

# SEDAR Stock Assessment Productivity and Long-term South Atlantic Assessment Planning

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August 2013

The goal of this document is to examine assessment productivity and priorities in the South Atlantic to develop a long term assessment schedule that addresses priority stocks and prevents assessments of them from becoming out of date.

## SAFMC Priority Stocks

The SAFMC prioritized stocks as part of the research and monitoring planning required under the Reauthorized Magnuson Stevens Act. This effort identified 18 primary stocks which account for the majority of landings in managed fisheries. The primary stocks are targeted for complete fishery, biological, and population monitoring, with population status evaluated through age-based assessments. In addition, there are 10 secondary stocks plus the penaeid shrimp group targeted for complete monitoring, and 8 stocks identified as 'Special Needs' due to their life history or management regime.

**Table 1. Primary, Secondary and Special Consideration stocks identified in the annual SAFMC Research and Monitoring Prioritization Plan.**

Primary	Secondary	Special
vermilion snapper	blue runner *^	Warsaw grouper*
snowy grouper	tomtate*	speckled hind*
tilefish	knobbed porgy*	Goliath grouper
red grouper	bar jack*	Nassau grouper*
black grouper	almaco jack *	red snapper
scamp*	lane snapper *	wreckfish*
black sea bass	banded rudderfish *	spiny lobster
gag grouper	rock hind*	golden crab*
greater amberjack	red hind*	
white grunt*	wahoo*	
yellowtail snapper	Penaeid shrimp*	
gray triggerfish		
mutton snapper		
red porgy		
dolphin*		
king mackerel		
Spanish mackerel		
blueline tilefish		

\* Denotes those stocks not assessed through SEDAR

^ Blue runner proposed for removal from snapper-grouper FMU

A less formal prioritization that is potentially more useful in terms of developing future assessment plans is provided through the SEDAR assessment history. Given the limited assessment resources that are available, the 20 stocks that have been assessed over the last 10

years are definitely Council priorities. These 20 stocks include 15 of the primary stocks, 3 of the special stocks, and two others (cobia and hogfish) that are not included in the research and monitoring prioritization of primary, secondary, and special stocks. Other possible priorities to consider are those stocks that have yet to be assessed but are often discussed during deliberation of future assessment plans. Examples include white grunt, scamp and dolphin from the primary stocks; wahoo from the secondary stocks; and speckled hind, Warsaw grouper, wreckfish and golden crab from the special stocks.

There is significant overlap between the research and monitoring priority stocks in Table 1 and the assessed stocks in Table 3, as well as some stocks included in either one or the other. Therefore, neither gives a complete picture of likely Council priorities and some combination of the two is suggested. A potential list of "core" stocks to consider for regular and ongoing assessments is proposed here based on combining the 20 SEDAR assessed stocks with the remaining unassessed stocks in the primary list. This gives 23 stocks to consider as priorities for regular and ongoing assessment scheduling (Table 2). Eighteen stocks in this list fall under the Snapper-Grouper (SG) FMP, 3 are in the Coastal Migratory Pelagics (CMP) FMP, 1 is in the dolphin-wahoo FMP and 1 is in the spiny lobster FMP.

One way of evaluating whether this list includes stocks that will adequately represent a fishery, such as the mixed-stock Snapper-Grouper complex, is to consider the proportion of total fishery landings represented by the core stocks. For the CMP and spiny lobster FMPs, all managed stocks are included. For the Dolphin-Wahoo FMP, only dolphin is included, so further consideration of wahoo may be required. For the SG FMP, the members of this list account for an average of 80% of the snapper grouper pounds landed between 2002 and 2011 (Figure 1).

**Table 2. Proposed list of "core" SAFMC stocks for regular and ongoing SEDAR assessments.**

black grouper	red grouper
black sea bass	red porgy
blueline tilefish	red snapper
cobia	scamp
dolphin	snowy grouper
gag grouper	Spanish mackerel
goliath grouper	spiny lobster
gray triggerfish	tilefish
greater amberjack	vermilion snapper
hogfish	white grunt
king mackerel	yellowtail snapper
mutton snapper	

