

# CALIFORNIA GROUND FISH COLLECTIVE ANNUAL REPORT

## 2014

Supplemental Informational Report 10  
September 2015



Report prepared by: Kate Kauer\* and Dwayne Oberhoff†

Central California Seafood Marketing Association  
*A California Fish Marketing Act Corporation*

Fort Bragg Groundfish Association  
*A California Fish Marketing Act Corporation*

Half Moon Bay Groundfish Marketing Association  
*A California Fish Marketing Act Corporation*

The Nature Conservancy  
*A District of Columbia Non-profit Corporation*



\*The Nature Conservancy

†Ecological Assets Management, LLC

## Acknowledgements:

The authors of this report wish to acknowledge and thank the contributors whose partnership, leadership, and commitment collectively make up and support the California Groundfish Collective's ability to create the results contained within this report. The California Groundfish Collective has benefitted from the input and guidance from many organizations and individuals; in particular this collaboration and the report are made possible by the Fort Bragg Groundfish Association and its fishermen members, the Half Moon Bay Groundfish Marketing Association and its members, the Central California Seafood Marketing Association its members, Michael Bell, Mary Gleason, Matt Merrifield, Steve Rienecke, Melissa Stevens, Chuck Cook, Joe Sullivan, Rick Algert, Merrick Burden, the Environmental Defense Fund, the Pacific Fisheries Management Council, the National Marine Fisheries Service, the Pacific States Marine Fisheries Commission, the California Department of Fish and Wildlife, and the National Fish and Wildlife Foundation.



### Suggested Citation:

Kauer, K. and D. Oberhoff. 2015. California Groundfish Collective Annual Report 2014. Report to the Pacific Fisheries Management Council. August 14, 2015.



## Introduction

In 2011 the Pacific groundfish fishery transitioned into an Individual Fishing Quota (IFQ) management system. Under this management system, the annual total allowable catch (TAC) for each managed species is divided into transferable quota shares and allocated among individual fishermen. Fishermen are afforded some flexibility under this system as to where and when to fish, and the quota is transferable so it can be leased or bought and sold.

For many participants, this management system presents a challenge due to the extremely limited supply of overfished species quota that constrains the harvest of more abundant species. The Pacific groundfish fishery is comprised of over 90 species of flatfish, rockfish, roundfish, and others; six rockfish species are federally designated as overfished, and therefore only small amounts of quota for these species are available to the fishery on an annual basis. Many fishermen are at high risk of exceeding their quota usage for certain overfished species while attempting to harvest more abundant target species. If the harvest of any species exceeds a fisherman's quota allocation, he or she may not take another fishing trip until adequate quota is acquired to cover the deficit. Because harvesting overfished species is not entirely predictable (i.e. these species can be caught incidentally), a fisherman could unintentionally harvest his or her entire annual quota allocation for one or more of the overfished species during one trip or set, even when taking reasonable precautionary measures to avoid these species.

This report describes the results of a collaborative effort along the coast of California to pool overfished species quota and reduce the risk of catching these species during the 2014 fishing season. In 2014, the California Risk Pool transitioned its name to the California Groundfish Collective in order to effectively communicate the collaborative efforts being taken by the fishing association members and The Nature Conservancy (TNC). The California Groundfish Collective has operated since 2011 and is formed by an annual agreement entered into by the Fort Bragg Groundfish Association (FBGA), the Central California Seafood Marketing Association (CCSMA) and the Half Moon Bay Groundfish Marketing Association (HMBGMA). The 2014 fishing season marked the fourth consecutive year of the operation of the California Groundfish Collective.

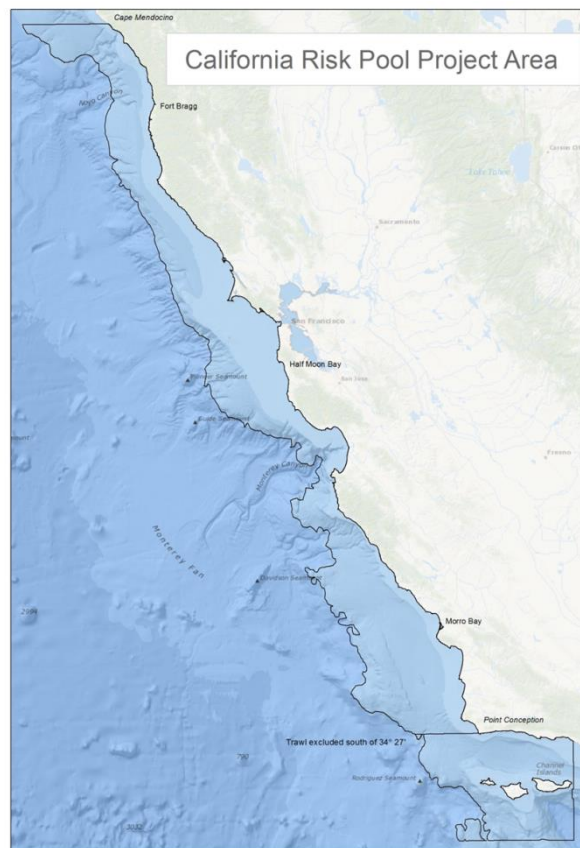
The goals of the California Groundfish Collective are to maximize conservation and economic opportunities and retain local access to fish. By establishing the California Groundfish Collective, fishermen members of each association agree to pool their overfished species quota pound allocations and develop regional fishing plans across 15 million acres (refer to Figure 1) designed to reduce the risk of catching overfished species. As parties to the agreement, California Groundfish Collective members who catch overfished species are covered by the California Groundfish Collective's quota, in return for adhering to the spatial fishing plans and using eCatch, an electronic logbook system, to share catch information on the location of overfished species. The objectives of the regional fishing plans are to promote the long term success of the fishery and the supporting port communities by:

- (i) Maximizing the harvest of target species from the fishery;
- (ii) Minimizing the harvest of overfished species from the fishery;
- (iii) Safeguarding sensitive fish habitat; and,



- (iv) Contributing to the rebuilding of overfished stocks.

