

# **A Comparative Cost Study for the West Coast Groundfish Trawl Catch Share Program**

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## List of Acronyms

Acronyms	Meaning
ABC	Allowable Biological Catch
ACL	Annual Catch Limit
ADF&G	Alaska Department of Fish and Game
AFA	American Fisheries Act
BC	British Columbia
CQ	Code of Conduct Quota
CDQ	Community Development Quota
CE-EDC	Cost and Earnings Survey
CPI	Consumer Price Index
CV	Catcher Vessel
DAS	Days at Sea
DFO	Department of Fisheries and Oceans
EDC	Economic Data Collection
EDR	Economic Data Reports
EFP	Exempted Fishing Permit
EM	Electronic Monitoring
ESSR	Economics and Social Science Research
FMA	Fisheries Monitoring and Analysis
FOS	Fisheries Observation Science
FOS	Fisheries Operating System
FRSL	First Receivers Site License
FSD	Financial Services Division
GDA	Groundfish Development Authority
GDQ	Groundfish Development Quota
gf	Groundfish
GOM	Gulf of Maine
GRS	Groundfish Retention Standard
HBCL	Habitat Bycatch Conservation Limit
ISD	Information Services Division
ITQ	Individual Transferable Quota
IVQ	Individual Vessel Quota
LAPP	Limited Access Privilege Program
LE	Limited Entry
LLP	License Limitation Program

Acronyms	Meaning
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEFSC	Northeast Fisheries Science Center
NPFMC	North Pacific Fishery Management Council
NWFSC	Northwest Fisheries Science Center
OLE	Office of Law Enforcement
OMB	Office of Management and Budget
OMD	Operations and Management Division
OPB	Operations and Policy Branch
OY	Optimal Yield
PacFIN	Pacific Fisheries Information Network
PFMC	Pacific Fishery Management Council
PRA	Paperwork Reduction Act
PSC	Prohibited Species Catch
PSMFC	Pacific State Marine Fisheries Commission
QP	Quota Pounds
QS	Quota Share
QS-EDC	Quota Share Owners Survey
RAM	Restricted Access Management Division
RAO	Regional Administrator's Office
REFM	Resource Ecology and Fisheries Management
RIR	Regulatory Impact Review
RP	Rockfish Program
RPP	Rockfish Pilot Program
SFD	Sustainable Fisheries Division
SOC	U.S. Secretary of Commerce
SSB	Social Sciences Branch
USCG	United States Coast Guard
VMS	Vessel Monitoring System
VMS	Vessel Monitoring System
VTR	Vessel Trip Report
WCR	West Coast Region



## Executive Summary

The Pacific Fishery Management Council (PFMC) recommended that the United States Secretary of Commerce (SOC) implement a Limited Access Privilege Program (LAPP) for the West Coast trawl groundfish fishery. The SOC implemented that program for the start of the 2011 fishing year. Two primary objectives for the program were 1) to create a structure that allowed for better management, including improved catch accounting and incentives for the fleets to implement bycatch reduction measures, and 2) to implement a management structure to provide for economically sustainable fisheries, benefiting all stakeholders.

It is generally recognized that the LAPP has helped achieve many of the program's stated management and conservation objectives. Economic objectives including achieving optimal yield (OY) and creating economically sustainable fisheries that benefit all stakeholders remain a concern for some stakeholders. A primary concern is the costs of some program elements. To better understand these concerns, NOAA Fisheries provided funding to the PFMC to delve more deeply into the underlying issues. This project has three primary objectives.

1. Document industry concerns and identify costs related to specific program elements;
2. compare program costs that are identified as primary concerns to similar catch share programs; and
3. organize and present the information to inform future deliberations that could modify the program.

To document industry concerns, emails were sent to all trawl groundfish quota share (QS) permit holders listed in the 2022 NOAA Fisheries permit holder database. A total of 25 individuals responded and provided input. Because of the relatively low response rate, conclusions on impacts to entire sectors or fisheries cannot be drawn. Instead, the opinions of individual stakeholders are presented. In general, stakeholders were concerned about costs associated with costs recovery, data collection, fisheries monitoring, and quota leasing costs. Some stakeholders were also concerned with being unable to harvest their allocation. Representatives with mothership and shoreside whiting allocations expressed this concern. Stakeholders from California noted the lack of groundfish markets and physical dockside infrastructure. A summary of the stakeholder input is provided in Sections 3 and 8.1. Input varied from very specific recommendations that could be incorporated into the LAPP to recommendations that are outside the scope of the LAPP.

Agency costs, cost recovery costs, and monitoring costs were compared across all U.S. LAPPs and the British Columbia, Canada IVQ program, using data that were publicly available. Agency costs to directly manage the LAPPs were derived from annual cost recovery reports. In years/fisheries when the cost recovery fee was less than or equal to 3% of the gross ex-vessel value of allocated species that were landed, agency costs and cost recover fee estimates were the same. If agency costs were greater than 3% of gross ex-vessel value, the total agency costs associated with directly managing the LAPP were reported. When available, industry costs as reported to the Office of Management and Budget for the Paperwork Reduction Act were also included in the program elements summary table (see Section 5). Cooperative program direct management and enforcement costs were typically substantially less than the 3% cap. These fisheries tend to generate relatively high gross ex-vessel revenues and the cooperative structure reduces some of NOAA Fisheries management costs, by shifting some of the management burden to the cooperatives. IFQ programs generally had cost recovery fees that were close to or equal to 3% during some or all years. Two LAPPs (Individual Bluefin Quota program and South Atlantic wreckfish ITQ program) have not collected cost recovery fees to date. The Bluefin Quota program will only collect fees if they are greater than the cost of collecting the fees. NOAA Fisheries will annually determine whether to charge fees based on an evaluation of the incremental costs of administering the

program, the total ex-vessel value of bluefin landed by pelagic longline vessels, and the estimated costs associated with administering the cost recovery program. If the amount of fees that may be recovered is like or less than the cost of administering the cost recovery program, NOAA Fisheries will not assess fees that year. The South Atlantic wreckfish ITQ program cost recovery program is still in the process of being implemented and a final decision on the cost recovery structure is tentatively scheduled for September 2023. Northeast Sectors are not LAPPs and not subject to cost recovery. The Canada IVQ program collects fees through the annual sale of Trawl Licenses. The fee has a base rate plus an additional fee for each unit of quota assigned to the license. In 2009, the most recent year that data were available, the fee was over 3% of the gross ex-vessel value of the allocated species landed.

Costs associated with specific elements of the West Coast Groundfish Trawl Program are described in in Table E-1 and in Sections 5.0 and 9.5. Many of the LAPP elements do not appear to provide opportunities for amendments that would result in cost savings. For program elements that may provide cost savings, monitoring costs for the IFQ fishery are one of the primary concerns. Because the IFQ program is based on accounting for at-sea discards as well as retained catch at the vessel level, reducing the 100% monitoring requirement is challenging. Much work has already been expended on reducing those costs, including minimizing time required to review EM video to reduce the need for PSMFC to hire additional reviewers. Increasing labor costs will impact both EM video review and observer/monitor costs. Whether reduced coverage levels could be sufficient in low volume/value fisheries is feasible to manage the allocations would require additional research. This is an issue that is worth continually working on to ensure needed information is collected at a relatively low cost.

Table E-1 Program Elements that may Provide Opportunities for Cost Savings

Program Element	Opportunity for cost savings	Description	Purpose of Program Element
Time frame required to remedy overage >10%	Industry Yes: Agency: No	Sufficient QP or IBQ pounds must be transferred into the vessel account to cover the deficit (if <= 10% overage limit) within 30 days of NMFS' issuance of QP or IBQ pounds to QS accounts in the following year or the date the deficit is documented (whichever is later) but not later than the end of the post-season transfer period. If the overage is greater than 10%, the overage must be covered within 30 days of the end of the fishing trip.	This element provides program participants with some flexibility in covering harvest overages but limits the extent and duration of overages that are allowed. It provides vessels an incentive to not exceed their QP balances by more than 10%.
Prohibition on beginning a fishing trip in QP deficit	Industry Yes: Agency: No	Prohibit fishing if a negative QP balance for any species or species group. Enforcement of overage violations are a necessary part of any program.	Ensure that quota holders do not start a trip when they have not finished covering catch for a previous trip and thereby reducing the chances of an overage of the fleet's allocation.
Overage/ Underage provision	Industry No: Agency Yes	The provision allows permit holders to carryover up to 10% of their annual allocation before adjustments (both overages and underages) to the following fishing year	Provide flexibility to stakeholders. They may recoup some value of fish that were underharvested the previous year or not be subject to enforcement actions that result from relatively small harvest overages.
QS and IBQ control	Industry Yes: Agency No	QS control is defined at 50 CFR 660.140(d)(4)(iii) and provides a detailed discussion of all methods of control.	Defining control of QS/QP is often complex but necessary to ensure that limits are adhered to as required under the MSA.
Shoreside CV Monitoring (Catch: Discards and Landings/ Deliveries)	Industry Yes: Agency Yes	Shoreside CV: Requires 1 certified observer or EM	The duty of the observer is to estimate bycatch, collect biological samples, and monitor for fishery interactions with marine mammals, sea turtles, and seabirds. EM provides a video record of the hauls to allow video review of discard events and interactions with various species.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element
At-sea CV monitoring (discards)	Industry Yes: Agency Yes	At-sea CV: Requires 1 certified observer or EM	Ensure that estimates of fish discarded, should the cod-end be bled or dumped, are accurately recorded in logbooks.
First receiver monitoring (landed catch)	Industry Yes: Agency Yes	First receiver: Catch monitor available to monitor all catch share landings	Ensure accurate weights of all species landed are reported.
Mothership monitoring	Industry Yes: Agency Yes	Motherships: Requires 2 certified observers	Ensure that all catch transferred to the mothership can be observed. Similar duties as observers on shoreside CVs.
Catcher-processor	Industry Yes: Agency Yes	Catcher-processors: Requires 2 certified observers	The duty of the observer is to estimate bycatch, collect biological samples, and monitor for fishery interactions with marine mammals, sea turtles, and seabirds.
Relationship between EM and logbooks	Industry Yes: Agency Yes	Note that logbooks were required prior to the implementation of the catch share program and may not be considered a cost directly resulting from its implementation. Logbooks are not used to track catch (discards or landings) for the catch share program except for vessels that use EM in place of an observer. Under such circumstances, EM is used to verify catch (landings and discards) reported by catcher vessels in logbooks.	EM allows the use of cameras to record catch and at-sea discards in place of an at-sea observer. EM is generally considered to be less invasive on the crew and the video can be reviewed to verify the accuracy of information reported in logbooks.
Declarations when using a VMS. Note that VMS was required prior to the implementation of the catch share program and may not be considered a cost directly resulting from its implementation.	Industry Yes: Agency No	The vessel owner must install and use (according to NMFS OLE installation and operation instructions) an approved VMS transceiver unit 24 hours per day; establish a service agreement with a type-approved communication service provider; send an activation report at least 72 hours prior to leaving port on the first trip that requires VMS and maintain a valid declaration report with NMFS OLE. Declaration reports must be submitted before a vessel leaves port on the first trip in which the vessel is required to have VMS. A new declaration report must be submitted before leaving port on a trip in which a different gear type will be used. Limited entry (LE) trawl vessels fishing in the Shorebased IFQ Program must provide NMFS OLE with a new declaration report each time a different groundfish trawl gear (bottom or midwater only) is fished. The declaration may be made from sea and must be made to NMFS before a different type (bottom or midwater only) of groundfish gear is fished. LE midwater trawl vessels targeting Pacific whiting may change their declarations while at sea between the Pacific whiting shorebased IFQ sector and the mothership sector. The declaration must be made to NMFS before a different sector is fished.	Provides management and enforcement agencies with the ability to track the time, location, and speed of vessels. That information can be used to validate fishing locations and whether a vessel is fishing, moored, or steaming. That information is useful for managing areas that are closed to fishing or using certain types of gear.
Socio-economic data collection and research costs	Industry Yes: Agency Yes	Operators or catcher vessels, motherships, catcher-processors, and first receivers must annually complete and submit economic data collection surveys. These forms are periodically revised when it is determined that specific information does not provide value greater than the cost of collecting the information.	Socio-economic data collections allow managers, policy makers, scientists, stakeholders, and the general public to better understand the social and economic impacts of the catch share programs on harvesters, processors, communities, and the Nation.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element
Socio-economic data reporting tools	Industry Yes: Agency Yes	NMFS provides access to non-confidential summaries of survey data through reporting tools (FISHEyE) .	Provides a relatively easy way for stakeholders and the public to access non-confidential data collected through the various data collection instruments.
Cooperative reports	Industry Yes: Agency No	The mothership cooperative report requirements are listed at 50 CFR 660.113(c)(3) and the catcher-processor requirements at 50 CFR 660.113(d)(3). In general, the reports must include the cooperative's allocation, actual retained and discarded catch certain allocated species on a vessel-by-vessel basis, methods used by the cooperative to monitor performance, and a description of any actions taken by the cooperative against member vessels, and for the current year - the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements within the cooperative.	Annual reports from the MS and CP are required to help the Council determine if the program is functioning well or if there are areas of concern the Council may consider addressing.
Cost recovery fee	Industry Yes: Agency Yes	Section 303A(e) of the MSA requires that a Council (1) develop a methodology and the means to identify and assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and (2) provide, under section 304(d)(2), for a program of fees paid by limited access privilege holders that will cover the costs of management, data collection and analysis, and enforcement activities.	To allow agency to recover certain costs that are directly attributable to the catch share program. The regulations define who must pay the fee, how it will be collected, when it is due, and penalties for late fee payment.
Additional fees	Agency Yes: Industry No	The Council has the authority to recommend the collection of additional fees to cover certain costs in addition to those that are included under cost recovery (e.g., EM data review costs). These fees are not currently collected, but they could be as the Council continues to develop EM options or other aspects of the program. This issue was also discussed under the monitoring issues.	Define how certain fees that may be collected will be collected and the any penalties of not paying the fee or late fee payment.
MSA required program and allocation reviews	Agency Yes: Industry Yes	A LAPP Program Review is required every 7 years after the initial review under the MSA and NOAA's Fisheries Allocation Policy Directive 01-119 requires allocation reviews. A Program Review is typically a fairly detailed review of the LAPP. This Council committed to 6-year program reviews and tied its trawl/nontrawl allocation action (Amendment 21) to the catch share program, considering the allocation integral to it; and so, reviews those allocations in tandem with its trawl catch share review.	To provide the regularly scheduled, detailed review of the catch share program. The reviews update how well programs are meeting their stated objectives and whether any changes to the programs might be considered.
Change season dates	Industry Yes: Agency No	The Council has adjusted the primary Pacific whiting season start date for all sectors of the Pacific whiting fishery from May 15 to May 1.	To create efficiencies in the program when the benefits outweigh any negative impacts of changing the time of year, fishing is allowed.

Stakeholders provided various recommendations regarding how the fishery in general and the catch share program specifically may be improved. Some of those recommendations are summarized. Catcher-vessels delivering to motherships are monitored to determine if cod-ends are bled or dumped and the information

is accurately reported in the logbook. Because cod-ends are not brought aboard the catcher vessel it may be difficult for observers or EM to verify the exact quantity and species composition discarded at sea by these vessels to account for QP use. An additional review of the data could verify the extent of these practices and whether they warrant the monitoring cost, if the discarding activity would not change in the presence of less monitoring.

Consider the use of EM at shore-plants to verify plant discards and retained catch. As EM technology is developed it may be possible to deploy the technology into processing plants at a lower cost than exclusively using plant monitors.

Modifying the observer educational requirements by allowing catch monitors with high school educations to perform certain duties. This is unlikely to result in substantial cost savings because the difference in pay the two classes of monitors and observers would receive is small relative to the total daily but could help expand the available pool of applicants should observer shortages be realized in the future.

Declarations that must be provided as part of VMS could be reviewed to determine whether all of the reports a vessel operator must supply while at-sea are necessary. This is more an issue of ensuring the vessel is compliant with all the required reporting requirements than the actual cost of making the reports. If the vessel operator does not comply with reporting all changes in fishing operations that are required, they could face other fines or penalties

While outside the scope of this project, the West Coast observer programs could be reviewed to determine if there are any efficiencies associated with better integration of the groundfish program with the other observer/monitoring programs.

Economic data collection agency costs have been reduced over time (with 2020 being an outlier) as NOAA Fisheries has developed more efficient ways to collect and make available the information collected. The collection program is still a substantial response burden to industry in terms of time spent organizing, verifying, and providing the data, as well as NOAA Fisheries costs associated with that collection that are recoverable. NOAA Fisheries staff continuously works to decrease the cost of running the survey (see Table 4-9) and decrease the burden hours associated with participation in the survey (see OMB PRA revision and renewal notice—[FR Doc. 2023-07236](#)). A review of the data collection instruments could be undertaken to further explore whether all the variables and levels of detail requested are needed to understand the impacts of the program. Industry costs of collecting, organizing, and providing the data to NOAA Fisheries are not expected to be reduced as a result of agency cost savings efforts. Only cost savings associated with cost recovery fees would be realized, since the costs to stakeholders submitting the data would not change. A review of the data collection instruments could be undertaken to determine if the information collected provides the data needed to understand the impacts of the program.

The annual cooperative reporting requirements have already been modified to eliminate the preliminary report. Cooperative reporting requirements could be reviewed to ensure that they are not asking for information already being submitted through other sources. For example, catch and discard data as well as annual cooperative allocations may be readily available, as is the cooperative's plan to adequately monitor and account for the catch of Pacific whiting and non-whiting groundfish, and to monitor and account for the catch of prohibited species. Information that is not collected from other sources are the penalties that the cooperative imposed on members during the year. The permit application does require a description of the cooperative's enforcement and penalty provisions. Finally, if the scope of the report is reduced it may be possible to receive a verbal report from the cooperative managers instead of a written report.

Quota transfers are discussed in terms of covering overages, accumulation limits, and leasing costs. Cost savings may be possible if the rules for covering harvest overages of more than 10% of the initial

allocation were extended to more than 30-days. The added time could allow a person to acquire quota with better terms but would reduce the incentives to minimize overages of 10% or more. Excessive share limits are mandated under the MSA, and the Council is provided authority to recommend excessive share for each LAPP to the SOC. Changing the excessive share limits could benefit the stakeholders under certain conditions (e.g., mothership processing limits that were already eliminated), but given the current fishery conditions, no changes have been identified to reduce costs.

QP leasing costs were identified by stakeholders as an area of concern. While total leasing costs, in both mean expenditures and lease price per pound, have declined in recent years, those costs remain a substantial expenditure. For example, Connelly et al (2022) estimated that active vessel owners paid about 21.4% of their gross ex-vessel revenue in lease fees during 2019. Concerns expressed by individuals interviewed for this paper were focused on the high cost of leasing sablefish quota as well as inactive participants and non-profit entities being lessors of quota. The sablefish leasing issues are being partially addressed in the proposed gear switching amendment. Inactive QS holders and non-profit entities leasing quota is a complex issue that is probably best addressed through the program review or a focused amendment on that issue.

A bulleted summary of stakeholder input is provided for issues specific to the trawl catch share program. More detail from the discussions with industry is provided in Section 9.1. Those discussions included issues that were more focused on fixed gear fisheries and other issues not directly related to the catch share program.

- Observers cost about \$550 per day (mid-night to mid-night) in the non-whiting fishery and about \$600/day in the whiting fishery. Need to consider ways to reduce at-sea and shorebased observer costs, while meeting the objective of monitoring catch, especially in the non-whiting IFQ fisheries.
- Firms holding QP to the end of the year results in some harvesters needing to pay a high price for quota to cover bycatch. This benefits the firms that were able to acquire enough quota to have excess available at the end of the year, but harms firms that must obtain quota to cover overages. There is probably little that can be done to prevent that behavior outside of changing holding or use caps.
- Allow catcher vessels to lease whiting between the IFQ and mothership cooperative sectors to help achieve OY.
- Allow greater flexibility in the establishment of set-aside apportionments and their use.
- Too many people only lease out quota and do not fish. Consider regulatory changes to reduce the amount of quota leased-out by persons that do not harvest fish.
- Consider removing or loosening vessel caps so vessels can continue to fish with greater flexibility.
- Consider developing a program to allow the use of EM at plants to replace shoreplant observers.
- Supports the continued development of EM for whiting and development of EM for non-whiting fisheries, as an alternative to at-sea observers.
- Streamline activities with recoverable costs, such as social science research and EM video review, to only what is absolutely necessary to fulfill program mandates.
- Improve product quality by creating a provision to allow deductions for slime and ice when calculating QP use, to reduce the number of times fish must be deiced before processing.

## 1.0 PROJECT DESCRIPTION

The Pacific Fishery Management Council (PFMC or Council) recommended, and NOAA Fisheries implemented a Limited Access Privilege Program (LAPP) for the West Coast Groundfish trawl fishery. The program is often referred to as the West Coast Groundfish Trawl Fishery Catch Share Program. It was implemented for the start of the 2011 fishery. With minor modifications, the Shoreside IFQ, Mothership Cooperative, and Catcher-Processor Cooperative programs continue to be managed under that structure.

When the West Coast Groundfish Trawl Fishery Catch Share Program was being developed, the Council stated its rationale for selecting its preferred alternative from a suite of alternative management measures, including the status quo. The problem statement provided a foundation for considering changes to the status quo management structure. The status quo condition and projected beneficial and adverse impacts of the trawl rationalization alternatives were described in Chapter 2, Chapter 4 and the appendices of the Regulatory Impact Review (RIR) implementing its preferred alternative (PFMC, 2010). The benefits of the Council's preferred alternative were determined to outweigh the disadvantages when compared to the status quo.

Two broad objectives in the problem statement steered the decision-making process. The first was creating a structure that allowed for better management, including improved catch accounting and bycatch reduction measures. The second was to provide economically sustainable fisheries, benefiting all stakeholders. The stated goal of the program reflected this desired outcome:

*“Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.”*<sup>1</sup>

While the catch share program has achieved many of the program's stated objectives, stakeholders have expressed concerns with specific aspects of the program. Primary concerns are that costs of some elements of the program are higher than anticipated and increases in gross and net revenue have not met expectations in all sectors. To better understand these concerns, NOAA Fisheries provided funding to the PFMC to delve more deeply into the underlying issues, focusing on program costs in particular. This project has three primary objectives to help better understand those issues.

1. Document industry concerns and identify costs related to specific program elements;
2. Compare those program costs that are identified as primary concerns to similar catch share programs; and
3. Organize and present the information to inform future deliberations that could modify the program.

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<sup>1</sup> See p 50 of the Amendment 20 RIR (<https://www.pcouncil.org/documents/2010/06/groundfish-amendment-20-final--environmental-impact-statement.pdf>)

## 2.0 FISHERY BACKGROUND AND MANAGEMENT

Catch share programs have been implemented throughout the world as a management tool. The features of catch share programs are tailored to help achieve the fishery manager's stated objectives. In federal U.S. fisheries, some program features are mandated under Section 303A(c) of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA). The stated requirements for limited access privilege programs are listed below and include several features that were implemented as part of the West Coast Trawl Groundfish Catch Share Program.

Any limited access privilege program to harvest fish submitted by a Council or approved by the Secretary under this section shall—

- (A) if established in a fishery that is overfished or subject to a rebuilding plan, assist in its rebuilding;
- (B) if established in a fishery that is determined by the Secretary or the Council to have over-capacity, contribute to reducing capacity;
- (Federal C) promote—
  - (i) fishing safety;
  - (ii) fishery conservation and management; and
  - (iii) social and economic benefits;
- (D) prohibit any person other than a United States citizen, a corporation, partnership, or other entity established under the laws of the United States or any State, or a permanent resident alien, that meets the eligibility and participation requirements established in the program from acquiring a privilege to harvest fish, including any person that acquires a limited access privilege solely for the purpose of perfecting or realizing on a security interest in such privilege;
- (E) require that all fish harvested under a limited access privilege program be processed on vessels of the United States or on United States soil (including any territory of the United States);
- (F) specify the goals of the program;
- (G) include provisions for the regular monitoring and review by the Council and the Secretary of the operations of the program, including determining progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals, with a formal and detailed review 5 years after the implementation of the program and thereafter to coincide with scheduled Council review of the relevant fishery management plan (but no less frequently than once every 7 years);
- (H) include an effective system for enforcement, monitoring, and management of the program, including the use of observers or electronic monitoring systems;
- (I) include appeals process for administrative review of the Secretary's decisions regarding initial allocation of limited access privileges;
- (J) provide for the establishment by the Secretary, in consultation with appropriate Federal agencies, for an information collection and review process to provide any additional information needed to determine whether any illegal acts of anti-competition, anti-trust, price collusion, or price fixing have occurred among regional fishery associations or persons receiving limited access privileges under the program; and
- (K) provide for the revocation by the Secretary of limited access privileges held by any person found to have violated the antitrust laws of the United States.



Section 303A(f) of the MSA defines characteristics of LAPPs established after 2006. That section notes that permits will be “issued for a period of not more than 10 years that— will be renewed before the end of that period, unless it has been revoked....” Most catch share programs that have been developed in the U.S. have allowed the permits to be renewed after 10-years without the Council or NOAA Fisheries needing to take additional actions to renew the program, including the West Coast Groundfish Trawl Fishery Catch Share Program.

There are several examples of catch share programs that have been implemented to manage other fisheries in the U.S. Current U.S. catch share programs are presented in Figure 2-1. In addition to those programs, a trawl catch share program for the Bering Sea and Aleutian Islands Pacific cod trawl fishery has been approved by the North Pacific Fishery Management Council (NPFMC) and the Final Rule is being developed. After final review, the Secretary of Commerce will determine whether to approve or disapprove that proposed program.

## Current Catch Shares Programs

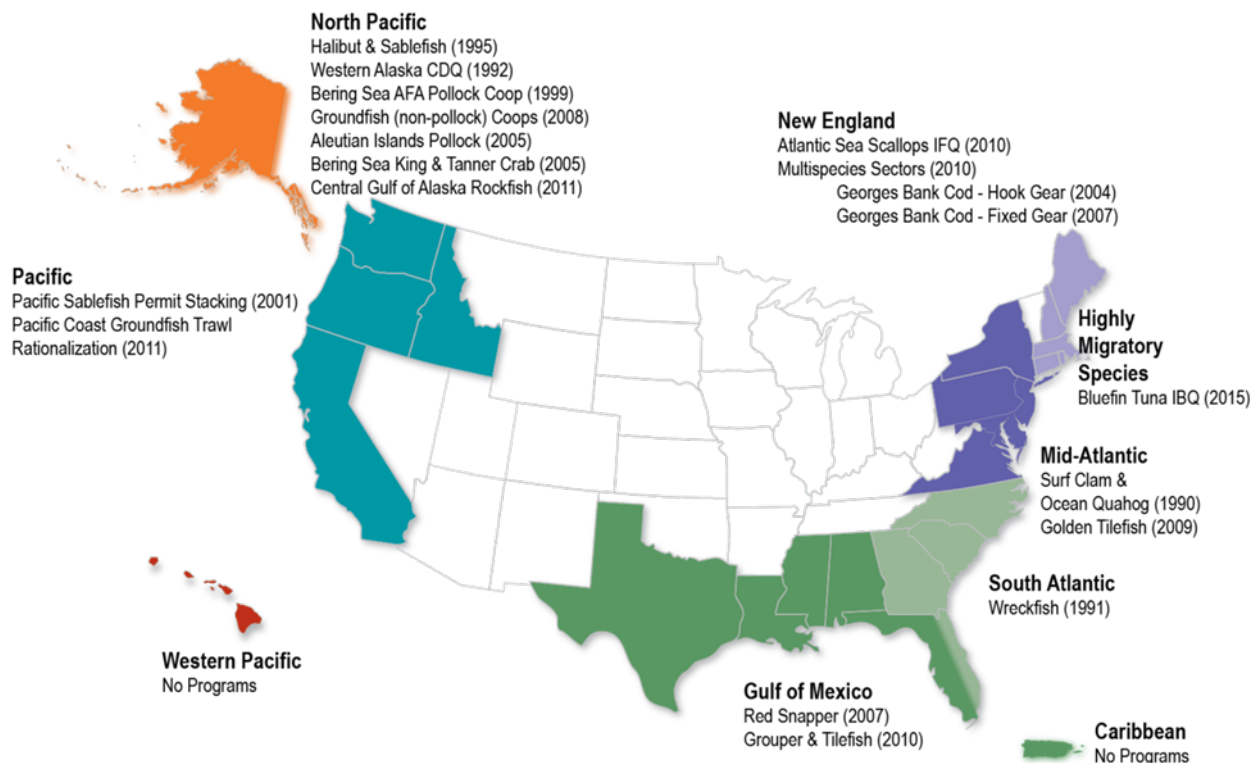


Figure 2-1 Catch share programs implemented in U.S. fisheries.

Source: <https://www.fisheries.noaa.gov/national/laws-and-policies/catch-shares>

For certain program elements considered in this paper (i.e., agency costs, cost recovery, and monitoring costs), all of the U.S. catch share programs will be considered. However, the paper will focus more on fisheries that were recommended by the Council and its advisory groups for comparison. These include the

- 1) New England Multispecies Sector program implemented in 2010, since it is also a U.S. multi-species trawl fishery. However, it is noted that NOAA Fisheries has determined that the Northeast Sector program does not meet the definition of Limited Access Privilege Program (LAPP).
- 2) The British Columbia (BC) groundfish program IBQ program, because it is also a multi-species trawl fishery. However, it is not subject to the same LAPP requirements defined in the MSA.
- 3) Trawl catch share programs in Alaska are also summarized, since they have many of the same participants as the West Coast whiting cooperatives and focus primarily on a single species.

## 2.1 West Coast Groundfish Trawl Catch Share Program Structure

When considering the structure of the catch share program, the Council developed its rationale for the various program components to meet its stated goals and objectives. Primary goals addressed in the Council's problem statement were the need to account for, control, and reduce bycatch, and the second was the need to provide for an economically sustainable fishery for the benefit of industry participants and fishery dependent communities. These were both reflected in the goals to "create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch." (PFMC 2010)

The status quo trawl fishery was viewed as economically unsustainable due to the number of participating vessels, excess capacity, a regulatory approach that constrained efficiency, and the management measures that were in place to protect fishery stocks that needed to be rebuilt. Because no management program is perfect, the Council had to determine whether the trawl rationalization program improved management relative to the status quo. For example, the Council debated whether the economic benefits expected from increased harvests and greater economic efficiency would offset the increased program costs. It also discussed whether the proposed program would foster improvements to ex-vessel and first wholesale markets for groundfish species allocated under the program. The majority of Council members concluded that while it may take time for current markets to expand and new markets develop, the potential for improving the economics of the fishery through trawl rationalization was substantial enough relative to the risks and uncertainties (PFMC, 2010). During its consideration and debate on the program,

*"Council members also noted that, due to cumulative limit management, the amount of one highly marketable fish species that had gone unharvested in a recent year was nearly enough to alone cover observer program costs, and reported discard rates and wastage were unacceptable. Given the under-harvest of available Optimum Yields (OY), the Council believed it was important to the fishermen and the public to provide an opportunity to achieve the OYs and develop markets for additional fish products. Furthermore, the program would provide the fishery an opportunity to increase profits, not just through harvest expansion, but also through a variety of mechanisms leading to cost reductions. For the non-whiting fishery, an economically healthy fishery would also be expected to result in some improvement in safety. For the whiting fishery, an end to the derby would create substantial safety improvements. In addition to the potential for safety and strong economic benefits, Council members noted the substantial conservation benefits expected from 100 percent monitoring of catch. This would help reduce bycatch and discards and rebuild stocks that are suffering partially because of discards." (PFMC, 2010. page 53)<sup>2</sup>.*

Given that a stated objective was to achieve OY, the percentage of IFQ species allocations that were harvested, and Pacific whiting for motherships and catcher-processors, are presented in Table 2-1. Whiting at-sea percentages are based on the catch of whiting taken in the directed whiting fishery as a

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<sup>2</sup> <https://www.pcouncil.org/documents/2010/06/groundfish-amendment-20-final-environmental-impact-statement.pdf>

percentage of the sector's whiting allocation. Percentages for the IFQ species were taken from the Gear Switching analysis<sup>3</sup>.

Pacific whiting catch in the catcher-processor sector has been harvested at a rate of 85% or more of its allocation most years. Shoreside Pacific whiting harvests were also 85% or more of the allocation for the majority of years considered. The mothership sector has not harvested more than 70% of their allocation in the past 5-years (2017 through 2021), with the lowest harvest percentages being 43% or less in 2020 and 2021. In general, the percentage of sole/flounder species harvested has shown a declining trend over the years the catch share program has been in place, but Petrale sole catches have typically been close to its allocation. Catches of canary rockfish were above its allocations in 2015, but the overage only occurred in that year and was due to IFQ carry-overs from the previous year. Rockfish species catch as a percentage of allocation have, in general, been relatively stable or increased. The percentage of flatfish and rockfish harvested are impacted by world whitefish market demand in addition to the management structure. Because of those interactions, it is difficult to parse out the impacts that result from management changes and the overall demand for those products.

Table 2-1 Percentage of trawl allocation harvested, 2011 through 2021

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
IFQ											
Arrowtooth flounder	20	26	63	50	52	47	12	9	7	6	10
Bocaccio rockfish S. of 40°10' N.	9	15	17	11	47	51	30	63	40	35	38
Canary rockfish	14	28	26	26	104	48	25	45	44	38	42
Chilipepper rockfish S. of 40°10' N.	21	22	36	29	16	6	6	16	27	37	43
Cowcod S. of 40°10' N.	1	5	22	20	26	21	27	30	35	25	11
Darkblotched rockfish	36	36	44	35	43	42	36	51	50	39	35
Dover sole	35	33	36	29	14	16	16	14	13	10	9
English sole	1	2	3	5	4	6	3	3	2	1	2
Lingcod	16	21	0	0	0	0	0	0	0	0	0
Lingcod N. of 40°10' N.	0	0	28	21	16	24	46	35	21	17	15
Lingcod S. of 40°10' N.	0	0	3	4	7	6	4	10	18	15	10
Longspine thornyheads N. of 34°27' N.	49	48	59	50	26	23	30	14	11	5	3
Minor shelf rockfish N. of 40°10' N.	3	8	6	7	3	3	21	24	40	45	48
Minor shelf rockfish S. of 40°10' N.	3	15	25	12	5	2	1	3	8	12	18
Minor slope rockfish N. of 40°10' N.	17	27	25	23	19	13	13	16	22	18	30
Minor slope rockfish S. of 40°10' N.	14	33	31	26	16	12	13	17	4	10	9
Other flatfish	17	16	19	20	11	14	10	10	8	9	10
Pacific cod	22	35	14	15	37	37	4	1	1	0	0
Pacific halibut (IBQ) N. of 40°10' N.	28	43	31	26	43	38	45	39	45	38	41
Pacific ocean perch N. of 40°10' N.	39	45	45	36	42	44	47	45	13	14	13
Pacific whiting (shoreside IFQ)	98	96	99	83	47	61	87	77	86	85	89
Petrale sole	93	100	92	97	98	95	100	101	98	87	76

<sup>3</sup> <https://www.pcouncil.org/documents/2023/06/h-2-attachment-3-electronic-only-analysis-to-inform-selection-of-initial-preliminary-preferred-alternative-for-sablefish-gear-switching.pdf/#page=9>

Species/Species Group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Sablefish N. of 36° N.	94	91	101	95	100	95	105	91	99	68	73
Sablefish S. of 36° N.	86	44	15	32	24	26	14	6	10	9	11
Shortspine thornyheads N. of 34°27' N.	50	50	60	50	45	48	48	42	36	24	27
Shortspine thornyheads S. of 34°27' N.	17	1	7	5	2	4	0	0	0	0	0
Splitnose rockfish S. of 40°10' N.	3	4	3	4	2	1	1	2	1	1	1
Starry flounder	2	1	0	2	1	2	1	0	0	0	0
Widow rockfish	40	45	41	66	57	59	52	97	94	89	80
Yelloweye rockfish	10	6	6	6	4	5	15	12	15	11	14
Yellowtail rockfish N. of 40°10' N.	24	32	27	40	32	26	58	76	74	84	66
Cooperative											
Pacific whiting (catcher-processor)	95	99	98	100	68	95	100	85	85	84	90
Pacific whiting (mothership)	94	98	93	85	39	81	69	69	54	41	43

A summary of some components of the program is discussed for each sector. For additional information please refer to Amendment 20 EA (PFMC, 2010), the program's five-year review document (PFMC and NOAA Fisheries, 2017), Section 5.0, and Section 9.5.

### 2.1.1 IFQ

A sector wide IFQ fishery was implemented for the shoreside component. When the program was implemented, it created trawl allocations for all species or species complex included under the program. Seven overfished species stocks were subject to rebuilding, so the OYs for these species were relatively low compared to target species OYs. The availability of quota for these stocks directly impacted the prosecution of the directed fisheries.

Management measures for non-whiting trawl fisheries that were in place prior to implementing the catch share program included two-month cumulative trip limit periods, gear restrictions to limit harvest of some overfished species, the use of trawl nets designed to reduce bycatch in certain areas, closed areas to protect overfished species, creation of essential fish habitat conservation areas to help protect bottom habitat. Some of the measures, like the two-month cumulative trip limits, were eliminated when the catch share program was implemented. Other measures, like closed areas and certain gear restrictions were initially maintained. The trawl catch share program also contributed to substantially reducing the trawl rockfish conservation areas ([Amendment 28](#) effective January 1, 2020) and liberalizing a number of trawl gear restrictions ([gear rule](#) effective January 1, 2019).

The catch share program included several different components to help ensure the Council's goals and objectives may be achieved. Some of the management measures include:

1. Comprehensive monitoring at-sea and shoreside requirements to ensure individual allocations were not exceeded;
2. Inseason quota tracking to allow quota transfers while having enforceable individual catch limits;
3. Annual allocations of quota pounds;

4. Carryover provisions that allow vessels that over or under harvest their quota by up to 10% to carry the overage or underage to the following year (for species for which the Annual Catch Limit (ACL) is less than the Allowable Biological Catch (ABC);
5. Adaptive Management that set-aside of 10% of quota shares to address future management issues (currently associated quota pounds (QP) are passed through to the quota share (QS) owners in proportion to the QS they own);
6. Reporting of economic, landings and discards, and other information as required;
7. Gear switching to allow the use of other gear types to harvest trawl quota; and
8. Allocation of some whiting QS to processors, to help balance market power between harvesters and processors.

Shoreside and mothership sector participants were initially allocated quota shares based on catch/processing history during the 1994 to 2003 time period and based on equal sharing of quota that might otherwise have been allocated to permits that were bought-back in 2003<sup>4</sup>. Harvesters were allocated all QS except the shoreside whiting apportionment where 20% of the QS was allocated to processors to help balance market power and compensate processors for stranded capital.

QS transfers were prohibited in the first years<sup>5</sup> of the program to help reduce transfers based on poor quota market information. QPs were fully transferable from the start of the program, since it was an annual transfer of pounds and not a permanent transfer of QS units. After the initial allocation and a cooling off period, eligible persons were allowed to buy and sell QS within limits established for the program. The program defined who could hold and use QS and QP and the amount they could hold and use. The MSA requires that LAPPs prevent the acquisition of an excessive share of the fishery, as defined in regulation.

As stated earlier, the MSA restricts the duration of a fishing privilege to 10 years and specifies conditions for automatic renewal. Allowing the limited entry permits to automatically renew unless they are revoked or modified allows the Council to focus its time and effort on other management issues rather than reauthorizing the program every 10 years.

QS for each stock represents a percent of the trawl allocation for that stock. Annually shares are converted from a percent to a quantity by issuing quota pounds (QPs) based on the trawl sector's share of the OYs/ACLs established for that fishing year. QP are assigned to the QS Account and then transferred to a vessel account for use. The amount of groundfish caught by a vessel fishing under the program, in most cases, even if it is subsequently discarded, is deducted from the vessel's QP<sup>6</sup>. For sablefish and lingcod (but not other species) QP accounts are credited for the discards that are expected to survive. The QPs that are used by discarding do not provide any direct economic value but allow the vessel operator to harvest other species in targeted complexes. Both QSs (in units) and QPs (in pounds) are divisible and tradable in one-pound increments.

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<sup>4</sup> As stated in the Final rule (70 FR 40225) on July 18, 2003, NOAA Fisheries invited reduction bids from the reduction fishery's permit holders. The bidding period opened on August 4, 2003, and closed on August 29, 2003.

<sup>5</sup> Initially, there was a two-year QS trading moratorium, but that period was extended first due to a lawsuit challenging the initial allocation and then to facilitate widow rockfish reallocation when that species became rebuilt.

<sup>6</sup> Requiring that discards be covered with QP (initially with no survival credit) was intended to maximize the disincentive for discarding. This avoids creating situations where a vessel might choose to discard all of a constraining species in order to earn discard survival credits and conserve QP for the purpose of landing more of other co-occurring species. More recently, discard survival credits have been provided for sablefish and lingcod, which are valuable species (species most vessels would likely want to retain) that have high survival rates.

Accumulation limits (QS control/QP vessel) were established to ensure that an entity does not acquire an excessive share of the fishery. The program does not contain a grandfather clause for persons initially allocated an amount of quota over the limit, so permit holders receiving QS or halibut IBQ in excess of the accumulation limits were required to divest their excess QSs or IBQ within an established period of time. Any QS or IBQ over the accumulation limit at the end of the period were to have been reallocated to other permit holders (as of November 8, 2008) that met registration criteria (by November 30, 2008) that were below the limit (76 FR 54911).

An Adaptive Management Program (AMP) was implemented for non-whiting species QSs. That program reserved 10% of the non-whiting QS to help achieve specific management measures in the future, if needed. AMP QPs were required to be passed through to QS holders in proportion to their holdings for the first two years of the program. That practice has continued through the current year.

The program's five-year review indicated that discards of six of the seven historically overfished rockfish species dropped at least 90 percent after implementation of Amendment 20. Bottom trawl gear accounted for 90 percent or more of the discards before 2011. With the implementation of the catch share program, total fishing mortality decreased for darkblotched rockfish, POP, and cowcod rockfish, largely due to the reduced discards. Widow rockfish discards did not decline as much because they are more pelagic than the other overfished rockfish species and are commonly caught using midwater trawl gear and as incidental catch in the directed whiting fishery (PFMC and NOAA Fisheries. 2017).

CVs are subject to 100% monitoring (at-sea observers or electronic monitoring [EM]) to ensure that catch and discards of catch are fully accounted and deducted as appropriate from the available QPs. Similar information for each haul is also reported in the vessel's log-books, which was a requirement in place before the catch share program was implemented. Similar, pre-catch share regulations required that vessels have operational VMS to provide information on a vessel's location, course, and speed. The speed of the vessel can also be used to help determine how a vessel is operating (fishing, running, etc.). A vessel cannot fish with a gear and monitoring type other than a gear type and monitoring type declared by the vessel or fish in a fishery other than the fishery most recently declared.

Shoreside processors taking IFQ deliveries are also subject to 100% monitoring coverage. The at-sea and shoreside monitoring provisions were implemented to ensure complete accounting of QPs that are caught, since at-sea monitoring (whether by observers or EM) focuses on discards rather than landings. Landings are counted at the first receiver.

Catcher vessels and first receivers are required to comply with annual economic data reporting requirements.

### **2.1.2 Mothership Cooperatives**

The mothership cooperative structure requires catcher vessels to declare which cooperative they will join before the beginning of the fishing year. Catcher vessel operators are obligated to deliver their catch to the associated mothership processor for that fishing season. In any subsequent year, catcher vessel operators could change their affiliation without first participating in the non-cooperative fishery. A provision for a non-cooperative fishery is included in the program structure. Any vessel not wishing to affiliate with a cooperative could participate in the non-cooperative fishery and deliver to any permitted mothership willing to accept its delivery.

The annual allocation of Pacific whiting quota among vessels (also known as catch history assignments) within the cooperative is decided by the members of each cooperative. Because of the cooperative allocation structure, it is impossible to track the accumulation of annually issued quota to a vessel in the way that QP vessel limits work in the IFQ program. A usage limit was implemented as an alternative approach. A catcher vessel may not catch more than 30% of the mothership sector's allocation (vessel QP

use). Initially, no individual or entity who owns a mothership permit could process more than 45% of the annual mothership sector allocation, but that limit has been removed. In addition to the usage limit, there are ownership limits (equivalent to the QS ownership limits in the shorebased sector). The mothership sector catcher vessel QS ownership limit was established so that no individual or entity may own catcher vessel permits that represent more than 20% of the sector's allocation.

Initially, in addition to the Pacific whiting quota, there were allocations (hard caps) of certain incidental catch species that were distributed to cooperatives in proportion to the whiting quota: widow rockfish, canary rockfish, darkblotched rockfish, and Pacific ocean perch. Beginning in with darkblotched rockfish and Pacific ocean perch in 2018, these species were instead managed with set-asides.

Motherships and the catcher vessels that deliver to them are both subject to 100% monitoring coverage under the catch share program. These requirements were in place prior to the catch share program for motherships but represent an increase (was about 14% to 24%) in coverage requirements for the CVs (Somers, 2017). Motherships must have two observers onboard, while CVs can use either one at-sea observer or EM to fulfill their monitoring requirements. Currently, almost all CVs are opting to use EM.

Motherships and catcher vessels are required to comply with reporting of economic data on an annual basis. Catch and discard information must be reported in log-books for each landing. Motherships and the catcher vessels delivering to them must have an operational vessel monitoring system (VMS) to track speed and location and comply with the VMS reporting requirements for that sector that were in place prior to the catch share program.

### **2.1.3 Catcher-processor Cooperative**

The catcher-processor sector operates as a single voluntary cooperative with all catcher-processor sector QP assigned to the cooperative. The cooperative members determine the proportion of the cooperative allocation each member may harvest. This includes both the initial allocation to members and any in-season transfers of quota between members. It is also the responsibility of the cooperative to ensure that the cooperative members do not catch more than their annual QP allocation. Because the cooperative is responsible for many of the in-season management measures, NOAA Fisheries has relatively limited management responsibilities.

Catcher-processors are subject to 100% observer coverage (two observers) to ensure that landings and discards are fully enumerated. These coverage rates were in place prior to the catch share program being implemented.

Catcher-processors are subject to completing the detailed annual economic data report. Reporting catch and discard information in log-books for each haul; and maintaining an operational VMS to provide speed and location information of the vessel is also required, as it was prior to catch share program implementation.

## **2.2 Northeast Sector Program**

Information in this section is derived from the NOAA website<sup>7</sup> and 50 CFR part 648. The Northeast Multispecies Fishery (groundfish fishery), is managed by the New England Fishery Management Council (NEFMC). The groundfish fishery is prosecuted by fixed and trawl gear vessels. Before 2010, the groundfish fishery was primarily managed using effort controls, including Days at Sea (DAS) and trip

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<sup>7</sup> <https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/sector-management-northeast-multispecies-fishery>

limits. Amendment 13 to the groundfish FMP (implemented May 2004) redefined initial allocations of DAS and allowed vessel operators to lease or transfer DAS within the limitations of the program. Amendment 13 also introduced the “Sector Allocation” program, which gave fishermen the opportunity to voluntarily form “sectors”, or groups of fishing vessels. Sectors were allotted a percentage of the total ACL for groundfish stocks based on the history of vessels that annually join the sector. Because the sector allocations were not associated with a permit that was “permanently” issued to individual fishermen, that guaranteed them an exclusive harvest privilege to an amount of available catch, it is not considered a LAPP as defined in the MSA. The allocation of quota eliminated the need to manage effort using DAS. Sectors could also request exemptions from many of the traditional input controls such as trip limits. The formation of sectors allowed Amendment 16 to the Northeast Multispecies FMP to be developed and implemented on May 1, 2010.

The Northeast multispecies (groundfish) complex consists of 13 species:

- Atlantic cod (*Gadus morhua*)
- Haddock (*Melanogrammus aeglefinus*)
- Yellowtail flounder (*Limanda ferruginea*)
- Pollock (*Pollachius virens*)
- American plaice (*Hippoglossoides platessoides*)
- Witch flounder (*Glyptocephalus cynoglossus*)
- White hake (*Urophycis tenuis*)
- Windowpane flounder (*Scophthalmus aquosus*)
- Winter flounder (*Pseudopleuronectes americanus*)
- Acadian redfish (*Sebastes fasciatus*)
- Atlantic halibut (*Hippoglossus hippoglossus*)
- Atlantic wolffish (*Anarhichas lupus*)
- Ocean pout (*Macrozoarces americanus*)

Groundfish are distributed throughout the Greater Atlantic region, from Cape Hatteras, North Carolina, to the U.S./Canada border. The majority of the groundfish that are landed in the Greater Atlantic Region are harvested in the Gulf of Maine (GOM) and on George’s Bank (GB). Fishermen primarily use bottom trawl, sink gillnet, and hook gear to target groundfish. Historically, many of the vessels that actively fish for groundfish have hailed from ports from New Jersey to Maine. Atlantic cod, haddock, and yellowtail flounder have traditionally been the highest-value groundfish species.

Table 2-2 shows the percentage of each species allocation that was harvested from 2009 through 2021. While comparisons are made to the pre-Sector allocations, the information should be used with caution, because the types of harvesters allowed to catch the TAC/ACL changed when the program was implemented. The highest valued species harvested are typically GB cod, whose harvest as a percentage of allocation has declined in recent years, with harvest the last three years being about 40%. That is less than the 64.9% harvested in 2009. It is also lower than the 2013 through 2017 period that ranged from 78.6% to 97.5%. GOM cod rates increased from 52.3% in 2009 to well over 80% most years. GB haddock percentages decreased and GOM haddock increase relative to 2009, but both are well below the harvest limit. Most yellowtail flounder fishery harvest rates have declined to less than 10% over the past three years, except for the CC/GOM stock that was 43.6% in 2021. That rate has declined from 2015



(85.1%) through 2020 (27.8%), with an increase to 43.6% in 2021. Note that because the fishing years are May through April, the final 2022 data were not available when this table was developed.

Table 2-2 Percentage of sector allocation harvested by species from 2009 through 2021 fishing years.

Species	2009*	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GB cod	64.9	83.2	76.4	35.2	86.7	78.6	91.6	97.5	84.4	71.1	35.0	40.5	44.8
GOM cod	52.3	83.6	92.5	60.3	90.1	80.5	90.3	96.1	96.2	86.6	80.3	83.1	88.1
GB Haddock	33.1	20.5	12.6	4.4	11.4	32.0	23.5	8.6	7.8	11.6	10.1	5.4	4.2
GOM Haddock	7.8	46.4	62.8	37.8	91.5	75.0	76.8	65.9	75.4	32.8	43.1	34.2	34.4
GB Yellowtail Flounder	60.2	92.0	88.1	59.1	36.6	24.9	19.3	9.7	19.4	14.9	3.2	7.0	1.4
SNE Yellowtail Flounder	63.1	64.9	90.1	70.1	57.8	67.7	37.9	26.3	6.0	20.0	6.9	7.5	1.7
CC/GOM Yellowtail Flounder	25.4	76.8	87.1	93.5	80.8	53.9	85.1	76.1	60.2	43.3	37.4	27.8	43.6
Plaice	44.6	54.7	53.7	49.7	99.8	95.3	98.9	96.5	89.4	68.6	58.2	20.7	26.5
Witch Flounder	81.5	84.1	82.0	68.8	106.7	86.0	87.8	97.1	67.8	97.9	91.6	70.0	66.2
GB Winter Flounder	86.5	75.8	96.5	57.3	49.1	34.2	46.4	72.2	61.4	57.9	41.3	57.7	50.7
GOM Winter Flounder	63.9	60.7	50.5	37.4	24.4	18.1	31.7	18.0	18.3	26.7	16.9	20.3	25.7
SNE Winter Flounder					62.4	46.1	50.9	75.8	72.2	50.2	30.4	20.5	26.3
Redfish	15.7	31.7	36.0	53.4	39.6	44.5	48.2	43.0	45.9	50.1	45.4	60.5	45.6
White Hake	77.7	88.4	102.3	75.1	53.4	41.0	37.1	42.9	60.7	77.2	75.8	91.2	96.8
Pollock	106.9	33.7	54.5	51.0	38.1	30.2	21.1	16.7	16.9	9.4	8.3	16.6	16.7

Source: [https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/h/groundfish\\_catch\\_accounting](https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/h/groundfish_catch_accounting) and <https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/mul.htm>

All vessels with a federal limited access Northeast multispecies permit are eligible to join a groundfish sector. A sector is defined as a group of three or more distinct persons holding limited access vessel permits, who have voluntarily entered into a contract and agreed to certain fishing restrictions for a specified period of time, and which has been granted a quota in order to achieve objectives consistent with the applicable fishery management plan goals and objectives. Vessel owners are not required to join a sector. This is an annual selection vessel owners make. Other members of a sector may approve or disapprove a vessel owner's application to join a sector.

Sectors in the Northeast multispecies fishery are intended to provide fishermen with more flexibility and more direct responsibility for managing the resource. On an annual basis, approved sectors receive quota for allocated groundfish stocks in the form of an annual catch entitlement. Each sector's annual catch entitlement is based on the cumulative contribution of each member vessel's fishing history.

Under the sector program vessels are exempted from trip limits with the exception of Atlantic halibut (1 fish per trip). Sector vessels are prohibited from possessing Atlantic wolffish, ocean pout, and windowpane flounder.

All groundfish catch, including landings and discards, by a sector vessel on a sector trip counts against a sector's annual catch entitlement for that stock. Sector vessels may not discard any legal-sized allocated stock, unless otherwise exempted.

