NATIONAL MARINE FISHERIES SERVICE REPORT ON
UPDATE ON 2021-2022 HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES

National Standard 1 Guidelines and Requirements for Accountability Measures

NOAA's National Marine Fisheries Service (NMFS) prepared this document to support the Pacific Fishery Management Council (Council) developing additional accountability measures (AM) for Pacific Coast groundfish stocks and stock complexes. This document provides background on the requirements for annual catch limits (ACL) and AMs, a brief analysis of existing Pacific Coast groundfish AMs, and some recommendations for the Council to consider moving forward. Additional background information, including examples of AMs from other regional fishery management councils, can be found in the Appendix. If the Council decides to develop any new AMs as part of the 2021-22 biennial harvest specifications or through a separate action, the next step would be to forward a range of alternatives for analysis. Developing a process for implementing automatic AMs to address an ACL overage would likely require an amendment to the Pacific Coast Groundfish Fishery Management Plan (FMP).

Background

The U.S. Congress passed the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA). The MRSA was signed into law on January 12, 2007. The MSRA made significant revisions to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and included new requirements regarding preventing and ending overfishing and rebuilding fisheries. The MSRA required fishery management plans (FMPs) to "establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.'' As a result of these new requirements, NMFS revised the National Standard 1 (NS1) guidelines in 2009 (74 FR 3178; January 16, 2009). NMFS again revised the NS1 guidelines in 2016 (81 FR 71858; October 18, 2016) to improve and streamline the guidelines, address experience gained since the 2009 revision, and provide some flexibility to regional fishery management councils in addressing management issues within current statutory limits.

The 2009 NS1 guidelines suggest certain provisions are required to be components of a FMP to address scientific and management uncertainty when setting upcoming year(s) catch limits, while other components are discretionary. As a whole, the system outlined by NS1 guidelines is designed to prevent overfishing managed resources, rebuild overfished stocks, and achieve optimum yield (OY). There are several catch limit terms defined in the NS1 guidelines. The Council and NMFS are required to set several of those terms, specifically the overfishing limit (OFL) and associated reference points to determine stock status, an acceptable biological catch (ABC), and an ACL, for all stocks or stock complexes that are in the fishery. The NS1 guidelines describe the relationship between these terms as: OFL≥ABC≥ACL. See Table 1 and Figure 1 for commonly used catch terms and their definitions

Table 1. Catch terms as defined by the National Standard 1 guidelines.

Maximum Sustainable Yield (MSY)	MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets. MSY is usually estimated in stock assessments.
Optimum Yield (OY)	OY is the long-term average amount of desired yield from a stock, stock complex, or fishery. Because the population size of fish stock fluctuates every year, the amount of fish that is available to the fishery in any given year may be above or below the OY. Sometimes these annual amounts are referred to as the "annual OY." The determination of OY should consider overall benefit to the nation, and any relevant economic, social, or ecological factors. The OY cannot exceed MSY, and must be achieved while preventing overfishing. In the case of an overfished fishery, the OY must provide for rebuilding to a level consistent with producing the MSY in such fishery. Regional Fishery Management Councils are required to assess and specify OYs in their FMPs.
Overfishing Limit (OFL)	The OFL is the best estimate of the maximum amount of a stock that can be caught in a year without resulting in overfishing. The OFL is an amount of catch calculated from the estimate of biomass for a year and the maximum rate of fishing mortality that does not result in overfishing. Catch equal to OFL results in equal probability that overfishing is or is not occurring.
Acceptable Biological Catch (ABC)	The ABC is an annual catch level recommended by a Council's SSC. The SSC's ABC recommendation should incorporate consideration of the stock's life history and reproductive potential, vulnerability to overfishing, and the degree of uncertainty in the science upon which the ABC recommendation is based. The ABC must be less than or equal to the OFL; however, in most situations the ABC will be less than OFL. If the ABC were set equal to the OFL, then catching the ABC would result in a 50-percent chance of overfishing. To comply with the MSA's requirement to prevent overfishing, the probability that an actual catch equal to a stock's ABC will result in overfishing cannot exceed 50-percent, and should usually be a lower value. In general, the higher the degree of scientific uncertainty, the bigger difference there should be between the OFL and ABC.
Annual Catch Limit (ACL)	Harvest specification set equal to or below the ABC in consideration of conservation objectives, socioeconomic concerns, management uncertainty, ecological concerns, and other factors. The ACL is a harvest limit that includes all sources of fishing-related mortality including landings, discard mortality, research catches, and catches in exempted fishing permit activities. The ACLs are established to achieve Sector-specific ACLs can be specified, especially in cases where a sector has a formal, long-term allocation of the harvestable surplus of a stock or stock complex. The ACL serves as the basis for invoking AMs.

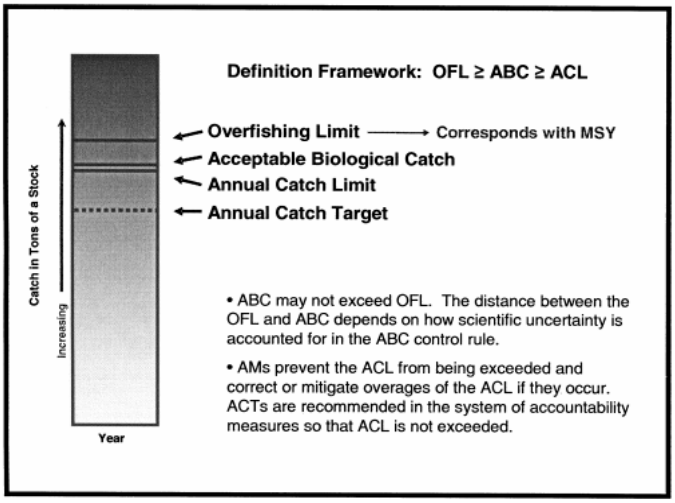

Figure 1. Relationship between OFL, ABC, and ACL.

