

Council Member Training Agenda

**November 1-3, 2016
Silver Spring, MD 20910**

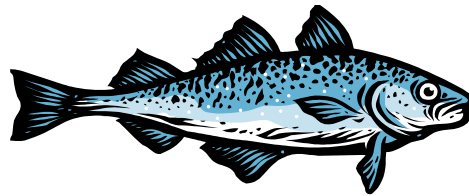
Stock Assessment Exercise

Discuss recommendations on Acceptable Biological Catch (ABC) as provided by your Scientific and Statistical Committee (SSC) and discuss analyses of alternative ABC control rules.

Directions:

- Half of the groups conduct Exercise A (a more data-rich stock)
- Half of the groups conduct Exercise B (a data- and information-limited stock)
- Evaluate your SSC's scientific advice on Acceptable Biological Catch
- Consider relevant background information and stakeholder concerns regarding stock and fishery dynamics and the development of ABC recommendations
- Discuss the SSC's analysis of alternative ABC control rules

Exercise A



Stock: Yellow-eyed cod

Fishery: High value, commercial and recreational harvest

Prior assessment: 2 years ago

Prior stock status: Not overfished and 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 regularly updated, and the new benchmark assessment was conducted using an analysis that was more comprehensive than previously attempted. 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; overfishing occurring in final assessment year (Figure 2)
- New types of data were used in the recent assessment with scientific uncertainty increasing relative to previous assessments (wider confidence bands). ABCs are scaled down to account for this increased uncertainty

Fig.1. Biomass relative to Unfished

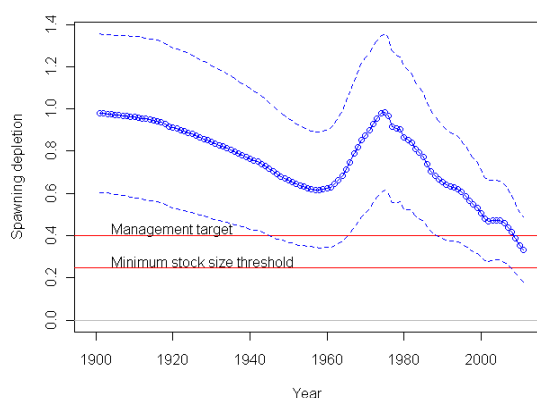
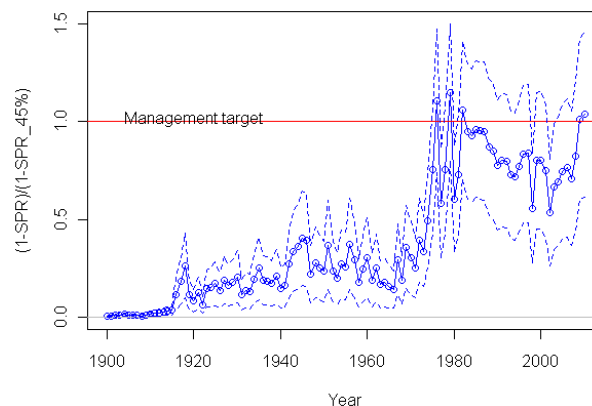


Fig.2. Fishing mortality relative to OFL



Considerations:

- Previous ABC levels were established using $P^*=49.9\%$, 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 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.
- During your meeting, a fishing industry representative is vocalizing strong skepticism over the assessment results. Their claim is that the industry has observed no change in catch rates over recent years and they are suggesting 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

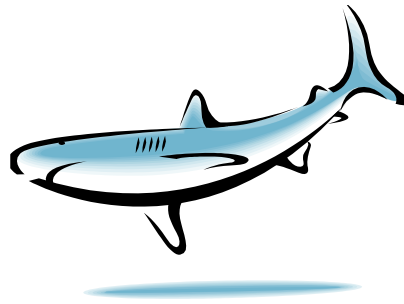
| ABC control rule | Next year's catch (% decline from current level) | Chance of stock becoming overfished within 5 years | Long-term avg catch (after recovering to target levels) |
|-------------------------|--|--|---|
| Status Quo: P*=49.9% | 49,500 mt (2% dec.) | 65% | 55,000 mt |
| Option A: P*=45% | 44,000 mt (12% dec.) | 50% | 54,500 mt |
| Option B: P*=40% | 40,000 mt (20% dec.) | 40% | 54,000 mt |
| Option C: P*=25% | 30,000 mt (40% dec.) | 28% | 53,000 mt |

Your task:

Discuss the situation and express your support of one of the following options:

1. Maintain the status quo ABC control rule (49.9% chance of overfishing)
2. Recommend a plan amendment incorporating one of the alternative ABC control rules (which one?)
3. Before deciding, request that your SSC comment on the industry representative's concerns (available during this exercise)
4. Other (please specify)

Exercise B



Stock: Shadow shark

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

Prior assessment: 12 years ago

Prior stock status: Overfished condition unknown, but 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

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 aren't accompanied with information to help guide long-term planning (e.g., probability of becoming overfished, change in long-term average catch, etc.)
- 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 on board. They support a conservative ABC to avoid a rebuilding plan, which could be very long given shadow shark life history.

- However, if bycatch monitoring is initiated and proves to be appreciable, shadow shark would likely become a choke stock that could limit the ability to land species that are more productive and more valuable

Table 2. ABC control rule scenarios

| ABC control rule | Next year's catch (% decline from current level) |
|--|--|
| Status quo: recent avg. catch (assume negligible discard mortality) | 1,775 mt (0% dec.) |
| Option A: recent avg. catch (assume discard mortality = 400 mt/year) | 1,375 mt (23% dec.) |
| Option B: recent avg. catch (assume discard mortality = 600 mt/year) | 1,175 mt (34% dec.) |

Your task:

Discuss the situation and express your support one of the following options:

1. Maintain status quo (recent avg. catch, but possibly consider discard mortality as management uncertainty and consider in the context of setting a catch target)
2. Maintain status quo, but request a directed effort to characterize discard mortality, followed by an update to the new assessment
3. Recommend a plan amendment where ABC includes uncertainty over discard mortality (option A or B?)
4. Other (please specify)