The At-Sea Monitoring (ASM) program is specific to groundfish sector monitoring. At-sea monitors and observers have different, but similar roles. At-sea monitors are primarily tasked with recording all kept and discarded catch, with discard information as the priority. Their duties are similar to those of a fishery observer, with the exception that at-sea monitors do not collect biological samples and do not record the same level of detail on protected species interactions.

Monitoring regulations require sectors to contract with an approved third-party at-sea monitoring company to provide at-sea monitoring services to the sector. The Northeast Sector fishery at-sea observer cost is estimated to be \$700/day. That cost is currently paid through federal funding, so industry cost is \$0/day, and the coverage rate was about 40% in 2022, as discussed in Section 4.1.4. At-sea monitoring data is used to verify area fished and catch (landings and discards), by species and gear type, and monitor sector quota. Data are reported to the sector managers and to the NOAA Fisheries. EM may be used in place of observers or at-sea monitors if the technology is deemed sufficient for a specific trip, based on gear type and area fished.

A paper<sup>8</sup> developed in 2015 compared costs for at-sea monitoring and provided suggestions for cost savings. Some of the savings suggested in the paper included negotiating partial day costs when the observer/monitor is not on the vessel for a full 24 hours. Allowing an at-sea observer/monitor to stay on the same vessel for longer periods of time, reducing the costs of changing vessels and/or locations. It also discussed the requirements for observers and at-sea monitors. The primary difference being that at-sea observers were required to hold a bachelor's degree in a specified sciences program (unless waived by the Regional Administrator) and at-sea monitors had to have a high school diploma.

Prior to 2023, less than 100% EM or at-sea observation was required. ASM coverage levels were specified by NOAA Fisheries on an annual basis. NOAA Fisheries set the 2022 total target ASM coverage level at 40 percent of all groundfish sector trips subject to the ASM program. NOAA Fisheries' annual analysis was based on the level of coverage required to estimate discards for each Northeast multispecies stock with no greater than a 30-percent coefficient of variation. NOAA Fisheries calculated a minimum target coverage level of 33 percent of all groundfish sector trips to achieve that coefficient of variation. That estimate was based on Georges Bank yellowtail flounder<sup>9</sup>. In addition to the coefficient of variation analysis, the analyses of bias developed by the Groundfish Plan Development Team and the peer review by a sub-panel of the Council's Scientific and Statistical Committee in 2019 were also considered.

The NEFMC developed and NOAA Fisheries implemented Amendment 23 to the Northeast Multispecies (Groundfish) plan for the 2023 fishing year, modify monitoring requirements<sup>10</sup>. Amendment 23 replaced the process for calculating an annual ASM coverage target with a fixed monitoring coverage target as a percentage of trips but is dependent on Federal funding. Amendment 23 included the following provisions:

1. approved the use of EM as an alternative to human at-sea monitors,

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<sup>8</sup><https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5702ba09746fb96347976bc3/1459796490558/Appendix+5+-+Analysis+of+ASM+Costs.pdf>

<sup>9</sup>[https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports//Sectors/ASM/FY2021\\_Multispecies\\_Sector\\_ASM\\_Requirements\\_Summary.pdf](https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports//Sectors/ASM/FY2021_Multispecies_Sector_ASM_Requirements_Summary.pdf)

<sup>10</sup> <https://d23h0vhs26o6d.cloudfront.net/221206-GF-A23-Final-Rule-2022-26350.pdf>

2. excluded certain trips from all trip monitoring requirements in geographic areas with expected low groundfish catch,
3. required periodic evaluation of the monitoring program and exclusions from the monitoring requirement; and
4. removed the management uncertainty buffer from the portion of the ABC allocated to the sector catch share, if warranted, when the monitoring coverage target is 100%.

Amendment 23 is expected to have substantial socioeconomic impacts in years the fishery participants are required to pay for coverage, because monitoring coverage would be increased from about 40% to 100% in most trawl fisheries and the participants would not be reimbursed for the monitoring cost.

When Amendment 23 was being developed, industry argued that 100% monitoring is too burdensome. NOAA Fisheries has argued that 100% monitoring improves enforceability and reduces risk of non-compliance, which should improve the fairness and equitability of management measures. NOAA Fisheries also argued that better estimates would allow the removal of the uncertainty buffer, making more fish available to the sectors. Harvesters argued that removing the buffer would have little impact on revenue since they are currently unable to harvest their entire allocation.

In the short term, impacts of 100% monitoring coverage on human communities participating in the fishery could be reduced if federal reimbursements for monitoring costs and government subsidies continue to be available. The costs would then be borne by taxpayers. Impacts over the long-term will vary depending on whether federal reimbursements of monitoring costs will continue into the future. Allowing sectors to use tools like EM to reduce costs relative to human at-sea observers/monitors could reduce the cost burden. NOAA Fisheries may also allow waivers of monitoring requirements in certain fisheries (NEFMC, 2020).

Vessels are required to have an operational VMS unit installed if they participate in the groundfish sector program. VMS units must report a vessel's position at least once per hour, for 24 hours a day, 365 days per year, unless otherwise exempted. If a vessel holds other permits that require 30-minute vessel monitoring system reporting (e.g., a limited access Atlantic sea scallop permit), that vessel must report based on the most restrictive rate.

Sectors are allowed to carry over up to a maximum of 10% of their unused annual catch entitlement from one fishing year to the next for most allocated stocks. The amount of carryover allowed may be reduced as needed to comply with sector regulations and prevent overfishing.

An amendment to the sector program in 2014 created a mechanism allowing a sector to convert any of their eastern GB haddock allocation to a western GB haddock allocation at any time during the fishing year<sup>11</sup>; this mechanism does not permit conversion in the opposite direction. That provision added flexibility to harvest the GB haddock allocation while ensuring that the U.S. does not exceed its limit for eastern GB haddock. Framework 55 (NEFMC 2016) adopted a similar mechanism for sectors to convert their eastern GB cod allocation to western GB cod allocation.

Any portion of a sector's annual catch entitlement may be temporarily transferred to another sector at any time during the fishing year. There is a two-week reconciliation period. Annual catch entitlement transfer requests must be submitted to, and approved by, NOAA Fisheries. Transfer requests may be submitted online or using paper applications.

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<sup>11</sup> [https://s3.amazonaws.com/nefmc.org/Framework\\_Adjustment\\_51.pdf](https://s3.amazonaws.com/nefmc.org/Framework_Adjustment_51.pdf)

These GB haddock stocks are managed under a single ACL.

Under the sector system each member of a sector could be jointly charged with serious violations. All members can be liable for a violation even if one sector member was responsible for that violation.

Sectors are required to submit an operations plan and contract to NOAA Fisheries prior to the fishing year in which it intends to operate. Operations plans may span either a 1 or 2-year period and must include information about membership, planned fishing activity, and sector rules and enforcement provisions.

The sector program also includes various accountability measures that are triggered when a sector's harvest of a quota allocation is exceeded. Accountability measures are designed to correct problems that caused the quota limit to be exceeded, so future overages can be prevented and include prohibiting a sector from fishing in the stock area for that stock (until it has acquired additional quota from another sector), deducting overages from that sector's quota of each stock for the following fishing year, applying common pool or limits to another sector associated with the permits of the disbanded sector.

Sector vessels are exempt from certain regulations when fishing in the sector multispecies program. Vessels are exempt from trip limits on Northeast multispecies stocks for which a sector receives quota with limited exceptions, Gulf of Maine Cod Protection Closures IV (October) and V (March), certain Northeast multispecies DAS restrictions, certain minimum codend mesh size restrictions.

### **2.3 British Columbia Groundfish Program**

Until the late 1970s, there was little management of marine resources in the waters off British Columbia (BC). The groundfish fishery was open to domestic and foreign fleets, and by the mid-70s, stocks had started to decline (e.g., in 1974 halibut landings were just one-third of the averages in the 1960s). In response, managers began implementing a variety of conventional management measures including limited entry licensing, annual catch limits, fishery closures, and gear/vessel restrictions.

Fishing licenses were largely based on the vessels' target species. For example, fishermen targeting halibut were required to have a halibut license while fishermen targeting sablefish were required to have a sablefish license. Fishermen who did not hold the appropriate license were not permitted to land those species. In reality, fishermen were encountering multiple species and were required to discard large amounts of marketable species.

From 1980 to the early 1990s, the capacity and ability of the fleet to catch fish increased dramatically. In 1980, the commercial halibut fleet harvested 5.7 million pounds of halibut in 65 days; in 1990, fishermen harvested 8.5 million pounds in six days (Sporer, 2001)<sup>12</sup>. In every year from 1979 to 1990 (except 1980), the halibut catch limit was exceeded and a race for fish resulted in shorter seasons, unsafe fishing conditions, large quantities of discards, poor quality of fish and inconsistent supply of fresh fish (and corresponding low dockside prices).

The experience was similar in the sablefish and groundfish trawl fisheries. The groundfish trawl fishery was closed in 1995 due to severe overharvesting of the catch limit and the inability of managers to ensure compliance with catch limits (Sporer, 2001). The management system failed to ensure sustainability leading to depletion of fish stocks, and the economic viability of the fleets and communities that depended upon them was decreasing.

In response to the failures of conventional management, and often upon request of the fishermen, catch share programs were implemented in the sablefish, halibut and groundfish fisheries in 1990, 1991 and 1997, respectively. Both trawl and non-trawl gear types were included in the program. The halibut and sablefish programs were initially implemented as trial programs, but they were formalized shortly

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<sup>12</sup> [https://www.fao.org/3/y2684e/y2684e23.htm#P0\\_0](https://www.fao.org/3/y2684e/y2684e23.htm#P0_0)

thereafter, upon meeting identified conservation and economic goals (Sporer, 2001). In 2006, the remaining groundfish fleets were included in the program and all commercial fisherman targeting groundfish (including halibut and sablefish) were integrated into a single catch share program.

Conservation and protection of fish and fish habitat is the primary goal of Canada's fishery management. Additional goals include compliance with regulations, secure and stable access to fish stocks for fishermen, fairness to individuals and groups, promotion of historical participation, economic viability, best use of the fish for economics, social and cultural needs, and assuring public access.

To accommodate some of these goals, the trawl groundfish program included "hold-back" programs. Under these programs 80% of the total groundfish trawl shares were allocated to eligible participants and the remaining 20% is held by the government and the IVQ pounds from these quota shares are allocated annually based on recommendations by the Groundfish Development Authority (GDA). The GDA consists of representatives from communities, crew and shore-workers, processors, groundfish trawl license holders, First Nations, and a non-licensed individual. The GDA oversees Groundfish Development Quota (GDQ) and Code of Conduct Quota (CCQ), each equaling 10% of total shares. These shares are allocated annually based on certain criteria, including treatment of crew and co-applications by processors and harvesters (Sporer, 2001).

Quota is divisible into one-pound increments, but a vessel must have a valid trawl license<sup>13</sup> (T license) to hold groundfish quota or harvest groundfish trawl TACs. Initially, there were 142 licenses issued that allow a vessel to participate in the IVQ program that allocates about 60 different fish species. Only about 40 of the licenses are actively being fished on vessels. The fleet ranges in size from 35 feet to 180 feet in length. The larger vessels are freezer trawlers. The six active freezer trawlers<sup>14</sup> may only process their own catch (prohibited from acting as a mothership for catcher vessels) and are limited to processing specific product types<sup>15</sup>. They can head, gut and tail fish but are not allowed to produce fillets. Vessels may fish with either mid-water or bottom trawl gear. Freezer trawlers primarily target hake, pollock and arrowtooth flounder. Rockfish<sup>16</sup> and other allocated species are taken as incidental catch in those directed fisheries. Catcher vessels (wet boats) also fish with bottom and mid-water gear and target rockfish, hake, pollock, flatfish and lingcod. Other allocated species (skate, sablefish, dogfish) and non-allocated species (ratfish, various soles and non-quota rockfish) are typically taken as incidental catch in the directed fisheries.

Each year a groundfish trawl vessel owner/license eligibility holder may choose to fish under the conditions of one of two options (A or B) for the current fishing year. A general description of the permitted activities under each option are:

#### Option A

- i) Permitted to fish with bottom trawl gear in all areas, except management Area 4B (Fisheries Management Areas 12 to 20 and 29) open to bottom trawling.
- ii) Permitted to fish by mid-water trawl coast-wide.
- iii) Subject to 100% dockside monitoring for all landings.

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<sup>13</sup> Information on licensed vessels is available online at the DFO website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/licencepermis/index-eng.htm>.

<sup>14</sup> A seventh freezer trawler has not been active for the past four years.

<sup>15</sup> Round, H&G, and HGT. One vessel also has a reduction plant on board and produces oil and fishmeal from the offal.

<sup>16</sup> There is a 100% retention requirement for rockfish catch.

- iv) Subject to 100% at-sea monitoring coverage (at-sea observers or EM) when fishing with bottom or mid-water gear.
- v) Permitted to fish throughout the year for groundfish species subject to TAC up to the amount of the IVQ specified on the license.
- vi) Permitted to reallocate IVQ holdings subject to the rules governing such reallocations.
- vii) Limited to 15,000 pounds per trip for all combined rockfish species not subject to TAC.
- viii) Permitted to retain incidentally caught mackerel equal to 6% of the offshore pacific hake IVQ portion of quota holdings.
- ix) No trip limit for groundfish species (excluding rockfish) not subject to a TAC.
- x) Not permitted to fish for and retain Eulachon, wolf eels, any salmon species unless authorized by a scientific license, Pacific Herring, Green Sturgeon, White Sturgeon, Pacific Basking Shark, Tope (Soupfin) Shark or Bluntnose Sixgill Shark.
- xi) Halibut is not permitted to be retained. Bycatch mortality caps for Halibut are issued on an individual vessel basis. License holders are responsible and accountable for all Halibut mortality incurred.
- xii) Corals and Sponges are not permitted to be retained unless specifically authorized by Fisheries and Oceans Canada.
- xiii) A fleetwide Habitat Bycatch Conservation Limit (HBCL) for Corals and Sponges has been set and allocated as IVQ to individual groundfish trawl vessels. The HBCL IVQ is transferable among groundfish trawl license holders within annual caps. Groundfish trawl license holders will be responsible and accountable for all coral and sponge mortality incurred.

#### Option B

- i) Required to request monthly amendments to groundfish trawl license prior to fishing.
- ii) Permitted to fish by bottom trawl in Area 4B (Areas 12 to 20 and 29) only.
- iii) Not permitted to fish by mid-water trawl in any Area.
- iv) Limited to a maximum of 15 landings per calendar month.
- v) Subject to 100% dockside monitoring for all landings.
- vi) Subject to mandatory at-sea monitoring of all fishing activities.
- vii) A 15,000-pound calendar month limit for all groundfish species combined other than dogfish, lingcod and rockfish; of which no more than 200 pounds may be Sablefish, and no more than 200 pounds may be Petrale sole, and no more than 500 pounds may be Pacific Cod.
- viii) It is not permitted to fish for and retain Eulachon, Halibut, Lingcod, any rockfish, squid, octopus, wolf eels, any salmon species, Pacific Herring, Green Sturgeon, White Sturgeon, Pacific Basking Shark, Tope (Soupfin) Shark or Bluntnose Sixgill Shark.
- ix) No limit on the quantity of Dogfish.

IVQ is fully transferable, but species caps limit the amount of each species that may be harvested on a vessel. Species caps are structured as hard and soft caps. Hard caps limit the amount of a species' IVQ that may be permanently held on a vessel. Species soft caps limit the amount of IVQ that may be

temporarily put on a vessel within the fishing year. Soft caps may be increased during the year based on vessels being capped out, market conditions, consumer demand, species availability, time left in the year, to allow for carryover, etc. Vessels are also subject to a Total Holdings Cap, limiting the total amount of IVQ (measured as groundfish equivalents) a vessel can hold. The vessel Total Holdings Cap is calculated by converting each IVQ species into a “common currency” with Pacific Ocean Perch set as the benchmark (1.0) and all other species are based off that equivalent<sup>17</sup> (Fisheries and Oceans Canada, 2022). Quota trades are common, primarily for soft cap species, with up to 8,000 trades per year. Trades often use quota as the currency, but money transfers also occur.

Compliance monitoring is paid for by industry using a third-party service provider (Archipelago). All vessels and processors/buyers are subject to 100% coverage (at-sea monitoring and dockside monitoring). Individual vessel accountability is for all catch (both retained and released). Dockside observers monitor the offload, sorting, and weighing of each species. Only retained catch delivered to the plants is monitored by dockside observers, since they have no access to discarded catch that was not retained. At-sea monitoring was 100% coverage (one observer on each boat) prior to Covid-19 measures being implemented on April 3, 2020. At-sea observers reviewed catch that was retained and catch that was discarded to help determine total catch. A data management system is paid for by industry using electronic logbooks for dockside and at-sea (both for the observer and fisherman).

For the 2022/23 fishing season, when an independent at-sea observer is not deployed to a vessel hailed out on an Option A vessel trip, 100% at-sea monitoring is achieved through the use of an EM system as part of the EM Program for trawl vessels. Vessel masters are required to keep an accurate and complete record of all fishing activity carried out under authority of the license in a DFO-approved Groundfish Trawl Log-Book (“fishing log”) and At-Sea Log-Book (“at-sea log”). Where an EM system is in use on a vessel, the accuracy of the at-sea log will be audited via a comparison against the EM data (“audit”). The shoreside data is only for retained catch by species. It does not include information on the area of catch or non-retained catch. At-sea data includes total catch estimates by species and stock area. The catch data is added into the DFO Fisheries Operating System (FOS) along with other information such as hail-in and hail-out reports. Observers record tow locations and when gear was deployed (doors went into the water) and retrieved (break release) using GPS information. VMS is not required on vessels.

Because of Covid-19, DFO stopped requiring that observers be deployed in all fisheries on April 3, 2020, and implemented EM requirements on April 10, 2020, based on a pilot EM program that had been developed by industry during the previous two years. EM requires three cameras on deck for all vessels (Freezer and wet boats) and an additional five cameras below deck for freezer trawlers to monitor all activity on the vessel, estimate total catch and catch disposition by species. Fish size limits can be verified to determine if they are legal by using measurement grids located above and below deck at all points where fish may be released, put into the hold, removed from the holding tanks, or sorted. The EM system has GPS capabilities. GPS is turned on when the vessel leaves the port until they return to port. GPS provides a complete track of the vessel. It also has hydraulic sensors that mark when fishing is occurring. EM is reviewed after every trip by the service provider at a defined rate. For wet boats, a minimum of 10% of tows are reviewed unless discrepancies with the logbook are found. Depending on the severity of the differences the vessel could be subject to increased review requirements (up to 100% of tows) as well as other penalties. Freezer trawlers have a minimum of 25% of their tows reviewed for compliance and verification against the logbook. Additional review (up to 100% of tows) and other penalties can be required if the logbooks do not match EM information. 100% of the trip sensor data (cruise track, number

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<sup>17</sup> See Appendix 8, p. 67

of tows, start and end points of tows, tow locations) is reviewed for the trips for both wet boats and freezer trawlers. Occurrence reports are sent to DFO for enforcement and are funded by industry.

All vessels in the BC groundfish fishery now use EM for at-sea monitoring. Recent information on total monitoring costs is not available to the analyst. See Section 4.3 for additional information. Information that is available indicated that the aggregate monitoring costs for groundfish fisheries was around 5% of the fishery value every year (McElderry, 2008b), but implementation of EM has likely reduced costs. The daily cost of EM was reported to be approximately \$154 Canadian dollars (U.S. \$146) versus \$558 Canadian dollars (U.S. \$527) for onboard observers (McElderry, 2008b).

## **2.4 Alaska Trawl Catch Share Fisheries**

This section briefly describes the catch share fisheries in Alaska where trawl is a legal type to harvest quota. Catch share programs where pot (crab and sablefish) or longline gear (halibut and sablefish)<sup>18</sup> are used are not included in the discussion, since the cost structure and prosecution of those fisheries are different than trawl fisheries.

### **2.4.1 Central Gulf of Alaska Rockfish Program**

The Central Gulf of Alaska rockfish fishery was traditionally prosecuted in July and was an important, but relatively small component, of the participating vessels annual fishing cycle. The trawl opening was generally timed to coincide with the availability of the third quarter halibut Prohibited Species Catch<sup>19</sup> (PSC) allocation, accommodate the sablefish longline survey that occurred later in the summer, and typically coincided with the openings of the Aleutian Islands Pacific ocean perch and Bering Sea flathead sole fisheries to distribute effort among the fisheries.

Congress directed the NPFMC to implement a catch share program for the Central Gulf rockfish fishery, so the NPFMC developed the Rockfish Pilot Program (RPP). The RPP was based on the guidelines described in the Consolidated Appropriations Act of 2004 to improve resource conservation and improve economic efficiency by establishing cooperatives that receive exclusive harvest privileges. Four goals of the program were to 1) reduce bycatch and discards; 2) encourage conservation-minded practices; 3) improve product quality and value; and 4) provide stability to the processing labor force.

The RPP allowed catcher-processors to form their own cooperatives. Catcher vessels were allowed to form cooperatives in association with shoreside processors located in Kodiak, Alaska. Catcher vessel cooperative contracts defined the requirements for deliveries to the associated cooperative processor. It was assumed when the program was being developed that these contracts would require member catcher vessels to deliver to the associated processor except under conditions agreed to by both parties and that is how the contracts were developed. The cooperative agreements allowed shoreside processors and their associated catcher vessels to better time deliveries of rockfish and directed salmon harvests during the summer months.

The RPP allocated harvest privileges to holders of License Limitation Program (LLP) groundfish licenses with a history of legal Central Gulf of Alaska rockfish landings during the period defined in Section 802 of the Consolidated Appropriations Act. Table 1 of the proposed rule (71 FR 33043) defines the specific dates for each year that define the qualifying landings. Once RPP Quota Shares (QS) were assigned to a

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<sup>18</sup> The industry organized freezer longline Pacific cod fishery that is a self-managed cooperative is also excluded.

<sup>19</sup> PSC species include salmon, halibut, and crab that cannot be retained when harvested incidentally in directed groundfish fisheries.



specific LLP license they could not be divided or transferred separately from that LLP license. The LLP holder was allowed to assign the license and associated QS for use in a rockfish cooperative, limited access fishery, or opt-out fishery. After the LLP license holder assigned the LLP license to a cooperative and the cooperative application was submitted to NOAA Fisheries, NOAA Fisheries would allocate each cooperative an amount of cooperative quota (CQ) that was generated by the QS assigned to the cooperative.

The Rockfish Program (RP) replaced the RPP and was authorized for 10 years from January 1, 2012, until December 31, 2021 (76 FR 81247). The RP changed the qualification years and made relatively minor changes to the RPP (NPFMC 2011).

Catcher vessels, when participating in the RP, are subject to 100% at-sea observer coverage. Catcher-processors are subject to 200% at-sea observer coverage (two observers). All catcher processors are also participants in the Amendment 80 (A80) catch share program, so they are subject to 200% coverage in all their fisheries, not just the RP. Vessels in the RP may not use EM in place of the at-sea observers. While the NPFMC is considering EM for multi-species trawl fisheries and using the RP as a pilot program, it is still in the developmental stages<sup>20</sup>.

One case where limited entry permits expired, unless they were renewed after 10 years, was in the Central Gulf of Alaska Rockfish Program. Renewing those permits was a 2-year analytical project that took substantial Council and industry time. Certain costs associated with the renewal project were subject to cost recovery. Primarily, slight changes to regulations were associated with reimplementation of the program and development of the proposed and final rule. However, the majority of the costs were borne by the NPFMC for staff to develop the regulatory documents and hold public meetings. These costs were not included as part of cost recovery. NOAA Fisheries incurred costs that were not included as part of cost recovery. Industry also incurred costs to attend the Council meetings, hold industry meetings, and provide written and oral testimony to the NPFMC. Because the West Coast catch share program was allowed to automatically renew after 10 years these costs were not incurred. In 2021, the NPFMC renewed the program with no expiration date. It also made minor changes to the RP. The changes are described in detail in the analytical document supporting the reauthorization (NPFMC 2020).

#### **2.4.2 American Fisheries Act Pollock Fishery**

The American Fisheries Act was signed into law in October 1998. The purpose of the AFA was to tighten U.S. ownership standards that had been exploited under the Anti-reflagging Act, and to provide the Bering Sea and Aleutian Islands (BSAI) pollock fleet the opportunity to conduct their fishery in a more rational manner while protecting non-AFA participants in the other fisheries. The AFA established sector allocations in the BSAI pollock fishery, determined eligible vessels and processors, allowed the formation of cooperatives, set limits on the participation of AFA vessels in other fisheries, and imposed special catch weighing and monitoring requirements on AFA vessels.

The Bering Sea pollock fishery has been operating under cooperative a structure since 1999 for catcher-processors and 2000 for catcher vessels and motherships. In 2005, Amendment 82 the BSAI FMP, established a framework for the management of the Aleutian Islands (AI) subarea directed pollock fishery<sup>21</sup>. This action was mandated under provisions of the Consolidated Appropriations Act of 2004 that require the AI directed pollock fishery to be allocated to the Aleut Corporation for the purpose of

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<sup>20</sup> [https://meetings.npfmc.org/CommentReview/DownloadFile?p=fe63bd61-9b73-4b74-8586-39fa83ca0adc.pdf&fileName=CGOA%20Rockfish%20EM%20Presentation%20for%20TEMC\\_FINAL\\_Jan2023.pdf](https://meetings.npfmc.org/CommentReview/DownloadFile?p=fe63bd61-9b73-4b74-8586-39fa83ca0adc.pdf&fileName=CGOA%20Rockfish%20EM%20Presentation%20for%20TEMC_FINAL_Jan2023.pdf)

<sup>21</sup> <https://www.federalregister.gov/d/05-3788/p-1>

economic development in Adak, Alaska. The Aleut Corporation has had limited success utilizing the pollock allocation due to a variety of reasons and it is typically reallocated to the BS cooperatives.

Catcher vessels in the shoreside component of the BSAI pollock fishery are required to carry an observer or use EM. EM has been operating under an Exempted Fishing Permit (EFP) through 2023. It is anticipated that regulatory changes will be in place to allow the use of EM on catcher vessels in the pollock fishery. When the NPFMC was considering allowing the use of EM in the pollock fisheries, its staff estimated the costs of observer coverage versus EM. The findings are summarized here and in Table 2-3 and Table 2-4. The trawl catcher vessel operators that participate in the BS pollock shoreside fishery have been required to pay for 100% observer coverage since 2009. The daily at-sea observer rate for the full coverage fleet was estimated to range from \$378/day to \$417/day. Based on the estimate of 5,070 observer days that would have been deployed on EM trips in 2021, the lower cost per day estimate is about \$1.92 million in at-sea observer costs and the higher cost per day yields about \$2.91 million in at-sea observer costs. For BS plants receiving deliveries of pollock, the daily rates for full coverage were estimated to range from \$380/day to \$430/day. The estimated number of plant observer days in 2021 was 1,599. Based on the number of observer days at these plants, the estimated cost ranged from \$608k to \$688k. EM was estimated to cost \$392k excluding the one-time equipment purchases. These costs were excluded because most vessels already had that equipment and there was grant funding available to cover the costs for vessel operators that did not have the equipment. In summary, the full-coverage pollock fleet was estimated to save between \$1.2 million (\$1.916 million at-sea observers + \$ 0.304 million plant observers without EM - \$0.608 million plant observers with EM - \$0.392 million EM costs) and \$2.2 million (using the same formula shown above at the higher cost rate) annually by using EM.

Gulf of Alaska pollock catcher vessels and their processing partners each contribute half of the fee, but it is collected from the processor. The partial coverage fee is currently set at 1.65% of their ex-vessel revenue and covers their monitoring costs. The average annual cost per sea day in the partial coverage fisheries have ranged between \$895 and \$1,393 since 2014. The cost savings in the partial coverage category were estimated to be small using EM. Because the partial coverage sector pays for coverage through the 1.65% ex-vessel fee, any cost savings that may result from increased use of EM could be used to increase coverage levels in non-catch share groundfish fisheries and in the halibut/sablefish IFQ program.

Table 2-3 Estimated costs of Status Quo Vessel Observers (for effort associated with 2021 trawl EM EFP)

Description	Area	Low Estimate	High Estimate
Partial coverage at-sea Observer Cost	GOA	\$357,000	\$570,000
Full coverage at-sea observer cost	BS	\$1,916,000	\$2,914,000
Full coverage shoreside monitoring cost	BS	\$304,000	\$344,000
Total	BS and GOA	\$2,577,000	\$3,828,000

Table 2-4 Estimated costs of Trawl EM (for 2021 EFP level of effort, scope, scale)

Description	Area	Low Estimate	High Estimate
Ongoing EM costs (does not include one-time equipment costs)	BS and GOA	\$392,000	\$392,000
Partial coverage shoreside monitoring cost	GOA	\$274,000	\$575,000
Full coverage shoreside monitoring cost	BS	\$608,000	\$688,000
Total	BS and GOA	\$1,274,000	\$1,655,000

### 2.4.3 Amendment 80

Amendment 80 to the BSAI FMP established a cooperative based catch share program for non-AFA trawl catcher-processors. The NPFMC adopted BSAI Amendment 80 to meet the broad goals of: (1) improving retention and utilization of fishery resources by the non-AFA trawl catcher-processor fleet by extending the groundfish retention standard (GRS) to non-AFA trawl catcher-processor vessels of all lengths; (2) allocating fishery resources among BSAI trawl harvesters in consideration of historic and present harvest patterns and future harvest needs; (3) authorizing the allocation of groundfish species to harvesting cooperatives and establishing a limited access privilege program for the non-AFA trawl catcher-processors to reduce potential GRS compliance costs, encourage fishing practices with lower discard rates, and improve the opportunity for increasing the value of harvested species; and (4) limiting the ability of non-AFA trawl catcher-processors to expand their harvesting capacity into other fisheries.

Amendment 80 catcher-processors are allocated Atka mackerel, flathead sole, Pacific cod, Pacific ocean perch, rock sole, and yellowfin sole. Prohibited species catch (PSC) limits are also established that limit mortality of PSC species (i.e., halibut, salmon, and crab). Catch of other groundfish species are limited through maximum retainable amounts and retention requirements.

## 3.0 STAKEHOLDER INPUT

Stakeholders were invited to provide their perspectives on the West Coast Trawl Groundfish catch share programs and suggest potential program changes that could result in cost savings. All Limited Entry Permit (LEP) holders and First Receiver License holders were initially notified of the project by email and were given the opportunity to provide any input related to the project they felt appropriate. A total of 120 emails were sent out to permit and license holders notifying them of the project and providing contact information if they wished to participate in the study. A person that held multiple permits was only sent one email. An email was sent to each plant location for the first receivers. One large processing firm had all their facility managers provide comments to a company representative who aggregated the comments and provided them to the author. In total, 21 individuals responded to the initial request for input. They represent catcher vessel owners/operators from California (4), Oregon (5), and Washington (5). Some of the vessel operators only fished non-whiting species with trawl or pot gear. Others fished non-whiting and whiting. Whiting catcher vessel operators either delivered shoreside to motherships or both. The first receivers were located in California (2), Oregon (4), and Washington (1). After the initial round of stakeholder input, the Council requested that additional stakeholders be contacted. That outreach resulted in four additional stakeholders providing input. Two representatives of the catcher-processor sector and one other stakeholder.

A summary of stakeholder input is provided in this section. The information is a bulleted list of the concerns and recommendations provided by industry. More detail from the discussions with industry is provided in Section 9.1.

#### *Catch Share Program Issues*

- Observers cost about \$550 per day (mid-night to mid-night) in the non-whiting fishery and about \$600/day in the whiting fishery. Need to consider ways to reduce at-sea and shorebased observer costs, while meeting the objective of monitoring catch, especially in the non-whiting IFQ fisheries.
- Firms holding QP to the end of the year results in some harvesters needing to pay a high price for quota to cover bycatch. This benefits the firms that were able to acquire enough quota to have excess available at the end of the year, but harms firms that must obtain quota to cover overages. There is probably little that can be done to prevent that behavior outside of changing holding or use caps.
- Allow catcher vessels to lease whiting between the IFQ and mothership cooperative sectors to help achieve OY.
- Allow greater flexibility in the establishment of set-aside apportionments and their use.
- Too many people only lease out quota and do not fish. Consider regulatory changes to reduce the amount of quota leased-out by persons that do not harvest fish.
- Consider removing or loosening vessel caps so vessels can continue to fish with greater flexibility.
- Consider developing a program to allow the use of EM at plants to replace shoreplant observers.
- Supports the continued development of EM for whiting and development of EM for non-whiting fisheries, as an alternative to at-sea observers.
- Streamline activities with recoverable costs, such as social science research and EM video review, to only what is absolutely necessary to fulfill program mandates.
- Improve product quality by creating a provision to allow deductions for slime and ice when calculating QP use, to reduce the number of times fish must be deiced before processing.

#### *Primarily Fixed Gear Issues*

- Vessel operators are concerned that small boat fishery access to larger fish has been reduced because of localized depletion and are primarily able to catch smaller fish that have a much lower value.
- Consider rules to prohibit the use of crucifiers on vessels.

### *Other Issues and General Comments*

- Costs are too high to run a viable operation under the current conditions and need to be reduced where possible.
- Additional markets for fresh fish have not developed under the catch share program and may have declined. This was attributed to delivery patterns as well as overall declines in the demand for higher valued finfish products domestically and worldwide.
- Captains would rather fish pink shrimp and whiting because they do not have to deal with as many bycatch/regulatory issues.
- Providing proper access to the fish was not a major goal of the plan but should have been.
- Program rules have removed any interest in dragging in some areas, and without changes the non-whiting trawl fishery in some areas could be eliminated. Current rules were stated to likely eliminate the trawl portion of the fishery, especially in California, within 10-years. Stakeholders said the Council needs to look around the world to find a system that works for that type of fishery.
- The lack of profits in the California trawl fishery means that owners cannot afford to pay the crew to help with maintenance 3 days a month, so some repair/maintenance has been forgone.
- California based trawls report that after all expenses are paid, they do not have enough revenue left to pay themselves and have been forced to leave the fishery or feel trapped with no apparent way to leave the fishery and get out from under their current debt.
- Need to consider new ways to get volume and value out of the fishery.
- Request to remove stripetail rockfish from the shelf rockfish group due to bycatch and quota acquisition issues.

## **4.0 SUMMARY OF AVAILABLE INDUSTRY COST DATA**

Several cost collection programs have been implemented in U.S. Federal fisheries. Thunberg et. al. (2015) provided an overview of those collections. Most of those data collection programs do not directly relate to this project. However, in addition to the West Coast program, information related to the Northeast Sector program, Gulf of Mexico ITQ programs, Ocean Quahog and Surfclam fishery, and some Alaska trawl fisheries are considered. To the extent data are available from the Canadian IVQ program, it is provided.

How data are collected, and the types of data collected varies by catch share program. West Coast cost data are generally more current and/or more comprehensive than other catch share programs. The availability of the West Coast cost and revenue data is useful for analysts, policy makers, and the public to understand the fishery. Stakeholders within the industry also benefit from having the data available but are concerned with the overall cost of the data collection in terms of hours spent providing the data and agency costs, that are recoverable, collecting the data.

## 4.1 West Coast

The primary source of cost data for the West Coast Trawl Groundfish program is specified in 50 CFR 660.114. The Economic Data Collection (EDC) program requires the submission of economic data by participants in the trawl rationalization program<sup>22</sup>. Those regulations require industry to submit EDC forms to NOAA Fisheries that provide ongoing, annual economic data. The required data includes annual data related to QS permit owner activity and characteristics of participation in the fishery, costs and earnings from quota trades, and quota leasing. It also includes annual data related to costs, earnings, value, labor, operations, physical characteristics, ownership and leasing information for vessels, first receiver sites, or shorebased processors. EDC collects much of the data related to participating in the fishery, but it may not cover all the cost data. Information collected from the annual EDC is summarized and made available to the public through the FISHEyE data tool.

In addition to FISHEyE, data from other sources are used to provide background information on buyback fees, monitoring costs, cost recovery fees, fuel costs, etc. These are costs that have been specified as a concern by stakeholders.

### 4.1.1 General summary of West Coast costs from FISHEyE data

FISHEyE uses EDC data and divides the catch share program vessels and processors into groupings. Vessels are grouped and summarized as all vessels in that fleet, whiting vessels that fished for Pacific whiting, including those that fished for both whiting and non-whiting, and groundfish vessels that did not fish whiting. Vessels are separated into whiting and non-whiting vessels because whiting vessels tend to be larger and catch a higher volume of fish. In addition, total allowable catch for Pacific whiting has more annual variation than total annual catch for species targeted in the non-whiting groundfish sector, which can make interpreting the metrics provided in the data more difficult. Catcher vessels are also grouped by size. Catcher vessels are grouped into three categories representing the range of catcher vessel lengths: Large Vessels (>80 ft), Medium Vessels (>60 ft, ≤80 ft), and Small Vessels (≤60 ft). Finally, catcher vessels are grouped by homeport and state. All of these various groupings are used to describe costs and revenues for the catcher vessel fleets. Motherships and catcher-processors are not broken out by the various groupings because of confidentiality issues, and they tend to operate out of the same region.

Shorebased processors are grouped into three size classes based on the number of production employees: Large (>200 workers), Medium (100–200 workers), and Small (<100 workers). On the EDC form, processors report the total number of production employees for the week that contains the 12th of each month. This information is used to classify processors. Table 4-1 reports the number of CVs that were reported in FISHEyE as being active in various fisheries during the 2009 through 2020 time period (the most recent year data were available when the report was generated). Catcher vessel's EDC submission requirements also means that only vessels that participated in the catch share fisheries are reported in the EDC. Therefore the "all catch share fisheries" and "all fisheries" counts are the same every year.

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<sup>22</sup> Table 5.1 provides a link to the PRA cost estimates of submitting the data.

Table 4-1 Number of catcher vessels reported in the FISHEyE data by fishery reporting group, 2009 through 2020

<i>Fisheries</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>
All catch share fisheries	138	130	113	110	105	101	96	97	99	100	98	87
All fisheries	138	130	113	110	105	101	96	97	99	100	98	87
All non-catch share fisheries	82	81	71	68	67	62	59	60	63	59	62	50
At-sea Pacific whiting	19	21	18	16	18	19	14	17	15	17	19	15
Crab	56	54	51	47	51	43	36	46	52	48	46	38
DTS trawl with trawl endorsement	108	97	63	58	58	51	51	50	55	49	45	37
Groundfish fixed gear w/ trawl end.	8	8	25	25	14	16	17	19	17	16	16	10
Groundfish with trawl gear	118	105	72	67	69	64	62	59	63	66	65	62
Non-whiting midwater trawl				5	5	9	12	9	14	20	23	25
Non-whiting, non-DTS trawl w/ trawl end.	89	58	42	45	44	49	36	47	50	44	46	43
Other fisheries	27	25	20	20	19	17	17	16	11	12	18	10
Pacific whiting	41	41	31	29	29	30	26	28	29	30	32	33
Shoreside Pacific whiting	34	35	26	25	24	25	22	23	25	26	27	28
Shrimp	32	35	30	33	31	31	35	27	26	31	31	23
Trawl only catch share fisheries	131	123	91	89	91	86	80	80	84	85	84	78

Source: FISHEyE application (<http://dataexplorer.northwestscience.fisheries.noaa.gov/fisheye/PerformanceMetrics/>) maintained by NOAA Fisheries NWFSC. Technical information can be found here: <https://repository.library.noaa.gov/view/noaa/31435>

Calculation of performance metrics in FISHEyE data are based on four primary data sources. Fish Ticket data are collected by each state and then compiled by the Pacific Fisheries Information Network (PacFIN). PacFIN data used in FISHEyE includes vessel IDs, buyer IDs, gear, delivery date, species, landings weight, and ex-vessel revenue for each shorebased delivery. For the purposes of the performance metrics, this information is primarily used to obtain shoreside ex-vessel revenue, landings weight, and number of trips.

Permit data are from the NOAA Fisheries West Coast Region Permits and Monitoring Branch. Data includes the limited entry permits on each vessel during a specific time period. Similar data are provided for First Receiver Site Licenses (FRSLs). The information is primarily used to assign trips and their associated ex-vessel revenue and landings to permit-specific fisheries.

Federal observer data collected for catcher-processors and motherships provide similar data to fish tickets, including catcher vessel IDs, fish buyer IDs, landings weight by species, and catch/delivery date. They do not include ex-vessel revenue for mothership deliveries, that is collected from other sources (e.g., fish ticket data). Catcher-processors do not pay an ex-vessel value, since they both harvest and process the fish. As a result, revenue and net revenue estimates for all catcher vessels, regardless of whether they deliver shoreside or to a mothership are based on ex-vessel value; revenue and net revenue estimates for motherships and catcher-processors are based on first wholesale values.

Economic Data Collection (EDC) forms that are used to collect data are the source of the majority of the data presented in the performance metrics. More details about each data element can be found on the EDC Forms web page<sup>23</sup> and in the descriptions of the performance metrics.

Not all entities receive revenue from each source or incur costs in each category listed on the EDC form. In this report confidential data are listed as “conf.” in the data tables and excluded from the average calculation when it allows the confidential data to be backcalculated. Vessel’s homeport/state, and processor’s location is based on the location of their facility. Size is based on the vessel length, or for processors, by the number of employees.

**It is also important to note that FISHEyE data does not include all expenses. For vessels, these expenses include office space, pickup trucks, storage of equipment, professional fees, and marketing. For processors, common costs that are not collected are trucks and professional fees. For these reasons, the EDC Program’s aggregated measures of costs (variable costs, fixed costs, and total costs) underestimate the true costs of operating a business<sup>24</sup>.**

Detailed tables derived from FISHEyE data are presented in the appendix (Section 9.2). The information is reported as a mean value for the vessel or processor class. The reader is referred to that section for detailed cost information by category. Summary information is included in the main body of the document and focuses on costs that are triggered by specific elements of the catch share program when possible.

Figure 4-1 is divided into two parts with the one on the left showing how the annual catcher vessel revenue, in real 2020 dollars, is divided between net revenue, fixed costs, and variable costs. The right part of the figure shows the percentage of ex-vessel revenue each of those groupings represents. Net revenue increased after the catch share program was implemented and remained greater than the pre catch share years until 2020. However, the peak year for net revenue was 2017 and has declined since.

A series of figures are included below for catcher vessels by state of homeport, motherships, catcher-processors, and shoreside processors. Two figures are included for each grouping. The first shows costs and total net revenue as a percentage of gross ex-vessel revenue for catcher vessels and gross first wholesale revenue for motherships, catcher-processors, and shoreside processors. The second figure in the grouping shows costs and total net revenue (note that not all costs are necessarily captured in the surveys, so the net revenue estimate may be overstated). All values were converted to 2020 real dollars. The figures are included to provide a relatively high-level graphical representation of the detailed data tables provided in the appendix.

Figure 4-2 California catcher vessel costs and total net revenue from all West Coast catch share fisheries in percentages of ex-vessel revenue and in dollars (ex-vessel). Figure 4-2 indicates that estimated total net revenue for the California catcher vessels was positive over the years considered, but gross ex-vessel revenue tended to decline. Labor costs were typically the largest cost with fuel being the second largest cost. Buyback fees, cost recovery fees (starting in 2014) and monitoring costs (primarily after 2012) were substantially less, but still comprised a substantial portion of total revenue especially in recent years. The figures do not separate whiting from non-whiting vessels because whiting vessels could not be reported because of confidentiality reasons after the first two years.

Figure 4-3 shows the costs and total net revenue for catcher vessels reported to be homeported in Oregon. Information for non-whiting and whiting vessels (both shoreside and mothership sector) are reported separately in the dollar value figure. It shows that gross revenue generated by non-whiting vessels tended

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<sup>23</sup> <https://www.fisheries.noaa.gov/west-coast/science-data/economic-data-collection-forms>

<sup>24</sup> NOAA Technical Memorandum NOAA FISHERIES-NWFSC-169



to decline after 2017, after increasing in 2016 and 2017. Whiting vessels gross revenue increased substantially in 2017 relative to the two previous years and remained relatively high until 2020. Costs, in general, followed the same trends as reported for California. Labor costs were typically the largest cost with fuel and onboard equipment also being substantial costs. Buyback fees, cost recovery fees (starting in 2014) and monitoring costs (primarily after 2012) were less, but still comprised a substantial portion of total revenue especially in recent years.

Figure 4-4 shows the costs and total net revenue for catcher vessels reported to be homeported in Washington or Alaska. Whiting vessels (both shoreside and mothership sector) generated substantially more gross ex-vessel revenue than the non-whiting vessels. Total net revenue for the whiting vessels was close to zero prior to implementation of the catch share program and increased substantially after it was implemented. Non-whiting vessels also were reported to have positive total net revenue, but the margins were smaller. Labor and fuel costs were again the largest costs for the catcher vessel fleets. Buyback, cost recovery, and monitoring fees were about 10% of gross ex-vessel revenue most years. Fishing gear costs tended to decline for all catcher vessels after the catch share program was implemented.

Figure 4-5 provides information for the mothership processor costs and gross first wholesale revenues. Total net revenues for the sector varied from about 25% of total gross revenue (2017) to close to zero (2012, 2014, 2015, 2019 and 2020). Fish purchases and labor were generally the largest costs.

Figure 4-6 catcher-processors showed a general increasing trend in total gross first wholesale revenue as well as positive total net revenue. Processing crew payments, non-processing crew payments, fuel, and other variable costs were the largest costs. Observer and cost recovery fees made up a relatively small portion of total first wholesale revenue.

Figure 4-7 provides cost and total net revenue data for the shoreside processing sector, based on size category (number of employees). Total net revenue for the small processor category was often negative and this category dropped out of the data after 2017. This does not mean that there were no active small processors, but there were not enough to provide the data under confidentiality requirements. For all size classes, some years the total net revenue was negative. Over the 2014-2019 period the mean total net revenue was negative. Fish purchases and labor accounted for almost 75% of total costs for all size classes combined. The smallest class had much higher fish purchase and labor costs that alone exceeded gross revenue on average from 2014 through 2019.

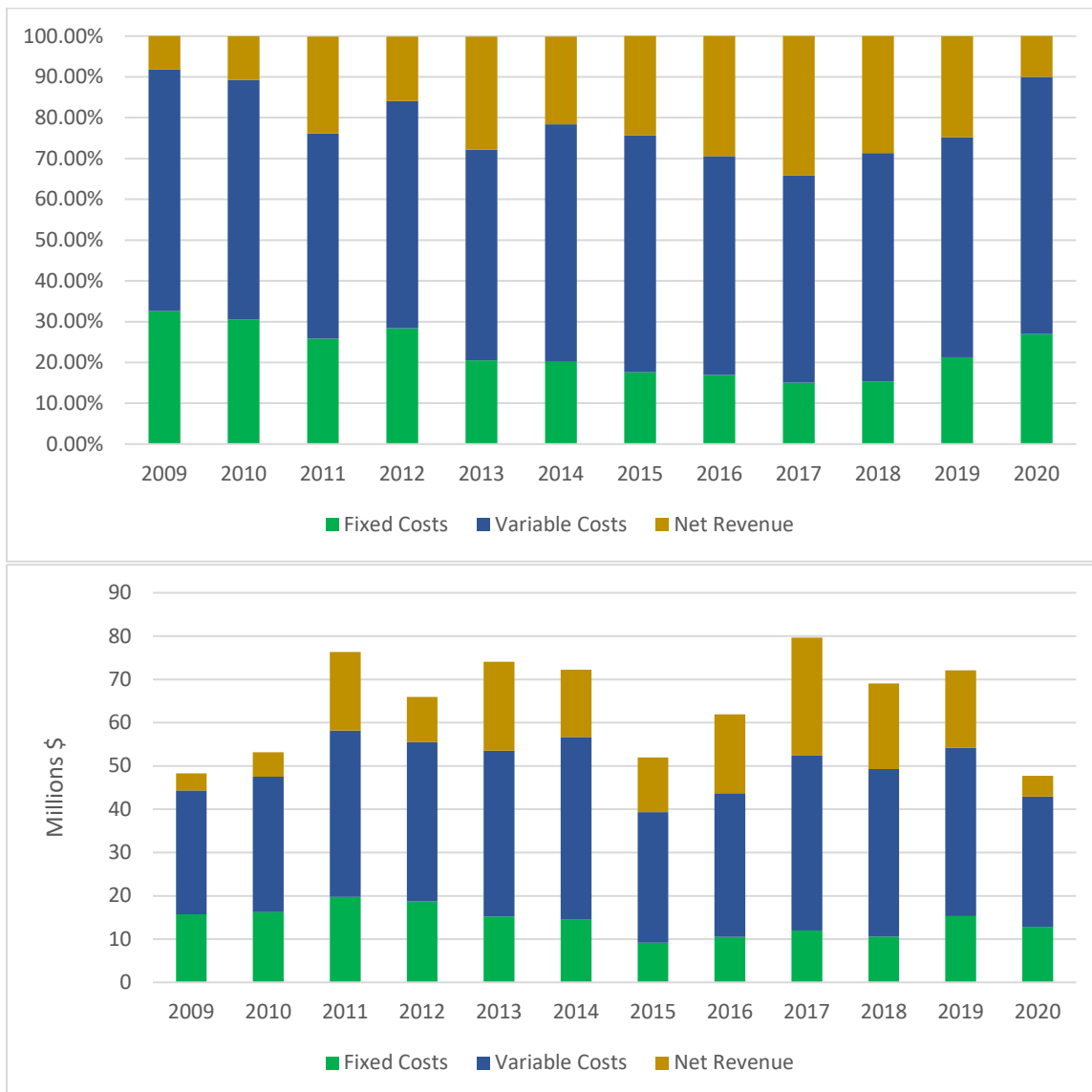


Figure 4-1 Shoreside catcher vessel revenue, net revenue, fixed costs, and variable costs, 2009 through 2020

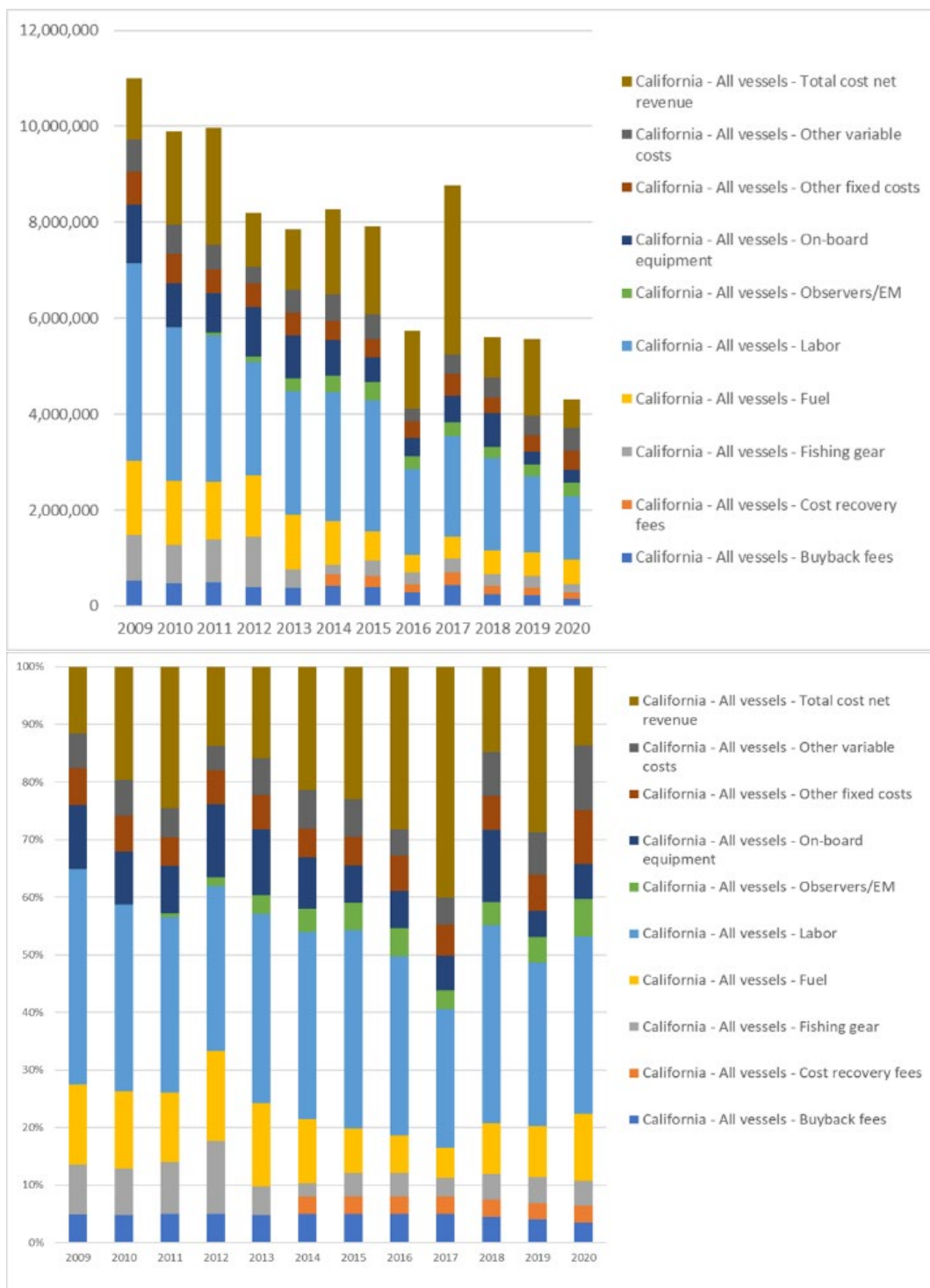


Figure 4-2 California catcher vessel costs and total net revenue from all West Coast catch share fisheries in percentages of ex-vessel revenue and in dollars (ex-vessel).

