NPFMC Stock Structure/Spatial Management workshop report

Alaska Fisheries Science Center

The North Pacific Fishery Management Council (NPFMC) convened a workshop on July 21, 2016 at the Alaska Fisheries Science Center in Seattle, WA to discuss issues related to stock structure and spatial management focused specifically on BSAI blackspotted/rougheye (BS/RE) management in the western Aleutian Islands.

Attendees in person and via webex: Paul Spencer, Dana Hanselman, Cindy Tribuzio, Alan Haynie, Mary Furuness, Ian Stewart, Ernie Weiss, Diana Stram, Ingrid Spies, Beth Concepcion, Todd Loomis, Grant Thompson, John Gauvin, Annika Saltman and Anne Hollowed

The agenda for the meeting is attached as is the primary PowerPoint presentation which was prepared for the meeting by Dr. Paul Spencer to frame the discussion. Updated catch of BSAI BS/RE as of September 3, 2016 as reported by the NMFS AKRO is attached.

Summary of Discussion items:

Diana Stram summarized the Council's motion from December 2015 to establish guidelines for addressing stock structure and spatial management concerns based upon the proposed timeline and schedule from the Joint Plan Teams (Table below):

Month	Action
September/October (year 1)	Notification of strong stock structure concern. SSC indicates to Council that it has 11 months to develop suite of tools and management and economic implications of the application of these tools to the stock/complex in question.
March/April (year 1)	Suite of proposed management tools compiled. One of these would be separate ABCs and/or OFLs per recommendations listed earlier.
March/April-August (year 1)	Evaluation of suite of management tools for consideration of management and economic implications. Note that this does not necessarily mean a comprehensive analysis; this could simply be an informed listing of the likely implications of each tool.
September/October (year 2)	Team/SSC/Council review of suite of tools and selection of approach for use in the coming harvest year (assuming that the approach does not require rulemaking).
2 years later: September/October (year 4)	Update on result of application of tool. If deemed insufficient to address issue, consideration of additional measures (e.g., area split).
Continuing forward annually in September/October	If management tool successful over 2 year time frame, continued annual update on progress. Consideration of performance criteria for continued need for tool.

Paul Spencer provided an overview of BSAI BS/RE stock structure and spatial harvest, and the background on the recommendations for the maximum subarea species catch (MSSC) beginning in 2014.

In 2014, the fishing fleet used an informal catch level as a *de facto* subarea ABC for the Western Aleutian Islands (WAI) harvest of BS/RE. In 2015, this informal catch level was termed the "MSSC" and reviewed by both the Plan Team and SSC. The NMFS Alaska Regional Office created a separate link[1] for informing the fleet as to catch accruing towards this MSSC and posted and distributed information bulletins periodically which reported catch accrual towards the MSSC. In both 2014 and 2015, the WAI catch of BS/RE exceeded this catch level. In 2015, the Amendment 80 vessels were able to limit their catch below the MSSC, but the reduction of SSL restrictions on the Pacific cod longline sector and increased effort in the WAI by this sector led to additional blackspotted catch in the WAI in the cod fleet, exceeding the aggregate MSSC for 2015. The longline participants were not aware of the MSSC, but have since been made aware of it and the fact that a failure to adhere to it may lead to additional formal spatial restrictions. Catch in the WAI for 2016 for all sectors is currently below the MSSC and representatives from the fishing industry have indicated they expected the total 2016 catch to be below the MSSC (see attached catch as of September 3, 2016).

As part of Dr. Spencer's analysis, weekly bycatch rates (tons of bycatch species/tons of target species) of blackspotted/rougheye rockfish in various target fisheries the eastern AI/EBS in 2013 were examined to evaluate whether bycatch rates declined once the subarea ABC has been reached. BS/RE rockfish in this area were placed on non-retention status in July of 2013. These data suggest for several fisheries, including arrowtooth flounder, "rockfish" (primarily POP), and Atka mackerel, bycatch rates of BS/RE after BS/RE were place in non-retention status declined relative to bycatch rates earlier in 2013 prior to non-retention status.

