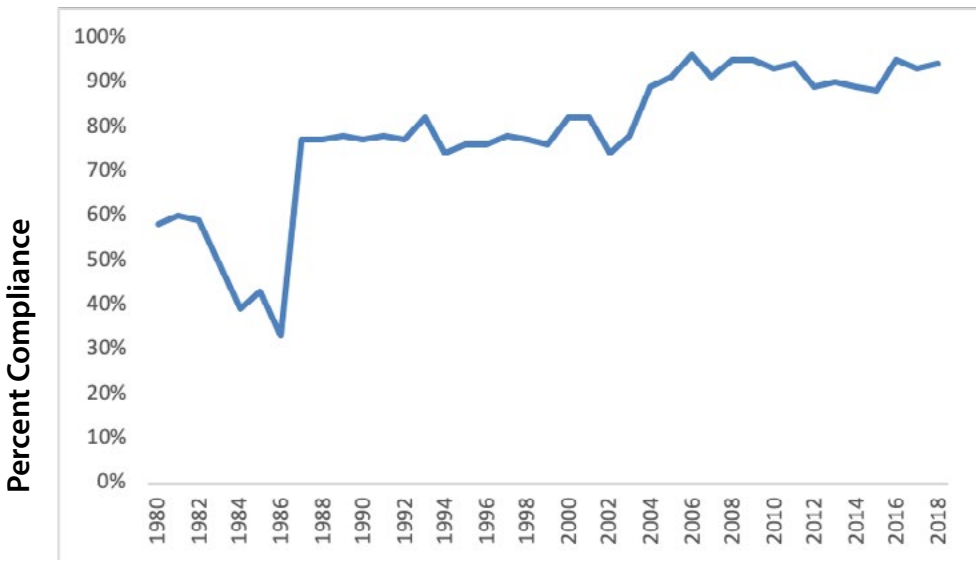


Figure 3. *Percentage of groundfish trawl vessels that maintained and submitted logbooks from 1980-2018. (courtesy of ODFW)*

Declining use of the nearshore

Interviews, logbooks and archival documents from the PFMC and ODFW show a trend towards a subsiding use of the nearshore. Increasingly within the evolving fishery and its management, those who fished nearshore groundfish described using it as a "filler fishery" for periods between the shrimp and Dungeness crab seasons, and sometimes only when those fisheries were performing marginally. One interviewee described nearshore groundfish as a summertime fishery:

"The most successful fishermen are only in [nearshore] groundfish for a few months. They fish that [groundfish] in the summer, which is historically the shelf fishing. In the fall and winter, they're gonna go deeper for black cod and Dover and such."

Tows along the Oregon shelf from 110 fathoms deep and shoreward declined from 541,612 during the 1990-99 period to 82,314 during the period from 2010-17 (Figure 4). From 30 fathoms deep and shoreward, tows dropped from 91,244 during the 1990-99 period to 10,633 during the 2010-17 period (Figure 5).

"Rent-a-skippers" and costs

The fleet raised concerns regarding what they called "rent-a-skippers," such as migratory fleets or more seasonal fishermen. They expressed concerns that these fishermen may not prioritize the sustainability of the fishery. As a result, they felt that they themselves might unfairly bear the brunt of regulations.

The fleet was also discouraged by the costs of doing business, which include: paying crew, buying quota to cover bycatch and paying $500 a day for a required observer on each vessel to monitor catches. Those costs can be daunting for small boats fishing the nearshore, especially because their volume is not nearly as high as that of larger boats farther out at sea. Compounded by largely static market values for nearshore species, the cost of fishing was often discussed as greater than the potential revenue.

"We're doing all the work, and there's not very many of us, and we're not seeing the benefits of it. And, it costs much more to do now. Yeah, our catch rates are more than they used to be, but our costs are way, way higher: observer costs, leaser fees, you know."

Fish stocks and regulations

Fishermen's and processors' perspectives on the types of fish present in the nearshore ranged broadly, dictated in part by the age of the interviewees and how long they had been working in the industry. Regardless, the most persistently discussed species were flatfish, and across all years assessed, specifically petrale sole (Figure 6).