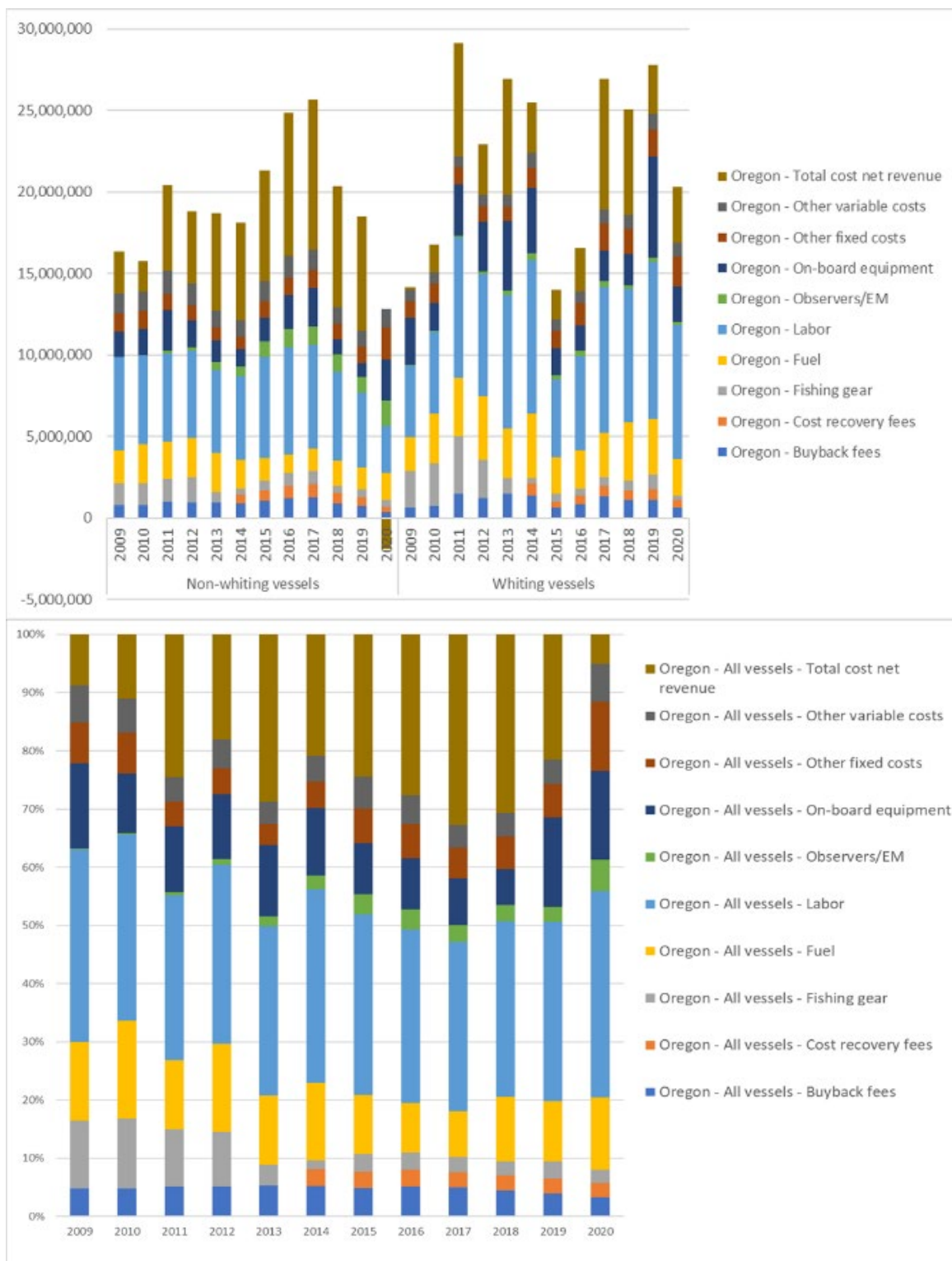


Figure 4-3 Oregon catcher vessel costs and total net revenue from all West Coast catch share fisheries in percentages of ex-vessel revenue and in dollars (ex-vessel).

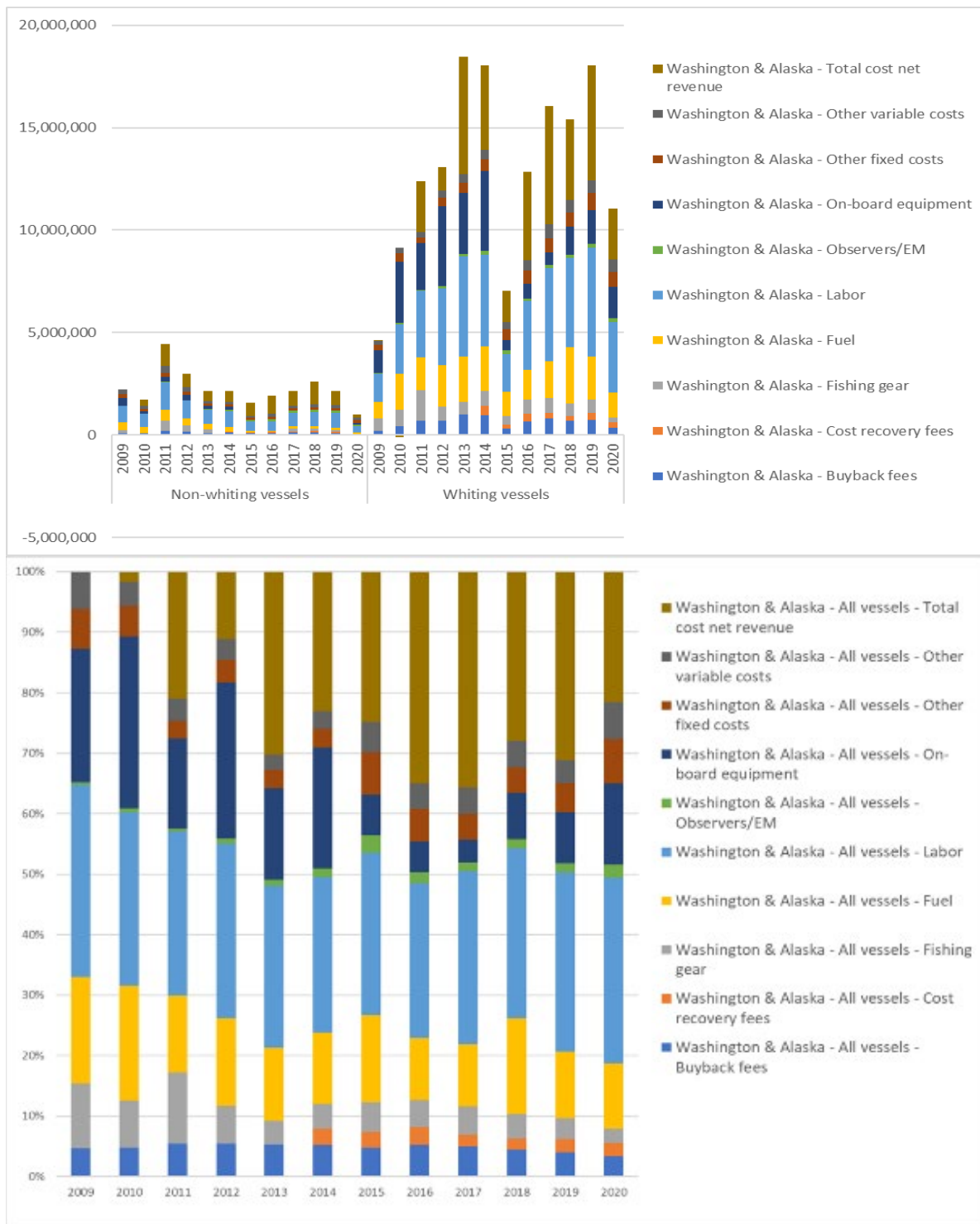


Figure 4-4 Washington and Alaska catcher vessel costs and total net revenue from all West Coast catch share fisheries in percentages of ex-vessel revenue and in dollars (ex-vessel).

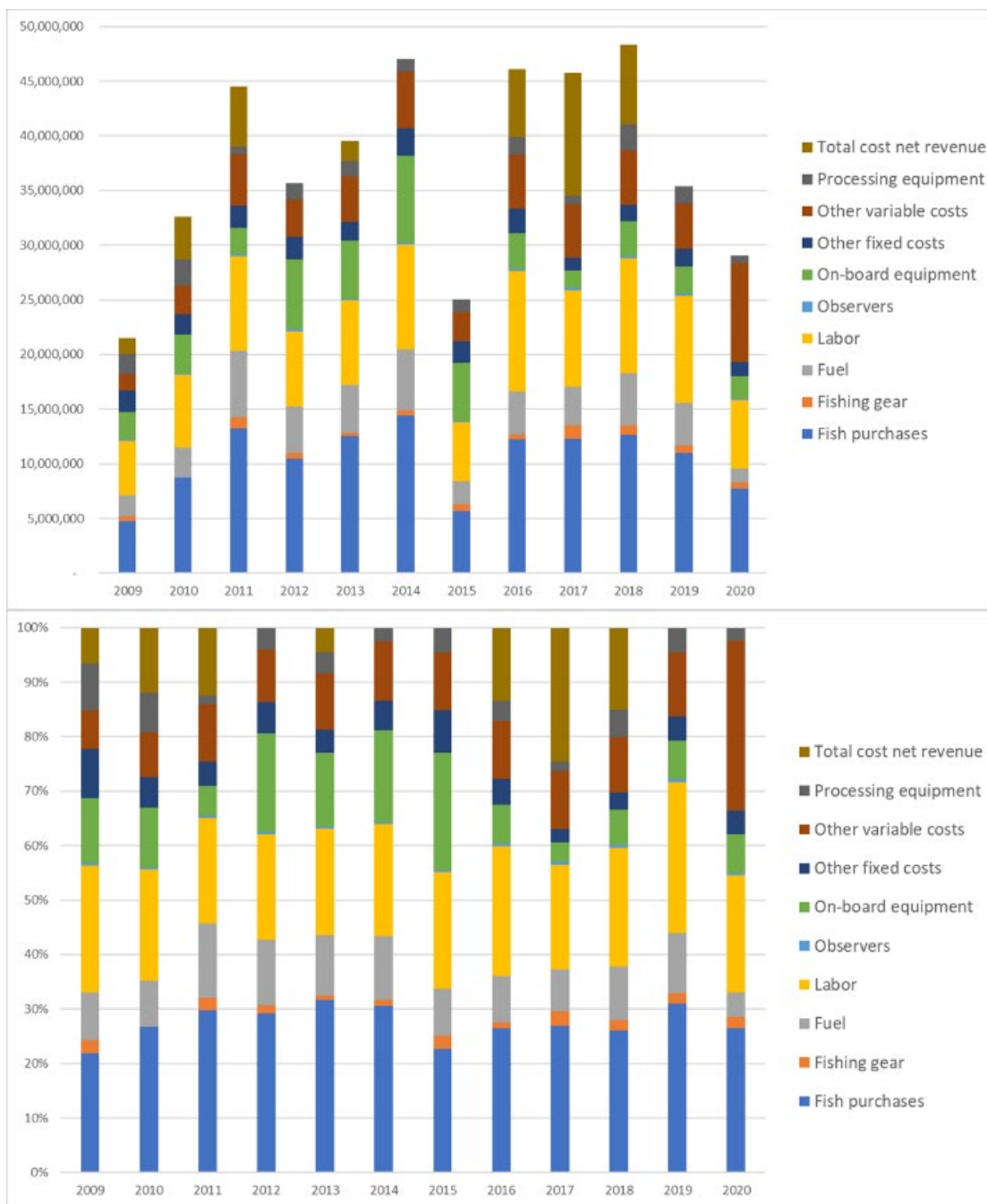


Figure 4-5 Mothership processor costs and total net revenue from all West Coast catch share fisheries in percentages of gross first wholesale revenue and in dollars (first wholesale)

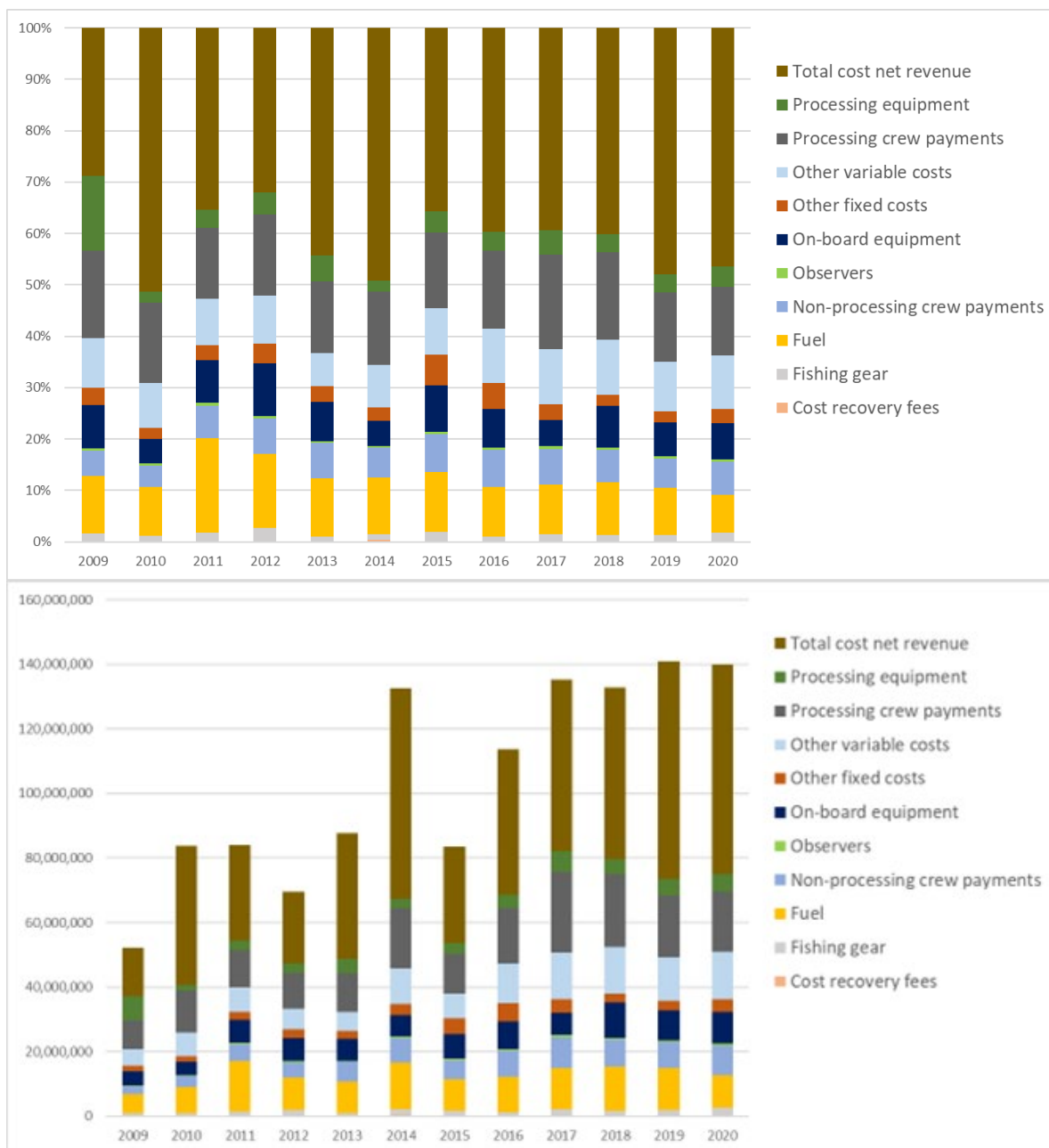


Figure 4-6 Catcher-processor costs and total net revenue from all West Coast catch share fisheries in percentages of gross first wholesale revenue and in dollars (first wholesale)



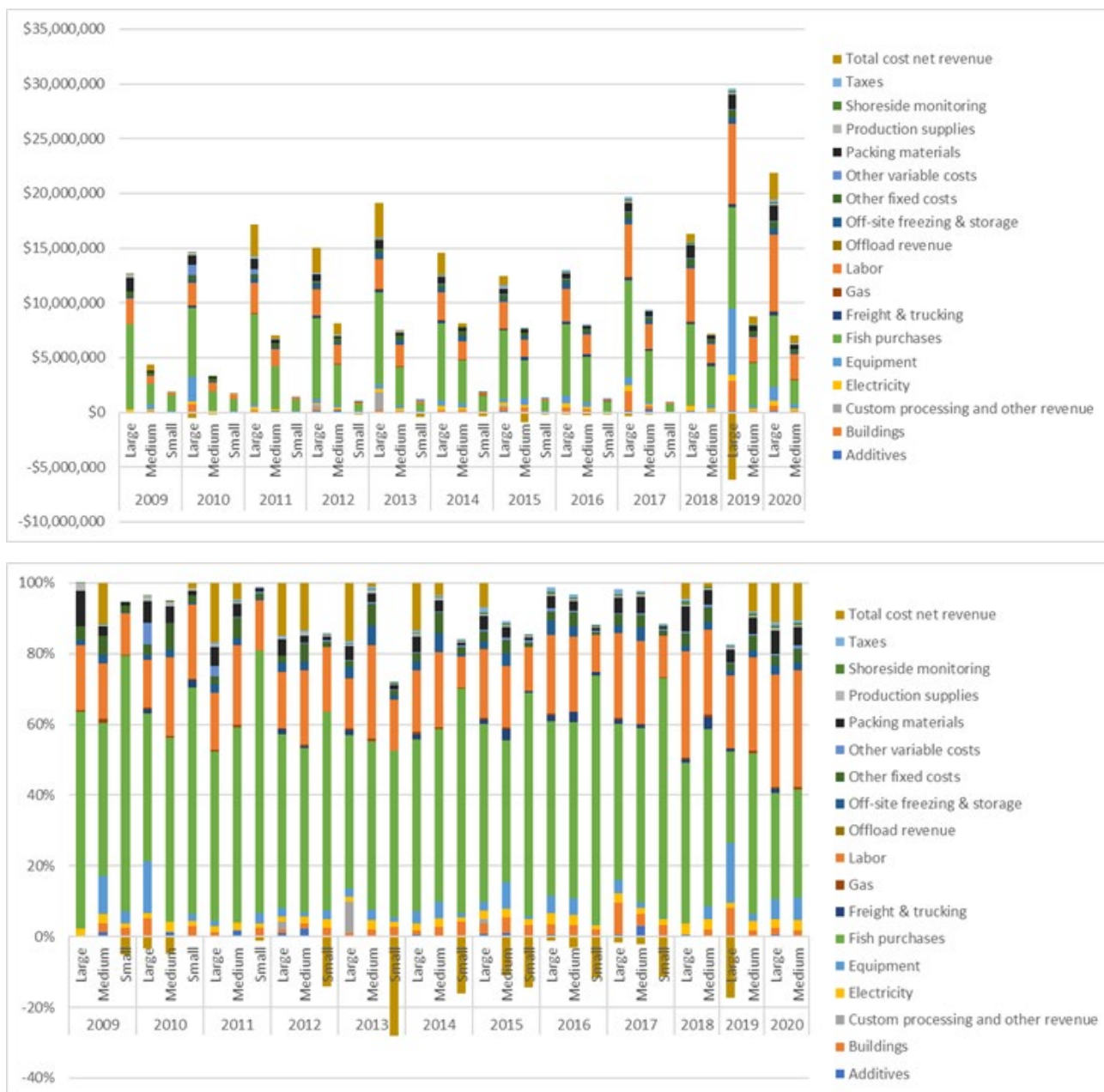


Figure 4-7 Small, medium, and large shoreside processors costs and total net revenue from all West Coast catch share fisheries in percentages of gross first wholesale revenue and in dollars (first wholesale).

#### 4.1.2 Observer and EM costs

Section 303A(C)(1)(H) of the MSA requires that LAPPs “include an effective system for enforcement, monitoring, and management of the program, including the use of observers or electronic monitoring systems”. Prior to implementing the catch share program total mortality for all species was measured and controlled by monitoring total landings and observing about 20% of the trawl trips to estimate bycatch rates (discard rates) that were applied to landings to develop an estimate of total catch and mortality. That



estimation methodology resulted in less certainty around the total catch and mortality estimates than is achieved under the catch share program.

Amendment 20 implemented 100% monitoring at-sea and dockside to ensure individual accountabilities for all landings and discards of all allocated species. Catcher-processors and motherships are required to carry two observers at all times, with certain exceptions based on the length of the vessel, and all catcher vessels are required to carry one observer until all fish are offloaded. First receivers are required to have shoreside catch monitors for 100% of IFQ offloads. These requirements were included in the program to address the Council's goals of individual accountability in the program. The Council determined that comprehensive monitoring at-sea and shoreside was necessary to ensure individual allocations are not exceeded. To achieve this for catch-based allocations, both discards (documented by observers or EM) and landings (documented by shoreside monitors) must be accurately assessed. This also supports the rebuilding of overfished stocks and helps ensure that ABC's of allocated species are not exceeded.

Detailed information regarding mean vessel observer and EM costs is provided in the FISHEyE data tables in Section 9.2. That information represents a mean monitoring cost for the vessels and processors in each category. FISHEyE data was also queried to report cost per day for vessels. That information is reported in Figure 4-8. The cost per day for motherships and catcher-processors is greater than for CVs, because of the requirement that they carry two observers, in most cases. Catcher vessel daily monitoring costs track fairly closely from 2011 through 2014. Prior to 2011, non-whiting CVs were not required to carry at-sea observers on 100% of trips (about 20%). The figure shows industry paid monitoring costs for non-whiting CVs were zero in 2009 and 2010. Starting in 2011, Federal subsidies were provided to help with observer costs. Beginning in 2015, whiting catcher vessels daily cost was about half of the non-whiting vessels. Some of that difference is attributed to the whiting CVs being allowed to use EM and part of the EM costs being subsidized, while the non-whiting vessels were required to carry at-sea observers and fund the cost of those observers.

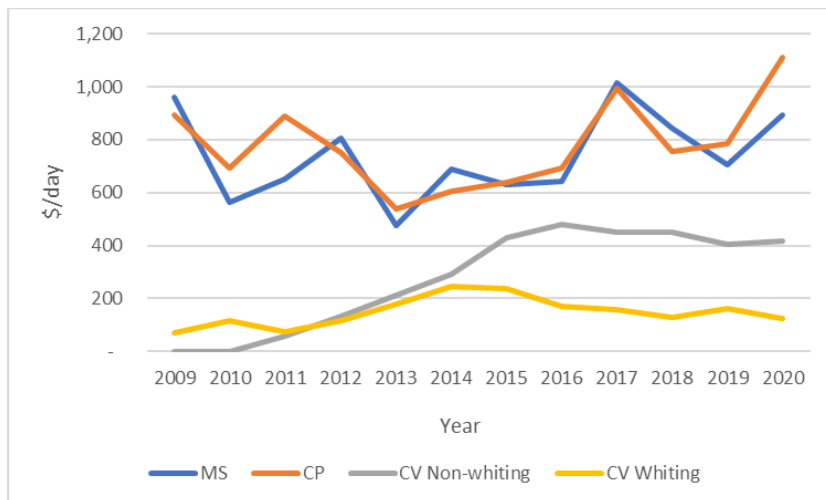


Figure 4-8 Reported monitoring cost per day

FISHEyE data does not provide estimates of daily shoreside monitoring costs. Instead, mean annual shoreside monitoring cost by the size class of the first receiver is presented in Figure 4-9. Mean annual cost differences could be impacted by number of days taking IFQ deliveries rather than differences in daily shoreside monitor rates.

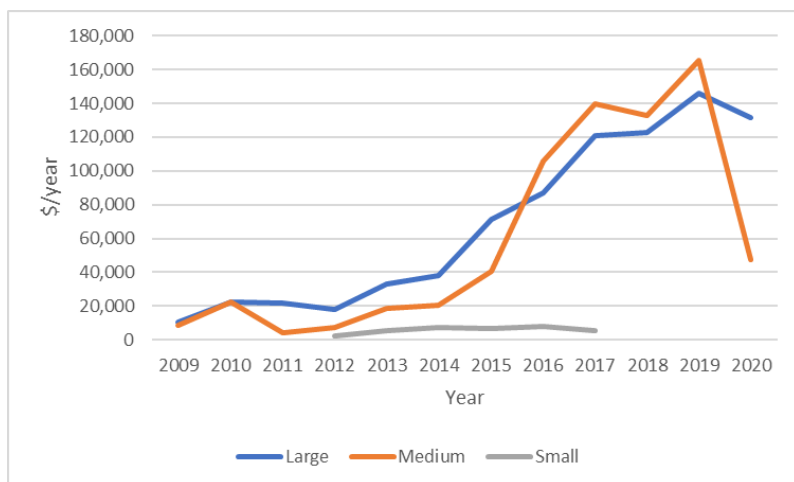


Figure 4-9 Mean annual monitoring cost of first receivers, 2009 through 2020 (2020 \$)

Information is also presented in this paper from sources other than FISHEyE. This information is intended to provide the reader with additional information on the differential costs of monitoring by sector. In a March 2021 report to the Council, NOAA Fisheries provided estimates of EM and costs as well as an estimate observer sea day costs. “Observer sea days” was NOAA Fisheries’ estimate of the cost of observer coverage if the EM EFP (exempted fishing permit) whiting fleet returned to using observers fulltime with an equivalent amount of effort, assuming 2,596 seadays and a seaday rate of \$525/day. The observer sea day rate was estimated based on the average cost reported to the Economic Data Collection Program 2015-2019 and feedback from observer providers<sup>25</sup>. Information collected for this report indicates that one observer provider for the non-whiting fishery is currently charging industry \$550/day. The current rate for at-sea and shoreside observers in the whiting fishery is \$600/day, but almost all participants are currently using EM for at-sea coverage<sup>26</sup>. These costs do not include costs incurred by NOAA Fisheries. Using information in the 2021 Council document referenced above and assuming the same NOAA Fisheries annual costs to support 2,596 seadays and \$550/day observer cost for non-whiting shoreside deliveries, the total daily rate for both vessel and NOAA Fisheries costs would be \$691/day.

EM was reported to cost industry participants about \$12,000 per year per vessel for whiting catcher vessels. Using the information from the EM report and assuming the EM EFP cost of \$1.119 million to fund 2,596 seadays, the industry cost per seaday is about \$431/day compared to observer costs of \$550/day for industry and \$691/day for industry and agency costs combined. Estimates of agency costs for EM are combined with other monitoring costs and are shown in Section 4.5.4. EM usage is increasing in many catch share programs around the world, and in most cases, there is little difference in catch estimates using at-sea observers and EM<sup>27</sup>.

It is almost universally recognized that a monitoring system that achieves the stated goals of the program is necessary. Some stakeholders are concerned that the level of monitoring is too burdensome and similar results could be achieved without 100% coverage, especially in lower value fisheries. These individuals often reference programs like the Northeast Sector program and the Alaska Halibut and Sablefish IFQ program that do not require 100% coverage. However, as noted to the extent possible, the Northeast

<sup>25</sup> [https://www.pcouncil.org/documents/2021/03/g-5-a-supplemental-NOAA\\_Fisheries-report-8-em-cost-estimates.pdf/](https://www.pcouncil.org/documents/2021/03/g-5-a-supplemental-NOAA_Fisheries-report-8-em-cost-estimates.pdf/)

<sup>26</sup> Personal communication with industry

<sup>27</sup> [https://www.nature.org/content/dam/tnc/nature/en/documents/Catalyzing\\_Growth\\_of\\_Electronic\\_Monitoring\\_in\\_Fisheries\\_9-10-2018.pdf](https://www.nature.org/content/dam/tnc/nature/en/documents/Catalyzing_Growth_of_Electronic_Monitoring_in_Fisheries_9-10-2018.pdf)

Sector program is scheduled to be moving to 100% coverage. Ultimately this is a policy decision that is driven by input from agency staff that are mandated to ensure healthy and viable fish stocks. The Alaska Halibut and Sablefish Program is based on landings that can be monitored at the plant using fish tickets and production reports.

#### 4.1.3 Diesel Fuel Cost and Prices

Fuel costs are a major component of annual variable costs for the West Coast groundfish fleet as shown in the FISHEyE data and members of the Groundfish Management Team specifically requested information on fuel costs. PSMFC staff have been collecting and reporting information on diesel fuel prices since 1999. That data is available by port and month. Monthly data by state was used to estimate an average annual price by taking the mean of the monthly price over the calendar year and using the annual mean of the quarterly Gross Domestic Product Implicit Price deflator<sup>28</sup> to convert the price to 2020 dollars. That information is reported in Figure 4-10, and shows that while real prices are high compared to the recent past, they are similar to the average realized from 2009 through 2014, except in California, where the 2022 price is considerably higher than any year during the time period considered.

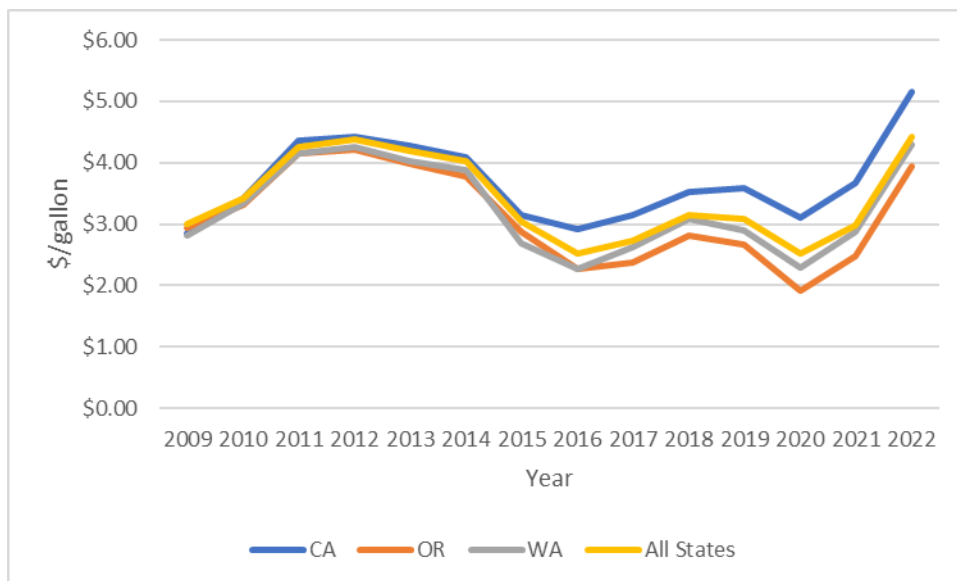


Figure 4-10 Average annual diesel fuel prices by state in 2020 dollars, 2009 through February 2023

Source: [https://www.psmfc.org/efin/data/state\\_averages.xls](https://www.psmfc.org/efin/data/state_averages.xls)

FISHEyE data shows overall fuel costs being lower 2015 through 2017 and beginning to increase in 2018 before declining in 2020. The decline that year is attributed to lower diesel prices as well as less usage, in part due to the COVID-19 issues. Figure 4-11 provides the mean fuel cost per vessel for catcher vessels, motherships, and catcher-processors. Greater detail is provided in Section 9.2. Due to increases in prices and usage after 2020, the steep decline in 2020 should not be considered a trend that would continue into the near future. Data are not currently available for the 2021 or 2022 fishing years. However, based on fuel price information for all states in Figure 4-10, the 2022 price was 76% more than the 2020 price.

<sup>28</sup> Link: <https://fred.stlouisfed.org>

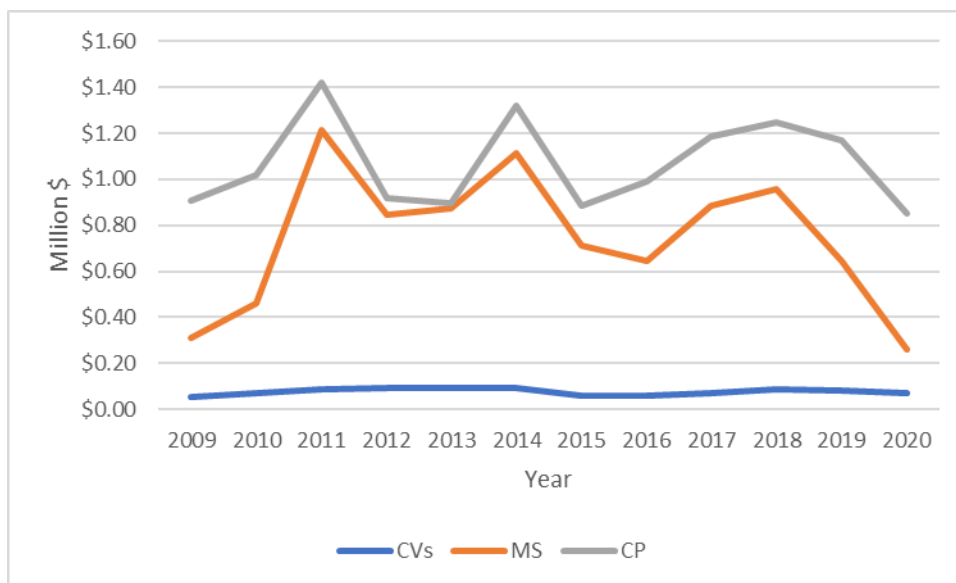


Figure 4-11 Mean fuel cost per vessel in millions 2020 \$, 2009 through 2020

Source: FISHEyE data

Fuel costs are impacted by changes in fishing behavior. Vessel operators in the IFQ fisheries and cooperatives often change fishing locations, even when directed harvests are good, to avoid incidental catch of species. Especially species whose catch is highly scrutinized (e.g., salmon) and species that have very small allocations that could prevent a vessel operator from harvesting all of the directed fishery allocations. Changes in equipment design and technologies (nets, engines, etc.) also impact fuel costs. Because fuel costs change for a variety of reasons each year, it is difficult to attribute fuel usage changes to any specific change in fishing behavior (i.e., changes in catch per unit effort or incidental catch avoidance measures employed by the vessel operator), versus other factors that change annually.

#### 4.1.4 Quota Leasing

A study by Connelly et. al. (2022) indicated that total expenses for annual quota transfers in the shorebased IFQ Program have ranged from a low of \$4.87 million in 2013 to a high of \$6.74 million in 2011, or on average of 18% of the total ex-vessel value of the shorebased IFQ Program. In 2019, quota share permit owners reported a total of \$3.70 million (Quota Share Owner Survey or QS-EDC), and vessel owners reported a total of \$2.91 million (Cost and Earnings Surveys or CE-EDC), earned from leasing quota, for a total of \$6.61 million in quota lease earnings. Quota share permit holders that reported not owning a vessel generated \$1.93 million in revenue from leasing quota. Of the \$60.05 million in ex-vessel value of the shorebased IFQ fishery, 11% went to IFQ leasing costs. The survey conducted as part of that analysis (QS-EDC survey) showed that at least 39% of quota share owners that own additional capital (vessels or processing facilities) do not actively fish or process fish.

#### 4.1.5 Vessel Buyback Program

Information in this section was primarily derived from the NOAA Fisheries website<sup>29</sup> and studies conducted by NOAA Fisheries staff. Congress authorized a \$46 million buyback program to remove excess capacity from West Coast fisheries. Using a reverse auction bidding model, the program permanently removed 91 vessels and 239 fishing permits from the groundfish trawl fishery and associated corollary fisheries of Dungeness crab and pink shrimp off the coasts of California, Oregon, and Washington.

Fees for repayment of the groundfish loan are based on groundfish harvests using federal trawl permits. Vessel operators making deliveries are required to pay the fee and all parties making the first ex-vessel purchase of groundfish (“fish buyers”) are required to collect the fee from vessel operators and submit the fee, and forward the fee revenue. Table 4-2 indicates the fee percentage charged in the various fisheries has changed over time. A dash indicates the fishery group has met their loan obligation and is no longer subject to the buyback fee. As of 2018, “groundfish species” is the only fishery group still subject to the fee, but the fee rate has decreased from 5.0% of ex-vessel value to 3.5%.

Table 4-2 Buyback fee percentages by year and fishery, 2005 through 2023

<i>Fishery group</i>	<i>2005–07</i>	<i>2008–12</i>	<i>2013–14</i>	<i>2015–16</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>
Groundfish species	5.0%	5.0%	5.0%	5.0%	5.0%	4.5%	4.0%	3.5%	3.5%	3.5%	3.5%
California crab	1.24%	1.24%	—	—	—	—	—	—	—	—	—
Oregon crab	0.55%	0.55%	0.55%	—	—	—	—	—	—	—	—
Washington crab	0.17%	0.17%	0.17%	0.17%	0.17%	—	—	—	—	—	—
California shrimp	5.00%	5.00%	5.00%	5.00%	—	—	—	—	—	—	—
Oregon shrimp	3.75%	4.70%	—	—	—	—	—	—	—	—	—

Source: NOAA Fisheries West Coast Region

Based on these fee rates, industry that was required to submit annual cost surveys reported paying about \$2.5 million during 2009 and 2010 (Figure 4-12). Annual payments for all fishery groups were generally \$3 to \$4 million per year from 2011 through 2017, with 2015 being the outlier. Fee payments decreased from 2017 through 2020. The current groundfish loan balance as of January 1, 2023, was about \$9.84 million<sup>30</sup> including outstanding principal and interest. While not a direct result of the catch share program, the buyback program did help facilitate development and implementation of the catch share program and is a substantial ongoing cost to the groundfish portion of the fishery.

<sup>29</sup> <https://www.fisheries.noaa.gov/national/funding-and-financial-services/pacific-coast-groundfish-buyback-program>

<sup>30</sup> <https://www.fisheries.noaa.gov/s3//2023-01/Groundfish-Loan-Balances-01-04-23.pdf>

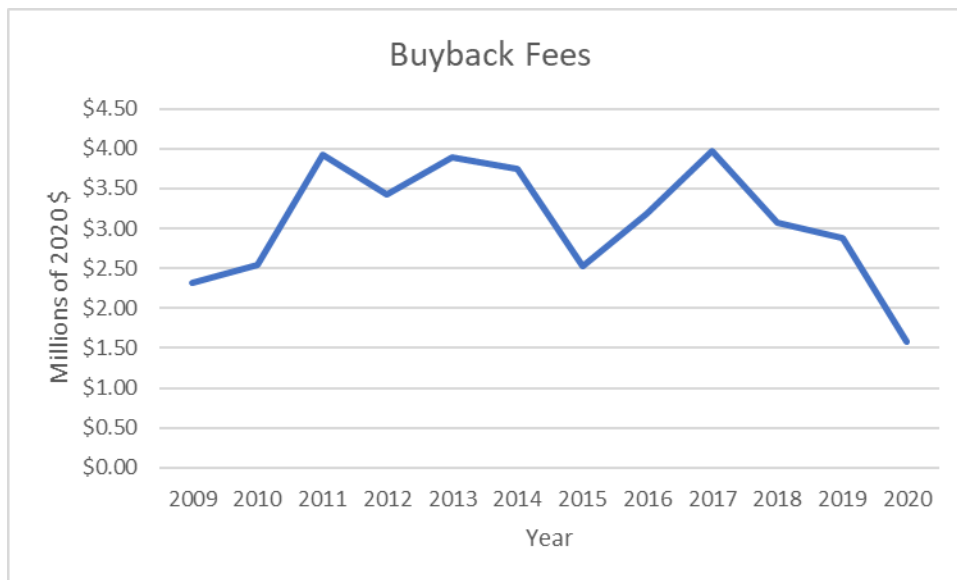


Figure 4-12 Industry buyback fees for 2009 through 2020.

Source: FISHEyE data.

Holland et al (2017) conducted an economic analysis of the costs and benefits of the buyback. The first method estimated the value generated by the buyback quota (quota distributed equally to all initial recipients that would otherwise have been attributed to the history of permits that were bought back). That valuation was based on the share of net revenues attributable to the buyback quota. The authors compared variable cost net revenue and total cost net revenue. Quota pound prices were also used to provide an alternative way to value the financial gains for the post-buyback fleet. The findings indicated that the average annual value of buyback quota has exceeded the average cost of financing the buyback and the average annual buyback landings fee collected between 2011 and 2014. However, as stated, some members of industry argue that the costs of repaying the buyback loan are too high and some stakeholders reported having difficulty affording the additional reduction in total net revenue. The authors indicated that during the earlier years of the buyback, landings fees collected each year between 2011 and 2014 were higher than the fixed payment necessary to repay the buyback loan, the loan is being repaid ahead of schedule, which lead to reduced payments. However, the higher early rates may have caused cash flow problems for some firms.

The authors also note that while the fleet in aggregate may have gained from the buyback, not all active vessel operators shared equally in either the program gains from the buyback or the cost of financing the buyback. Some vessel operators may be negatively impacted by the buyback and its repayment cost. Entrants into the fishery that were not initially allocated any buyback quota are most likely to be negatively impacted.

## 4.2 Northeast Sector Program

The Social Sciences Branch (SSB) of the Northeast Fisheries Science Center (NEFSC) collected fixed and labor cost information, on a voluntary basis, from commercial fishing vessel owners for the years 2011, 2012, and 2015. At-sea monitors/observers in the Northeast region collect information on vessel operating costs (i.e., trip costs), such as fuel, bait, and ice. The SSB cost survey is the only source of cost information collected by NOAA Fisheries in the Northeast region for vessel-level repairs, upgrades, fees

and insurance, and business level/overhead costs (e.g., trucking, advertising, administration). A survey is underway to update the available information, but the results were unavailable when this document was drafted.

All active, federally permitted commercial fishing vessels owned by individuals operating in the Northeast region were sent the SSB cost survey. An active fishing vessel was defined as holding at least one federal fishing permit and reporting landings of at least one pound of finfish or shellfish through the Northeast seafood dealer reporting system or through the vessel trip report (VTR) during the cost years 2011 and 2012. The definition was slightly modified in 2015 to only include vessels that had dealer-reported landings. This excluded VTR trips associated with federally permitted party/charter vessels. Data derived from those survey years are reported in this analysis to compare similar costs against the groundfish program on the West Coast.

Variable costs are collected using a different method. Trip level costs are collected on observed trips. Econometric modeling is used to predict trip costs for trips where costs were not observed (Werner et al, 2020). Econometric modeling adjusts for biases within the trip cost data, as data collectors are stratified by biological data needs rather than economic.

Trip level costs are provided using information from the 5-year review. That report summarized changes in net revenue, where net revenue was calculated as ex-vessel revenue less trip level costs. Various caveats should be noted when considering the vessel and trip cost data. First, trip costs are derived using different methodologies. Second, the most recent year of the cost surveys was 2015. Third, the response rate for the trawl sectors was relatively low in all three years of the SSB cost survey, with response rates falling from about 30 percent in 2011 to about 7 percent in 2015. The pot/trap sectors also exhibited similar trends, as did most other sector's response rates (Table 9-30).

Detailed fixed cost categories were surveyed in 2011, 2012, and 2015. Questions and the structure of the surveys were not constant over the three years. As a result, data had to be rearranged to form consistent groupings. Those cost category groupings are provided in the appendix (Section 9.3) and summarized Figure 4-13. The information in that table shows that while the total fixed costs have declined, the vessel permit and value have also declined from 2011 to 2015. Recall the vessel and permit value was collected as a metric to represent the economic health of the fishery.

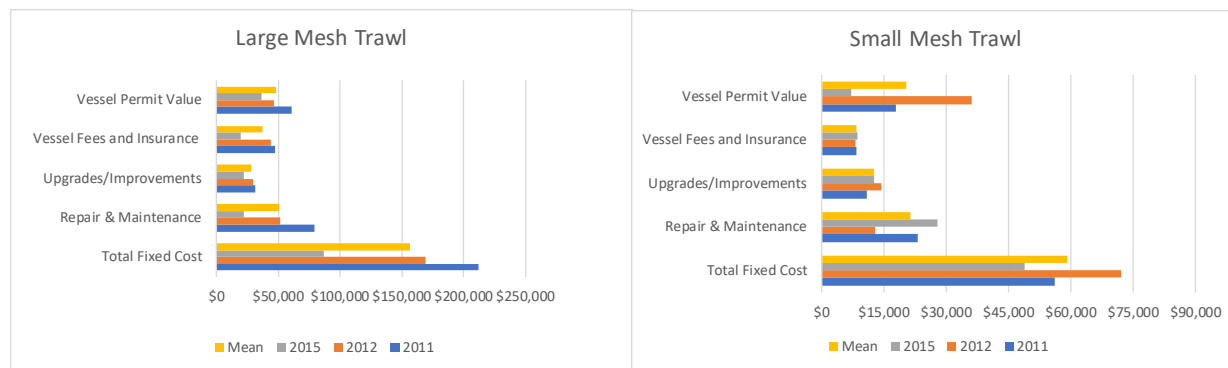


Figure 4-13 Northeast Sector mean fixed costs per sector, 2011, 2012, and 2015 (2020 \$).

The recent five-year review of the Northeast Sector program provides a summary of cost data and “profitability” of trips and vessels. The review notes that estimating profitability in commercial fishing requires a full account of revenues, variable costs (costs associated with at-sea operation) and fixed costs (costs that are constant despite vessel operation). It also notes that cost data for crew and recent year for fixed costs are limited because the most recent fixed cost survey data that are available were conducted in 2015 and the voluntary survey had a low response rate. Because of the fixed cost data limitations, trip

costs including the cost of supplies, groceries, bait, fuel, ice, water and oil, were used to estimate net revenues (revenue minus variable costs). Trip level costs are more current and complete than vessel level costs. Trip cost data do not include leasing quota, crew payments, sector fees, or at-sea monitoring costs.

Net revenues were used in the five-year review<sup>31</sup> to track the financial performance of the groundfish fleet at the groundfish trip, vessel, and entity level. Net revenues per groundfish vessel were generally higher after the implementation of the sector management program. Average net revenues per vessel ranged from \$199,000 to \$224,000 with a mean of \$210,000 over 2007-2009. The range increased to \$283,000 to \$364,000 (a mean of \$325,000) from 2010 through 2015. The changes represent a 55% increase in average net revenues from the pre- to post-sector time period. However, it is noted that including leasing of quota, changes in crew payments, sector fees that would not have been incurred prior to the sector program, and additional at-sea monitoring costs – if they are paid by industry in the future the magnitude or direction of the estimate could change.

Variable trip costs per hour (fuel, ice, bait, supplies, groceries, water and oil) were \$40.9/hour pre catch share (\$982 / 24-hour day) and increased to \$43.4/hour (\$1,042 / 24-hour day) post-catch share period. Average trip costs per hour are primarily impacted by average fuel prices, as fuel expenditures generally accounted for about 78% of total trip costs.

Note that for the same reasons the 5-year review did not attempt to calculate total net revenue in the fishery, this analysis does not either. Too many assumptions would be required, making the conclusions unreliable.

Monitoring costs, for the Northeast trawl vessels have been - and are - currently paid by federal funding, with the fleet currently being reimbursed for costs by the Atlantic States Marine Fisheries Commission. Daily observer costs were estimated to cost about \$700. As described in Section 2.2, the goal of the monitoring program had been to determine the level of at-sea monitoring coverage required to estimate discards for each Northeast multispecies stock with no greater than a 30-percent coefficient of variation, but Amendment 23 changed the structure starting in 2023.

### 4.3 Canadian Pacific Individual Vessel Quota Program

DFO has in the past administered the “Costs and Earnings Survey” to collect information, but low response rates made efforts in years leading up to 2008 unsuccessful. In 2008, with DFO’s Pacific Region Economic Analysis Unit guidance, and industry participation, Stuart Nelson was retained to develop a methodology to assess the financial situation of several commercial fleets for the 2007 calendar year (Nelson, 2009). Additional fleet profiles were added to the series in 2011. Discussions with Bruce Turriss indicated that DFO has undertaken an updated data collection with good response rates. Information from that survey was not available when this document was drafted. As a result, much of the information in this analysis relies on data collected by Nelson (2011) for the fleet profiles he developed for the 2009 fishing year. Direct comparisons across years are not made for the Canada profiles, based on the advice of the author. This also means that baseline data, prior to development IVQ program, are not provided.

The author noted that while all profiles are part of the series, there are important methodological differences between the studies in terms of the data used, the quantity of data used in generating estimates, and the presentation of results. Nelson stated that “while *results within a single study are comparable, users should use caution when making comparisons between studies*, including between years.” In addition, the author cautions that values within the studies were not based on a census or always even a statistically validated sample. “Consequently, it is best to view the reports as providing a

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<sup>31</sup> [https://s3.amazonaws.com/nefmc.org/Sector-Program-Review\\_Final-May2021.pdf](https://s3.amazonaws.com/nefmc.org/Sector-Program-Review_Final-May2021.pdf)



range of estimates validated by the informed judgement of the authors. Users should not use these numbers without thoughtful consideration.” Fixed costs may or may not allocate between fisheries when vessels participated in more than one fishery. The degree of aggregation by cost categories is consistent across reports but were based on the fisheries examined and the level of information available.

Other sources of data are provided on government websites, but that information only focused on landings and revenue<sup>32</sup>. Also, DFO reportedly conducted another mandatory cost and earnings survey. Response rates were reported to be good, but published results were not available for this paper.

The groundfish trawl license (T license) renewal fee for 2022/2023 is based on the combination of a base license fee of \$521.22 and the Permanent IVQ holdings assigned to the license on February 20<sup>th</sup> each year. The IVQ fee portion of the license renewal cost for 2022/2023 is shown in Table 4-3. In accordance with the Service Fees Act, the annual license renewal fees are adjusted by the annual rate of inflation as determined by the Consumer Price Index (CPI) published by Statistics Canada.

Table 4-3 Trawl vessel license renewal fee for 2022/2023

IVQ species	Fee per mt of IVQ	Fee per pound of IVQ
All rockfish species	\$ 15.64	\$ 0.0071
All sole species	\$ 16.68	\$ 0.0076
Lingcod	\$ 16.68	\$ 0.0076
Pollock	\$ 7.82	\$ 0.0035
Hake	\$ 4.17	\$ 0.0019

Source: <https://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/fees-frais-22-23-eng.html#groundfish>

Figure 4-14 shows the percentage of cost and earnings in the BC IVQ fishery as a percentage of total ex-vessel revenue. Earnings before interest payments, taxes, depreciation, and amortization were about 15% of gross ex-vessel revenue for the fleet in total. License fees, including the quota fees to help offset management costs, were about 3% of gross ex-vessel revenue, or about the same as the West Coast IFQ sector’s cost recovery fee. Monitoring costs were more than 4% gross ex-vessel value. Note that not all costs are included in the calculation, so the reported earnings over-estimate the total profit for the vessels.

<sup>32</sup> [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/statistics/industry-and-sector-profiles/sector-reports/british\\_columbias\\_fisheries\\_and\\_aquaculture\\_sector\\_2016\\_edition.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/statistics/industry-and-sector-profiles/sector-reports/british_columbias_fisheries_and_aquaculture_sector_2016_edition.pdf) <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/336686.pdf>

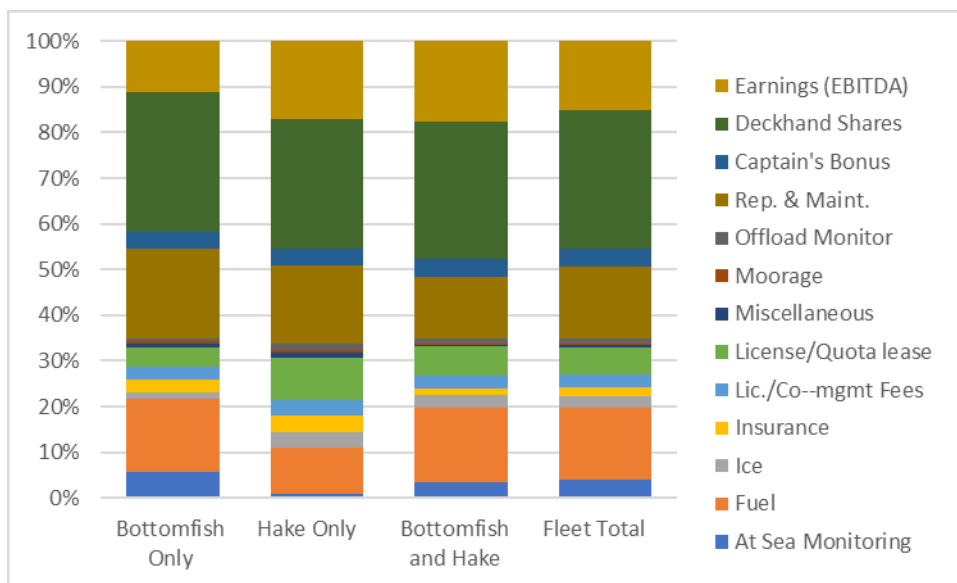


Figure 4-14 Percent of ex-vessel costs and Northeast revenue associated relative to total revenue, 2009

Source: Nelson 2011

Figure 4-15 provides similar information, but the data are shown in real 2020 dollars as opposed to a percentage of total revenue. The figure is provided to show the difference in cost and earnings by value and not percentage.