Discussion by the group and public noted mechanisms which may result in reduced or more variable weekly bycatch rates, including changes in the sectors of the fleet fishing within the year, potential trade-offs between target catch in multiple flatfish targets with halibut bycatch, trends in BS/RE catch by area when aggregating over time, and trade-offs (specifically in 2013) of shortraker rockfish catch approaching an OFL and the resulting avoidance of areas where shortraker were expected to be present. It was recommended that potential future analyses more carefully assess all of these factors. Given the responsiveness in which the fishing industry has altered their behavior to remain below the MSSC in the WAI and previous reductions in bycatch rates following a subarea ABC being reached , it is expected that a subarea ABC for blackspotted/rougheye rockfish would also produce a reduction in bycatch rates should that management option be selected. Further consideration should be given to the risk of periodic overages of the MSSC by area. Some additional consideration could be given to other cases where TAC is set below ABC and to what extent this is relevant for consideration of BS/RE. It is not clear how frequently the expressed concerns over the impact of sub-area ABCs on the TAC-setting process would be realized given the tendency to set TAC = ABC for this stock in most years.

Some concerns were expressed by members of industry that the border between the western and central Aleutians Islands bisects important fishing grounds and is not biologically meaningful. Following the workshop Dr. Spencer examined the spatial distribution of tows sampled by fishery observers and found a relatively small percentage of fishing effort close this border; details can be found in a companion paper prepared for the Plan Team.

[1] https://alaskafisheries.noaa.gov/sites/default/files/reports/car112_rougheye_rockfish_catch2016.pdf

The group summarized the available tools for BSAI BS/RE into two main categories – 1) a subarea ABC and TAC and 2) an MSSC. A brief presentation of the perceived benefits and drawbacks of each of these are shown in the table below:

MANAGEMENT MEASURE CONSIDERED	***BENEFITS***	***DRAWBACKS***	***POTENTIAL MODIFICATIONS AND OTHER CONSIDERATIONS***
SUBAREA ABC AND TAC	Transparent and familiar catch limit and in-season response mechanism for putting on non-retention status Clear disincentive (and lack of revenue) to catch fish when ABC is reached.	Some potential to increase in discards without decreasing total catch (assuming current catch level are primarily incidental with no targeting to top off); unclear what the implications for subarea ABC for remaining sub-areas would be; May cause unnecessary avoidance of good fishing areas which may have other negative impacts;	Request that the stock assessment author provide proposed splits for all sub-areas so that it is clear what the proposed ABC/TAC implications are to all areas.
MSSC	Provides flexible measure to increase avoidance (assuming that the fishing fleet is motivated to not exceed the MSSC) without closing fisheries or increasing discards or forcing the Council to spatially divide the TAC as part of the TAC-setting process.	Less transparent than ABC or TAC level because it does not appear in the harvest specifications or the Federal Register; no immediate management response to exceeding MSSC. Additional work for stock assessment scientists, Plan Teams/SSC, and managers to create, monitor, and manage a separate category of harvest advice.	The Council could declare that it will impose an all-area TAC reduction in subsequent years if the MSSC is exceeded which could provide a stronger political incentive for industry to adhere to the MSSC. A lower TAC would be established to further account for management and implementation uncertainty.

MSSC (CONT)		Because the MSSC does not correspond to a recognized management unit (i.e., areas for which we have OFLs/ABCs/TACs), it could more easily be removed and thus fail to prevent high exploitation rates in the future. May cause additional and unnecessary avoidance of good fishing areas which may have other negative impacts;	
MULTI-YEAR AVERAGE TO CALCULATE OVERAGE	Could provide increased incentive in low years to reduce catch to enable catch in future years when it is difficult for the fleet to avoid.	Would require multi-year tracking of catch.	This would create a 2- or 3-year average MSSC; if exceeded it would trigger a subarea ABC. The average would be a running average so there would always be a future cost of current exceedances. Additional discussion required how to average over years if biomass changes dramatically.