In 2014, the California Groundfish Collective included ten vessels using various gear types: bottom trawl, longline, pots, and Scottish seine. The California Groundfish Collective was governed by a four member Advisory Committee made up of one representative from each fishing association and one representative from TNC. TNC owns quota in the Pacific groundfish fishery and is engaged in the fishery with the goal of working with the industry and local communities to develop and implement best practices for an economically and environmentally sustainable fishery for port communities where the California Groundfish Collective operates. TNC invested quota into the California Groundfish Collective and collaborated with FBGA, CCSMA and HMBGMA to combine the best available science along with local fishermen knowledge to create the regional fishing plans, as well as to implement technology solutions for sharing information.



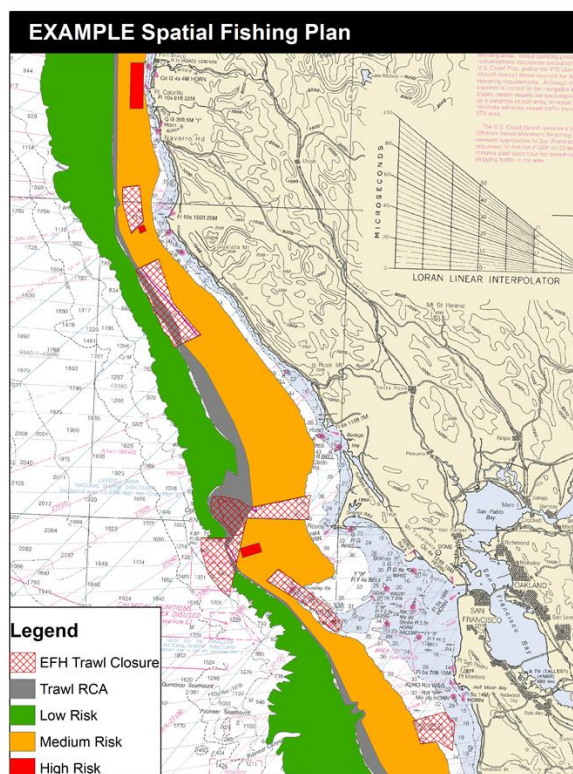
**Figure 1.** Black outline shows the spatial extent of the California Groundfish Collective regional fishing plans.





## California Groundfish Collective Fishing Plans

Under the California Groundfish Collective agreement, the FBGA, HMBGMA and CCSMA created spatial fishing plans in partnership with TNC to reduce the risk of catching overfished species. The spatial fishing plans cover specific regions and combine the fishermen’s knowledge with the best available science and technology to delineate risk zones (e.g. high, medium and low) as well as voluntary closures. The fishing plans are created collaboratively and are specific to each gear type for a specific region. Risk-based zones may also include fishing prescriptions - such as test tows or reduced tow durations - that are assigned based on the risk of encountering overfished species or the presence of sensitive habitat areas. The fishing plans set out specific precautionary actions that a vessel must take when overfished species are harvested above certain thresholds, including move-on rules and communication to all California Groundfish Collective members in the area over radio or satellite phones. The spatial fishing plans are adapted and updated throughout the fishing season using information collected and shared among California Groundfish Collective participants. In return for adaptively managing and complying with the fishing plans, fishermen are covered for catches of overfished species. When incidental catches of overfished species occur, the California Groundfish Collective agreement ensures that spatial information and details of the catch are shared across the collective group. Figure 2 provides an example of the spatial components of a regional fishing plan that identifies risk zones (note this is just an example, not an actual plan).



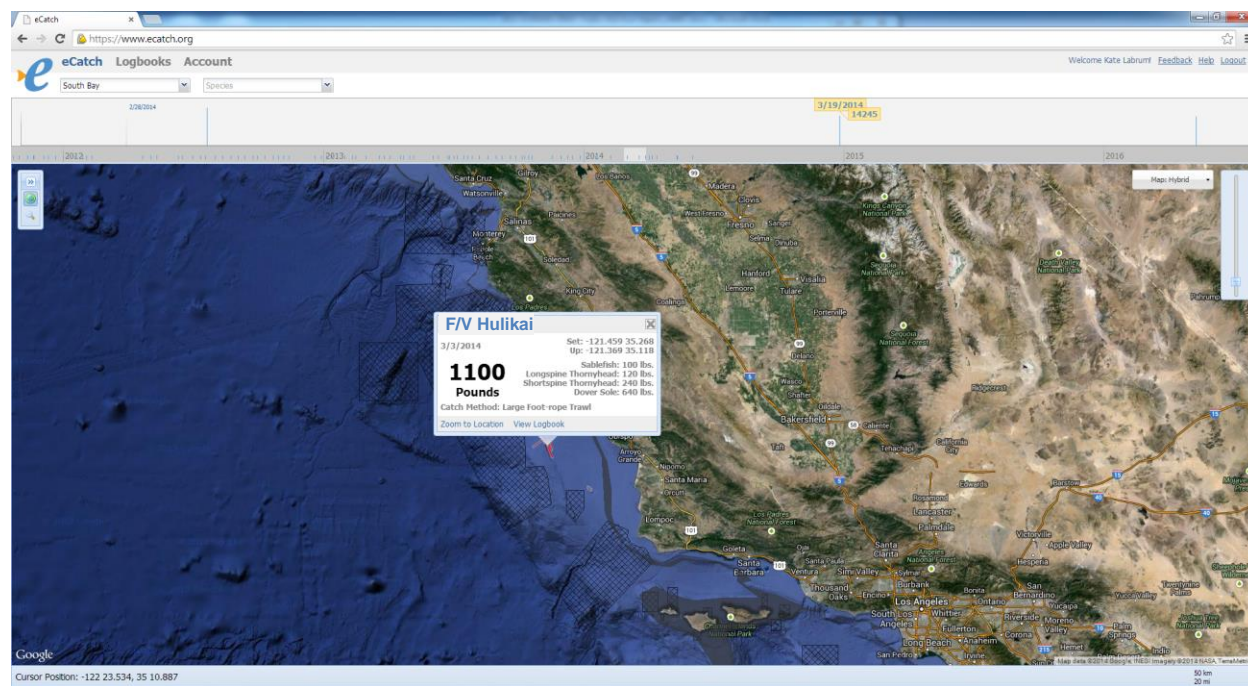
**Figure 2.** Example of spatial component of a regional fishing plan in the central coast of California that depicts high, medium and low risk zones as well as existing management closures. Certain fishing prescriptions are assigned to zones.



