Gulf of Mexico Fishery Management Council
Scientific and Statistical Committee
Summary of Carryover Discussions
2017 – 2019

January 10, 2017

Review of Updated National Standard Guidelines (webinar)

Another revision to the guidelines would allow unused quota to be carried forward to the following year. This could be accomplished in two ways (Figure 2). First, if the ACL is set less than ABC, the unused portion of the ACL could be added to the following year's ACL to the extent that it does not exceed the following year's ABC. Second, if the ACL is set equal to the ABC, the ABC control rule could be used to increase the following year's ABC to account for the underharvest in the previous year. The NS1 guidelines explain that the basis for allowing an increase in the ABC is that there has been an increase in stock abundance resulting from the fishery harvesting less than the full ACL. Therefore, when considering the amount of underharvest that can be carried over, it is appropriate to consider natural mortality and other population dynamic effects.

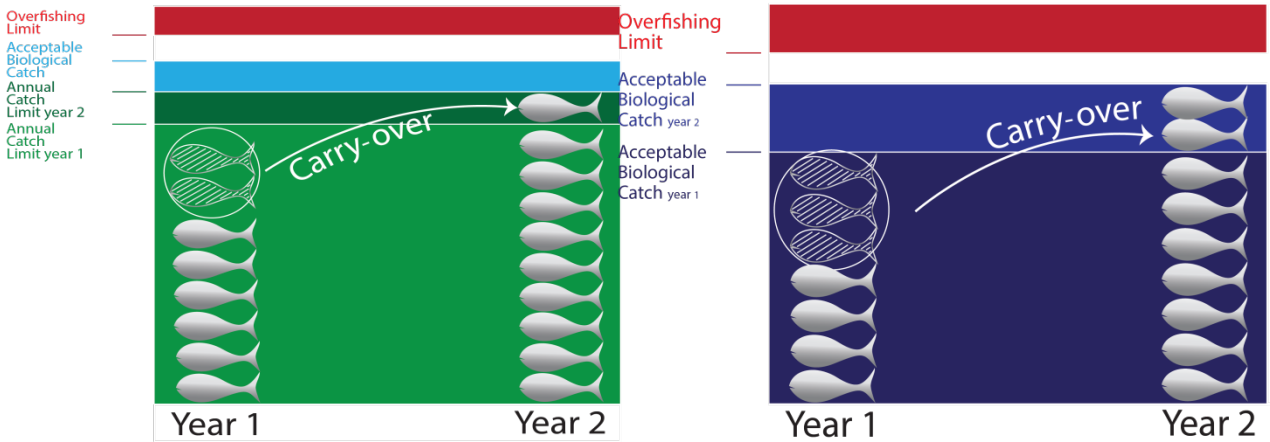

Figure 1. Two possible scenarios for unused ACL carryover.

An SSC member asked if the carryover had to be to the immediate year following, or if it could be carried over to a second year. He noted that delays in getting landings could make it difficult to do annual carryovers. Ms. Lambert responded that the guidelines do not describe all the possible ways that carry-over could occur. But the guidelines do provide guidance on how carryover ABC control rules can be used to adjust ABCs and said that those types of control rules must be described in an FMP.

Mechanism for Allowing Carryover of Quota Underharvest

Staff briefed the SSC on the premise behind the Council's desire to consider carrying over unused quota from the previous fishing year to the following fishing year.

SEFSC staff developed a simulation to demonstrate the hypothetical effect of carrying unused quota over to the following year, and the resultant effect on the rebuilding plan. Ultimately, the simulation showed that 100% of the unused quota could be carried over.

The simulation assumed a 20% underage for each of the directed fishing fleets, and this was assumed to be the hypothetical maximum underage based on historical landings. The final Stock Synthesis 3 projection model from the SEDAR 31 update assessment was used to determine the effect of the act of carrying over unused quota. The current allocation between the commercial (48.5%) and recreational (51.5%) sectors was used, and the landings were modified to simulate the 20% underage. The carryover was simulated to be added 2 years following the year from which the underage occurred to account for data processing time to ensure the use of finalized landings. For example, an underage from 2015 would not be carried over until the 2017 fishing year.

