Minutes of the Joint Meeting of the Plan Teams for the Groundfish Fisheries of the Gulf of Alaska (GOA) and Bering Sea Aleutian Islands (BSAI)

North Pacific Fishery Management Council
1007 West Third, Suite 400
Anchorage, Alaska 99501
November 16, 2020

Groundfish Plan Team Membership:

BSAI Team		**GOA Team**	
Grant Thompson	AFSC REFM (co-chair)	Jim Ianelli	AFSC REFM (co-chair)
Steve Barbeaux	AFSC REFM (co-chair)	Chris Lunsford	AFSC ABL (co-chair)
Steve MacLean	NPFMC (coordinator)	Sara Cleaver	NPFMC (coordinator)
Mary Furuness	NMFS AKRO	Obren Davis	NMFS AKRO
Alan Haynie	AFSC REFM	Craig Faunce	AFSC FMA
Allan Hicks	IPHC	Lisa Hillier	WDFW
Lisa Hillier	WDFW	Pete Hulson	AFSC ABL
Kirstin Holsman	AFSC REFM	Sandra Lowe	AFSC REFM
Andy Kingham	AFSC FMA	Nat Nichols	ADF&G
Kalei Shotwell	AFSC ABL	Jan Rumble	ADF&G
Chris Siddon	ADF&G	Paul Spencer	AFSC REFM
Cindy Tribuzio	AFSC ABL	Marysia Szymkowiak	AFSC REFM
vacant	ADF&G	Kresimir Williams	AFSC RACE
vacant	USFWS	vacant	ADF&G
		vacant	USFWS

Administrative/Intro

Documents and presentations: All documents provided prior to or during the meeting as well as presentations given during the meeting were posted to the Council's electronic agenda.

Introductions: The Joint meeting for the Groundfish Plan Teams ("Teams") began on Monday, November 16, 2020 at 9:00am PST. Participation was remote via Adobe Connect. Roughly 140 people attended the meeting.

Minutes guidelines: Grant Thompson reminded Team members about formatting for recommendations in the minutes. The most updated guidelines for minutes are located on the electronic agenda.

September 2021 Team meeting: Tentative dates for the September 2021 Plan Team meeting are September 20-24, depending on whether the meeting will be held virtually or in-person.

Grenadiers

Cara Rodgveller presented the assessment of the grenadier stock complex in Alaska. Grenadier have been part of the ecosystem component (EC) in the BSAI and GOA since 2015. As such, no ABC or OFL is required for grenadier, but a SAFE report chapter is produced every four years. Under Amendments 100/91 to the BSAI and GOA FMPs, grenadiers are not allowed to be targeted, but there is an 8% Maximum Retainable Allowance (MRA) to allow for product testing and market development.

The authors provided updated estimates of catch and biomass calculated as relative population weight from the longline survey. New data inputs include catch data through September 22, 2020; 2018 and 2020 Aleutian Island (AI) biomass using the estimation method presented in the 2012 SAFE report; AFSC longline survey relative population weights (RPWs) in the Gulf of Alaska for 2017-2020, in the Eastern Bering Sea (EBS) for 2017 and 2019, and in the AI for 2018 and 2020; and updated GOA trawl survey biomass time series through 2019 using a random effects model. The authors also provide unofficial estimates of ABC and OFL using Tier 5 calculations. Catch is down in the Bering Sea and GOA. Grenadier are primarily caught in the Greenland turbot and halibut fishery in the Bering Sea and in the sablefish fishery in the GOA. Catch in the Aleutian Islands is fairly stable. The authors use the random effects model to estimate biomass down to 1000 m. Biomass is estimated at each depth stratum and then summed together to get the total biomass estimate. Biomass for the BSAI and GOA are both down and in the GOA is the lowest it has been since 1998. The slope bottom trawl survey has not happened for a while, but biomass has remained steady. The AFSC longline survey index is down in all areas, possibly due to hook competition for sablefish, since the latter are increasing. However, catch and biomass using other surveys are also down, and it is unknown how much sablefish are affecting grenadier on the longline survey.