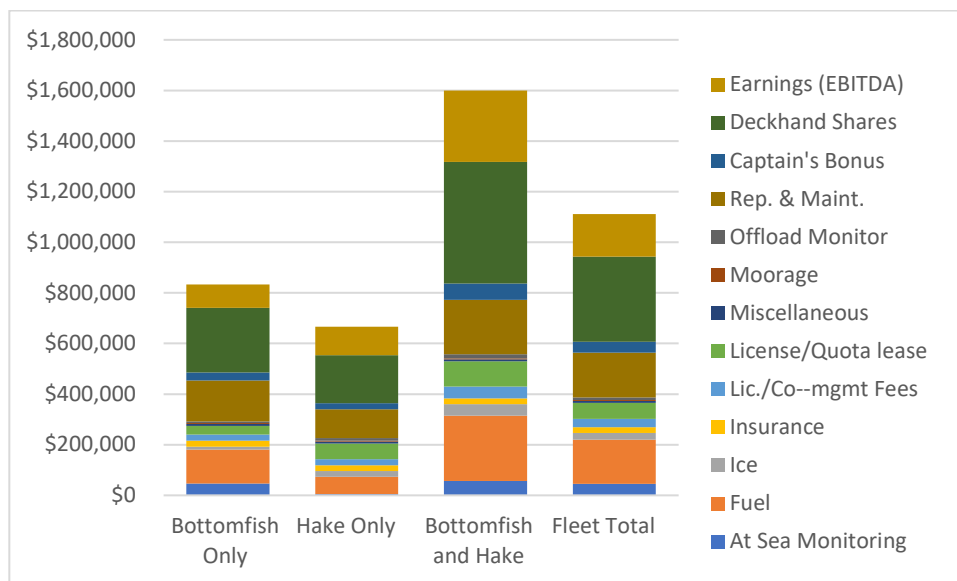


Figure 4-15 BC cost by fishery and expense group and earnings, 2009

Source: Nelson 2011

Table 4-4 shows the most recent cost data available for the BC trawl fishery. As noted, more recent information may be available soon, and the result of a recent survey. This information was not available for the final draft.

Table 4-4 British Columbia Groundfish Trawl Fleet Vessel Totals and Mean Costs from 2011 (converted to 2020 U.S. \$)

Groundfish Trawl Fleet	Bottomfish Only	Hake Only	Bottomfish and Hake	Fleet Total
Vessels (count)	31	8	25	64
Landings (lb.) – All Species	1,094,591	3,872,780	4,984,328	2,961,293
Vessel Price (per Lb.)	\$0.50	\$0.11	\$0.21	\$0.24
Gross Revenue (Gross Stock)	\$832,939	\$666,815	\$1,599,907	\$1,111,771
Less: Fishery Specific Expenses				
Fuel	\$133,097	\$68,557	\$257,729	\$173,714
At sea monitoring	\$47,271	\$5,142	\$56,738	\$45,703
Offload Monitor	\$6,253	\$9,834	\$16,740	\$10,797
License / Co--management Fees	\$24,098	\$23,433	\$46,229	\$32,660
License/Quota lease	\$34,996	\$62,430	\$100,318	\$63,942
Ice	\$12,409	\$22,852	\$46,309	\$26,957
Bait	\$0	\$0	\$0	\$0
Gear Maintenance/replace	\$0	\$0	\$0	\$0
Total Fishery Specific Expenses	\$258,125	\$192,248	\$524,063	\$353,772
Net Revenue (Net Stock)	\$574,814	\$474,567	\$1,075,845	\$757,998
Less:				
Captain's Bonus	\$32,064	\$23,728	\$64,104	\$43,537
Deckhand Shares	\$255,040	\$189,827	\$481,001	\$335,154
Fishery Contribution (Boat Share)	\$287,711	\$261,012	\$530,739	\$379,307
Vessel Fixed Expenses				
Insurance	\$22,852	\$22,852	\$22,852	\$22,852
Repairs & Maintenance	\$162,178	\$114,262	\$214,812	\$176,749
Moorage	\$3,047	\$3,047	\$3,047	\$3,047
Miscellaneous	\$7,617	\$7,617	\$7,617	\$7,617
Total Vessel Expenses	\$195,695	\$147,779	\$248,329	\$210,266
Earnings (EBITDA)	\$92,016	\$113,233	\$282,410	\$169,041

Source: Nelson, 2011

To compare BC IVQ industry costs to those in the West Coast trawl Groundfish fisheries Table 4-5 is provided. The costs were from the most current cost survey years available (excluding COVID-19 years). The BC IVQ program and West Coast surveys were developed using different survey designs and covered different years. Caution should be used when drawing definitive comparisons. For example, the cost data for the BC IVQ observers/EM was prior to the fleet using EM. The costs are expected to be

lower now, since the entire fleet has opted to use EM. How much the reported 5.1% of ex-vessel value decreased is not known with information available.

Table 4-5 Industry BC IVQ and West Coast Trawl Groundfish costs

Item	2014-2019			2009
	WC CV	WC MS	WC CP	BC
Net Revenue (Total Cost)	27.4%	10.0%	42.5%	15.2%
Variable Costs	55.0%	70.7%	42.6%	67.9%
Lic./mgmt Fees/cost recovery	2.7%	n/a	0.1%	2.9%
Observers/EM	2.7%	0.5%	0.5%	5.1%
Buyback Fees	4.8%	n/a	n/a	
Labor	29.9%	22.3%	22.0%	34.1%
Fish Purchases	n/a	27.5%	n/a	
Fuel	10.4%	9.6%	10.1%	15.6%
Other Variable Costs	4.5%	10.8%	9.9%	10.2%
Fixed Costs	17.6%	19.3%	14.9%	16.9%
Fishing Gear	3.0%	1.8%	1.3%	
Processing Equipment	n/a	3.5%	3.6%	
Onboard Equipment	9.3%	9.5%	6.7%	
Other Fixed Costs	5.3%	4.4%	3.3%	

#### 4.4 Alaska Trawl Catch Share Programs

Certain catch share fisheries under the authority of the NPFMC are currently (or have been) subject to reporting economic data (costs). Revenue information is collected through other reports (e.g., fish tickets) and not described here. Each fishery has different Economic Data Report (EDR) requirements. The only catcher vessel trawl fisheries that have EDRs are the Central GOA Rockfish Program trawl fishery vessels and the AFA fishery vessels. AFA catcher-processors and non-pollock trawl catcher-processors, typically referred to as the Amendment 80 or A80 sector are subject to EDR requirements, with the Amendment 80 catcher-processors being required to submit the most detailed annual cost reports. Also note that the NPFMC is considering restructuring all the EDRs to collect limited, but similar information, for all fisheries (NPFMC 2023).

The GOA trawl fishery EDR collects information on fuel and fluids purchased, fishing gear costs, excluder device cost, and captain and crew cost and license information. No other fishing cost information is collected from the fleet on an annual or systematic basis

AFA EDRs focuses on Chinook salmon bycatch and measures employed to avoid catching Chinook incidentally to pollock harvests. A fuel survey also collects information on the average rate of fuel consumption and annual fuel purchases (in dollars and gallons). Fuel information excludes lubrication and

fluids costs. Because of the limited cost information collected under these reports, it is not used to compare costs in this study. However, the costs of collecting those data are presented.

Table 4-6 outlines the historic administrative costs associated with EDR data collection and the cost recovery paid by participants of rationalized programs to fund these administrative costs. The Crab program is included to show the impact of auditing CDRs had on the cost of running that program. The GOA Trawl program will no longer be active in 2023 since the NPFMC is not currently developing a broader trawl catch share program for the GOA.

Table 4-6 Cost Recovery and PSMFC Administrative Costs of the Alaska EDR Programs

<i>Program/Year</i>	<i>Crab<sup>1</sup></i>	<i>A80</i>	<i>AFA<sup>2</sup></i>	<i>Cost Recovery Total</i>	<i>GOA Trawl<sup>3</sup></i>	<i>Total EDR cost</i>
2005	\$150,000			\$150,000		\$150,000
2006	\$150,000			\$150,000		\$150,000
2007	\$259,938			\$259,938		\$259,938
2008	\$338,276			\$338,276		\$338,276
2009	\$314,303			\$314,303		\$314,303
2010	\$352,508			\$352,508		\$352,508
2011	\$323,588			\$323,588		\$323,588
2012	\$373,316			\$373,316		\$373,316
2013	\$318,278			\$318,278		\$318,278
2014	\$342,703			\$342,703		\$342,703
2015	\$269,583			\$269,583	\$53,771	\$323,354
2016	\$345,509	\$88,254	\$62,114	\$495,877	\$73,221	\$569,098
2017	\$180,168	\$91,482	\$66,929	\$338,579	\$91,879	\$430,458
2018	\$202,012	\$92,462	\$40,631	\$335,105	\$61,765	\$396,870
2019	\$180,224	\$87,644	\$56,989	\$324,857	\$57,486	\$382,343
2020	\$91,620	\$72,976	\$48,194	\$212,791	\$107,459	\$320,250
2021	\$72,927	\$85,123	\$52,735	\$210,786	\$73,240	\$284,026

Source: EDR Amendment Final Action (February 2022)<sup>33</sup>

<sup>1</sup> The year listed in this table reflects the first year of the crab fishing season, since it spans two calendar years.

<sup>2</sup> Only includes costs associated with the inshore sector

<sup>3</sup> Only includes PSMFC administrative costs

PSMFC is the Data Collection Agent for the EDRs. The costs of the EDR efforts are primarily borne by AFSC. Catch share programs have cost recovery requirements that may be used to support EDR programs. EDRs are funded through NOAA Fisheries' Data Collection Grant which is then passed on to PSMFC. AFSC manages the grant and oversees PSMFC's scope of work for each of the EDR projects.

<sup>33</sup> <https://meetings.npfmc.org/CommentReview/DownloadFile?p=9409e0da-1e1a-4e07-9654-1b49cafebac6.pdf&fileName=D5%20Universal%20Data%20Collection%20Discussion%20Paper.pdf>

PSMFC submits expenditure reports to NOAA Fisheries (NPFMC 2023). Copies of the data collection instruments are available on the PSMFC website<sup>34</sup>.

In addition to agency costs, industry also realizes the costs of preparing and submitting EDRs. To estimate the cost to the industry cost per hour and number of hours to complete the forms are needed. Based on Paperwork Reduction Act reports, an estimate of \$37 per hour for small vessel operators to complete the form was used as the low end of the range. The estimate of \$37 per hour has not been systematically validated through surveys. The upper estimate for the hourly expense identified for EDRs was \$165 per hour for the crab EDR and \$75 per hour for the AFA EDR, based on comments received on past EDR renewals. The Amendment 80 EDR is estimated to take 22 hours, the crab EDR is estimated to take 20 hours, and the GOA Trawl EDR form was estimated to take 15 hours to complete and submit (NPFMC 2023).

#### **4.5 Summary Comparison of Total Net Revenue and Specific Costs**

A direct comparison of a time series of all costs and total net revenues by fishery cannot be provided because of a lack of consistent data within and between fisheries. A limited comparison of variable cost less gross ex-vessel revenue is provided in Table 4-7 for the fisheries the Council specifically asked to be considered but should be viewed with caution when making conclusions. The SSC requested that costs for other LAPPs be considered in this study. While the net revenue information is limited to the Fisheries requested by the Council, specific agency cost categories are provided for a broader selection of U.S. LAPPs.

##### **4.5.1 Total Net Revenue**

Fixed cost data for the Northeast Groundfish Sector program and both variable and fixed costs for the BC IVQ program are either outdated, incomplete, or both. There have also been many changes in the fisheries, markets, and policies that have taken place since 2009 and 2015. While the data from the Northeast Groundfish Program and the BC IVQ program were updated to real 2020 dollars and the BC IVQ program data was converted to U.S. dollars using an average 2020 exchange rate, those changes do not capture the fundamental, underlying changes in the economy and fish markets that could impact changes in revenue less variable cost shown in Table 4-7. As a result of the limited data that are available, cost comparisons across LAPPs (and the Northeast Sector Program) are focused on monitoring, cost recovery, and other agency costs when available.

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<sup>34</sup> <https://www.psmfc.org/edr/>

Table 4-7 Revenue minus variable costs by fishery, mean per vessel (millions of 2020 U.S. \$)

Fishery	Species Groups	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
WC CV	Gf. fixed gear w/ trawl end.	\$0.028	\$0.087	\$0.192	\$0.113	\$0.108	\$0.143	\$0.141	\$0.190	\$0.205	\$0.136	\$0.128	\$0.056
WC CV	Gf with trawl gear	\$0.122	\$0.109	\$0.179	\$0.171	\$0.188	\$0.173	\$0.209	\$0.242	\$0.286	\$0.201	\$0.195	\$0.096
WC CV	Whiting	\$0.123	\$0.239	\$0.655	\$0.513	\$0.738	\$0.561	\$0.248	\$0.387	\$0.611	\$0.497	\$0.579	\$0.337
WC CV	Trawl catch share fisheries*	\$0.148	\$0.173	\$0.364	\$0.296	\$0.378	\$0.324	\$0.242	\$0.314	\$0.425	\$0.331	\$0.371	\$0.219
WC MS	Whiting	\$1.368	\$2.085	\$2.216	\$1.672	\$1.995	\$2.753	\$1.784	\$2.207	\$3.836	\$2.869	\$1.883	na
WC CP	Whiting	\$4.356	\$6.589	\$3.956	\$3.391	\$4.900	\$7.104	\$4.201	\$5.748	\$6.589	\$6.638	\$7.783	\$7.133
WC Shoreside Processor (gf prod)		\$1.658	\$1.201	\$1.840	\$1.528	\$1.406	\$1.424	\$0.639	\$0.663	\$1.255	\$2.712	\$1.919	\$2.616
NE Sector Groundfish		\$0.210	\$0.296			\$0.283		\$0.364					
BC IVQ Bottomfish Only		\$0.288											
BC IVQ Hake Only		\$0.261											
BC IVQ Bottomfish and Hake		\$0.531											
BC IVQ Fleet Total		\$0.379											

Sources: FISHEyE, Northeast Sector 5-year review, Nelson 2011.

\*Includes all catcher vessels submitting an EDR.

Discussions with stakeholders from the IFQ, mothership, and catcher-processor sectors, Section 3.0 and Appendix 8.1, indicated that three of their primary cost concerns were monitoring costs, agency costs (especially those associated with recoverable costs), and cost recovery fees. IFQ stakeholders expressed the greatest concern with monitoring costs in the IFQ program and cost recovery fees in the West Coast Groundfish Trawl Program.

#### 4.5.2 Agency Costs

The structure of LAPPs and the regulations included under each structure have a substantial impact on the costs the management agencies incur to manage and enforce the program. Certain direct agency costs that would not have been incurred if the program were not in place can be collected from permit holders through cost recovery. This section provides a summary of costs that are a direct result of the programs considered, to the extent they are available.

##### 4.5.2(a) Pacific Coast Groundfish Trawl Rationalization Program

Direct program costs in fiscal year 2022 are presented in Table 4-8. Costs are reported for all three sectors by NMFS office (WCR, NWFSC, and OLE) and by cost category. Monitoring the program and issuing permits accounted for about 75% of the IFQ sector costs. During the years 2017 through 2021 the percentage for monitoring and permit costs ranged from 43% to 66%. The increase for 2022 was largely due to the PSMFC grant to support EM. The Scientific Data Management grant, Social and Economic data, and enforcement accounted for the next most costs. Additional information on the program costs is presented in the annual cost recovery report (see Table note for source).

Table 4-8 Pacific Coast Groundfish Trawl Rationalization Program Costs, FY 2022

	<i>IFQ</i>		<i>CP</i>		<i>MS</i>	
<b>West Coast Region</b>	\$	%	\$	%	\$	%
Groundfish	\$29,570	2%	\$4,484	13%	\$18,249	14%
Operations & Policy (OPB)	\$11,893	1%	\$11,490	34%	\$12,013	9%
Permits & Monitoring	\$45,267	3%	\$1,142	3%	\$13,936	11%
Scientific Data Management grant	\$153,565	9%	\$242	1%	\$10,912	8%
Pacific States Marine Fisheries Commission grant	\$688,104	40%	\$0	0%	\$11,175	9%
Total	\$928,398	55%	\$17,357	51%	\$91,971	71%
<b>Northwest Fisheries Science Center</b>						
Fisheries Observation Science	\$550,699	32%	\$194	1%	\$47,753	37%
Economics & Social Science Research	\$129,188	8%	\$9,970	29%	\$10,573	8%
Total	\$679,188	40%	\$10,164	30%	\$58,326	45%
<b>Office of Law Enforcement (OLE)</b>	\$87,363	5%	\$5,982	18%	\$3,812	3%
Total personnel and contract/grant costs	\$1,695,648	100%	\$33,503	99%	\$11,175	9%
Total travel costs	\$1,647	0%	\$337	1%	\$337	0%
Total printing costs	\$4,609	0%	\$0	0%	\$0	0%
Total costs	\$1,701,903	100%	\$33,840	100%	\$128,759	100%

Source: <https://www.pccouncil.org/documents/2023/03/g-2-a-nmfs-report-1-pacific-coast-groundfish-trawl-rationalization-program-2023-cost-recovery-annual-report-fee-calculation-for-2023-and-fishing-year-2022-payments.pdf/>



Table 4-9 provides more detailed information on recoverable costs. The expenditure information is provided for the 2017 through 2021 fishing years. Cost recovery reports for earlier years did not report this level of detail, so that information is not included in this table. The more detailed reports are a result of stakeholder requests for additional expenditure information.

Table 4-9 Detailed NOAA Fisheries costs for 2017 through 2021 fishing years

	<i>Nominal costs during fishing year</i>				
	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<b>West Coast Region</b>					
<b>IFQ</b>					
<i>Groundfish</i>	\$121,463	\$46,834	\$49,719	\$69,826	\$62,693
<i>Permits</i>	\$142,255	\$35,572	\$31,089	\$64,838	\$44,040
<i>NWFSC Information Technology (IT)</i>	\$370,481	\$370,535	<i>n/a</i>		
<i>OPB</i>	<i>n/a</i>	<i>n/a</i>		\$21,766	\$10,741
<i>NWFSC (SDM)</i>	<i>n/a</i>	<i>n/a</i>	\$496,071	\$228,951	\$181,909
<i>PSMFC</i>	\$199,361	\$201,882	\$278,655	\$269,994	\$618,595
<b>C/P</b>					
<i>Groundfish</i>	\$34,236	\$22,253	\$36,364	\$23,539	\$9,408
<i>Permits</i>	\$1,127	\$1,796	\$1,903	\$848	\$3,730
<i>OPB</i>				\$18,950	\$4,050
<i>NWFSC (SDM)</i>				\$2,889	\$2,463
<i>NWFSC (IT)</i>	<i>na</i>	<i>na</i>	\$20,294		
<i>PSMFC</i>	<i>na</i>	<i>na</i>	<i>na</i>	-	
<b>MS</b>					
<i>Groundfish</i>	\$28,740	\$17,706	\$24,104	\$17,426	\$30,564
<i>Permits</i>	\$1,770	\$4,160	\$9,457	\$24,115	\$15,642
<i>NWFSC (IT)</i>	<i>na</i>	<i>na</i>	<i>n/a</i>		
<i>OPB</i>			\$20,089	\$19,063	\$5,746
<i>NWFSC (SDM)</i>			<i>na</i>	\$21,509	\$7,759
<i>PSMFC</i>			<i>na</i>	-	\$14,986
<b>Total</b>	<b>\$899,432</b>	<b>\$700,737</b>	<b>\$967,745</b>	<b>\$783,714</b>	<b>\$1,012,326</b>
<b>Northwest Fisheries Science Center</b>					
<b>IFQ</b>					
<i>Economics and Social Science Research (ESSR)</i>	\$262,100	\$188,504	\$130,461	\$332,758	\$58,955
<i>ESSR Contractors</i>	\$185,988	\$211,190	\$187,999		\$174,842
<i>Fisheries Observation Science (FOS)</i>	\$187,229	\$159,407	\$154,584	\$511,945	\$188,308
<i>FOS Contractors</i>	\$52,567	\$47,384	\$48,041		\$291,731
<i>PSMFC</i>	\$427,077	\$390,704	\$343,878		
<b>C/P</b>					
<i>Economics and Social Science Research</i>	\$10,369	\$3,789	\$556	\$16,414	\$1,685
<i>ESSR Contractors</i>	\$27,309	\$10,343	\$24,972		\$4,011
<i>Fisheries Observation Science</i>	\$1,744	\$593	\$828	\$152	\$160

	Nominal costs during fishing year				
	2017	2018	2019	2020	2021
<i>FOS Contractors</i>	<i>na</i>	<i>Na</i>	<i>Na</i>		
<i>PSMFC</i>	<i>na</i>	<i>Na</i>	<i>Na</i>		
<b>MS</b>					
<i>Economics and Social Science Research</i>	\$33,554	\$12,709	\$12,592	\$19,989	\$4,461
<i>ESSR Contractors</i>	\$55,149	\$23,100	\$25,366		\$5,768
<i>Fisheries Observation Science</i>	<i>na</i>	\$2,248	\$4,767	\$43,017	\$28,841
<i>FOS Contractor</i>	\$848	\$846	\$858		\$7,938
<i>PSMFC</i>	\$4,314	\$10,631	\$9,357		
<b>NW Fisheries Science Center Total</b>	<b>\$1,248,248</b>	<b>\$1,061,448</b>	<b>\$944,259</b>	<b>\$924,276</b>	<b>\$766,700</b>
<b>Office of Law Enforcement</b>					
<b>IFQ</b>					
<i>FTE</i>	\$62,765	\$101,642	\$66,661	\$25,026	\$44,085
<i>Contractor</i>	\$4,463		<i>na</i>		
<b>C/P</b>					
<i>FTE</i>	\$2,032	\$8,405	\$520	\$352	\$10,450
<b>MS</b>					
<i>FTE</i>	\$4,079	<i>na</i>	\$572	\$9	\$1,560
<b>OLE Total</b>	<b>\$73,339</b>	<b>\$110,047</b>	<b>\$67,753</b>	<b>\$25,387</b>	<b>\$56,095</b>
<b>Personnel Total</b>	<b>\$2,221,019</b>	<b>\$1,872,232</b>	<b>\$1,979,757</b>	<b>\$1,733,378</b>	<b>\$1,835,121</b>
<b>Other Costs Total</b>	<b>\$39</b>	<b>\$0</b>	<b>\$20,408</b>	<b>\$486</b>	<b>\$19,633</b>
<b>Grand Total</b>	<b>\$2,221,058</b>	<b>\$1,872,232</b>	<b>\$2,000,165</b>	<b>\$1,733,863</b>	<b>\$1,854,754</b>

Source: Annual Cost Recovery Reports

#### 4.5.2(b) AFA

Information in this section was primarily derived from the AFA cost recovery fee report:

<https://www.fisheries.noaa.gov/s3/2023-02/afa-pollock-cost-recovery-fee-report-2022-akro.pdf>.

Costs in this section (see Table 4-10) focus on the inshore sector of the fishery because catcher-processors have not been included in the cost recovery fee reports since 2018 and motherships since 2019. These sectors are not included because management costs are relatively low and fees that were more than direct costs were collected in prior years can cover current costs. The majority of costs associated with the catcher-processor and mothership sectors were maintenance of the catch accounting system, programming and web design for online applications, observer sampling station inspections, data quality assurance, and administering Amendment 91 Chinook Salmon Bycatch Economic Data Reports.

The most direct AFA inshore program costs for FY 2022 were attributed to OLE. Costs accrue to support personnel engaged in enforcing fines, investigation, and outreach efforts. The second highest direct program costs were attributed to the Alaska Fisheries Science Center. Cost supported the Fisheries Monitoring and Analysis (FMA) and Resource Ecology and Fisheries Management (REFM) Divisions. The FMA division operates the North Pacific Observer Program, which deploys observers onboard fishing vessels to collect catch data. The Observer Program also provides quality control and quality assurance on data provided by the observers. The REFM division operates the Economic and Social Sciences Research Program which administers the Chinook Salmon Economic Data Report Program, providing NOAA Fisheries Alaska Region with data to assess the effectiveness of the Amendment 91

Chinook salmon bycatch management measures. NOAA Fisheries Alaska Region was the third highest contributor to costs, largely due to changes in contract costs. Contract costs are related to development, support, and maintenance of data flow for the trawl EM and cost recovery programs. Personnel category costs support eLandings<sup>35</sup> and maintenance of the Catch Accounting System. These costs were apportioned based on a formula that includes weighting factors for the degree of complexity, amount of integration, time sensitivity, and workload for eLandings maintenance tasks. These are then used to calculate the proportion of eLandings tasks that can be attributed to each program sector. Additionally, there are NOAA Fisheries personnel costs for at-sea scale inspections and general program administration. PSMFC costs are for personnel that support data collection, analysis, the administration of AFA EDRs and time spent on updates to the website. No Alaska Department of Fish & Game (ADF&G) costs were incurred in FY 2022.

Table 4-10 AFA Inshore Program Costs, FY 2020 through FY 2022

<i>AFA Inshore</i>	<i>FY 2020</i>		<i>FY 2021</i>		<i>FY 2022</i>	
Cost Category	\$	%	\$	%	\$	%
Personnel/Overhead	\$233,484	62%	\$287,518	60%	\$309,541	62%
Travel	\$322	0%	\$644	0%	\$494	0%
Transportation	\$0	0%	\$0	0%	\$0	0%
Printing	\$0	0%	\$0	0%	\$4,500	1%
Contracts/Training	\$29,152	8%	\$118,691	25%	\$167,646	33%
Supplies	\$2,177	1%	\$0	0%	\$738	0%
Equipment	\$26,028	7%	\$210	0%	\$2,000	0%
Rent/Utilities	\$42,200	11%	\$11,208	2%	\$17,868	4%
Other	\$45,187	12%	\$62,830	13%	\$198	0%
Total Direct Costs	\$378,550	100%	\$481,120	100%	\$502,984	100%

#### 4.5.2(c) Crab Rationalization Alaska

Information in this section was primarily derived from the cost recovery fee report:

<https://www.fisheries.noaa.gov/s3/2023-02/crab-cost-recovery-fee-report-2021-2022-akro.pdf>

Management of Crab Rationalization fisheries is delegated to the State of Alaska. As a result, ADF&G incurs the highest costs of all management units involved in the program. Table 4-11 shows that ADF&G's largest cost component is personnel to support the added duration and complexity of management, stock assessment, and monitoring programs implemented through rationalization. Personnel, and the associated administrative overhead costs increased between FY2020 and FY2021. Contract and training expenses, which support crab observer deployment and training, decreased.

OLE is tasked with inspections, boardings, investigations and enforcement activities. The two largest cost categories are for personnel and contracting. Costs are reflective of the number of participants (75-80

<sup>35</sup> The Interagency Electronic Reporting System for reporting commercial fishery landings in Alaska. eLandings is used to report landings and/or production data for groundfish, IFQ/CDQ halibut and sablefish, and IFQ/CDQ crab and Community of Adak golden king crab. In the future, the system will include landings for shellfish and salmon.

boats), complexity of the program, and duration of Crab Rationalization fisheries. Costs decreased between FY2020 and FY2021, primarily due to reduced personnel costs.

NMFS Operations and Management Division (OMD), NMFS Information Services Division (ISD), and NMFS Sustainable Fisheries (SF) support eLandings, provide maintenance of the catch accounting system, develop and implement regulatory actions, determine fees and collection processes, and provide training and outreach for electronic reporting of crab harvest. Costs increased for these operating units between FY2020 and FY2021, primarily due to contract renewals.

NOAA Fisheries Restricted Access Management (RAM) issues permits, handles transfers of QS and IFQ, and answers questions about permits and transfers. RAM incurs the largest share of costs of NOAA Fisheries operating units. Costs increased between FY2020 and FY2021, primarily due to increased contract costs.

For other operating units, NMFS Financial Service Division (FSD) costs decreased for FY2021 due to fewer servicing actions and processing of crab loans compared to the increase in loans seen in FY2020 due to the onset of COVID-19. NOAA Fisheries RA/OAA did not report any appeals costs in FY2021. Overall, NOAA Fisheries costs increased between FY2020 and FY2021.

The AFSC and PSMFC support administration of the Crab Rationalization Program Economic Data Reports. AFSC costs decreased, while PSMFC costs increased between FY2020 and FY2021, primarily due to decreases and increases in personnel expenses, respectively.

Table 4-11 Crab Rationalization Program costs for 2021/2022 crab season

<i>Crab 2021/2022</i>	<i>ADF&amp;G</i>	<i>OLE</i>	<i>OMD</i>	<i>ISD</i>	<i>SF</i>	<i>RAM</i>	<i>FSD</i>	<i>AFSC</i>	<i>PSMFC</i>	<i>Total</i>	<i>% of Total</i>
Personnel	\$827,026	\$46,463	\$10,465	\$63,503	\$23,022	\$55,227	\$6,553	\$15,884	\$49,042	\$1,097,186	42%
Benefits		\$27,917						\$6,645	\$20,875	\$55,436	2%
Travel	\$12,549				\$2,460					\$15,010	1%
Transportation											0%
Printing											0%
Ace Contract				\$64,651	\$115,721	\$286,802				\$467,175	18%
Contracts/Training	\$209,532	\$437,702							\$526	\$647,760	25%
Training											0%
Contract fees		\$8,631		\$1,293	\$2,314	\$5,736				\$17,974	1%
Supplies	\$2,422								\$53	\$2,475	0%
Equipment											0%
Rent/Utilities d		\$52,451	\$1,692	\$6,993	\$7,376	\$8,264			\$1,900	\$78,676	3%
Overhead	\$203,557								\$8,471	\$212,028	8%
Other e									\$506	\$506	0%
Total	\$1,255,087	\$573,163	\$12,157	\$136,441	\$150,894	\$356,030	\$6,553	\$22,529	\$81,374	\$2,594,226	100%
% of Total	48%	22%	0%	5%	6%	14%	0%	1%	3%	100%	

#### 4.5.2(d) Halibut and Sablefish IFQ

Information in this section was primarily derived from the cost recovery fee report:

<https://www.fisheries.noaa.gov/s3/2023-02/ifq-cost-recovery-2022-akro.pdf>

NOAA Fisheries Alaska Region separates costs by operating units, including NMFS Restricted Access Management (RAM), NMFS ISD, NMFS OLE Alaska Division, NMFS SF, NMFS Financial Service

Division (FSD), NMFS OMD, and NMFS Regional Administrator Office/Office of Administrative Appeals (RAO/Appeals).

Among NOAA Fisheries operating units, OLE expenses accounted for roughly half of the IFQ program costs (Table 4-12). OLE has high direct costs for the IFQ Program due to the high number of participants and regulatory complexity. OLE's primary cost is personnel for enforcement monitoring and investigations of the IFQ program due to the high number of participants (1100+ vessels), landings (5000+), and offload ports (30+), as well as the duration of IFQ fisheries. A secondary cost is for the IFQ data clerk contract. Further, OLE is responsible for shoreside enforcement and provides after-hours surveillance.

The US Coast Guard (USCG) also refers labor costs to OLE for at-sea enforcement; when the USCG documents at sea violations, it refers the offence to OLE for final action. Additionally, the IFQ Program does not require the use of vessel monitoring systems when fishing for halibut, which contributes to higher enforcement costs.

Prior to implementing the IFQ program the halibut fishing seasons were very short. Moving to a fishery that is open several months, substantially increased OLE costs to ensure compliance. The increased costs are subject to cost recovery. OLE employs a multifaceted strategy to maximize compliance in the IFQ fisheries. This strategy includes educational outreach, partnerships, patrols, inspections, and investigations. OLE spends thousands of hours annually providing marine resource users with compliance assistance, including staffing booths at organized events, daily contacts in communities, ports, harbors, and at-sea to ensure that the most current and accurate regulatory information is widely distributed and understood. OLE also spends thousands of hours annually conducting patrols to provide a visible deterrence, monitor fishing, detect violations, conduct compliance inspections, and provide compliance assistance. OLE personnel investigate reports or complaints of IFQ violations as well as regularly analyze IFQ data that may lead to investigations of abnormal activity and missing or questionable information. Overall, OLE costs increased from FY 2021 to FY 2022.

Within NOAA Fisheries operating units, RAM incurs significant personnel costs issuing the large number of IFQ permits and processing transfers of quota shares, including transfers related to medical leases and right of survivorship. FY 2022 costs in the personnel category decreased to support the IFQ program, largely due to fluctuations in personnel changes and reduced COVID-related requests.

ISD costs maintain the electronic landings system (eLandings) for the IFQ program. Because eLandings is used for multiple fisheries, ISD has developed a formula for tracking the time spent by computer programmers to maintain the system. The formula includes weighting factors for the degree of complexity, amount of integration, time sensitivity, and workload for eLandings maintenance tasks, then it calculates the proportion of eLandings tasks that can be attributed to each fishery program. This formula is reevaluated every year. Costs for FY 2022 increased.

FSD costs support the loan program. For FY 2022, FSD costs decreased year over year due to a lower loan volume and fewer COVID-related servicing requests.

SFD and OMD incur administrative and regulatory development costs. For FY 2022, costs increased for SFD and decreased for OMD.

Outside of NOAA Fisheries operating units, costs incurred by the IPHC are primarily attributed to personnel and benefits. Personnel supports the IFQ fishery and IPHC administrative duties. IPHC costs for FY 2022 increased from 2021, due to field office support. Nearly all ADF&G costs are related to maintaining the eLandings catch accounting program. FY 2022 costs decreased.

Table 4-12 Halibut and Sablefish IFQ Program Costs FY 2022

<i>Cost Component</i>	<i>NMFS OMD</i>	<i>NMFS RAM</i>	<i>NMFS SFD</i>	<i>NMFS ISD</i>	<i>NMFS FSD</i>	<i>NMFS OLE</i>	<i>IPHC</i>	<i>ADF&amp;G</i>	<i>Total</i>	<i>% of Total</i>
Personnel/benefits	\$27,629	\$292,461	\$74,232	\$163,972	\$113,995	\$1,278,708	\$620,238	\$100,779	\$2,672,015	63%
Overhead	-	-	-	-	-	-	\$70,280	\$25,481	\$95,761	2%
Travel	-	-	\$1,349	-	-	-	\$40,318	-	\$41,667	1%
Transportation	-	-	-	-	-	-	\$24,912	-	\$24,912	1%
Printing	\$1,170	-	-	-	-	-	\$180	-	\$1,350	0%
Contracts/ Training	-	\$285,973	\$167,076	\$255,514	-	\$461,936	\$1,023	-	\$1,171,522	28%
Supplies	-	-	-	-	-	-	\$1,522	-	\$1,522	0%
Equipment	-	-	-	-	-	-	\$705	-	\$705	0%
Rent/Utilities	\$7,688	\$55,865	\$6,579	\$23,000	-	\$100,832	\$15,289	-	\$209,253	5%
Other	-	-	-	-	-	-	\$4,781	-	\$4,781	0%
Total	\$36,487	\$634,299	\$249,236	\$442,486	\$113,995	\$1,841,476	\$779,247	\$126,259	\$4,223,488	100%
% of Total	1%	15%	6%	10%	3%	44%	18%	3%	100%	

#### 4.5.2(e) Central Gulf of Alaska Rockfish Program

Overall, direct program costs for FY 2022 (\$308,955) were slightly higher than in FY 2021 (\$285,252). However, the FY 2022 fee percentage of 2.53 is less than the fee percentage for FY 2021 due to an increase in fishery value.

Costs in FY 2022 are primarily attributed to NOAA Fisheries AKR personnel for catch accounting, inspections, permit issuance, and fisheries management. Additional personnel were cross trained to speed permit issuance. The effort was captured under personnel costs for the agency. There was also an increase in contract cost due to necessary upgrades to eFish and supporting systems. Although NOAA Fisheries AKR costs were slightly higher in FY 2022 than in FY 2021 costs for FY 2022 are in alignment with historical costs for NOAA Fisheries AKR.

Table 4-13 Central Gulf of Alaska Rockfish Program Costs, FY 2022

<i>Cost Recovery Component</i>	<i>NOAA Fisheries AKR</i>	<i>NOAA Fisheries AFSC</i>	<i>ADF&amp;G</i>	<i>Total</i>	<i>%</i>
Personnel Costs	\$201,745	\$3,674	\$5,551	\$210,970	68%
Travel	\$598	\$49	-	\$647	0.2%
Transportation	\$6,134	-	-	\$6,134	2%
Printing	-	\$450	-	\$450	0.1%
Contracts/Training	\$77,878	\$3,002	-	\$80,880	26%
Supplies	-	\$200	-	\$200	0.1%
Equipment	\$700	\$72	-	\$772	0.2%
Rent/Utilities	\$8,902	-	-	\$8,902	2.9%
Other	-	-	-	-	0%
Total	\$295,957	\$7,447	\$5,551	\$308,955	100%

#### 4.5.2(f) Ocean Quahog and Surfclam

For the surfclam and ocean quahog ITQ program agency costs directly related to the program include the costs of issuing and renewing ITQ permits, processing cage tag transfers, and tracking cage tag usage. The costs associated with each activity are not provided in the annual cost recovery report<sup>36</sup>. Based on the cost recovery report, the agency cost in 2021 was \$93k and in 2022 was \$113k. The value of the fishery was about \$42 and \$47 million, respectively.

#### 4.5.2(g) Gulf of Mexico Snapper and Grouper/Tilefish

Information in this section was primarily derived from the cost recovery fee report:

[https://gulfcouncil.org/wp-content/uploads/B-4c-Background\\_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final\\_508-1.pdf](https://gulfcouncil.org/wp-content/uploads/B-4c-Background_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508-1.pdf)

Costs are calculated separately for the Snapper and the Grouper/Tilefish programs and the costs of each are reported in the annual cost recovery reports. When the cost recovery fee is collected a single percentage of ex-vessel value is applied to each fishery. The information in this section combines the costs associated with both fisheries. Personnel, OLE costs, Science Center costs, and travel accounted for about 96% of total reported agency costs.

Table 4-14 Gulf of Mexico Snapper and Grouper/Tilefish Program Mean Costs, 2012 through 2018

	\$	%
OLE	\$226,943	26%
Southeast Fisheries Science Center	\$183,300	21%
Travel	\$78,557	9%
Contracts	\$4,364	0.5%
Communications	\$8,729	1%
Printing	\$262	0.03%
Supplies	\$17,457	2%
Labor	\$366,600	42%
Total	\$872,857	100%

#### 4.5.2(h) Individual Bluefin Quota

Information in this section was primarily derived from the 3-year program review:

[https://media.fisheries.noaa.gov/dam-migration/three-year\\_review\\_of\\_the\\_individual\\_bluefin\\_quota\\_program.pdf](https://media.fisheries.noaa.gov/dam-migration/three-year_review_of_the_individual_bluefin_quota_program.pdf)

An initial estimate of the incremental costs to NOAA Fisheries is equivalent to the work of between two and four full-time employees. Contracts to support the EM Program are relatively expensive (hundreds of thousands of dollars per year). Based on the costs of full-time employees to NOAA Fisheries (in excess of \$40k per year), and contracts, it is clear that the incremental costs to NOAA Fisheries exceed three percent of the ex-vessel value of the bluefin, based on the small amount of bluefin ex-vessel revenue

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<sup>36</sup> <https://www.fisheries.noaa.gov/bulletin/2023-cost-recovery-surfclam-and-ocean-quahog-cage-tag-fees>

subject to cost recovery, as well as the scope of NOAA Fisheries' incremental costs to manage the pelagic longline fishery.

In addition, the cost of the recovery program itself was considered. The administrative/operational cost to NOAA Fisheries associated with implementing the cost recovery program (as distinct from the incremental cost of the IBQ Program). The operational costs that would be associated with routine administration of the cost recovery program include multiple components in addition to the annual development of the estimate of annual incremental costs. Specifically, NOAA Fisheries would need to annually calculate the ex-vessel value of bluefin, calculate individual fees, develop a Federal Register document providing formal public notification, communicate with individuals in the fishery to educate them about the process and assess the fees, and conduct oversight of collection of fees including follow-up and enforcement, oversight of cost recovery program, and database/computer costs.

While there are some economies of scale when running cost recovery programs, for the most part the costs will be similar regardless of the level of costs being recovered. If the total funds to be recovered is small, it may cost close to or more to recover these funds than would be recovered (net loss to the agency). As the cost of implementing a cost recovery program is considered incremental, this could result in industry being required to pay more for the calculation and collection of cost recovery fees than the value of all other recoverable costs.

#### **4.5.2(i) British Columbia IVQ**

The BC fishery uses a combination of license fees and annual research allocations to help fund agency costs and research. Sometimes these allocations may be in excess of forecasted survey catches to support the costs of completing select science projects. Allocations are made based on the Minister's authority to allocate fish or fishing gear for the purpose of financing scientific and fisheries management activities. Limited published information is available on agency costs in this fishery.

#### **4.5.3 Cost Recovery**

A summary of all the cost recovery fees that are described in this section are summarized in Table 4-15. Information for 2017 through current years is provided, when available.



Table 4-15 Cost Recovery Fees by Fishery

<i>Fishery</i>	<i>Fee % Calculated</i>	<i>Fee % Charged</i>	<i>Fee Payment</i>
West Coast IFQ (2017-2023)	2.5% to 4.2%	2.5% to 3.0%	\$1.48 to \$2.25 (million)
West Coast MS (2017-2023)	0% to 1.7%	0% to 1.7%	\$71k to \$168k
West Coast CP (2017-2023)	0% to 0.2%	0% to 0.2%	\$34k to \$133k
AK Halibut Sablefish (2017-2022) <sup>37</sup>	1.9% to 4.3%	1.9% to 3.0%	\$3.9 to \$4.6 (million)
AK AM80 (2017-2022)	0.7% to 1.43%	0.7% to 1.43%	\$0.84 to \$1.09 (million)
AK AFA Inshore (2017-2022)	0.19% to 0.32%	0.19% to 0.32%	\$0.34 to \$0.50 (million)
AK AFA MS (2017-2022)	0% to 0.22%	0% to 0.22%	\$80k to \$125k, but not reported in years fees were not collected due to overpayment in previous years.
AK AFA CP (2017-2022)	0% to 0.21%	0% to 0.21%	\$308k but were not reported in years that fees were not collected due to overpayment in previous years.
AK Crab (2017-2022)	1.09% to 2.23%	1.09% to 2.23%	\$2.3 to \$3.0 (million)
AK CDQ (2017-2022)	0.55% to 0.85%	0.55% to 0.85%	\$447k to \$567k
AK GOA Rockfish (2017-2022)	2.04% to 3.66%	2.04% to 3.0%	\$209k to \$321k
Gulf of Mexico snapper and grouper-tilefish (2017-2020)	n/a	3.0%	\$1.5 to \$1.6 million
Mid-Atlantic surf clam and ocean quahog IFQ (2021 and 2022)	0.22% to 0.24%	0.22% to 0.24%	\$93k to \$113k
Individual Bluefin Quota	Cost recovery fees have not been collected in the Bluefin tuna or Wreckfish fisheries		
South Atlantic wreckfish ITQ			
Northeast Sectors			
Canada IVQ	Not a LAPP and not subject to cost recovery Pays license fee: 2.9% of gross ex-vessel value in 2009		

Source: AK cost recovery information is available at <https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska>

Section 303A(e) of the MSA requires that a Council (1) develop a methodology and the means to identify and assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and (2) provide, under section 304(d)(2), for a program of fees

<sup>37</sup> <https://www.fisheries.noaa.gov/s3/2023-02/ifq-cost-recovery-2022-akro.pdf>

paid by limited access privilege holders that will cover the costs of management, data collection and analysis, and enforcement activities. When the scope of this project was being developed, the Council was advised by NOAA Fisheries staff that the project would focus on historical costs and not the methods the agency uses to estimate those costs and not which costs are considered recoverable. Within those parameters, the Council could consider whether the methodologies currently employed meet its management, data collection and analysis, and enforcement objectives and explore whether there are alternatives that are less costly to achieve its objectives.

Cost recovery fees were often noted by stakeholders, especially in the IFQ fishery, as a concern. When the scope of this project was being developed, project managers indicated that changes to the cost recovery program would be reviewed under a separate agenda item. This paper summarizes the cost recovery information that is currently available for the West Coast Trawl Catch Share Program, other catch share programs in the U.S., and the Canadian IBQ program license fee used to recover costs. This study does not recommend changes to the cost recovery system or how fees are determined, since that is outside the scope.

West Coast Trawl Groundfish Catch Share Program participants were assessed about \$1.7 million from the IFQ component of the fishery, \$36k from catcher-processor operators, and \$128k from mothership sector participants in 2023 based on 2022 fiscal year costs. These estimates were determined to result in a 3.0% cost recovery fee for IFQ holders, 1.7% for mothership cooperatives, and 0.1% for the catcher-processor cooperative. The reported recoverable cost for each sector in millions of nominal dollars for the fiscal years 2017 through 2023 are reported below.

Table 4-16 Recoverable agency expenditures in millions of nominal dollars by year

<i>Sector</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>
IFQ	2.02	2.18	1.75	1.81	1.48	1.69	1.70
Mothership	0.17	0.13	0.07	0.15	0.14	0.13	0.13
Catcher-Processor	0.06	0.13	0.05	0.85	0.04	0.04	0.04
West Coast Total	2.25	2.44	1.87	2.81	1.66	1.86	1.87

Source: Annual cost recovery reports (<https://www.fisheries.noaa.gov/resource/data/federal-register-notices-trawl-catch-share-program-cost-recovery-program>)

Note: Values exclude adjustments for earlier overpayment in earlier years.

NOAA Fisheries' authority to collect certain cost recovery fees from members of the catcher-processor cooperative and the reasonableness of NOAA Fisheries' calculation of the catcher-processor program's 2014 fee percentage was challenged in court. NOAA Fisheries re-evaluated and modified the methodology used to determine the catcher-processor's fee calculation and adjusted amount of fees owed. The change resulted in a determination that there had been overpayments of the cost recovery fee by the catcher-processor and mothership cooperatives, so NOAA Fisheries adjusted the fees for the catcher-processor sector and the mothership sector in subsequent years to account for overpayments.

Agency cost reimbursements are not realized for the portion of costs that exceed 3% of the ex-vessel value. These costs are borne by the agency incurring the costs. For 2023, the IFQ cost recovery fee was set at 3% and costs were calculated to be 3.5% of ex-vessel value, meaning that 0.5% of the recoverable costs were paid through the agency (<https://www.federalregister.gov/documents/2022/12/12/2022-26923/fisheries-off-west-coast-states-pacific-coast-groundfish-fishery-trawl-rationalization-program->

2023). The mothership and catcher-processor sectors have always been well below the 3% limit, so the full amount of the recoverable costs has been collected for these sectors.

LAPP recoverable costs vary by fishery based on various agency expenditures that are included in the recoverable costs. In Alaska, the halibut and sablefish IFQ fee was estimated to be 1.9% of ex-vessel value in 2022, but was 2.8%, 3%, 3%, and 2.3% in 2018 through 2021, respectively. Amendment 80 non-pollock trawl catcher-processors paid 0.87% in 2022. AFA pollock inshore catcher vessels paid 0.32% and community development quota holders paid 0.85% of their ex-vessel value. These fee percentages are fairly representative of past years. In both cases, the catcher-processor's ex-vessel value was based on the price paid to catcher vessels for that species, because catcher-processors harvest the fish they process and do not purchase fish when operating as a catcher-processor.

The Gulf of Mexico snapper and grouper-tilefish fishery cost recovery fee is set at 3% in most years. A summary of the Grouper-Tilefish annual report summarizing the fishery cost recovery is provided at their Region's website ([https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021\\_GT\\_AnnualReport\\_SEROFinal.pdf](https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf)) and the Snapper fishery at ([https://gulfcouncil.org/wp-content/uploads/B-4d-2021\\_RS\\_AnnualReport\\_SEROFinal.pdf](https://gulfcouncil.org/wp-content/uploads/B-4d-2021_RS_AnnualReport_SEROFinal.pdf)). A summary of both fisheries IFQ review is at ([https://gulfcouncil.org/wp-content/uploads/B-4c-Background\\_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final\\_508-1.pdf](https://gulfcouncil.org/wp-content/uploads/B-4c-Background_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508-1.pdf)). Any overage in fees collected remains in the Limited Access System Administration Fund and is used during years when expenses are higher. Examples of expected costs that do not occur on an annual basis are updating the IT support and development of the program reviews.

The Mid-Atlantic surf clam and ocean quahog IFQ fishery's cost recovery fee is based on trap fees as described on their website (<https://www.fisheries.noaa.gov/bulletin/2022-cost-recovery-surflam-and-ocean-quahog-cage-tag-fees>). Because the fee is calculated and applied somewhat differently than most other cost recovery fees in the U.S., additional detail on the fee collection structure is provided. The 2022 cost recovery fee was based on cage tags used for the Atlantic surfclam and ocean quahog ITQ programs. The 2022 fees apply to ITQ permit holders that received an initial allocation of cage tags for use in 2022. The ITQ permit holder who first received the annual allocation of cage tags is responsible for the fee for each tag used to land clams or quahogs that year, even for tags that are leased, sold, or otherwise used by someone else. The 2023 cost recovery per-cage tag fee for the Atlantic surfclam fishery was \$1.21 and for the ocean quahog fishery was \$0.66. The fee was calculated by dividing the 2022 direct program costs by the total number of tags issued in 2022. For Atlantic surfclams the recoverable cost was \$27,796 and 51,696 cage tags were used, and for ocean quahogs the recoverable cost was \$21,391 and 76,686 cage tags were used. The direct program costs in 2022 represent 0.23% of the ex-vessel value (\$27,795,837) of the surfclam fishery and 0.24% of the ocean quahog fishery's ex-vessel value (\$21,391,456). If more money is collected than needed to cover the direct incremental costs of the surfclam and ocean quahog ITQ program, the difference is applied when setting the per-tag fee in the following year. The percentages of ex-vessel value are relatively close to the amounts estimated for previous years, and all<sup>38</sup> year's fees were substantially less than the 3% of ex-vessel value maximum.

Cost recovery fees for the Individual Bluefin Quota program may not be collected each year<sup>39</sup>. Annually, NOAA Fisheries will determine whether to charge fees based on an evaluation of the incremental costs of the administering program, the total ex-vessel value of bluefin landed by pelagic longline vessels, and the estimated costs associated with administering the cost recovery program. If the amount of fees that may

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<sup>38</sup> [https://www.fisheries.noaa.gov/rules-and-announcements/bulletins?title=cost+recovery&field\\_species\\_vocab\\_target\\_id=&sort\\_by=created](https://www.fisheries.noaa.gov/rules-and-announcements/bulletins?title=cost+recovery&field_species_vocab_target_id=&sort_by=created)

<sup>39</sup> <https://media.fisheries.noaa.gov/2022-10/A13%20Compliance%20Guide%20Oct%202022.pdf>

be recovered is similar to or less than the cost of administering the cost recovery program, NOAA Fisheries will not assess fees. Otherwise, NOAA Fisheries will notify Atlantic Tunas Longline permit holders through their Shareholder Accounts of their fees, which will be based on the total dressed weight of bluefin sold to dealers by their vessels and the total amount of fees that may be recovered. Using a per pound approach is different from using ex-vessel value, unless they assume all harvesters are paid the same ex-vessel price.

Based on the program's 3-year review<sup>40</sup>, the incremental costs to NOAA Fisheries of implementing the Individual Bluefin Quota Program are principally costs associated with labor, both NOAA Fisheries staff and contracted entities tasked with program oversight, customer service, database maintenance, computer programming (maintenance and development), the EM Program, monitoring of various data metrics for the program, policy discussions, preparation of Federal Register documents, preparation of fleet communication, providing status reports to the Highly Migratory Species Advisory Panel, and enforcement related activities. NOAA Fisheries estimated that the maximum amount that could be recovered, based on ex-vessel value of bluefin landed by the pelagic longline fishery under the 3% fee, ranged from \$18k to about \$28k during 2015 through 2017 and costs would many times that amount. Based on these estimates the recoverable bluefin fee was determined to likely not cover the cost of implementing the cost recovery program. Because Amendment 13 to the 2006 Consolidated Atlantic HMS Fishery Management Plan addressing bluefin cost recovery was not published until October 3, 2022, actual estimated cost recovery fees have not yet been collected and cost recovery fee estimates have not been published.

The South Atlantic wreckfish ITQ program cost recovery program is still in the process of being implemented and a final decision on the cost recovery structure is tentatively scheduled for the September 2023 meeting ([https://safmc.net/documents/sg\\_a1a\\_amendment48decisiondocument-pdf/](https://safmc.net/documents/sg_a1a_amendment48decisiondocument-pdf/)). Cost recovery fee estimates for this fishery were not provided in the Amendment 48 decision document referenced above. Because that program is still under development, information regarding actual cost recovery fees and recoverable amounts is not available.

Northeast Sectors are not LAPPs and not subject to cost recovery. As a result of that determination, management costs that would be subject to cost recovery are not provided.

#### 4.5.4 Monitoring Costs

The cost of monitoring catch and discards at-sea and deliveries to the first receivers are substantial and typically borne by the quota holders, harvesters and/or first buyers of fish. This section summarizes the monitoring costs that have been described in earlier sections of the document in a tabular format (Table 4-17).

