

Discussion Paper:

Full Retention of Rockfish for Fixed Gear Catcher Vessels

December 2017¹

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1 Introduction

In October 2016, the Council requested staff develop a discussion paper to consider requiring full retention of all rockfish species for fixed-gear catcher vessels. Some of the primary reasons the Council is considering full retention of rockfish species include:

- Provides benefit to vessel operators, by alleviating their responsibility for identifying and retaining only certain hard-to-differentiate rockfish species as specific data quality concerns arise.
- Improves data collection on the incidental catch of rockfish in the fixed gear fisheries, resulting in more accurate estimation of rockfish fishing mortality and improved rockfish stock assessments.
- Avoids increasing incentives either to target rockfish or to discard rockfish in excess of the amount that can legally be sold for profit.
- Reduces waste, if the retained rockfish are donated or otherwise used instead of discarded.

This discussion paper originated with the Council’s fixed gear electronic monitoring (EM) integration analysis in October 2016. In the EM integration analysis initial review draft, the Council had evaluated an option that would have required full retention of all rockfish species *by vessels using EM*. The option was intended to facilitate identification of certain rockfish species pairs that cannot be distinguished by cameras, and full retention was proposed in order to implement a simple and consistent policy for all rockfish, rather than requiring fishermen to identify and remember which rockfish species must be retained and which must be discarded. In the end, the Council did not include this option as part of their preferred alternative for EM. Rather, the Council tasked staff to develop a discussion paper to evaluate full rockfish retention to all fixed-gear vessels, rather than limiting full retention of rockfish to fixed-gear

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vessels using EM. Industry representatives on the EM Workgroup supported extending the full rockfish retention requirement because it would result in a consistent regulation for rockfish retention across all regulatory areas and species, and would apply regardless of whether a vessel is using EM.

This document addresses the Council's request by providing background on current rockfish management by fixed-gear catcher vessels, a brief description of the benefits of full retention, and challenges of a full rockfish retention. For purposes of this paper, we have defined fixed gear as including hook-and-line, pot and jig gear. Limited rockfish incidental catch occurs with pot vessels and there are no data for jig gear, therefore this discussion paper focuses on hook-and-line gear. Additionally, we defined rockfish as including all *Sebastes* and *Sebastolobus* species, thus including thornyheads.

2 Background Section on Rockfish Management by Fixed-gear Catcher Vessels

This section of the discussion paper provides background information concerning full retention of rockfish. Many rockfish species are challenging to manage because they are commonly caught as incidental species, have low acceptable biological catch (ABC) amounts, have several area breakouts in the Gulf of Alaska (GOA), and have higher variance of at-sea discards estimates from observed discard rates on smaller hook-and-line vessels. NMFS closes directed fishing to most rockfish species at the beginning of the year because the total allowable catch (TAC) does not support directed fishing. Once a TAC is reached, NMFS prohibits retention of the species, which removes financial incentives to catch a species.

The section includes information on maximum retainable harvest (MRA) which is used to regulate the catch of species closed to directed fishing like many of the rockfish fisheries. This section also provides information on the demersal shelf rockfish (DSR) full retention regulations that were approved by the Council and implemented by NMFS in 2005. The DSR full retention requirement provides invaluable experience to the Council on the benefits and challenges associated with a full rockfish retention requirement for fixed gear catcher vessels in the GOA and Bering Sea and Aleutian Islands (BSAI). Finally, the section includes information on incidental harvest of rockfish by gear in the GOA and BSAI, which is important since it provides an indication of potential amounts of rockfish that would have to be retained under a full retention requirement.

2.1 Maximum Retainable Amount Regulations

MRAs are the primary tool NMFS uses to regulate the catch of species closed to direct fishing. NMFS closes directed fishing to avoid reaching a TAC, reaching an amount or percentage of groundfish TAC included in the annual harvest specifications for a gear and species or species group, or when a directed fishery has attained a prohibited species catch (PSC) limit (e.g., halibut PSC limits). When NMFS prohibits directed fishing for a groundfish species, retention of the catch of that species is allowed up to an MRA.

The MRA tables show retainable proportions of incidental catch species, relative to basis species open to directed fishing. The MRA table is a matrix of proportions representing a range of rates of expected or accepted incidental catch of species closed to direct fishing, relative to target species. As a management tool, MRAs rely on the ability of the vessel operator to selectively catch groundfish species. The species open for a directed fishery are called the basis species in the MRA regulations. Groundfish species not open for a directed fishery is the incidental catch species. The MRA percentages are intended to slow the rate of harvest of a species when insufficient TAC amounts are available to support a directed fishery.

MRA regulations at § 679.20(e) establish the calculation method and set individual MRAs for groundfish species or species groups, when directed fishing for that species is closed. The MRA is calculated as a percentage of the retained amount of a species closed to direct fishing, relative to the retained amount of basis species or basis species groups open for directed fishing. Amounts that are caught in excess of the MRA percentage must be discarded. Table 1 shows the rockfish MRAs in the BSAI and GOA for the fixed-gear fisheries.

Table 1 Rockfish MRAs for fixed-gear fisheries in the BSAI and GOA

Basis Species	BSAI		GOA	
	Shortraker/rougheye	Aggregated rockfish ²	Shortraker/rougheye	Aggregated rockfish ³
Pacific cod	2	5	*	5
Sablefish	7	15	7	15
Aggregated non-groundfish species ¹	2	5	*	5

Source: Tables 10 and 11 to Part 679 – GOA and BSAI Retainable Percentages

¹All legally retained species of fish and shellfish including CDQ halibut and IFQ halibut that are not listed as FMP groundfish.