Unofficial ABC for 2021 is 61,738 t in the BSAI and 21,623 t in the GOA, representing a 12% decrease in the BSAI and a 27% decrease in the GOA. Catches are well below these unofficial ABC and OFL estimates.

There was a question from the Joint Plan Team regarding whether any hook competition research existed to confirm the impact of sablefish on grenadier. Cara noted that a past publication demonstrated that grenadier and sablefish CPUE were negatively correlated and there has been a decrease in the grenadier longline survey index with a concurrent increase in the sablefish longline survey index in recent years. It is possible that the trends may be related; however, these indices do not move in opposite directions in all years and we lack data on how quickly grenadier are caught on the gear in relation to other species.

Another set of questions arose, regarding the MRA for grenadiers and whether a market developed for grenadier would result in them being moved out of the EC and back into the FMP. National guidelines state that the criterion for moving a stock/complex out of the EC is that it is in need of conservation and management; just because there is a market does not mean that a stock/complex has to be moved out of the EC (e.g., squid). Ten factors need to be considered when deciding on putting a stock in the EC (see 50 CFR 600.305). Grenadier are retained for fish meal and survey bait, and retention and deliveries are recorded. However, Cara mentioned that there is a potential problem with retention data in that there is no way to distinguish between fish being dumped or retained after landing for use as fish meal.

The Teams accepted the authors' unofficial recommended ABCs and OFLs, which are not management quantities, but used for monitoring only.

Sablefish

ESP

A partial/updated ESP for sablefish was presented by Kalei Shotwell. Of note were the marine heatwave conditions, which the ESP points out impacts different areas of the distribution differently, the declining YOY growth index, and below average condition for the age-4 and large female sablefish on the longline survey. The authors also noted that the incidental catch of sablefish in the arrowtooth fishery has been high the last four years, which they are interpreting as a change in the overlap or distribution of the species and not meant to be a socioeconomic indicator. The authors presented updated indicator analysis scores, in which the ecosystem and socioeconomic scores appear to be negatively correlated. The Teams discussed if this could be partially related to a lack of size-based socioeconomic indicators.

The Teams note the amount of effort required to produce even a partial update and commend the ESP team for their efforts. The authors point out that it is an evolving process and therefore more onerous than it will be in the future. The authors intend to develop a plan for the timing of contributions, similar to the ESRs, to help make the ESP process more streamlined.

The Teams pointed out that sablefish bycatch has shifted from a minor to major issue.

The Teams request that the next ESP include a thorough socioeconomic analysis of the impacts of the bycatch on various fleets.

The Teams also suggest that the ESP developers explore the idea of “hot topics,” similar to the ESR.

Assessment

The assessment was presented by Dan Goethel. The Teams discussed many aspects of the model (Model 16.5) which is unchanged from the previous assessment. The Teams spent some time discussing fishery data and indices included in the model. The author showed how the top four year classes were distributed among regions through time based on the survey ages. The Teams discussed how a distribution based on fishery data might compare to this. The author noted that it would be possible to compute such a distribution, but trends would be more difficult to see.

The Teams request that the authors explore the spatial distribution of the top four year classes (within the timeframe of the assessment) in the fishery data (i.e., repeat Figure 3.23 from the SAFE chapter using fixed gear fishery data) and consider the changing fishery dynamics. The Teams request that this exploration consider how the spatial distribution of these year classes in both the fishery and survey may have changed with respect to changes in the environment, and if possible compare them to the spatial distribution of the 1977 year class (if possible, given available data).

the Teams recommended that, to the extent practical, the authors look into bycatch in the foreign pollock fishery to evaluate its impact on the sablefish stock, particularly if a similar pattern occurred when there was a large 1977 year class.

Further discussion on fishery data focused on fishery CPUE and changes in the fishery dynamics. The fishery CPUE index is for the longline fleet only. As more vessels move to pots, this index should incorporate both gear types. The Teams were concerned about vessel effects

because the characteristics of vessels switching to pots may be different from those using longline gear. Further, effort data are currently limited for vessels participating in the fixed gear electronic monitoring (EM) program.