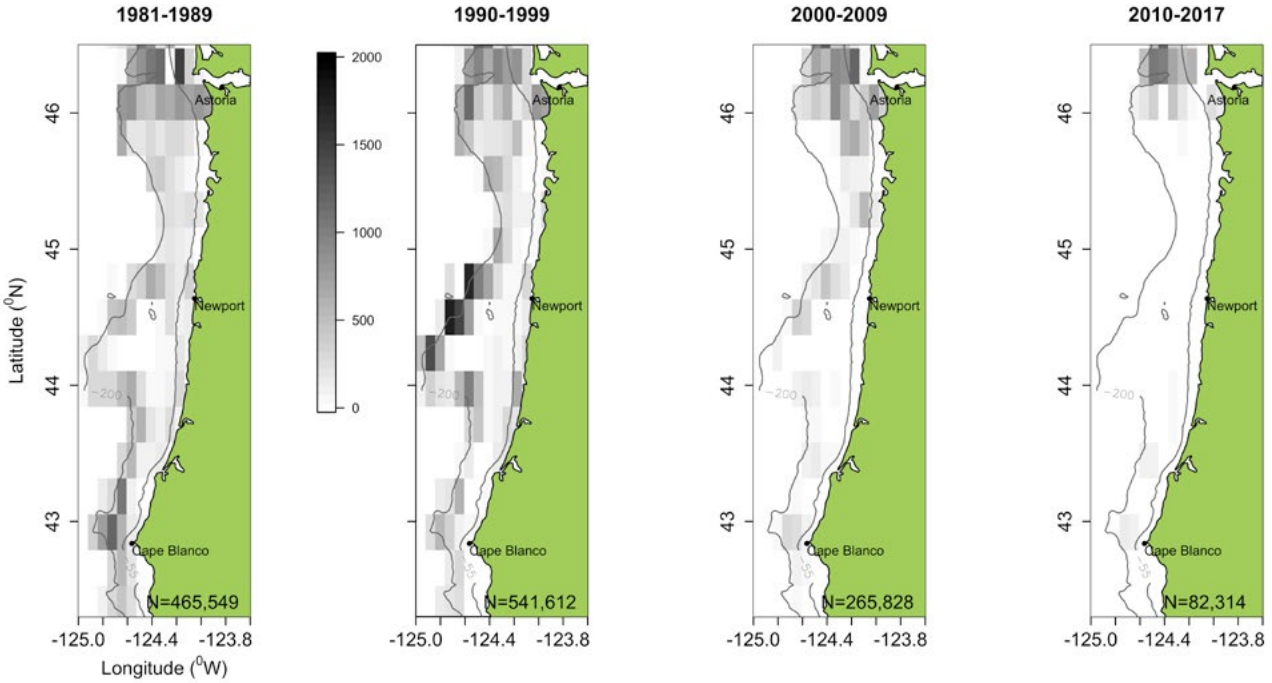


Figure 4. *Logbook trawl set points 110 fathoms and shoreward for all tows from 1981-2017. The colorbar denotes the number of trawl set points. The line closest to the shore in the ocean indicates the 30-fathom (55-meter) depth contour. The line to the left of it indicates the 110-fathom (200-meter) depth contour and is the outer limit of the nearshore as defined by this project. N denotes the total number of tows.*