## Technology

Capturing and sharing spatially explicit fisheries data is a fundamental component of California Groundfish Collective operations. California Groundfish Collective members need to know almost immediately if other members have caught overfished species in order to reduce the risk of additional catches and to update and adapt spatial fishing plans. In addition, California Groundfish Collective managers also need to ensure that fishing occurs in compliance with spatial fishing plans in order to fill deficits for overfished species quota and effectively monitor fishing operations.

To capture and share certain catch data, the California Groundfish Collective uses an application developed by TNC called eCatch ([www.ecatch.org](http://www.ecatch.org)). eCatch allows fishermen to easily capture logbook information using an iPad or iPhone, visualize and query catch data on web-based maps, and share spatial data with others if it makes sense to do so. The eCatch logbook records fishing event locations with latitude and longitude (start and end locations recorded for each fishing set) and records estimates of catch at each location. This technology can reduce the cost of data entry and enable the rapid sharing of fisheries information. eCatch also provides the California Groundfish Collective manager with a tool to ensure compliance with spatial fishing plans. After four consecutive years of using eCatch, the California Groundfish Collective participants are building a spatial library of valuable fisheries data that is used to update and adapt regional fishing plans.



**Figure 3.** eCatch web-based mapping interface. The eCatch application ([www.ecatch.org](http://www.ecatch.org)) allows fishermen to capture logbook data using an iPad and then query that data and visualize it on web-based maps.



### *Seafood Watch External Assessment*

In late 2013, the California Groundfish Collective began a process with Seafood Watch to conduct an external assessment and evaluate the ecological sustainability of a subset of eight species caught by the Collective in the Pacific groundfish fishery. The purpose of engaging in the external assessment was to test whether a market distinction could be created for the seafood caught by vessels operating under the California Groundfish Collective harvest guidelines.

The California Groundfish Collective and TNC gathered and synthesized a high resolution data set from sources including eCatch, IFQ vessel accounts, and the West Coast Observer Program. The data were used by a Seafood Watch analyst to evaluate the fishing and management practices of the California Groundfish Collective using four categories or criteria that Seafood Watch uses to rate the sustainability of both farmed and wild caught seafood. One of the criteria they use assesses the impacts of fishing on habitat and the ecosystem; the eCatch database provided an additional layer of data other than what's currently available through landings data from vessel accounts and observer data and proved to be key in demonstrating the spatial patterns of fishing and interaction of fishing gear with habitat for this criterion in particular. Without accurate and accessible data on where fishing occurs, assessments or certification programs sometimes must make assumptions about habitat impacts of fishing activity. Using the eCatch data, the California Groundfish Collective demonstrated that 99% of fishing activity occurred on soft bottom substrate, not on cobble, boulder or biogenic habitat which would be scored as higher concern.

The full external assessment was published in October 2014 by Seafood Watch<sup>1</sup>. The report is available online and resulted in eight species caught by the California Groundfish Collective (using trawl gear or fixed gear) receiving the "Best Choice" (Green) rating. The species include Chilipepper Rockfish, Dover sole, English sole, Pacific sanddab, Petrale sole, Sablefish, and both Shortspine and Longspine Thornyhead Rockfish.

## **Overfished Species Quota Holdings Summary**

Members of the FBGA, HMBGMA, CCSMA, and TNC transferred their 2014 overfished species quota pounds into California Groundfish Collective managed holding accounts (e.g. IFQ vessel accounts) following execution of the annual agreement. Due to specific IFQ regulations on daily quota pound limits for overfished species, the California Groundfish Collective was not able to deposit all overfished species quota into a single holding account. The Pacific Fisheries Management Council approved changes to risk pool regulations under the catch share management program in late 2011 that will allow a California Groundfish Collective vessel holding account to hold overfished species quota above the currently established vessel account caps. When this change is implemented it will greatly streamline risk pool management of overfished species quota pounds and provide cost savings.

---

<sup>1</sup> California Groundfish Collective Fishery Seafood Watch Report: [http://www.seafoodwatch.org/-/m/sfw/pdf/reports/mba\\_seafoodwatch\\_california\\_groundfish\\_collective\\_fishery\\_report.pdf](http://www.seafoodwatch.org/-/m/sfw/pdf/reports/mba_seafoodwatch_california_groundfish_collective_fishery_report.pdf)



The California Groundfish Collective's total overfished species quota pound holdings for 2014 are presented in Table 1 and Figure 4 below. In the region where the California Groundfish Collective participants operate, the most constraining overfished species are Bocaccio (*Sebastes paucispinis*), Canary Rockfish (*S. pinniger*), cowcod (*S. levis*), Darkblotched Rockfish (*S. crameri*), and Yelloweye Rockfish (*S. ruberrimus*).<sup>2</sup> Pacific Ocean Perch (*S. alutus*) is also an overfished species in the Pacific groundfish fishery, yet the California Groundfish Collective did not manage any holdings of this species. Nevertheless we include Pacific Ocean Perch in the following tables and figures.

Table 1. California Groundfish Collective's quota pound (QP) holdings of overfished species in 2014 compared to the sector allocation for the entire west coast groundfish fleet.

<b>Overfished Species Managed by California Groundfish Collective</b>	<b>California Groundfish Collective's QP Holdings</b>	<b>IFQ Sector's Total QP Allocation</b>	<b>California Groundfish Collective's QP Holdings as Percentage of IFQ Sector Allocation</b>
Bocaccio rockfish	97,321	174,165	56%
Canary rockfish	5,791	90,610	6%
Cowcod	1,363	2,205	62%
Darkblotched rockfish	33,326	613,789	5%
Pacific Ocean Perch	0	247,535	0%
Yelloweye rockfish	172	2,205	8%
<b>Totals</b>	<b>137,972</b>	<b>1,130,509</b>	<b>12%</b>

In 2014, approximately 12% of the IFQ's sector-wide overfished species quota pounds were collectively managed and held by the California Groundfish Collective (refer to Table 1, Figure 4).

