

HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON PROTECTED SPECIES HARD CAPS FOR THE CALIFORNIA DRIFT GILLNET FISHERY

Introduction

In the September 2014 Briefing Book under Agenda Item G.4.b, the Highly Migratory Species Management Team (HMSMT) presented three sets of alternatives for Council consideration including hard cap management, potential finfish bycatch mitigation, and fishery monitoring elements. Dr. Stephen Stohs will present preliminary results on the utility of a bootstrap method for simulating potential impacts for a range of hard cap management scenarios. The details of this analysis and the parameters assessed are presented in Appendix 1. The HMSMT will also present catch per unit of effort (CPUE) estimates from 2001 to 2013 for the principal non-target species recorded by National Marine Fisheries Service (NMFS) observers in the drift gillnet (DGN) fishery.

Finfish Bycatch

The HMSMT, in Figure 1 below, presents a time series of catch per unit of effort (CPUE) for the four primary non-target finfish species that have been observed captured in the DGN fishery from 2001-2013. The average dead removals and average number released alive are included in the parenthetical statement of the legend and include ocean sunfish (aka mola mola) 68 and 1,691; opah 184 and 0; blue shark 143 and 81; and short fin mako shark 242 and 6. No evidence of declining CPUE trends is apparent for any of the species in question.

Blue Shark Stock Assessment Summary

The ISC Shark Working Group completed an assessment and future projection scenario for the north Pacific blue shark stock.¹ Based on the base case and plausible model scenarios, the north Pacific blue shark stock is not overfished and overfishing is not occurring. The analyses indicate that the stock is in a healthy condition and current levels of F are sustainable in the short and long term. The ISC Shark Working Group is scheduled to conduct a stock assessment on short-fin mako shark in 2015.

Council Deliberation and Guidance

The HMSMT seeks Council guidance on what additional alternatives and analysis should be undertaken to develop a full suite of alternatives for public review.

The HMSMT notes that additional alternatives for consideration could include (1) limiting the number of active vessels participating in the fishery as a control of bycatch levels in lieu of managing with hard caps, and (2) considering multi-year cap management in lieu of annual cap management, including caps with roll-over features.

¹ <http://isc.ac.affrc.go.jp/pdf/ISC14pdf/Annex%2013%20-%20BSH%20assessment%20report%208-26-14-final.pdf>

The HMSMT requests Council guidance on the potential for removing finfish bycatch harvest ratios for future consideration given the conservative management regime already in place for the DGN fishery coupled with historic lows in vessels numbers and effort and the lack of a pressing conservation concern for the species in question.

The HMSMT recommends moving towards an EM-based monitoring system for DGN fishery contingent on available funding and commercial applicability of current EM systems.

The HMSMT notes that more time is needed to conduct an adequate and thorough impact analysis for the conservation and economic impacts of any package of proposed alternatives that may be adopted. The HMSMT is confident that such analysis would be ready for the March 2015 Council meeting.