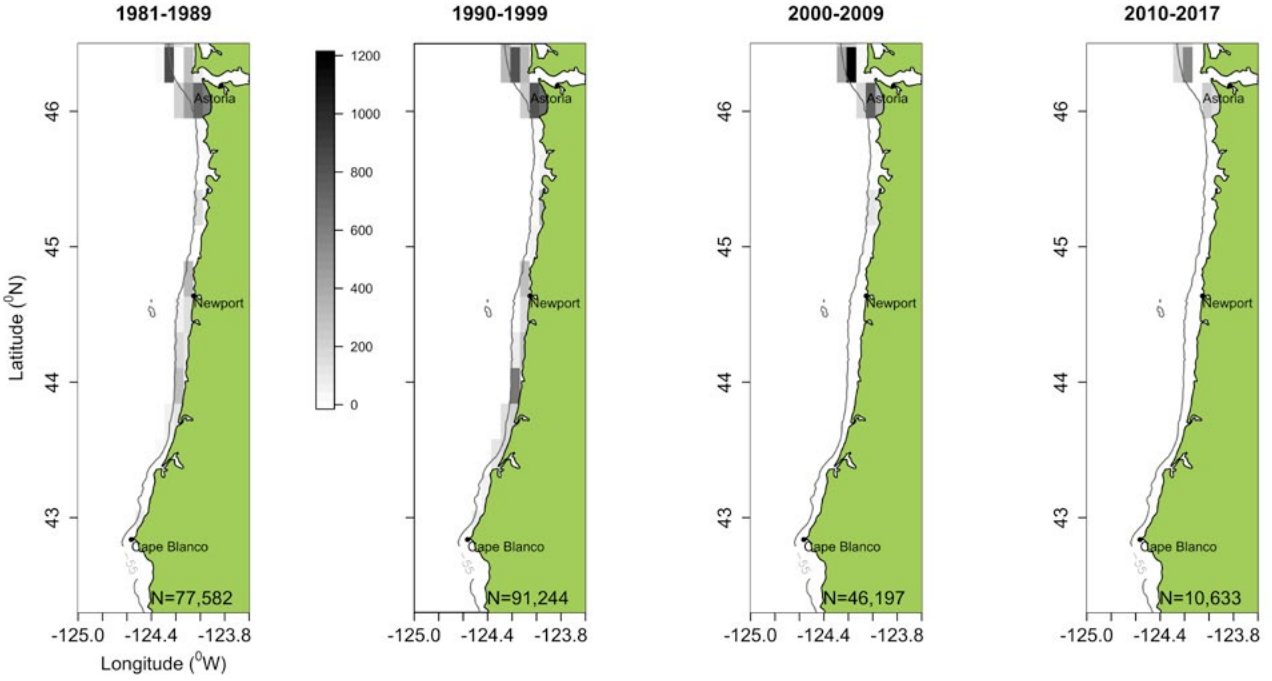


Figure 5. *Logbook trawl set points 30 fathoms and shoreward for all tows from 1981-2017. The colorbar denotes the number of trawl set points. The line in the ocean indicates the 30-fathom (55-meter) depth contour and is the outer edge of the nearshore as defined by ODFW. N denotes the number of tows.*

Interviewees who were active during the 1970s-1990s portrayed an industry that caught a much wider range of fish than the contemporary fleet. This broader swath of target species was reflected in the logbook entries from those years. Because of limited scientific surveys 30 fathoms deep and shoreward, local ecological knowledge on the presence and harvest of fish is particularly insightful. English sole, starry flounder, arrowtooth flounder, rex sole, Pacific sanddab and sand sole were commonly identified as high-value flatfish abundant in the 10-30 fathom range off the Oregon coast. Several species of rockfish, such as canary, widow, darkblotched and yellowtail, were also of prevailing interest. Additionally, black cod (also known as sablefish) and big skate were of interest to the nearshore sector of the groundfish fleet. The processing and marketing landscape of the Oregon coast at the time allowed fishermen to target a greater diversity of species.

This is one type of net that groundfish trawlers use. (photo by Amanda Gladics)

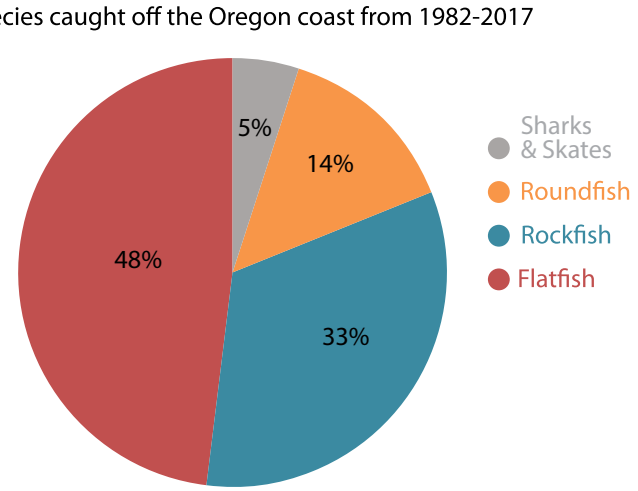


Figure 6. *Fishermen caught 18 different species of rockfish, 12 species of flatfish, five species of roundfish, and three species of sharks and skates out to 110 fathoms deep off the Oregon coast between 1982 and 2017.*

The option of selling to multiple buyers who specialized in marketing different species allowed the fleet to diversify its catch:

"When I fished [starry and arrowtooth] flounder, I fished inside of 30 fathoms. And some years that I fished, it was pretty good. I'd have a mixture of flounder, which was going for around 40 cents a pound, and sand sole, which were going for 90 cents a pound, and a few English [sole]. And then there'd be some oddball stuff in there. I had a market for about 150 fish, and that's what they'd let me catch."

Less stringent regulations also allowed the fleet to target a larger mix of species. Without bycatch reduction measures or management of individual stocks, trawlable habitat and catch were not limited. The gear types that were preferred between 1970 and 1990 (Table 2) enabled the fleet to access high-relief areas to target rockfish using a roller or rock hopper apparatus.

