SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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Dr. Michelle Duval, Chair | Charlie Phillips, Vice Chair
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March 29, 2017

Mr. Sam Rauch
Acting Assistant Administrator for Fisheries
NOAA Fisheries
1315 East-West Highway
Silver Spring, MD 20910

RE: MRIP ESTIMATES & HIGH PSE VALUES

Dear Mr. Rauch:

Requirements to manage fisheries with specific Annual Catch Limits (ACLs) under the Reauthorized Magnuson-Stevens Act have significantly increased the importance of recreational catch estimates provided by the Marine Recreational Information Program (MRIP). This has led to closer scrutiny of MRIP methods, which has in turn led to a number of changes in those methods over the last few years. While many knowledgeable experts and scientific reviewers agree that these changes have reduced bias and improved the statistical properties of the estimates, there remains considerable skepticism among the fishing public, state managers, and Council members that the MRIP program accurately reflects recreational catch and effort. This skepticism is particularly acute among those who fish in the Exclusive Economic Zone (EEZ) in the South Atlantic and pursue species managed by the South Atlantic Fishery Management Council (SAFMC), as many of these species fall into the category of "rare events", exhibiting catch estimates that are prone to outliers and high uncertainty. One success from increased efforts to promote awareness and understanding of MRIP is a more knowledgeable fishing public. The flip side of this success is that same public now becoming more aware of shortcomings and challenges, and more prone to let their dissatisfaction be heard, particularly when estimates that seem "wrong" to them lead to closures of favored fisheries.

Recreational fishing is incredibly important to the Southeast Region, including those areas managed by the South Atlantic and Gulf of Mexico Fishery Management Councils. Nearly 31 million recreational fishing trips are reported by MRIP for the South Atlantic and Gulf of Mexico Regions in 2016, representing 60% of the trips measured by the program. Over 2.7 million of these trips were taken in the EEZ, representing over two-thirds of all EEZ trips reported by MRIP. These values for 2016 are by no means anomalous; the Gulf and South Atlantic areas have accounted for over 60% of all trips over the entire MRIP survey period. Nor do these values represent the full importance of recreational fishing in the Region, as trips taken on headboats, or in Texas, are not included in these values.

Prior to requirements to manage by ACLs, large increases or "spikes" in MRIP estimates did not exert much effect on the management program, as the "MRFSS" program (as it was then

called) was widely accepted as meeting its stated goal of providing accurate information on overall trends of recreational fishing, with less accuracy and precision expected of individual estimates. That is no longer the case, as management programs must now prevent landings from exceeding the ACL. Within the South Atlantic Region, a number of recent, high-profile, unexpected spikes have led to recreational fishery closures that, to many observers, are simply the result of outlier values within the MRIP estimation process, and not indicative of actual landings or fishery trends.

In 2015, NOAA Fisheries closed the **recreational hogfish fishery** in the South Atlantic on August 24 due to landings exceeding the ACL. This was triggered by an estimate for Wave 2 (March and April) of 228,494 pounds, a value that was 3.8 times the entire annual ACL of 85,355 pounds. Given that average annual hogfish landings reported by MRIP from 1986 to 2014 were only 75,126 pounds, and landings exceeded 100,000 pounds in only 4 of those years, the 2015 Wave 2 seems an outlier – far out of line with the normal and expected values. Moreover, in most recent years landings are highest in Waves 3 and 4. Nonetheless, the fishery was closed. The Council raised this issue in 2015, and the response from Dr. Dave Van Voorhees is attached. Percent standard errors were frequently well over 50% for hogfish. The response noted: "This level of imprecision could result in highly variable changes in the time series, particularly at the 2-month wave level, and may continue to be a source of concern moving forward." We agree with this conclusion and want to work with NOAA Fisheries to address this problem across our fisheries.

In 2015, NOAA Fisheries closed the **recreational blueline tilefish fishery** on April 7 due to landings exceeding the ACL. MRIP reported 162,483 pounds of blueline tilefish landed in 2016, with 155,293 pounds (96%) taken in Wave 4. Total annual landings exceeded this single wave estimate in only 3 of the prior 20 years of estimates, and the 2015 landings for Wave 3 was only 373 pounds. Blueline tilefish appears particularly resistant to MRIP sampling efforts. No values are reported for 1986-1992, 1994, 1998-1999, and estimates are only reported in 1 or 2 waves for the 10 years from 1993 through 2005 that provide any estimate.

Impacts and consequences of abnormal and outlier catch estimates extend beyond the immediate effects of annual fishery closures, because such estimates become part of the databases that provide Best Scientific Information. Management action evaluations required for Council FMPs rely upon time series data, so the impact of an outlier value will be felt every time the dataset is used to evaluate an action. Stock assessments also depend upon the time series of past estimates. Unusual and outlier values, whether unusually high spikes or missing values effectively treated as zeros, add to the uncertainty of assessment estimates. As these values never 'go away', their impact on the assessment never goes away. In addition, nearly all Southeast Data, Assessment and Review (SEDAR) workshops devote considerable effort to evaluating outlier MRIP values. Even more importantly, the lack of public confidence in such values undermines confidence in the entire assessment product.