²Aggregated rockfish in BSAI includes all “rockfish” as defined at § 679.2, except shortraker and rougheye rockfish

³Aggregated rockfish in GOA (see § 679.2) means any species of the genera *Sebastes* or *Sebastolobus* except *Sebastes ciliatus* (dark rockfish), *Sebastes melanops* (black rockfish), and *Sebastes mystinus* (blue rockfish), except in: SEO District where DSR is a separate species group for those species marked with an MRA; Eastern Regulatory Area where shortraker and rougheye is a separate species group for those species marked with an MRA.

*Where an MRA is not indicated, use the MRA for shortraker/rougheye included under Aggregated rockfish.

When NMFS prohibits directed fishing for a groundfish species, MRAs buffer the amount of catch of that species occurring in directed groundfish fisheries that remain open. Ideally, the application of an MRA slows catch of a species, so that harvest can be managed up to the TAC by the end of the year. Beyond management of a TAC to obtain optimum yield, MRA calculations perform two additional functions. First, MRAs limit retention to a species’ expected or accepted incidental catch rate. Second, the MRA functions as a trip limit for retention of incidental catch of a species. This function allows for limited targeting of a species up to the MRA (“topping off”).

“Topping off” works in this way: the MRA tables assign an MRA percentage for species not open for directed fishing to each species open to directed fishing. If a vessel does not catch its MRA while fishing for a species open for directed fishing before the end of a fishing trip the vessel may be able to make some target sets on the incidental catch species and still not exceed its MRA.

For several incidental catch/basis species combinations, the use of low MRAs may reduce the incentive for “topping off” (i.e., deliberately targeting species closed to directed fishing) that would occur in the absence of the MRA. In other cases, the MRAs represent the expected catch of an incidental catch species; absent any deliberate action by the vessel operator to target or avoid that incidental catch species (i.e., the natural rate of incidental catch).

2.2 Demersal Shelf Rockfish Full Retention

Starting in 2005, operators of a federally permitted catcher vessel using hook-and-line or jig gear in the SEO of the GOA were required to retain and land all DSR caught while fishing for groundfish or for Pacific halibut under the Individual Fishing Quota (IFQ) program. DSR is an assemblage of seven

rockfish species² managed under the Gulf of Alaska Groundfish Fisheries Management Plan (FMP). The Council's objective in requiring full retention of DSR by fixed-gear catcher vessels fishing in the SEO included:

- To improve data collection on the incidental catch of DSR in the halibut and groundfish hook-and-line fisheries in the SEO in order to more accurately estimate DSR fishing mortality, improve DSR stock assessments, and evaluate whether current maximum retainable amounts (MRAs) are the appropriate levels for DSR in the SEO
- To minimize waste to the extent practicable
- To avoid either increasing incentives to target on DSR or increasing incentives to discard DSR that is caught in excess of the amount that can legally be sold for profit
- To maintain a consistent approach within State and Federal regulations that governs the retention and disposition of DSR.

The FMP delegates to the State of Alaska (State) some management responsibility for the DSR fishery in the Southeast Outside District (SEO) of the Eastern GOA, subject to Council and federal oversight. The Council and NMFS establish the annual total allowable catch (TAC) for DSR (see §679.20), regulate the catch of prohibited species in the DSR directed fishery (see §679.21), set recordkeeping and reporting requirements (see §679.5), and impose a maximum retainable amount requirement for DSR caught incidentally in Federal fisheries (see §679.20(d) and(e); Table 10 to Part 679). Existing State regulations for DSR establish fishing seasons (5 AAC 28.130) and gear restrictions (5 ACC 28.130), set guideline harvest levels for directed DSR fishing based on the federal TAC (5 ACC 28.160), and limit the amount of DSR that can be retained as bait (5 AAC 28.190). The State has a full retention requirement for DSR caught in State waters (5 AAC 28.171).

The only exception to the full retention requirement for DSR is when on PSC status. If NMFS were to put DSR on PSC status, regulations require that DSR must be discarded. If the Council develops a proposed action to require full retention of rockfish for fixed-gear catcher vessels in the future, the Council might consider including a change to the management of DSR so when on PSC status full retention is still required. The benefits of full retention of DSR when on PSC status are comparable to the benefits outlined in Section 1.

For species with full retention requirements, like DSR, the MRA is the percent of retained species that can enter commerce. Anything over the MRA for a full retention species is prohibited from entering commerce and is referred to as an overage. For example, an individual is limited to selling an amount of retained DSR that is no more than 10 percent of the aggregate round weight equivalent of IFQ halibut and groundfish, other than IFQ sablefish, that is retained onboard the vessel. For IFQ sablefish, an individual is limited to selling an amount of retained DSR that is no more than 1 percent of the aggregate round weight equivalent of IFQ sablefish that is retained onboard the vessel. Amounts of DSR in excess of the sale limits are prohibited from entering commerce through sale, barter, or trade, although when a vessel lands DSR in excess of the MRA limits, the fish is either used for personal consumption, donated, or is discarded at the processor.

² Canary rockfish (*Sebastes pinniger*), China rockfish (*S. nebulosus*), copper rockfish (*S. caurinus*), quillback rockfish (*S. maliger*), rosethorn rockfish (*S. helvomaculatus*), tiger rockfish (*S. nigrocinctus*), and yelloweye rockfish (*S. ruberrimus*).

NOAA Office of Law Enforcement (OLE) receives notification of numerous DSR overages throughout the year. For a DSR overage, OLE verifies the product has not entered commerce through voluntary reporting and eLandings. As long as the DSR overage has not entered commerce, OLE does not investigate it any further. Most of the time, the OLE investigation can be completed with one phone call to verify the overage did not enter commerce. This is not a burdensome task, and OLE are freed up to work other investigations. OLE has had at least 3 cases in 2017, where the buyer/processor purchased DSR in excess of the MRA.