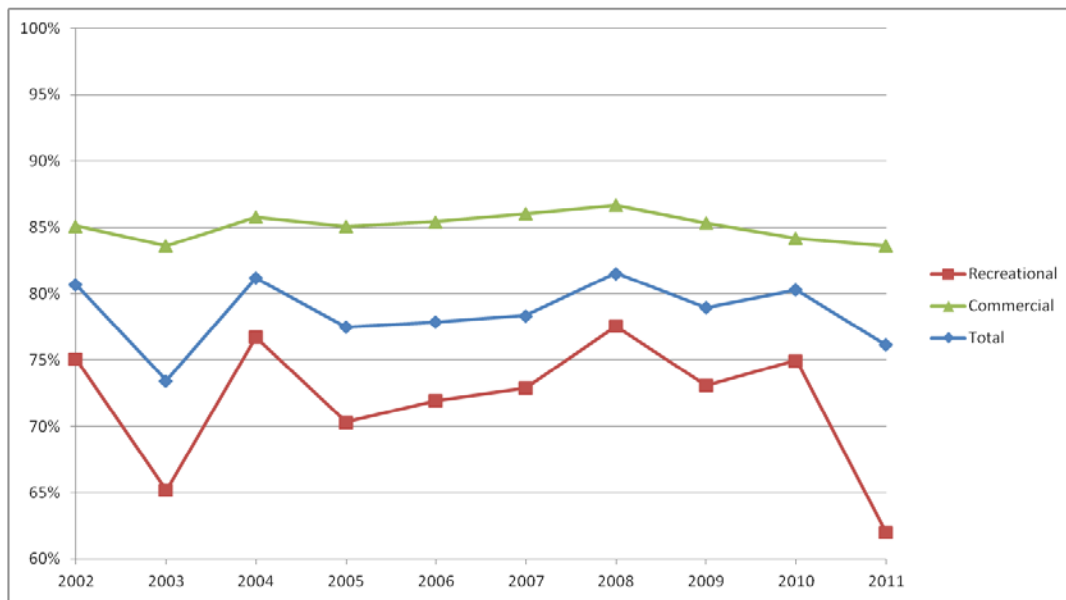


Figure 1. Proportion of total, commercial and recreational landings of species in the snapper-grouper fishery management unit that are attributed to the proposed core stocks.

### SEDAR Productivity.

SEDAR began with very limited assessment capabilities, assessing 1 stock in the first year, 2002 (Figure 2). Three stocks were assessed in 2003 and an additional 2 stocks were put through the peer review process. Overall productivity varied between 4 and 6 for the next several years, with the exception of 2007 where productivity spiked to 10. This was largely due to assessing 5 shark populations. Productivity increased after 2010, largely in response to increased assessment staff at the SEFSC. Since that initial increase that allowed productivity to reach 12 assessments annually, staff turn-over and more recent budget reductions have hindered the long-term plan of accommodating 15 or more stocks per year.

A brief summary of the SEDAR assessment planning process and vocabulary will be helpful, before delving further into the challenges of balancing assessment needs with assessment capabilities. Overall assessment workload in the Southeast Region is managed through the SEDAR Steering Committee, which consists of representatives of SEFSC, SERO, HMS, the three Southeast Councils, and the 2 Atlantic and Gulf states commissions. The Council cooperators develop short and long-term assessment priorities, while the SEFSC indicates how many assessment projects can be completed, by indicating to each cooperator how many 'slots' (as they are called during planning) are available in a given year. The SEFSC has multiple labs working on assessments: Miami, which addresses Gulf and Caribbean assessments; Beaufort, which addresses South Atlantic and Commission assessments, and Panama City, which addresses shark assessments. The slots available to each Cooperator are closely related to, but may not always exactly match, the number of experienced lead assessment analysts available in each assessment team. Additional assessment capabilities are provided by the Florida Fish and Wildlife Commission. FWCC resources are primarily devoted to those stocks which are found off the coast of FL, such as yellowtail snapper, spiny lobster and black grouper. Timing of these assessments is determined by the FWCC.