Annual Catch Limits

An ACL is a limit on the total annual catch of a stock or stock complex. ACLs can be set equal to but cannot exceed the ABC and tend to be the basis for invoking AMs. The NS1 guidelines state that, when specifying catch limits and AMs, the Council must consider uncertainty in scientific information and management control of the fishery.

A Council may, but is not required to, divide an ACL into sector-ACLs to meet a wide variety of management objectives, including to address differences in the degree of management uncertainty between sectors. If sector-ACLs are used, sector-AMs should also be specified. "Sector," for purposes of this section, means a distinct user group to which separate management strategies and separate catch quotas apply. Examples of sectors include the commercial sector, recreational sector, or various gear groups within a fishery (e.g., trawl and non-trawl). If the management measures for different sectors differ in the degree of management uncertainty, then sector-ACLs may be necessary for the Council to develop along with appropriate AMs for each sector. If a Council chooses to use sector-ACLs, the sum of sector-ACLs must not exceed the stock or stock complex level ACL. The system of ACLs and AMs designed must be effective in protecting the stock or stock complex as a whole. Even if sector-ACLs and sector-AMs are established, additional AMs at the stock or stock complex level may be necessary, as shown in Figure 2.

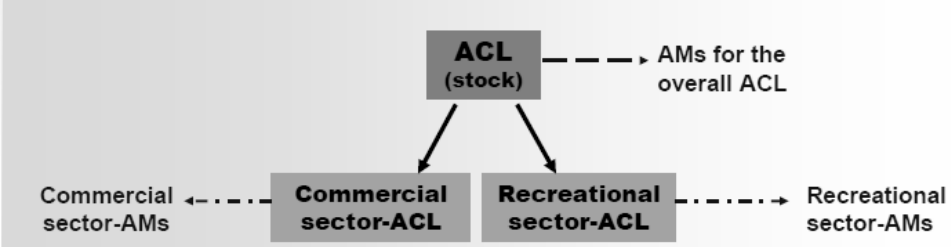

Figure 2. ACLs at the stock level and the commercial and recreational sector level, as well as which AMs would be needed and where.

Accountability Measures

Accountability measures are management controls. If catch of a stock is approaching or exceeds its ACL or sector-ACL, fishery managers use AMs to keep catch below the ACL or to correct any ACL overages. AMs should address and minimize both the frequency and magnitude of ACL overages and correct the problems that caused the overage in as short a time as possible.

The NS1 guidelines identify two categories of AMs: 1) inseason AMs that slow catch before it reaches the ACL; and 2) AMs for when catch exceeds the ACL. The choice for appropriate AMs for a given ACL depends on the data sources that will support implementing the AM (*e.g.*, inseason data, annual catch compared to the ACL, or multi-year averaging).

Inseason AMs. The NS1 guidelines suggest that, whenever possible, FMPs should include inseason monitoring and management measures to prevent catch from exceeding ACLs. Inseason AMs could include, but are not limited to:

- an annual catch target (ACT);
- changes in trip or bag limits;
- effort reductions;
- gear changes or restrictions; or,
- fishery or area closures.

A detailed definition of each of these AMs can be found in Table A.1. in the Appendix.

If final data or data components of catch are delayed, the Council should make appropriate use of preliminary data, such as landed catch, in implementing inseason AMs. FMPs could contain inseason closure authority giving NMFS the ability to close fisheries if it determines, based on the best scientific information available, that an ACL has been exceeded or is projected to be reached, and that closure of the fishery is necessary to prevent overfishing. For fisheries without inseason management control to prevent the ACL from being exceeded, the Council could build management measures (such as bag or trip limits) around ACTs that are set below ACL. Catch would then be distributed based on the lower ACT amount to reduce the risk that total catch does not exceed the ACL.

AMs for when catch exceeds the ACL. In certain cases, catch exceeds an ACL in spite of inseason management actions. Alternatively, for certain stocks, data is not available to allow the Council or NMFS to react to an ACL overage inseason. In these situations, NMFS performs an annual evaluation to determine whether catch exceeded the ACL after the end of a fishing year or season.

If catch for a given stock exceeds an ACL, the NS1 guidelines require NMFS or the Council to correct the operational issue that caused the ACL overage, as well as any biological consequences to the stock or stock complex resulting from the overage when it is known.

AMs for when catch exceeds the ACL could include, among other things:

- modifications of inseason AMs;
- using or modifying an ACTs; or
- overage adjustments to the subsequent season catch limit.

The type of AM chosen by a Council will likely vary depending on the sector of the fishery, status of the stock, the degree of the overage, recruitment patterns of the stock, or other pertinent information. For stocks and stock complexes in rebuilding plans, the AMs should include overage adjustments that reduce the ACLs in the next fishing year by the full amount of the overage, unless the best scientific information available shows that a reduced overage adjustment, or no adjustment, is needed to mitigate the effects of the overage.

Pacific Coast Groundfish Fishery AMs

The Council has a diverse, flexible, and largely effective system of AMs in place for most Pacific Coast groundfish stocks and stock complexes (Table 2). These AMs have been implemented for Pacific Coast groundfish stocks and stock complexes as catch controls, through the biennial specifications process and through routine inseason action. Existing, commonly used AMs include ACTs, bag limits, season limits, and trip limits. The Council also has options for area management (e.g., block area closures). AMs that have been implemented inseason recently include midwater trawl gear bycatch reduction area (BRA), closure of the limited entry fixed gear [LEFG] and open access [OA] sablefish daily trip limit [DTL] fishery, and implementation of the ocean salmon conservation zone. Table 2 summarizes the AMs that are available in the Pacific Coast groundfish FMP for several fishery sectors. In general, the AMs for this fishery are not automatic (meaning they do not have a set trigger built into regulation) and require the Council, advisory bodies, and NMFS to consider and develop the type and level of response to each stock and situation.