The Council recognizes that fishing effort in the EEZ is not a large component of the overall effort surveyed by MRIP, only representing about 8% of the trips observed in recent years in the South Atlantic Region. Given that total EEZ trips includes effort directed at common South Atlantic targets such as dolphin, billfish, tuna, and mackerels, the number of observed trips interacting, much less directing on, the species in our snapper grouper complex will be even lower. As a result, most, if not all, of the species in our snapper grouper complex can likely be considered 'rare events' when it comes to the MRIP sampling effort. The Council further

recognizes that no generalized survey, such as MRIP, is likely capable of providing accurate, robust estimates of rare events in a cost effective manner. Unfortunately, there is nothing in the Magnuson Act that relaxes the requirements for management by ACLs when the only accepted monitoring program is simply incapable of providing estimates that meet the accuracy standards demanded for management by ACLs.

To address these important data issues, the Council is working with the NMFS SERO, Snook and Gamefish Foundation, state partners, and ACCSP on a project to pilot an electronic permit and logbook for the private recreational fishery. We will work closely with MRIP and the NMFS SEFSC during this project to ensure proper design, methods, and verification/validation. Validation would be greatly improved if the MRIP interviewers would ask if the person being interviewed has the electronic permit and record the permit number. The Council is also working on another project with the NMFS SERO, SEFSC, state partners, and Harbor Light Software, Inc. to conduct outreach for electronic reporting in the charter and headboat fisheries. This would greatly improve reporting in the for-hire fisheries.

In addition, the Council, in cooperation with NOAA Fisheries, Sea Grant, our constituents, and our state partners, has established a Citizen Science Program. The objective is to work with fishermen and scientists to address our significant data shortcomings. At the Citizen Science kickoff meeting in January 2016, one of the greatest concerns brought forward by stakeholders was the accuracy and precision of recreational discard estimates, particularly for species such as red snapper. Both the recently completed stock assessment for red snapper (SEDAR 41) and the existing management regime are almost entirely dependent on estimates of discards. The highest priority project suggested by participants at the Citizen Science kickoff workshop was a discard "app" that would allow fishermen the ability to provide information (currently not collected by MRIP) that is critical to estimates of discard mortality. The Council is currently seeking funding to develop and pilot this technology for scamp grouper, with the hope of expanding its use to other species. Through both the Citizen Science program, as well as the projects described above, the Council is working to stretch every federal dollar in its budget to address these challenges from our end.

MRIP staff provided a presentation to the SAFMC Scientific and Statistical Committee (SSC) in October 2015 that outlined several alternative approaches for estimating catch and effort for rare recreational species for use in comparing to ACLs to determine when closures should take place. The SSC considered the alternatives reasonable and appropriate and able to provide estimates with increased precision. There was also discussion regarding efforts to develop precision standards within the MRIP program. Further, it is our understanding that the alternative estimation methods developed by MRIP can be applied on a regional basis to address the type of rare event estimation issues illustrated in this letter. The attached letter from Dr. Van Voorhees contains suggestions for alternative approaches for improving precision on catch estimates for rare event species based on the SSC presentation.

Therefore, we request that the MRIP program make sufficient MRIP staff resources available within existing funding levels to work with the Southeast Fisheries Science Center to enable the Center to implement alternative estimation methods for appropriate rare event species including Hogfish, Blueline Tilefish, Golden Tilefish, Snowy Grouper, Red Snapper, and the Atlantic migratory group of Cobia and use those methods to monitor Annual Catch Limits (ACLs). The output of this effort should be the delivery of estimates in different forms (e.g., using annual estimates of catches and effort) for recreational ACL tracking to reduce the PSEs

that are available for review and consideration by the Councils, SSCs, Advisory Panels, and the public.

To get this effort started, and ensure a consistent approach is taken across the Southeast Region, we also ask that MRIP staff participate in a joint meeting of the South Atlantic and Gulf of Mexico Council's Scientific and Statistical Committees, devoted to this topic, that the South Atlantic Council has requested be held later this year. We are in the process of organizing this meeting with the Gulf Council and will provide the relevant information as soon as possible. It is critical that MRIP/Center provide outputs of various methods for review prior to the Joint SSC meeting. Having MRIP/Center representatives at the Joint SSC meeting to present these outputs will greatly improve the efficiency of developing alternative methods for recreational ACL tracking. We recognize the uncertain funding situation but want to express our strong support for in-person participation at this meeting.

Thank you for your help with this critical issue. We would appreciate a response as soon as possible but no later than our June 12-16, 2017 Council meeting. This issue will also be discussed at the upcoming Council Coordinating Committee (CCC) meeting May 16-18, 2017, and it would be very helpful if a response were available at that meeting. We look forward to working with you to improve the livelihoods of our stakeholders by advancing the data available for management.