The Teams requested that authors explore vessel effects on the fishery CPUE indices, given the changing fleet dynamics and loss of data due to vessels switching to EM.

The Teams also recommended that the authors evaluate the CPUE index further and include pot gear if data are available.

Because the EM fleet may be spatially concentrated and could be limited to certain sizes of vessels, there may be significant changes in the average CPUE from the change in vessels included in the index that could be conflated with biologically driven changes.

The Teams recommended an evaluation of EM's impact on data available for the assessment.

FMA staff noted that they anticipate the proportion of the fleet participating in the fixed-gear EM program will increase in the future. This change in the fleet observer coverage type changes the data that are available for the assessment, in particular effort data and biological samples. One solution for the lack of CPUE data would be to substitute logbook data. The Teams also suggest that the authors, and representatives of other assessments which use fishery CPUE, meet with the AKRO to determine if and how logbook data from vessels in the fixed gear EM program may become available to assessment authors. The Teams encourage authors to reach out to the fleet to discuss data availability concerns. Regarding vessels moving to EM, the authors expressed concerns over reduced biological sampling due to fewer at-sea human observers.

Retrospective bias is a substantial concern for this model. The 2016 CIE review suggested that the model was overfitting the indices and underfitting the compositional data, and weighting has not been examined since. The author described plans to explore the weighting in future assessments and ran some sensitivity analyses for this year's presentation. The fits to the indices improved dramatically when Francis reweighting was undertaken (not presented in the 2020 SAFE). Although the author noted slight overestimation of the indices, it was not nearly as extensive as in the base model. The retrospective pattern remains a concern for this assessment, in particular the terminal year. The author pointed out that reweighting fixed much of the retrospective pattern, however not the terminal year issue. This is likely due to data lags and fixed recruitment in the terminal year.

The author described the high bycatch in the BSAI trawl fisheries in recent years. The Teams discussed whether there was a potential year class effect. The author noted that the 1977 year class was estimated to be similar in magnitude to the 2014 year class and may have spread widely through the BSAI based on analysis of the longline survey proportions by area during the late 1970s and early 1980s. The primary concern regarding bycatch by trawl fleets in the BSAI is how long it takes for the bycatch of an incoming year class to decline (as a proportion of the extant numbers at age). One other concern, with regard to bycatch in the trawl fisheries, is that biological sampling of sablefish is a low priority for at-sea observers and thus composition data from those fisheries may be limited.

It was noted that the switch to pot gear may become very rapid as the fleet is now using slinky pots, which allow pot usage on smaller boats than previously. With these new pots, pot usage is expected to grow more quickly than with just the transition to standard pots.

Because this is a Tier 3 assessment, estimation of biomass reference points is based on "average recruitment," as specified in the FMP. Because of the apparent intermittent nature of recruitment in this stock it was noted that the arithmetic mean may not be the best method for projecting recruitment. The Teams discussed this briefly, noting that any new investigation of the issue might begin by consulting the September 2014 minutes of the Joint Teams and the reports presented by the Recruitment Working Group.

The Teams also requested that the authors revisit the age-independent natural mortality assumption, as age-specific natural mortality may be more appropriate.

The Teams requested that the authors continue their investigation into updating the maturity curve, which seems to suggest a shift to later age at maturity.

Risk table/ABC

The Teams reviewed the risk table presented by the author. Team members expressed a range of opinions about the scores. Some members agreed with the authors' description of uncertainty and level of concern, while others suggested that, although the concerns expressed were appropriate, they disagreed with the level of concern and how that would apply to a reduction from maxABC. For example, in the "assessment" category of the table, a level 3 score is one step shy of fully rejecting the model (level 4), and the Teams agreed that this assessment model did not warrant a level 4 concern. However, there were substantial concerns within the model that could justify a level 3, in particular the high retrospective bias. The Teams suggested that the rise of the pot fishery in the GOA is an assessment model consideration as opposed to a fishery performance consideration. Overall, the Teams agreed with the authors that a reduction from the maximum permissible ABC was warranted.