Recently, there has been confusion among regional fisheries managers and the public regarding the regulatory response when there is a risk to the ACL or an ACL is exceeded. Because the Council's AM system for groundfish is flexible and tailored to each situation, Council floor time is necessary to discuss an appropriate response. In the most extreme situations, the Council has scheduled emergency meetings to identify a response. For example, in June 2019, members of the public discussed at the June Council that catch may exceed the shortbelly rockfish ACL, and expressed concern about the potential for NMFS to close a fishery due to the ACL overage. In September 2019, the Council allocated time to discuss increasing the shortbelly rockfish ACL in 2020 to avoid potential economic harm of a fishery closure should catch exceed the ACL in 2020 (Agenda Item H.6, September 2019). This process took time for the Council to assess and discuss the issue for the following fishing year.

Defining when an AM is needed in response to a concern over an ACL, and which AM is appropriate is required by NS1 and also helps promote efficient management of the fishery.

NS1 guidelines require all existing FMPs to have established ACL and AM mechanisms to prevent and end overfishing and promote accountability. Additionally, NS1 guidelines require that conservation and management measures must be implemented so that the ACL is not exceeded, and that AMs must apply whenever the ACL is exceeded. Currently, the Pacific Coast Groundfish FMP and implementing regulations at 50 CFR § 660 include AMs for several fishery sectors (Table 2).

Table 2. AMs by sector for Pacific Coast Groundfish Fisheries found in the FMP and implementing regulations.

Stock	Sector	Accountability Measures	Authority/Initiated By	Automatic Trigger (if any)
All	Shorebased IFQ	Quota		None-Amounts established biennially
Big skate, California skate, California scorpionfish, leopard shark, soupfin shark, finescale codling, Pacific rattail (grenadier), ratfish, kelp greenling, shortbelly rockfish, and cabezon in Washington.	Shorebased IFQ	Sub-limits, aggregate limits	§ 660.60(c)/Council, inseason change	None-Inseason action or established biennially
Widow rockfish, canary rockfish, yellowtail rockfish, Pacific ocean perch, yelloweye rockfish, black rockfish, blue/deacon rockfish, splitnose rockfish, blackgill rockfish in the area south of 40°10′ N. lat., chilipepper, bocaccio, cowcod, Minor Nearshore Rockfish or shallow and deeper Minor Nearshore Rockfish, shelf or Minor Shelf Rockfish, and Minor Slope Rockfish; Dover sole, sablefish, shortspine thornyheads, and longspine thornyheads; petrale sole, rex sole, arrowtooth flounder, Pacific sanddabs, big skate, and the Other Flatfish complex, which is composed of those species plus any other flatfish species listed at §660.11; Pacific whiting; lingcod; Pacific cod; spiny dogfish; longnose skate; cabezon in Oregon and California and "Other Fish" as defined at §660.11.	Commercial Limited Entry and Open Access Fisheries	Harvest guidelines, trip limits, closed areas	§ 660.60(c)/Council	None-Inseason action or established biennially

Stock	Sector	Accountability Measures	Authority/Initiated By	Automatic Trigger (if any)
All stocks and stock complexes	MS, C/P, IFQ	Discretionary-restricted or close the sector, including area restrictions, season closures, or other measures to prevent the trawl sectors in aggregate or the individual trawl sector (Shorebased IFQ, MS Coop, or C/P Coop) from exceeding an ACL, ACT, or formal allocation specified	§ § 660.140(a)(3), 660.150(a)(5), 660.160(a)(5)	None-Discretion falls to the NMFS Regional Administrator
Yelloweye rockfish, bocaccio south of 40°10’ N. lat., canary rockfish	Recreational	Harvest guidelines, bag limits, size limits, time/area closures, boat limits, hook limits, season duration restrictions, and dressing requirements	§ 660.60(c)(1)	None-Inseason action or established biennially
All stocks and stock complexes with an ACL (does not include ecosystem component species)	All	Catch Monitoring, Inseason adjustments	Pacific Coast Groundfish FMP	ACL is exceeded more than 1 in 4 years, addressed biennially
Sablefish, Lingcod, Pacific whiting, and Rockfish	Limited entry fixed gear and open access, Shorebased IFQ	Size Limits	§ 660.60(h)(5)(ii)	None-inseason action or established biennially
All stocks and stock complexes	Trawl	Gear Restrictions-type of trawl gear allowed on board	§ 660.60(c)(1)(iii)	None-inseason action or established biennially
All stocks and stock complexes	All	Depth-based management measures (rockfish conservation area, bycatch reduction areas, block area closures)	§ 660.70	None-inseason action or established biennially

Stock	Sector	Accountability Measures	Authority/Initiated By	Automatic Trigger (if any)
Pacific whiting	MS and C/P	Close one or both sectors	§ 660.60(d)(1)(i)/NMFS Regional Administrator	Automatic-Pacific whiting allocation is reached, or is projected to be reached
Non-whiting groundfish stocks with allocations	MS and C/P	Close one or both sectors	§ 660.60(d)(1)(ii)/NMFS Regional Administrator	Automatic-Non-whiting species allocation is reached, or is projected to be reached
Non-whiting groundfish stocks with allocations	MS and C/P	Close one or both sectors	§§ 660.60(d)(1)(vi) and 660.131/NMFS Regional Administrator	Automatic-Implement BRAs when NMFS projects sector-specific allocation will be reached before the sector's whiting allocation
Pacific whiting or non-whiting groundfish stocks	MS non-coop fishery	Close the sector	§ 660.60(d)(1)(i)/NMFS Regional Administrator	Automatic-Pacific whiting or non-whiting allocation is reached, or is projected to be reached
Canary rockfish, yelloweye rockfish, and black rockfish in CA	Commercial and Recreational	Commercial-black rockfish trip landing and frequency limits; and depth based management measures. Recreational-black, canary, and yelloweye rockfish bag limits, time/area closures, and depth based management.	§ 660.60(c)(4)	NMFS has determined that a California state-specific federal harvest limit for canary rockfish, yelloweye rockfish, or black rockfish, is attained or projected to be attained prior to the first day of the next Council meeting