Some additional information will be provided by the stock assessment author at the September Joint Plan Team meeting as well as proposed subarea ABC allocations for consideration in the 2017 specifications cycle. Some additional consideration may be given to what level of overage represents a biological concern and on what temporal basis (i.e., inter-annual catch on average with some variance to account for variability above and below average). The BSAI Plan Team will make a recommendation in September for the 2017 specifications based on the range of tools discussed.

General implications for stock structure and spatial management of other stocks:

The workshop participants discussed the pros and cons of extending the MSSC concept to other stocks with specific area catch concerns. Multiple MSSC for various stocks may create a management impact regardless of the lack of regulatory requirements due to necessity of maintaining separate catch accounting and informational bulletins for additional stocks (such as the northern rockfish example discussed), as well as a lack of clear criteria determining which stock would use subarea ABCs and which

stocks would use MSSCs. For BS/RE in the WAI there are limited number of boats targeting POP and Pcod; thus for this fishery with the limited number of participants and the cooperative structure in place, the use of an MSSC guideline has a high potential to be successful. In the WAI, the POP fishery has no new participants but for the Pcod fishery there could be additional non-trawl participants in the future, thus complicating information dissemination for the entire fleet.

In general, some framework considerations should be assessed for use of voluntary measures such as the MSSC including: 1) who are people that could fish in this area? 2) is there a management structure in place to adhere to such a voluntary measure?

The evaluation contained in this report, while not comprehensive, does follow the guidelines of an informed consideration of likely outcomes, and does provide more information for making a management decision for BS/RE than what was available in previous years. Some members of the workgroup have expressed interest in conducting a more comprehensive analysis, although the extent to which this would be required for making a management decision for BS/RE for 2017 will need to be decided. Any potential future analyses will need to distinguish between topics focused specifically on BS/RE and topics that pertain generally to management of stocks with spatial structure. Future analyses will also benefit by clearly defining and quantifying (if possible) the types of costs and benefits to be considered (i.e., defining the problems that motivate consideration of alternative management systems), although some of the drawbacks noted above (e.g., transparency, additional workload) may be difficult to quantify.

Draft agenda for Blackspotted/Rougheye (BS/RE) rockfish stock structure/spatial management workshop

July 21, 2016

AFSC Seattle (Traynor Room)

1:30-5:30pm (Webex available details below)

1:30 Introductions, agenda and objectives of workshop per Plan Team and Council direction

1:45pm Overview of BS/RE assessment and background on catch issues

2:30 pm Discussion of available tools and input from workgroup and public participants

3:30 Comparison of alternative management measures with subarea ABC management. How should the efficacy of these measures be evaluated?

4:30pm Next steps for BS/RE for 2016 assessment and BSAI Plan Team discussions for September

5:30pm adjourn

Webex information:

AFSC WebEx1 invites you to join this WebEx meeting.

BS/RE spatial management Thursday, July 21, 2016 1:30 pm | Pacific Daylight Time (San Francisco, GMT-07:00) | 4 hrs 30 mins Meeting number: 804 063 749 Meeting password: ss123

For questions please contact Diana Stram at: diana.stram@noaa.gov

Evaluation of spatial management for BSAI blackspotted/rougheye rockfish

Paul Spencer
Alaska Fisheries Science Center

Background

2010

Initial stock structure analysis, and noted that WAI catches were frequently above the "potential" subarea ABCs. Plan Team found "*stock structure within the BSAI area*" (September, 2010), and recommended WAI/CAI and EBS/EAI areas for subarea ABCs.

2012

Presented exploitation rates, and some comparisons between fishery and survey data.

Outline

- Background on the management process, and blackspotted/rougheye rockfish spatial management and catch issues
- Comparison of recent spatial management to subarea ABCs
  a) Effectiveness in reducing bycatch
  b) Efficiency of communication of information
  c) Safeguards to minimize risk of future high subarea exploitation rates.
- Summary/Conclusions
- Thoughts for discussion

2013 – Management process activity

April -- A workshop on stock structure and spatial management was held.

