GULF OF MEXICO KING MACKEREL CARRY OVER SIMULATIONS

Gulf of Mexico Fisheries Management Council
Standing, Socioeconomic
Reef Fish Scientific and Statistical Committee
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The Request

- The amount of uncaught quota to be carried over will be added to the ABC for the following fishing year, and the new ABC cannot exceed 95% of that year's OFL.
- Simulate successive carry-overs, and one-year intervals between carry-overs
- Natural mortality for fish selected by the fishing fleets must be discounted from the uncaught quota and be considered in the carry-over provision
- The uncaught quota to be carried over may only be applied to the ACL of the smallest divisible fishing sector component from whence it came (e.g., for king mackerel, the Gulf Western Zone*)

*This was not possible as the commercial GWZ was not a modeled as a separate area/fishery. The carry-over is applied to the commercial sector as a whole, and it won't matter where the carry over is applied since the gear selectivity is uniform throughout zones

Preface

- These projections are for demonstration purposes and should not be taken as “official” management advice
- The adjustment to decrement Carry over landings by natural mortality ($N_{t+1} = N_t * \exp(-M)$ is approximate because the catch is in weight and not numbers
- The native calculations in the forecast software implicitly account for natural mortality, so there is no need for the decrementing procedure above

First, Some Things to Keep in Mind

- The GOM king mackerel stock is currently not overfished and not undergoing overfishing
- Neither the Commercial sector nor the Recreational sector land their annual allotted catch (i.e. the stock has routinely been fished below F_{SPR30})
- So, even if the underage is carried over from one year to the next year it is highly unlikely all of it will be caught.
- However, years of no carry over were still assumed to be fished at F_{SPR30}. While this is not likely to happen the assumption was necessary due to the inability to predict what future landings would actually be.

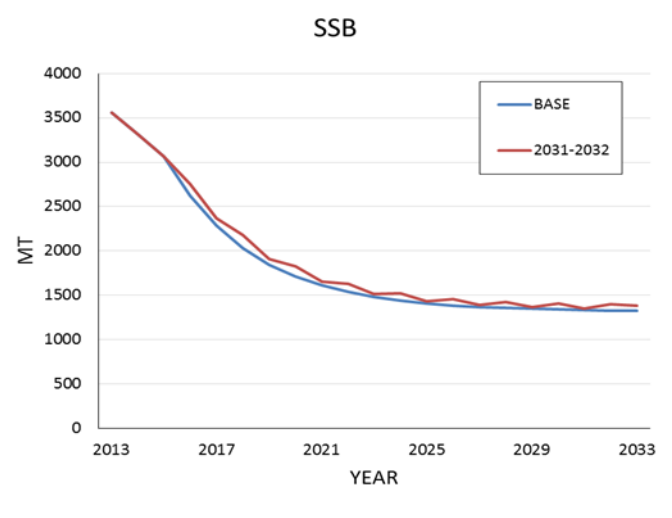
Agreed Upon Methods/Steps

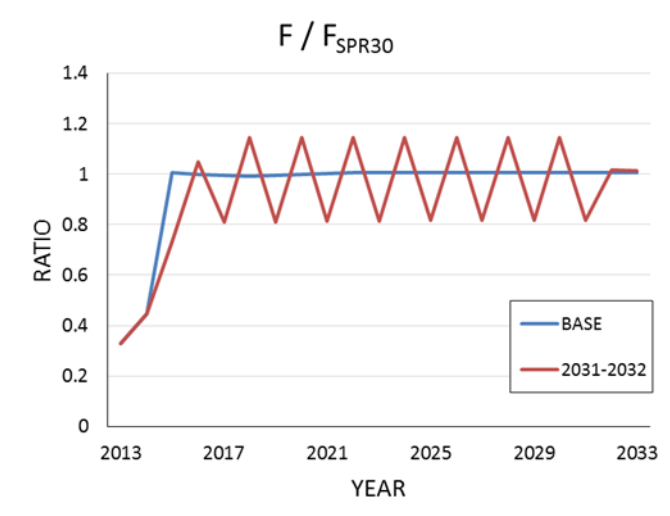
1. Fish the stock at FSPR30 in 2015
2. Reduce the 2015 landings by 20% for Commercial and 50% for Recreational to get underage value
3. Add this underage to the 2016 landings and re-run the model using these landings for 2015 and 2016. Carryover(number fish)=Underage(number fish)*e^-M. These landings will now be fixed for 2015 and 2016 for next steps.
4. Fish the stock in 2015 and 2016 at the landings from step #3 above, and at FSPR30 for 2017 and 2018.
5. Repeat steps 2, 3 and 4 above for 2017 and 2018. No more than 1 year-to-year carry over.
6. Repeat this cycle to complete a 10 year projection.