Stock	Sector	Accountability Measures	Authority/Initiated By	Automatic Trigger (if any)
All stocks and stock complexes	Whiting and non-whiting	Close the sector	§ 660.60(d)(1)(iv) and (v)/NMFS Regional Administrator	Automatic-Sector exceeded its annual Chinook salmon bycatch guideline and the reserve, and/or a Sector exceeded its annual Chinook salmon bycatch guideline if the other sector has already been closed after exceeding its Chinook salmon bycatch guideline and the reserve
Yelloweye rockfish, Cowcod s. of 40°10’ N. lat	All	ACT	Pacific Coast Groundfish FMP	None-inseason action or established biennially

Overview of Pacific Groundfish Stocks

When determining which stocks need AMs and when (inseason or post-season) such AMs can be implemented, it is important to understand historical attainment of stocks and stock complexes, availability of data (e.g. inseason or post season), and the type of AM available to be implemented. Figure 3 shows the percentage of a stock's or stock complex's ACL attained by year for the past four years (2016-2019) only for those stocks for which 50 percent or more of their ACL has been harvested in a single year. Actual numbers for the percentages by stock or stock complex are provided in Table 3. These data were pulled from the Pacific Fishery Information Network (PacFIN) and are only meant to be illustrative as some of these numbers have not been finalized.

As is illustrated in Figure 3 and Table 3, very few Pacific coast groundfish stocks and stocks complexes have exceeded their ACLs in recent years. Based on preliminary data from the Pacific Fishery Information (PacFIN) Groundfish Scorecard:

- In 2019, catch of only one stock, shortbelly rockfish, exceeded the ACL. Catch of five stocks and stock complexes exceeded 80 percent of their ACL (kelp greenling/OR cabezon, nearshore rockfish north of 40° North (N) latitude (lat.), petrale sole, sablefish north of 36° N. lat., and widow rockfish).
- In 2018, catch exceeded the ACL for two stocks: shortbelly rockfish and spiny dogfish. Additionally, five stocks (OR black rockfish, cabezon, petrale sole, sablefish north of 36° N. lat., and widow rockfish exceeded 80 percent of their respective ACLs.
- Petrale sole and sablefish north of 36° N. lat. are the only two stocks for which catch exceeded 80 percent of the ACL in the past four years.

Table 3 also illustrates that many of the current groundfish stocks and stock complexes are also under-attained when comparing total catch to the ACL. Total catch has been less than 50 percent of the ACL for nineteen stocks in each of the past four years.

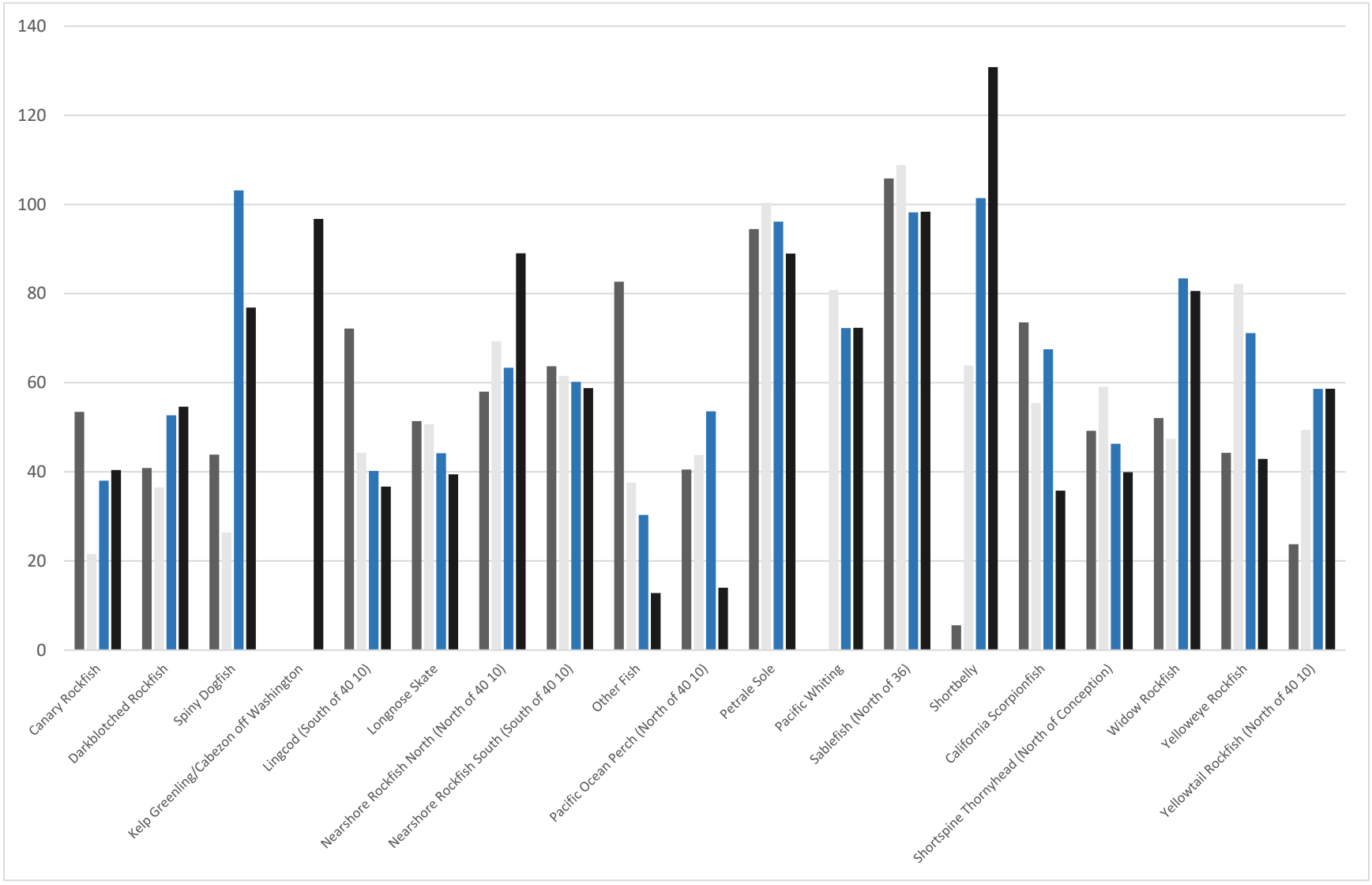

Figure 3. Percentage of ACL attainment by stock or stock complex and by year for stocks for which 50 percent of the ACL has been attained in one year. Only for those stocks where attainment has exceeded 50 percent in at least one of the past four years. 2016=dark gray, 2017=light gray, 2018=blue, and 2019=black, (Source: PacFIN's Groundfish Scorecard, pulled January 20, 2020)