Table 4-17 Monitoring requirements and costs for various catch share and sector programs

<i>Fishery</i>	<i>Monitoring system</i>	<i>Payment structure</i>	<i>Cost</i>
West Coast IFQ	CVs 100% coverage (EM or one observer). First receivers have 100% observer coverage. VMS	Harvesters and first receivers pay for their own monitoring coverage	Obs. per day: \$600 whiting & first receiver, \$550 non-whiting EM per day \$431

<sup>40</sup> [https://media.fisheries.noaa.gov/dam-migration/three-year\\_review\\_of\\_the\\_individual\\_bluefin\\_quota\\_program.pdf](https://media.fisheries.noaa.gov/dam-migration/three-year_review_of_the_individual_bluefin_quota_program.pdf)

<i>Fishery</i>	<i>Monitoring system</i>	<i>Payment structure</i>	<i>Cost</i>
			CV Total Observer/EM: \$1.25 million (2021) First Receiver: 974k (2021)
West Coast MS	CVs 100% coverage (EM or one observer). MS must have two observers. VMS	CVs pay observer/EM providers for their own coverage. MS pay observer providers	MS & CVs per day: \$600/observer MS Total: \$137k (2021)
West Coast CP	CPs must have two observers. VMS	CPs pay observer providers for their own coverage	CP total: \$765k (2020)
AK Halibut Sablefish	Partial observer coverage in trip selection pool. VMS	Pay monitoring fee of 1.65% of ex-vessel value of halibut/sablefish	Obs. per day About \$1,400 Total: \$1.9 million (2021)
AK <sup>41</sup> AM80	Two observers. VMS	Pay observer providers	Observer per day: \$382 (2021)
AK AFA Inshore	CVs 100% coverage (EM or one observer), Plant two observers when plant is taking AFA deliveries. VMS.	Pay observer providers	CV cost per day: \$417 Total CV cost: \$2.9 million Shoreplant cost: \$430 /observer Total Cost \$688k
AK AFA MS	CVs no coverage. MS two observers. VMS	Pay observer providers	Observer per day: \$369 (2021)
AK AFA CP	Two observers. VMS	Pay observer providers	Observer per day: \$369 (2021)
AK Crab <sup>42</sup>	Varies by fishery CV (30% - 100%), 100% for CP. State of Alaska oversees the program. VMS.	Bristol Bay Red King, snow crab, and tanner crab CVs funded by test fisheries and crab rationalization funds. CPs partially funded. Aleutian Islands Golden King crab funded by that species test fishery. Other fisheries are industry funded.	Difficult to determine because of the various funding mechanisms.

<sup>41</sup> [https://repository.library.noaa.gov/view/noaa/47114/noaa\\_47114\\_DS1.pdf](https://repository.library.noaa.gov/view/noaa/47114/noaa_47114_DS1.pdf)

<sup>42</sup>

[https://www.adfg.alaska.gov/static/fishing/PDFs/commercial/bering\\_aleutian/fy22\\_adfgreporttoCOOTF.pdf](https://www.adfg.alaska.gov/static/fishing/PDFs/commercial/bering_aleutian/fy22_adfgreporttoCOOTF.pdf)

<i>Fishery</i>	<i>Monitoring system</i>	<i>Payment structure</i>	<i>Cost</i>
AK CDQ (2017-2022)	Depends on fishery: Two observers for CPs one for CVs. VMS.	Pay observer providers	Observers per day: About \$380/day
AK GOA Rockfish (2017-2022)	CV one observer. Plant observer. VMS.	Pay observer providers	Observer per day: \$430/day
Gulf of Mexico snapper and grouper-tilefish (2017-2020)	Functioning VMS turned on all the time reporting every hour.	Initially equipment funded by grant, industry paid for installation, maintenance, and data.	About \$3,100 for equipment, \$40/month for data reporting, and \$300 for installation (in 2012) <sup>43</sup>
Mid-Atlantic surf clam and ocean quahog IFQ (2021 and 2022)	No observer requirements unless randomly selected by NOAA Fisheries for a trip. Prior to leaving port at the start of a fishing trip, the vessel's owner or operator must declare its intent to fish in the area through the vessel's VMS	Industry funded	N/A
Individual Bluefin Quota	Requires EM and VMS	Industry Funded	N/A
South Atlantic wreckfish ITQ	Wreckfish vessel logbooks; Wreckfish dealer reports; Fishermen (vessel) coupons; and Fish House (dealer) coupons.	N/A	N/A
Northeast Sectors	Fixed monitoring coverage target as a percentage of trips, dependent on Federal funding. Allows EM. Excludes monitoring requirement all trips in geographic areas with expected low groundfish catch. Requires periodic evaluation of the monitoring program and exclusions from the monitoring requirement. Grants authority to the Greater Atlantic Regional	Federally funded, but could be industry funded depending on available federal funding.	Fleet-wide ASM costs are estimated to be approximately \$2.09 million per year <sup>44</sup> and at-sea observer rates about \$700/day

<sup>43</sup> [https://safmc.net/documents/attach2a\\_vms\\_qa\\_draftfeb2013-pdf/](https://safmc.net/documents/attach2a_vms_qa_draftfeb2013-pdf/)

<sup>44</sup> See FR page 75863: <https://www.federalregister.gov/documents/2022/12/09/2022-26350/fisheries-of-the-northeastern-united-states-northeast-multispecies-fishery-amendment-23>

<i>Fishery</i>	<i>Monitoring system</i>	<i>Payment structure</i>	<i>Cost</i>
Canada IVQ	Administrator to revise sector reporting requirements to streamline reporting for the industry.  100% at-sea and shoreside. All vessels use EM	Industry funded	About \$1.2 million in 2009. EM use likely has lowered costs, but the change was not available for this report.

#### 4.5.5 Quota Leasing Costs

Annual lease rates, reported in dollars per pound, are shown in Table 4-18. Lease rates are one indication of the expected value stakeholders anticipate generating from the use of that additional pound of quota, and assuming the QP buyers are making sound business decisions may be an indicator of the economic health of the fishery. The values shown in red are greater than the 2011 through 2022 average. Species that tend in recent years to lease for amounts above their long-term average include minor slope rockfish North of 40°10' N, minor shelf rockfish North of 40°10' N, and yellowtail rockfish North of 40°10' N. Petrale sole is the only flatfish that leased for more than its long-term average since the early years of the LAPP. These trends seem to correspond with the percentage of allocated species that were harvested in recent years.

Table 4-18 Reported lease rates of QP 2011 through 2022

<i>Species</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>Average 2011-2022</i>
Arrowtooth flounder		0.02	0.01		0.01	0.01							0.01
Bocaccio rockfish South of 40°10' N.	0.5		0.2	0.3	0.27	0.29	0.23	0.15	0.12	0.11			0.24
Canary rockfish	1.21	1.49	3.09	2.12	1.14	1.35		0.67	0.3			0.66	1.34
Chilipepper rockfish South of 40°10' N.	0.05	0.03	0.02	0.03	0.02				0.01	0.01	0.01	0.02	0.02
Cowcod South of 40°10' N.						2.06	2.37	2.06	2.09	1.53			2.02
Darkblotched rockfish	0.4	0.22	0.53	1.08	0.52	0.55	0.35	0.4	0.32	0.4	0.22	0.26	0.44
Dover sole	0.06												0.06
English sole													
Lingcod	0.07	0.05											0.06
Lingcod North of 40°10' N.						0.01	0.01	0.03	0.01	0.01			0.01
Lingcod South of 40°10' N.					0.01					0.01			0.01
Longspine thornyheads N. of 34°27' N.	0.04	0.05	0.05	0.06	0.03	0.02	0.02						0.04
Minor shelf rockfish North of 40°10' N.							0.01	0.01	0.02	0.02	0.04	0.08	0.03
Minor shelf rockfish South of 40°10' N.			0.04	0.03									0.04
Minor slope rockfish North of 40°10' N.		0.04	0.03	0.03	0.02	0.01	0.02	0.01	0.01	0.02	0.03	0.06	0.03
Minor slope rockfish South of 40°10' N.	0.05	0.03	0.05		0.02		0.02	0.01					0.03
Pacific cod	0.05	0.02		0.02	0.01								0.03
Pacific halibut (IBQ) North of 40°10' N.	1.31	1.19	1.76	0.58	0.58	0.72	0.72	0.95	0.56	0.36	0.46	0.50	0.81

Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average 2011-2022
Pacific ocean perch North of 40°10' N.	0.14		0.75	0.99	0.56	0.51	0.51	0.67					0.59
Pacific whiting	0.02	0.04	0.04	0.03		0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Petrale sole	0.35	0.40	0.25	0.28	0.35	0.33	0.37	0.36	0.43	0.41	0.24	0.24	0.33
Sablefish North of 36° N.	1.07	1.04	0.88	1.00	1.11	1.10	1.21	1.06	0.61	0.42	0.23	0.45	0.85
Sablefish South of 36° N.	0.75	1.05	0.26	0.16	0.18	0.17	0.07				0.10		0.34
Shortspine thornyheads N. of 34°27' N.	0.07	0.05	0.05	0.06	0.04	0.03	0.02	0.01			0.04	0.03	0.04
Shortspine thornyheads S. of 34°27' N.	0.17												0.17
Widow rockfish	0.44	0.34	0.53	0.23	0.15	0.15	0.03	0.03	0.04	0.05	0.05	0.06	0.18
Yelloweye rockfish	32.28	21.76	29.58	27.07	19.86		13.3		13.6	14.58	14.4	13.72	20.02
Yellowtail rockfish North of 40°10' N.		0.01	0.03	0.02	0.01	0.01	0.02	0.03	0.05	0.05	0.05	0.05	0.03

Source: <https://www.webapps.nwfsc.noaa.gov/apex/ifu/f?p=155:25:::>

Data on total quota leasing costs are provided in Tables 8-1 through 8-4. Information in those tables show the number of vessels whose operators lease quota and the value of the quota leased. The data are further broken down by fishery, vessel length, and homeport.

Figure 4-16 shows the number of vessels that were associated with leasing expenditures over the years 2011 through 2021. Medium size vessels accounted for the largest category of vessels with leasing expenditures until 2020, when the large vessel class accounted for more vessels with leasing expenditures. The small vessel class only had leasing costs in the non-whiting fishery, so all vessels and non-whiting vessel lines are directly over the other. Large non-whiting vessels and medium whiting vessels were the vessel classes that had the fewest number of vessels with leasing expenditures. They were also the vessel classes that had the fewest number of participants in the program, so almost all of the medium whiting vessels and about half of the large non-whiting vessels had leasing expenditures in recent years.

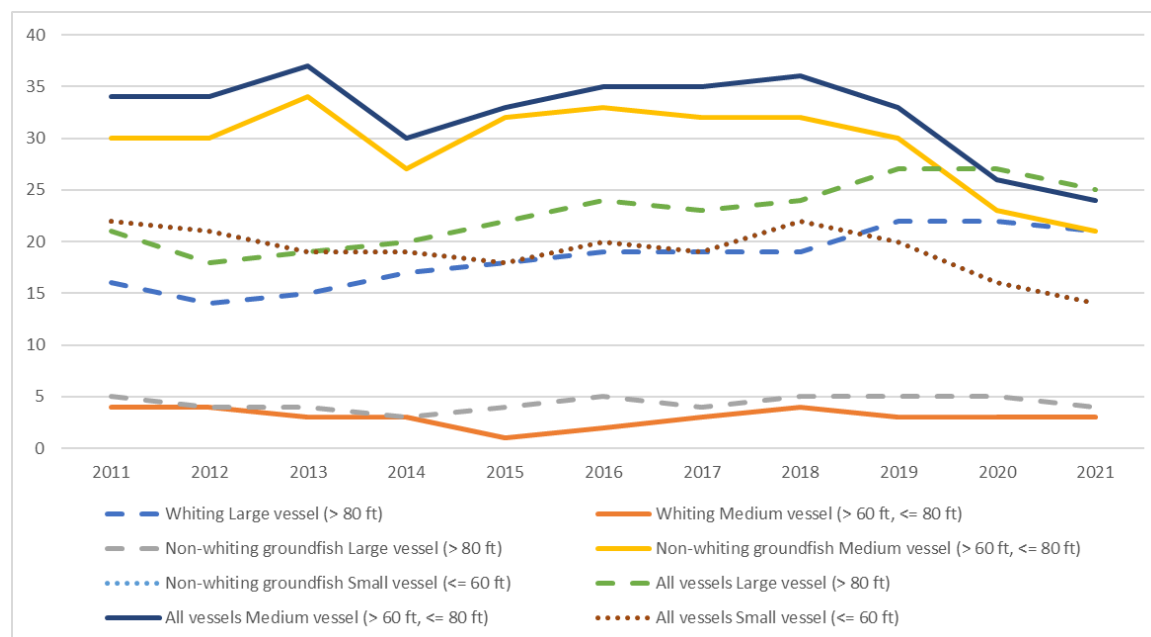


Figure 4-16 Vessels associated with quota lease expenditures 2011 through 2021 (Millions of 2021 \$)



Figure 4-17 shows the percentage of vessels in each class that was associated with leasing expenditures during the 2011 through 2021 fishing years. Typically, 60% to 90% of the vessels were associated with leasing quota. The percentage of small vessels and medium vessels associated with leasing quota declined dramatically in 2021. Determining the reasons for the decline would require additional research, but could be linked to the lingering Covid-19 issues and the amount of QP that were not utilized that year. The larger vessel class still had less than 70% of vessels associated with quota leases.

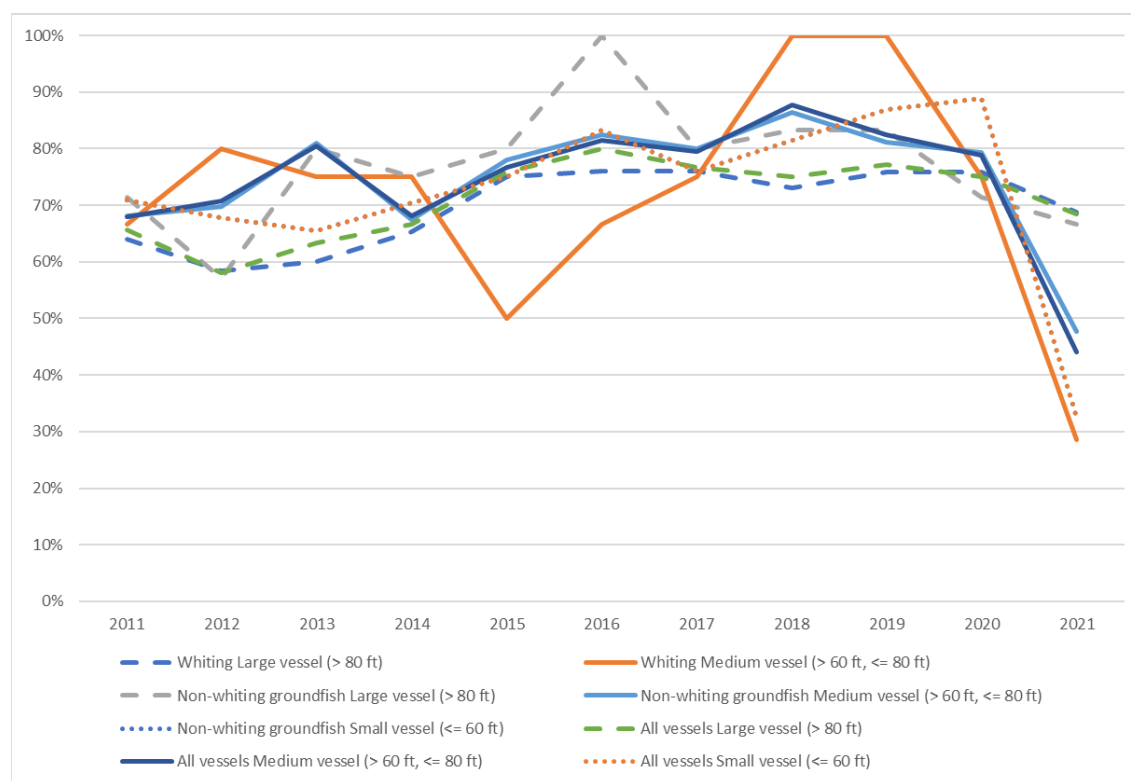


Figure 4-17 Percentage of vessels associated with quota lease expenditures 2011 through 2021

Figure 4-18 reports the mean leasing expenditure by year and vessel category from 2011 through 2021. Leasing expenditures associated with all vessel classes in 2021 were less than their 2011 through 2021 average. The only vessel classes that increased their leasing expenditures from 2020 to 2021 were the large catcher vessels. All other vessel classes have decreased real leasing expenditures since 2019. Determining the reasons for the recent declines in leasing expenditures for the medium and small vessel classes are not known and would require more research but may be in part linked to COVID-19 issues, an increase in the QP that are unharvested, and expected value derived from leasing quota.

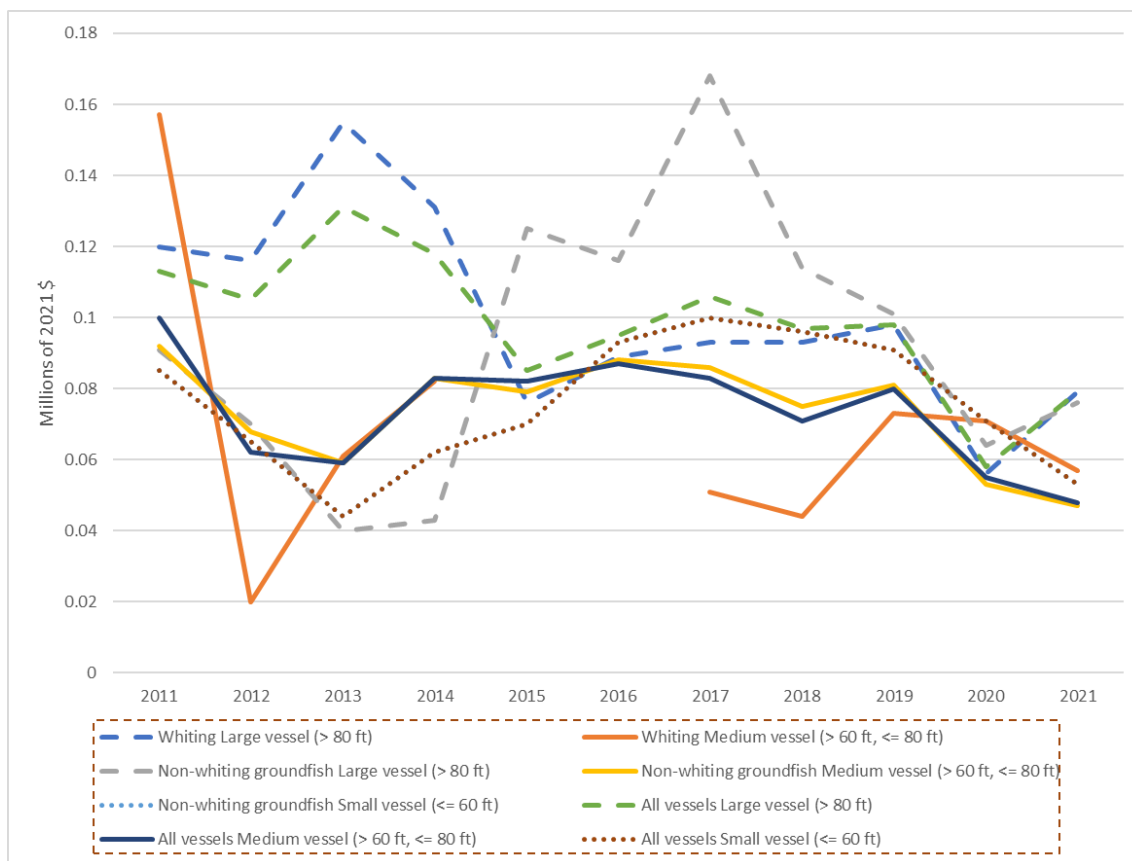


Figure 4-18 Mean expenditures on quota leasing for catcher vessels by vessel size (millions of 2021 \$)

While the IFQ program allows transfers of QP within the ownership and use caps, the costs are shown to be a substantial component of annual costs to lessees and a substantial source of revenue for lessors. Over time, as other program costs are reduced, quota leasing costs would be expected to increase, if the paying the lease costs is expected increase in net revenue. The Council could consider the extent to which inactive quota owners are allowed to lease, but that may be a broader and more complex issue that may be most appropriate to address in the upcoming IFQ program review.

## 5.0 PROGRAM ELEMENTS CONSIDERED FOR POTENTIAL COST SAVINGS OPPORTUNITIES

The focus of this section is to review the various components of the West Coast Groundfish Trawl Catch Share Program and determine if there are opportunities for either agency or industry cost savings. Cost savings in this context are defined as whether future regulatory changes could result in reduced costs to NOAA Fisheries (including OLE) or the stakeholders that participate in the IFQ or cooperative catch share programs. Costs are considered in terms of industry costs versus agency costs. It is noted that certain agency costs that would not have been incurred but for the program are recoverable and those costs must be passed on to industry. Some of the elements considered would have different impacts on costs relative to the two groups. Because the focus is on directional changes and not estimates of quantitative cost changes, overall cost changes are not provided.

Elements of the Trawl Groundfish Catch Share Program were reviewed and those which might be modified to generate cost savings are shown in Table 5-1. Program elements that were considered but did not appear to provide opportunities for cost savings are described in Section 9.5.

Table 5-1 Program elements that may provide opportunities for cost savings

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Time frame required to remedy overage >10%	Industry Yes: Agency: No	Sufficient QP or IBQ pounds must be transferred into the vessel account to cover the deficit (if <= 10% overage limit) within 30 days of NMFS' issuance of QP or IBQ pounds to QS accounts in the following year or the date the deficit is documented (whichever is later) but not later than the end of the post-season transfer period. If the overage is greater than 10%, the overage must be covered within 30 days of the end of the fishing trip.	This element provides program participants with some flexibility in covering harvest overages but limits the extent and duration of overages that are allowed. It provides vessels an incentive to not exceed their QP balances by more than 10%.	Other catch share fisheries require that QS holders cover any overages prior to issuing QS the following year. The time period QS holders have to cover the overage is often the end of the fishing year, the end of the calendar year, or prior to issuing QS for the following year. The NE Sector program has a two-week period to cover sector overages.	The 30-day limit to cover an overage greater than 10% requires that a person find available quota within 30-days. Depending on the market for that species and the time of the year, it could limit the buyer's options and benefit quota sellers. Allowing a vessel operator to coverage harvest overages after the following year's QP has been issued increases the time harvesters have to acquire quota before they are subject to enforcement actions. Being able to access quota from two separate years may also provide the opportunity to acquire the needed quota at a better price.	Eliminating the overage provision may reduce some agency costs and increase others. Changing the program structure would result in one-time increases in IT costs that could be passed on to industry and may negate any potential cost savings over the short term.
Prohibition on beginning a fishing trip in QP deficit	Industry Yes: Agency: No	Prohibit fishing if a negative QP balance for any species or species group. Enforcement of overage violations are a necessary part of any program.	Ensure that quota holders do not start a trip when they have not finished covering catch for a previous trip and thereby reducing the chances of an overage of the fleet's allocation.	Most other catch share programs require the permit holder to have quota prior to starting a fishing trip, whereas the trawl IFQ program only requires that there not be deficits—leaving to vessel responsibility the determination of whether they want to take the risk of fishing first and acquiring all of the needed quota later.	Forgoing trips when QP leases are temporarily unavailable could result in higher fishing trip costs and higher lease costs. Requiring that a person have no negative balances before fishing may be challenging for species that have small annual allocations and are difficult to avoid catching. Stakeholders have developed risk pools to help address some of these issues. It is possible that industry could recommend other regulatory actions to help	Agency costs for monitoring overages and enforcing no fishing requirements are established and have been accounted for in the quota accounting system so changes in regulations are not expected to result in additional cost savings. Allowing vessels to fish while in deficit would increase the possibility that an in-season action would be needed to restrict fishing and keep the fleet within its overall allocation—generating additional

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
					mitigate the risks and costs of overharvesting "choke" species. The likelihood of cost savings may be small and there is some chance of a negative impact to the fleet (see discussion in Agency Cost column).	management cost and potentially imposing a cost on the industry.
Overage/ Underage provision	Industry No: Agency Yes	The provision allows permit holders to carryover up to 10% of their annual allocation before adjustments (both overages and underages) to the following fishing year	Provide flexibility to stakeholders. They may recoup some value of fish that were underharvested the previous year or not be subject to enforcement actions that result from relatively small harvest overages.	AFA pollock and CGOA Rockfish programs only allow carryovers across seasons within a year, but not across years. NE sectors deduct overages from the following year and must stop fishing when the catch limit is reached. Canada's IVQ program has a 30% overage/underage provision for all species except offshore Pacific hake, Halibut bycatch, and Bocaccio rockfish that is set at 15%. There is a 15% underage provision for halibut but no halibut mortality overage provision. The AK halibut and sablefish program also includes a 10% overage and underage provision. The Amendment 80 fishery has "hard" caps that may not be exceeded during a year. The British Columbia Integrated Groundfish Program, catch accounting takes place upon the landing of a vessel and participants must account for any overages prior to engaging in any further fishing activity. In the CGOA Rockfish Program a person must have available quota to start a trip, but groundfish post-delivery transfers have until December	Industry benefits because the provision creates more opportunity for the fleet to fully harvest its allocation in the context of a multispecies catch-based quota program in which it would be difficult to catch the exact amount needed to use the trawl allocation for multiple species.	The overage/underage provision increases the cost to the agency to balance/adjust QP accounts on an annual basis. Eliminating the carryover could reduce agency costs, but would likely require adjustments to programing that has already been developed.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
				31. Halibut PSC cooperative quota is not available for transfer after November 15, or after a cooperative termination of fishing declaration has been received by NMFS. Depending on when the overages must be covered it could result in quota holders manipulating the market, knowing that overages must be covered.		
QS and IBQ control	Industry Yes: Agency No	QS control is defined at 50 CFR 660.140(d)(4)(iii) and provides a detailed discussion of all methods of control.	Defining control of QS/QP is often complex but necessary to ensure that limits are adhered to as required under the MSA.	The MSA requires that LAPPs included excessive share limits. These limits are established based on the need for specific fisheries. The limits typically vary by the number of participants in the fishery and the objective of limiting or allowing consolidation in the harvesting and processing sectors.	Changing the share control limits could reduce costs to industry if they currently limit the efficient use of resources beyond that required to prevent excessive control of shares and reduce QS value by limiting the amount that larger entities may hold/control.	Agency cost are not expected to be reduced. The only potential exception might be if annual collections of ownership/control information is changed to only be required when the permit holder's ownership/control of QS/IBQ/QP changes. A cost associated with not annually filing the forms may be that updates are, unintentionally, not provided when changes are made.
Shoreside CV Monitoring (Catch: Discards and Landings/ Deliveries)	Industry Yes: Agency Yes	Shoreside CV: Requires 1 certified observer or EM	The duty of the observer is to estimate bycatch, collect biological samples, and monitor for fishery interactions with marine mammals, sea turtles, and seabirds. EM provides a video record of the hauls to allow video review of discard events and interactions with various species.	MSA 303A(c)(H) requires that any LAPP include an effective system for enforcement, monitoring, and management of the program, including the use of observers or EM systems. Coverage for catch based fisheries is typically set at 100% LAPPs (i.e., the West Coast Groundfish IFQ and cooperative programs). Landings based LAPPs like the Halibut and Sablefish IFQ program may not require 100% monitoring coverage (e.g., Halibut IFQ program in Alaska). A universal discard mortality rate of 16% is	Industry CV monitoring costs from 2016 through 2020 ranged from \$1.3 million to \$1.9 million with an average annual cost of \$1.5 million. IFQ fisheries observation science direct program costs for FY21 included in the cost recovery fee calculation for the IFQ sector as reported in the 2022 cost recovery report were \$480k. This figure represents 75% of the total NMFS costs for labor associated with observer program administration and training. NMFS deducts 25% of the total labor cost before including in the	NMFS incurs observer costs such as program administration, training, safety gear, and supplies. Agency costs not reimbursed by cost recovery include 25% of labor costs to account for coverage rates realized before the IFQ program was implemented (see explanation under industry costs), in addition to all costs for supplies, equipment, etc.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
				<p>applied for discards in those LAPP fisheries<sup>1</sup>. The Alaska partial coverage fisheries under the federal observer program are required to pay an observer fee based on a percentage of ex-vessel value. This fee was authorized under regulatory Amendment 86 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area and Amendment 76 to the Fishery Management Plan for Groundfish of the Gulf of Alaska. The authority to collect the fee was granted specifically to the NPFMC by section 313 of the MSA. The NPFMC is considering a cost efficiencies review for monitoring that includes the use of Federal employees as observers. Currently fee collections to cover observer costs on the West Coast are not authorized in regulation. The NEFMC uses both observers and at-sea monitors (that do not have the same degree requirements as at-sea observers<sup>2</sup> and have different duties).</p>	cost recovery fee calculation based on an assumption that the 20%-30% observer coverage rate realized before implementation of the catch share program would be in place today without the program.	
At-sea CV monitoring (discards)	Industry Yes: Agency Yes	At-sea CV: Requires 1 certified observer or EM	Ensure that estimates of fish discarded, should the cod-end be bled or dumped, are accurately recorded in logbooks.			

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
First receiver monitoring (landed catch)	Industry Yes: Agency Yes	First receiver: Catch monitor available to monitor all catch share landings	Ensure accurate weights of all species landed are reported.		Industry first receiver shoreside monitoring costs from 2016 through 2020 ranged from \$130k to \$201k with an average of \$170k	NOAA Fisheries Catch Monitor Program coordinator conducts site inspections for each initial application, and at least once every three years for re-registrations. Approve catch monitoring plan as described at <a href="https://media.fisheries.noaa.gov/dam-migration/first_receiver_license_guidelines.pdf">https://media.fisheries.noaa.gov/dam-migration/first_receiver_license_guidelines.pdf</a>
Mothership monitoring	Industry Yes: Agency Yes	Motherships: Requires 2 certified observers	Ensure that all catch transferred to the mothership can be observed. Similar duties as observers on shoreside CVs.		Industry mothership monitoring costs from 2016 through 2020 ranged from \$147k to \$267k with an average of \$227k. Cost recovery for fisheries observation science was \$37k in 2021.	Agency costs are covered through cost recovery.
Catcher-processor	Industry Yes: Agency Yes	Catcher-processors: Requires 2 certified observers	The duty of the observer is to estimate bycatch, collect biological samples, and monitor for fishery interactions with marine mammals, sea turtles, and seabirds.		Industry CP monitoring costs from 2016 through 2020 ranged from \$561k to \$765k with an average of \$657k.	Cost recovery for fisheries observation science was very small (\$160) compared to IFQ.



Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Relationship between EM and logbooks	Industry Yes: Agency Yes	Note that logbooks were required prior to the implementation of the catch share program and may not be considered a cost directly resulting from its implementation. Logbooks are not used to track catch (discards or landings) for the catch share program except for vessels that use EM.in place of an observer. Under such circumstances, EM is used to verify catch (landings and discards) reported by catcher vessels in logbooks.	EM allows the use of camaras to record catch and at-sea discards in place of an at-sea observer. EM is generally considered to be less invasive on the crew and the video can be reviewed to verify the accuracy of information reported in logbooks.	All other U.S. trawl LAPP programs require a vessel operator to submit a logbook. Logbooks help verify reported catch and discards after deliveries are made and during enforcement boardings at-sea.	The movement to electronic logbooks has upfront costs but are anticipated to result in cost savings in the longer term. Washington and Oregon administer their logbook programs. California repealed the trawl logbook requirement in 2019. OMB number 0648-0782 Supporting Statement A estimated costs for 27 California trawl vessels completing logbooks was about \$29,500 annually. PRA estimates for Washington and Oregon vessel operators were not provided because they are operated by the states and not the federal government. EM is also considered to be a monitoring tool that could reduce costs as technology improves and becomes less costly.	The annual cost to the federal government is estimated to be about \$2,000/year to enter California logbooks into the database. This estimate excludes the cost of managing the data after it is entered into the database (OMB 0648-0782)

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Declarations when using a VMS. Note that VMS was required prior to the implementation of the catch share program and may not be considered a cost directly resulting from its implementation.	Industry Yes: Agency No	The vessel owner must install and use (according to NMFS OLE installation and operation instructions) an approved VMS transceiver unit 24 hours per day; establish a service agreement with a type-approved communication service provider; send an activation report at least 72 hours prior to leaving port on the first trip that requires VMS and maintain a valid declaration report with NMFS OLE. Declaration reports must be submitted before a vessel leaves port on the first trip in which the vessel is required to have VMS. A new declaration report must be submitted before leaving port on a trip in which a different gear type will be used. Limited entry (LE) trawl vessels fishing in the Shorebased IFQ Program must provide NMFS OLE with a new declaration report each time a different groundfish trawl gear (bottom or midwater only) is fished. The declaration may be made from sea and must be made to NMFS before a different type (bottom or midwater only) of groundfish gear is fished. LE midwater trawl vessels targeting Pacific whiting may change their declarations while at sea between the Pacific whiting shorebased IFQ sector and the mothership sector. The declaration must be made to NMFS before a different sector is fished.	Provides management and enforcement agencies with the ability to track the time, location, and speed of vessels. That information can be used to validate fishing locations and whether a vessel is fishing, moored, or steaming. That information is useful for managing areas that are closed to fishing or using certain types of gear.	Vessels fishing on a trip on which NE multispecies are landed are required to declare their intent to fish in one or more broad stock areas via VMS prior to each trip. The VTR serial number will be used to link VTRs with dealer reports and VMS data to increase the accuracy of data used for monitoring catch. VMS in Alaska is required for some fisheries, but there are no requirements to notify the agencies of changes to their fishing activities (declarations) during a trip (50 CFR 679.28(f)).	<p>Could reduce costs if some declarations that may be unnecessary for the shorebased IFQ program were removed. Declarations include participating in the limited entry groundfish non-trawl, Shorebased IFQ Program, limited entry midwater trawl, non-whiting Shorebased IFQ Program, Limited entry midwater trawl, Pacific whiting Shorebased IFQ Program, limited entry bottom trawl, Shorebased IFQ Program, not including demersal trawl, limited entry demersal trawl, Shorebased IFQ Program.</p> <p>The actual reductions in cost (\$) are likely small, but the main concern was the time burden associated with coordination vessel operator and NMFS to ensure compliance with the regulations.</p> <p>At-sea whiting declarations include limited entry midwater trawl, Pacific whiting catcher/processor sector, limited entry midwater trawl, Pacific whiting mothership sector (catcher vessel or mothership).</p>	None of the changes would reduce agency costs and to the extent they may increase enforcement costs they could be passed on to industry through cost recovery fees.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Socio-economic data collection and research costs	Industry Yes: Agency Yes	Operators or catcher vessels, motherships, catcher-processors, and first receivers must annually complete and submit economic data collection surveys. These forms are periodically revised when it is determined that specific information does not provide value greater than the cost of collecting the information.	Socio-economic data collections allow managers, policy makers, scientists, stakeholders, and the general public to better understand the social and economic impacts of the catch share programs on harvesters, processors, communities, and the Nation.	Data collections vary greatly by fishery with some fisheries having no economic data collections, some collecting specific elements that are of interest to the Council/NMFS and others that have very detailed data collections.	Based on the PRA analysis ( <a href="https://omb.report/icr/202102-0648-005/doc/https://omb.report/icr/202102-0648-005/doc/109653800">https://omb.report/icr/202102-0648-005/doc/https://omb.report/icr/202102-0648-005/doc/109653800</a> ), the estimated number of respondents was 339; the estimated time per response was 8 hours for catcher processors, catcher vessels, and motherships, 1 hour for quota share permit owners, and 20 hours for first receivers and shorebased processors. The estimated total annual burden hours were 2,195 and the estimated total annual public recordkeeping/reporting cost was \$106k.	For 2022, the Economic and Social Science cost recovery estimates for IFQ were \$234k, CP \$6k, and MS \$10k. These costs are passed on to industry when the cost recovery fee is less than 3% of ex-vessel value that year.
Socio-economic data reporting tools	Industry Yes: Agency Yes	NMFS provides access to non-confidential summaries of survey data through reporting tools (FISHEyE)	Provides a relatively easy way for stakeholders and the public to access non-confidential data collected through the various data collection instruments.	Reporting tools vary by fishery. Some information is included in the Economic SAFE documents in the North Pacific. Often information is included in the program reviews. NMFS has also developed websites (e.g., FISHEyE) to provide non-confidential summaries of the data. Not all LAPPs collect these types of data on an annual basis.		
Cooperative reports	Industry Yes: Agency No	The mothership cooperative report requirements are listed at 50 CFR 660.113(c)(3) and the catcher-processor requirements at 50 CFR 660.113(d)(3). In general, the reports must include the cooperative's allocation, actual retained and discarded catch certain allocated species on a vessel-by-vessel basis, methods used by the cooperative to	Annual reports from the MS and CP are required to help the Council determine if the program is functioning well or if there are areas of concern the Council may consider addressing.	Cooperative reports are required from all AFA cooperatives, Rockfish Program cooperatives, Amendment 80 cooperatives.	The Council has already eliminated the required filing of preliminary cooperative report that had been due in November. Cooperative managers have developed a template for providing the required information. Removing some of the requirements could slightly	These reports are submitted to the NMFS and the Council and changing the reports would not impact agency costs.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
		monitor performance, and a description of any actions taken by the cooperative against member vessels, and for the current year -the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements within the cooperative.			reduce costs. Changes to the reporting requirements that increase the information submitted would increase costs of generating the reports. If the information required is limited to that needed by the NMFS and the Council and not collected through another source, costs may be further reduced.	
Cost recovery fee	Industry Yes: Agency Yes	Section 303A(e) of the MSA requires that a Council (1) develop a methodology and the means to identify and assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and (2) provide, under section 304(d)(2), for a program of fees paid by limited access privilege holders that will cover the costs of management, data collection and analysis, and enforcement activities.	To allow agency to recover certain costs that are directly attributable to the catch share program. The regulations define who must pay the fee, how it will be collected, when it is due, and penalties for late fee payment.	NE Sectors are not LAPPs and not subject to cost recovery. LAPP regulations and the associated costs vary by fishery, with halibut and sablefish IFQ fee being 1.9% of ex-vessel value in 2022 (but was 2.3%, 3%, 3%, and 2.8% in 2021 through 2018, respectively. For 2022, non-pollock CPs in Alaska paid 0.87%, AFA pollock inshore paid 0.32% and community development quota holders paid 0.85% of ex-vessel value. The Gulf of Mexico Snapper and Grouper fishery is set at 3%. A summary of the Grouper-Tilefish annual report summarizing the fishery cost recovery is provided at ( <a href="https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf">https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf</a> ) and the Snapper fishery at ( <a href="https://gulfcouncil.org/wp-content/uploads/B-4d-2021_RS_AnnualReport_SERO_Final.pdf">https://gulfcouncil.org/wp-content/uploads/B-4d-2021_RS_AnnualReport_SERO_Final.pdf</a> ). A summary of both fisheries IFQ review is at ( <a 12="" 2022="" 2022-26923="" documents="" fisheries-off-west-coast-states-pacific-coast-groundfish-fishery-trawl-rationalization-program-2023"="" href="https://gulfcouncil.org/wp-content/uploads/B-4c-&lt;/a&gt;&lt;/td&gt;&lt;td&gt;The estimates used to determine the 2023 cost recovery fee were about \$1.7 million for IFQ, \$36k for CP, and \$128k for MS. These estimates were determined to result in a 3.0% for IFQ, 1.7% for the mothership cooperatives, and 0.1% for the catcher-processor cooperative.&lt;/td&gt;&lt;td&gt;For 2023 the IFQ cost recovery fee was set at 3% and costs were calculated to be 3.5% of ex-vessel value (&lt;a href=" https:="" www.federalregister.gov="">https://www.federalregister.gov/documents/2022/12/12/2022-26923/fisheries-off-west-coast-states-pacific-coast-groundfish-fishery-trawl-rationalization-program-2023</a> ). This has only ever been realized in the IFQ fishery as the MS and CP fisheries have always been well below the 3% limit.		

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
				Background_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508-1.pdf). The South Atlantic wreckfish ITQ program cost recovery program is still in the process of being implemented ( <a href="https://safmc.net/documents/sg_a1a_amendment48decisiondocument-pdf/">https://safmc.net/documents/sg_a1a_amendment48decisiondocument-pdf/</a> ).		
Additional fees	Agency Yes: Industry No	The Council has the authority to recommend the collection of additional fees to cover certain costs in addition to those that are included under cost recovery (e.g., EM data review costs). These fees are not currently collected, but they could be as the Council continues to develop EM options or other aspects of the program. This issue was also discussed under the monitoring issues.	Define how certain fees that may be collected will be collected and the any penalties of not paying the fee or late fee payment.	Policy makers in the North Pacific are considering implementing a video review monitoring fee to cover additional costs associated with EM	To the extent additional fees are charged in the future they would be in addition to any observer, cost recovery, and other costs directly borne by industry.	The additional fees would not change agency costs.
MSA required program and allocation reviews	Agency Yes: Industry Yes	A LAPP Program Review is required every 7 years after the initial review under the MSA and NOAA's Fisheries Allocation Policy Directive 01 -119 requires allocation reviews. A Program Review is typically a fairly detailed review of the LAPP. This Council committed to 6-year program reviews and tied its trawl/nontrawl allocation action (Amendment 21) to the catch share program, considering the allocation integral to it; and so, reviews those allocations in tandem with its trawl catch share review.	To provide the regularly scheduled, detailed review of the catch share program. The reviews update how well programs are meeting their stated objectives and whether any changes to the programs might be considered.	MSA requirements apply to all U.S. catch share programs. The NPFMC is considering methods to streamline the process because of the time and resources involved in completing all the reviews. The report to the Council is available at <a href="https://meetings.npfmc.org/CommentReview/DownloadFile?p=44cfcc5b-8999-4c82-a384-c4d8bdcfc3ab.pdf&amp;fileName=PP T%20E%20Allocation%20Review%20Approach.pdf">https://meetings.npfmc.org/CommentReview/DownloadFile?p=44cfcc5b-8999-4c82-a384-c4d8bdcfc3ab.pdf&amp;fileName=PP T%20E%20Allocation%20Review%20Approach.pdf</a> . Catch share reviews for other fisheries are cited as part of this paper.	Industry members are typically very involved in helping develop the scope and reviewing the findings of program reviews. To the extent the process can be standardized and streamlined it could reduce costs of attending meetings and reviewing document contents.	Program reviews are generally very time consuming for NOAA Fisheries and Council staff. Stakeholders also incur time costs reviewing and providing input on the contents of the reviews. Streamlining and standardizing the review process to the extent practicable could reduce costs.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Change season dates	Industry Yes: Agency No	The Council has adjusted the primary Pacific whiting season start date for all sectors of the Pacific whiting fishery from May 15 to May 1.	To create efficiencies in the program when the benefits outweigh any negative impacts of changing the time of year, fishing is allowed.	Catch share programs provide the opportunity for vessels to fish when catch rates are higher, bycatch is lower, or there are fewer conflicts with other fisheries. Changing season dates can, in some cases, provide the flexibility necessary to achieve those objectives. For example, it allowed the CGOA Rockfish program to begin earlier to reduce halibut bycatch. The Alaska halibut IFQ program allowed season dates to change from a few days to about 10 months.	Longer seasons do not necessarily mean greater costs to stakeholders. The flexibility provided by catch share programs allows harvesters to consolidate quota harvests on fewer vessels and to prosecute their catch share fisheries harvests around other fisheries may result in cost savings. Limits on harvest of other fisheries may be needed to protect those participants if changing season lengths provide opportunities to increase participation in those fisheries.	Changing season lengths are not expected to reduce agency costs by a significant amount. Longer seasons could result in small increases in monitoring and days-at-sea enforcement costs to account for the additional days.

## **6.0 CONCLUSION AND POTENTIAL FUTURE STEPS**

An overall conclusion of the study is that all West Coast Groundfish Trawl catch share fisheries have been successful at reducing bycatch and establishing monitoring requirements that allow catch and discards to be accurately reported as required in Section 303A of the MSA. Achieving these goals has been an important component of rebuilding stock (some industry members feel that rebuilding stocks was occurring prior to the implementation of the catch share program and the program ensured catch limits were not exceeded) that were overfished prior to implementation of the catch share program. This was a primary objective of the Council when implementing the catch share program.

The net benefit to the nation and economic stability goals of the program have had mixed results. The whiting fishery, in general, has allowed harvesters to operate profitably, based on data reported in the FISHEyE data tool. Some catcher vessel owners that are not vertically integrated with the mothership have indicated that the program has not allowed them to fully harvest their allocation, because not enough markets are available to deliver their catch. In their opinion, the program has failed to achieve its OY objective. Harvesting a fraction of their allocation (less than 45% in 2020 and 2021 and about 67% in 2022) has reduced potential profits and total benefits generated by the fishery. Catcher vessels operating in the shoreside whiting fishery are also concerned about markets, but most indicated there are several shoreside buyers. Vessel operators in this sector have harvested more than 85% of their whiting allocation in most years, but less in 2022. Catcher-processors have been able to fully harvest their allocation most years. Shoreside processors are concerned about the quality of whiting being delivered and how that impacts their final products. They are also concerned about the limited availability of fresh markets. All participants noted that the structure of the LAPP relative to trip limits and seasonal management has made it difficult to develop and maintain fresh markets in both whiting and non-whiting groundfish.

Participants in the IFQ groundfish fishery have noted the lack of infrastructure to support their fishery in some geographic areas, as well as the lack of markets. Larger trawl vessel operators in California, in particular, have indicated that the program has not improved their economic conditions. Many of the vessel operators in this category have exited the fishery or stated that they feel trapped in the fishery with no way to exit the fishery and pay off their fishery related debts. Other groundfish vessel operators have also expressed concern with the additional IFQ program costs. Costs directly related to the IFQ program that are often cited by stakeholders are the monitoring costs, cost recovery fees, and quota leasing/purchase costs. Groundfish participants also noted that the cost of the buyback program is problematic, even though the fee percentage has declined in recent years and studies have indicated that it provided stability to facilitate implementation of the program.

Specific recommendations provided by stakeholders are listed in Section 9.1. Some of the recommendations are outside the scope of this paper and could have broader biological implications (e.g., removing stripetail rockfish from the shelf rockfish group). The focus of this section is monitoring, recoverable agency costs, and transfers.

### **6.1 Monitoring Costs**

Monitoring costs for the non-whiting IFQ fishery are a primary concern. Because the IFQ program is based on accounting for at-sea discards as well as retained catch at the vessel level, reducing the 100% monitoring requirement is challenging. Much work has already been expended on reducing those costs, including providing more flexibility in the time required to review EM video to reduce the need for PSMFC or other EM service providers to hire additional reviewers. Increasing labor costs would impact both EM video review and observer/monitor costs. Minimizing monitoring costs is an issue that is worth continually working on to ensure needed information is collected at a relatively low cost. Additional research on the amount of discards incurred prior to cod-end transfer to mothership vessels would be

useful. The primary objective of monitoring mothership catcher vessels is to ensure that cod-ends being bled or dumped are reported in the logbook and accurate (to the extent possible) amount of discards by species are recorded. Because cod-ends are not brought aboard the catcher vessel, it may be difficult for observers or EM to verify the quantity and species of discards that result from bleeding or dumping a cod-end to account for QP use.

Consider the use of EM at shore-plants to verify plant discards and retained catch. Monitoring would be required from the offload point through the plant until all fish are weighed and reported. As EM technology is further developed it may be possible to deploy the technology at processing plants at a lower cost than plant monitors. Development and implementation of shoreside monitoring via EM would require regulatory changes and would also likely require a multi-year process to ensure that the information collected meets the necessary standards. The need to observe multiple locations (e.g., vessel hold, offload area, sorting belts, etc.) for shoreside monitoring presents a logistical challenge.

During the development of the paper two issues were considered. The first was MSA modifications to allow landings fees to be used to pay for observer coverage, much like the partial coverage fleet in Alaska pays. Doing so could also allow the Council to consider recommending NOAA Fisheries explore hiring observers as federal employees. Both these concepts were rejected because modifications to the MSA are beyond the scope of this project, and NOAA Fisheries staff indicated that hiring federal employees to serve as observers was unlikely to result in any cost savings.

Modifying the observer educational requirements by allowing catch monitors with high school educations to perform certain duties. This is unlikely to result in substantial cost savings because the difference in pay the two classes of monitors would receive is small relative to the total daily cost of a monitor but could help expand the available pool of applicates should observer shortages be realized in the future.

Fishing declarations that must be provided as part of VMS could be reviewed to determine whether all of the reports a vessel operator must supply while at-sea are necessary. This is more an issue of simplifying vessel compliance with all the required reporting requirements than the actual cost of making the reports. If the vessel operator does not comply with reporting all changes in fishing operations that are required, they could face enforcement actions. The current justification for the requirements (see 86 FR 1947), is that it allows for monitoring and enforcement of areas closed to fishing by gear type because traditional enforcement methods (such as aerial surveillance, boarding at sea via patrol boats, landing inspections and documentary investigation) are difficult to use when the closed areas are large-scale and the lines defining the areas are irregular.

Review West Coast observer programs to determine if there are efficiency gains that could be realized with better integration of the groundfish program with the other observer/monitoring programs. Such a review goes beyond the scope of this paper but may provide cost savings that extend beyond the trawl groundfish catch share program.

## **6.2 Information Collection Costs**

### **6.2.1 Economic Data Collection**

Economic data collection agency costs have been reduced over time as NOAA Fisheries has developed more efficient ways to collect and make available the information collected. The collection program is still a substantial response burden to industry in terms of time spent organizing, verifying, and providing the data, as well as NOAA Fisheries costs associated with that collection that are recoverable. NOAA Fisheries staff continuously works to decrease the cost of running the survey (see Table 4-9) and decrease the burden hours associated with participation in the survey (see OMB PRA revision and renewal notice—[FR Doc. 2023-07236](#)). A review of the data collection instruments could be undertaken to further



explore whether all the variables and levels of detail requested are needed to understand the impacts of the program.

### **6.2.2 Cooperative reports**

Annual cooperative reports are required from the mothership and catcher-processor cooperatives. The cooperative manager must submit an annual report to NMFS and the Council by March 17 each year, before a cooperative permit is issued for that year. Cooperative manages time to complete the reports are minimal and stakeholders have not indicated concern over producing the reports. The annual cooperative reports contain information about the previous year's fishery, including:

- (i) The mothership sector's annual allocation of Pacific whiting and the permitted mothership cooperative allocation;
- (ii) The mothership cooperative's actual retained and discarded catch of Pacific whiting, salmon, Pacific halibut, rockfish, groundfish, and other species on a vessel-by-vessel basis;
- (iii) A description of the method used by the cooperative to monitor performance of cooperative vessels that participated in the fishery;
- (iv) A description of any actions taken by the cooperative in response to any vessels that exceed their allowed catch and bycatch; and
- (v) Plans for the current year's mothership cooperative fishery, including the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements.

The cooperative reports contain information that is available from other sources such as catch and discard data and the cooperative agreements that are maintained by PSMFC. Vessel-by-vessel catch, and discard data could be derived from PSMFC reports. This would require the cooperative members to waive certain confidentiality agreements to release only the required information at the vessel level. Cooperative allocations are determined by NOAA Fisheries and could be provided as part of an annual report to the Council. The annual cooperative application already requires that the cooperatives provide a plan to adequately monitor and account for the catch of Pacific whiting and non-whiting groundfish, and to monitor and account for the catch of prohibited species. The information that is not collected is the penalties that the cooperative imposed on members during the year. The permit application does require a description of the cooperative's enforcement and penalty provisions, and they must be adequate to maintain catch of Pacific whiting and non-whiting groundfish within the allocations.

Finally, it may be possible to receive a verbal report from the cooperative managers instead of a written report if the report is more focused and includes only information that is not available from other sources. However, this could require additional time and effort to access that information from meeting recordings if it is not written.

## **6.3 Whiting Utilization**

Utilization of the mothership sector's whiting allocation was a concern of some stakeholders. While the Council has recently taken actions to address some of the underlying issues<sup>45</sup>, some members of industry recommended going further. Recommendations were made to consider the leasing of whiting quota between sectors where catcher-vessels are utilized to harvest whiting.

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<sup>45</sup> [https://www.fisheries.noaa.gov/s3/2022-12/ComplianceGuide\\_Whiting\\_Utilization.pdf](https://www.fisheries.noaa.gov/s3/2022-12/ComplianceGuide_Whiting_Utilization.pdf)

## **6.4 Allocation and Use of Set-Aside Species**

Because of concerns that have arisen in recent years regarding the allocation and use of the set-aside species by the three sectors, stakeholders recommended that the Council consider how the set-asides are apportioned and used by each sector. The general intent was to determine if there are opportunities to preserve the conservation objectives associated with the set-aside species apportionments, while providing more stability and accountability with their usage.

## **6.5 Distribution of Benefits from QS Ownership Issues, Including Quota Leasing Costs**

QP leasing costs were identified by stakeholders as an area of concern. Concerns of individuals interviewed for this paper were focused on the high cost of leasing sablefish quota as well as quota leased to harvesters by inactive participants in the fishery and non-profit entities. Inactive QS holders and non-profit companies leasing quota is a complex issue that is probably best addressed through the program review or a focused amendment on that issue.

Quota transfers are discussed in terms of covering overages and accumulation limits. Cost savings may be possible if the rules for covering harvest overages of more than 10% of the initial allocation were extended to more than 30-days. The added time could allow a person to acquire quota with better terms but would reduce the incentives to minimize overages of 10% or more. Any cost savings would benefit persons that are non-compliant with the harvest limits.

Excessive share limits are mandated under the MSA. The Council is provided authority to recommend an excessive share level for a particular fishery. Changing the excessive share limits could benefit the stakeholders under certain conditions (e.g., removing the limits for mothership processors). Given the current fishery conditions no changes have been identified to reduce costs, but changes in allocations and fleet size could warrant revisiting the limits.