2.3 State of Alaska Rockfish Retention Requirements

In addition to DSR full retention requirements, the State of Alaska has full rockfish retention requirements that differ depending on the area. In the Westward Region, which equates to all Federal management areas west of Kodiak, all rockfish retention requirements mirror federal MRAs. This is done through the global emergency order each year to ensure there are not different regulations for rockfish retention during state fisheries/parallel fisheries.

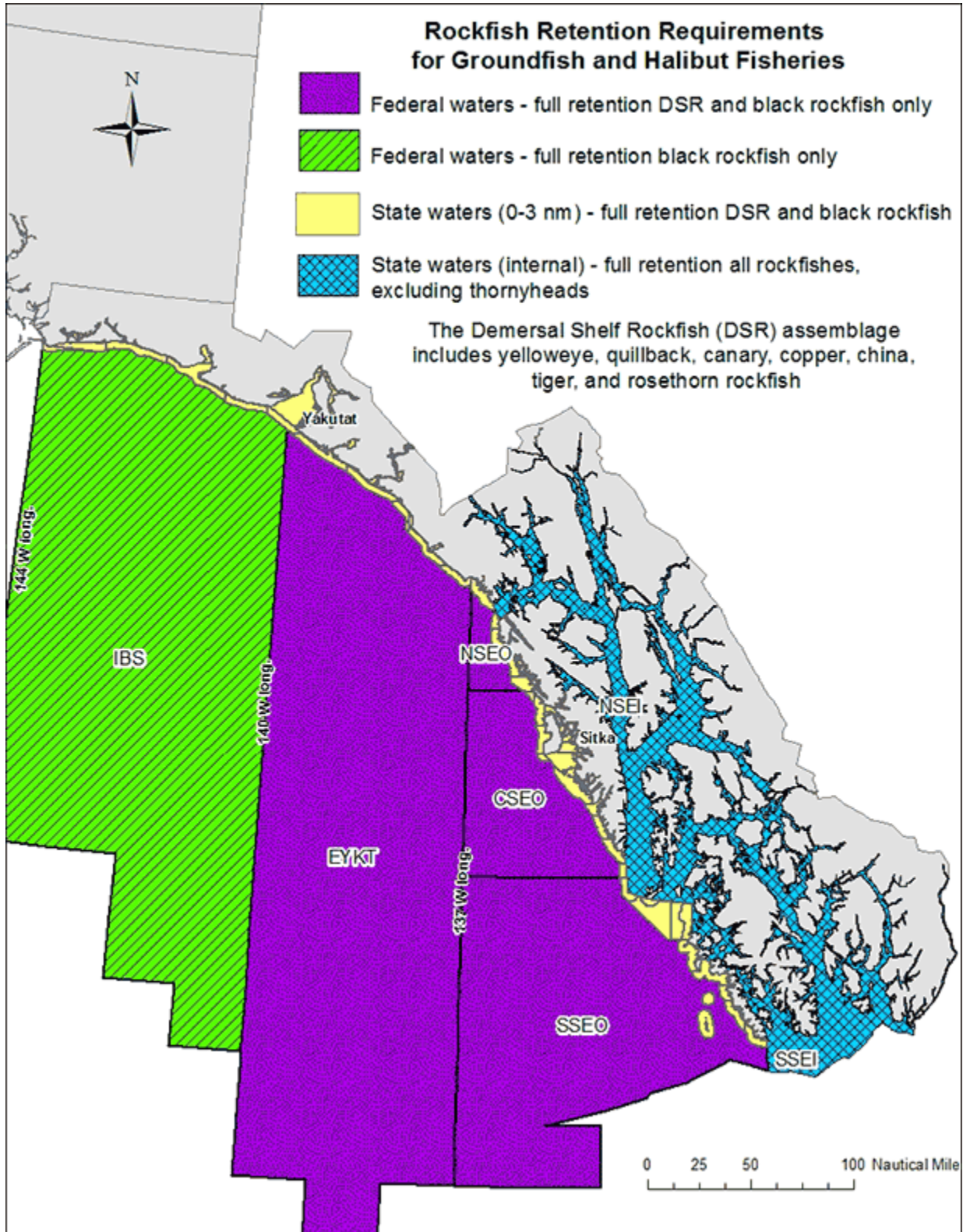
In Prince William Sound (PWS) /Cook-Inlet area, retention requirements for rockfish are different. In state waters of the PWS and Cook Inlet Areas (latitude of Cape Douglas east to longitude of Cape Suckling), ADF&G requires full retention of all rockfish due to their high discard mortality rate.

In the Southeast and Yakutat area, retention requirements for rockfish are also different (see Figure 1). In state waters (internal), full retention is required of all rockfish (excluding thornyheads) for vessels fishing for groundfish or halibut. In state waters (0-3 nm) and in federal waters east of 140° W. longitude, vessels fishing for groundfish and halibut are required to retain all DSR.

In the Icy Bay Subdistrict (140° to 144° W. long.) (labeled IBS on Figure 1) full retention of DSR is required in state waters but is not a requirement for federal waters. Full retention of black rockfish is required in the 0-3 nm section as well as in federal waters for vessels fishing for groundfish or halibut. There are no groundfish full-retention requirements in the salmon troll fishery.

As described in the previous section, IFQ permit holders may sell up to 10% DSR, by weight based on the round weight of basis species, except that sablefish permit holders are restricted to 1%. DSR overages from federal waters must be retained for personal use or donated but may not be sold. DSR overages from state waters are forfeited to the State and no enforcement action is pursued. ADF&G does allow permit holders to retain state DSR bycatch overage for personal use, but all overages must be reported on the fish ticket.