Table 3. Percentage of ACL attained by each stock or stock complex by year. Dark gray cells represent percentages in excess of 100. Blue cells represent percentages between 75 and 100. Light gray cells represent percentages between 50 and 74. (Source: PacFIN's Groundfish Scorecard, pulled January 20, 2020)

	Percentage of ACL Attained Each Year			
Stock Name	**2016**	**2017**	**2018**	**2019**
Arrowtooth Flounder	27.63	10.39	8.16	5.53
Bocaccio (South of 40 10)	33.13	34.52	41.43	21.7
Blue/Deacon/Black Rockfish Complex off Oregon	-	-	-	71.2
Black (CA)	-	51.05	43.76	48.27
Black (OR and CA)[1]	75.99	-	-	-
Black (OR)	-	100.84	77.67	-
Black (WA)	89.17	74.28	83.52	78.69
Big Skate	-	58.9	39.9	44.68
Cabezon (CA)	51.14	36.63	35.92	31.63
Cabezon (OR)	59.26	111.37	91.41	-
Chilipepper (South of 40 10)	5.02	4.81	11.38	14.62
Canary Rockfish	53.47	21.58	38.04	40.41
Cowcod (South of 40 10)	9.52	14.44	15.21	29.47
Darkblotched Rockfish	40.86	36.53	52.68	54.63
Dover Sole	14.7	15.86	12.77	11.69
Spiny Dogfish	43.86	26.4	103.15	76.85
Ecosystem Component Species	-	-	-	-
English Sole	6.54	4.1	3.38	2.29
Kelp Greenling/Cabezon off Oregon	-	-	-	26.63
Kelp Greenling/Cabezon off Washington		-	-	96.76
Lingcod (North of 40 10)	30.32	35.38	33	20.41
Lingcod (South of 40 10)	72.15	44.29	40.2	36.69
Longnose Skate	51.39	50.69	44.17	39.45
Longspine Thornyhead (North of Conception)	21.82	40.55	13.42	10.12
Longspine Thornyhead (South of Conception)	1.08	1.63	1.63	1.47
Nearshore Rockfish North (North of 40 10)	58	69.31	63.37	89.03
Nearshore Rockfish South (South of 40 10)	63.71	61.52	60.19	58.79
Other Flatfish	14.1	11.32	10.54	10.35
Other Fish	82.69	37.6	30.34	12.8
Pacific Cod	36.39	9.92	5.64	1.95
Pacific Ocean Perch (North of 40 10)	40.51	43.76	53.56	13.99
Petrale Sole	94.49	100.38	96.16	88.98
Pacific Whiting	-	80.81	72.28	72.33
Sablefish (North of 36)	105.84	108.84	98.22	98.37
Sablefish (South of 36)	33.05	24.56	25.09	23.46
Shortbelly	5.57	63.88	101.42	130.82

	Percentage of ACL Attained Each Year			
Stock Name	**2016**	**2017**	**2018**	**2019**
California Scorpionfish	73.53	55.43	67.5	35.79
Shelf Rockfish North (North of 40 10)	3.02	16.26	15.51	29.35
Shelf Rockfish South (South of 40 10)	26.32	33.8	33.42	42.95
Slope Rockfish North (North of 40 10)	19.42	24.59	34.37	30.47
Slope Rockfish South (South of 40 10)	11.65	17.73	14.05	9.15
Splitnose (South of 40 10)	0.75	0.93	2.03	1.01
Shortspine Thornyhead (North of Conception)	49.2	59.08	46.3	39.94
Shortspine Thornyhead (South of Conception)	12.44	17.68	12.72	9.36
Starry Flounder	1.23	1.93	0.55	2.68
Widow Rockfish	52.07	47.43	83.42	80.59
Yelloweye Rockfish	44.26	82.15	71.13	42.9
Yellowtail Rockfish (North of 40 10)	23.77	49.4	58.63	58.65

Another important factor when considering AMs is whether or not there is reliable data available inseason, post season, or in subsequent years and at what scale. A simplistic way of considering the reliability and frequency of data availability is to consider which sector (e.g., trawl, non-trawl, recreational, or other which could include research or incidental open access) predominantly harvests that stock or stock complex and the associated data available from that sector. For example, if a stock is trawl dominant we can assume that the majority of the catches are reported by observers and catch monitors. This means that, by comparison, we have more timely and accurate data for trawl dominant stocks than for stock for which most of the catch is in the recreational sector. Figure 4 depicts each stock or stock complex and the percentage of the ACL taken by each of the sectors (i.e., Trawl, Non-Trawl Commercial, Recreational, and Other) for 2018, which is the most recent year for which we have a complete data set of the estimated discard and catch of groundfish species.

Figure 4 shows that of the stocks that exceeded their ACLs in 2018 (e.g. shortbelly rockfish and spiny dogfish) both are trawl dominant species. Therefore, we can infer that most data is highly certain and available inseason. If the Council wanted to develop additional AMs for these two species, it could consider both inseason and post-season AMs. Of the stock and stock complexes in 2018 for which more than 80 percent was attained two stocks are trawl dominant (e.g. widow rockfish and petrale sole), one is non-trawl dominant (e.g. sablefish north of 36° N. lat.) and the other was predominantly caught in recreational fisheries (e.g. OR cabezon). Therefore, the data available for these species is highly variable with the trawl dominant species having the most reliable and readily available data inseason. Data for OR cabezon are less readily available inseason, therefore, it is likely that AMs would not be available inseason but could be implemented post-season.