Some Team members were reluctant to support the authors' recommended reduction from the maxABC. First, the stock is increasing and maintaining a constant ABC implies that it may not be. Second, the authors' recommended F rate discounts the inherent value of the assessment model, whereas the concern is with the projection model. The Teams reiterated their concern about the current model due to the retrospective pattern, but did not reject the model.

The Teams discussed the projected ABC "bookends" provided by the author: ABCs based on the standard Model 16.5 (upper bound) and the same projection model with average recruitment (lower bound). The authors' recommended ABC is similar to the ABC based on average recruitment based. The Teams noted that the projection model is likely very optimistic, as the recent high recruitments have continually been downgraded in subsequent years' assessment models. There is precedent for reducing ABCs based on average recruitment.

While noting the concerns expressed above, the discussion circled around there being no compelling case for any single reduction recommendation. The Teams noted that the ABCs based on average recruitment may also be acceptable.

The Teams noted that, over the years, many more (and more complicated) assessments have been added to the meeting agendas, yet the meeting lengths have remained approximately the same. A sub-group, or groups, to perform more in-depth reviews prior to the meeting might lead to more efficient and informed discussions.

Apportionment

Diana Stram provided an overview of Annual Catch Limits (ACLs), Accountability Measures (AMs), and the Council's apportionment and spatial management policies (https://www.npfmc.org/wp-content/PDFdocuments/SPECS/SpatialMgtPolicy1013.pdf).

The OFL is the catch level that corresponds to the stock's maximum sustainable yield. For 2020, the SSC set the OFL statewide to represent the overall area of the stock boundary. No biological reasoning has been brought forward for further stock separation. The ACL (= ABC) is at the spatial scale of the OFL (statewide). Among the issues are that, in 2019:

1. Catch exceeded the Alaska-wide ACL/ABC by 1,487 t or 10% of the Alaska-wide ACL/ABC and the Alaska-wide catch was 50% less than the Alaska-wide OFL.
2. The 2019 area and gear allocations with catch overages (amount in parentheses) with respect to the TAC allocations were non-CDQ Bering Sea trawl gear (1,764 t), Western GOA trawl gear (4 t), Central GOA fixed gear (181 t), Central GOA trawl gear (924 t), West Yakutat district fixed gear (94 t), and Southeast Outside district fixed gear (140 t). The catch for all other areas and gear allocation were under their respective allocations of the TAC.

According to the MSA National Standard 1 Guidelines, the AMs should prevent exceeding ACLs and correct or mitigate overages of the ACL if they occur. The following are AMs for the BSAI and GOA:

- Observer coverage
- Catch accounting
- In-season management authority
- Harvest specifications

The Council acknowledged that the SSC set the OFL statewide to represent the overall area of the stock boundary. The sablefish stock biomass is increasing and the overages in 2019 and 2020 are unlikely to represent a conservation concern requiring additional Council action (outside of the AM already taken during the Dec. 2019 specification process).

The Council's spatial management policy states that:

"Step 1) As soon as preliminary scientific information indicates that further stock structure separation or other spatial management measures may be considered, the stock assessment authors, Plan Teams (groundfish, crab, scallop), and SSC should advise the Council of their findings and any associated conservation concerns."

The issue is whether the sablefish spatial catch and conservation concerns are related primarily to research priorities, or are raised to a level relevant to the Council's Spatial Management Policy. The Teams acknowledged that exceeding an area-specific ABC does not exceed the ACL since (ACL =ABC) is set at the spatial scale of the OFL.

There are biological considerations that would influence the need to change the apportionment scheme and move away from a fixed apportionment scheme. These include large changes in spatial distributions, the age compositions, the possibility of age differential natural mortality, etc. Four apportionment strategies were presented, including the fixed apportionment strategy.