<sup>2</sup> The California Risk Pool annual reports for 2011 and 2012 included widow rockfish, as well as Pacific halibut IBQ. Since widow rockfish were delisted in 2012, the data presented in the 2014 report only include the six overfished species listed above in Table 1.





## 2014 California Groundfish Collective Overfished Species Quota Holdings

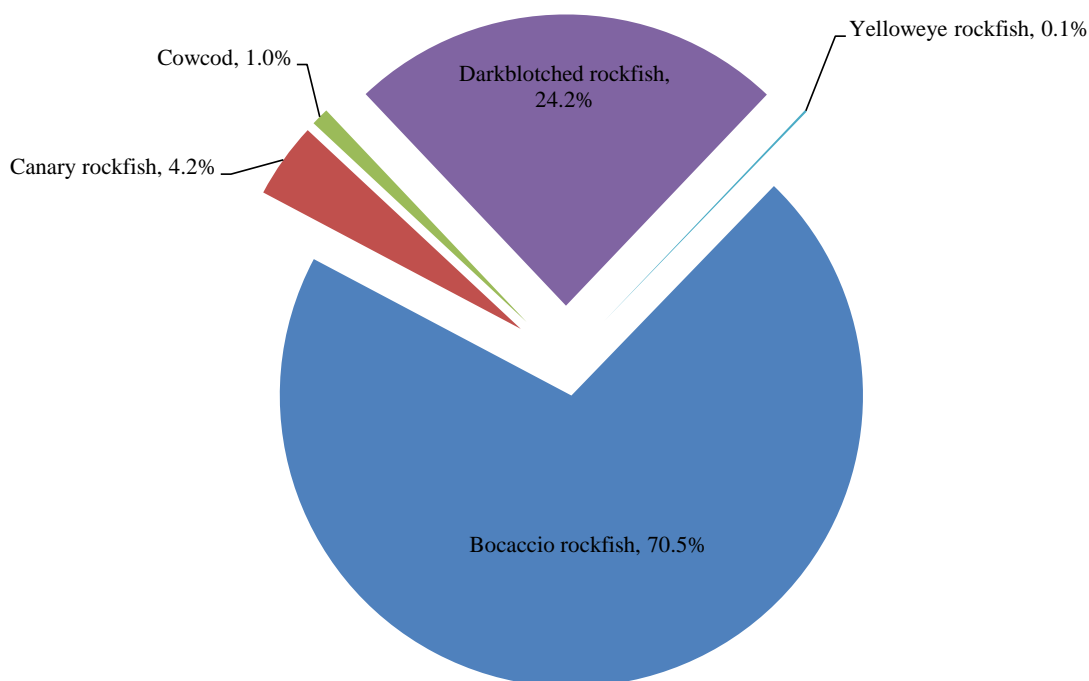


Figure 4. Breakdown of the California Groundfish Collective 2014 overfished species quota pound holdings.

### California Groundfish Collective Fishing Results: Catch and Utilization Rates

#### *Overfished Species*

We use utilization rates as a simple (though imperfect) metric to present the activity of the California Groundfish Collective and provide a measure of comparison. Utilization rates represent the percentage of an annual allocation of quota that has been caught (i.e. pounds caught divided by annual allocation of pounds). In 2014, the entire groundfish IFQ fleet (including the California Groundfish Collective) used a total of 348,485 pounds of the available 1,130,509 pounds of overfished species quota pounds available, or 31% of the total allowable catch. The California Groundfish Collective collectively managed a total of 137,972 pounds of overfished species quota pounds and collectively caught a total of 14,715 pounds, or 11% of the total California Groundfish Collective holdings (refer to Table 2).



Table 2. California Groundfish Collective's quota pound holdings and total catch in 2014.

Overfished Species Managed by California Groundfish Collective	2014 California Groundfish Collective's QP Holdings	2014 California Groundfish Collective's Total Catch	2014 Total Catch as Percentage of QP Holdings
Bocaccio rockfish	97,321	11,012	11%
Canary rockfish	5,791	2,270	39%
Cowcod	1,363	360	26%
Darkblotched rockfish	33,326	1,058	3%
Pacific Ocean Perch	0	0	0%
Yelloweye rockfish	172	15	9%
Totals	137,972	14,715	11%

From 2011 to 2013 the California Groundfish Collective increased its utilization of overfished species quota, but in 2014 overfished species utilization decreased. From 2011 to 2014 the California Groundfish Collective's overall overfished species utilization has remained below the rest of the groundfish fleet's total utilization of overfished species (refer to Figure 5). However, despite the decrease in overfished species utilization in 2014 the California Groundfish Collective members increased their total catch of target species in 2014 by 10.2% when compared to 2013.

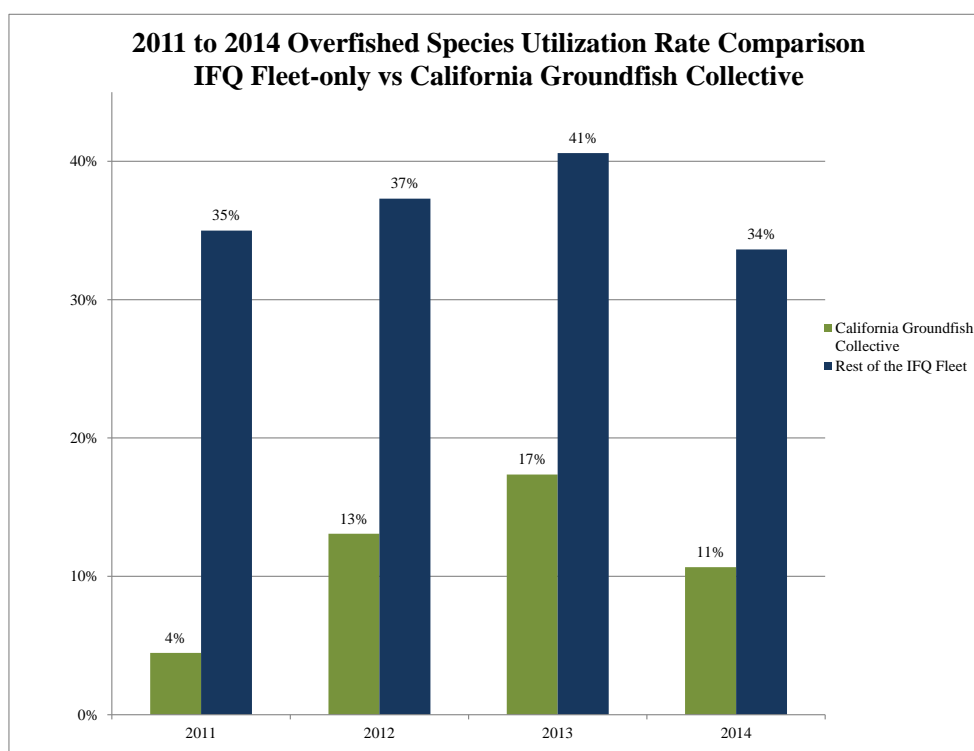


Figure 5. Comparison of overfished species utilization rates for the California Groundfish Collective and the rest of the IFQ groundfish fleet from 2011 to 2014 (widow rockfish is not included).