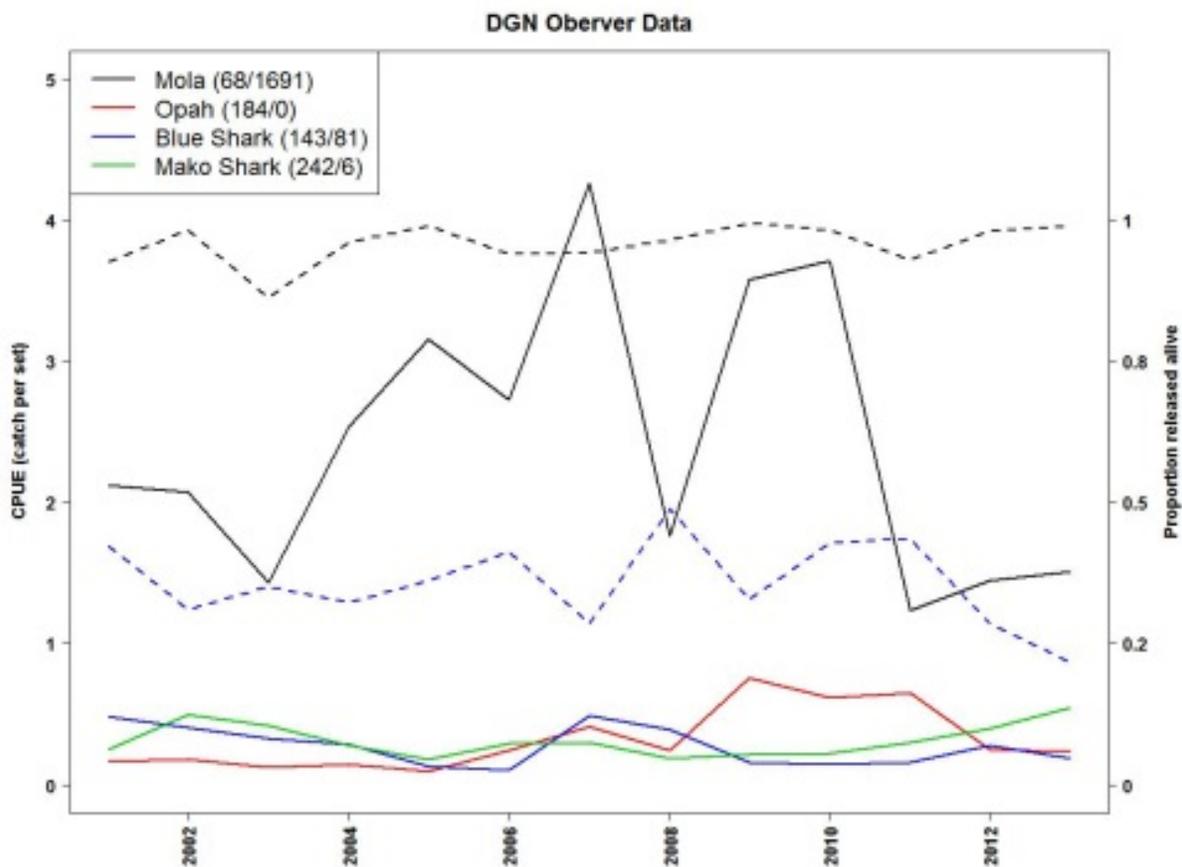


Figure 1. DGN Observer data on selected finfish catches from 2001-2013. CPUE is represented by the solid lines scaled on the primary y-axis. Proportion of live releases for ocean sunfish and blue shark are represented by the dashed lines and scaled on the secondary y-axis. Live ocean sunfish release is well above 90% year after year, and blue shark live releases ranges from approximately 20% to 50%.

Appendix I. Summary of Preliminary Testing of Bootstrap Analysis of Hard Cap Alternatives

At their June 2014 meeting, the Council asked the HMSMT to consider the implications for establishing a hard cap management program for Endangered Species Act- (ESA) listed species with a documented history of interactions in the swordfish/thresher shark drift gillnet fishery. The initial list of species included fin, humpback and sperm whale, and leatherback, loggerhead, green and olive ridley sea turtles.

The HMSMT would like to bring to the Council's attention a number of questions about the potential effect of using hard caps to limit interactions with these ESA-listed species. These questions include:

- What cap levels could achieve bycatch mitigation requirements for various species proposed for management by hard caps?
- How would economic profitability be affected if a cap is likely to be reached early in the fishing season?
- What maximum fleet size would optimize profitability under a given cap policy?
- Can limiting the number of active permits achieve the same bycatch mitigation objectives as hard caps?
- Could a multi-year rolling bycatch cap allow for better economic performance than a single-year cap while still meeting bycatch conservation goals?
- Could a rollover provision, whereby caps adjust up or down in each season by the excess or shortfall of the previous seasons' takes, improve the performance of the fishery compared to fixed hard caps?

These questions were incorporated into a preliminary test of the bootstrap simulation method and the results to be presented in the upcoming presentation by Dr. Stohs describe a range of outcomes for assessing conservation and economic benefits.

Five scenarios were analyzed for the preliminary test:

1. Limit on number of DGN vessels fishing, roughly equal to the number currently active in the fishery.
2. Single-year hard caps at the levels stated above, with 100% observer coverage.
3. Multi-year hard caps analyzed for a rolling 5-year period at 5 times the above-stated levels, with 100% observer coverage; caps apply against total takes over the trailing 4 year period plus in-season observed takes.
4. Hard caps with a rollover feature, which allows the caps to adjust upwards by the amount 1-year caps exceed bycatch counts, or downwards by the amount 1-year caps are exceeded. Maximum cap levels were set at 2 times the 5-year hard caps. The policy that was tested reverts to 1-year caps in case the bank balance is exhausted for a species.

5. Multi-year hard caps analyzed for a rolling 5-year period, with 30% observer coverage. Average bycatch rates per set since 2001 were attributed to unobserved sets of effort, to develop an expected level of takes at each point in the season.

These scenarios and preliminary findings represent possible ways to operationalize the alternatives in the HMSMT report on this agenda item in the briefing book. They were used to develop the approach and to explore its potential value in assessing caps alternatives, and are not intended as recommendations for hard cap alternatives or to guide a current decision.

The simulation method employs the following sequence of steps to simulate seasons of DGN fishing:

1. Resample from logbook distribution of vessel effort per season to replicate total effort for simulated seasons;
2. Resample set-level observer records on retained market species and protected species interactions counts to replicate retained catch and bycatch for simulated seasons;
3. Resample again to obtain observer sample at less than 100% coverage (for 30% coverage scenario);
4. Apply caps policy to cumulative sums of (expected) bycatch counts to determine the point in the season when effort ends;
5. Sum simulated market catch and bycatch through end of season;
6. Use cost and revenue information to transform market catch counts into estimated total profits and average profits per vessel;
7. For each alternative, summarize distributions of sets, total and average profits, and bycatch for simulated seasons;
8. Simulate 10,000 seasons for each management alternative;
9. Repeat over a range of fleet sizes from $L = 1$ to some maximum number under consideration (e.g. $L_{max} = 40$).

Based on preliminary findings from the test simulation runs the HMSMT concludes the following:

- While hard caps and well developed management response can provide some certainty for fisheries and conservation, it is unclear whether conservation benefits improve significantly over a simple limit on active permits;
- For rare-event interactions such as occur with protected species in the DGN fishery, multi-year rolling or rollover caps likely balance conservation needs, management flexibility, and detrimental impact to economic viability of the fishery;

- Overly restrictive hard caps may severely limit effort, reducing the economic viability of drift gillnet fishing;
- A multi-year cap may improve economic performance of the fishery over one-year caps while achieving conservation requirements;
- Rollover caps may offer a less economically risky alternative to limit bycatch rates without increasing bycatch risk for the species subject to hard caps.

The bootstrap simulation method for assessing the application of hard caps for management in the DGN fishery is currently under review by various NMFS economists and biologists. If the Council adopts hard cap alternatives for future consideration, this method could be used to analyze bycatch and economic risk tradeoffs. Results of analysis would undergo peer review, such as Scientific and Statistical Committee review at a future Council meeting.

PFMC
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