September -- Questions for Council clarification are raised by the Joint Plan Team.

October -- A Council policy on stock structure and spatial management was created.

2013 – Blackspotted/rougheye activity

September -- A report was presented to the Plan Team that identified 1 genetic and 6 non-genetic attributes related to the estimated low abundance and relatively high exploitation rates of blackspotted rockfish in the western Aleutian Islands. The Plan Team found the information "*compelling*" and expressed "*strong concern*".

November -- The BSAI Team "*anticipates a management response* [for blackspotted/rougheye rockfish] *in 2014*"

December -- The 'potential' WAI ABC level for 2014 was informally discussed between the assessment scientist and an industry representative as a guideline to assist voluntary effects to reduce bycatch.

2015

September -- The Team endorses the SSC's recommendation that a subgroup of Team, SSC, and Council members be formed to address the questions regarding stock structure and spatial management posed in both the November 2013 and November 2014 Team minutes, as well as to work on additional tools or potential management actions to address findings of "moderate" or "strong" concern.

October -- The SSC recommends:

1) a workgroup be created to initiate step 2 of the Council policy (i.e., evaluate management options);

2) the Council work with the Regional Office to establish a mechanism for inseason reporting to the industry when the MSSC goal is being approached;

3) Improved outreach should be undertaken to advise all recent and prospective new fishery participants about concerns regarding the blackspotted/rougheye rockfish complex.

2014

September) The BSAI Team continues to express concern regarding this stock complex, and "*recommends continued annual reporting on the status of the population in each management area*"

October) The SSC requests that stock structure policy include a recommended maximum area specific catch level for stocks with a stock structure "concern" in order to provide a clear guide to industry regarding what reductions in catch would be needed to alleviate the "concern".

November) The Plan Team notes that the steps associated with the Council policy on stock structure and spatial management for blackspotted/rougheye rockfish have not been taken.

The Council Policy (Paraphrased)

1. *. . . Plan teams (groundfish, crab, scallop), and SSC should advise the Council of their findings and any associated conservation concerns.*
2. *With input from the agency, the public, and its advisory bodies, the Council (and NMFS) should identify the economic and management implications and potential options for management response to these findings and identify the suite of tools that could be used to achieve conservation and management goals. . . .*
3. *. . . further refinement . . . should be discussed through the process described in recommendations 1 and 2 above.*
4. *Based on the best information available provided through this process, the SSC should continue to recommend OFLs and ABCs that prevent overfishing of stocks.*

Recommendation from the Stock Structure/Spatial Management Workgroup

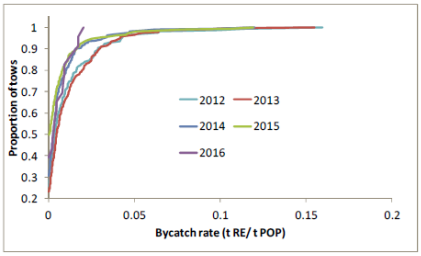
"... the list of alternative tools/options to be included under Step 2 of the Council process should always include separate harvest specifications at the TAC level, the ABC level, the OFL level, or all three"

From the December, 2015 NPFMC minutes:

"The Council requests that the workgroup continue to meet to develop possible additional management tools and convene a public meeting . . . to solicit public input on those or other options for consideration in the 2017 specifications."

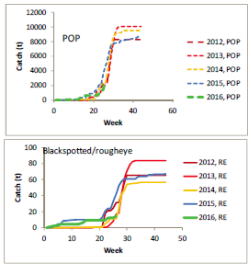
Effectiveness in reducing bycatch

Recent bycatch rates of western Aleutian Islands blackspotted/rougheye rockfish (Observer data, POP target, A80 vessels)



Effectiveness in reducing bycatch

Recent catches of western Aleutian Islands blackspotted/rougheye rockfish



Efficiency of communication (to the Plan Team)

- Information on management activity is communicated to the Plan Team via presentations and reports from the stock assessment author in September, primarily because this information is not available from traditional reporting sources (i.e. harvest tables)
- Early years consisted of the stock structure template (2010) and updates on exploitation rates and biological information (2012, 2013). Recent years have requested information on management and fishery activity.
- This level of activity requires additional time and imposes an opportunity costs on both the Plan Team and assessment scientists.
- In a system with subarea management units (i.e., many GOA stocks), information in subarea stock status and management activity is more easily accessible, often well understood before the Plan Team meeting, and presented as needed.