Given the indication that there are no stock-wide concerns or biological differences amongst the options, and with the authors' recommendation of the non-exponentially-weighted survey-based option, the Teams recommended that a range of apportionments, rather than a single apportionment, be forwarded to the SSC, AP, and Council for their consideration. The Teams expressed a preference to move off of the current fixed apportionment in place since 2013 and move toward the non-exponential survey-based apportionment. How quickly, and to what degree, this occurs is a policy decision. Thus, while the authors provided a specific stairstep option, the Teams did not weigh in on a preferred increment. Both bounds are provided to establish an adequate range but the Teams recommend moving away from the fixed apportionment in this specifications cycle, while leaving it to the SSC, AP, or Council to weigh in on the appropriate apportionment.

The Teams discussed additional information that could be provided in the future to help inform the implications of varying apportionment schemes and what the best forum is for providing that information outside of the assessment. Specifically, they requested calculation of the differential exploitation rates by area that would be realized under different apportionment schemes given the default allocation of catch by area to fixed and trawl gear (i.e., 50:50 in BSAI; 95:5 in GOA WYAK, SEO; rest of GOA 80:20). While information is currently sufficient to make changes to the apportionment for 2021, discussion noted that a separate workshop could be held in 2021 to provide additional information on a range of apportionments including both differential F rates as well as socio-economic considerations that are not included in the assessment. The Teams note that proposed alternate methods for computing subarea ABCs constitute "spatial management measures" that are referenced in Step 1 of the Council's Spatial Management Policy. The Teams recommend that the SSC and Council consider application of the Spatial Management Policy and thus host a Council workshop in 2021 to evaluate both the fishing mortality rates by gear associated with different apportionment schemes as well as the management and socio-economic considerations of alternatives. This workshop would satisfy step 2 of the policy, which is to "identify the economic, social, and management implications and potential options for management response". The Teams also referred back to the SSC requests from the June 2020 meeting regarding additional analyses, noting that these should also be included for the workshop. As opposed to the Teams convening a workshop on their own, convening this workshop as an outgrowth of the Council's spatial management policy is more consistent with the intent to pull in a broader range of Council and NMFS RO staff to address management concerns that are outside of the scope of the assessment and the expertise of the stock assessment authors.

A Council-led workshop might also benefit other stocks that have spatial management issues, and could clarify general questions regarding application of the policy. For example, although the Spatial Management Policy was applied to BSAI blackspotted/rougheye rockfish in 2016, disproportionate harvesting has continued and grown worse since then, and discussions of spatial management have been a near-annual event at BSAI Team meetings. Some general guidance on application of the Spatial Management Policy could address the following issues: 1) What are the criteria for assessing whether a spatial management tool has been effective? 2) What are the specific criteria for when the Policy should be applied (either for the first time for a stock, or follow-up applications)? 3) Are there criteria for balancing conservation concerns (i.e., stock biomass and productivity) vs socio-economic concerns, and do these vary between target and bycatch stocks? In general, providing additional spatial limits on stock exploitation may increase the long-term productivity of a stock, but there are management trade-offs (especially under the 2 million ton BSAI OY cap) and more discussion is needed about about how to address uncertainty that can arise with young, very uncertain year classes and with climate change that may shift the spatial distributions of some stocks.

Economic SAFE

Steve Kasperski presented the Economics SAFE Report. The Report updates available economic information for 2019; as always, there is a one-year delay in most economic data. However, the report includes 2020 current-year price projections and new figures that compare inseason catch rates throughout the year. Given unprecedented conditions resulting from COVID-19, the Economics SAFE Report authors have also included “nowcast” (or 2020) revenue projections for each species through September 2020. These trends demonstrate 2020 revenue losses relative to previous years, but the authors noted that fishing can shift seasonally so that some of the revenue may be recuperated later in the year.

Steve noted where Economic SAFE data may be found online and the overall structure of the report. The data underlying the Econ SAFE is publicly available through the AKFIN Apex reporting system (https://reports.psmfc.org/akfin) as well as the Pac States Ejournal of Sci Visualization (https://psesv.psmfc.org/). In general, the core content is purposely static and the report card metrics provide a high-level overview of changes relative to the longer time series. ESSR also provides socioeconomic information into the species-specific EPRs and ESPs.