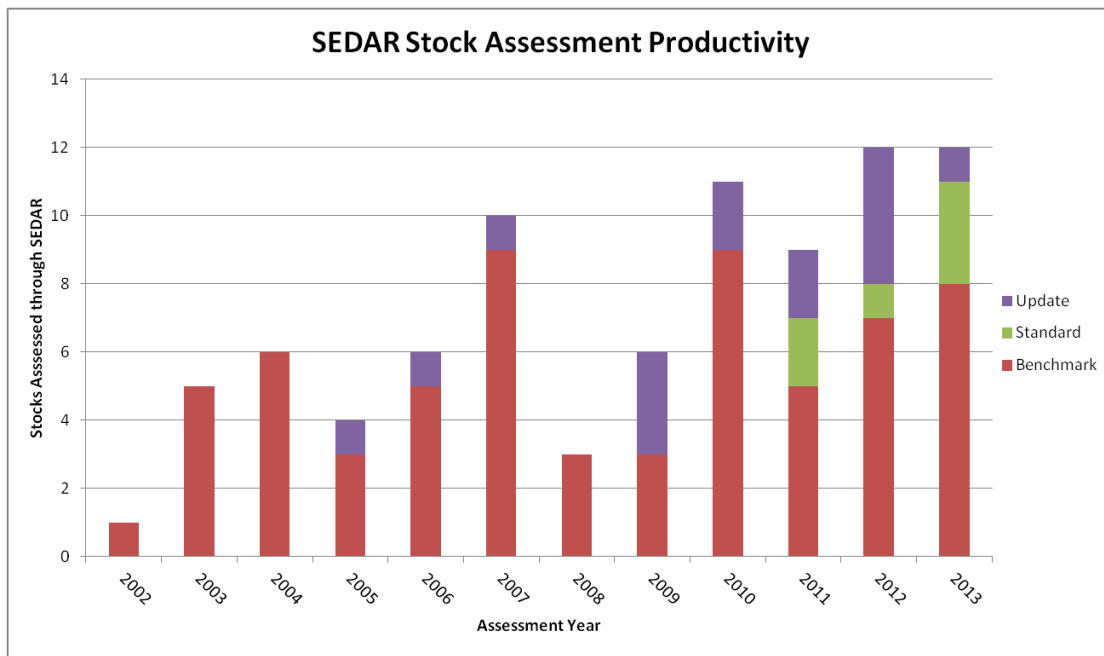


Figure 2. SEDAR stock assessment productivity, 2002 - 2013.

Focusing on assessment of South Atlantic stocks, productivity has ranged from the single stock which began the program in 2002 to a peak of 5 stocks in 2012 and 2013 (Table 3 and Figure 3). These counts include assessments conducted by the Florida Fish and Wildlife Commission. One further caveat is that assessments of king mackerel are not counted in this evaluation. Although managed jointly by the SAFMC and GMFMC, king mackerel assessments are conducted through the Miami SEFSC Laboratory and are considered separate from the Beaufort Laboratory resources which handle other SAFMC assessment needs.

Discussions at the SEDAR Steering Committee indicate that the SEFSC goal is to support 5 South Atlantic assessment projects annually. Adding in an annual average of one South Atlantic/Gulf stock assessed through FL FWCC brings the target output to 6 stocks a year. However, despite the increases in SEFSC staff and contributions of FWCC to assessment productivity, the program has been unable to exceed 5 stocks per year. Reasons for this vary from year to year, and include issues such as staff turn-over, complex assessments that require additional resources, and assessment resources required for regional Commission stocks such as menhaden. Due to the reality illustrated in Figure 3, 4 SEFSC and 1 FWCC assessment 'slots' will be considered in the planning alternatives that follow.

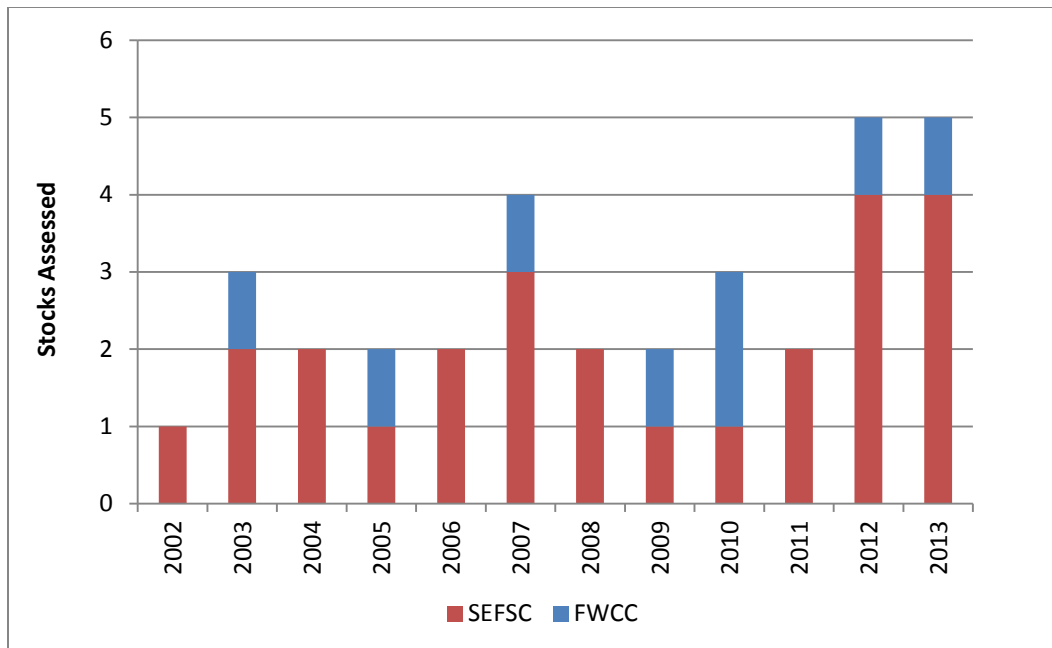


Figure 3. Number of SAFMC managed stocks assessed through SEDAR, 2002 - 2013, by lead assessment agency.

