Appendix

Simple Estimation of Growth Potential in the Snapper-Grouper Fishery

SAFMC Visioning Workshop

October 14 – 16, 2014

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Introduction

This document provides a review of the snapper grouper fishery in 2013 by sector (recreational and commercial) to characterize future growth potential, indicated by the difference between 2013 landings and a hypothetical "OY" (optimum yield) value. An effort was also made to identify which species are not fully used within each sector, indicated by landings below the 2013 ACL. To avoid confusion with the term OY, the hypothetical OY derived here will be called POY, for "potential optimum yield".

Please note that this analysis is not intended as an exact or particularly robust examination of future yield and certainly offers no guarantee that any future OY indicated will be available to the fishery in the future. It is simply offered as a tool for discussion during the visioning workshop, to provide some indication of stocks and sectors offering the potential for increased future yield. Finally, it can rightly be called "back of the envelope", put together solely for visioning discussion and lacking any peer review.

Methods

Potential Optimum Yield is intended to represent the total yield a stock may provide, as based on equilibrium MSY principles. Values of POY were derived by sector for each species or species complex which is assigned an ACL. Overall POY for a sector is the sum of values by species. For unassessed stocks and complexes, POY was simply set equal to the 2013 ACL. For assessed stocks, POY was set at 90% of the equilibrium MSY. Sector allocation percentages were then applied to the overall POY to determine commercial and recreational POYs. Total POY for a sector is the sum of species-based POYs, and total for the fishery is the sum of commercial and recreational POYs.

Information on 2013 landings and ACLs is taken from the SERO quota monitoring webpage, for consistency with the information reported in the visioning paper on year round access. MSY values, where available, are based on the SSC assessment recommendations. To reduce the number of species considered, landings and ACLs are reported by species groupings where the Council has specified them as groups for monitoring AMs. No effort was made to address discard losses or specific discard allocations, as this is a topic of

another visioning paper. No effort was made to infer how POY could respond to stocks moving from unassessed to assessed.

Wreckfish is not included in these calculations due to its unique management approach. The recreational ACL for red snapper, reported in numbers, was converted to pounds using the mean weight reported in the projection report of 5.78 pounds. The recreational ACL for snow grouper, also reported in numbers, was converted to weight using the MRIP reported mean weight in 2013 of 28.4 pounds.

One final yet very important caveat stands alone. The information presented here is based on 2013 conditions. Thus it does not reflect current, as in 2014, ACLs. Nor does it reflect the impacts of many actions the Council has taken during 2013 and 2014 to better, more fully, use the overall ACL available.

Growth potential for the fishery can be considered several ways, and it can quickly get confusing when dealing with current landings, current ACL and the POY. The first measure considered is the immediate increase in landings available from fully using or landing the ACL in a particular year. In the results below that is the difference between 2013 landings and ACL. The second measure is longer-term, and is the increase primarily available from rebuilding stocks or reducing uncertainty in assessments and management so that ACL can approach closer to OFL and ABC. Technically this is just the difference between ACL and POY. Finally, when considering actual fishery conditions the sum of both types of growth potential may be of interest, and is reported as the difference between 2013 landings and POY. All of these values can be reported in absolute pounds as well as in percentages.

Several factors will affect the difference between 2013 ACL and POY. Some stocks are at a biomass that exceeds Bmsy, and therefore have short-term realized ACLs that exceed equilibrium MSY. These stocks provide a decrease in POY from 2013 levels. In the snapper grouper complex these are vermilion, greater amberjack, and black sea bass. Other stocks are under rebuilding plans with ACL significantly below MSY. These include red porgy, red grouper, snowy grouper and red snapper, and will provide an increase in POY as compared to 2013 levels. Remaining assessed stocks, those that are neither overfished nor at particularly high biomass, have ACLs based on projections that incorporate estimated stock abundance, a target exploitation rate and measures of uncertainty that in any given year will deviate somewhat from the simplified POY based on 90% of equilibrium MSY. Finally, adjustments for uncertainty applied through the ABC control rule may result in differences between ABC and OFL that are greater than the 10% difference used here to generically estimate POY from MSY. Yellowtail snapper is a good example, with a 2013 total ACL (commercial and recreational combined) that is 88% of the POY. Each of these circumstances can be evaluated as the Council moves from finding a vision to developing specific regulations. However, attempting to address them is far beyond the scope of this work.