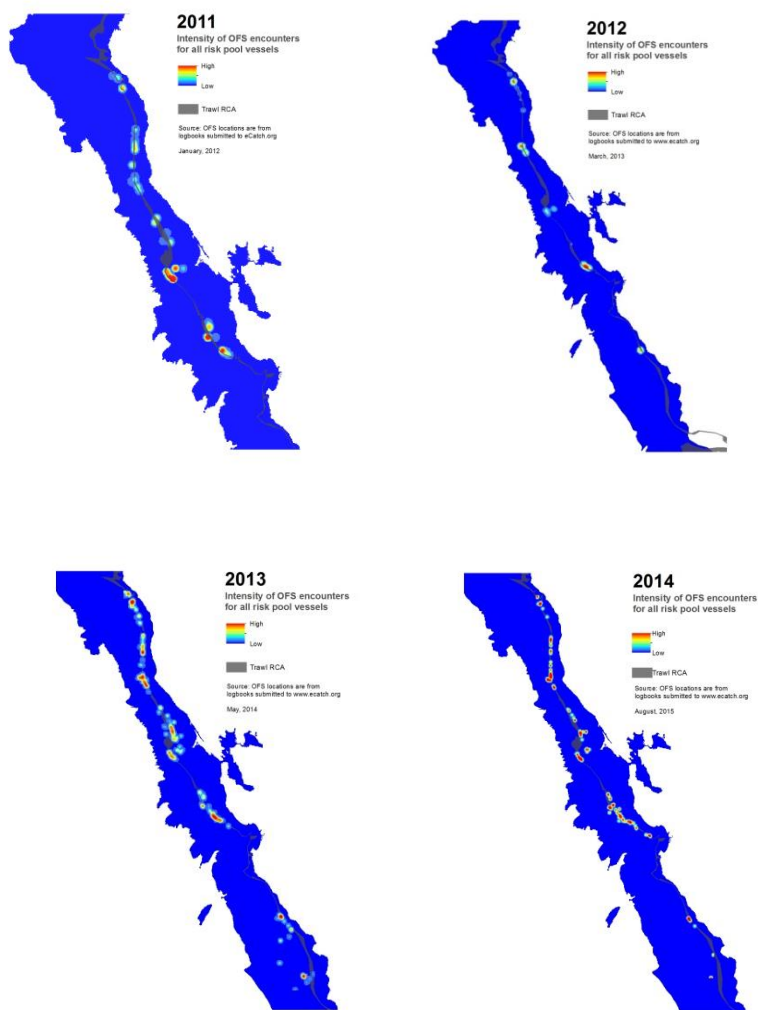
The California Groundfish Collective operates in the non-whiting sector of the groundfish IFQ, thus removing the whiting fleet's catch and allocations for overfished species provides a more relevant utilization comparison. The rest of the non-whiting fleet caught 287,747 pounds of overfished species, or 48% of the non-whiting fleet's holdings (with the California Groundfish Collective removed) (refer to Table 3, Figure 7).

Table 3. 2014 overfished species utilization rates for California Groundfish Collective, rest of the non-whiting fleet, and the total IFQ fleet (groundfish collective removed).

<b>Overfished Species</b>	<b>2014 California Groundfish Collective's Utilization</b>	<b>2014 Non-whiting Fleet Utilization (Groundfish Collective removed)</b>	<b>2014 Total IFQ Fleet Utilization (Groundfish Collective removed)</b>
Bocaccio rockfish	11%	12%	11%
Canary rockfish	39%	36%	25%
Cowcod	26%	10%	9%
Darkblotched rockfish	3%	53%	37%
Pacific Ocean Perch	0%	58%	36%
Yelloweye rockfish	9%	7%	5%
	11%	48%	34%



Using eCatch, the California Groundfish Collective was able to map the location and amount of overfished species that were caught by members during the 2014 fishing season. Areas of high catch intensity can indicate higher potential risk of catching overfished species over time (refer to Figure 6), and this information is used by the California Groundfish Collective to adaptively manage the regional fishing plans and update spatial restrictions or rules throughout the year. Data collected in eCatch also makes it possible to evaluate overfished species harvests on a trip by trip or set by set basis. In 2014, the California Groundfish Collective members harvested overfished species in approximately 30% of all sets, which provides a measure of the risk of encounter.



**Figure 6.** Maps created using eCatch data depicting the intensity of overfished species encounters for all California Groundfish Collective vessels during 2011 (top left), 2012 (top right), 2013 (bottom left), and 2014 (bottom right). Intensity is calculated as frequency of fishing sets where overfished species were harvested. [Note, 2011 and 2012 include widow rockfish encounters.]





The California Groundfish Collective provides its members with insurance – a secure and reliable source of overfished species quota – so that they may fish and maximize their harvest of target species. In 2014, the California Groundfish Collective manager filled more than 170 overfished species deficits for its members. Requests to fill a deficit were generally processed within minutes to a few hours. This rapid process resulted in no loss of fishing time for the members of the California Groundfish Collective from attempting to acquire overfished species quota pounds, but instead allowed them to concentrate on planning their next fishing trip and manage their overall fishing operations.

Midway through the year, the California Groundfish Collective conducted an assessment of overfished species quota pound holdings and utilization rates to determine the need to retransfer quota pounds back to contributing members so they may be made available on the open market. Additionally, by December 31, 2014, all remaining quota pounds were assessed and retransferred pro-rata back to the original contributing members of the California Groundfish Collective.