Efficiency of monitoring subarea status

- With subarea management units, a system of reporting and tracking 'overages' exists, which (presumably) increases efficiency in monitoring multiple stocks and subareas.
- Without recognition of spatial management units, the maximum species subarea (MSSC) catch is not reported in either the harvest specification table or traditional harvest reports. A separate webpage has been created to contain this information.
- A subarea ABC would be an additional specification that fits within an existing system. A MSSC is the creation of new management category that serves as a de facto subarea ABC.
- This seems like it would require *more* work to maintain and monitor.
- Question: What would happen if had a MSSC for more than one stock?

Safeguards to minimize risk of future localized depletion or high subarea exploitation rates

- The ability to minimize these risks depends on whether the framework for subarea harvest recommendations continues in the future.
- The original MSSC was obtained in 2013 and used as a informal guide in voluntary efforts to reduce bycatch in the 2014.
- The SSC refers to the MSSC as a "*guide to industry*" in October, 2014, and a "*goal*" in October, 2015.
- The stock structure/spatial management workgroup report (December 2015) discusses the need to identify "*under what conditions the tool should be considered no longer necessary*".

Efficiency of communication (to the public)

- In a system with subarea ABCs, both the subarea harvest specifications and inseason management actions (i.e., placing fisheries on bycatch or non-retention status) are publically available, placed in the Federal Register, with a public comment period (Fisheries Leadership and Sustainability Forum, 2013).
- The MSSC is in meeting minutes, but does not appear in the harvest specification table or the Federal Register.
- Without subarea management units, it is less clear (to me) what management actions would be available other than informal communication, which is not publically available.

Examples – subarea ABCs

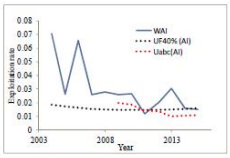
- BSAI Pacific ocean perch -- subarea ABCs have provided a longstanding framework to minimize risk in subarea harvest rates:
- The average percentage of the AI catch in the eastern AI was 58% from 1993-1995. After enactment of subarea ABC, the percentage dropped to 25% in 1996.

Examples – Informal mechanisms for communication of harvest advice

BSAI rougheye/shortraker

Dec, 2002) Discussion paper presented at Council meeting examining subarea TACs among the AI. Additional public attention in 2003-2005.

Assumes bycatch rates would not be affected by subarea ABCs.



It seems plausible that the increase in WAI exploitation in 2012 and 2013 are at least partially because the public attention in the early 2000s was nearly a decade old.

Do subarea ABCs reduce catch rates for bycatch species?

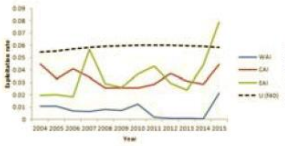
Once the ABC has been exceeded, do bycatch rates decrease ?

Focus on BSAI fisheries relatively similar to BSAI blackspotted/rougheye

Examples – Informal mechanisms for communication of harvest advice

BSAI northern rockfish

2012 -- Stock structure template completed. Plan Team discussion mentioned alternatives to subarea ABCs ("getting industry to agree on voluntary measures")

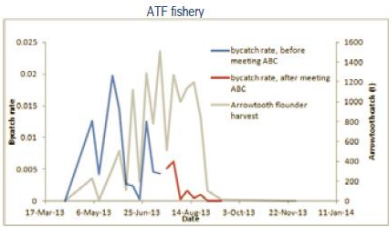


Since 2012, disproportionate harvesting has increased. If we had subarea ABCs, the 2015 catch in the eastern AI would have exceeded it.

