

New Council Member Training – 10/21/21

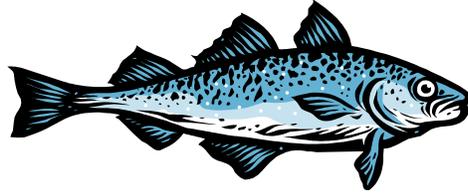
Stock Assessment Exercise

Discuss recommendations on Acceptable Biological Catch (ABC) as provided by your Scientific and Statistical Committee (SSC) and discuss analyses of alternative ABC control rules. There is no “correct” answer.

Directions

1. Convene with your assigned breakout group in your ‘virtual’ Webex Breakout room
 - a. Breakout groups A1 & A2 will work on Yellow-Eyed Cod (data-rich)
 - b. Breakout groups B1 & B2 will work on Shadow Shark (data-limited)
2. Review the assessment results and discuss the ABC advice provided by your SSC
3. Consider relevant background information, stakeholder concerns, and available ecosystem data regarding stock and fishery dynamics and the development of ABC recommendations
4. Discuss the SSC’s analysis of alternative ABC control rules
5. After analyzing all available information, discuss the situation and express your support for one of the available options below. Be prepared to discuss your reasoning and any dissenting opinions during full session.
 - a. Breakout groups A1/A2, discuss the following alternatives:
 - i. Maintain the status quo ABC control rule (49.9% chance of overfishing)
 - ii. Recommend a plan amendment incorporating one of the alternative ABC control rules (which one?)
 - iii. Another action (please specify)
 - b. Breakout groups B1/B2, discuss the following alternatives:
 - i. Maintain status quo (recent average catch, but possibly consider discard mortality as management uncertainty and consider in the context of setting a catch target) and discontinue the electronic monitoring (EM) program
 - ii. Maintain status quo and support operationalizing the EM program to provide complete characterization of discard mortality for future use
 - iii. Recommend a plan amendment where the ABC control rule accounts for uncertainty around discard mortality (specify). Additionally, provide a recommendation regarding the future of the EM program.
 - iv. Another action (please specify)

Exercise A



Yellow-Eyed Cod

Fishery: High value, commercial and recreational harvest

Last assessment: 2 years ago

Stock status from last assessment: Not overfished, overfishing not occurring

Background

Given high value and stakeholder interest, Yellow-Eyed Cod receives substantial attention, particularly from fishery participants in a catch share program. The assessment of this stock is frequently updated, and this new benchmark stock assessment was conducted to account for revised recreational catch estimates, following calibration of the redesigned MRIP survey. Peer reviewers from the Center for Independent Experts (CIE) requested a few minor adjustments, but otherwise offered a favorable review of the assessment. In consideration of a future management plan amendment, you have asked your SSC to conduct an analysis of various ABC control rules. This analysis will be presented alongside the latest assessment results.

New Assessment Results

- Declining biomass, but still above the minimum stock size threshold (Figure 1).
- Recent increase in fishing mortality rate maintained, with overfishing occurring in the final assessment year (Figure 2).
- In addition to revised MRIP estimates, the recent assessment included new types of data with scientific uncertainty increasing relative to previous assessments (wider confidence bands). ABCs are scaled down to account for this increased uncertainty.

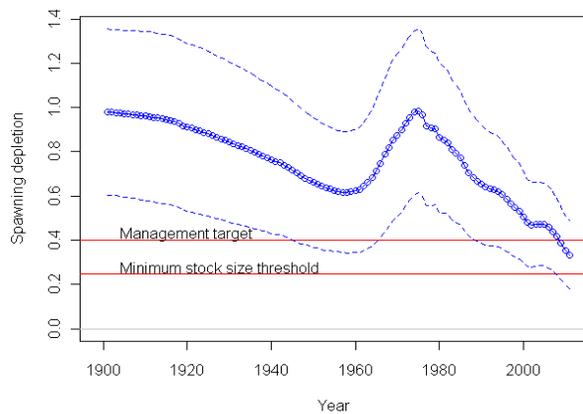


Figure 1. Biomass relative to unfished.

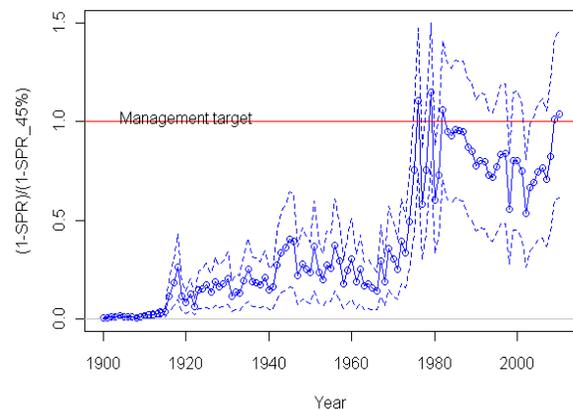


Figure 2. Fishing mortality relative to OFL.