### *Target Species*

Since the California Groundfish Collective seeks to maximize conservation and economic opportunities, measures of overfished species utilization must be considered in conjunction with target species utilization. A primary objective of the California Groundfish Collective is to maximize the harvest of target species, though this objective is not exclusive of the other objectives to minimize the bycatch of overfished species, safeguard sensitive habitat, contribute to the rebuilding of overfished species stocks and participate in collaborative fisheries research. In 2014, the California Groundfish Collective members collectively held allocations for 10,324,103 pounds of target species (excluding overfished species and halibut IBQ). Allocations included individual allocations plus any additional quota pounds transferred into California Groundfish Collective member accounts throughout the year. Target species are considered all IFQ species except for overfished species and Pacific halibut IBQ. In 2014, California Groundfish Collective members caught a total of 3,757,159 pounds of target species, or 36% of their collective holdings.

In 2014, the total catch of target species for the entire IFQ fleet was 257,881,023 pounds, or 67% of the fleetwide allocation. Whiting contributes a substantial amount of pounds to the total target catch, and when the whiting fleet is removed, the non-whiting groundfish fleet caught 39,442,578 pounds or 37% of the non-whiting target allocation.<sup>3</sup>

---

<sup>3</sup> Non-whiting data acquired through personal communication with Sarah Towne, NMFS, May 16, 2014.



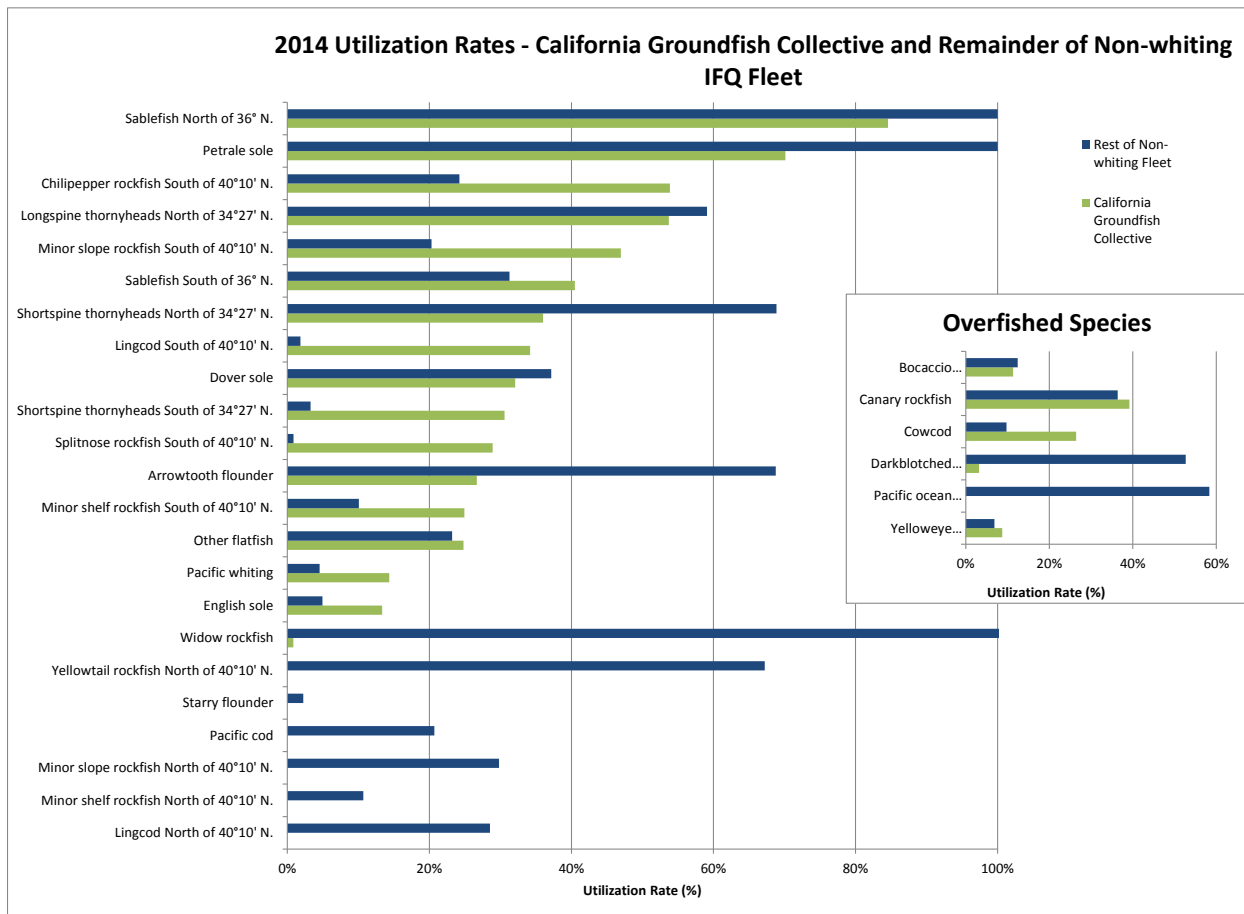


Figure 7. Comparison of target species and overfished species utilization rates for the California Groundfish Collective and the rest of the *non-whiting* IFQ groundfish fleet in 2014.



A bycatch ratio is an additional metric that can be used to evaluate the performance of the California Groundfish Collective relative to that of the rest of the groundfish fleet. Using information available on the total catch of overfished species and total catch of target species, a simple bycatch ratio can be determined by dividing the total catch of overfished species by the total catch of target species. When comparing bycatch ratios, a smaller number indicates less overfished species were caught while harvesting target species. From 2011 to 2014 the California Groundfish Collective’s bycatch ratio has remained lower than the rest of the non-whiting IFQ fleet (refer to Table 5).