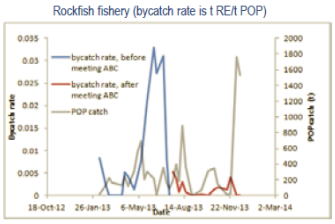
Rougheye rockfish, 2013, EAI/BS

Placed on non-retention status July 12

Bycatch rate measured as (t RE)/(t target species)



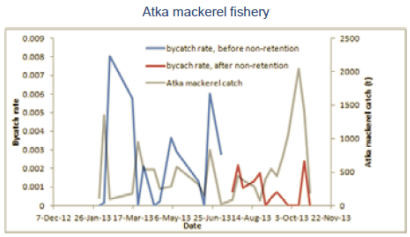
Rougheye rockfish, 2013, EAI/BS



Management Comparison

Evaluation Category	MSSC	subarea ABCs
Assessment process	Identical to subarea ABCs	Subarea ABCs based on spatial distribution of survey data, and age structured assessement
Ability to reduce bycatch	yes	yes

Rougheye rockfish, 2013, EAI/BS



Management Comparison

Evaluation Category	MSSC	subarea ABCs
Communication of fishery activity/ management effectiveness	A presentation/report has been requested for each year, typically separate from the assessment report	Information discussed, as needed, as part of the assessment report
Communication of harvest recommendation to the public	MSSC not in harvest spec table or Federal Register. Catch levels relative to the MSSC required the creation and maintence of separate catch tables.	Subarea ABCs are in harvest spec table and Federal Register, and reported in existing catch tables.
Communication to fishing industry	A mechanism for reporting inseason catch to the industry needs to be created.	Inseason communication (presumably) occurs as part of monitoring official harvest specifications.

Management Comparison

Evaluation Category	MSSC	subarea ABCs
Safeguards to prevent future high exploitation rates	Because the MSSC does not correspond to a recognized management unit, it could more easily be removed	Subarea ABCs typically are recognized as permanent management features that prevent disproportionate harvest

Questions for discussion

1) Should the WAI be a management unit?

   (Currently, it is not recognized as a management unit, but we expect catch rates to correspond as if it were a management unit).

2) What are our specific management goals ? (i.e. what problems are we trying to solve by avoiding the subarea harvest specifications?). Are there ways to achieve them within the OFL/ABC/TAC framework?

   (i.e., if more 'flexibility' is desired, what does this specifically mean, and can we find easier ways to achieve it?)

Conclusions

1) Both the MSSC and subarea ABCs are forms of monitoring that can reduce bycatch rates.
2) An argument against subarea harvest specifications is that it is harder to manage smaller harvest specifications. However, we currently have created an alternative system that recreates much of what is done by subarea ABCs, with seemingly more work and less efficiency.
3) MSSC is a harvest recommendation that does not appear in the harvest specification table or the Federal Register, and does not have the same level of transparency.
4) Subarea ABCs are generally viewed as permanent measures that prevent future disproportionate harvests. If MSSC is viewed as a short-term temporary measure that can be removed, it would not prevent future disproportionate harvests.
5) "voluntary industry cooperation" and subarea ABCs are not mutually exclusive.

Bering Sea and Aleutian Islands
Rougheye Rockfish Catch Report

Through: 03-Sep-2016

National Marine Fisheries Service
Alaska Region, Sustainable Fisheries
Catch Accounting

Area	Total Catch	Last Week's Catch
Bering Sea	37	2
Eastern Aleutian Islands	25	1
Central Aleutian Islands	43	0
Western Aleutian Islands	34	0
Totals:	139	3

At the December 2015 Council meeting, the Science and Statistical Committee (SSC) addressed concerns about fishing pressure relative to biomass in the Western Aleutian Islands. The SSC recommended estimation of a maximum sub-area species catch (MSSC) amount to guide the public regarding the level of catch needed to alleviate the "concern". For 2016, the MSSC amount is 58 mt and 324 mt for the Western and Central Aleutian Islands, respectively. Information on the calculation of these amounts may be found in the most recent Blackspotted and Rougheye Rockfish stock assessment at http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIrougheye.pdf