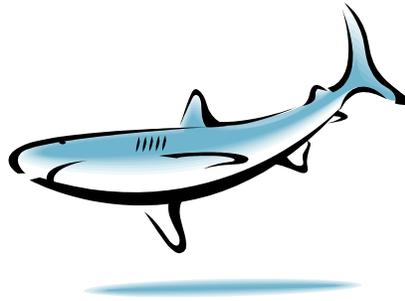
Additional Considerations

- Previous ABC levels were established using $P^*=49.9\%$. This is a liberal threshold according to the National Standard 1 Guidelines, which require ABCs to be set such that the probability of overfishing does not exceed 50% and further recommend a value lower than 50%.
- Your SSC has conducted an analysis of four ABC control rule scenarios: status quo, and three more conservative recommendations that have a lower probability of the stock becoming overfished and are therefore less likely to eventually require a rebuilding plan (Table 1).
- The alternative rules would reduce next year's catch by varying degrees; however long-term average catch would be less affected.
- The Ecosystem Status Report (ESR) provides evidence that:
 - Waters in the region are warming; warmer water is known to be unfavorable for Yellow-Eyed Cod recruitment.
 - Prey for Yellow-Eyed Cod has been decreasing.
 - A known Yellow-Eyed Cod predator species has been expanding its distribution into the region.
 - The recent stock assessment did not directly consider these ecosystem changes.
- During your meeting, a fishing industry representative is vocalizing strong skepticism over the assessment results. They claim that industry has observed no change in catch rates over recent years and suggest that the scientific survey, on which the assessment is based, does not represent stock dynamics because many of the survey stations are outside areas where dense schools of Yellow-Eyed Cod can be found. They do not support the current assessment or future amendments that would further limit catch.

Table 1. ABC control rule scenarios

ABC Control Rule	ABC Recommendation (% decline from current level)	Chance of stock becoming overfished within 5 years	Long-term average catch (after recovering to target levels)
Status Quo: $P^*=49.9\%$	49,500 mt (2% decline)	65%	55,000 mt
Option A: $P^*=45\%$	44,000 mt (12% decline)	50%	54,500 mt
Option B: $P^*=40\%$	40,000 mt (20% decline)	40%	54,000 mt
Option C: $P^*=25\%$	30,000 mt (40% decline)	28%	53,000 mt

Exercise B



Shadow Shark

Fishery: Lower value, small directed commercial harvest, negligible recreational harvest

Last assessment: 12 years ago

Stock status based on last assessment: Overfished condition unknown, overfishing not occurring

Background

The Shadow Shark stock has essentially flown under the radar. Only one assessment was attempted previously, and given substantial uncertainty, the assessment results were discarded, no annual catch was set, and resulting management measures consist only of size and gear restrictions. When an annual catch limit (ACL) was implemented for this fishery, it was set to 1,775 mt, which was equal to your SSC's ABC recommendation. The SSC's ABC value was based on recent average landings from the directed commercial fishery. There is known to be bycatch and discard mortality, but monitoring is not sufficient to estimate the magnitude. There is no fishery-independent sampling, and the new assessment was not able to use methods capable of estimating biomass. Therefore, no estimates of maximum sustainable yield (MSY) or optimum yield (OY) were generated. Assessment scientists simply analyzed trends in catch and effort time series. In consideration of a future management plan amendment, you have asked your SSC to conduct an analysis of various ABC control rules. This analysis will be presented alongside the latest assessment results.

New Assessment Results

- Catch and effort have remained relatively stable over recent years.
- Based on a comparison between Shadow Shark and species with a similar life history, it is likely that the stock can continue to support the current level of landings.
- However, a moderate discard mortality ($> \sim 500$ mt/y) is likely unsustainable for the stock.
- The new assessment maintained prior stock status of an unknown overfished condition and overfishing not likely occurring.

Additional Considerations

- Following the management plan's ABC control rule, your SSC is recommending an ABC based on recent average catch, but two alternative control rules that account for uncertainty with discard mortality were analyzed (Table 2).
- Unfortunately, due to data limitations, the alternative scenarios are not accompanied with information to help guide long-term planning (e.g. probability of becoming overfished, change in long-term average catch, etc.).
- Due to warming waters, Shadow Sharks are shifting their distribution into an area with higher fishing activity, increasing potential fishery interactions, which will likely increase bycatch rates on the species.

- During your meeting, a representative from an environmental NGO voices strong opposition to any management measures that do not attempt to account for discard mortality. Through interviews with numerous stakeholders, the NGO has evidence to suggest that several fisheries catch Shadow Shark incidentally, and many of the sharks are not alive when brought onboard. They support a conservative ABC to avoid a rebuilding plan, which could be very long given Shadow Shark life history. In such a case, the species would likely become a choke stock that could limit the ability to land species that are more productive and more valuable.
- Following the NGO comments, you received a presentation showing the results of a pilot electronic monitoring study. While the study was not comprehensive enough to extrapolate bycatch estimates to the entire fleet, the analyses did suggest that bycatch and discard mortality may be higher than currently assumed, and in fact, the study observed ~100 mt of discard mortality on a subset of the fleet.

Table 2. ABC control rule scenarios

ABC Control Rule	ABC Recommendation (% decline from current level)
Status Quo: recent average catch (assume negligible discard mortality)	1,775 mt (0% decline)
Option A: recent average catch (assume discard mortality = 400 mt/year)	1,375 mt (23% decline)
Option B: recent average catch (assume discard mortality = 600 mt/year)	1,175 mt (34% decline)