Steve presented the overall status and trends within the Groundfish SAFE for 2019. The FMP groundfish real first wholesale price and revenue indices were down slightly in 2019 relative to recent years but high relative to the overall trend since 1993. The FMP groundfish ex-vessel share of first-wholesale revenue was relatively static from 2018 to 2019, while the Alaska resident share of FMP groundfish shoreside ex-vessel value continued a decreasing trend that began in 2017. Alaska’s effective share of pollock and cod global catch remained static from 2018 to 2019, and was similar to recent years, while the effective real exchange rate index for AK fisheries exports (foreign currency per dollar) increased slightly. The total catch of FMP groundfish decreased by about 2% or 2.18 million metric tons, while aggregate ex-vessel value was stable to increasing in the BSAI and decreased in the GOA. In the aggregate, although prices were relatively stable, decreasing harvests led to decreased values. The wholesale revenue decomposition figures in the BSAI show large increases in pollock revenues due to the coupled effect of increasing harvests and prices, with the highest prices since 2012/2013. Pollock in the GOA had a net revenue decline despite strong prices, and GOA rockfish and sablefish had large revenue declines. The latter was a continuation of the downward trend in 2018 due to decreases in size of average fish and price margin between fish sizes.

The “nowcasts” for revenues for 2020 show a year-over-year decline in harvest volumes through September of approximately 11% compared with 2019, and ex-vessel revenues are expected to be down 4% from 2019. The GOA year-over-year harvest volumes fell 27% through September in 2020 and ex-vessel revenues are expected to be down 32% from last year. For pollock, with lower prices and stable to decreasing expected catch levels revenues can be expected to decrease in 2020 to about 2018 levels. First-wholesale pollock prices for 2020 show price decreases for fillets and H&G, stable prices for surimi, and a decreasing price for roe. For Pacific cod, ex-vessel prices in 2020 are expected to decrease and, coupled with lower volumes, will lead to lower revenues. Prices in 2020 are going to be at approximately 2016/2017 levels but remain strong relative to historical levels. For sablefish, ex-vessel prices are expected to decrease further in 2020. Yellowfin sole prices are predicted to be down slightly in 2020 and arrowtooth prices are expected to be similar to 2019. Atka mackerel prices are expected to decline slightly in 2020 and rockfish prices to increase.

ESSRP is providing NMFS leadership with information on the progress of catch and production as well as other COVID-related impacts to Markets. A National working group, co-led by Ben Fissel, is analyzing trade impacts since COVID and reporting to NMFS S&T.

Ocean Strategies, LLC is conducting a COVID-19 impact survey (not affiliated with NMFS or the Council) on West Coast and Alaska fishers, which closes Nov 25th, see:

https://www.oceanstrat.com/updates/2020/11/3/survey-tracks-covid-19- impacts-on-fishermen .

Steve also presented information on fishery performance and community information. Steve described the range of sources that contribute to social science analysis that is part of the Annual NPFMC cycle. Namely, Steve noted the 1) Econ SAFEs, 2) Ecosystem Status Reports (ESR), 3) Economic Performance Report (EPR) / Economic and Socioeconomic Profile (ESP), 4) Annual Community Engagement and Participation Overview (ACEPO), 5) Webtools, and 6) Other Sources (e.g., research, testimony, PTs, SSC input etc.). Steve discussed the staff members who take leads in each of these areas.

There are a number of human dimensions objectives in the MSA as well as its biological objectives. Steve described a number of indices that are informative about each of the following MSA Objectives: 1) Seafood Provisioning, 2) Commercial Profits, 3) Employment, 4) Recreational Opportunities, 5) Community Resilience, 6) Fishery Sustainability, and 7) Stability.

Steve also presented the Annual Community Engagement and Participation Overview (ACEPO) that was prepared by Sarah Wise. The ACEPO presents a variety of Engagement Indices and regional shares of landings revenues for communities highly engaged in commercial harvest. School enrollment has been trending downward in most fishery-dependent communities, with the exception of Petersburg. This has been especially true in the communities on Kodiak Island.