Information in Table 8.2 shows that total leasing costs have declined in recent years, but those costs remain a substantial expenditure. For example, Connelly et al (2022) estimated that active vessel owners paid about 21.4% of their gross ex-vessel revenue in lease fees. Declining lease fees may also reflect reduced economic health of a fishery. Note that actions which reduce program costs borne by industry are likely to result in higher QP lease fees and QS costs, but buyers are willing to pay the higher rates because they determined that year's change in profitability (from QP) or the stream of long-term profitability (from QS) would justify the increased cost.

## 7.0 ACKNOWLEDGEMENTS

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## **9.0 APPENDIX**

### **9.1 Summary of stakeholder input**

This section does not attempt to verify or refute opinions of the persons providing comments, or the validity of suggested program changes. The author felt it is important to allow the stakeholder's views to be expressed as they were provided.

There was almost universal agreement, from permit holders that wished to comment on the program, that it has achieved many of its conservation and management objectives of addressing environmental impacts (including supporting the rebuilding of stocks through better catch accounting) and achieving individual accountability of catch and bycatch. A preponderance of stakeholders that commented (the number is too small to draw fleet-wide conclusions), especially in the non-whiting fisheries, felt that the economic goals of the program have not been met, with many respondents indicating they felt structure of the program did not allow for the program to achieve its economic objectives of increasing net economic benefits, creating individual economic stability, and providing for full utilization of the trawl sector allocation.

#### **9.1.1 Non-Whiting Harvesters**

Stakeholders that commented from the non-whiting sector included both permit holders that are still active in the fishery and those that have exited<sup>46</sup> the fishery because they stated that they were unable to operate profitably. All stakeholders that provided input expressed concern that the overhead associated with the program is too high. One stakeholder downgraded the size of vessel he operated and tried multiple strategies to make the fishery work including selling directly to buyers at the dock and value-added marketing of his catch. He reported that none of these strategies allowed him to cover his operating costs.

Harvesters, particularly those operating larger trawl vessels out of California ports, noted problems associated with local ports not having sufficient infrastructure to allow for efficient offloading of fish. Offloads sometimes would need to be done by hand because they could not access a hoist in the San Francisco area. These offloads took more hours and drove up the costs. These logistical problems at the dock were stated to have delayed offloads and increased costs associated with paying processing/dock staff and vessel crew. The loss of infrastructure problem was reported to be related to reduced catch limits necessary to facilitate the rebuilding of certain rockfish stocks. The lack of dock and hoist availability, in some cases, necessitated finding dock space in other communities that were an additional 2-hour cruise each way. Another permit holder dealing with a lack of portside infrastructure also noted that what is available is expensive. He stated that in his area there is a charge of \$0.08 per pound to offload vessels using traps and \$0.001 per pound for trawl vessels.

Another permit holder stated that in the 1990's people would fish mostly groundfish year-round. During that time period six trawl vessels delivered to the local processor. Now they were reported to be the only boat fishing out of their port and there are only two trawl vessels fishing groundfish between Monterey and San Francisco. The permit holder's opinion was that catch shares allow a little more fishing flexibility, but the cost of that flexibility is too high. Cost of observers, quota leases, buy-back fees, and the current high fuel prices, were stated to "make it impossible to make a reasonable profit". He noted that fuel prices were high 20-years ago and those prices were driving people out of business. He felt they have comparable fuel prices, but because of all the additional costs, fuel - which costs about \$2,000/trip, is only about one-third of the regulatory costs that directly resulted from the catch share program. To reduce observer costs, they try to make day trips and need to catch about

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<sup>46</sup> As noted, the persons contacted were permit holders and first receivers. Persons that exited the fishery had either sold their permit since the permit file used to develop the contact list was generated and were no longer active in the fishery or they had sold their permit and quota, but still held an active first receiver's license.

13,000 lbs. of fish to break even. They estimated they have \$6,000 - \$7,000 invested per trip in regulatory costs. Part of that cost is leasing quota. Even though he gets a small price break (about 10% off the market price) by leasing from a community organization that holds quota, the added cost is substantial. In addition to the other costs, fish taxes were reported to be 7% to 8% of the ex-vessel value and that also reduces the profitability of the firms.

One permit holder's perception of the program was that it was primarily focused on conservation goals. To achieve those goals an objective was to reduce the size of the fleet. To fix the program, the Council would need to reevaluate the program's goals and establish goals that would increase the percentage of allowable catch that is landed. He felt "they need to catch more fish and have a more consistent supply of fish being landed to support new infrastructure development". The program that was developed was intended to control a larger derby style fishery and applying those tools to the non-whiting fishery was not going to work from the beginning, in his opinion.

Another permit holder stated that he started out as a deck-hand and worked his way up to being a captain. He then acquired his own boat. His business plan was to use his quota and that of a community organization and deliver the fish to a processor and sell directly to consumers. However, leasing fish (especially sablefish) is expensive and creating own markets has a high overhead. In addition, more of the firm's income gets "eaten up" by observer fees and high fuel costs, making it hard to be profitable. Because he still has not paid for the boat, he needs to figure out a way to make his business work to pay off his loan. He has not found a profitable solution yet, and he feels trapped in the fishery, stating that the entity he leases quota from "makes their margin but he does not make any money". He stated that the revenue he makes is just enough to cover the costs with no money left over to pay himself.

A harvester that fishes sablefish quota with traps provided the following summary. Prior to IFQs harvesters were able to make trips throughout the year and catch larger sablefish. The smaller vessels spread out the catch and did not fish in very deep waters that he feels provided a sanctuary for the larger fish that made up an important part of the breeding population. With the implementation of the IFQ program, larger vessels moved into the limited fishing areas they had traditionally fished as well as deeper water that was not accessible to the smaller vessels. He feels the stock assessments are good, but they should be improved to account for localized depletion of fishing areas that are caused by larger boats taking more removals in a short period of time from areas that were not traditionally targeted.

Another permit holder stated that the program is structured so that they cannot utilize the quota they are issued. He stated that historically the fishery in his area was a small boat fishery comprised of vessels typically less than 35 feet, with no large boats operating in the fishery. He stated that there are only one or two 35-foot boats operating because they cannot afford all the fees and costs incurred under the program and there is increased competition from larger vessels. With the increase effort in the area, he indicated his vessel's CPUE decreased. He stated that the smaller boats in his areas would typically set about 35 traps. When the large boats entered the fishery, he said they would set about 30 traps, go get another 30 traps to set, and then set another 30 traps so they could rotate pulling about 90 traps. Because of the increased competition he said the fleet has been reduced from about 30 or 40 vessels to four to six vessels. In his opinion, vessels used to take 24-hour trips to supply a fresh market and now they do not have that market because of Covid-19 and increased regulations selling into that market.

A permit holder felt the resource is better managed when removals are spread out over a longer time in the summer, so it does not lead to localized depletion for the smaller vessels and it allows the fresh market to better absorb deliveries. His opinion was that the glut of fish at one time ruined the fish market. He indicated that in the past, small boats had a 2,000-pound limit and smaller boats would often high-grade to make sure they brought larger, higher valued fish to market while staying within the 2,000-pound limit. He was concerned that the large boats have the capacity "to catch 100,000 pounds per trip". He also felt that since boats are required to have VMS, other fishermen can easily track where they are fishing, making it easier for other harvesters not familiar with the area to

determine productive fishing grounds. The permit holder indicated that tracking the larger boats they can see that they are fishing where the smaller boats traditionally fished. He also noted that larger boats have put escape ports in their traps to help increase the size of fish caught and larger boats have the ability to fish deeper waters with traps (600 fathoms to 700 fathoms). He considered the deeper waters as a reserve for the fish stocks that small boats could not easily fish, but when the larger vessels began fishing, they could set their traps with heavier line to fish deeper and were able to selectively remove the larger fish.

Another permit holder stated that he “has not seen anything good coming out of these programs”. He stated that he relies on permits in other fisheries to keep their fishing operation viable. His opinion was that the program has not improved prices or allowed the creation of new markets. These factors were stated to have limited his ability to operate a viable groundfish fishing business. Prior to the IFQ program, he said they would determine available markets and fish those fisheries. The flexibility to move fisheries was thought to be important to their business plan. The IFQ program qualifying years were stated to have had a negative impact on a lot of fishermen that relied on different fisheries based on markets, by limiting their initial allocation. To reduce costs and increase efficiency he built a new boat. However, he felt the quota he holds is insufficient to off-set the costs of the program, even with the more efficient vessel.

A permit holder noted that about 3 years ago a study was conducted on how to revitalize the fishery in Fort Bragg. He has never heard the results of the study. However, he noted that they have lost almost all of their support industry. He said they have lost the electronics people, mechanics, ice production capacity is almost gone, fuel dock is gone (fuel comes down on a truck and is \$2 a gallon higher than other places). He said the local fishermen now have to get ice and fuel from Bodega Bay. He indicated that most vessel operators are either getting supplies from processors or other communities. He also noted that the port needs to be dredged for the larger vessels and noted that trawlers have some money saved for dock improvements.

Another limitation reported to be placed on harvesters is they cannot sell directly from the boat because of the first receiver permits that are required. This was stated as an obstacle limiting their ability to directly market fish.

One California harvester noted that they cannot obtain “John Doe” crew licenses that are available other places, so all workers need a crew license to help off-load. He noted that it is difficult to work through the application process for new crew to get a license. For people that already have had a license in the past, the process was reported to be relatively easy. Pre-IFQ the vessel owner stated he would have crew that only helped with the offload and they operated the vessel with four fishing crew members including the captain and two additional crew to help with the offload. Recently, he said they were only employing the captain and one crew member to reduce costs.

One harvester noted that one of the primary processors in California is for sale and the other is on a 40,000 lb. delivery limit. The delivery limit was stated to reduce the economic efficiencies of larger trawlers that have the capacity to deliver much more than that amount on a trip.

One person noted that too much quota is being held by persons not actively harvesting fish (including trusts and other persons that only lease quota) that charge lease rates, when added to all the other costs, make it difficult for harvesters to earn a reasonable profit. He felt that people that only lease quota are in a more difficult position to access loans, since they do not hold the long-term asset value to use as collateral.

Another issue stated to be causing lower profits is the non-whiting harvesters are able to utilize less of the available fish. One person felt that the three years before catch shares, the non-whiting catch (excluding rockfish (e.g., flatfish)) was better. Under the program he said that landings volume has decreased, and landings have consolidated geographically. He felt they are at the mercy of the processor and processors are at the mercy of markets with low-priced imports. He noted that seafood is going to larger volume, lower cost, products. For example, he stated that costs have risen dramatically, but the price of dover/widow is same or less as 1993. Since the program was introduced, he stated that

the number fillet lines have declined. He thinks the program has inhibited the fresh product market and the world has changed in terms of fish marketing and consumption.

Gear switching remains a controversial issue. People in general felt that it needed to be fixed, with some people stating it hurts the fishery and others using it as an important business tool. One vessel operator noted that during the past year sablefish lease fees started at about \$0.25 per pound. The price increased to \$0.35 per pound in the spring. When the vessel operator provided comments, he indicated that the price was about \$0.60 per pound<sup>47</sup>. He reported that most trawlers were getting \$0.90 to \$0.95 per pound for sablefish. Because of the structure of the DTS fishery, he felt that black cod lease rates of \$0.20 to \$0.30 per pound were sustainable in the fishery. Rates above that level make it difficult to operate profitably.

A respondent felt that the industry is in real trouble as a result of losing historical memory from long-term participants. “The older generation is getting out of the fishery” (greying fleet) and the younger generation is either discouraged from becoming owners or they do not have interest given current conditions that, they feel, do not provide the opportunity for reasonable returns on time and investment.

### **9.1.2 Whiting Harvesters**

#### **9.1.2(a) IFQ**

Whiting vessel operators indicated that the program has, in general, worked well. However, some stated that for other groundfish species the program was implemented too late. He felt “regulators waited until the fishery had already collapsed” and at that point there were limited processor options for deliveries and the marketing of fish was poor. He felt that prior to the last two or three years, the whiting fishery had worked well. Fishermen noted that the recent problems with the fishery are reflected in the amount of whiting left in the water during 2022. The reported utilization rates for whiting in 2022 are 66.9% shoreside, 66.4% motherships, and 100% catcher-processors, for an overall total utilization rate of 72.4%<sup>48</sup>.

Representatives of one company noted that the program has worked very well rebuilding overfished stocks. Previously overfished stocks that they encounter now were called “abundant”. This included choke species like widow rockfish, canary rockfish, and yellowtail. Overall, they felt the catch share program has done what it was intended to do.

One respondent noted that the costs in the fishery are too high because of the vessel buyback, cost recovery, at-sea and shoreside observers, ODFW fees, trawl commission fees, and taxes. The respondent was specifically concerned that the economic data collection program costs under the cost recovery fee were excessive. The operator was not only concerned about the cost, but also cited concerns about the quality of data generated, if the information provided does not neatly fit into the boxes provide in the questionnaire and match closely with the information provided by other harvesters. Fuel prices/costs were provided as an example. Firms that buy fuel at the local docks pay a premium relative to firms that buy in bulk. Buying in bulk saves the firm \$0.25 to \$0.50 per gallon. Because the information they report is different from the fleet that buys at the dock, their information is flagged by NOAA Fisheries and sent back for correction. Instead of using the actual price they ask what the “correct” price is and report that price, even though it does not reflect their business practice. They do not intend to change how they purchase fuel because that practice provides cost savings for their business and works better than the using either commodity markets to buy futures to help create more certainty in future costs or buying higher priced fuel at the dock.

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<sup>47</sup> The Jefferson State Trading Company website shows two QP transactions for 2023 with one transaction selling sablefish for \$0.50 per pound and the other selling sablefish for about \$0.70 per pound.  
<https://jeffersonstatetradingco.com/closedauctions2.php?>

<sup>48</sup> Table E.1 [https://media.fisheries.noaa.gov/2023-02/2023-hake-assessment-post-srg\\_web.pdf](https://media.fisheries.noaa.gov/2023-02/2023-hake-assessment-post-srg_web.pdf)



Another stakeholder stated program costs significantly impact their business. Cost recovery fees, buyback program fees currently account for about 6.5% of ex-vessel revenue and was higher when the buyback fee percentage was higher. Fish taxes also increase costs. The increased fuel costs were reported to account for about 40% of trip costs. Stakeholders were also concerned that regulators want to assess another fee for EM review for full retention of salmon discards. The additional costs and reviews were felt to be unnecessary because unusual events on deck in the whiting fisheries would be easy to detect. He indicated that discard events are rare, and they typically result from poor weather conditions or other safety situations. The stakeholder also noted that the discard information is provided in the logbooks that is readily available. He was concerned that too much emphasis is placed on enforcement of the program and feels that industry has shown they can be trusted to report information accurately.

It was recommended that the VMS reporting should be changed to “be more like it is done in Alaska”. On the West Coast they are required to call every time they switch gears. This is difficult for harvesters at-sea to coordinate with their home office and NOAA Fisheries. In Alaska, the agency monitors VMS to see where vessels are located and their speed. Some harvesters felt a similar program structure could be implemented in the West Coast fisheries to reduce reporting burdens on the fleet.

Industry members stated that they are willing to pay for the additional costs associated with operating their cooperative’s (this was stated by participants in shoreside as well as at-sea cooperatives), but they are less happy with all of the costs included in the cost recovery program that results in IFQ program participants paying close to the full 3% fee most years. There was concern that a lot of the monitoring costs are hidden in the cost recovery fee and members of industry continue to request more transparency from the agency relative to those costs.

Members of industry remain hopeful that EM can provide cost savings. They feel that the video review to determine if there are discrepancies between the logbook and the video captured should not take much time or require additional fees. They also indicated that EM of the whiting fishery should not be a tool for harassment/fining industry for accidental/minor violations.

#### **9.1.2(b) At-sea**

One independent harvester in the mothership sector was dissatisfied with the program because of lack of processing capacity and available markets for some years. That person felt that catcher vessel operators that are independent of the mothership were at a disadvantage. Catcher vessels that are owned by the mothership and fleets that own the mothership were stated to have better markets and benefit more from the catcher vessels and motherships working together.

An independent operator felt that the mothership whiting fishery has completely “failed to meet any kind of legitimate goals for a rationalized fishery other than it has controlled bycatch”. When compared to the AFA pollock fishery and the Alaska crab cooperative he felt that it was not as successful in meeting the stated program goals of providing economic benefits to the independent at-sea catcher vessel fleet. He stated the mothership sector has never harvested all of its whiting quota and some quota holders do not even catch half of their whiting allocation. A cited primary reason was the lack of adequate processor markets available to independent catcher vessels. He noted that there are unused mothership licenses, owned by the same processors operating in the mothership fishery. Holding those licenses, but not using them, was stated to limit the markets for catcher vessels and the motherships that are operating do not have the capacity to take all the whiting catcher vessels who want to deliver during certain times of year. He stated that many of the catcher vessels also fish pollock and Pacific cod in Alaska or operate in other west coast fisheries part of the year, limiting the times of year they are available to harvest whiting.

Lack of catcher vessel market power was also stated as a problem. When there is more quota available than is being delivered and catcher vessels compete for market opportunities to deliver their quota, the catcher vessel operators saw themselves as having little market power. Mothership operators were felt to be able to attract new catcher vessels to make deliveries making it more difficult for the vessels that had delivered to them to fully utilize their quota. One person said that market conditions and capacity

limits can result in a catcher vessel being placed in a delivery rotation. He noted that if a mothership operator adds a catcher vessel to the delivery rotation, it reduces the number of deliveries a CV can make, because harvest is limited by MS hold capacity before they must offload product.

One person suggested combining the mothership and shoreside sectors into a single IFQ fishery to provide harvesters with more markets and allow the mothership quota holders to deliver more of their quota. Other respondents noted that it would be hard to combine the two whiting fisheries because of the bycatch quota in the two fisheries. It was also noted that the mothership fleet can be efficient and has benefited from lower program costs.

Another person indicated that the whiting fishery is operating better under the cooperative structure than it was under the derby fishery. Costs of participating in the whiting fishery were thought to be reasonable under the cooperative fishery. He said that NOAA Fisheries has limited costs associated with running the fishery and as a result of the cost recovery fees are relatively low. He noted that the cooperative members incur additional costs to hire a cooperative manager and information technology specialists help run the cooperatives and monitor their performance. Those costs were anticipated when the program was being developed and the fleet, in general, felt they were reasonable.

A participant noted that they pay annual dues to one or more organizations. Cooperative membership can be in the at-sea cooperative and/or an IFQ cooperative. Membership in those cooperatives was stated to aid in season hot-spot management and salmon bycatch avoidance in addition to other vessel coordination issues. Some harvesters are also members of United Catcher Boats or Midwater Trawlers Association. Firms involved in both harvesting and processing may also be members of the West Coast Seafood Processors Association. Depending on which groups and how many groups they are members, stakeholders said their annual dues for these groups can exceed \$100,000.

Another harvester holds quota but leases it and no longer fishes. The person holds both groundfish and whiting quota and was more involved during the whiting cooperative formation and in the cooperative management in prior years. This person also noted the lack of processing in the mothership sector. The lack of markets (for catcher vessels delivering and the mothership first wholesale markets) were stated as reasons for the sector not using all its quota. During the years the person was more involved in the cooperative, he felt both the shoreside and mothership cooperatives allowed the fleet to be very successful managing bycatch.

### **9.1.3 Shoreside Processors**

One respondent indicated that he was concerned from the beginning that the program would not work well for his sector/business for several reasons. The trip limit program required harvesters to catch and deliver groundfish every two months or lose their apportionment of fish. That structure forced deliveries to be spread out over more of the year, which was more conducive to supplying a fresh market. He indicated that harvesters would often fish for groundfish for a couple weeks and then fish for other species like shrimp. After the IFQ program was implemented, harvesters tended to shift the timing of groundfish effort and its associated catch to the fall. He stated that harvesters would fish shrimp from April 1 through October. About the same time the IFQ program was implemented the shrimp stock was increasing and offering a good price, leading to more effort on shrimp and less on groundfish. Moving groundfish effort to later in the year made sense for harvesters because they did not need to keep switching fisheries and he indicated that groundfish are often easier to catch in the fall. However, from the processor's perspective it did not work as well since they would need to freeze more of the product, because it was delivered in a more compressed time window creating a glut of fish on the fresh market. Frozen product was stated to have a lower value and increased costs due to loans required to cover costs until the product can be sold and the cost of freezing and holding the fish. He noted that rockfish and Dover sole compete well in the fresh market in terms of quality and price compared to substitute products like tilapia. He stated that fresh tilapia shipping costs increase the market price, and the fresh shipping costs of locally harvested fish are less making the local fish price more competitive. Costs of shipping frozen tilapia were said to be much less and increased freezing and holding costs of frozen local products make it more difficult to compete on price. The change in

the market structure with fewer local or more independent buyers also was stated to make it more difficult to develop markets for smaller/less predictable deliveries of fresh fish. In general, the stakeholder felt the program has hurt the fresh market and in the stakeholder's opinion, the fresh market could have beaten the substitute fish fresh market, but the program's design inhibited its development.

One processor thought the shoreside IFQ program may have worked better if it was designed as a cooperative structure that incentivizes harvesters and processors working together. The IFQ structure was thought to have never completely bridged the gap between harvesters and processors, like cooperative structures have in some other fisheries.

People indicated that the processing of groundfish is very different than the processing of whiting. The general opinion was that whiting was faring better in the world market than non-whiting species. It was noted that the USDA has bought whiting, shrimp, and rockfish in the past. Stakeholders are also encouraging the USDA to buy flatfish as an inexpensive, high-quality source of protein. The fresh market rockfish was hurt by Covid-19 restrictions and has not bounced back to previous levels, according to some stakeholders. USDA buys fish once a year, but some members of industry would prefer that it was purchased quarterly. Quarterly purchases and more consistent purchases were thought to help the processors, especially with overseas markets being less certain because of tariffs and other geopolitical uncertainties. People generally thought that the fresh groundfish market is a more difficult market to be in than the frozen/surimi market. Fresh markets were reported to need volume from a variety of fisheries to sustain a business. Access to multiple fisheries was stated to allow stakeholders to survive when a specific fishery has poor production or markets are soft.

Processors addressed the processing of groundfish in a variety of ways. Processors with multiple locations may truck the fish from a whiting plant to be cut in another location. Another processor noted that they do not take groundfish deliveries but buy groundfish from whiting processors. The buyer does not get discounted pricing, but it helps both operations. The whiting processor can pay harvesters for the fish and generate some revenue from their delivery and the processor buying the groundfish has access to raw product.

Oregon processors, and likely processors in other states, noted issues with wastewater permits. Wastewater problems may cause processors to move inland to process instead of processing at the docks, to reduce the issues associated with wastewater treatment and the permitting process.

Harvesters are strongly encouraging processors to invest in the fishery. Some of the processors are investing others are not, likely depending on their forecast of long-term participation in the fishery. Harvesters want processors to increase fillet production, by investing in equipment like fillet machines and tunnel freezers. Processors stated that they need a system that provides incentives to invest in flatfish processing automation. Two flatfish fillet machines were reported to cost about \$5 million and to make the investment payoff they need greater certainty about steady, high-quality deliveries. One processor representative noted that it takes about 2 years to fully train an employee to be a good filleter and keeping good employees that long is often difficult.

Another person noted that while costs are always a concern, industry really needs a fishery that will grow in volume and value. He said value can be increased if the fish delivered are of higher quality. This is an issue for whiting, because it begins to breakdown quickly. Stakeholders indicated that fish handling and chilling are important to maintaining whiting quality. In a stable fishery, stakeholders indicated they may be more willing invest in equipment if it can provide a return on investment.

Gear switching was noted as a contentious issue by several of the stakeholders that responded. A representative of a smaller processing firm supported the gear switching provision but was concerned that some competitors did not want smaller processors to use quota to attract fixed gear deliveries. Other processors were opposed to gear switching because of the impact sablefish has on constraining the harvest of other groundfish species. Everyone acknowledged that fixed gear sablefish is more valuable than trawl caught sablefish. However, stakeholders in the trawl sector were concerned about the impact sablefish availability has on the fleets ability to "get more fish out of the water". The

competition for sablefish quota has increased the cost of sablefish quota (as noted earlier). Because of the high price and limited availability over the last three years, fewer transfers were said to have been made. Some people felt that quota holders that got into gear switching under the control date should be grandfathered, but others should not be allowed to gear switch. Others would like to see a cap placed on how much can be used by fixed gear vessels, indicating that the reported 29% to 30% is too much. That person would like to see gear switching scaled back. He expressed concern that “armchair quota shareholders” are part of the problem. Keeping all of the sablefish within the trawl sector would help to make the DTS fishery more profitable. That person would be okay with a 10% to 12% annual sablefish gear switching limit. That person did not like the original control date, but since it is in place it is not likely to change. He also said that industry and policy makers need to resolve the issue so that they can focus on other pressing matters that more broadly impact the fishing industry, like wind energy that could have a substantial impact on both fishermen and fish/marine mammal populations in the future.

Some processors in the IFQ program still feel they should have been given an initial allocation of groundfish. A processor stated that they have bought quota to use in the fixed gear fishery and use that quota to build stronger relationships with their harvesters. That processor is pessimistic that the program will change because once the fishery is allocated, people do not want to change the rules. Because this processor is not a traditional participant in the groundfish or whiting fishery, the primary cost increase he noted was the cost of buying quota used to leverage fixed gear deliveries.

Some processor representatives indicated that they do not like that economic data collection program. For the vessels it was stated to be relatively low cost in time and money, only taking four to five hours to complete the survey. The processor data collection is very intensive and takes staff several days to complete.

One processor noted that they have considered opening a plant in San Francisco or south, but it does not pencil out as a profitable business decision.

A very specific comment and request for a regulatory change to improve fish quality by accounting for ice to determine QP used was provided by Dr. John Lin VP of Ocean Pacific Seafood. Because of the detailed and specific nature of the request it is included below as presented to the analyst. It is also noted that the NPFMC halibut IFQ program does include a 2% adjustment factor for slime and ice<sup>49</sup>.

#### **Background info on Quality:**

*It is our philosophy that the maximum end-point quality, utility, and value of wild-caught seafood is determined at the point of harvest. Once quality of the raw product is lost, no method of processing, post-processing, or careful cold-chain handling is going to return that quality or value to the consumer.*

*Quality loss in wild seafood products come from many sources: heat abuse, mishandling and direct damage (crushing, bruising, wounding), and contamination by bacteria or foreign materials (oil, plastic, wood, glass, etc.). All quality loss leads to reduced marketability, reduced market value, increased waste of product, shrinking profit margins, decreased return to fishermen and coastal communities, and inconsistency in product that directly results in decreased consumer confidence. On top of negative effects on primary fishery products (fillet, whole product, mince, kamaboko), degradation on the “front-end” also decreases opportunity and viability in by-product/co-product valorization, which again directly impacts the ex-vessel value of each fish and the return to the coastal community.*

*As we work with our fishing partners on improving at-sea handling and chilling and with our receiving facilities on improving production technology and practices, we would like to address one of the points of quality loss necessitated by policy.*

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<sup>49</sup> <https://www.federalregister.gov/d/2019-04714/p-75>

### **Current Procedure**

*Due to the requirement of an accurate weight at the point of landing, the current procedure is de-icing in water, re-sorting (primary sorting occurs on the vessel), re-icing (usually bottom and middle ice) on the dock, weighing with a catch monitor present, and then top-icing in the tote. Once it is time for production to begin, the product must again be de-iced in water.*

*As mentioned, primary sorting takes place on the vessel deck to remove bycatch and detritus after harvest. This is also a critical point for quality loss or retention as there can be many hours between harvest and stowing in flake ice, depending on the contents of the trawl and the efficiency of the crew.*

### **Issues with Current procedure**

*The primary issue with the current landing procedure is the potential for quality loss through heat abuse. De-icing the product raises the temperature (increasing enzymatic and bacterial activity), and although efforts are made to pass fish through the de-icing process as efficiently as possible, there is always the possibility of retention, particularly for flat fish. The icing method of bottom-middle-top ice then results in uneven cooling throughout the tote, resulting in variable quality of product, which decreases the shelf-life, value, and marketability of the final product.*

*Other issues include increased risk of contamination from seabirds and human sources, increased risk of mishandling during sorting, and the waste of energy in the cold chain to continually re-cool de-iced product. The current offloading practice and the on-the-dock resorting are a major attractant for local seabirds and other pests, regardless of deterrents. The droppings of seabirds have been found to contain high levels of both fecal coliforms and enterococcus bacteria, and they are known vectors of Listeria.*

### **Result and Icelandic Example**

*To combat quality loss at receiving, Iceland accepts a weight for each species provided by the vessel, along with an estimated ice percentage, and then the buyer provides an exact weight taken at the time of processing. These weights and percentages can be verified at any time by a 3<sup>rd</sup> party observer, and heavy financial consequences or opportunity consequences are levied against anyone found to be misreporting.*

*US policy makers should look to the example of advanced fishing nations, such as Iceland, Norway, and the Faroe Islands. Their commercial species are analogous to many of the US west coast and northwest fisheries species, and decades ago, they faced and overcame many of the challenges with which the US wild fisheries and regulatory bodies are currently grappling. Iceland boasts the highest return value per seafood employee of any nation, a total utilization of bycatch, and expanding valorization of high value co-products. Although the US is not primarily a fishing-based economy, recent supply chain issues, and forecasted food insecurities make protecting and enhancing domestic means of producing nutritious food products more critical than ever. Challenges presented by changing oceans within changing climates must be met with more responsible and sustainable use of harvested resources.*

*We cannot make progress or sustain growth on the fantasy of simply increasing harvestable fish populations (and therefore quotas and harvests) alone, and many critical at-sea behavior changes and handling adjustments will result in lower harvest volumes. To make these lower volumes palatable to fishermen (and processors) who traditionally relied largely on volume for profits, reaching quality goals and market return for that increased quality must be achievable. It will not be achievable if quality cannot be preserved at the dock.*

### **Request**

*We ask that NOAA and other regulatory bodies work with Industry to find an approach to monitoring catch weights that is congruent with the stated goals of enhancing the economic value of these fisheries, ensuring the sustainability of both the marine resource and the seafood production, and*

*maximizing the economic yield of US fisheries to the benefit of local fishing economies and the US economy as a whole.*

## **9.2 Detailed FISHEyE Data Tables**

All cost data presented in the tables are derived from the EDC surveys. These data are also reported in the NOAA Fisheries FISHEyE data tool available online. Vessel counts are based on vessels subject to the annual EDC reports. Revenue data are derived from PacFIN data aggregations.

At the time the data were summarized, cost information was only available through the 2021 fishing year. Caution should be used when considering 2020 data because of the impacts that COVID-19 had on the fishery and the economy in general.

### 9.2.1 Catcher vessels mean cost and revenues by vessel length in the Catch Share Fisheries

Table 9-1 Numbers of catcher vessels with quota lease expenditures by vessel length

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011-2021
Whiting	Large vessel (> 80 ft)	16	14	15	17	18	19	19	19	22	22	21	18.5
	Medium vessel (> 60 ft, <= 80 ft)	4	4	3	3	1	2	3	4	3	3	3	3.5
Non-whiting groundfish	Large vessel (> 80 ft)	5	4	4	3	4	5	4	5	5	5	4	4.5
	Medium vessel (> 60 ft, <= 80 ft)	30	30	34	27	32	33	32	32	30	23	21	25.5
	Small vessel (<= 60 ft)	22	21	19	19	18	20	19	22	20	16	14	18.0
All vessels	Large vessel (> 80 ft)	21	18	19	20	22	24	23	24	27	27	25	23.0
	Medium vessel (> 60 ft, <= 80 ft)	34	34	37	30	33	35	35	36	33	26	24	29.0
	Small vessel (<= 60 ft)	22	21	19	19	18	20	19	22	20	16	14	18.0

Table 9-2 Mean expenditures on quota leasing for catcher vessels by vessel length (millions of 2021 USD)

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Whiting	Large vessel (> 80 ft)	0.120	0.116	0.155	0.131	0.076	0.089	0.093	0.093	0.098	0.056	0.079
	Medium vessel (> 60 ft, <= 80 ft)	0.157	0.020	0.061	0.082			0.051	0.044	0.073	0.071	0.057
Non-whiting groundfish	Large vessel (> 80 ft)	0.091	0.070	0.040	0.043	0.125	0.116	0.168	0.114	0.101	0.064	0.076
	Medium vessel (> 60 ft, <= 80 ft)	0.092	0.068	0.059	0.083	0.079	0.088	0.086	0.075	0.081	0.053	0.047
	Small vessel (<= 60 ft)	0.085	0.065	0.044	0.062	0.070	0.093	0.100	0.096	0.091	0.071	0.053
All vessels	Large vessel (> 80 ft)	0.113	0.105	0.131	0.118	0.085	0.095	0.106	0.097	0.098	0.058	0.079
	Medium vessel (> 60 ft, <= 80 ft)	0.100	0.062	0.059	0.083	0.082	0.087	0.083	0.071	0.080	0.055	0.048
	Small vessel (<= 60 ft)	0.085	0.065	0.044	0.062	0.070	0.093	0.100	0.096	0.091	0.071	0.053



Table 9-3 Numbers of catcher vessels with quota lease expenditures by home port

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011- 2021
Whiting	Astoria	2	2	1	2		1	1	1	1	1	1	1
	Brookings	1	1	1	1	1	1	1	1	1	1	1	1
	Coos Bay	2	1										2
	Newport	10	8	9	8	10	10	12	12	11	12	13	10
	Oregon	15	12	11	11	11	12	14	14	14	15	15	13
	Puget Sound	5	5	5	7	6	7	6	7	9	8	7	7
	Washington & Alaska	5	6	7	9	8	9	8	9	11	10	9	8
	South and central WA coast		1	2	2	2	2	2	2	2	2	2	2
	Tillamook									1	1		1
Non-whiting groundfish	Eureka	4	5	6	7	4	3	3	4	4	3	4	4
	Fort Bragg	6	6	6	6	6	6	5	4	3	3	4	5
	Morro Bay-Monterey	6	5	4	4	3	3	4	3	2	2	3	4
	San Francisco	1	1	1	1	1	1	2	3	2	3	1	2
	California	17	18	19	19	14	14	16	15	12	12	13	15
	Astoria	16	15	15	11	17	20	17	17	16	13	10	15
	Brookings	5	5	3	4	4	6	5	5	5	5	2	4
	Coos Bay	7	7	10	7	7	7	5	8	4	3	3	6
	Newport	5	4	6	4	8	8	9	9	12	9	8	7

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011- 2021
	Tillamook	1											1
	Oregon	34	31	34	26	36	41	36	39	37	30	23	33
	Puget Sound	5	5	2	2	3	3	2	4	5	1	2	3
	South and central WA coast	1	1	2	2	1		1	1	1	1	1	1
	Washington & Alaska	6	6	4	4	4	3	3	5	6	2	3	4
	Crescent City		1	2	1		1	2	1	1	1	1	1
All vessels	Eureka	4	5	6	7	4	3	3	4	4	3	4	4
	Fort Bragg	6	6	6	6	6	6	5	4	3	3	4	5
	Morro Bay-Monterey	6	5	4	4	3	3	4	3	2	2	3	4
	San Francisco	1	1	1	1	1	1	2	3	2	3	1	2
	California	17	18	19	19	14	14	16	15	12	12	13	15
	Astoria	18	17	16	13	17	21	18	18	17	14	11	16
	Brookings	6	6	4	5	5	7	6	6	6	6	3	5
	Coos Bay	9	8	10	7	7	7	5	8	4	3	3	6
	Newport	15	12	15	12	18	18	21	21	23	21	21	18
	Tillamook	1								1	1		1
	Oregon	49	43	45	37	47	53	50	53	51	45	38	46
	Puget Sound	10	10	7	9	9	10	8	11	14	9	9	10
	South and central WA coast	1	2	4	4	3	2	3	3	3	3	3	3

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011- 2021
	Washington & Alaska	11	12	11	13	12	12	11	14	17	12	12	12
	Crescent City		1	2	1		1	2	1	1	1	1	1

Table 9-4 Mean expenditures on quota leasing for catcher vessels by home port (millions of 2021 USD)

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011- 2021
Whiting	Newport	0.074	0.048	0.045	0.098	0.052	0.053	0.060	0.068	0.068	0.034	0.066	0.061
	Oregon	0.099	0.065	0.049	0.081	0.051	0.052	0.058	0.067	0.069	0.039	0.067	0.063
	Puget Sound	0.210	0.176	0.265	0.205	0.134	0.143	0.164	0.133	0.129	0.091	0.101	0.159
	Washington & Alaska	0.210	0.153	0.282	0.175	0.124	0.133	0.139	0.112	0.128	0.086	0.093	0.149
Non-whiting groundfish	Eureka	0.021	0.023	0.039	0.028	0.075	0.089	0.109	0.063	0.082	0.037	0.048	0.056
	Fort Bragg	0.048	0.026	0.034	0.036	0.049	0.028	0.031	0.037	0.042	0.039	0.029	0.036
	Morro Bay-Monterey	0.049	0.030	0.015	0.065	0.083	0.040	0.053	0.186			0.061	0.065
	San Francisco								0.018		0.024		0.021
	California	0.041	0.025	0.028	0.038	0.063	0.042	0.048	0.068	0.060	0.050	0.041	0.046
	Astoria	0.119	0.101	0.093	0.125	0.093	0.104	0.093	0.093	0.116	0.080	0.080	0.100
	Brookings	0.056	0.050	0.037	0.037	0.067	0.060	0.101	0.050	0.045	0.020		0.052

Vessel type	Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2011- 2021
All vessels	Coos Bay	0.019	0.016	0.010	0.011	0.023	0.024	0.073	0.025	0.025	0.017	0.009	0.023
	Newport	0.133	0.117	0.066	0.187	0.118	0.190	0.192	0.138	0.114	0.085	0.059	0.127
	Oregon	0.093	0.075	0.059	0.090	0.082	0.101	0.116	0.084	0.096	0.065	0.060	0.084
	Puget Sound	0.152	0.122			0.149	0.212		0.193	0.091			0.153
	Washington & Alaska	0.207	0.150	0.117	0.117	0.115	0.212	0.123	0.156	0.078		0.041	0.132
	Eureka	0.021	0.023	0.039	0.028	0.075	0.089	0.109	0.063	0.082	0.037	0.048	0.056
	Fort Bragg	0.048	0.026	0.034	0.036	0.049	0.028	0.031	0.037	0.042	0.039	0.029	0.036
	Morro Bay- Monterey	0.049	0.030	0.015	0.065	0.083	0.040	0.053	0.186			0.061	0.065
	San Francisco								0.018		0.024		0.021
	California	0.041	0.025	0.028	0.038	0.063	0.042	0.048	0.068	0.060	0.050	0.041	0.046
	Astoria	0.133	0.093	0.094	0.111	0.093	0.102	0.091	0.093	0.118	0.083	0.081	0.099
	Brookings	0.047	0.043	0.035	0.039	0.062	0.056	0.091	0.048	0.047	0.024	0.044	0.049
	Coos Bay	0.044	0.053	0.010	0.011	0.023	0.024	0.073	0.025	0.025	0.017	0.009	0.029
	Newport	0.093	0.071	0.053	0.128	0.081	0.114	0.117	0.098	0.092	0.056	0.063	0.088
	Oregon	0.095	0.072	0.057	0.088	0.075	0.090	0.100	0.080	0.089	0.056	0.063	0.079
	Puget Sound	0.181	0.149	0.216	0.183	0.139	0.163	0.168	0.155	0.115	0.090	0.088	0.150
	South and central WA coast			0.233	0.098			0.045	0.028	0.089	0.063	0.056	0.087

<b>Vessel type</b>	<b>Category</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Average 2011- 2021</b>
	Washington & Alaska	0.208	0.152	0.222	0.157	0.121	0.153	0.134	0.128	0.110	0.083	0.080	0.141

Table 9-5 Catcher vessel counts in catch share program by length category

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	30	31	25	24	25	26	24	25	25	26	29	29	27	30.5	25.9
	Medium vessel (> 60 ft, <= 80 ft)	11	10	6	5	4	4	2	3	4	4	3	4	3	10.5	3.8
Non-whiting vessels	Large vessel (> 80 ft)	6	6	7	7	5	4	5	5	5	6	6	7	7	6.0	5.8
	Medium vessel (> 60 ft, <= 80 ft)	44	44	44	43	42	40	41	40	40	37	37	29	29	44.0	38.4
	Small vessel (<= 60 ft)	47	39	31	31	29	27	24	24	25	27	23	18	17	43.0	25.1
All vessels	Large vessel (> 80 ft)	36	37	32	31	30	30	29	30	30	32	35	36	34	36.5	31.7
	Medium vessel (> 60 ft, <= 80 ft)	55	54	50	48	46	44	43	43	44	41	40	33	32	54.5	42.2
	Small vessel (<= 60 ft)	47	39	31	31	29	27	24	24	25	27	23	18	17	43.0	25.1

Table 9-6 Catcher vessel mean variable cost net revenue (millions of 2021 \$) from the catch share program

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.212	0.329	0.753	0.607	0.832	0.626	0.326	0.475	0.72	0.609	0.664	0.399	0.549	0.27	0.596
	Medium vessel (> 60 ft, <= 80 ft)	0.253	0.189	0.537	0.336	0.635	0.465	Conf.	0.263	0.549	0.404	0.526	0.358	0.287	0.221	0.436
Non-whiting vessels	Large vessel (> 80 ft)	0.063	0.156	0.216	0.114	0.232	0.258	0.358	0.43	0.457	0.34	0.303	0.188	0.199	0.11	0.281
	Medium vessel (> 60 ft, <= 80 ft)	0.141	0.126	0.202	0.177	0.182	0.177	Conf.	0.216	0.228	0.181	0.175	0.133	0.147	0.134	0.182
	Small vessel (<= 60 ft)	0.081	0.081	0.156	0.111	0.104	0.119	0.127	0.183	0.166	0.122	0.132	0.066	0.116	0.081	0.127
All vessels	Large vessel (> 80 ft)	0.187	0.301	0.635	0.495	0.732	0.577	0.331	0.467	0.676	0.558	0.602	0.358	0.477	0.244	0.537
	Medium vessel (> 60 ft, <= 80 ft)	0.164	0.138	0.242	0.194	0.221	0.203	0.193	0.219	0.257	0.203	0.202	0.161	0.16	0.151	0.205
	Small vessel (<= 60 ft)	0.081	0.081	0.156	0.111	0.104	0.119	0.127	0.183	0.166	0.122	0.132	0.066	0.116	0.081	0.127

Table 9-7 Catcher vessel mean total cost net revenue (millions of 2021 \$) from the catch share program

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	-0.007	0.04	0.315	0.164	0.457	0.249	0.136	0.264	0.495	0.362	0.267	0.166	0.295	0.016	0.288
	Medium vessel (> 60 ft, <= 80 ft)	0.044	0.035	0.232	-0.037	0.286	0.111	Conf.	0.134	0.377	0.243	0.22	0.213	0.125	0.04	0.19
Non-whiting vessels	Large vessel (> 80 ft)	-0.02	0.044	0.115	0.029	0.114	0.12	0.253	0.229	0.222	0.25	0.223	-0.209	0.07	0.012	0.129
	Medium vessel (> 60 ft, <= 80 ft)	0.038	0.029	0.09	0.072	0.102	0.113	Conf.	0.139	0.153	0.124	0.119	0.084	0.09	0.034	0.109
	Small vessel (<= 60 ft)	0.027	0.04	0.084	0.046	0.06	0.084	0.078	0.131	0.084	0.071	0.087	0.019	0.073	0.034	0.074
All vessels	Large vessel (> 80 ft)	-0.009	0.04	0.271	0.133	0.4	0.232	0.156	0.258	0.449	0.341	0.259	0.093	0.248	0.016	0.258
	Medium vessel (> 60 ft, <= 80 ft)	0.039	0.03	0.107	0.061	0.118	0.113	0.116	0.139	0.174	0.136	0.127	0.1	0.093	0.034	0.117
	Small vessel (<= 60 ft)	0.027	0.04	0.084	0.046	0.06	0.084	0.078	0.131	0.084	0.071	0.087	0.019	0.073	0.034	0.074



Table 9-8 Catcher vessel mean ex-vessel revenue (millions of 2021 \$) from the catch share program, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.493	0.759	1.502	1.414	1.684	1.551	0.841	1.146	1.595	1.474	1.529	1.024	1.277	0.626	1.367
	Medium vessel (> 60 ft, <= 80 ft)	0.595	0.535	1.188	0.997	1.361	1.325	Conf.	0.694	1.274	0.989	1.193	0.827	0.822	0.565	1.067
Non-whiting vessels	Large vessel (> 80 ft)	0.364	0.459	0.552	0.341	0.684	0.666	0.858	0.989	1.014	0.773	0.702	0.493	0.448	0.412	0.684
	Medium vessel (> 60 ft, <= 80 ft)	0.395	0.371	0.481	0.463	0.463	0.481	Conf.	0.481	0.534	0.457	0.43	0.327	0.376	0.383	0.453
	Small vessel (<= 60 ft)	0.205	0.198	0.329	0.251	0.248	0.299	0.328	0.411	0.387	0.309	0.322	0.234	0.291	0.202	0.31
All vessels	Large vessel (> 80 ft)	0.471	0.71	1.294	1.172	1.517	1.433	0.844	1.12	1.498	1.343	1.387	0.92	1.106	0.591	1.239
	Medium vessel (> 60 ft, <= 80 ft)	0.435	0.401	0.566	0.519	0.541	0.557	0.511	0.496	0.601	0.509	0.487	0.388	0.418	0.418	0.508
	Small vessel (<= 60 ft)	0.205	0.198	0.329	0.251	0.248	0.299	0.328	0.411	0.387	0.309	0.322	0.234	0.291	0.202	0.31

Table 9-9 Catcher vessel mean fixed costs (millions of 2021 \$) in catch share program by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.219	0.289	0.438	0.443	0.375	0.377	0.19	0.211	0.225	0.246	0.397	0.233	0.254	0.254	0.308
	Medium vessel (> 60 ft, <= 80 ft)	0.21	0.154	0.306	0.373	0.349	0.354	Conf.	0.129	0.172	0.16	0.306	0.145	0.163	0.182	0.246
Non-whiting vessels	Large vessel (> 80 ft)	0.082	0.112	0.101	0.086	0.118	0.138	0.105	0.2	0.236	0.09	0.08	0.396	0.129	0.097	0.153
	Medium vessel (> 60 ft, <= 80 ft)	0.103	0.097	0.112	0.105	0.08	0.064	Conf.	0.076	0.075	0.057	0.056	0.049	0.057	0.1	0.073
	Small vessel (<= 60 ft)	0.054	0.041	0.072	0.064	0.044	0.035	0.049	0.052	0.082	0.051	0.046	0.047	0.043	0.048	0.053
All vessels	Large vessel (> 80 ft)	0.196	0.26	0.364	0.362	0.332	0.345	0.175	0.209	0.227	0.217	0.343	0.265	0.228	0.228	0.279
	Medium vessel (> 60 ft, <= 80 ft)	0.125	0.107	0.135	0.133	0.104	0.09	0.077	0.08	0.084	0.067	0.075	0.061	0.067	0.116	0.088
	Small vessel (<= 60 ft)	0.054	0.041	0.072	0.064	0.044	0.035	0.049	0.052	0.082	0.051	0.046	0.047	0.043	0.048	0.053

Table 9-10 Catcher vessel mean variable costs (millions of 2021 \$) in catch share program by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.281	0.43	0.749	0.807	0.852	0.925	0.516	0.671	0.875	0.865	0.865	0.625	0.728	0.356	0.771
	Medium vessel (> 60 ft, <= 80 ft)	0.341	0.346	0.651	0.661	0.726	0.859	Conf.	0.431	0.725	0.586	0.667	0.47	0.535	0.344	0.631
Non-whiting vessels	Large vessel (> 80 ft)	0.301	0.303	0.336	0.227	0.452	0.408	0.5	0.56	0.557	0.433	0.399	0.305	0.249	0.302	0.402
	Medium vessel (> 60 ft, <= 80 ft)	0.253	0.244	0.279	0.286	0.281	0.304	Conf.	0.265	0.306	0.277	0.254	0.193	0.229	0.248	0.271
	Small vessel (<= 60 ft)	0.124	0.117	0.173	0.141	0.143	0.181	0.201	0.228	0.221	0.187	0.19	0.168	0.175	0.12	0.183
All vessels	Large vessel (> 80 ft)	0.284	0.41	0.659	0.676	0.785	0.856	0.513	0.653	0.822	0.784	0.785	0.563	0.629	0.347	0.702
	Medium vessel (> 60 ft, <= 80 ft)	0.271	0.263	0.324	0.325	0.319	0.354	0.318	0.277	0.344	0.307	0.285	0.227	0.258	0.267	0.303
	Small vessel (<= 60 ft)	0.124	0.117	0.173	0.141	0.143	0.181	0.201	0.228	0.221	0.187	0.19	0.168	0.175	0.12	0.183

Table 9-11 Catcher vessel mean observer and EM costs (millions of 2021 \$) in catch share program by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.002	0.003	0.005	0.009	0.015	0.023	0.017	0.017	0.016	0.014	0.014	0.011	0.01	0.002	0.014
	Medium vessel (> 60 ft, <= 80 ft)	0.002	0.004	0.005	0.01	0.017	0.026	Conf.	0.022	0.035	0.008	0.013	0.01	0.004	0.003	0.015
Non-whiting vessels	Large vessel (> 80 ft)			0.002	0.004	0.017	0.014	0.035	0.037	0.035	0.032	0.032	0.03	0.011		0.023
	Medium vessel (> 60 ft, <= 80 ft)			0.002	0.006	0.013	0.017	Conf.	0.021	0.024	0.024	0.022	0.02	0.02	NaN	0.017
	Small vessel (<= 60 ft)			0.003	0.004	0.008	0.012	0.016	0.022	0.018	0.015	0.017	0.021	0.017	NaN	0.014
All vessels	Large vessel (> 80 ft)	0.002	0.003	0.005	0.008	0.015	0.022	0.02	0.02	0.019	0.017	0.017	0.015	0.011	0.002	0.015
	Medium vessel (> 60 ft, <= 80 ft)	0	0.001	0.003	0.007	0.013	0.017	0.023	0.021	0.025	0.022	0.021	0.019	0.019	0	0.017
	Small vessel (<= 60 ft)			0.003	0.004	0.008	0.012	0.016	0.022	0.018	0.015	0.017	0.021	0.017	NaN	0.014

Table 9-12 Catcher vessel mean cost recovery fees (millions of 2021 \$) for catch share program vessels by vessel length 2014 through 2021

Vessel type	Category	2014	2015	2016	2017	2018	2019	2020	2021	Average
Whiting vessels	Large vessel (> 80 ft)	0.043	0.021	0.033	0.033	0.029	0.033	0.022	0.025	0.03
	Medium vessel (> 60 ft, <= 80 ft)	0.039		0.021	0.038	0.03	0.035	0.024	0.021	0.03
Non-whiting vessels	Large vessel (> 80 ft)	0.02	0.026	0.03	0.031	0.023	0.02	0.015	0.011	0.022
	Medium vessel (> 60 ft, <= 80 ft)	0.014		0.014	0.017	0.014	0.012	0.01	0.009	0.013
	Small vessel (<= 60 ft)	0.009	0.01	0.012	0.012	0.009	0.009	0.007	0.007	0.009
All vessels	Large vessel (> 80 ft)	0.04	0.022	0.033	0.032	0.028	0.031	0.021	0.022	0.029
	Medium vessel (> 60 ft, <= 80 ft)	0.017	0.015	0.015	0.019	0.015	0.014	0.011	0.01	0.014
	Small vessel (<= 60 ft)	0.009	0.01	0.012	0.012	0.009	0.009	0.007	0.007	0.009

Table 9-13 Catcher vessel mean buyback fees (millions of 2021 \$) for catch share program vessels by vessel length 2011 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.022	0.034	0.08	0.076	0.092	0.083	0.039	0.061	0.079	0.065	0.061	0.033	0.045	0.028	0.065
	Medium vessel (> 60 ft, <= 80 ft)	0.03	0.027	0.06	0.054	0.069	0.067	Conf.	0.035	0.064	0.044	0.048	0.029	0.029	0.028	0.05
Non-whiting vessels	Large vessel (> 80 ft)	0.018	0.023	0.028	0.017	0.034	0.033	0.043	0.049	0.052	0.035	0.028	0.017	0.016	0.02	0.032
	Medium vessel (> 60 ft, <= 80 ft)	0.02	0.018	0.024	0.023	0.023	0.024	Conf.	0.024	0.028	0.021	0.017	0.011	0.013	0.019	0.021
	Small vessel (<= 60 ft)	0.01	0.01	0.016	0.013	0.012	0.015	0.016	0.021	0.021	0.014	0.013	0.008	0.01	0.01	0.014
All vessels	Large vessel (> 80 ft)	0.021	0.033	0.069	0.062	0.083	0.077	0.04	0.059	0.075	0.06	0.055	0.03	0.039	0.027	0.059
	Medium vessel (> 60 ft, <= 80 ft)	0.022	0.02	0.028	0.026	0.027	0.028	0.026	0.025	0.032	0.023	0.019	0.014	0.015	0.021	0.024
	Small vessel (<= 60 ft)	0.01	0.01	0.016	0.013	0.012	0.015	0.016	0.021	0.021	0.014	0.013	0.008	0.01	0.01	0.014