The data available will also help determine the appropriate AM needed for a stock or stock complex. For example, because shortbelly is predominantly caught by the trawl sector, and the trawl sector is highly monitored, the Council could use that information to determine which of the

available AMs would be preferable to address an overage during the fishing year. In the case of shortbelly rockfish, we know that trawl vessels were catching shortbelly rockfish in 2019 in multiple fishing areas and across multiple depths. Therefore, developing an automatic AM which would implement a depth based area closure in response to an ACL overage for shortbelly would be unlikely to address an ACL overage. Instead implementing a post-season AM, such as an ACT which accounts for the ACL overage and has a closure mechanism in the second year, in response to an ACL overage may be the best option.

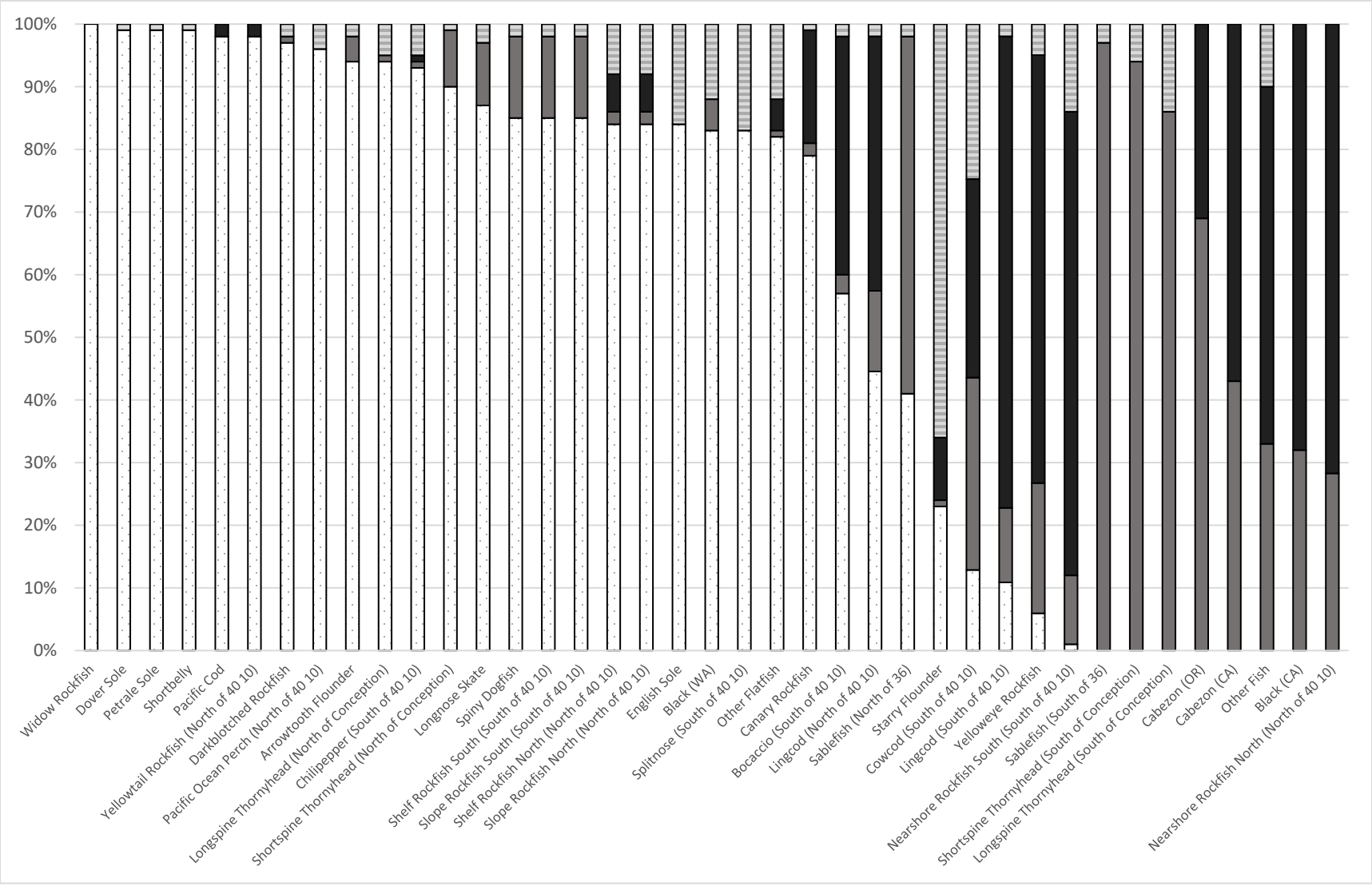

Figure 4. Percent of ACL taken by fishing sector for each stock or stock complex in 2018. In order for . Trawl=white with dots, Non-trawl (LEFG and OA)=gray, Recreational=black, and Other, including IOA, pink shrimp, halibut, and research=gray horizontal line. (Source; Groundfish Expanded Mortality Multi-year [GEMM] data product, September 2019)

Recommendations

The Council has been and continues to use AMs successfully to keep catch for most groundfish stocks and stock complexes within ACLs. However, the Council should:

- Evaluate the tradeoff of the flexibility in the existing AM system against the time required to develop custom AM responses for each situation. There may be sector or fishery-wide catch limits for which the Council can develop automatic response.
- Evaluate AMs when changing allocation structures. For example, switching the at-sea sector allocations to set-asides means the automatic closure authority for allocation is no longer necessary. However, the Council may need to develop a policy for shifting back to allocation management if set-aside catch consistently contributes to ACL overages.
- Evaluate existing ambiguous AMs (e.g., NMFS closure authority for shorebased IFQ/MS/CP sectors in sections 660.140, 660.150, 660.160) and give clear direction to NMFS for when these authorities should be used for different stocks.
- Consider whether there are additional AMs beyond the list of existing tools that may allow the Council to respond to catch limit overages.

We recommend the Council make these considerations as part of upcoming, allocation focused actions, such as the upcoming Amendment 21 trawl/non-trawl allocation action listed on the Year at a Glance in June 2020.

For the 2021-22 harvest specifications, shortbelly rockfish is the only stock for which NMFS would recommend the Council consider developing automatic AMs in the second year of the cycle (2022) to address any overages of the ACL that may occur in the first year of the cycle (2021).