NOTE: This figure does not include assessments of king mackerel, which are jointly managed by the Gulf and South Atlantic and assessed by the Miami team.

Table 3. Timing and frequency of SAFMC stocks assessed through SEDAR, 2002-2014. The upper group of stocks are assessed through SEFSC, and the lower through FL FWCC.

Stock	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
SAFMC cobia											X		
AG King Mackerel			X				X					X	
SAFMC black sea bass		X		X						X		X	
SAFMC blueline tilefish												X	
SAFMC gag grouper					X								X
SAFMC gray triggerfish												X	
SAFMC greater amberjack						X							
SAFMC red grouper								X					
SAFMC red porgy	X				X						X		X
SAFMC red snapper						X			X				X
SAFMC snowy grouper			X									X	
SAFMC Spanish mackerel							X				X		
SAFMC tilefish			X							X			
SAFMC vermilion snapper		X				X	X				X		
AG goliath grouper			X						X				
AG spiny lobster				X					X				
AG hogfish			X									X	
AG black grouper								X					X
AG mutton snapper						X					X		
AG yellowtail snapper		X								X			

"AG" indicates stocks under the jurisdiction of both the Gulf and South Atlantic Councils.

## Future SAFMC Assessment Planning

The two key components of the long term plan are priority stocks and assessment output. The analyses above provide a list of 23 "core" or assessment priority stocks, and suggest that 5 stocks per year is a reasonable output expectation given current staff and capabilities at SEFSC and FWCC. This indicates that the South Atlantic Council will require just over 4 years to run through the list of 23 stocks, meaning that each stock can be assessed about every 4 years. This provides a starting point for developing a long term assessment plan that prevents any single assessment from becoming severely outdated.

Consideration is given to the lead assessment agency involved with each stock, as this can have implications for scheduling and workload. As mentioned above, a number of the stocks included in the priority lists and the past assessments lists are assessed by the FL FWCC. Specifically, the FWCC has assessed six of the core stocks: Goliath grouper, spiny lobster, mutton snapper, black grouper, yellowtail snapper, and hogfish. This can be reduced to 5 by considering Goliath grouper a special stock that will not receive regular updates. If FL is able to assess one of the remaining 5 annually, the average assessment age of these stocks will be 5 years. Table 4 illustrates one scheduling alternative for these stocks as an example; actual scheduling is under the purview of the FL FWCC.

Allowing the FWCC to continue taking the lead on assessment of the 6 core stocks found largely in FL waters leaves 17 core stocks to be addressed by the SEFSC. The workload analysis above indicated that SEFSC can typically provide the SAFMC with 4 assessment 'slots' a year. A reduction to 16 stocks is possible if future king mackerel assessments remain under the purview of the Miami assessment team. From this point it is relatively simply to schedule 4 assessments per year, on a rotation that addresses each stock every 4 years.

This approach is proposed as option 1, and Table 4 provides one example of how this would work if implemented. Proposed dates of future assessments are based the timing of the last completed assessment and keeping the interval between that and the next assessment to 3 to 5 years. It is simple and easy to manage, and ensures timely assessments of those stocks that support most of the landings in the fisheries managed by the South Atlantic Council, excluding shrimp. However, it makes no allowance for assessing additional stocks, such as the special needs stocks identified by the Council, without first obtaining additional assessment capabilities. Further, any future changes in the schedule that may be needed to address unforeseen circumstances will increase the interval between subsequent assessments.

A second option is proposed that extends the interval between assessments by one year, to 5 years, to provide some assessment slots that can be allotted to special needs stocks or held in reserve to accommodate unforeseen circumstances (Table 5). This adds up to 2 additional slots in some years, and averages just under 1 slot per year. During the 10 year period from 2015 through 2024 it allows development of an additional 9 stock assessments. Table 5 shows one possible allocation of these slots to address the secondary and special needs stocks identified by the Council. Assessing the 9 secondary snapper-grouper stocks could increase the amount of snapper-grouper landings attributable to assessed stocks by about 10%, based on 2002-2011.