Alan Haynie mentioned the SocioEconomic Aspects in Stock Assessments Workshop, (SEASAW) which will publish a technical report this winter. The report will provide some direction for ways to better utilize economic data and analysis in the stock assessment process; authors will communicate the results to the Teams next year.

There was the discussion among Team members about the relationship between stock-specific community information and broader, community-specific data.

The Teams would like the SSC to clarify how the community information should be presented in a stock-specific manner in ESPs, or if it could better be placed in the broader context of the changes being experienced by communities.

Risk table

The Teams completed a risk table summary (see table below) with 2019 and 2020 author recommended values for comparison. The Teams noted that there were differences in treatment of the levels among assessments, and did not assert that there was consistency across assessments. The Teams did not recommend any changes to the author-recommended risk table scores this year. At the close of the meeting, there was a brief discussion about ensuring adequate time for a risk table discussion during the September 2021 Joint Plan Team meeting.

Please refer to the minutes for the individual stock as well as the risk table discussion in the Harvest Recommendations section of the respective SAFE chapters for more information regarding the risk table levels, proposed reductions, and issues identified by the authors.

Table of stock-specific risk table levels for 2019 and 2020.

Stock	Assessment	Population	Environment	Fishery	Proposed

	related		Dynamics		Ecosystem		Performance		Reduction	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Sablefish	2	3	3	3	2	2	3	3	57%	57%
EBS pollock	1	1	2	1	2	2	2	2	43%	30%
Bogoslof pollock		1		1		1		1		0%
AI pollock		1		1		1		1		0%
EBS Pacific Cod	1	1	1	1	2	2	1	1	*	0%
AI Pacific cod	1	1	1	1	2	2	1	1	*	0%
BSAI Yellowfin sole	1	1	1	1	1	1	1	1	0%	0%
Alaska Plaice	1		1		1		1		0%	
BSAI Greenland turbot		1		1		2		1		0%
BSAI Arrowtooth		1		1		1		1		0%
BSAI Kamchatka		1		1		1		1		0%
BSAI Northern rock sole		2		1		1		1		0%
BSAI Flathead		1		1		1		1		0%
BSAI Other Flatfish		1		1		1		1		0%
BSAI POP		2		1		1		1		0%
BSAI Blackspotted/RE		3		2		1		2		0%
BSAI Northern Rockfish	2		1		2		1		0%	
BSAI Shortraker		1		1		1		1		0%
BSAI Other Rockfish		2		1		1		1		0%
BSAI Atka Mackerel	1	1	1	1	1	1	1	1	0%	
BSAI Skates		1		1		1		1		0%
BSAI Sharks		2		2		1		1		0%
BSAI Octopus		1		1		1		1		0%
GOA pollock	2	1	1	1	1	1	1	1	10%	0%
GOA Pacific cod	2	2	2	2	2	1	1	1	*	0%
GOA Northern Rockfish		1		1		1		1		0%
GOA Arrowtooth	1		1		2		1		0%	
GOA Deepwater Flatfish	2		1		1		1		0%	
GOA POP	2	2	2	2	1	1	1	1	0%	0%
GOA Northern Rockfish		1		1		1		1		0%
GOA Dusky Rockfish		2		1		1		1		0%
GOA Rougheye/BS	1		1		1		1		0%	
GOA Thornyheads		1		1		1		1		0%
GOA Other Rockfish	1		1		1		1		0%	
GOA Shortraker	1		1		1		1		0%	
GOA Atka Mackerel	1		Unknown		1		1		0%	
GOA Skate	1		1		1		1		0%	
GOA Sharks		2		2		1		1		0%
GOA Octopus	1		1		1		1		0%	

* Authors did not provide a recommendation and deferred to the SSC.

Please note that some stocks on a three or four year cycle have not had risk tables completed as of yet. These stocks include GOA shallow-water flatfish, GOA flathead sole, GOA northern and southern rock sole, GOA rex sole, and demersal shelf rockfish.