Results

Based on the simplified approach used here to derive snapper grouper potential yield, overall total POY could be around 19.7 mpds. Under current allocations, 8.8 mpds would go to the commercial sector and 10.8 to the recreational. The difference between POY and existing, 2013 ACLs is not particularly large, at only around 3 mpds. In other words, the overall resource is nearly fully used despite a few high profiles stocks under rebuilding plans, such as red snapper. The red snapper 2013 ACL is estimated here at around 76,000 pounds, while the POY based on the MSY estimate from the last assessment is 1.9 mpds. This stock alone represents 1.8 mpds of the around 3 mpds difference between 2013 ACL and overall POY . One interpretation this leads to is that more can be gained in the short term, across the entire fishery, from better use of existing ACLs than should be hoped for in the future from rebuilt stocks or changes in uncertainty adjustments.

In 2013 the Snapper-Grouper fishery landed 11.7 mpds (million pounds), representing 71% of the 16.6 mpds ACL (Table 1). Using the terms defined above, immediate growth potential is around 5 mpds. These landings were 59% of the overall POY based on 2013 conditions of 19.8 mpds. The overall ACL for 2013 is 84% of the overall POY, indicating the long term growth potential of the fishery as a whole, expressed as the difference between what was landed in 2013 and the total POY, could be as much as 8 mpds. Note that to take advantage of this potential yield, the Council must primarily find a way to move current landings closer to current ACLs as nearly 5 of these 8 mpds is composed of the unharvested 2013 yield, that "left on the table" by landings less than ACL.

Most of the growth potential appears to lie with the recreational sector. 2013 landings of 5.2 mpds are only 59% of the 2013 ACL and 48% of the POY. In terms of pounds, the recreational fishery could access an additional 3.6 mpds in the short term and 5.7 mpds in the long term.

The commercial fishery landed 6.5 mpds in 2013, representing 85% of the 7.7 mpds ACL and 73% of the 8.9 mpds POY. Total poundage increases for the commercial fishery are less than the recreational, indicating that the commercial fishery is using more of the existing ACL. Commercial yield in pounds could increase by 1.1 mpds through full use of the ACL, and 2.4 mpds in the long term if stocks approach POY levels.

Table 1. Landings, ACL and POY for the snapper-grouper fishery by sector for 2013.

	2013	2013	Equilibrium				pounds	pounds
SECTOR	landings	ACL	POY	Land/ACL	Land/POY	ACL/POY	ACL-Land	POY-Land
comm	6,535,944	7,731,458	8,893,136	0.85	0.73	0.87	1,195,514	2,357,192
rec	5,189,556	8,843,007	10,888,453	0.59	0.48	0.81	3,653,451	5,698,897
total	11,725,500	16,574,465	19,781,589	0.71	0.59	0.84	4,848,965	8,056,089

Another way to consider growth potential is by individual stock. The figures below show the difference between 2013 landings and POY by sector and stock, and are ordered from left to right by decreasing 2013 ACL. In Figure 2, the recreational fishery, considerable increases are possible in the short term for stocks such as yellowtail snapper, greater amberjack, black sea bass and mutton snapper. Of stocks in rebuilding plans, the most potential for increased yield is offered by red snapper. Some stocks or complexes show reductions in the long term, such as snowy grouper which has very low recreational yield overall and a 2013 overage.

Within the commercial fishery (Figure 1), potential increases show up more in the stocks in the middle of the sort order (by decreasing 2013 ACL). Some high potential stocks for the recreational fishery, such as greater amberjack or black sea bass, show the opposite in the commercial fishery. There are notable commercial increases possible from rebuilding stock such as red grouper, red porgy, snowy grouper and red snapper.