Appendix

For purposes of this document, commonly used terms as defined by the PCGFMP, are provided in Table A.1.

Table A.1. Commonly used terms for specifications and management measures and their definitions.

	Term	Definition
Accountability Measures	Annual Catch Target (ACT)	Management target set below the ACL and may be used as an AM in cases where there is uncertainty in inseason catch monitoring to ensure against exceeding an ACL. Since the ACT is a target and not a limit it can be used in lieu of harvest guidelines or strategically to accomplish other management objectives. Sector-specific ACTs can also be specified to accomplish management objectives for a specific sector.
	Off the top deductions	Amount of total fishing mortality resulting from tribal fisheries, incidental open access fisheries (e.g., non-groundfish fisheries that impact groundfish stocks), scientific research, and exempted fishing permits (EFPs). Deducted from the ACL, resulting in the harvest guideline.
	Harvest Guideline (HG)	Specified numerical harvest objective which is not a quota. Attainment of a HG does not require closure of a fishery.
	Allocation	Apportionment of an item for a specific purpose or to a particular person or group of persons. Allocation of fishery resources may result from any type of management measure, but is most commonly a numerical quota or HG for a specific gear or fishery sector. Direct allocation occurs when numerical quotas, HGs, or other management measures are established with the specific intent of affecting a particular group's access to the fishery resource. "Formal" allocation, first introduced through A21, is a long-term allocation formula (i.e., sector percentages) that is "fixed" in the Pacific Coast Groundfish FMP. In section 6.3.2 of the FMP is the statement, "Under Amendment 21, it was decided that any formal allocations be specified in the FMP."
	Set Asides	Amount of yield of an actively managed stock or stock complex that is deducted from an ACL or sector allocation. A set-aside deducted from an ACL is designed to accommodate catch in Tribal fisheries, research fisheries, exempted fishing permit activities, and bycatch in non-groundfish fisheries. A set-aside deducted from a sector allocation is designed to accommodate catch for a portion of the sector where within-sector allocations are not specified (e.g., set-asides for the at-sea whiting sectors for many stocks are deducted from formal trawl allocations to accommodate expected bycatch).
	Sector-specific ACL	Management control used to prevent exceedance of an annual catch limit. Sector-specific ACLs can be specified, especially in cases where a sector has a formal, long-term allocation of the harvestable surplus of a stock or stock complex. Sector-specific ACLs would sum to the ACL for the stock for the entire fishery. The ACL serves as the basis for invoking AMs.
	Fishery closure	When referring to closure of a fishery, means that taking and retaining, possessing or landing the particular species or species complex is prohibited
	Time/Area closure	The Council uses a variety of time/area closures to control the directed rate of catch of targeted species, to reduce the incidental catch of non-target, protected (including overfished) species; and to prevent fishing in specified areas in order to mitigate the adverse effects of such activities on groundfish EFH. Time/area closures vary by type both in their permanency and in the size of area closed

	Gear Restrictions	The Council uses gear definitions and restrictions to protect juvenile fish (trawl mesh size), to disable lost gear so that it no longer catches fish (biodegradable escape panels for pots), to slow the rates of catch in particular sectors (recreational fisheries hook limits), to reduce bycatch of non-target species (trawl configuration requirements), and to protect marine habitat (trawl roller gear size restrictions).
	Trip Limits	A trip limit is the amount of groundfish that may be taken and retained, possessed, or landed from a single fishing trip. Trip limits, trip frequency limits, and trip limits that vary by gear type or fishery may be applied to either groundfish or non-groundfish fisheries. Trip landing limits and trip frequency limits are used to control landings to delay achievement of a quota or HG and thus avoid premature closure of a fishery if it is desirable to extend the fishery over a longer time. Trip landing limits also may be used to minimize targeting on a species or species group while allowing landings of some level of incidental catch.
	Bag Limits	A bag limit is a restriction on the number of fish that may be taken and retained by an individual angler operating in a recreational fishery, usually within a period of a single day
	Boat Limits	A boat limit is a cumulative restriction on the total number of fish that may be taken and retained by all of the persons operating from a recreational fishery vessel. Boat limits restrict the overall per-vessel catch in a recreational fishery. A boat limit may prevent an angler from taking what would otherwise be allowed within an individual bag limit, depending on the number of fish already taken on that boat.
	Effort Reductions	Limiting fishing capacity or effort through permits, licenses and endorsements, and quotas, or by means of input controls on fishing gear, such as restrictions on trawl size/shape or longline length or number of hooks or pots
	Seasons	Fishing seasons are closures of all or a portion of the West Coast EEZ for a particular period and time of year. Seasons may be used to constrain the rate of fishing on a targeted species, to encourage targeting of a more abundant stock during periods of higher aggregation, or to limit catch of a protected species during its spawning season. Seasons may be for the entire fleet, for particular sectors within the fleet, for regions of the coast, or for individual vessels.

Examples of AMs from other Fishery Management Councils

Mid-Atlantic Fishery Management Council

In 2011, the Mid-Atlantic Fishery Management Council (MAFMC) considered several FMP amendments under an omnibus package to establish a system of comprehensive accountability, which addresses all components of catch, for each of its managed resources. MAFMC considered alternatives which provided either proactive AMs (i.e. AMs intended to prevent, as much as practicable, the ACL from being exceeded) or reactive AMs (i.e. AMs used in response to an ACL overage and are designed to mitigate that overage and/or prevent it from occurring in subsequent years) for each managed resource.

In September 2011, NMFS implemented an AM approach that uses ACTs for all species (76 FR 60606, September 29, 2011). The ACT results from a reduction in the harvestable amount available to fisheries to account for management uncertainty. Sector-specific ACTs (commercial and recreational) that reduce the harvestable amount by management uncertainty under each sector would also be used for those species with sector-specific ACLs. The amount of the reduction from the ACL to the ACT is recommended to the Council after review of the available information. Existing proactive accountability measures, including commercial trip and possession limits, commercial fishery closure authority, and commercial fishery overage repayments were retained and codified as AMs.