Figure 1 Rockfish retention requirements for groundfish and halibut fisheries in Southeast Alaska and Yakutat commercial fisheries



Note: IBS = Icy Bay Subdistrict, EYKT= East Yakutat, SSEO = Southern Southeast Outside, CSEO = Central Southeast Outside, NSEO = Northern Southeast Outside, NSEI = Northern Southeast Inside, SSEI = Southern Southeast Inside.

2.4 Incidental Harvest of Rockfish

Incidental catch of rockfish occur in most groundfish fisheries off Alaska. Incidental catch of rockfish is highest in hook-and-line catcher vessel fisheries in the GOA. Other fixed gear catcher vessels with incidental catch of rockfish include pot and jig. Of the hook-and-line catcher vessel fisheries, the IFQ sablefish fishery in the GOA has the highest incidental catch followed by the hook-and-line halibut fishery in the GOA. Provided below are tables showing incidental catch amounts and incidental catch rates for hook-and-line and pot gears in the GOA and BSAI. The next set of tables show incidental catch amounts and incidental catch rates for the IFQ sablefish, IFQ halibut, and Pacific cod target fisheries for hook-and-line catcher vessels in the GOA and BSAI. The final table shows retention rates of rockfish by hook-and-line catcher vessel sector by target fisheries.

2.4.1 Catch by Gear and Area

Table 2 and Table 3 show the incidental catch and the percentage of total catch that is rockfish by gear type in the GOA and the BSAI. The calculation of the rates is the amount of total rockfish divided by the total retained groundfish in each gear type and FMP area. These data are limited to catcher vessels delivering shoreside and do not include State fisheries or trips that were identified as directed fishing for rockfish.

Table 2 Rockfish incidental catch and incidental catch rates by gear type in the Gulf of Alaska

Year	Hook-and-line		Pot	
	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)
2013	1,792	6.03	8	0.04
2014	1,313	5.2	9	0.05
2015	1,337	5.53	9	0.04
2016	1,270	6.49	19	0.1
2017	1,051	5.9	49	0.39

Source: NMFS

Table 3 Rockfish incidental catch and incidental catch rates by gear type in the Bering Sea and Aleutian Islands

Year	Hook-and-line		Pot	
	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)
2013	120	3.11	7	0.03
2014	189	4.22	4	0.02
2015	75	2.53	3	0.01
2016	66	2.95	3	0.01
2017	63	2.93	1	0

Source: NMFS

Given the limited incidental rockfish catch that occurs with pot vessels (see Table 2 and Table 3) and the lack of data for jig gear, the remainder of this discussion paper focuses on hook-and-line gear.

Table 4 and Table 5 show the incidental catch and the incidental catch rate of rockfish in the primary hook-and-line targets: IFQ halibut, IFQ sablefish, and Pacific cod. The rates are calculated using the same methods as above.

The rate of incidental catch of rockfish varies depending on the target fishery. The incidental catch of rockfish is highest in the hook-and-line sablefish fishery, followed by the hook-and-line halibut fishery. The high incidental catch of rockfish in the IFQ sablefish fishery is primarily due to incidental catch of thornyheads, which are more common in the sablefish fishery. Thornyheads tend to be more valuable than other rockfish and therefore have a higher retention rate. Thornyheads are distinguished from the “true” rockfish in the genus *Sebastes* primarily by reproduction biology and the lack of swim bladder. Discards of thornyheads are thought to be regulatory discards stemming from PSC actions and MRA limits. Rockfish retention requirements for internal state waters exclude thornyheads (see Figure 1).

Table 4 Hook-and-line rockfish incidental catch rates by target fishery in the Gulf of Alaska

Year	IFQ Halibut		IFQ Sablefish		Pacific cod	
	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)
2013	502	4.52	1,265	11.7	24	0.31
2014	403	4.84	900	9.56	11	0.14
2015	383	4.35	903	10.06	50	0.78
2016	384	4.41	853	10.51	33	1.19
2017	340	4.17	774	9.62	31	1.29

Source: NMFS

Table 5 Hook-and-line rockfish incidental catch rates by target fishery in the Bering Sea and Aleutian Islands

Year	IFQ/CDQ Halibut		IFQ/CDQ Sablefish		Pacific cod	
	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)	Incidental catch (mt)	Incidental catch rate (%)
2013	73	3.14	47	9.16	<1	0.01
2014	51	2.94	132	22.03	7	0.31
2015	52	2.76	21	6.06	2	0.26
2016	54	2.6	12	7.63	<1	0
2017	54	2.73	8	10.82	<1	0.15

Source: NMFS

Another way to identify how predominate rockfish incidental catch is in a fishery is identifying presence or absence of rockfish in a sample from an observed set. These data show that from 2013 to October 2017, there were approximately 16,500 observed sets by hook-and-line catcher vessels. These data are summarized below:

- Hook-and-line sets identified as halibut trip target accounted for 44% of the observed sets and rockfish presence was observed in approximately 50% of those sets.
- Hook-and-line sets identified as sablefish trip target accounted for 41% of the observed sets and rockfish presence was observed in approximately 98% of those sets.
- Hook-and-line sets identified as Pacific cod trip target accounted for 15% of the observed sets and rockfish presence was observed in 29% of those sets.

Information is also available by area. The data indicate that there is higher incidental catch of rockfish in some areas. If the Council were to request an analysis of proposed action, then a finer scale spatial look at where rockfish incidental catch is higher would be included in that analysis.