The last analysis provided is a big picture overview, showing the time trend of annual yield relative to POY by sector. The recreational fishery (Figure 4) removed more than POY in the early 1980's, before declining to about half of that level around 1998. Landings approached POY in 1998 and 1999 before again dropping, although the recent trend is upward. Since 2000, recreational fishery landings represent 67% of the total potential yield. The commercial fishery exhibits a similar overall trend (Figure 5), with a less sharp and more continual decline from its peak than the recreational fishery. The commercial fishery has been quite consistent since around 2000, taking as landings about 80% of its currently estimated potential yield.

Including this with the materials for the visioning discussion of increased, year-round access, is because it may help determine whether stocks subject to closures have any potential for increased yield to offset and alleviate those closures. For example, in the 2013 commercial fishery, several stocks offering increased yield are subject to the spawning season closure for shallow water grouper. Excluding rebuilding stocks such as red snapper, several of those subject to ACL based closures including gray triggerfish, golden tilefish and the jacks complex do not have much growth potential available. However, our understanding of triggerfish and jacks could change once these stocks are assessed.

Within the recreational fishery, the only ACL closures in 2013 were for golden tilefish and snowy grouper, neither of which offers much potential to alleviate those closure through yield increases. Red snapper offers the most potential for increased yield to lead to a reduction in closures as the stock rebuilds, assuming of course that increased effort and availability do not offset increased ACLs.

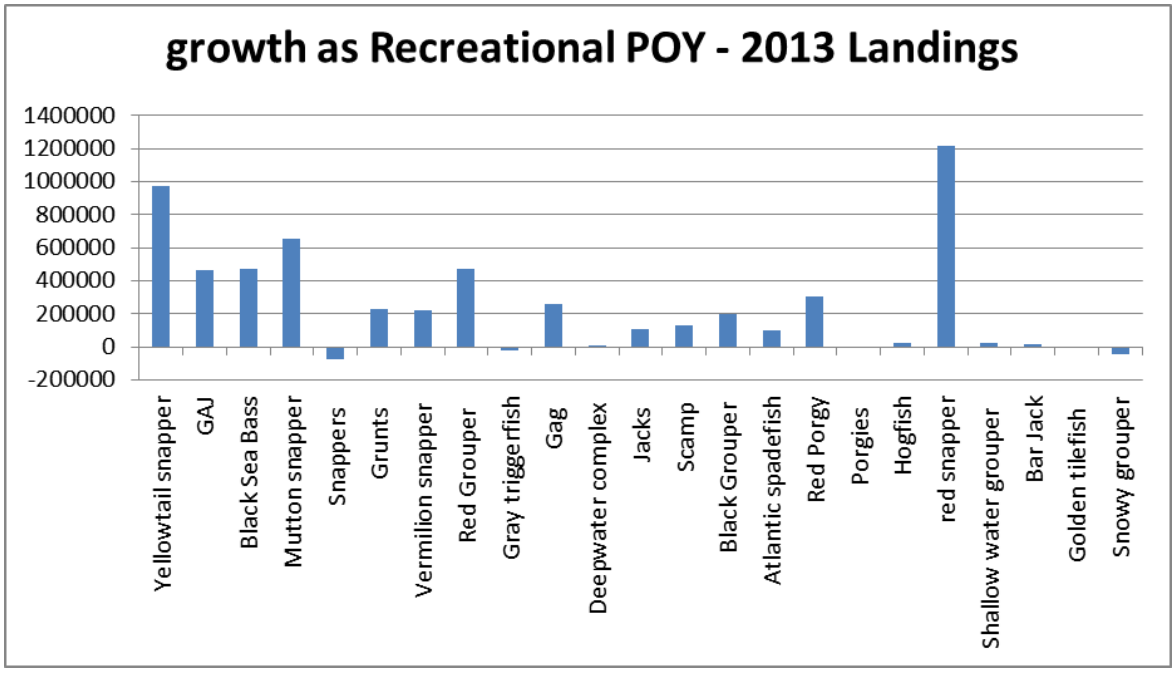

Figure 2. Recreational growth potential by stock, shown as the difference between POY and 2013 landings.