These are just two examples of how limited assessment resources can be managed over the long-term. Both are simplified approaches that treat all stocks equally with regard to the interval between assessments, while the Council could consider more complex approaches. One example of an added complexity is to impose different assessment intervals for different stocks, such as assessing stocks under rebuilding plans on a 3 year interval and others on a 5 year interval.

Another method of increasing overall productivity is by combining some stocks in the scheduling slots. For example, dolphin and wahoo could be combined such that the stocks alternate each time a dolphin/wahoo assessment slot comes up in the rotation. This will double the interval for each stock, so under the 5 year interval alternative the interval between subsequent assessments of a given stock will be 10 years, but it will provide for occasional assessment of both stocks. Such an interval may seem excessive, however, under the current scheduling approach no assessments of either stock have been conducted to date, despite implementation of the dolphin-wahoo FMP in 2004 and the addition of both stocks to the long-term assessment list for the last several years.

## Conclusion

Because South Atlantic Council assessment needs exceed regional assessment production capabilities, the Council must make trade-offs when determining which stocks are assessed in a given year. Such decisions are based on the most pressing needs at the time, which can lead to some stocks being continually pushed toward the horizon, such as is the case with scamp and white grunt, and to some assessments becoming excessively outdated, such as is the case with greater amberjack. This paper proposes several alternatives that provide a comprehensive approach to establishing assessment priorities and scheduling stocks for future assessment. These alternatives are intended to support Council discussion of assessment priorities and may be modified as needed.

In addressing these alternatives, the Council is asked to consider the number of stock assessed, the interval between assessments, and the degree to which assessment capabilities should be committed to regular assessment of core stocks. The proposed alternatives addressing core stocks are intended to provide a practical solution to the challenge of limited resources, and should not be construed as an indication that stocks not included do not warrant assessment consideration. Rather, identifying what can be assessed with available resources is a first step toward determining what additional resources are needed to meet the Council's full assessment needs. Once the Council develops an acceptable approach for maintaining current assessments, consideration should be given to how many additional assessment slots are required to address developing issues or other components of the FMUs.

Table 4. Proposed assessment schedule through 2026 based on Option 1. The upper group of stocks are assessed through SEFSC, and the lower through FL FWCC.

Stock	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
AG King Mackerel		X													
SAFMC cobia	X					Y				Y				Y	
SAFMC black sea bass		X			Y				Y				Y		
SAFMC blueline tilefish		X				Y				Y				Y	
SAFMC gag grouper			X				Y				Y				Y
SAFMC gray triggerfish		X				Y				Y				Y	
SAFMC greater amberjack				Y				Y				Y			
SAFMC red grouper				Y				Y				Y			
SAFMC red porgy	X		X				Y				Y				Y
SAFMC red snapper			X				Y				Y				Y
SAFMC snowy grouper		X					Y				Y				Y
SAFMC Spanish mackerel	X				Y				Y				Y		
SAFMC tilefish				Y				Y				Y			
SAFMC vermilion snapper	X				Y				Y				Y		
SAFMC dolphin					Y				Y				Y		
SAFMC scamp				Y				Y				Y			
SAFMC white grunt						Y				Y				Y	
AG goliath grouper															
AG spiny lobster						Y					Y				
AG hogfish		X					Y					Y			
AG black grouper			X					Y					Y		
AG mutton snapper	X				Y					Y					Y
AG yellowtail snapper				Y					Y					Y	



Table 5. Proposed future assessment schedule based on Option 2. In this table, the upper group are the core stocks assessed through SEFSC and the lower group is additional stocks proposed for assessment in this alternative that increases the interval between assessments to 5 years.

Stock	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
AG King Mackerel		X													
SAFMC cobia	X					Y					Y				
SAFMC black sea bass		X			Y					Y					Y
SAFMC blueline tilefish		X				Y					Y				
SAFMC gag grouper			X					Y					Y		
SAFMC gray triggerfish		X					Y					Y			
SAFMC greater amberjack				Y					Y					Y	
SAFMC red grouper				Y					Y					Y	
SAFMC red porgy	X		X					Y					Y		
SAFMC red snapper			X					Y					Y		
SAFMC snowy grouper		X					Y					Y			
SAFMC Spanish mackerel	X				Y					Y					Y
SAFMC tilefish				Y					Y					Y	
SAFMC vermilion snapper	X				Y						Y				
SAFMC dolphin					Y				Y				Y		
SAFMC scamp				Y						Y					Y
SAFMC white grunt						Y					Y				
wreckfish										Y					
speckled hind							Y								
Warsaw grouper							Y								
wahoo						Y									
golden crab								Y							
Tomtate												Y			
Knobbed porgy												Y			
Lane snapper														Y	
rock hind/red hind															Y