**Table 5. Bycatch ratios for the California Groundfish Collective and the rest of the non-whiting IFQ fleet.**

<b>Year</b>	<b>California Groundfish Collective</b>	<b>Non-whiting IFQ Fleet (Groundfish Collective removed)</b>
2011	0.20%	0.83%
2012	0.43%	0.81%
2013	0.56%	0.91%
2014	0.39%	0.81%
Averages	0.40%	0.84%

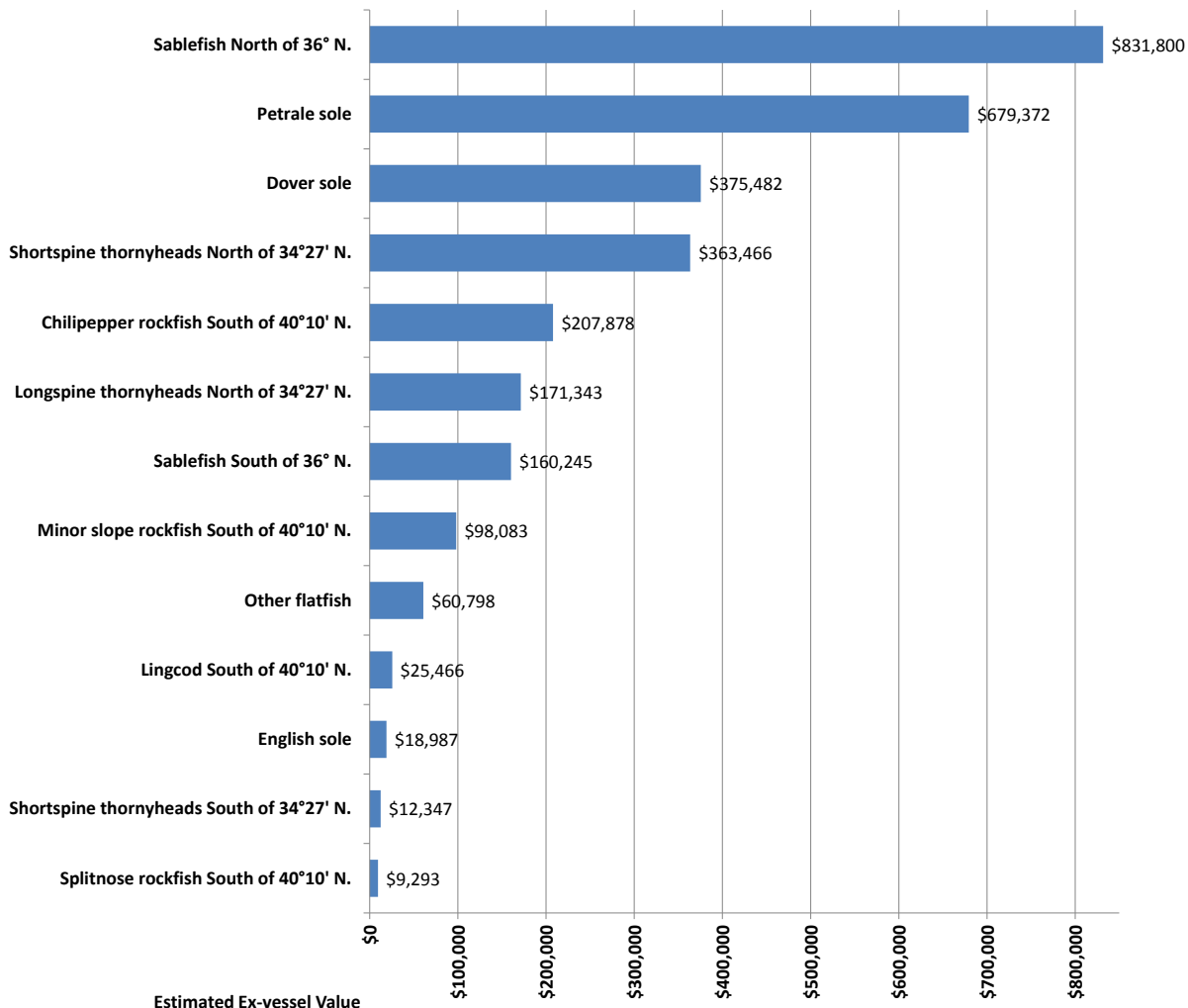
## **Socioeconomic Metrics**

### *Estimated Total Ex-vessel Value*

Ex-vessel value is a commonly used value that represents the value of the fish at the first landing before any processing is done. The estimated ex-vessel value of the combined total groundfish catch of the California Groundfish Collective members in 2014 was approximately \$3.03 million (2013: \$2.8 million; 2012: \$2.7 million; and 2011: \$3.5 million). The estimated total ex-vessel value was calculated from California Groundfish Collective members’ fish tickets (landing receipts) for each port where landings occurred in 2014. For landings where fish tickets (landing receipts) were not available, PacFIN (<http://pacfin.psmfc.org/index.php>) data were used to provide the average price per pound for a specific port. It should be noted that more than half of the members of the California Groundfish Collective participate in other West Coast fisheries for a portion of each year. The top five species, Sablefish, Petrale Sole, Dover Sole, Shortspine Thornyhead and Chilipepper Rockfish, accounted for over 81% of the California Groundfish Collective member’s estimated ex-vessel value (refer to Figure 8).



**Estimated Total Ex-Vessel Value for Target Species Caught by the California Groundfish Collective Members in 2014.**



**Figure 8.** Estimated total ex-vessel value (dollars) of groundfish, by species, landed by the California Groundfish Collective members in 2014.

*Costs of Participating in the West Coast IFQ Groundfish Fishery*

Participation in the west coast groundfish IFQ fishery requires significant costs that are incurred by fishing businesses. Costs of participation can be divided into three major categories: operational costs, fixed costs, and IFQ management related costs. Within each of these three categories there are various costs that may or may not pertain to every fishing operation. Each one of these costs incrementally reduces the profitability of each operation and increasing costs can result in lost profits for fishing operations. Operational costs (including crew shares) comprised the majority of costs incurred, followed by fixed costs, then management costs for the California Groundfish Collective members (Table 6).





Table 6. Average costs of participating in the West Coast IFQ Groundfish Fishery for California Groundfish Collective members presented as percentage (%) of gross revenue.