The act of carrying unused quota over to a fishing season 2 years later was demonstrated to have no negative long-term impact on spawning potential ratio, and therefore would not negatively impact the red snapper rebuilding plan. A key caveat to this simulation is that unused quota could only be given back to the fleet which had the underage in a previous fishing season. For example, an underage originating with the private recreational fleet could only be reassigned to that fleet, and not to the for-hire or commercial fleet. Adding an underage to a different fleet would result in different effects related to gear selectivity, size at age, and other metrics, and could therefore be detrimental to the rebuilding plan.

SEFSC staff stressed that this exercise should not form the basis of management advice; however they did indicate that the results of this simulation would likely prove similar for many of the species managed by the Gulf Council. The SSC was not requested to formally accept or reject the simulation, since it was created to be informative and address the SSC's previous concerns about the potential effect that carrying over unused quota could have on the rebuilding plan.

May 10, 2017

Review of Draft Underharvest Carry-over Options

Staff reviewed the draft amendment to create a carryover provision in the Council's ABC Control Rule, and the accompanying changes to the framework procedures for the Council's Fishery Management Plans. Generally, SSC members understood the Council's intent, which is to utilize all of the ACL for qualifying species whenever possible. The draft amendment is divided into sections: (1) to which species a carryover provision would apply; (2) application of the carryover provision to IFQ species; (3) fixing a buffer between the OFL and ABC for carryover years; (4) adjustments to the carryover for natural mortality and management uncertainty; and (5) framework procedure modifications.

An SSC member questioned whether episodic events such as hurricanes should be considered when applying a carryover, to account for the inability to access the fishery, as opposed to the inability to harvest all that has been allowed in a given fishing year. However, in most circumstances, the amount of unused ACL in a fishing year which could be carried over to the following fishing year would be only a small fraction of the total ACL. Bearing this in mind, the SSC was in general agreement that a simulation of the effect of carrying unused ACL over to the following fishing year should be conducted, and emphasized the need for that simulation to demonstrate the effect of

multiple instances of the carryover provision in effect within a single rebuilding timeline for overfished stocks.

An SSC member questioned whether it would also be appropriate to consider a larger carryover than the amount of unused ACL from the previous fishing year, accounting for growth and reproduction benefits borne by the subject species due to the foregone yield in the previous fishing year. Staff remarked that such an approach was not currently being considered, is not provided for in the revised National Standard 1 Guidelines, and would be considerably more time-intensive than the current approach.

An SSC member proposed incorporating the adjustment for natural mortality into the adjustment for management uncertainty. Staff indicated that the varied levels of natural mortality amongst species managed by the Council would make such an approach more difficult, in that a "universal" adjustment incorporating natural mortality would disproportionately affect many stocks.

Recognizing that the carryover amendment is in early stages of development, the SSC requested to review future document updates, especially in light of the simulations the Committee requested above. The SSC thought that review of these simulations would allow the Committee to better evaluate the different outcomes and trade-offs of the various options in this amendment.

January 9-10, 2018

Analyses Related to Draft Generic Amendment – Carryover Provisions and Framework Modifications

Staff reviewed the actions and alternatives in a draft Generic Amendment for Carryover Provisions and Framework Modifications. Science Center staff then gave two presentations describing the results of simulated underharvest scenarios.

<u>King Mackerel Scenarios</u>

Dr. Michael Schirripa presented a scenario where king mackerel were fished at alternating years of 20% for commercial and 50% for recreational relative to $F_{30\%\ SPR}$ vs. years when the full ACL was taken along with carryover from the underharvest years adjusted for natural mortality (carryover in numbers of fish=underage in number of fish*e^-M). This sequence was repeated for 10 years. This resulted in a decrease in biomass over time because the stock is currently being fished at less than $F_{30\%\ SPR}$. However, SPR followed about the same track as if fishing occurred at a constant $F_{30\%\ SPR}$ each year. Similarly, catches also followed the same track as a baseline of a constant $F_{30\%\ SPR}$, except that the year-to-year landings alternated above and below the baseline. Based on the results, Dr. Schirripa's conclusions were:

- 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 increase more rapidly 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 carryover of underages should have little to no effect on the future status of the Gulf king mackerel stock.