Table 9-14 Catcher vessel mean fuel usage (millions of 2021 \$) for catch share program vessels by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.081	0.144	0.192	0.237	0.197	0.222	0.14	0.152	0.174	0.237	0.189	0.116	0.169	0.112	0.184
	Medium vessel (> 60 ft, <= 80 ft)	0.074	0.094	0.157	0.156	0.147	0.174	Conf.	0.058	0.102	0.101	0.11	0.082	0.12	0.084	0.121
Non-whiting vessels	Large vessel (> 80 ft)	0.087	0.063	0.066	0.036	0.095	0.051	0.052	0.045	0.058	0.05	0.051	0.037	0.031	0.075	0.052
	Medium vessel (> 60 ft, <= 80 ft)	0.051	0.057	0.055	0.059	0.061	0.053	Conf.	0.024	0.031	0.036	0.035	0.023	0.034	0.054	0.041
	Small vessel (<= 60 ft)	0.025	0.026	0.028	0.032	0.031	0.028	0.018	0.019	0.02	0.021	0.021	0.023	0.021	0.026	0.024
All vessels	Large vessel (> 80 ft)	0.082	0.131	0.165	0.192	0.18	0.199	0.124	0.134	0.154	0.202	0.165	0.1	0.141	0.107	0.16
	Medium vessel (> 60 ft, <= 80 ft)	0.055	0.063	0.068	0.069	0.068	0.064	0.039	0.027	0.038	0.043	0.041	0.031	0.042	0.059	0.048
	Small vessel (<= 60 ft)	0.025	0.026	0.028	0.032	0.031	0.028	0.018	0.019	0.02	0.021	0.021	0.023	0.021	0.026	0.024

Table 9-15Catcher vessel mean labor cost (millions of 2021 \$) by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.155	0.223	0.441	0.449	0.506	0.507	0.258	0.362	0.516	0.466	0.516	0.394	0.423	0.189	0.44
	Medium vessel (> 60 ft, <= 80 ft)	0.201	0.188	0.4	0.394	0.461	0.502	Conf.	0.252	0.44	0.363	0.411	0.29	0.32	0.194	0.383
Non-whiting vessels	Large vessel (> 80 ft)	0.159	0.19	0.209	0.149	0.277	0.268	0.319	0.359	0.345	0.266	0.236	0.17	0.156	0.174	0.25
	Medium vessel (> 60 ft, <= 80 ft)	0.156	0.144	0.169	0.168	0.16	0.17	Conf.	0.159	0.18	0.16	0.143	0.109	0.129	0.15	0.155
	Small vessel (<= 60 ft)	0.074	0.064	0.098	0.075	0.074	0.094	0.114	0.126	0.126	0.104	0.107	0.083	0.093	0.069	0.099
All vessels	Large vessel (> 80 ft)	0.156	0.217	0.39	0.382	0.468	0.475	0.269	0.362	0.488	0.428	0.468	0.351	0.368	0.186	0.404
	Medium vessel (> 60 ft, <= 80 ft)	0.165	0.152	0.197	0.191	0.186	0.2	0.187	0.165	0.203	0.18	0.163	0.131	0.147	0.158	0.177
	Small vessel (<= 60 ft)	0.074	0.064	0.098	0.075	0.074	0.094	0.114	0.126	0.126	0.104	0.107	0.083	0.093	0.069	0.099



Table 9-16 Catcher vessel mean other variable costs (millions of 2021 \$) by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.021	0.025	0.031	0.036	0.043	0.048	0.041	0.045	0.057	0.054	0.052	0.049	0.057	0.023	0.047
	Medium vessel (> 60 ft, <= 80 ft)	0.034	0.033	0.029	0.048	0.032	0.052	Conf.	0.043	0.047	0.04	0.051	0.034	0.04	0.034	0.042
Non-whiting vessels	Large vessel (> 80 ft)	0.037	0.028	0.031	0.02	0.029	0.021	0.025	0.04	0.037	0.027	0.031	0.036	0.023	0.032	0.029
	Medium vessel (> 60 ft, <= 80 ft)	0.027	0.026	0.029	0.03	0.024	0.026	Conf.	0.023	0.025	0.023	0.025	0.02	0.023	0.026	0.025
	Small vessel (<= 60 ft)	0.015	0.018	0.028	0.017	0.018	0.023	0.027	0.029	0.024	0.023	0.023	0.026	0.026	0.016	0.024
All vessels	Large vessel (> 80 ft)	0.024	0.026	0.031	0.033	0.04	0.044	0.038	0.044	0.054	0.049	0.049	0.047	0.05	0.025	0.044
	Medium vessel (> 60 ft, <= 80 ft)	0.029	0.027	0.029	0.032	0.025	0.029	0.029	0.024	0.027	0.024	0.027	0.021	0.025	0.028	0.027
	Small vessel (<= 60 ft)	0.015	0.018	0.028	0.017	0.018	0.023	0.027	0.029	0.024	0.023	0.023	0.026	0.026	0.016	0.024

Table 9-17 Catcher vessel mean fishing gear costs (millions of 2021 \$) by vessel length 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Large vessel (> 80 ft)	0.076	0.098	0.183	0.111	0.039	0.038	0.039	0.044	0.045	0.045	0.044	0.02	0.049	0.087	0.06
	Medium vessel (> 60 ft, <= 80 ft)	0.072	0.065	0.152	0.185			Conf.							0.068	0.168
Non-whiting vessels	Large vessel (> 80 ft)	0.022	0.018	0.028	0.027	0.045	0.009	0.024	0.031	0.051	0.028	0.027	0.03	0.028	0.02	0.03
	Medium vessel (> 60 ft, <= 80 ft)	0.032	0.031	0.034	0.039	0.017	0.01	Conf.	0.015	0.014	0.009	0.01	0.007	0.007	0.032	0.016
	Small vessel (<= 60 ft)	0.019	0.016	0.03	0.026	0.013	0.009	0.014	0.013	0.02	0.014	0.013	0.012	0.01	0.018	0.016
All vessels	Large vessel (> 80 ft)	0.067	0.085	0.149	0.092	0.04	0.034	0.036	0.042	0.046	0.042	0.041	0.022	0.044	0.076	0.053
	Medium vessel (> 60 ft, <= 80 ft)	0.04	0.037	0.048	0.054	0.031	0.012	0.013	0.015	0.016	0.01	0.017	0.008	0.009	0.038	0.021
	Small vessel (<= 60 ft)	0.019	0.016	0.03	0.026	0.013	0.009	0.014	0.013	0.02	0.014	0.013	0.012	0.01	0.018	0.016

Table 9-18 Catcher vessel counts by homeport and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2016	2017	2018	2019	2020	2021	2015	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	1	1												1.0	
	Eureka	1	1												1.0	
	San Francisco	1	1	1	1										1.0	1.000
	California	3	3	1	1										3.0	1.000
	Astoria	3	3	3	3	1	2	1	1	1	1	1	1		3.0	1.500
	Brookings	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1.000
	Coos Bay	4	2	2	1										3.0	1.500
	Newport	16	16	15	14	15	15	14	14	15	14	16	15	14	16.0	14.700
	Tillamook	2	2						1		1	1			2.0	1.000
	Oregon	26	24	21	19	17	18	16	17	17	17	19	17	15	25.0	17.800
	Puget Sound	11	13	8	7	10	10	10	10	11	13	12	11	9	12.0	10.200
	South and central WA coast	1	1	1	2	2	2	2	2	2	2	2	2	2	1.0	1.900
	Washington & Alaska	12	14	9	9	12	12	12	12	13	15	14	13	11	13.0	12.100

Vessel type	Category	2009	2010	2011	2012	2013	2014	2016	2017	2018	2019	2020	2021	2015	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City	6	5	3	4	4	3	3	4	3	1	1	2	2	5.5	2.800
	Eureka	9	8	7	7	7	7	6	4	7	8	5	6	6	8.5	6.400
	Fort Bragg	7	7	7	6	7	7	6	7	4	3	4	4	6	7.0	5.500
	Morro Bay-Monterey	9	6	7	7	6	5	3	4	3	3	3	4	3	7.5	4.500
	San Francisco	6	8	5	5	5	3	1	3	3	2	3	3	2	7.0	3.300
	California	37	34	29	29	29	25	19	22	20	17	16	19	19	35.5	22.500
	Astoria	19	17	19	19	18	16	20	18	18	16	13	11	20	18.0	16.800
	Brookings	7	7	6	6	4	6	6	6	6	5	6	5	6	7.0	5.600
	Coos Bay	15	16	13	13	14	13	11	9	10	8	6	5	12	15.5	10.200
	Newport	9	8	5	5	6	6	9	10	9	13	10	10	9	8.5	8.300
	Tillamook	3	3	1	2	1									3.0	1.333
	Oregon	53	51	44	45	43	41	46	43	43	42	35	31	47	52.0	41.300
	Puget Sound	3	2	7	5	2	3	3	4	6	6	2	2	3	2.5	4.000
	South and central WA coast	4	2	2	2	2	2	1	1	1	1	1	1	1	3.0	1.400
	Washington & Alaska	7	4	9	7	4	5	4	5	7	7	3	3	4	5.5	5.400

Vessel type	Category	2009	2010	2011	2012	2013	2014	2016	2017	2018	2019	2020	2021	2015	Average 2009-2010	Average 2011-2021
All vessels	Crescent City	7	6	3	4	4	3	3	4	3	1	1	2	2	6.5	2.800
	Eureka	10	9	7	7	7	7	6	4	7	8	5	6	6	9.5	6.400
	Fort Bragg	7	7	7	6	7	7	6	7	4	3	4	4	6	7.0	5.500
	Morro Bay-Monterey	9	6	7	7	6	5	3	4	3	3	3	4	3	7.5	4.500
	San Francisco	7	9	6	6	5	3	1	3	3	2	3	3	2	8.0	3.500
	California	40	37	30	30	29	25	19	22	20	17	16	19	19	38.5	22.700
	Astoria	22	20	22	22	19	18	21	19	19	17	14	12	20	21.0	18.300
	Brookings	8	8	7	7	5	7	7	7	7	6	7	6	7	8.0	6.600
	Coos Bay	19	18	15	14	14	13	11	9	10	8	6	5	12	18.5	10.500
	Newport	25	24	20	19	21	21	23	24	24	27	26	25	23	24.5	23.000
	Tillamook	5	5	1	2	1			1		1	1			5.0	1.167
	Oregon	79	75	65	64	60	59	62	60	60	59	54	48	62	77.0	59.100
	Puget Sound	14	15	15	12	12	13	13	14	17	19	14	13	12	14.5	14.200
	South and central WA coast	5	3	3	4	4	4	3	3	3	3	3	3	3	4.0	3.300
	Washington & Alaska	19	18	18	16	16	17	16	17	20	22	17	16	15	18.5	17.500

Table 9-19 Catcher vessel mean total cost net revenue (millions of 2021 \$) by homeport city and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.14	0.129	Conf.	Conf.										0.134	Conf.
	Astoria	0.029	0.452	0.569	-0.132	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.241	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	-0.147	Conf.	Conf.	Conf.										-0.147	Conf.
	Newport	0	0.01	0.266	0.162	0.376	0.214	0.103	0.156	0.502	0.386	0.158	0.181	0.314	0.005	0.256
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	-0.004	0.065	0.311	0.143	0.414	0.158	0.127	0.167	0.475	0.383	0.17	0.18	0.334	0.03	0.26
	Puget Sound	0.031	0.165	0.365	0.082	0.45	0.367	0.163	0.363	0.566	0.394	0.444	0.22	0.305	0.098	0.338
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	-0.006	-0.026	0.272	0.106	0.46	0.34	0.145	0.36	0.483	0.299	0.368	0.16	0.204	-0.016	0.291
	Crescent City	0.003	0.003	0.023	0.019	-0.039	0.024		0.026	0.052	Conf.	Conf.	Conf.	Conf.	0.003	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Eureka	0.04	0.027	0.096	0.036	0.076	0.053	0.105	0.125	0.156	0.118	0.078	0.07	0.082	0.034	0.09
	Fort Bragg	0.097	0.085	0.082	0.04	0.066	0.082	0.158	0.045	0.062	0.035	0.172	0.076	0.017	0.091	0.076
	Morro Bay-Monterey	-0.043	0.078	0.045	-0.026	0.003	0.083	-0.027	0.011	-0.015	-0.185	-0.086	-0.151	-0.072	0.018	-0.038
	San Francisco	-0.009	0.006	0.016	-0.005	0.014	-0.03	Conf.		-0.018	Conf.		-0.031	Conf.	-0.001	-0.026
	California	0.017	0.04	0.059	0.012	0.032	0.054	0.071	0.06	0.052	0.014	0.06	0.01	0.018	0.028	0.04
	Astoria	0.055	0.025	0.112	0.143	0.186	0.198	0.171	0.199	0.22	0.176	0.195	0.122	0.225	0.04	0.177
	Brookings	0.063	0.088	0.15	0.047	0.21	0.122	0.123	0.13	0.024	0.123	0.12		0.006	0.076	0.106
	Coos Bay	0.032	0.017	0.046	0.027	0.018	0.03	0.03	0.041	0.117	0.054	0.046	0.052	0.004	0.024	0.042
	Newport	0.027	0.006	0.179	0.112	0.122	0.179	0.152	0.289	0.228	0.236	0.148	0.106	0.134	0.016	0.171
	Tillamook	-0.001	0.035	Conf.	Conf.	Conf.									0.017	Conf.
	Oregon	0.042	0.029	0.104	0.083	0.12	0.131	0.125	0.17	0.173	0.153	0.143	0.03	0.125	0.036	0.123
	Puget Sound	-0.013	Conf.	0.095	0.089	Conf.	0.069	0.115	0.208	0.145	0.152	Conf.	Conf.		Conf.	0.12
	South and central WA coast	0.005	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	0.005	Conf.
	Washington & Alaska	-0.003	0.078	0.123	0.091	0.13	0.113	0.162	0.227	0.152	0.166	0.103	0.038	0.045	0.038	0.123

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Crescent City	0.013	-0.002	0.023	0.019	-0.039	0.024		0.026	0.052	Conf.	Conf.	Conf.	Conf.	0.005	Conf.
	Eureka	0.056	0.03	0.096	0.036	0.076	0.053	0.105	0.125	0.156	0.118	0.078	0.07	0.082	0.043	0.09
	Fort Bragg	0.097	0.085	0.082	0.04	0.066	0.082	0.158	0.045	0.062	0.035	0.172	0.076	0.017	0.091	0.076
	Morro Bay-Monterey	-0.043	0.078	0.045	-0.026	0.003	0.083	-0.027	0.011	-0.015	-0.185	-0.086	-0.151	-0.072	0.018	-0.038
	San Francisco	0.014	0.045	0.062	0.008	0.014	-0.03	Conf.		-0.018	Conf.		-0.031	Conf.	0.029	-0.019
	California	0.026	0.047	0.067	0.014	0.032	0.054	0.071	0.06	0.052	0.014	0.06	0.01	0.018	0.036	0.041
	Astoria	0.052	0.089	0.175	0.105	0.192	0.144	0.171	0.188	0.228	0.169	0.176	0.127	0.221	0.07	0.172
	Brookings	0.078	0.124	0.206	0.107	0.387	0.135	0.171	0.188	0.104	0.205	0.217	-0.213	0.138	0.101	0.15
	Coos Bay	-0.005	0.01	0.058	0.052	0.018	0.03	0.03	0.041	0.117	0.054	0.046	0.052	0.004	0.002	0.046
	Newport	0.01	0.009	0.244	0.149	0.303	0.204	0.123	0.208	0.388	0.33	0.153	0.153	0.242	0.01	0.227
	Tillamook	0.043	-0.028	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.007	Conf.
	Oregon	0.027	0.04	0.17	0.101	0.203	0.139	0.126	0.169	0.258	0.218	0.151	0.083	0.199	0.034	0.165
	Puget Sound	0.021	0.142	0.239	0.085	0.392	0.298	0.151	0.327	0.446	0.308	0.332	0.195	0.255	0.081	0.275
	South and central WA coast	-0.077		-0.007	0.142	0.337	0.191	0.145	0.326	0.108	-0.066	-0.022	-0.123	-0.174	-0.077	0.078



Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	Washington & Alaska	-0.005	-0.003	0.198	0.099	0.378	0.273	0.15	0.327	0.386	0.252	0.283	0.139	0.174	-0.004	0.242

Table 9-20 Catcher vessel mean variable cost net revenue (millions of 2021 \$) by homeport city and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.261	0.264	Conf.	Conf.										0.262	Conf.
	Astoria	0.269	0.594	0.855	0.1	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.432	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	0.156	Conf.	Conf.	Conf.										0.156	Conf.
	Newport	0.254	0.268	0.683	0.531	0.755	0.489	0.333	0.382	0.75	0.633	0.744	0.433	0.595	0.261	0.575
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.244	0.302	0.694	0.492	0.79	0.476	0.351	0.387	0.723	0.636	0.709	0.417	0.599	0.273	0.57
	Puget Sound	0.16	0.3	0.816	0.692	0.827	0.851	0.273	0.526	0.727	0.59	0.652	0.409	0.476	0.23	0.622
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.167	0.289	0.754	0.695	0.826	0.797	0.282	0.539	0.658	0.511	0.585	0.363	0.423	0.228	0.585

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City	0.094	0.056	0.085	0.098	0.054	0.078		0.078	0.117	Conf.	Conf.	Conf.	Conf.	0.075	Conf.
	Eureka	0.121	0.126	0.173	0.122	0.136	0.136	0.205	0.203	0.288	0.18	0.135	0.136	0.15	0.124	0.169
	Fort Bragg	0.198	0.151	0.151	0.123	0.123	0.147	0.21	0.089	0.11	0.08	0.213	0.136	0.069	0.174	0.132
	Morro Bay-Monterey	0.001	0.122	0.117	0.039	0.083	0.102	0.001	0.041	0.008	-0.063	-0.034	-0.077	-0.029	0.062	0.017
	San Francisco	0.037	0.036	0.058	0.043	0.05	0.011	Conf.		0.025	Conf.		-0.003	Conf.	0.036	0.021
	California	0.088	0.099	0.125	0.085	0.096	0.11	0.138	0.113	0.114	0.081	0.113	0.067	0.065	0.094	0.101
	Astoria	0.138	0.109	0.247	0.246	0.282	0.26	0.267	0.312	0.317	0.239	0.261	0.203	0.303	0.124	0.267
	Brookings	0.154	0.185	0.262	0.168	0.318	0.24	0.206	0.28	0.22	0.195	0.19	0.058	0.057	0.169	0.199
	Coos Bay	0.09	0.106	0.132	0.096	0.055	0.049	0.057	0.085	0.166	0.08	0.069	0.076	0.045	0.098	0.083
	Newport	0.126	0.088	0.265	0.198	0.162	0.23	0.207	0.341	0.342	0.302	0.211	0.145	0.211	0.107	0.238
	Tillamook	0.072	0.058	Conf.	Conf.	Conf.									0.065	Conf.
	Oregon	0.121	0.112	0.217	0.177	0.188	0.186	0.194	0.259	0.278	0.209	0.2	0.14	0.192	0.116	0.204
	Puget Sound	0.07	Conf.	0.174	0.14	Conf.	0.099	0.153	0.23	0.204	0.179	Conf.	Conf.		Conf.	0.163
	South and central WA coast	0.126	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	0.126	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska	0.102	0.139	0.229	0.201	0.243	0.19	0.208	0.275	0.223	0.201	0.144	0.136	0.148	0.12	0.2
	Crescent City	0.108	0.066	0.085	0.098	0.054	0.078		0.078	0.117	Conf.	Conf.	Conf.	Conf.	0.087	Conf.
	Eureka	0.139	0.125	0.173	0.122	0.136	0.136	0.205	0.203	0.288	0.18	0.135	0.136	0.15	0.132	0.169
	Fort Bragg	0.198	0.151	0.151	0.123	0.123	0.147	0.21	0.089	0.11	0.08	0.213	0.136	0.069	0.174	0.132
	Morro Bay-Monterey	0.001	0.122	0.117	0.039	0.083	0.102	0.001	0.041	0.008	-0.063	-0.034	-0.077	-0.029	0.062	0.017
	San Francisco	0.073	0.094	0.162	0.143	0.05	0.011	Conf.		0.025	Conf.		-0.003	Conf.	0.083	0.046
	California	0.101	0.112	0.144	0.104	0.096	0.11	0.138	0.113	0.114	0.081	0.113	0.067	0.065	0.107	0.104
	Astoria	0.156	0.182	0.33	0.226	0.312	0.278	0.267	0.305	0.331	0.246	0.272	0.215	0.306	0.169	0.281
	Brookings	0.172	0.238	0.329	0.26	0.507	0.259	0.263	0.338	0.298	0.302	0.307	0.131	0.198	0.205	0.29
	Coos Bay	0.104	0.115	0.183	0.146	0.055	0.049	0.057	0.085	0.166	0.08	0.069	0.076	0.045	0.11	0.092
	Newport	0.208	0.208	0.578	0.443	0.585	0.415	0.284	0.366	0.58	0.509	0.487	0.323	0.441	0.208	0.456
	Tillamook	0.151	0.073	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.112	Conf.
	Oregon	0.161	0.173	0.371	0.271	0.359	0.274	0.232	0.292	0.404	0.33	0.347	0.237	0.336	0.167	0.314
	Puget Sound	0.141	0.267	0.516	0.462	0.713	0.677	0.243	0.458	0.577	0.445	0.484	0.365	0.41	0.204	0.486
	South and	0.151	0.196	0.368	0.528	0.581	0.427	0.339	0.537	0.31	0.159	0.196	0.127	0.205	0.174	0.343

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.143	0.256	0.492	0.479	0.68	0.619	0.262	0.473	0.53	0.402	0.445	0.323	0.372	0.2	0.462

Table 9-21 Catcher vessel mean fixed cost (millions of 2021 \$) by homeport city and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.121	0.135	Conf.	Conf.										0.128	Conf.
	Astoria	0.239	0.142	0.286	0.232	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.19	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	0.303	Conf.	Conf.	Conf.										0.303	Conf.
	Newport	0.254	0.258	0.417	0.369	0.379	0.275	0.23	0.227	0.248	0.247	0.586	0.252	0.281	0.256	0.319
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.248	0.237	0.383	0.349	0.376	0.318	0.224	0.22	0.248	0.252	0.539	0.237	0.265	0.242	0.31
	Puget Sound	0.129		0.451	0.61		0.484	0.111	0.163	0.161	0.197	0.207			0.129	0.298
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.173	0.314	0.482	0.589	0.365	0.457	0.137	0.179	0.175	0.212	0.218	0.203	0.219	0.244	0.294

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City			0.062	0.079	0.092	0.054		0.053	0.065	Conf.	Conf.	Conf.	Conf.	NaN	Conf.
	Eureka			0.077	0.086	0.06	0.083	0.1	0.078	0.132	0.062	0.056	0.067	0.068	NaN	0.079
	Fort Bragg	0.1	0.066	0.069	0.084	0.057	0.064	0.051	0.044	0.049	0.045	0.041	0.06	0.052	0.083	0.056
	Morro Bay-Monterey	0.044	0.044	0.072	0.065	0.08	0.018	0.028	0.03	0.023	0.122	0.052	0.074	0.042	0.044	0.055
	San Francisco					0.035	0.04	Conf.		0.042	Conf.		0.028	Conf.	NaN	0.048
	California	0.071	0.059			0.063	0.056	0.068	0.053	0.061	0.067	0.053	0.056	0.048	0.065	0.058
	Astoria	0.083	0.084	0.134	0.104			0.096							0.084	0.111
	Brookings														NaN	NaN
	Coos Bay	0.058				0.037	0.019	0.027	0.044	0.049	0.026	0.023	0.025	0.041	0.058	0.032
	Newport	0.099	0.083	0.086	0.086	0.041	0.052	0.054	0.052	0.113	0.066	0.063	0.039	0.077	0.091	0.066
	Tillamook			Conf.	Conf.	Conf.									NaN	Conf.
	Oregon	0.079	0.083	0.113	0.094	0.068	0.055	0.069	0.089	0.105	0.056	0.057	0.11	0.067	0.081	0.08
	Puget Sound	0.083	Conf.	0.079	0.051	Conf.	0.03	0.038	0.022	0.059	0.027	Conf.	Conf.		Conf.	0.042
	South and central WA coast		Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	NaN	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska	0.105	0.062	0.106	0.11	0.113	0.076	0.047	0.048	0.07	0.035	0.041	0.098	0.103	0.083	0.077
	Crescent City	0.096	0.067	0.062	0.079	0.092	0.054		0.053	0.065	Conf.	Conf.	Conf.	Conf.	0.082	Conf.
	Eureka	0.082	0.095	0.077	0.086	0.06	0.083	0.1	0.078	0.132	0.062	0.056	0.067	0.068	0.088	0.079
	Fort Bragg	0.1	0.066	0.069	0.084	0.057	0.064	0.051	0.044	0.049	0.045	0.041	0.06	0.052	0.083	0.056
	Morro Bay-Monterey	0.044	0.044	0.072	0.065	0.08	0.018	0.028	0.03	0.023	0.122	0.052	0.074	0.042	0.044	0.055
	San Francisco	0.059	0.049	0.101	0.134	0.035	0.04	Conf.		0.042	Conf.		0.028	Conf.	0.054	0.065
	California	0.075	0.066	0.077	0.089	0.063	0.056	0.068	0.053	0.061	0.067	0.053	0.056	0.048	0.071	0.063
	Astoria	0.104	0.093	0.155	0.121	0.12	0.134	0.096	0.117	0.103	0.078	0.096	0.088	0.086	0.098	0.109
	Brookings	0.094	0.114	0.123	0.153	0.12	0.124	0.092	0.15	0.194	0.097	0.09	0.343	0.061	0.104	0.141
	Coos Bay	0.109	0.105	0.125	0.094	0.037	0.019	0.027	0.044	0.049	0.026	0.023	0.025	0.041	0.107	0.046
	Newport	0.198	0.199	0.334	0.294	0.282	0.211	0.161	0.158	0.192	0.179	0.334	0.17	0.199	0.198	0.229
	Tillamook	0.108	0.101	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.105	Conf.
	Oregon	0.134	0.133	0.2	0.17	0.155	0.135	0.106	0.123	0.146	0.112	0.196	0.154	0.137	0.134	0.149
	Puget Sound	0.119	0.126	0.278	0.377	0.322	0.379	0.092	0.131	0.132	0.137	0.153	0.17	0.155	0.122	0.211
	South and	0.228	0	0.375	0.386	0.244	0.236	0.194	0.212	0.202	0.225	0.218	0.25	0.379	0.114	0.266



Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.148	0.258	0.294	0.379	0.302	0.345	0.113	0.146	0.144	0.15	0.162	0.184	0.197	0.203	0.22

Table 9-22 Catcher vessel mean variable costs (millions of 2021 \$) by homeport city and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.308	0.359	Conf.	Conf.										0.334	Conf.
	Astoria	0.379	0.477	0.935	0.998	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.428	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	0.294	Conf.	Conf.	Conf.										0.294	Conf.
	Newport	0.319	0.464	0.712	0.736	0.839	1.01	0.624	0.718	0.968	0.895	1.028	0.736	0.795	0.392	0.824
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.324	0.43	0.757	0.769	0.865	1.006	0.625	0.694	0.934	0.904	0.999	0.701	0.795	0.377	0.823
	Puget Sound	0.225	0.369	0.737	0.82	0.783	0.783	0.367	0.525	0.678	0.673	0.615	0.447	0.576	0.297	0.637
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.236	0.387	0.691	0.829	0.791	0.781	0.387	0.581	0.742	0.728	0.673	0.477	0.595	0.312	0.661

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City	0.179	0.104	0.109	0.182	0.107	0.16		0.183	0.195	Conf.	Conf.	Conf.	Conf.	0.142	Conf.
	Eureka	0.186	0.183	0.262	0.204	0.22	0.253	0.318	0.271	0.415	0.271	0.247	0.271	0.248	0.184	0.271
	Fort Bragg	0.275	0.246	0.292	0.255	0.253	0.286	0.326	0.21	0.214	0.223	0.277	0.26	0.277	0.26	0.261
	Morro Bay-Monterey	0.149	0.151	0.116	0.082	0.15	0.224	0.305	0.092	0.101	0.217	0.204	0.197	0.134	0.15	0.166
	San Francisco	0.085	0.063	0.116	0.117	0.162	0.177	Conf.		0.122	Conf.		0.106	Conf.	0.074	0.137
	California	0.176	0.151	0.193	0.167	0.188	0.236	0.297	0.203	0.214	0.212	0.23	0.218	0.194	0.163	0.214
	Astoria	0.242	0.265	0.316	0.338	0.383	0.393	0.393	0.393	0.391	0.337	0.329	0.259	0.311	0.254	0.349
	Brookings	0.25	0.281	0.371	0.296	0.53	0.375	0.298	0.377	0.417	0.311	0.308	0.154	0.115	0.266	0.323
	Coos Bay	0.137	0.158	0.174	0.163	0.108	0.092	0.109	0.124	0.2	0.142	0.12	0.094	0.091	0.148	0.129
	Newport	0.21	0.175	0.199	0.216	0.155	0.261	0.251	0.289	0.326	0.33	0.243	0.177	0.251	0.192	0.245
	Tillamook	0.123	0.126	Conf.	Conf.	Conf.									0.124	Conf.
	Oregon	0.201	0.211	0.268	0.26	0.267	0.276	0.281	0.306	0.34	0.286	0.26	0.189	0.225	0.206	0.269
	Puget Sound	0.243	Conf.	0.185	0.103	Conf.	0.077	0.162	0.167	0.208	0.154	Conf.	Conf.		Conf.	0.152
	South and central WA coast	0.213	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	0.213	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska	0.226	0.311	0.287	0.245	0.317	0.288	0.223	0.237	0.244	0.188	0.192	0.22	0.232	0.268	0.243
	Crescent City	0.21	0.145	0.109	0.182	0.107	0.16		0.183	0.195	Conf.	Conf.	Conf.	Conf.	0.178	Conf.
	Eureka	0.197	0.203	0.262	0.204	0.22	0.253	0.318	0.271	0.415	0.271	0.247	0.271	0.248	0.2	0.271
	Fort Bragg	0.275	0.246	0.292	0.255	0.253	0.286	0.326	0.21	0.214	0.223	0.277	0.26	0.277	0.26	0.261
	Morro Bay-Monterey	0.149	0.151	0.116	0.082	0.15	0.224	0.305	0.092	0.101	0.217	0.204	0.197	0.134	0.15	0.166
	San Francisco	0.106	0.097	0.182	0.2	0.162	0.177	Conf.		0.122	Conf.		0.106	Conf.	0.102	0.156
	California	0.186	0.167	0.204	0.182	0.188	0.236	0.297	0.203	0.214	0.212	0.23	0.218	0.194	0.176	0.216
	Astoria	0.261	0.297	0.4	0.428	0.421	0.435	0.393	0.388	0.424	0.359	0.356	0.285	0.345	0.279	0.385
	Brookings	0.275	0.308	0.482	0.382	0.627	0.525	0.347	0.432	0.485	0.437	0.51	0.243	0.241	0.292	0.428
	Coos Bay	0.17	0.169	0.236	0.181	0.108	0.092	0.109	0.124	0.2	0.142	0.12	0.094	0.091	0.17	0.136
	Newport	0.28	0.368	0.584	0.599	0.644	0.796	0.478	0.55	0.701	0.683	0.65	0.521	0.578	0.324	0.617
	Tillamook	0.189	0.165	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.177	Conf.
	Oregon	0.242	0.281	0.426	0.411	0.437	0.499	0.364	0.406	0.508	0.462	0.473	0.369	0.427	0.262	0.435
	Puget Sound	0.229	0.353	0.479	0.521	0.662	0.62	0.316	0.443	0.543	0.489	0.472	0.407	0.506	0.291	0.496
	South and	0.241	0.452	0.539	0.731	0.704	0.689	0.454	0.721	0.838	0.821	0.824	0.546	0.619	0.347	0.681

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.232	0.37	0.489	0.574	0.672	0.636	0.343	0.495	0.595	0.539	0.52	0.432	0.527	0.301	0.529

Table 9-23 Catcher vessel mean observer and EM cost (millions of 2021 \$) by homeport city and state, 2009 through 2021

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California			Conf.	Conf.										NaN	Conf.
	Astoria					Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		NaN	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay		Conf.	Conf.	Conf.										NaN	Conf.
	Newport	0.002	0.004	0.005	0.009	0.016	0.027	0.017	0.018	0.023	0.012	0.015	0.01	0.007	0.003	0.014
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.002	0.003	0.006	0.009	0.017	0.027	0.018	0.021	0.023	0.012	0.015	0.009	0.006	0.002	0.015
	Puget Sound	0.003		0.004	0.01		0.018	0.019	0.013	0.013	0.015	0.013			0.003	0.013
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.003	0.005	0.005	0.01	0.013	0.018	0.017	0.012	0.013	0.014	0.012	0.014	0.014	0.004	0.013

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City			0.002	0.004	0.005	0.008		0.021	0.013	Conf.	Conf.	Conf.	Conf.	NaN	Conf.
	Eureka			0.003	0.004	0.011	0.013	0.024	0.021	0.03	0.02	0.02	0.022	0.027	NaN	0.018
	Fort Bragg			0.002	0.005	0.011	0.014	0.02	0.01	0.01	0.007	0.016	0.019	0.013	NaN	0.012
	Morro Bay-Monterey			0.002	0.004	0.009	0.017		0.007	0.012			0.027	0.007	NaN	0.011
	San Francisco					0.008	0.015	Conf.		0.005	Conf.		0.008	Conf.	NaN	0.011
	California					0.009	0.014	0.021	0.015	0.014	0.012	0.015	0.019	0.017	NaN	0.015
	Astoria			0.004	0.009			0.031							NaN	0.015
	Brookings														NaN	NaN
	Coos Bay					0.006	0.007	0.01	0.01	0.015	0.014	0.011	0.013	0.012	NaN	0.011
	Newport			0.001	0.004	0.007	0.011	0.016	0.019	0.023	0.026	0.019	0.016	0.018	NaN	0.015
	Tillamook			Conf.	Conf.	Conf.									NaN	Conf.
	Oregon			0.003	0.006	0.012	0.015	0.021	0.025	0.028	0.026	0.024	0.022	0.019	NaN	0.018
	Puget Sound		Conf.	0.002	0.003	Conf.		0.017	0.022	0.016	0.01	Conf.	Conf.		Conf.	0.012
	South and central WA coast		Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	NaN	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska			0.002	0.005	0.012	0.015	0.019	0.028	0.02	0.015	0.017	0.026		NaN	0.016
	Crescent City			0.002	0.004	0.005	0.008		0.021	0.013	Conf.	Conf.	Conf.	Conf.	NaN	Conf.
	Eureka			0.003	0.004	0.011	0.013	0.024	0.021	0.03	0.02	0.02	0.022	0.027	NaN	0.018
	Fort Bragg			0.002	0.005	0.011	0.014	0.02	0.01	0.01	0.007	0.016	0.019	0.013	NaN	0.012
	Morro Bay-Monterey			0.002	0.004	0.009	0.017		0.007	0.012			0.027	0.007	NaN	0.011
	San Francisco			0.003	0.004	0.008	0.015	Conf.		0.005	Conf.		0.008	Conf.	NaN	0.009
	California			0.002	0.004	0.009	0.014	0.021	0.015	0.014	0.012	0.015	0.019	0.017	NaN	0.013
	Astoria			0.004	0.009	0.019	0.024	0.031	0.038	0.036	0.034	0.035	0.034	0.027	NaN	0.026
	Brookings			0.003	0.004	0.018	0.016	0.021	0.027	0.027	0.018	0.016	0.011	0.009	NaN	0.015
	Coos Bay			0.003	0.004	0.006	0.007	0.01	0.01	0.015	0.014	0.011	0.013	0.012	NaN	0.01
	Newport	0.001	0.003	0.004	0.008	0.013	0.022	0.017	0.018	0.023	0.017	0.017	0.012	0.011	0.002	0.015
	Tillamook			Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			NaN	Conf.
	Oregon	0.001	0.001	0.004	0.007	0.014	0.019	0.021	0.024	0.026	0.022	0.021	0.017	0.015	0.001	0.017
	Puget Sound	0.002	0.003	0.003	0.007	0.011	0.016	0.019	0.015	0.014	0.014	0.014	0.015	0.013	0.002	0.013
	South and				0.012	0.018	0.022	0.013	0.022	0.02	0.019	0.016	0.019	0.02	NaN	0.018



Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.002	0.004	0.004	0.008	0.013	0.017	0.017	0.016	0.015	0.014	0.014	0.016	0.014	0.003	0.013

Table 9-24 Catcher vessel mean cost recovery fee (millions of 2021 \$) by homeport and state

Vessel type	Category	2014	2015	2016	2017	2018	2019	2020	2021	Average
Whiting vessels	Crescent City									NaN
	Eureka									NaN
	San Francisco									Conf.
	California									Conf.
	Astoria	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay									Conf.
	Newport	0.043	0.024	0.033	0.039	0.034	0.04	0.026	0.027	0.033
	Tillamook			Conf.		Conf.	Conf.			Conf.
	Oregon	0.043	0.025	0.032	0.039	0.036	0.039	0.026	0.028	0.034
	Puget Sound	0.041	0.015	0.03	0.022	0.019	0.024			0.025
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.041	0.017	0.032	0.025	0.021	0.026	0.018	0.019	0.025
Non-whiting vessels	Crescent City	0.007		0.008	0.012	Conf.	Conf.	Conf.	Conf.	Conf.
	Eureka	0.012	0.016	0.014	0.026	0.014	0.011	0.012	0.01	0.014
	Fort Bragg	0.013	0.016	0.009	0.013	0.009	0.014	0.012	0.009	0.012
	Morro Bay-Monterey	0.01	0.009	0.004	0.004	0.005	0.005	0.003	0.003	0.005

Vessel type	Category	2014	2015	2016	2017	2018	2019	2020	2021	Average
	San Francisco	0.006	Conf.		0.006	Conf.		0.003	Conf.	0.004
	California	0.01	0.013	0.009	0.013	0.009	0.01	0.008	0.006	0.01
	Astoria		0.02							0.02
	Brookings									NaN
	Coos Bay	0.004	0.005	0.006	0.011	0.007	0.005	0.005	0.003	0.006
	Newport	0.015	0.014	0.019	0.02	0.019	0.013	0.009	0.012	0.015
	Tillamook									Conf.
	Oregon	0.014	0.014	0.017	0.019	0.015	0.013	0.01	0.01	0.014
	Puget Sound	0.005	0.009	0.012	0.012	0.01	Conf.	Conf.		0.009
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
All vessels	Washington & Alaska	0.014	0.013	0.015	0.014	0.012	0.01	0.01	0.009	0.012
	Crescent City	0.007		0.008	0.012	Conf.	Conf.	Conf.	Conf.	Conf.
	Eureka	0.012	0.016	0.014	0.026	0.014	0.011	0.012	0.01	0.014
	Fort Bragg	0.013	0.016	0.009	0.013	0.009	0.014	0.012	0.009	0.012
	Morro Bay-Monterey	0.01	0.009	0.004	0.004	0.005	0.005	0.003	0.003	0.005
	San Francisco	0.006	Conf.		0.006	Conf.		0.003	Conf.	0.004
	California	0.01	0.013	0.009	0.013	0.009	0.01	0.008	0.006	0.01
	Astoria	0.021	0.02	0.021	0.023	0.018	0.018	0.015	0.016	0.019
	Brookings	0.023	0.017	0.023	0.023	0.021	0.021	0.01	0.01	0.018

<b>Vessel type</b>	<b>Category</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Average</b>
	Coos Bay	0.004	0.005	0.006	0.011	0.007	0.005	0.005	0.003	0.006
	Newport	0.035	0.02	0.027	0.031	0.029	0.027	0.02	0.021	0.026
	Tillamook			Conf.		Conf.	Conf.			Conf.
	Oregon	0.023	0.017	0.021	0.024	0.021	0.021	0.015	0.017	0.02
	Puget Sound	0.033	0.014	0.026	0.019	0.016	0.019	0.016	0.017	0.02
	South and central WA coast	0.033	0.024	0.038	0.034	0.029	0.029	0.02	0.021	0.028
	Washington & Alaska	0.033	0.016	0.028	0.022	0.018	0.021	0.017	0.017	0.022

Table 9-25 Catcher vessel mean labor cost (millions of 2021 \$) by homeport and state

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.18	0.197	Conf.	Conf.										0.188	Conf.
	Astoria	0.25	0.271	0.567	0.586	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.26	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	0.16	Conf.	Conf.	Conf.										0.16	Conf.
	Newport	0.182	0.241	0.441	0.422	0.509	0.574	0.329	0.399	0.595	0.515	0.628	0.488	0.489	0.212	0.49
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.185	0.226	0.465	0.44	0.526	0.571	0.331	0.382	0.567	0.517	0.604	0.46	0.477	0.206	0.485
	Puget Sound	0.119		0.415	0.443		0.403	0.167	0.273	0.386	0.329	0.352			0.119	0.346
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.127	0.198	0.39	0.462	0.462	0.409	0.177	0.309	0.42	0.367	0.396	0.275	0.328	0.162	0.363

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City			0.076	0.101	0.055	0.091		0.101	0.114	Conf.	Conf.	Conf.	Conf.	NaN	Conf.
	Eureka			0.171	0.131	0.131	0.154	0.198	0.175	0.259	0.173	0.154	0.175	0.147	NaN	0.17
	Fort Bragg	0.192	0.164	0.21	0.173	0.163	0.18	0.216	0.141	0.137	0.152	0.169	0.147	0.164	0.178	0.168
	Morro Bay-Monterey	0.066	0.06	0.055	0.042	0.065	0.098	0.145	0.056	0.038	0.102	0.112	0.053	0.063	0.063	0.075
	San Francisco					0.083	0.069	Conf.		0.059	Conf.		0.042	Conf.	NaN	0.065
	California	0.109	0.09			0.106	0.133	0.18	0.128	0.126	0.13	0.136	0.116	0.105	0.1	0.129
	Astoria	0.15	0.156	0.178	0.183			0.231							0.153	0.197
	Brookings														NaN	NaN
	Coos Bay	0.084				0.052	0.048	0.063	0.074	0.118	0.082	0.071	0.055	0.053	0.084	0.068
	Newport	0.111	0.079	0.117	0.125	0.088	0.138	0.137	0.163	0.188	0.178	0.136	0.097	0.136	0.095	0.137
	Tillamook			Conf.	Conf.	Conf.									NaN	Conf.
	Oregon	0.121	0.122	0.158	0.148	0.151	0.153	0.165	0.18	0.2	0.162	0.146	0.105	0.129	0.122	0.154
	Puget Sound	0.106	Conf.	0.089	0.046	Conf.	0.031	0.085	0.063	0.118	0.085	Conf.	Conf.		Conf.	0.076
	South and central WA coast		Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	NaN	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska	0.117	0.17	0.154	0.138	0.174	0.163	0.128	0.115	0.139	0.104	0.105	0.105	0.141	0.144	0.133
	Crescent City	0.133	0.092	0.076	0.101	0.055	0.091		0.101	0.114	Conf.	Conf.	Conf.	Conf.	0.112	Conf.
	Eureka	0.133	0.137	0.171	0.131	0.131	0.154	0.198	0.175	0.259	0.173	0.154	0.175	0.147	0.135	0.17
	Fort Bragg	0.192	0.164	0.21	0.173	0.163	0.18	0.216	0.141	0.137	0.152	0.169	0.147	0.164	0.178	0.168
	Morro Bay-Monterey	0.066	0.06	0.055	0.042	0.065	0.098	0.145	0.056	0.038	0.102	0.112	0.053	0.063	0.063	0.075
	San Francisco	0.055	0.04	0.077	0.091	0.083	0.069	Conf.		0.059	Conf.		0.042	Conf.	0.048	0.07
	California	0.115	0.099	0.125	0.107	0.106	0.133	0.18	0.128	0.126	0.13	0.136	0.116	0.105	0.107	0.127
	Astoria	0.164	0.173	0.231	0.238	0.242	0.238	0.231	0.221	0.245	0.201	0.192	0.157	0.199	0.168	0.218
	Brookings	0.167	0.199	0.324	0.238	0.385	0.315	0.212	0.267	0.303	0.258	0.307	0.146	0.125	0.183	0.262
	Coos Bay	0.1	0.098	0.132	0.1	0.052	0.048	0.063	0.074	0.118	0.082	0.071	0.055	0.053	0.099	0.077
	Newport	0.157	0.187	0.36	0.344	0.389	0.449	0.254	0.307	0.426	0.389	0.391	0.337	0.348	0.172	0.363
	Tillamook	0.092	0.069	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.08	Conf.
	Oregon	0.142	0.155	0.257	0.235	0.257	0.281	0.205	0.232	0.304	0.263	0.278	0.23	0.252	0.148	0.254
	Puget Sound	0.117	0.179	0.263	0.278	0.381	0.317	0.146	0.224	0.309	0.243	0.268	0.227	0.274	0.148	0.266
	South and	0.144	0.255	0.32	0.449	0.416	0.399	0.233	0.416	0.467	0.46	0.526	0.328	0.376	0.2	0.399

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.124	0.191	0.272	0.321	0.39	0.336	0.164	0.26	0.337	0.275	0.303	0.245	0.293	0.158	0.291



Table 9-26Catcher vessel mean fuel cost (millions of 2021 \$) by homeport and state

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Whiting vessels	Crescent City	Conf.	Conf.												Conf.	NaN
	Eureka	Conf.	Conf.												Conf.	NaN
	San Francisco	Conf.	Conf.	Conf.	Conf.										Conf.	Conf.
	California	0.079	0.117	Conf.	Conf.										0.098	Conf.
	Astoria	0.085	0.145	0.235	0.283	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.		0.115	Conf.
	Brookings	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Coos Bay	0.078	Conf.	Conf.	Conf.										0.078	Conf.
	Newport	0.078	0.148	0.166	0.2	0.179	0.23	0.16	0.16	0.174	0.213	0.213	0.127	0.164	0.113	0.181
	Tillamook	Conf.	Conf.						Conf.		Conf.	Conf.			Conf.	Conf.
	Oregon	0.083	0.135	0.181	0.214	0.186	0.231	0.156	0.155	0.17	0.219	0.212	0.123	0.175	0.109	0.184
	Puget Sound	0.069		0.197	0.241		0.197	0.11	0.126	0.152	0.217	0.141			0.069	0.173
	South and central WA coast	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Washington & Alaska	0.07	0.131	0.183	0.232	0.195	0.191	0.114	0.126	0.155	0.22	0.147	0.096	0.151	0.1	0.165

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting vessels	Crescent City			0.015	0.045	0.028	0.031		0.019	0.015	Conf.	Conf.	Conf.	Conf.	NaN	Conf.
	Eureka			0.05	0.042	0.048	0.041	0.036	0.026	0.036	0.029	0.03	0.03	0.035	NaN	0.037
	Fort Bragg	0.043	0.048	0.044	0.045	0.045	0.043	0.03	0.021	0.021	0.025	0.037	0.043	0.052	0.046	0.037
	Morro Bay-Monterey	0.056	0.036	0.016	0.019	0.037	0.035	0.049	0.009	0.019	0.037	0.025		0.021	0.046	0.027
	San Francisco					0.039	0.036	Conf.		0.015	Conf.		0.017	Conf.	NaN	0.025
	California	0.037	0.031			0.041	0.039	0.034	0.02	0.021	0.026	0.03	0.033	0.031	0.034	0.031
	Astoria	0.048	0.062	0.064	0.075			0.042							0.055	0.06
	Brookings														NaN	NaN
	Coos Bay	0.027				0.032	0.017	0.012	0.008	0.02	0.017	0.014	0.011	0.012	0.027	0.016
	Newport	0.052	0.052	0.029	0.041	0.027	0.037	0.026	0.022	0.029	0.044	0.031	0.021	0.036	0.052	0.031
	Tillamook			Conf.	Conf.	Conf.									NaN	Conf.
	Oregon	0.04	0.049	0.051	0.054	0.057	0.046	0.03	0.026	0.034	0.037	0.034	0.022	0.03	0.044	0.038
	Puget Sound	0.079	Conf.	0.042	0.015	Conf.	0.007	0.008	0.011	0.015	0.011	Conf.	Conf.		Conf.	0.016
	South and central WA coast		Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.	NaN	Conf.

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
All vessels	Washington & Alaska	0.058	0.077	0.064	0.049	0.072	0.044	0.018	0.018	0.023	0.018	0.02	0.023	0.024	0.068	0.034
	Crescent City	0.038	0.032	0.015	0.045	0.028	0.031		0.019	0.015	Conf.	Conf.	Conf.	Conf.	0.035	Conf.
	Eureka	0.031	0.035	0.05	0.042	0.048	0.041	0.036	0.026	0.036	0.029	0.03	0.03	0.035	0.033	0.037
	Fort Bragg	0.043	0.048	0.044	0.045	0.045	0.043	0.03	0.021	0.021	0.025	0.037	0.043	0.052	0.046	0.037
	Morro Bay-Monterey	0.056	0.036	0.016	0.019	0.037	0.035	0.049	0.009	0.019	0.037	0.025		0.021	0.046	0.027
	San Francisco	0.033	0.037	0.074	0.077	0.039	0.036	Conf.		0.015	Conf.		0.017	Conf.	0.035	0.04
	California	0.04	0.038	0.042	0.045	0.041	0.039	0.034	0.02	0.021	0.026	0.03	0.033	0.031	0.039	0.033
	Astoria	0.053	0.075	0.088	0.103	0.09	0.078	0.042	0.035	0.046	0.049	0.048	0.035	0.051	0.064	0.06
	Brookings	0.051	0.053	0.081	0.078	0.122	0.104	0.043	0.054	0.066	0.087	0.112	0.04	0.067	0.052	0.078
	Coos Bay	0.038	0.041	0.054	0.043	0.032	0.017	0.012	0.008	0.02	0.017	0.014	0.011	0.012	0.04	0.022
	Newport	0.069	0.116	0.132	0.158	0.136	0.175	0.107	0.106	0.113	0.15	0.125	0.086	0.113	0.092	0.127
	Tillamook	0.058	0.062	Conf.	Conf.	Conf.			Conf.		Conf.	Conf.			0.06	Conf.
	Oregon	0.054	0.077	0.093	0.101	0.094	0.102	0.061	0.059	0.072	0.088	0.085	0.058	0.081	0.066	0.081
	Puget Sound	0.071	0.12	0.125	0.147	0.165	0.153	0.084	0.099	0.113	0.144	0.102	0.082	0.131	0.096	0.122
	South and	0.051	0.117	0.12	0.167	0.161	0.132	0.104	0.097	0.13	0.176	0.137	0.086	0.11	0.084	0.129

Vessel type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
	central WA coast															
	Washington & Alaska	0.066	0.119	0.124	0.152	0.164	0.148	0.088	0.099	0.116	0.149	0.107	0.083	0.127	0.092	0.123

#### 8.1.4 Catcher-processor mean cost and revenue

Table 9-27 Catcher-processor mean cost and revenue data (millions of 2021 1st wholesale \$), 2009 through 2021

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009- 2021	Average 2011- 2021
Number of vessels	5.000	6.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	10.000	10.000	5.500	9.182
Total cost net revenue	2.240	5.724	2.795	2.189	3.780	6.170	2.953	4.447	5.163	5.098	6.391	5.740	6.484	3.982	4.655
Revenue	8.134	11.198	7.994	6.724	8.423	12.638	8.085	10.960	13.055	12.675	13.225	12.083	12.064	9.666	10.721
Fishing gear	0.129	0.130	0.142	0.180	0.089	0.151	0.150	0.105	0.201	0.166	0.182	0.217	0.181	0.130	0.160
On-board equipmen t	0.699	0.552	0.675	0.688	0.634	0.636	0.725	0.796	0.659	1.041	0.894	0.814	0.548	0.625	0.737
Other fixed costs	0.256	0.231	0.234	0.258	0.254	0.326	0.477	0.555	0.394	0.265	0.293	0.338	0.307	0.244	0.336
Processin g equipmen t	1.217	0.234	0.288	0.282	0.439	0.288	0.339	0.398	0.634	0.435	0.478	0.465	0.313	0.726	0.396
All fixed costs	2.317	1.169	1.343	1.358	1.345	1.261	1.442	1.565	1.729	1.845	1.749	1.713	1.248	1.743	1.509
Cost recovery fees						0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.006
Fuel	0.948	1.066	1.483	0.960	0.936	1.382	0.926	1.035	1.240	1.308	1.223	0.888	0.931	1.007	1.119
Labor	1.820	2.230	1.616	1.516	1.724	2.547	1.749	2.411	3.301	2.941	2.579	2.426	2.199	2.025	2.274

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009- 2010	Average 2011- 2021
Observer s	0.039	0.046	0.043	0.026	0.026	0.038	0.043	0.054	0.073	0.057	0.058	0.066	0.049	0.042	0.048
Other variable costs	0.786	0.986	0.718	0.624	0.541	1.055	0.724	1.157	1.389	1.365	1.298	1.282	1.254	0.886	1.037
All variable costs	3.577	4.306	3.856	3.176	3.298	5.207	3.690	4.947	6.162	5.732	5.085	4.631	4.332	3.942	4.556

### 9.2.2 Mothership mean cost and revenue

Table 9-28 mothership mean cost and revenue data (millions of 2021 1st wholesale \$), 2009 through 2021

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009- 2010	Average 2011- 2021
Number of vessels	6.000	6.000	5.000	5.000	5.000	5.000	3.000	6.000	4.000	5.000	6.000	5.000	5.000	6.000	4.909
Total cost net revenue	0.247	0.674	1.160	-0.296	0.379	0.543	-1.088	1.079	2.944	1.523	1.009	-0.477	-0.257	0.460	0.593
Revenue	3.763	5.856	9.356	7.196	8.308	10.428	7.671	8.069	12.005	10.148	7.208	5.592	5.931	4.810	8.356
Fishing gear	0.093		0.222	0.112	0.061	0.099	0.216	0.086	0.324	0.189	0.123	0.122	0.104		0.151
On-board equipmen t	0.446	0.619	0.503	1.354	1.122	1.659	1.879	0.569	0.418	0.652	0.427	0.432	1.992	0.532	1.001
Other fixed costs	0.336	0.325	0.431	0.434	0.354	0.531	0.687	0.393	0.302	0.314	0.285	0.264	0.245	0.330	0.385
Processin g equipmen t	0.321	0.424	0.151	0.304	0.308	0.247	0.393	0.295	0.202	0.503	0.279	0.140	0.226	0.372	0.277
All fixed costs	1.183	1.507	1.159	2.045	1.708	2.337	2.954	1.230	1.068	1.478	0.960	0.831	2.474	1.345	1.659
Fish purchase s	0.824	1.530	2.781	2.194	2.635	3.028	1.986	2.142	3.231	2.650	1.920	1.609	1.347	1.177	2.320
Fuel	0.328	0.482	1.274	0.891	0.920	1.169	0.750	0.680	0.930	1.003	0.679	0.275	0.458	0.405	0.821
Labor	0.878	1.169	1.809	1.448	1.628	2.027	1.876	1.925	2.307	2.211	1.721	1.302	1.233	1.024	1.772

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009- 2010	Average 2011- 2021
Observers	0.020	0.021	0.044	0.039	0.034	0.043	0.037	0.044	0.067	0.056	0.038	0.031	0.028	0.020	0.042
Other variable costs	0.271	0.461	0.981	0.716	0.866	1.082	0.935	0.855	1.280	1.046	0.728	1.895	0.554	0.366	0.994
All variable costs	2.333	3.675	7.038	5.447	6.220	7.548	5.805	5.760	7.992	7.147	5.239	5.238	3.714	3.004	6.104

### 9.2.3 Shoreside processor mean cost and fish sales revenue

Table 9-29 Shoreside processor mean cost and fish sales revenue

Processor type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009- 2010	Average 2011- 2021
All processors	Number of process ors	19.000	20.000	18.000	18.000	19.000	17.000	18.000	17.000	18.000	14.000	13.000	13.000	13.000	19.500	15.500
	Total cost net revenue	0.034	-0.216	1.124	1.103	0.899	0.719	-0.101	-0.211	-0.249	0.353	-2.123	1.176	0.347	-0.091	1.124
	Seafood sales revenue	7.715		9.416	8.278	8.560	9.211	7.054	8.648	11.723	13.026	14.717	12.684	12.246		10.416
	Fixed costs	1.701	1.473	0.801	0.495	0.572	0.770	0.770	0.904	1.561	2.484	4.130	1.330	1.047	1.587	0.801
	Variable costs	5.983	5.066	7.600	6.801	7.497	7.787	6.435	7.978	10.497	10.226	12.741	10.362	10.939	5.524	9.100



Processor type	Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average 2009-2010	Average 2011-2021
Non-whiting processors	Number of processors	7.000	8.000	9.000	10.000	11.000	9.000	10.000	9.000	10.000	6.000	6.000	6.000	6.000	7.500	7.500
	Total cost net revenue	0.521	0.528	0.547	0.334	-0.036	0.128	-0.045	0.103	0.091	0.545	0.237	-0.783	-0.572	0.524	0.047
	Seafood sales revenue			4.583	3.874	2.936	4.088	3.741	4.739	5.037	5.249	4.651	3.030	3.386		4.083
	Fixed costs	0.198	0.138	0.176	0.163	0.187	0.194	0.162	0.190	0.168	0.169	0.210	0.234	0.291	0.168	0.176
	Variable costs	3.339	2.694	3.899	3.383	2.793	3.773	3.637	4.449	4.806	4.575	4.229	3.345	3.672	3.016	3.899
Whiting processors	Number of processors	12.000	12.000	9.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000	7.000	7.000	7.000	12.000	8.000
	Total cost net revenue	-0.249	-0.712	1.701	2.065	2.184	1.385	-0.172	-0.525	-0.589	0.208	-4.146	2.576	1.135	-0.480	1.701
	Seafood sales revenue			14.250	13.784	16.294	14.974	11.195	12.556	18.409	18.859	23.345	20.959	19.841		16.750
	Fixed costs	2.577	2.363	1.426	0.910	1.101	1.418	1.529	1.618	2.954	4.220	7.490	2.114	1.696	2.470	1.426
	Variable costs	7.526	6.648	11.301	11.073	13.966	12.303	9.933	11.508	16.189	14.464	20.038	16.376	17.168	7.087	13.801

### **9.3 NE Sector Cost Data**

Information from the SSB cost surveys for 2011, 2012, and 2015 are presented in this section. Each of the cost categories are described and the mean cost per vessel is reported. Note that the survey also includes crew and captain payments. That information is also included.