2.4.2 Percentage of Rockfish Incidental Catch Being Retained

In most hook-and-line catcher vessel fisheries, more rockfish are retained than are discarded. Vessels with federal fisheries permits are required to retain rockfish that are taken when IFQ halibut or IFQ sablefish are on board unless rockfish are required to be discarded under other regulations (see 679.7). The retention rate also varies, depending on the area, likely due to existing retention regulations. For example, in the Southeast Alaska where there is full retention of DSR, a higher proportion of rockfish overall are retained. Observer data indicates this is not limited to only DSR but also includes other rockfish being retained at higher percentages than other areas. This may indicate that if any species is on full retention, then it incentivizes full retention of similar species as vessel operators seek to avoid a violation resulting from misidentification of the required species.

The reason vessels are not retaining more of their rockfish can come from multiple factors that are not easily identifiable. These range from regulatory discards to prevent exceeding an MRA or a PSC action that prohibits retention of a particular species or species complex. Another reason could be lack of market or available hold space as discussed in Section 5. These are all factors to consider when implementing full retention of rockfish. However, as Table 6 shows, more rockfish are being retained than discarded under current regulations. Those rockfish that are discarded are likely dead as a result of barotrauma.

Table 6 Retention rates of rockfish by hook-and-line catcher vessels by target fishery

Year	IFQ Halibut	IFQ Sablefish	Pacific Cod
2013	52%	45%	50%
2014	54%	59%	25%
2015	59%	58%	62%
2016	58%	57%	37%
2017	61%	60%	36%

Source: NMFS

3 Benefits of Full Rockfish Retention

For vessels that have opted into the EM pool, full retention of rockfish could increase the accuracy in species identification among those species of rockfish that are difficult to distinguish on EM video. Implementing a blanket policy of all rockfish retention could benefit these vessel operators by alleviating their responsibility for identifying and retaining only certain hard-to-differentiate rockfish species. Full rockfish retention could also create an avenue for the Observer Program to collect biological samples.

By mandating the complete retention of all rockfish by fixed-gear catcher vessels, the action would likely result in much better information on the incidental catch of rockfish by these vessels, because data on retained and landed fish are recorded in the existing reporting system. Catcher vessel estimates of at-sea discards of rockfish are calculated using discard rates that are applied to the retained groundfish landed. These discard rates have variability. Full retention removes most of that variability in the discard rates. This is increasingly important when accounting for species that have low acceptable biological catch (ABC) amounts. A more precise estimate can assist in management of these stocks.

However, improved data collection on incidental catch of rockfish under a full retention requirement is dependent on fishermen retaining all of the rockfish that they catch. Some fishermen, without increased monetary incentives (i.e., the ability to sell all retained rockfish), may choose to violate the full retention requirement. However, OLE has indicated that since implementation of the full retention of DSR for hook-and-line catcher vessels and jig vessels in SEO, there appears to be increasing compliance.

Full retention of rockfish could also reduce waste since many rockfish suffer internal injuries when they are brought to the surface. The assumed mortality rate for incidentally-caught rockfish off Alaska is 100%. Requiring full retention of all rockfish catch would eliminate the discard of rockfish at sea and would create the potential for increased human consumption through personal use and charitable donations. This would benefit stakeholders outside of the harvester and processor categories.

Full retention of rockfish could allow OLE time to pursue other priorities. Typically, an MRA overage requires an enforcement agent or officer to double check the calculations, write and submit an enforcement action report, enter the information in the data management system to document the overage, and mail the required paperwork to the permit holder. Each overage is estimated to take approximately 1 hour to complete. Full rockfish retention removes this burden as the priority shifts from a violation of the MRA to ensuring the species does not enter commerce.

Rockfish MRAs can be challenging for a vessel operator to understand. Retention rates for rockfish change depending on the target fishery, the species of rockfish encountered, and the area in which a vessel is fishing. Additionally, in some areas, the State of Alaska requires higher retention requirements than the federal MRA when a vessel is fishing inside state waters, as discussed in Section 2.3. The inconsistency of MRA regulations between target fishery, species, and area makes for it harder for a vessel operator to ensure compliance. A full retention requirement for all rockfish by a sector, in this case fixed-gear catcher vessel, will make it easier to understand and comply with regulations.

4 Challenges for Implementing of Full Retention and Potential Mitigation

4.1 Inseason Management Concerns

Currently, rockfish are retained and discarded as discussed in Section 4.3. The Catch Accounting System estimates of rockfish total catch by fixed-gear catcher vessels are derived from two sources: Elandings reports of retained rockfish and estimates of at-sea discard of rockfish. At-sea discard estimates are calculated from rates based on observed discards of rockfish.

Increasing MRAs or requiring more fish to be retained can create concerns that the action could increase harvest when fishermen top-off on a species. However, this scenario is less likely with rockfish. Rockfish species are not considered by inseason management to be easily available in concentrated numbers to support top-off fishing. Most top-off species are more valuable than the target fishery, creating a financial incentive to target a top-off species. However, rockfish are less valuable than the target species of halibut and sablefish. Therefore, the financial incentives that drive top-off fishing are less for rockfish. With a reduced top-off fishery for rockfish, some of the benefits of a MRA as a tool to control harvest of rockfish are reduced. Therefore, raising the MRA for rockfish would likely have little affect at increasing incidental catch of rockfish.

Analyzing rockfish harvest six weeks before and after an action to prohibit retention of a rockfish species (PSC action) allows for a test to see if PSC actions are effective and possibly if top-off fishing for rockfish is occurring. If the PSC action reduces harvest after the action, then it could be stated that top-off fishing for rockfish was occurring. If the harvest is similar before and after the PSC action, then the PSC action can be considered to do little to control harvest. This also may indicate that there is little top-off fishing for rockfish. This analysis was run for all rockfish PSC actions that have occurred since 2013 and during time periods that had active hook-and-line catcher vessel activity.