With the footrope restrictions and the requirement of selective flatfish trawl gear, these regions of the nearshore and corresponding target species became less accessible. As a result, many species were no longer consistently supplied to markets.

Scientists and the fleet have collaborated over the years to innovate gear to minimize bycatch of juvenile and protected species. Both groups expressed feeling a sense of solidarity and trust thanks to the EFP. Fleet participants in the EFP had the opportunity to test new and modified gear, including in areas often otherwise closed to fishing. They appreciated being able to demonstrate their knowledge of fishing grounds and become part of the solution:

"It was a positive experience. We went in there and we did what we needed to do. We caught fish cleanly and showed the government that, 'Hey, we can go in there and do this without making mistakes.'"

The RCA, EFH and IFQ amendments mandated that the fleet significantly alter its actions to comply with regulations. The fleet adapted by either avoiding areas where protected and target species overlap or by being extremely cautious in these areas. Because stringent quotas were imposed on protected stocks, fishermen bought extra quotas to cover any catches that exceeded those limits. Prior to its recovery in 2015, fishermen were anxious about catching canary rockfish, which they described as "balls of orange" in their nets. They worried about being closed down or being financially penalized for catching them.

Even though most fish have shifted into healthy levels again, fishermen are still worried about whether there are enough fish to go around. In allocating future quotas, it is important for management to understand how the fleet may shift back into some of the formerly closed areas.

The future: cooperation and cautious optimism

Despite certain vexations, interviewees were cautiously optimistic about the future of the nearshore groundfish trawl fishery, particularly when discussing the reopening of historically important fishing grounds. They frequently mentioned new avenues for rebuilding the market for a greater array of recovered groundfish species. Some described the potential of marketing campaigns, such as the one by the nonprofit trade association Positively Groundfish, to promote the sustainability of the recovered fishery and its diverse species. Some favored becoming a smaller, more specialized fleet. The consolidation of processors along the coast and a rising shortage of filleters, however, makes it challenging for the industry to use up their allocated quotas and be competitive cost-wise.

Canary rockfish on the West Coast were declared overfished in 2000. A recovery plan was implemented in 2001, and the stock was declared rebuilt in 2015. (photo courtesy of ODFW)

Some members of the fleet, however, are collaborating and selling their own fish. Fishermen also described the way fisheries management – particularly catch shares – has reshaped how they interact with other fleet members. Instead of keeping fishing spots and unexpected abundances secret, they're telling each other about pockets of recovering stocks. And they're selling unused quotas to their colleagues so both make money. Having more frequent dialogue allows fishermen to source emergency quota if they exceed quota on incidental catches.

While there are still certainly areas of discontent with management, fishermen recognize that regulatory measures, such as EFH protection, are why they're able to continue fishing:

"We're accountable for every pound of fish we catch. That's what lets us go fishing. But [in 2020], we're gonna be able to go in there [to the reopened fishing grounds], everybody is, and basically fish how we want to. It's going to be neat! There's going to be areas that are still closed that we've given up, and that's good. I am all for that. That's a good thing."

Final Thoughts

The story of nearshore groundfish ultimately centers around an exceptionally diverse group of fish that are tightly enmeshed with the people who have managed, researched and harvested them along Oregon's continental shelf. The prominent intersections of these fish and stakeholders have not been sufficiently explored. Based on this study, we are encouraged by the prospects of inspiring better understanding and communication about the use and conservation of this rich asset.

The long and tumultuous road to rehabilitation for West Coast groundfish has drastically reshaped the remaining fleet. Now, the nearshore fleet is in a transitionary stage. The fishermen's success, of course, will depend on whether consumers can be persuaded to buy more of these "white fish." But other factors will also come into play. Local and scientific ecological knowledge must be integrated into long-term monitoring of the nearshore. And lines of communication between fisheries managers and the fleet must be improved so that management understands how fishermen are responding to regulations and scientific advances.

A thought expressed in an early interview resurfaced throughout our interviews. It's a succinct synopsis of a complex fishery and its evolution. It's good to keep in mind as the nearshore groundfish fishery transitions into its next phase:

"The fishermen have been working and operating under a lot of regulations, especially related to the groundfish fishing disaster and all the quotas and catch limits. And now that we're sort of coming out the other side, I think they would just like to have the flexibility and availability to just fish."

Rockfish and black cod are for sale at Local Ocean's seafood counter in Newport. (photo by Tiffany Woods)

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The Columbian Star docks in Warrenton. (photo by Stephen Ward)