#### **Total Fixed Cost**

Total fixed cost is the sum of all the reported cost categories except labor. These groupings included Repair/Maintenance, Upgrade/Improvement, Vessel Fees and Insurance, Business Costs by Vessel, Other Costs, and Value of Vessel and Associated Permits.

#### **Repair/Maintenance**

A fishing vessel and its various equipment will require repairs due to general wear and tear. The 2011 and 2012 surveys, asked for the cost of repairs for engine, hull, and electronics components separately. A composite value across all vessel components was queried for the 2015 survey. The 2012 survey included a separate line item for “Other Repair/Maintenance Costs”. To maintain consistency in the repair/maintenance category for the other years, these costs were included in the Other Costs category. Finally, the 2011 and 2012 surveys queried only vessel-level repair/maintenance costs, while the 2015 survey queried these costs at the vessel-level and business-level. This created confusion among respondents, so only vessel-level costs are summarized.

#### **Upgrade/Improvement**

Vessel upgrades were separated from repairs since they increase the value of the capital stock associated with the vessel. Like for Repair/Maintenance, the 2011 and 2012 asked for the cost of each component that was upgraded or improved and a composite value across all vessel components was requested in 2015. A separate line item for “Other Upgrade/Improvement Costs” was included in the 2012 survey and those costs were included in “Other Costs”.

Since the method for querying upgrade/improvement costs varied across the three survey years, the same depreciation factors could not be applied (i.e., the lifespan/rate of depreciation for various vessel components will differ). To maintain a consistent approach across the 3 surveys, upgrade/improvement values simply represent the upfront cost to the vessel owner.

As with repair/maintenance costs, the 2011 and 2012 surveys queried only vessel level upgrade/improvement costs, while the 2015 survey queried these costs at the vessel-level and business-level. The apparent confusion resulted in only vessel-level costs being reported.

#### **Vessel Fees and Insurance**

Vessel permit fees, mooring fees, and vessel insurance premiums were queried separately for all three surveys. Since these are all true fixed costs—expenses that would be expected to be incurred even if the vessel was inactive in a given year— they were grouped together into the Vessel Fees and Insurance category.

#### **Business Costs by Vessel**

Vessel owners incur business costs that are independent of vessel-related costs. Business costs include principal and interest paid on loans, vehicle usage costs (for transport of unloaded catch), association fees (such as groundfish sector fees), and advertising costs. These costs must be apportioned to vessels if a firm owns more than one. For the 2011 survey, owners of multiple vessels were instructed to only report their business costs associated with the vessel specified at the beginning of the survey (i.e., vessel owners were asked to apportion a percentage of their total business cost to the specified vessel). For the 2012 and

2015 surveys, owners of multiple vessels were instructed to report their cumulative business costs across all vessels and to provide the number of vessels owned. Average business cost per vessel was calculated by dividing the reported costs by the number of vessels included in the survey.

#### **Other Costs**

Vessel owners were given the option to note additional costs in all three survey years. The vast majority (95%) of respondents across the 3 survey years did not list any additional costs in this section. A slightly higher proportion of respondents filled in Other Costs for the 2015 survey compared to 2011 and 2012. For the 2015 survey, haul-out costs were the most frequent other cost listed

#### **Value of Vessel and Associated Permits**

This information was collected to help determine the economic health of a fishing business. Vessel owners were asked to provide the current combined market value of the vessel and its associated fishing permits.

#### **Total Payment to Crew/Hired Captain and Crew Payment System**

Vessel payments to crew/hired captain and benefits paid to crew/hired captain were collected all 3 survey years. The vast majority of vessel owners across all years (~90%) indicated they did not provide benefits to crew. Crew payments and benefits were aggregated to form the total payment to crew/hired captain category.

A share system was determined to be the most likely form of payment. For the 2015 survey, vessel owners were asked directly if their method of crew payment was a share system, a flat rate, or a combination. Additionally, for all survey years, the vessel owner was asked whether the vessel listed was run owner-operator or if a captain was hired.

The table below is presented to show the number of surveys sent out and the response rate. Because it was a voluntary survey the response rate declined each year the survey was conducted.

Table 9-30 SSB (Northeast) fixed cost survey sample size and response, by strata.

	2011			2012			2015		
	Sample	Response	% Response	Sample	Response	% Response	Sample	Response	% Response
Dredge_Large	144	29	20.1%	83	16	19.3%	123	7	5.7%
Dredge_Small	82	11	13.4%	86	4	4.7%	119	5	4.2%
Gillnet_Large	60	24	40.0%	61	14	23.0%	96	3	3.1%
Gillnet_Small	58	16	27.6%	62	12	19.4%	84	7	8.3%
Handgear_Large	32	4	12.5%	27	7	25.9%	87	7	8.0%
Handgear_Small	114	43	37.7%	186	45	24.2%	140	14	10.0%
Longline & Seine	25	8	32.0%	38	6	15.8%	58	5	8.6%
Pot/Trap_Large	276	80	29.0%	380	92	24.2%	618	36	5.8%
Pot/Trap_Small	295	96	32.5%	657	128	19.5%	918	60	6.5%
Trawl_Large	101	33	32.7%	86	22	25.6%	97	7	7.2%
Trawl_Small	100	28	28.0%	112	12	10.7%	149	9	6.0%
Total	1,287	372	28.9%	1,778	358	20.1%	2,489	160	6.4%

Source: NOAA Technical Memorandum NOAA Fisheries-NE-278

Table 9-31 Northeast Sector participants survey mean cost per vessel data, 2011, 2012, and 2015

Strata	2011		2012		2015		Mean	
	N	\$/Vessel	N	\$/Vessel	N	\$/Vessel	N	\$/Vessel
Large Trawl								
Total Fixed Cost	30	212,079	18	169,089	5	86,669	18	155,946
Repair & Maintenance	30	79,197	20	51,554	3	22,088	18	50,946
Upgrades/Improvements	27	31,617	17	29,169	4	22,376	16	27,720
Vessel Fees and Insurance	29	46,919	20	43,663	5	19,643	18	36,742
Vessel Permit Value	29	61,018	18	46,608	5	35,874	17	47,834
Crew & Captain Payments	29	257,128	20	178,908	5	81,848	18	172,628
Small Trawl								
Total Fixed Cost	28	56,128	10	72,031	7	48,718	15	58,959
Repair & Maintenance	27	23,121	12	12,932	7	27,797	15	21,283
Upgrades/Improvements	26	10,876	11	14,353	7	12,574	15	12,601
Vessel Fees and Insurance	26	8,310	12	8,022	8	8,442	15	8,258
Vessel Permit Value	25	17,758	9	36,043	7	7,147	14	20,316
Crew & Captain Payments	22	59,518	12	35,102	8	52,360	14	48,993

## 9.4 BC Groundfish Catch Share Costs

Table 9-32 BC Groundfish Program fleet-wide costs under catch share program in 2009

Groundfish Trawl Fleet	Bottomfish Only	Hake Only	Bottomfish and Hake	Fleet Total
Number of Vessels	31	8	25	64
Landings (kg) – All Species	15,391,467	14,053,325	56,521,398	85,966,190
Vessel Price (per kg)	\$1.10	\$0.25	\$0.46	\$0.54
Gross Revenue (Gross Stock)	\$16,948,640	\$3,501,510	\$26,253,956	\$46,704,106
<b>Less: Fishery Specific Expenses</b>				
Fuel	2,708,250	360,000	4,229,250	7,297,500
At-sea monitoring	961,875	27,000	931,050	1,919,925
Offload Monitor	127,245	51,637	274,704	453,586
License / Co-management Fees	490,350	123,049	758,602	1,372,001
License / Quota lease	712,105	327,828	1,646,183	2,686,115
Ice	252,500	120,000	759,913	1,132,413
Gear Maintenance/replace	--	--	--	--
Total Fishery Specific Expenses	5,252,325	1,009,514	8,599,702	14,861,540
Net Revenue (Net Stock)	11,696,315	2,491,996	17,654,255	31,842,565
<b>Less:</b>				
Captain's Bonus	652,434	124,600	1,051,920	1,828,954
Deckhand Shares	5,189,542	996,798	7,893,075	14,079,415
Fishery Contribution (Boat Share)	5,854,339	1,370,598	8,709,259	15,934,196
Vessel Fixed Expenses				
Insurance	465,000	120,000	375,000	960,000
Repairs & Maintenance	3,300,000	600,000	3,525,000	7,425,000
Moorage	62,000	16,000	50,000	128,000
Miscellaneous	155,000	40,000	125,000	320,000
Total Vessel Expenses	3,982,000	776,000	4,075,000	8,833,000
Earnings (EBITDA)*	\$1,872,339	\$594,598	\$4,634,259	\$7,101,196

Source: Nelson, S. 2011.

\* EBITDA: Earnings before interest, taxes, depreciation, and amortization.

Table 9-33 BC Groundfish Program mean vessel costs and revenue under catch share program in 2009 (converted to 2020 US \$)

<b>Groundfish Trawl Fleet</b>	<b>Bottomfish Only</b>	<b>Hake Only</b>	<b>Bottomfish &amp;Hake</b>	<b>Fleet Total</b>
Number of Vessels	31	8	25	64
Landings (lbs.) – All Species	1,094,591	3,872,780	4,984,328	2,961,293
Vessel Price (per lb.)	\$0.43	\$0.10	\$0.18	\$0.21
Gross Revenue (Gross Stock)	\$468,030	\$376,350	\$891,237	\$621,590
Less: Fishery Specific Expenses (variable costs)				
Fuel	\$74,867	\$38,563	\$144,973	\$97,714
At-sea monitoring	\$26,590	\$2,892	\$31,915	\$25,708
Offload Monitor	\$3,518	\$5,531	\$9,416	\$6,074
License / Co--management Fees	\$13,555	\$13,181	\$26,004	\$18,371
License / Quota lease	\$19,685	\$35,117	\$56,429	\$35,967
Ice	\$6,980	\$12,854	\$26,049	\$15,163
Gear Maintenance/replace	\$0	\$0	\$0	\$0
Total Fishery Specific Expenses (non-crew variable costs)	\$145,195	\$108,140	\$294,785	\$198,997
Net Revenue minus non-crew variable costs	\$323,333	\$266,944	\$605,163	\$426,374
Less crew costs:				
Captain's Bonus	\$18,036	\$13,347	\$36,058	\$24,490
Deckhand Shares	\$143,460	\$106,778	\$270,563	\$188,524
Gross ex-vessel revenue less all variable costs	\$161,837	\$146,819	\$298,541	\$213,360
Vessel Fixed Expenses				
Insurance	\$12,854	\$12,854	\$12,854	\$12,854
Repairs & Maintenance	\$91,225	\$64,272	\$120,832	\$99,421
Moorage	\$1,714	\$1,714	\$1,714	\$1,714
Miscellaneous	\$4,285	\$4,285	\$4,285	\$4,285
Total Vessel Expenses (fixed costs)	\$110,078	\$83,126	\$139,685	\$118,274
Mean Earnings Per Vessel (EBITDA)*	\$51,759	\$63,694	\$158,856	\$95,085

Converted to 2020 \$ using: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810000501>

Converted to US dollars using an exchange rate of \$1.0 Canadian equals \$0.75 US dollar using:

<https://www.exchangerates.org.uk/CAD-USD-spot-exchange-rates-history-2020.html>

\* EBITDA: Earnings before interest, taxes, depreciation, and amortization.

Table 9-34 Percent of gross revenue by cost and earnings, 2009

Item	Bottomfish Only	Hake Only	Bottomfish and Hake	Fleet Total
Fuel	16.0%	10.3%	16.1%	15.6%
At-sea monitoring	5.7%	0.8%	3.5%	4.1%
Offload Monitor	0.8%	1.5%	1.0%	1.0%
License / Co-management Fees	2.9%	3.5%	2.9%	2.9%
License / Quota lease	4.2%	9.4%	6.3%	5.8%
Ice	1.5%	3.4%	2.9%	2.4%
Captain's Bonus	3.8%	3.6%	4.0%	3.9%
Deckhand Shares	30.6%	28.5%	30.1%	30.1%
Insurance	2.7%	3.4%	1.4%	2.1%
Repairs & Maintenance	19.5%	17.1%	13.4%	15.9%
Moorage	0.4%	0.5%	0.2%	0.3%
Miscellaneous	0.9%	1.1%	0.5%	0.7%
Earnings (EBITDA)*	11.0%	17.0%	17.7%	15.2%

\* EBITDA: Earnings before interest, taxes, depreciation, and amortization.



## 9.5 Program Elements Considered for Cost Savings

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Initial allocation components	No	Initial allocation of QS for species that are not overfished has been completed. The initial allocation structure defined eligible persons, recent participation requirements, issues relative to special situations, and appeals.	Necessary to determine who may harvest/process quota prior to any transfers of the initial allocation.	The West Coast Groundfish Catch Share Program used a combination of the buyback history and/or catch history to allocate QS among stakeholders. Other programs were based on catch history, processing history, and equal allocations of a portion of the available quota.	Initial allocation costs are no longer incurred by the fishing industry.	Initial allocation costs are no longer incurred by management agencies.
Annual quota allocations	No	Each year a QS holder must apply for QP that are allocated to a permit and assigned to a vessel before fishing is allowed.	Necessary to determine the persons eligible to be allocated quota pounds (QS holders in good standing) and how much quota they are allocated on an annual basis.	The application process varies by fishery, but all U.S. LAPPs, the NE sector program, and Canada's IVQ include an annual allocation of pounds for each allocated species to a permit, sector, vessel, or cooperative before vessels are allowed to harvest the quota	Trawl Groundfish Catch Share Program PRA submissions for QS permit renewals; QS percent transfers; QP transfers from a QS account to a vessel account; vessel account renewals; QP transfers from a vessel account to another vessel account; trawl identification of ownership interest forms for online QS and vessel account renewals; first receiver site license application forms (new applicants and re-registrations); and mothership permit renewal forms estimated total annual burden hours were 663 and the cost to the public was \$12,640.	Based on the 2021 cost recovery estimates, Permits and Monitoring costs for the Region were about \$63k. This is an over estimate of the costs only associated with issuing permits.

<b>Program Element</b>	<b>Opportunity for cost savings</b>	<b>Description</b>	<b>Purpose of Program Element</b>	<b>Comparisons to other programs</b>	<b>Industry Costs</b>	<b>Agency Costs</b>
Permit duration	No	The Council selected the option in 303A(f) of the MSA that allows permits to be issued for up to 10-years and renewed before the end of that period, unless it has been revoked, limited, or modified.	Regulations implemented determine how many years QS is allocated before the program's allocation must be renewed.	Most other programs in the U.S. follow the structure used for the West Coast Groundfish catch share program. One exception was the CGOA Rockfish Program and renewing the permits after 10-years was a costly 2-year process for the NPFMC, NMFS, and stakeholders.	The option selected by the Council allowed permits to be renewed in the most cost-effective way, since it reduces (or eliminated) potential controversial reallocation decisions.	The option selected by the Council to allow permits to be renewed is the most cost-effective manner for NOAA Fisheries and the Council.
Reallocations resulting from changes in overfished status	No	Widow rockfish: Amendment 20 allocated widow rockfish to permit holders. The allocation formula selected approximates the allocation formula used for species that were not overfished when the program was initially implemented. It includes an equal allocation component, allocations based on 1994-2002 widow rockfish landing history for non-whiting trips, and allocations proportional to individual whiting quota shares allocations. A moratorium on the trading of widow quota shares was in	All of the reallocation options were developed to provide guidance on how groundfish species will be allocated that were not included in the original program. Elements were defined to provide stakeholders with an understand of the Council's intent regarding future allocations of these species. These are statements of intent and does not bind future Council's to selecting the proposed allocation methods.	Species allocated under the Alaska LAPPs are not defined as overfished and this was not a component included in any of the programs. Overfished species yelloweye, Quillback, Copper, China and Tiger rockfish are not allocated as IVQ in the BC program. All proceeds resulting from landing these rockfish species are relinquished and the vessel fishing restrictions for IVQ overages do not apply. Allocation of these species, when rebuilt, are not defined in the 2023 Integrated Fisheries Management Plan. The NE Sector program not have similar regulations, but does allocate some overfished species to sectors.	Widow rockfish is considered rebuilt and has been allocated. There are no cost savings with allocating widow rockfish.	Widow rockfish is considered rebuilt and has been allocated. There are no cost savings with allocating widow rockfish.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
		place until the reallocation was implemented.				
	No	Other overfished/rebuilt stocks. Not currently allocated under the program.		Other programs typically do not predefine allocations or reallocations of species that were not initially allocated.	No cost savings relative to the status quo are expected for the industry, except possibly through lower cost recovery fees.	If the Council uses a predefined allocation formula it could reduce the cost of developing regulations to allocate the quota. The qualifying period may be less acceptable to stakeholders as it becomes more outdated. For overfished/rebuilt stocks a reallocation is not required but is a decision of the Council. The reallocation formula has been used for N and S lingcod in 2017. How controversial specific allocations/reallocations are and how stale the data are will likely impact whether the predetermined formula or some new formula is used for the
Reallocations resulting from changes in management area definitions	No	Area subdivision. Not reallocated to date				
		Areas Combined. Not reallocated to date				
		Area line moved. Not reallocated to date				

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
						allocation.
Reallocations when species groups are subdivided	No	Subdivide species groups. Defines how quota allocations will be calculated if species groups are subdivided in the future.			Costs could increase if reallocation is controversial, but no cost savings are expected relative to the status quo.	Changing the allocation would not reduce costs.
Adding "other fish" in the groundfish category to the program	No	Regulations currently state that the Council will use the original allocation formula based on catch history (1994-2003) to allocate QS, unless the Council determines another approach is preferred			No cost savings are expected. Limiting cost increases would depend on whether the Council used the original qualifying period and rules for the initial allocation. As the years pass it may be more likely the Council could use a more recent period of time to determine the allocation.	Changing the allocation by adding other fish to the program would not reduce agency costs.
Permit use requirements	No	In order to participate in the Shorebased IFQ Program, a vessel must be registered to an eligible limited entry trawl permit. A vessel account is established on request for an owner of a vessel registered to an eligible limited entry trawl permit in order to track QP and IBQ pounds.	Permit requirements determine the vessels that program provisions. Once that is established, all the program requirements apply to that vessel. A specific list of vessels included under the program help to minimize management and enforcement costs	All LAPPs assign a "person" a permit that grants exclusive to access a percentage of the species allocated under the program and determines the vessels/persons to whom the program provisions apply.	This is a necessary element of a LAPP and it is not expected that costs could be reduced by modifying the requirements.	NMFS has developed the programing and structure for allocating permits. Cost savings are not anticipated by changing the regulations, but regulatory changes could increase costs to implement those changes.

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Harvest overages (transfers)	Industry Yes: Agency: No	Sufficient QP or IBQ pounds must be transferred into the vessel account to cover the deficit (if $\leq 10\%$ overage limit) within 30 days of NMFS' issuance of QP or IBQ pounds to QS accounts in the following year or the date the deficit is documented (whichever is later) but not later than the end of the post-season transfer period. If the overage is greater than 10%, the overage must be covered within 30 days of the end of the fishing trip.	This element provides program participants some flexibility in covering harvest overages, but limits the extent and duration of overages that are allowed. It provides an incentive to not exceed an allocation by more than 10%.	Other catch share fisheries require that QS holders cover any overages prior to issuing QS the following year. The time period QS holders have to cover the overage is often the end of the fishing year, the end of the calendar year, or prior to issuing QS for the following year. The NE Sector program has a two-week period to cover sector overages.	The 30-day limit to cover an overage greater than 10% requires that a person find available quota within 30-days. Depending in the market for that species and the time of the year, it could limit the buyer's options and benefit quota sellers. Allowing a vessel operator to coverage harvest overages after the following year's QS has been issued increases the time harvesters have to acquire quota before they are subject to enforcement actions. Being able to access quota from two separate years may also provide the opportunity to acquire the needed quota at a better price.	Eliminating the overage provision may reduce agency some agency costs and increase others. Costs may be reduced if only one period of time for covering the overage was defined. For example, overages of more than 10% must be covered prior to being issued QP for the following year. However, changing the program structure would result in increased IT costs that could be passed on to industry and may negate any potential cost savings.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Harvest overages (prohibit fishing)	Industry Yes: Agency: No	Prohibit fishing if a negative QP balance for any species or species group. Enforcement of overage violations are a necessary part of any program.	Ensure that quota holders do not start a trip when they do not have quota available.	Most other catch share programs also require the permit holder to have quota prior to starting a fishing trip.	Requiring that a person have no negative balances before fishing may be challenging for species that have small annual allocations and are difficult to avoid catching. Stakeholders have developed risk pools to help address some of these issues. It is possible that industry could recommend other regulatory actions to help mitigate the risks and costs of overharvesting "choke" species. The likelihood of cost savings may be small.	Agency costs for monitoring overages and enforcing no fishing requirements are established and have been accounted for in the quota accounting system so changes in regulations are not expected to result in additional cost savings
Harvest overages (prohibit permit sales)	No	Prohibit sale or transfer of permit while it has an overage. Prohibiting the sale allows NOAA Fisheries to limit the value a person can generate from selling the permit while they are non-compliant with the program's regulations.	This provision eliminates the possibility of a person not covering an overage before they leave the fishery and ensures that people permit know that it is not subject to any overage enforcement actions.	Most other catch share programs also prohibit the sale of permits and quota of the person has an outstanding balance on their account. The permit is a tangible asset that has value that could be used to recover outstanding debt.	Any cost savings would only benefit persons that are non-compliant with the current regulations and would not benefit those in compliance unless they were able to purchase permits at a discount because of the liability attached.	Changing the provision would not reduce agency costs.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Overage/ Underage provision	Industry No: Agency Yes	The provision allows permit holders to carryover up to 10% of their annual allocation before adjustments (both overages and underages) to the following fishing year	Provide flexibility to stakeholders. They may recoup some value of fish that were underharvested the previous year or not be subject to enforcement actions that result from relatively small harvest overages.	AFA pollock & CGOA Rockfish programs only allow carryovers across seasons within a year, but not across years. NE sectors deduct overages from the following year and must stop fishing when the catch limit is reached. Canada's IVQ program has a 30% overage/underage provision for all species except offshore Pacific hake, Halibut bycatch, and Bocaccio rockfish that is set at 15%. There is a 15% underage provision for halibut but no halibut mortality overage provision. The AK halibut and sablefish program also includes a 10% overage and underage provision. The Amend. 80 fishery has "hard" caps that may not be exceeded during a year. The British Columbia Integrated Groundfish Program, catch accounting takes place upon the landing of a vessel and participants must account for any overages prior to engaging in any further fishing activity. In the CGOA Rockfish Program a person must have available quota to start a trip, but groundfish post-delivery transfers have until Dec 31. Halibut PSC cooperative quota is not available for transfer after Nov. 15, or after a cooperative termination of fishing declaration has been received by NMFS. Depending on when the overages must be covered it could result in quota holders manipulating the market, knowing that overages must be covered.	Industry benefits because it allows stakeholders greater flexibility to address small (less than 10%) harvest overages and allows a stakeholder to "bank" some quota if economic or harvest conditions result in underharvest during a year.	The overage/underage provision increases the cost to the agency to balance/adjust QP accounts on an annual basis. Eliminating the carryover could reduce agency costs, but would likely require adjustments to programing that has already been developed.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Transfers of QS and QP	No	QS may be transferred to eligible buyers that are under the excessive share caps. QP can only be transferred to and between vessel accounts. The program used to require transfers to a vessel account by September, but transferring QP to a vessel account by that date is no longer required.	A necessary element to define transfer rules to help determine eligible participants and if they are within program QS/QP caps.	To increase the efficiency, catch share programs generally allow transfers of long term and annual allocations within the excessive share cap rules. Regulations determine who may purchase and use the quota. For example, in the Halibut and Sablefish IFQ program a buyer must be able to document a 150 or more days of experience working as part of a harvesting crew in any U.S. commercial fishery to purchase QS, with limited exceptions. That experience must be documented on an "application for eligibility to receive QS/IFQ". In the Crab Rationalization program 3% of the quota was issued to captains to protect the interests of captains and crew members and can only be transferred to documented crew members.	There are no expected cost savings with modifying regulations since it has already been modified to be less restrictive and reduce industry costs.	There are no expected cost savings with modifying regulations.
QS and IBQ control	Industry Yes: Agency No	QS control is defined at 50 CFR 660.140(d)(4)(iii) and provides a detailed discussion of all methods of control.	Defining control of QS/QP is often complex but necessary to ensure that limits are adhered to as required under the MSA.	The MSA requires that LAPPs included excessive share limits. These limits are established based on the need for specific fisheries. The limits typically vary by the number of participants in the fishery and the objective of limiting or allowing consolidation in the harvesting and processing sectors.	Changing the share control limits could reduce costs to industry if they currently limit the efficient use of resources beyond that required to prevent excessive control of shares and reduce QS value by limiting the amount that larger entities may hold/control.	Agency cost are not expected to be reduced. The only potential exception would be if annual collections of ownership/control information is changed to only be required when the permit holder's ownership/control of QS/IBQ/QP changes



Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Accumulation limits IFQ	No	Accumulation limits uses a formula where QS and IBQ holdings are converted to pounds using the trawl portion of the 2010 OY as the baseline. The maximum number of QS and QPs an entity may control in the shorebased IFQ fishery and the maximum amount of QP in a vessel account (used and unused) are defined in regulation at 50 §CFR 660.111. These limits vary according to the stock or stock complex.	Defining accumulation limits is necessary to ensure that limits are adhered to as required under the MSA. Because of the different TAC levels for species and the need for some species as incidental catch these limits were established using a formula to create a common currency across species	The Canadian IVQ program uses a similar system to determine accumulation limits based on relative prices at time of initial allocation. Other programs do not use a weighted structure. Most other programs establish limits for individual species or species groups.	If accumulation limits are changed it would have agency costs that could be recovered and passed on to industry in years the program is under the 3% cost recovery limit.	If accumulation limits are changed it would have agency costs that could be recovered if under the 3% limit.
Accumulation limits mothership sector	No	The permit ownership limit is no more than 20% of the MS sector's allocation of Pacific whiting, as described at § 660.150(g)(3)(i). Catcher vessel usage limit is no more than 30% of the MS whiting allocation as described at § 660.150(g)(3)(ii).	Implemented to prevent stakeholders in the MS sector from accumulating an excessive share of the quota.	The Council already removed the 45% processing cap to provide greater flexibility for the sector participants.	No additional cost savings are anticipated.	If accumulation limits are changed it would have agency costs that could be recovered.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Catcher-processor accumulation limits	No	Catcher-processor sector accumulation limits will take effect in the event that the catcher-processor cooperative fails and converts to an IFQ-based fishery. Because of the structure of the catcher-processor sector and the fishery has a single cooperative, there are currently no accumulation limits for that sector.	All quota is allocated to a single entity that is managed by the small number of participants in the sector, so no accumulation limits were necessary.	For Bering Sea Aleutian Islands pollock §679.20(a)(5)(i)(A)( 6) establishes an excessive harvesting share limit equal to 17.5 percent of the sum of the non-Community Development Quota (CDQ) pollock directed fishing allowance (DFA). §679.20(a)(5)(i)(A)( 7) establishes an excessive processing share limit equal to 30 percent of the sum of the non-CDQ pollock DFAs.	Costs to the industry are not expected to change, because there is no limit currently in place for this sector and changes to regulations would not decrease costs.	The whiting fishery catcher-processor cooperative program has been successful and it not anticipated that the sector allocation will revert to an IFQ structure in the foreseeable future.
Monitoring	Yes	Shoreside CV: Requires 1 certified observer or EM	The purpose of all monitoring is to ensure that total catch of all allocated species is accounted for including accurate estimates of retained and discarded catch.	MSA 303A(c)(H) requires that any LAPP include an effective system for enforcement, monitoring, and management of the program, including the use of observers or EM systems. Coverage for catch based fisheries is typically set at 100% LAPPs (i.e., the West Coast Groundfish IFQ and cooperative programs). Landings based LAPPs like the Halibut and Sablefish IFQ program may not require 100% monitoring coverage (e.g., Halibut IFQ program in Alaska). A universal discard mortality rate of 16% is applied for discards in those LAPP fisheries <sup>1</sup> . The Alaska partial coverage fisheries under the federal observer program are required to pay an observer fee based on a percentage of	Industry CV monitoring costs from 2016 through 2020 ranged from \$1.3 million to \$1.9 million with an average annual cost of \$1.5 million IFQ fisheries observation science direct program costs for FY21 included in the cost recovery fee calculation for the IFQ sector as reported in the 2022 cost recovery report were \$480k. This figure represents 75% of the total NMFS costs for labor associated with observer program administration and training. NMFS deducts 25% of the total labor cost before including in the cost recovery fee calculation based on an assumption that the 20%-30% observer coverage rate realized before implementation of the catch share program would be in place today without the program.	NMFS incurs observer costs such as program administration, training, safety gear, and supplies. Agency costs not reimbursed by cost recovery include 25% of labor costs to account for coverage rates realized before the IFQ program was implemented (see explanation under industry costs), in addition to all costs for supplies, equipment, etc.
	Yes	At-sea CV: Requires 1 certified observer or EM				

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
	Yes	First receiver: Catch monitor available to monitor all catch share deliveries		ex-vessel value. This fee was authorized under regulatory Amendment 86 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area and Amendment 76 to the Fishery Management Plan for Groundfish of the Gulf of Alaska. The authority to collect the fee was granted specifically to the NPFMC by section 313 of the MSA. The NPFMC is considering a cost efficiencies review for monitoring that includes the use of Federal employees as observers. Currently fee collections to cover observer costs on the West Coast are not authorized in regulation. The NEFMC uses both observers and at-sea monitors (that do not have the same degree requirements as at-sea observers <sup>2</sup> and have different duties).	Industry first receiver shoreside monitoring costs from 2016 through 2020 ranged from \$130k to \$201k with an average of \$170k	NOAA Fisheries Catch Monitor Program coordinator will conduct a site inspection for each initial application, and at least once every three years for re-registrations. Approve catch monitoring plan as described at <a href="https://media.fisheries.noaa.gov/dam-migration/first_receiver_license_guidelines.pdf">https://media.fisheries.noaa.gov/dam-migration/first_receiver_license_guidelines.pdf</a>
	Yes	Motherships: Requires 2 certified observers			Industry mothership monitoring costs from 2016 through 2020 ranged from \$147k to \$267k with an average of \$227k. Cost recovery for fisheries observation science was \$37k in 2021.	Agency costs are covered through cost recovery.
	Yes	Catcher-processors: Requires 2 certified observers			Industry CP monitoring costs from 2016 through 2020 ranged from \$561k to \$765k with an average of \$657k.	Cost recovery fisheries observation science was very small (\$160) compared to IFQ.

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	Yes	Logbooks are an important tool to report discards and catch. EM is used to verify catch (landings and discards) reported by catcher vessels in logbooks.	EM allows the use of camaras to record catch and at-sea discards in place of an at-sea observer. EM is generally considered to be less invasive on the crew and the video can be reviewed to verify the accuracy of information reported in logbooks.	All other U.S. trawl LAPP programs require a vessel operator to submit a logbook. Logbook help verify reported catch and discards after deliveries are made and during enforcement boardings at-sea.	The movement to electronic logbooks has upfront costs, but are anticipated to result in cost savings in the longer-term. Washington and Oregon administer their logbook programs. California repealed the trawl logbook requirement in 2019. OMB number 0648-0782 Supporting Statement A estimated cost for 27 California trawl vessels completing logbooks was about \$29,500 annually. PRA estimates for Washington and Oregon vessel operators were not provided because they are operated by the states and not the federal government. EM is also considered to be a monitoring tool that could reduce costs as technology improves and becomes less costly.	The annual cost to the federal government is estimated to be about \$2,000/year to enter California logbooks into the database. This estimate excludes the cost of managing the data after it is entered into the database (OMB 0648-0782)
Landing hours (currently not a regulation - was discussed when program was implemented	No	Landing hour restrictions for CVs delivering to a shoreside processor.	This element was not included in the program, but could be considered if shoreside monitoring is too costly. This could also be addressed effectively by stakeholder communication with each other. As the regulations at 50 CFR 660.140(i)(1) state that "a catch monitor is required be present at each IFQ first receiver	Other LAPPs have either landing hours restrictions or landings notice requirements that allow shoreside monitors to be available if the delivery is selected for review. Other programs include a notice of delivery time so that a monitor can be provided if NMFS selected the delivery for observation.	At-sea monitoring costs could be increased if the landing cannot be made before mid-night and it requires an additional observer day. Cost savings can be realized by coordination between the plants and their delivery vessels if they do not need a catch monitor at the plant 24-hours a day.	Agency costs are not expected to be reduced by limiting delivery times in regulation, but could be notified by plant operators when deliveries are scheduled.

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			whenever an IFQ landing is received, unless the first receiver has been granted a written waiver from the catch monitor requirements by NMFS."			
Shoreside site license	No	Shoreside site license to accept IFQ deliveries	Used to define persons eligible to take deliveries of IFQ species.	First receivers of landings of catch shares are required to have a permit and meet certain requirements to facilitate shoreside monitors viewing and verifying catch and taking required samples of certain species.	There is a cost for the permit application and any structural changes to the offload operation that is required to allow deliveries to be monitored.	Defines the first receivers that are eligible to take harvests deducted from QP. This reduces the costs of monitoring additional first receivers that are not eligible to take QP deliveries because they have not applied and met the site license requirements. Enforcement costs are also reduced because only licensed sites must be monitored.

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Vessel Monitoring System (VMS)	Industry Yes: Agency No	<p>The vessel owner must install and use (according to NMFS OLE installation and operation instructions) an approved VMS transceiver unit 24 hours per day; establish a service agreement with a type-approved communication service provider; send an activation report at least 72 hours prior to leaving port on the first trip that requires VMS and maintain a valid declaration report with NMFS OLE.</p> <p>Declaration reports must be submitted before a vessel leaves port on the first trip in which the vessel is required to have VMS. A new declaration report must be submitted before leaving port on a trip in which a different gear type will be used. Tribal trawl vessels must submit a declaration report before the first trip in which the vessel is used to fish in the</p>	Provides management and enforcement agencies the ability to track the time, location, and speed of vessels. That information can be used validate fishing locations and whether a vessel is fishing, moored, or steaming. That information is useful for managing areas that are closed to fishing or using certain types of gear.	Vessels fishing a trip on which NE multispecies are landed are required to declare their intent to fish in one or more broad stock areas via VMS prior to each trip. The VTR serial number will be used to link VTRs with dealer reports and VMS data to increase the accuracy of data used for monitoring catch. VMS in Alaska is required for some fisheries, but there are not requirements to notify the agencies of changes to their fishing activities (declarations) during a trip (50 CFR 679.28(f)).	<p>Could reduce costs if some declarations that may be unnecessary for the shorebased IFQ program were removed. Declarations include participating in the limited entry groundfish non-trawl, Shorebased IFQ Program, limited entry midwater trawl, non-whiting Shorebased IFQ Program, Limited entry midwater trawl, Pacific whiting Shorebased IFQ Program, limited entry bottom trawl, Shorebased IFQ Program, not including demersal trawl, limited entry demersal trawl, Shorebased IFQ Program.</p> <p>The actual reductions in cost (\$) are likely small, but the main concern was the time burden associated with coordination vessel operator and NMFS to ensure compliance with the regulations.</p> <p>At-sea whiting declarations include limited entry midwater trawl, Pacific whiting catcher/processor sector, limited entry midwater trawl, Pacific whiting mothership sector (catcher vessel or mothership).</p>	None of the changes would reduce agency costs and to the extent they may increase enforcement costs they could be passed on to industry through cost recovery fees.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
		<p>trawl RCA. Limited entry (LE) trawl vessels fishing in the Shorebased IFQ Program must provide NMFS OLE with a new declaration report each time a different groundfish trawl gear (bottom or midwater only) of groundfish trawl gear is fished. The declaration may be made from sea and must be made to NMFS before a different type (bottom or midwater only) of groundfish gear is fished. LE midwater trawl vessels targeting Pacific whiting may change their declarations while at sea between the Pacific whiting shorebased IFQ sector and the mothership sector. The declaration must be made to NMFS before a different sector is fished.</p>				

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Socio-economic data collection and research costs	Yes	Operators or catcher vessels, motherships, catcher-processors, and first receivers must annual complete and submit economic data collection surveys. These forms are periodically revised when it is determined that specific information does not provides value greater than the cost of collecting the information.	Socio-economic data collections allow managers, policy makers, scientists, stakeholders, and the general public to better understand the social and economic impacts of the catch share programs on harvesters, processors, communities, and the Nation.	Data collections vary greatly by fishery with some fisheries having no economic data collections, some collecting specific elements that are of interest to the Council/NMFS and others that have very detailed data collections.	Based on the PRA analysis ( <a href="https://omb.report/icr/202102-0648-005/doc/https://omb.report/icr/202102-0648-005/doc/109653800">https://omb.report/icr/202102-0648-005/doc/https://omb.report/icr/202102-0648-005/doc/109653800</a> ), the estimated number of respondents was 339; the estimated time per response was 8 hours for catcher processors, catcher vessels, and motherships, 1 hour for quota share permit owners, and 20 hours for first receivers and shorebased processors. The estimated total annual burden hours were 2,195 and the estimated total annual public recordkeeping/reporting cost was \$106k. These costs are in addition to the cost recovery fees to support the data collection, storage, and analysis shown in agency costs. These costs have declined over time.	For 2022, the Economic and Social Science cost recovery estimates for IFQ was \$234k, CP \$6k, and MS \$10k. These costs are passed on to industry when the cost recovery fee is less than 3% of ex-vessel value that year.
Socio-economic data reporting tools	Yes	NMFS provides access to non-confidential summaries of survey data through reporting tools (FISHEyE)	Provides a relatively easy way for stakeholders and the public to access non-confidential data collected through the various data collection instruments.	Reporting tools vary by fishery. Some information is included in the Economic SAFE documents in the North Pacific. Often information is included in the program reviews. NMFS has also developed websites (e.g., FISHEyE) to provide non-confidential summaries of the data. Not all LAPPs collect these types of data on an annual basis.		



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Cooperative reports	Industry Yes: Agency No	The mothership cooperative report requirements are listed at 50 CFR 660.113(c)(3) and the catcher-processor requirements at 50 CFR 660.113(d)(3). In general, the reports must include the cooperative's allocation, actual retained and discarded catch certain allocated species on a vessel-by-vessel basis, methods used by the cooperative to monitor performance, and a description of any actions taken by the cooperative against member vessels, and for the current year - the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements within the cooperative.	Annual reports from the MS and CP are required to help the Council determine if the program is functioning well or if there are areas of concern the Council may consider addressing. The current information required in	Cooperative reports are required from all AFA cooperatives, Rockfish Program cooperatives, Amendment 80 cooperatives.	The Council has already eliminated the required filing of preliminary cooperative report that had been due in November. Cooperative managers have developed a template for providing the required information. Removing some of the requirements could slightly reduce costs. Changes to the reporting requirements that increase the information submitted would increase costs of generating the reports. If the information required is limited to that needed by the Council and not collected through another source, costs may be further reduced.	These reports are submitted to the Council and changing the reports would not impact agency costs.
Cost recovery fee	Yes	Section 303A(e) of the MSA requires that a Council (1) develop a methodology and the means to identify and	To allow agency to recover certain costs that are directly attributable to the catch share	NE Sectors are not LAPPs and not subject to cost recovery. LAPP regulations and the associated costs vary by fishery, with halibut and sablefish IFQ fee being 1.9% of ex-	The estimates used to determine the 2023 cost recovery fee were about \$1.7 million for IFQ, \$36k for CP, and \$128k for MS. These estimates were determined to result in a 3.0% for IFQ,	Agency cost savings only occur when recoverable costs exceed the 3% ex-vessel limit.

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
		<p>assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and (2) provide, under section 304(d)(2), for a program of fees paid by limited access privilege holders that will cover the costs of management, data collection and analysis, and enforcement activities. The Council could consider whether the methodologies currently employed meet its management, data collection and analysis, and enforcement objectives. And explore if there are alternatives that are less costly to achieve the original or updated objectives.</p>	<p>program. The regulations define who must pay the fee, how it will be collected, when it is due, and penalties for late fee payment.</p>	<p>vessel value in 2022 (but was 2.3%, 3%, 3%, and 2.8% in 2021 through 2018, respectively. For 2022, non-pollock CPs in Alaska paid 0.87%, AFA pollock inshore paid 0.32% and community development quota holders paid 0.85% of ex-vessel value. The Gulf of Mexico Snapper and Grouper fishery is set at 3%. A summary of the Grouper-Tilefish annual report summarizing the fishery cost recovery is provided at (<a href="https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf">https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf</a>) and the Snapper fishery at (<a href="https://gulfcouncil.org/wp-content/uploads/B-4d-2021_RS_AnnualReport_SEROFinal.pdf">https://gulfcouncil.org/wp-content/uploads/B-4d-2021_RS_AnnualReport_SEROFinal.pdf</a>). A summary of both fisheries IFQ review is at (<a href="https://gulfcouncil.org/wp-content/uploads/B-4c-Background_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508-1.pdf">https://gulfcouncil.org/wp-content/uploads/B-4c-Background_Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508-1.pdf</a>). The South Atlantic wreckfish ITQ program cost recovery program is still in the process of being implemented (<a href="https://safmc.net/documents/sg_al_a_amendment48decisiondocument-pdf/">https://safmc.net/documents/sg_al_a_amendment48decisiondocument-pdf/</a>).</p>	<p>1.7% for the mothership cooperatives, and 0.1% for the catcher-processor cooperative.</p>	<p>For 2023 the IFQ cost recovery fee was set at 3% and costs were calculated to be 3.5% of ex-vessel value (<a href="https://www.federalregister.gov/documents/2022/12/12/2022-26923/fisheries-off-west-coast-states-pacific-coast-groundfish-fishery-trawl-rationalization-program-2023">https://www.federalregister.gov/documents/2022/12/12/2022-26923/fisheries-off-west-coast-states-pacific-coast-groundfish-fishery-trawl-rationalization-program-2023</a>). This has only ever been realized in the IFQ fishery as the MS and CP fisheries have always been well below the 3% limit.</p>

Program Element	Opportunity for cost savings	Description	Purpose of Program Element	Comparisons to other programs	Industry Costs	Agency Costs
Additional fees	Agency Yes: Industry No	The Council has the authority to recommend the collection of additional fees to cover certain costs (e.g., EM data review costs). These fees are not currently collected, but they could be as the Council continues to develop EM options or other aspects of the program. This issue was also discussed under the monitoring issues.	Define how certain fees that may be collected, will be collected and the any penalties of not paying the fee or late fee payment.	Policy makers in the North Pacific are considering implementing a video review monitoring fee to cover additional costs associated with EM	To the extent additional fees are charged in the future they would be in addition to any observer, cost recovery, and other costs directly borne by industry.	The additional fees would reduce monitoring costs associated with video review contracts that the agency has with PSMFC.
MSA required program and allocation reviews	Agency Yes: Industry Yes	A LAPP Program Review is required every 7-years after the initial review under the MSA. A Program Review is typically a fairly detailed review of the LAPP. In addition, NOAA issued Fisheries Allocation Policy Directive 01-119 established an allocation review process. It is a tool for addressing stock specific allocation reviews.	To provide the regularly scheduled, detailed review of the catch share program. The reviews update how well programs are meeting their stated objectives and whether any changes to the programs might be considered.	MSA requirements apply to all U.S. catch share programs. The NPFMC is considering methods to streamline the process because of the time and resources involved in completing all the reviews. The report to the Council is available at <a href="https://meetings.npfmc.org/CommentReview/DownloadFile?p=44cfcc5b-8999-4c82-a384-c4d8bdcfc3ab.pdf&amp;fileName=PPT%20E%20Allocation%20Review%20Approach.pdf">https://meetings.npfmc.org/CommentReview/DownloadFile?p=44cfcc5b-8999-4c82-a384-c4d8bdcfc3ab.pdf&amp;fileName=PPT%20E%20Allocation%20Review%20Approach.pdf</a> . Catch share reviews for other fisheries are cited as part of this paper.	Industry members are typically very involved in helping develop the scope and reviewing the findings of program reviews. To the extent the process can be standardized and streamlined it could reduce costs of attending meetings and reviewing document contents.	Program reviews are generally very time consuming for NOAA Fisheries and Council staff. Stakeholders also incur time costs reviewing and providing input on the contents of the reviews. Streamlining and standardizing the review process to the extent practicable could reduce costs.

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Adaptive management	No	10% of the IFQ quota is held by NMFS to be used to address problems associated with the fishery. Currently all QS is passed through to QS holders in proportion to their allocation.	Puts quota aside in a “public trust pool” in case it is needed to address problems caused by the program. Adaptive management shares could be used to support community and processor stability, conservation, new entry, or to compensate for unintended consequences. This program has not yet been used.	Other catch share programs in the U.S. have set-asides to benefit specific groups or communities. The structure of these set-asides is typically defined in regulation.	Because the adaptive management apportionment has been passed back to QS holders, it has not increased costs. To the extent the Council takes action in the future to use the quota to address issues in the fishery it could result in increased costs to stakeholders that historically received the passthrough.	To the extent the Council takes action in the future to use the quota to address issues in the fishery it could result in increased costs to NOAA Fisheries and the Council to develop and enforce are regulations.
Mandatory discards of halibut	No	Halibut bycatch may not be retained and sold. Similar provisions are in place in BC and Alaska catch share programs that have halibut bycatch.	Reduce the incentives to catch halibut	Mandatory discards of halibut in groundfish catch share programs are the norm. Discussions of allowing halibut retention have been considered, but have never been implemented.	Avoiding halibut can be costly in terms of costs incurred and lost revenue. Discarding halibut does not generate revenue and leasing/purchasing quota can be expensive.	No reduction in agency costs is anticipated.

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Change season dates	Industry Yes: Agency No	The Council has adjusted the primary Pacific whiting season start date for all sectors of the Pacific whiting fishery from May 15 to May 1.	To create efficiencies in the program when the benefits outweigh any negative impacts of changing the time of year fishing is allowed.	Catch share programs provide the opportunity for vessels to fish when catch rates are higher, bycatch is lower, or there are fewer conflicts with other fisheries. Changing season dates can, in some cases, provide the flexibility necessary to achieve those objectives. For example, it allowed the CGOA Rockfish program to begin earlier to reduce halibut bycatch. The Alaska halibut IFQ program allowed season dates to change from a few days to about 10 months.	Longer seasons do not necessarily mean greater costs to stakeholders. The flexibility provided by catch share programs allow harvesters to consolidate quota harvests on fewer vessels and to prosecute their catch share fisheries harvests around other fisheries may result in cost savings. Limits on harvest of other fisheries may be needed to protect those participants if changing season lengths provide opportunities to increase participation in those fisheries.	Changing season lengths are not expected reduce agency costs by a significant amount. Longer seasons could result in small increases in monitoring and days-at-sea enforcement costs to account for the additional days.
Mothership and catcher-processors activity in same year	No	This action has already been taken by the Council and allowed a vessel to operate as a MS and CP in the same year.	Improved efficiency by allowing a vessel that has the capacity to both harvest and process fish to do both in the same year.	This requirement varies by catch share program. Non-pollock trawl catcher-processors are allowed to act as a mothership and catcher-processor in the same year. Limits were placed on the amount of certain species that could be received from catcher vessels. The AFA pollock fishery is structured like the West Coast whiting fishery where separate and non-transferrable allocations are made to the two sectors.	The cost savings of providing the fleet greater flexibility have been realized.	No agency cost savings are anticipated.

Vessel Buyback	No	Is not part of the catch share program. Aided its development but is an issue of concern to stakeholders. Industry economists generally found that it benefited participants that stayed in the fishery, but those currently paying the fees may be different from the primary beneficiaries of the buyback. In the groundfish fishery the 2003 buyback permanently removed 91 vessels and 239 fishing permits from the Pacc groundfish trawl fishery and associated Dunge crab and pink shrimp fishery. Was financed with \$10 million in public funding and a \$36 million loan to be repaid over 30 years by fees on landings. Section 600.1013(b) directs NMFS to recalculate the fee rate to ensure repayment within the specified 30-year term. The original fee percentage was 5.0% but was reduced to 4.5% in 2018, 4.0% in 2019, & to its current level of 3.5% starting in 2020.	N/A in terms of program elements. Helped to facilitate implementation of the IFQ program.	The AFA pollock fishery and crab fisheries in Alaska included a buyback program.	Repayment of loan at a rate of 3.5% of ex-vessel value of IFQ landings (currently)	Collecting payments, producing reports and notices, database development, and other tasks.
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