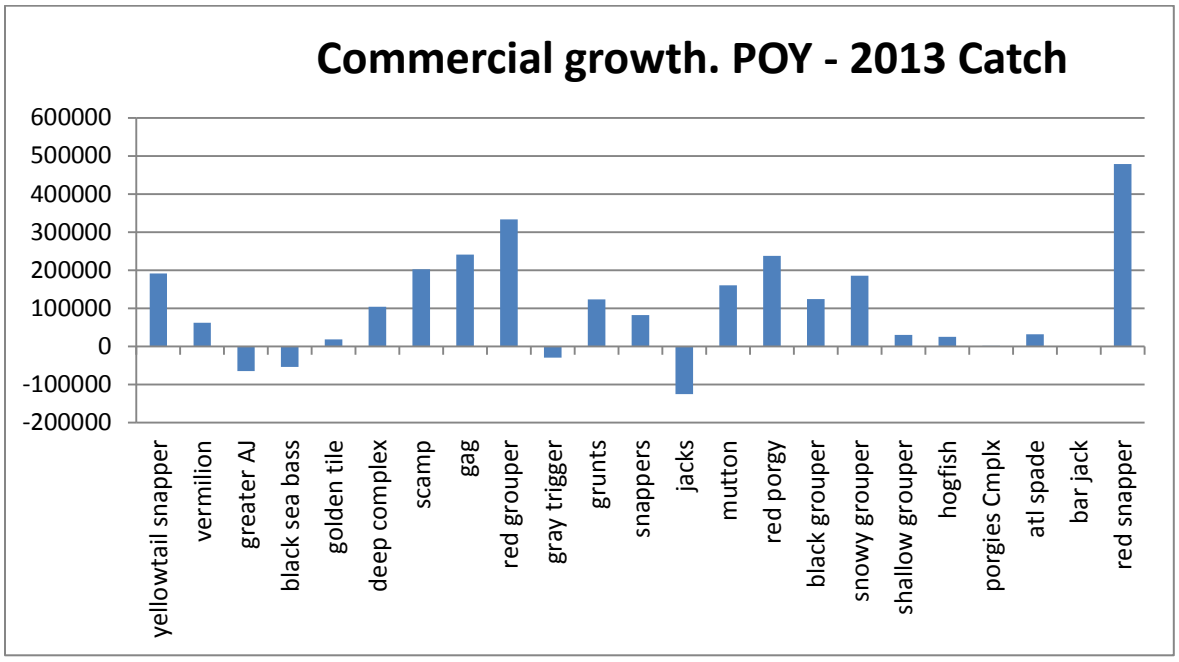

Figure 3. Growth potential in the commercial sector by stock, based on the difference between 2013 catch and potential optimum yield.