Benchmarks

1. Projected SSB decreases over time because the stock is currently being fished below F_{SPR30} however projections assume it will be in the future.

2. Likewise for the projected retained catch, since the projections assume that the stock will be fished <u>below</u> FSPR30 on "non-carry over years" and <u>at</u> FSPR30 on "carry over years" the catch is projected to switch between low (non-carry over years) and high levels.

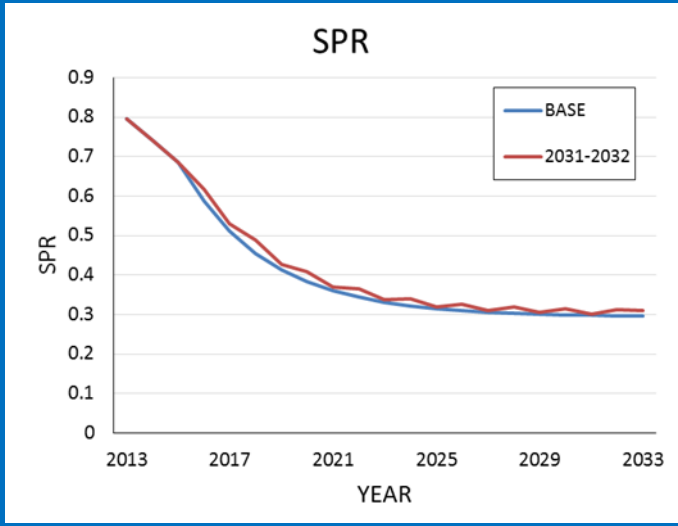


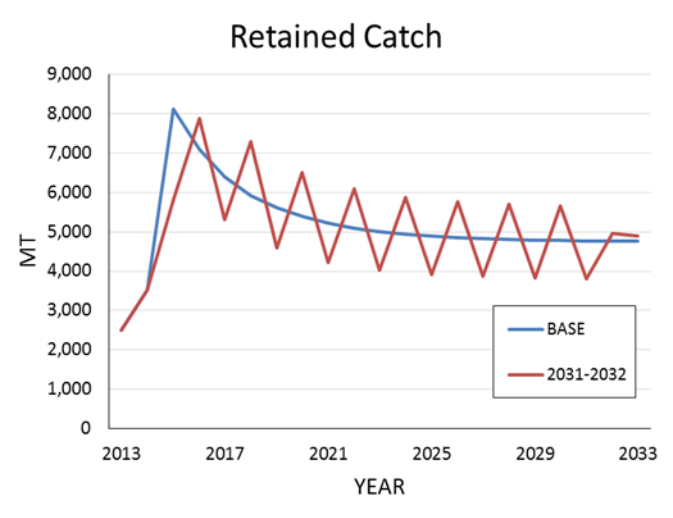


Benchmarks

1. Projected SPR decreases over time because the stock is being fished currently below F_{SPR30} however projections assume F will increase to F_{SPR30} in the future.

2. Likewise for the projected retained catch, since the projections assume that the stock will be fished below FSPR30 on "non-carry over years" and at FSPR30 on "carry over years" the catch is projected to switch between low (non-carry over years) and high levels.





Conclusions

- The methods used by the SEFSC to project the abundance and mortality of a stock implicitly account for the effects of natural mortality. Therefore the SEFSC recommends against further use of the proposed method to decrement the carryover allowance
- All other things equal, partial carryovers of underages will generally result in stock biomass trends that are greater in magnitude than would have occurred if no underages had occurred.
- In the case of King Mackerel, assuming that both the Commercial and Recreational sectors continue to land less than their ABC, the carry over of underages should have little to no effect on the future status of the GOM king mackerel stock