This is a simple test and cannot estimate the effects of new effort or new areas of fishing that may affect the rate of rockfish harvest. Also, this method can only be used on species and areas that have had PSC actions in the past and cannot determine if top-off fishing is occurring in other areas or species.

Table 7 shows three examples of rockfish PSC actions that have occurred since 2013 and during time periods that had hook-and-line catcher vessel activity. This table shows the total catch, total rockfish catch, rockfish retention rate, and the rate of rockfish catch prior to and after a PSC action.

These examples of PSC actions are for rockfish species that are more commonly caught in sablefish directed fisheries; therefore, the data was limited to sablefish targets. This removed some of the effects of new effort in new target fisheries that may affect this analysis; however, it does not remove all of them. As a test, a similar analysis was done with no restrictions to hook-and-line catcher vessel sablefish targets and the results showed a similar trend indicating that restricting the data to sablefish targets did not change the overall results. These data and analysis of other actions show that there is little impact from these rockfish PSC actions in controlling harvest and indicates top-off fishing is minimal for rockfish species for hook-and-line gear fisheries.

Table 7 Three examples of hook-and-line catcher vessel catch before and after a rockfish PSC action

Examples	Action	Total groundfish and IFQ halibut retained catch (mt)	Total catch of prohibited rockfish (shortraker or thornyhead) (mt)	Rate of prohibited rockfish catch
Shortraker Rockfish PSC in Central GOA (Sept 19, 2016)	Prior to PSC	532	6.65	1.25%
	After PSC	498	6.32	1.27%
Shortraker Rockfish PSC in Western GOA (Sept 19, 2016)	Prior to PSC	254	4.87	1.92%
	After PSC	171	5.98	3.50%
Thornyhead PSC in Western GOA (Aug 17, 2013)	Prior to PSC	277	75.1	27.21%
	After PSC	307	66.7	21.76%

Source: NMFS

As discussed above, if a full retention regulation were implemented, MRAs would be used to calculate how much rockfish a fisherman can sell but would likely be limited in controlling incidental catch of rockfish. The above analysis also shows that current MRAs are set close to the incidental catch rates of rockfish without top-off fishing. In general, having an MRA can provide an additional layer of insurance that total harvest will not increase from top-off fishing that occurs because the current MRAs limit how much retained rockfish can be sold thereby removing the financial incentives, but with little evidence of a top-off fishery, the benefit of an MRA for rockfish is limited.

Full retention will not remove all discards. There may still be some unintentional discard of rockfish as fish drop off at the rail or gear loss. Catcher vessels with human observers or EM systems will gather these discard data. These discards could create an enforcement concern in determining what is an unintentional discard; however, the amount of drop-offs or unintentional discards should be minimal. The Catch Accounting System and observer program are set up to account for these unintentional discards. With these data, an at-sea discard rate will continue to be calculated and applied to a vessel's retained catch to estimate these unintentional drop-offs. The rate of at-sea discards will likely be much lower than they are currently.

There is a chance that full retention may create a situation where catch is underestimated. Under full retention, rockfish catch estimates will be calculated primarily on retained harvest (Elandings data). At-sea discard estimates will be reduced to very small amounts. While NMFS believes that most vessels are compliant with the regulations, there is a chance that an underestimate may occur from an interaction with the observer effect and vessel non-compliance.

The observer effect occurs when vessel behavior is different when observed. Vessels operators with an observer or EM coverage are more likely to ensure compliance with the regulations when being observed.

In a full-retention scenario there will be little to no at-sea discard estimates. Unobserved vessels that are not compliant with the regulations and discard rockfish will not have at-sea discard rates applied to their landings that estimate these higher discards and this may result in underestimates of total catch by that vessel.

This scenario may be occurring for Southeast Alaska DSR; however, NMFS did not have baseline data to determine the severity of non-compliance. One way to test this is based on anecdotal evidence. It is believed that not all vessels are compliant with the DSR full retention requirement. With the current observer program, the baseline data as shown in Tables 2 through 5 may allow NMFS to determine if there is significant non-compliance. For example, if there is a significant decrease in the overall catch rates of rockfish after a full retention rule becomes effective, this may indicate non-compliance or the estimates of discard rates before full retention were too high. As a result, increased monitoring of these vessels may be warranted to better estimate rockfish catch and ensure compliance.

Some rockfish species are challenging to manage because they are commonly caught as incidental species, have low ABCs amounts, in the GOA have several area breakouts, and have higher variance of at-sea discard estimates from observed discard rates on smaller hook-and-line vessels. NMFS closes directed fishing to most rockfish species at the beginning of the year because the TAC does not support directed fishing. Once a TAC is reached, NMFS prohibits retention of the species which removes financial incentives to catch a species. Since 2013, there has been increased total catch of rockfish. Part of this increase is better data collection and the ability to get estimates of rockfish incidental catch and at-sea discard on hook-and-line vessels. Prior to 2013, there was little data from these vessels to estimate rockfish at-sea discards. The tools available to NMFS to control harvest are limited and are somewhat ineffective in reducing harvest of rockfish to ensure that the TAC is not exceeded. NMFS continues to adapt management to address the increase in total catch; however, TACs and area ABCs are exceeded for some rockfish species.