Red Snapper Scenarios

Dr. Matt Smith presented scenarios that modeled carryover of red snapper underharvest. Dr. Smith evaluated four carryover scenarios: with and without an adjustment for natural mortality, and with and without a cap that the resulting harvest from a carryover could not exceed 95% of the OFL (OFL cap). Underages ranged from 5% to 20%, and were applied separately by fleet. These were compared to fishing at a constant $F_{REBUILD}$ and a constant $F_{26\% SPR}$. The model runs indicated that adjusting for natural mortality had little effect on resulting yields, but the OFL cap had a major effect on the carryover yield. Under all scenarios tested the stock rebuilt prior to the 2032 target rebuilding date. Scenarios with underages and carryovers rebuilt slightly faster than the $F_{REBUILD}$ baseline, but none of the scenarios included overages. Dr. Smith's conclusions were:

- Results are expected to hold for underages <20% and/or fewer fleets with underages (still < 20%), but extreme underages (>20%) and their resulting carryover are untested and may demonstrate different dynamics.
- Results only hold if carryover is applied to the fleet for which the underage occurred. Differing selectivities by fleet imply that carryovers are non-transferable across fleets.
- The same approach is not expected to hold for an overage and subsequent underage.

In both presentations, the presenters cautioned that the analysis was for demonstration only, and not meant as the basis for management advice. A suggestion was made that, if there is an underage, the question should first be asked as to why there is an underage. Dr. Schirripa responded that if the CPUE is not going down, the underage is due to decreased effort.

March 13-14, 2019

Review of Generic ACL Carryover Amendment

Council staff reviewed the Generic Annual Catch Limit (ACL) Carryover Amendment, outlining the functionality of the provision with respect to the Acceptable Biological Catch (ABC) Control Rule and the October 2016 update to the National Standard 1 Guidelines. SSC members asked questions about the general function and purpose of the various rules which underpin the provision and requested that Table 1.1.1 in the document explicitly show which ACLs were exceeded in 2017. SSC members recalled the two simulations provided at past meetings by the SEFSC which demonstrated that an ACL underage could be carried over, pound for pound, to the following fishing year, without any negative effect on the stock. This is because the foregone yield will be assumed to have increased in size and possibly reproduced (depending on species and fleet selectivity); therefore, even the carryover may be more conservative than necessary, as it does not also include any additional production by the previously foregone yield.

SSC members asked whether overages and payback provisions had been considered in the carryover provision. Noting that they had not, SSC members questioned the effect of an overage, and subsequent payback provision, on a stock which in a different year had the carryover provision

applied. The SSC's interest in this scenario was whether the combined effects of overages, with underages negated by a carryover provision, would have an adverse effect on a stock, particularly one with a rebuilding plan. The payback provision currently used by the Council is a 1:1 payback of the overharvest in the previous fishing year from the following fishing year. This payback provision, in the inverse of the carryover provision, may not be conservative enough, as it does not directly address the future foregone contributions to recruitment by the fish removed through excessive harvest. Thus, the SSC made the following motion with respect to the previously reviewed simulations of carryover on red snapper and Gulf migratory group king mackerel:

> **Motion: The SSC moves that the Council request that the SEFSC include periodic underages and overages of the ACL in the simulations for carryover.**
>
> *Motion carried unanimously*.

SSC members asked how uncertainty was addressed in the carryover provision. Council staff demonstrated the use of the Council's ACL/Annual Catch Target (ACT) Control Rule to the SSC, which operates in a similar way to the ABC Control Rule to create a measured buffer between the ABC and the ACL and between the ACL and the ACT, if applicable. Council staff added that Action 2 in the Generic ACL Carryover Amendment further constrained the amount of pounds which could be carried over to account for management uncertainty, in addition to the management uncertainty already acknowledged in the ACL/ACT Control Rule.