New AMs were also established to close recreational fisheries when data in hand indicates ACLs have been met or exceeded. MAFMC also established a "buy-back" system for any overages either at the fishery level or at the sector-specific level. A "buy-back" is a deduction from the current year's harvestable limit to account for overages in the previous year. For example, if the ACL is exceeded in year 1, then the ACL would be reduced in year two under a fishery buy-back. If the ACL is exceeded in year 1 and it is determined to be because the recreational or commercial sector exceeded their sector-specific ACT, then the buy-back would occur at the sector level (commercial or recreational sector) in the second year.

New England Fishery Management Council

In 2010, NMFS implemented measures approved under Amendment 16 to the Northeast Multispecies Fishery Management Plan which was developed by the New England Fishery Management Council (NEFMC) (75 FR 18261, April 9, 2010). Amendment 16 implemented AMs for both the commercial and recreational fisheries, including separate AMs for sector vessels, vessels fishing in the common pool, and private recreational and charter/party vessels.

Amendment 16 specified two alternative AMs for common pool vessels and those that participate in Sectors. [1] First, Amendment 16 prohibited Sector vessels from fishing in a particular stock area

[1] As part of the amendment package, NEFMC developed sector administration provisions. Under these provisions, a sector means a group of persons (three or more persons, none of whom have an ownership interest in the other two persons in the sector) holding limited access vessel permits who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted a TAC(s) in order to achieve objectives consistent with applicable FMP goals and objectives. In the formation of a sector, sector participants can

unless that Sector is allocated or acquires quota for all stocks found in that stock area. Additionally, Amendment 16 requires Sector vessels to cease fishing in a particular stock area if the Sector exceeds its allocation of any stocks caught in a particular stock area. Any overages at the end of a fishing year would also be deducted from that Sector's allocation during the subsequent fishing year. Common pool vessels are subject to a total allowable catch (TAC). Under this AM, the sub-ACL available to common pool vessels is apportioned as a percentage into trimesters of 4 months duration beginning at the start of the fishing year. The distribution percentage is adjusted through the biennial adjustment process and reflects the landing patterns of the most recent 5-year period. If a trimester TAC is exceeded/under-harvested, the overage/underage would be applied to the following trimester, with the exception that any underage could not be applied to the following fishing year's trimester TACs. For some stocks, if the Regional Administrator projects that 90 percent of the trimester TAC will be caught, the Regional Administrator would close the area where the stock is predominantly caught to all common pool vessels using gear capable of catching that species for the remainder of that trimester. If the entire common pool sub-ACL for a particular stock is exceeded (i.e., the common pool catch of that stock at the end of the fishing year exceeds all three trimester TACs for that stock combined, including the common pool's share of any overage of the overall ACL for a particular stock caused by excessive catch of that stock by vessels fishing in state waters outside of the FMP, exempted fisheries, or the scallop fishery), an amount equal to the overage would be deducted from the sub-ACL for that stock that is allocated to common pool vessels during the following year.

For the recreational fishery, the amendment included consideration of adjustments to seasons, size limits, or bag limits. NEFMC determined that AMs will be implemented at the end of the year following a fishing year with an overage. Additionally, NEFMC determined that a three-year average of recreational catch will be compared to a three-year average of the ACL to determine whether an overage has occurred.

Gulf of Mexico Fishery Management Council

In December 2011, NMFS implemented a generic amendment to the Red Drum, Reef Fish Resources, Shrimp, and Coral and Coral Reefs Fishery Management Plans for the Gulf of Mexico as recommended by the Gulf of Mexico Fishery Management Council (GMFMC) (76 FR 82044, December 29, 2011). Among other things, this generic amendment and the implementing regulations established initial ACLs for species and species groups not subject to overfishing, as well as inseason and post-season AMs to control or mitigate harvest levels with respect to those ACLs.

For species within the GMFMC's IFQ program, the quota serves as an AM for the commercial sector as landings are closely monitored and IFQ participants are limited to their individual quotas. Therefore, the GMFMC recommended, and NMFS implemented, AMs for the recreational sector in the event of a stock ACL overage for IFQ related species. If the sum of the commercial and recreational landings exceeds the stock complex ACL, then during the following fishing year, if the sum of the commercial and recreational landings reaches or is projected to reach the applicable

select who may participate. Only vessels with a limited access multispecies permit are eligible to join a multispecies sector. Vessels within the sector are allowed to pool harvesting resources and consolidate operations in fewer vessels if they desired.

ACL, the Assistant Regional Administrator will file a notification with the Office of the Federal Register to close the recreational sector only for the remainder of that fishing year. The commercial sector would remain open to fish under their IFQ. For non-IFQ species, NMFS implemented new AMs for both commercial and recreational sectors. For these stocks, if a stock or stock complex exceeds its ACL in a given fishing year, then during the following fishing year, if the sum of commercial and recreational landings reaches or is projected to reach the stock ACL, the commercial and recreational sectors would both close for the remainder of that fishing year.

Western Pacific Fishery Management Council

In June 2011, the Western Pacific Fishery Management Council implemented procedures and timing requirements for developing ACLs and AMs for western Pacific fisheries through an amendment to their Fishery Ecosystem Plans (FEPs) (76 FR 37285, June 27, 2011). The amendment established a procedure by which the Council would develop and recommend ACLs, including possibly multi-year ACLs, and AMs to NMFS for western Pacific fisheries. NMFS then monitors the fishery inseason. When an ACL is projected to be reached during the year, NMFS would notify fishermen and the public that fishing for the regulated stock will be restricted through one or more predetermined inseason AMs to ensure that the ACL is not exceeded. AMs would be developed through the ACL development process and may include, but are not limited to, closing the fishery, closing specific areas, changing bag limits, or otherwise restricting effort or catch. Any inseason restriction would remain in effect until the end of the fishing year. If inseason monitoring, or subsequent data analyses for those stocks that do not have data available inseason, indicate that an ACL was exceeded in the previous fishing year, the Council may also recommend that NMFS reduce the ACL for the subsequent year by the amount of the overage as a post-season AM.

PFMC
03/05/20