The reasons for exceeding an area ABC is a multi-faceted problem spanning multiple gear types, targets, and incentives. While hook-and-line gear generally catches most rockfish species this sector's catch is not always the main reason for exceeding an area ABC. Total catch of rockfish is not expected to increase by large amounts under a full retention regulation and full retention of rockfish may allow for better accounting as a result of reducing the variance on the rates used for at-sea discard estimates.

4.2 Enforcement Considerations

Full retention of rockfish removes some of the challenges OLE staff encounter when investigating MRA overages. For species with full retention requirements, like DSR in Southeast Alaska, OLE focuses on ensuring the amount in excess of the MRA does not enter commerce. OLE staff may seek to confirm the calculation of the amounts in excess of the MRA and then follow up with the processing plant and vessel owner to ensure amounts in excess of the MRA do not enter commerce. OLE staff may also seek to ensure the species are identified correctly because currently only some rockfish species have full-retention requirements. With full retention of all rockfish, MRA overages will likely result in less investigative work to determine the MRA overage and verify species identification.

Retention overages of an MRA species are likely to continue whether this action is implemented or not. If full retention for all rockfish species were implemented there may be an increase in the amount of overages. However, the reduced workload investigating and documenting full retention overages could outweigh the increase in number of cases. This would likely result in less investigative work for rockfish overages overall. Therefore, OLE staff believes that full retention of all rockfish species has more benefits than challenges.

Currently, when a species goes on PSC status, retention of that species is prohibited. However, **if full retention of rockfish is proposed, the Council may want to also consider changing the management of rockfish when on PSC status to still require full retention.** Since fishing mortality for rockfish is near 100%, continuing to maintain full retention of rockfish but restricting it from entering commerce would allow many of the benefits of full retention but also restrict the financial incentive of retention.

4.3 Options to Utilize Retained Rockfish Over the MRA Without It Entering Commerce

Under the current full retention of rockfish regulations for DSR, an individual can use amounts of retained DSR in excess of the MRA for other purposes, including personal consumption or donation. Amounts of DSR in excess of the MRA are prohibited from entering commerce through sale, barter, or trade. This provides a challenge for vessels that encounter large amounts of rockfish incidental catch and for enforcement to ensure that the amounts in excess of the MRA do not enter commerce.

For rockfish overages, the vessel bears the cost of the overage through operational challenges noted above and is not compensated monetarily for the rockfish overage. Processors must discard unwanted rockfish at the dock under current regulation unless fishermen seek to utilize catch that is delivered and cannot be sold. Southeast Alaska hook-and-line fishermen have addressed the challenge to use rockfish that they cannot sell in multiple ways. Home packs are commonly used for overages. In some areas, a community bin has been established. This is a tote with ice that rockfish in excess of the MRA are placed and free to community members. However even with these remedies, there are times when a vessel operator is challenged to find a way to use rockfish that they cannot sell. One potential solution would be to make it easier to donate of fish in excess of the MRA.

An example would be to explore ways in which to encourage/incentivize processors to process fish in excess of the MRA and distribute to local food banks, schools and community programs that assist those in need. This would allow the rockfish in excess of the MRA to be processed and distributed to those in need and would help prevent rockfish in excess of the MRA from entering commerce. An example is through authorized distributors like SeaShare. Bear in mind that there is a cost to processors to process, freeze, and package fish so an incentive may be needed to encourage participation. Local processors could develop relationships with local community groups to distribute rockfish and charge a minimal cost for processing these fish. Currently the Prohibited Species Donation program allows retained halibut and salmon PSC to be distributed to food banks in Alaska. If this action were to move forward, this option would need to be explored further.

Another solution would be to adopt how the State enforces full retention and the MRA. The value of the rockfish in excess of the MRA is forfeited to the state but the processors can process and sell these fish. This balances the cost to processors having to handle increase rockfish catch. This is a different approach to limiting the financial incentives to a vessel to harvest rockfish and may create challenges. This option would need to be explored further should this action move into analysis.

Additionally, the Council could consider increasing the MRA amounts to allow more rockfish to be sold. This may result in an increase in total harvest as some vessels may change behavior to seek more rockfish. These impacts are hard to quantify and may create additional management challenges. Based on available information, the current MRA rates appear to be set appropriately to capture the average rockfish incidental catch rate without incurring a financial incentive.

4.4 Impacts to Vessels

A full retention requirement for fixed-gear catcher vessels could have operational implications for fishermen since they would have to retain all incidental catch of rockfish, thus utilizing valuable hold

space. Two main storage techniques are used on fixed-gear catcher vessels: ice down fish in fish holds or store fish in refrigerated sea water (RSW) tanks. Storing additional rockfish onboard raises three issues: (1) displacement of other more valuable fish, (2) impact on quality of other fish, and (3) impact on rockfish quality.

Assuming hold space is limited, the additional rockfish retained would displace fish of higher value, thereby decreasing per trip revenues. Additionally, the problem of damaging more valuable species, such as IFQ sablefish, by mixing rockfish in the hold may be a problem for many of the vessels. Rockfish have spines which can puncture other fish in the same storage compartment and reduce their commercial value. Storage in RSW tanks may also lead to abrasion between the rockfish and other more valuable species, damaging the scales and flesh of the other species. Rockfish themselves lose quality when they are stored in RSW tanks. Yelloweye rockfish are valued, in part, for their bright red or orange color. Storage in RSW tanks tends to wash out the color. This reduces their value on delivery. On larger vessels using RSW tanks, the rockfish can be iced in totes on the deck. Smaller vessels using RSW tanks and with limited deck space for totes may experience the greatest storage issue. On vessels that rely on storing the fish on ice, these issues may be dealt with by setting the rockfish aside until the other species are iced down, and then storing the rockfish in a separate top layer in the fish hold. Also, the rockfish may be iced down in a bait hold. All of these options impose operational compromises and economic costs.