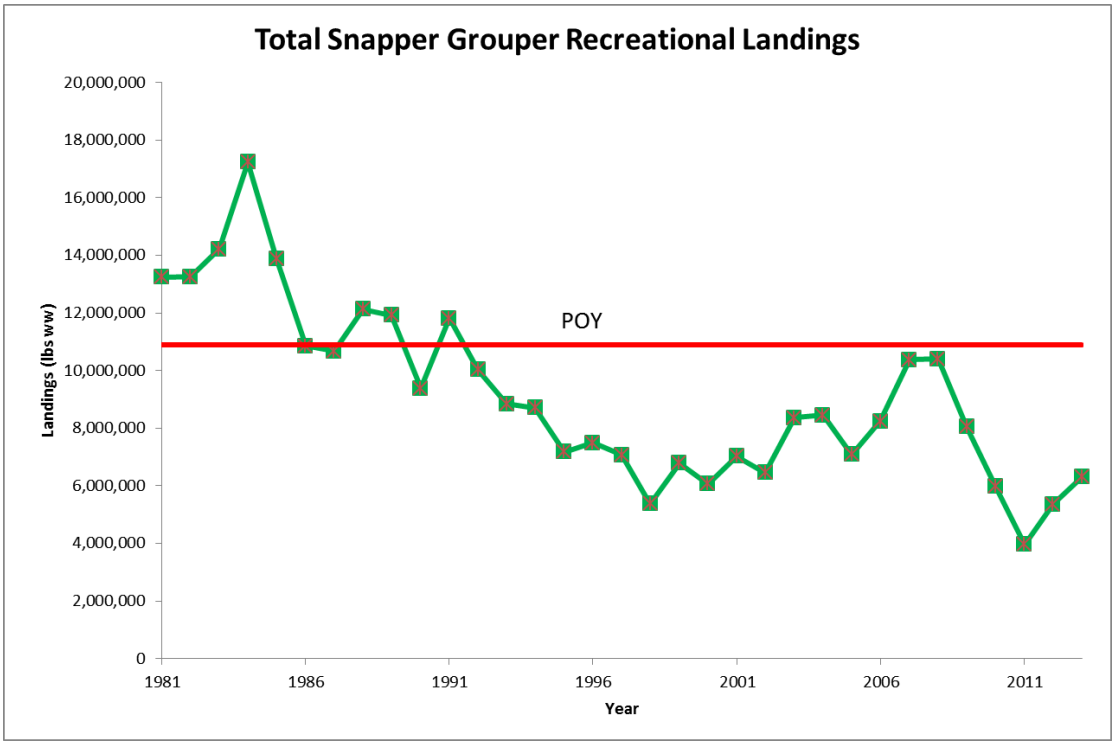

Figure 4. Time series of total recreational landings and 2013 POY

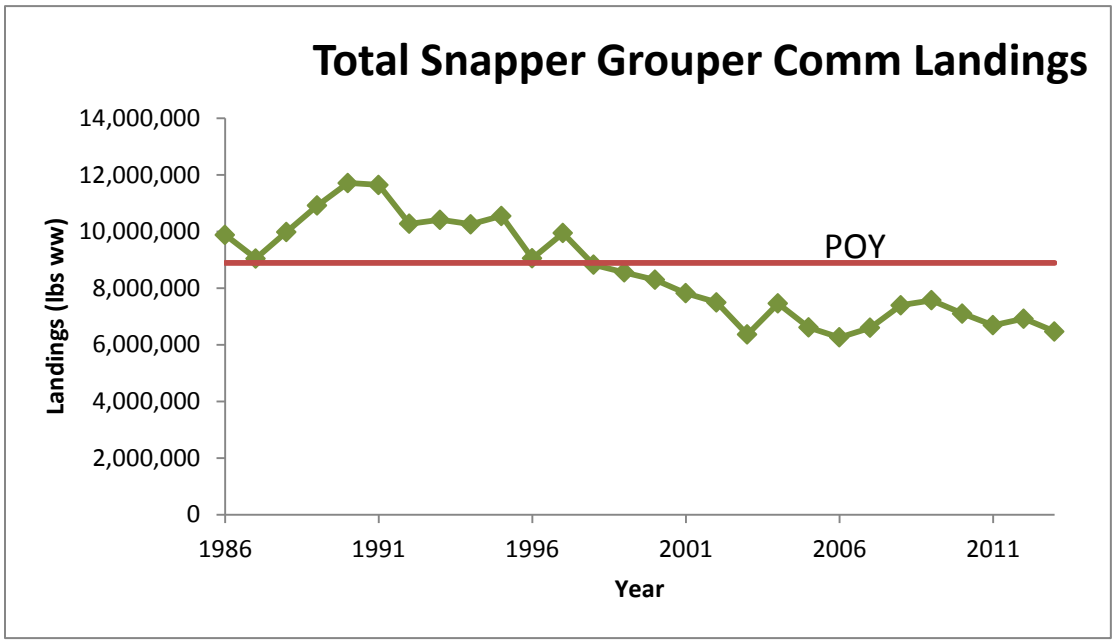

Figure 5. Time series of total commercial landings and 2013 POY.