<u>Operation Costs</u>	<u>Percent of Gross Revenue (%)</u>
Captain/Crew Shares	38.5%
Fuel	13.5%
Ice	1.3%
QP Leasing	8.5%
<u>Fixed Costs</u>	
Vessel Insurance	4.0%
Vessel Maintenance/Repairs (i.e. haul-out, new rigging, etc.)	6.8%
Vessel Equipment (i.e. hauler, reel, electronics, etc.)	1.1%
Licenses/Permits (includes renewals)	0.4%
Fishing Supplies (i.e. nets, webbing, longline gear, hooks, etc.)	1.5%
Professional Services (i.e. lawyer, accountant, bookkeeper, etc.)	1.5%
Slip/Mooring Fees	0.9%
Landings Assessments and Membership Dues	1.3%
<u>IFQ Groundfish Management Costs</u>	
Trawl Buyback Fees	5.0%
Cost Recovery	3.0%
Observers	4.0%
First Receivers/Catch Monitors	0.0%
<u>Miscellaneous Operating Expenses</u>	8.8%
	<hr/> 100.0%

## Compliance and Monitoring

The 2014 annual California Groundfish Collective agreement established the protocol for dealing with non-compliance events or possible violation by one of the associations' vessels of their respective fishing plan regional rules. As directed by the California Groundfish Collective Advisory Committee, the California Groundfish Collective Manager was responsible for reviewing all vessel and trip specific data (i.e. spatial data from eCatch, landings, etc.) with incidents of overfished species catch to ensure compliance with regional fishing plans. In addition, to verify compliance with spatial fishing restrictions, the California Groundfish Collective used eCatch and the Advisory Committee reserved the right to require subsequent audits of Vessel Monitoring Systems (VMS) data from suspected or violating vessels.

In 2014, during routine compliance monitoring, the California Groundfish Collective Manager observed a non-compliance event by a member new to the California Groundfish Collective. The fisherman mistakenly entered an area designated by the Collective as high risk ("no-go" zone) and conducted two tows targeting sanddabs (other flatfish), Petrale sole and lingcod. The incident was reviewed by the California Groundfish Collective Advisory Committee and due to data collected



during the review of the non-compliance event, no further action was taken. Following the incident, the fisherman's Association submitted a proposal to the California Groundfish Collective Advisory Committee requesting that the high risk zone be opened due to the importance of the area to his operation. The California Groundfish Collective Advisory Committee reviewed the proposal and voted to open a majority of the high risk zone by changing it to a medium risk zone, while retaining some areas as high risk.

## Collaborative Research

The California Groundfish Collective has partnered with TNC and others in a collaborative fisheries research project to gather data on the distribution of rebuilding species, their demographic patterns, and habitat associations that will provide key information to share with fishermen, managers and stock assessment scientists. In 2012 TNC and multiple partners<sup>4</sup> initiated a study to investigate the distribution of overfished species within the Rockfish Conservation Areas (RCAs) off the West Coast. The RCAs are depth-based closures intended to help with rebuilding efforts for overfished species populations and reduce bycatch. However, fishing opportunities, and the economic benefits associated with them, are constrained by this coast-wide closure in the groundfish fishery since the RCAs cover a large percentage of the continental shelf and upper slope habitats. Due to the limitations of annual trawl surveys to adequately sample these species in rocky habitats, there is limited understanding of the spatial distribution and abundance of overfished species within rocky habitats. Landings of many target species (e.g. Lingcod, Yellowtail Rockfish, and Chilipepper) are significantly lower than quota allocations due to efforts by fishermen to avoid encountering overfished species. The RCAs have been in place since 2002, yet to date there has been little research on the finer-scale distribution patterns of overfished species that could help fishermen target healthy populations while avoiding depleted ones.

In an effort to better understand of the demographics and distributional patterns of these overfished species within the RCA, the NOAA Biogeographic team developed coast-wide predictive distribution maps for seven overfished species and eight target species. To ground truth those predictive maps, a research team, which includes fishermen, conducted surveys along the central coast of California (between Point Conception and Half Moon Bay) using a stereo drop video camera, as well as directed fishing surveys using standardized hook and line (hydraulic snapper reel gear) through an Exempted Fishing Permit (EFP). Additional fisheries dependent and independent data sets along with local fishermen knowledge are also being used to help gain a better understanding of overfished species distribution and as a means to compare with the annual NOAA trawl survey data. The California Groundfish Collective dedicated overfished species quota pounds to the research effort in 2014 (refer to Table 7).

---

<sup>4</sup> Environmental Defense Fund (EDF), Moss Landing Marine Laboratories (MLML) / California Sea Grant, University of California at Santa Barbara, the National Marine Fisheries Service/Southwest Fisheries Science Center (NMFS/SWFSC Santa Cruz lab), the California Department of Fish and Wildlife, Marine Applied Research and Exploration (MARE), and local fishermen.



In 2012, the first year of the study, efforts focused on designing, building, and testing a stereo drop video camera system. This Video Lander system, which can be deployed to depths of 1,000 feet, is easier and cheaper to operate from than a remotely operated vehicle and collects data on size, density, and habitat associations of demersal fish. It has been used successfully to film and size over 60 species of fish, including Yelloweye Rockfish, Cowcod, Canary Rockfish, and many others.

In 2013 and 2014, under an Exempted Fishing Permit, visual and directed fishing surveys were conducted in 28 study plots in Central California. The visual surveys were designed to quantitatively assess target and overfished species in primarily rocky habitats where fishing occurred, while the directed fishing effort aimed to demonstrate whether hook and line fishing with this gear type could be conducted with minimal bycatch of the most constraining species in the same areas. The California Groundfish Collective provided quota of overfished species to support the research (Table 7).

**Table 7. Overfished species quota pounds dedicated to the Rockfish Conservation Area Exempted Fishing Permit Study and total catch in 2014.**

	<b>Dedicated QPs</b>	<b>Total Catch in 2014</b>
Bocaccio rockfish	1,000	279
Canary rockfish	500	37
Cowcod	200	23
Darkblotched rockfish	500	0
Yelloweye rockfish	34	23
	2,234	362

The research project is now complete and data will be analyzed through 2015 to produce a final report for the Pacific Fisheries Management Council. This research will provide new data on the abundance and distribution of both target and overfished stocks within the RCAs that will help support bycatch avoidance plans and inform stock assessments and spatial management planning efforts and decisions.