Rockfish generally must be delivered within three days of catch to be accepted by processors for full value. Other species like halibut may maintain their quality (and market value) onboard for significantly longer periods. The average trip length by hook-and-line catcher vessels is 3 days and most are less than 5 days, however some trip lengths can exceed 10 days. The trip lengths vary depending on the vessel size, trip target, and the location of the fishery. Table 8 through Table 10 show that the average trip length for hook-and-line catcher vessels varies by target fishery, area, and vessel length.

The impacts of full retention are hard to quantify. However, based on the average harvest of rockfish from trip and trip length data, the impacts of full retention on fishing trips are thought to be small. If large amounts of rockfish are encountered, the retention of rockfish may require fishermen to end trips when the storage space is full. Fishermen may need to take extra trips to fully harvest their target species including IFQs. This factor may incentivize avoidance of rockfish, which may reduce rockfish catch.

Table 8 Hook-and-line catcher vessel trip length by target fishery Alaska wide

Target fishery	Average trip length (days)	Proportion of trips (2013-Oct. 2017)
IFQ Halibut	2.99	59%
IFQ Sablefish	4.49	26%
Pacific Cod	2.79	14%

Source: NMFS

Table 9 Hook-and-line catcher vessel trip length by area

Area	Average trip length (days)	Proportion of trips (2013-Oct. 2017)
Southeast Alaska (650/659)	2.68	32%
West Yakutat / PWS (640/649)	3.79	8%
Central GOA (630)	3.31	27%
Central GOA (620)	4.91	6%
Western GOA (610)	5.25	7%
Bering Sea	2.27	16%
Aleutian Islands	7.69	4%

Source: NMFS

Table 10 Hook-and-line catcher vessel trip length by vessel length Alaska wide

Vessel length	Average trip length (days)	Proportion of trips (2013-current)
Less than 30 feet	1.04	15%
30 feet – 40 feet	2.46	23%
40 feet – 50 feet	3.07	22%
50 feet – 60 feet	4.64	30%
60 feet – 100 feet	5.85	9%
Greater than 100 feet	5.15	< 1%

Source: NMFS

5 Conclusions

The discussion paper identifies multiple benefits and challenges with full retention of rockfish (see Table 11). After reviewing this discussion paper, the Council could decide there is sufficient need to require full retention of rockfish for fixed-gear vessels. If full retention of rockfish is proposed, the Council may also want to consider changing the management of rockfish, including DSR, when on PSC status to still require full retention. If so, the next step would be the development of a purpose and need statement. The Council could focus their purpose and need statement on all fixed-gear vessels in the BSAI and the GOA or it can focus on just one FMP area and/or one fixed-gear type. The purpose and need statement should be focused on identifying species problems that motivate the proposed action, which, in turn, will serve to guide the development of specific alternatives and options for consideration.

Table 11 Benefits and challenges of full retention of rockfish for fixed-gear vessels in the BSAI and GOA

Category	Benefit	Challenge	Ways to address challenges
Reduction of Waste / utilization of rockfish incidental catch	Full retention requires rockfish incidental catch to be retained. This will lead to more utilization of incidental catch, especially as rockfish are assumed to have a 100% discard mortality.	Cost to processors to handle unwanted fish. Full retention requirements change MRA from allowed retention to amount allowed to be sold. Amounts in excess of the MRA may create challenges for utilization or disposal of delivered rockfish.	Reduce regulatory constraints that may impact donation of unwanted fish.
Increased compliance resulting from clarity of regulations	Full retention eliminates confusion of different retention requirements for rockfish depending on the species, area fished, and target fishery.	Addressing regulations that conflict, such as MRA regulations, inseason management actions that prohibit retention, and State/Federal differences in retention regulations.	To extent possible, design compatible regulations.
Impact to vessels	Incentivizes avoidance of areas of high rockfish incidental catch to limit impact to a trip.	Vessels would be required to retain rockfish that would take hold space of target species. Presence of rockfish mixed with other species may damage more valuable fish. Could result in more trips to harvest available	Vessels that avoid high rockfish areas will be less impacted than those that fish in high rockfish areas. The impact to fishing trips is believed

Category	Benefit	Challenge	Ways to address challenges
		quota if a vessel encounters high incidental catch rates of rockfish.	to be low based on available information.
Catch Accounting	Full retention allows for identification and weighing of incidental catch. This reduces estimation variance due to reliance on delivered catch weights instead of at-sea discard rates calculated from observed vessels. EM identification issues can be resolved with full retention.	Lack of compliance may cause underestimation of total rockfish harvest. Unobserved vessels are most likely to be out of compliance, and no data on at-sea discards will be available to apply.	Monitoring outcomes of the regulation will inform potential needs in monitoring and enforcement to address any concerns should they arise.
Management of rockfish	Rockfish are a species of management concern due to low ABCs and TACs. Directed fishing of most incidentally caught rockfish is closed. Improved data collection could allow for more precise management.	An increase in rockfish incidental catch may occur if estimation of at-sea discard underestimates total rockfish catch. This could increase challenge of managing rockfish quotas.	MRA and PSC actions are less effective at controlling harvest for rockfish species. Top-off behavior is also not common with rockfish. Therefore, this is not considered to be a large challenge. Removing financial incentives to catch more rockfish will help address these concerns.

6 References

Faunce, C., J. Gasper, F. Wallace, J. Cahalan, J. Mondragon, T. Amar, S. Lowe, and R. Webster. Annual Performance Review, North Pacific Groundfish and Halibut Observer Program, First and Preliminary 2013 Version. NOAA.