Best Regards,

Michelle A. Duval

Michelle Duval,
Chair

cc: Council Members & Staff
Bonnie Ponwith & Theo Brainerd
Monica Smit-Brunello
Jack McGovern & Rick DeVictor
Alan Risenhoover
Dave Van Voorhees

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

DEC 07 2015

Michelle Duval, Ph.D.
South Atlantic Fishery Management Council
4055 Faber Place Drive; Suite 201
North Charleston, SC 29405

Dear Dr. Duval:

This letter is a combined response to your separate requests for information on recreational hogfish landings dated October 27, 2015 and November 12, 2015. Our response is organized into separate sections: 1) concerns over historical survey data on hogfish landings from North Carolina, and 2) concerns about recent high landings estimates for the Atlantic coast of Florida.

1. North Carolina Historical Data

In response to the Council's concerns over hogfish landings data in North Carolina, we conducted an internal review of the data and also consulted survey operations staff with the North Carolina Division of Marine Fisheries (NCDMF) regarding any miscoding of the records in question. Our review covered a number of data elements including the frequency of species code use, species composition in the catch on trips with recorded hogfish landings, and fish measurement distributions among others. We also reviewed various metrics at the sampler level including distributions of intercepts obtained by site and trip end time across years and counts of measured fish by species.

Given our internal findings combined with the information provided by NCDMF, it does appear that the hogfish records in question are atypical. However, we were unable to make a final determination as to whether the records are erroneous or simply rare event observations. The available information is not sufficient to determine if a revision of historic data and estimates is justified.

2. Florida Landings Estimates

We share the Council's concerns over the hogfish landings estimates for 2014 Wave 1 and 2015 Wave 2. We flagged those estimates for further examination during our standard estimate review process, which we perform prior to every release of preliminary estimates.

We conducted investigations into both cases, reviewing all of the survey data collected during those waves by the Access Point Angler Intercept Survey (APAIS, the intercept survey), as well as output produced at various steps in the MRIP estimation process. Based on those reviews, which are briefly summarized below, we did not find anything that would indicate a problem with either the survey data or the estimation process. We do recognize that the landings estimates in question are very imprecise, so we have included a list of approaches that may be explored to help improve the precision of estimates going forward for rare event species like hogfish. These are the same approaches that John Foster presented in more detail at the Council's October 2015 SSC meeting.

2.1 APAIS Data and MRIP Estimation

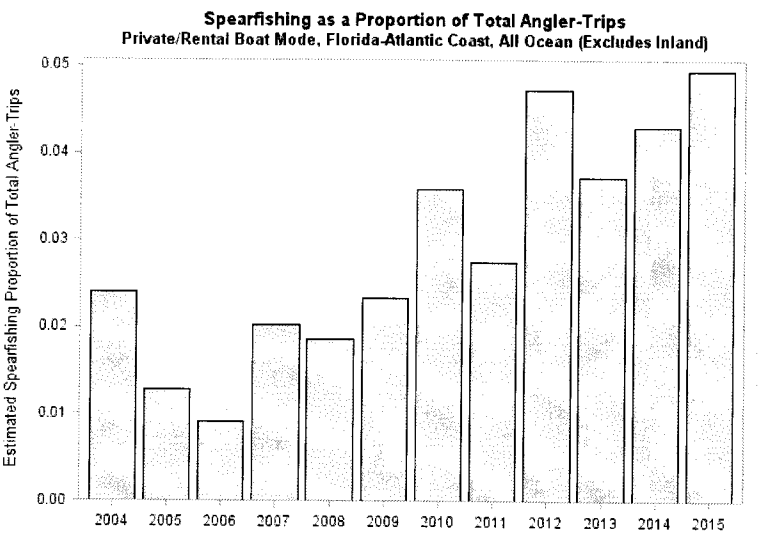
The findings described here are limited to the private/rental boat mode on the Atlantic coast of Florida in 2014 Wave 1 and 2015 Wave 2. In both cases, the private/rental boat mode estimates in Florida accounted for the majority of the large landings estimate for the region. Angler-trips with hogfish catch accounted for very small percentages of intercepted trips, approximately 1.5% (12 of 780) of intercepts in 2014 Wave 1 and also 1.5% (18 of 1174) in 2015 Wave 2. These percentages were larger than what we have typically seen in the past, but we have been seeing what appears to be an increasing trend in spearfishing trips overall.

We also examined the counts of landed hogfish at the trip level along with the weight measurements for individual fish. While some counts of observed and unobserved landed fish at the angler-trip level were above what we have generally seen, they were all below the long term 95th percentiles for these catch dispositions of hogfish. In terms of fish weight, the mean weights were 1.7 lb. in 2014 Wave 1 and 1.8 lb. in 2015 Wave 2, both very much in-line with what we have seen for hogfish in recent years.

Further, we reviewed the sample weights calculated during the MRIP estimation process for these trips. In both cases, the range of sample weights for intercepted trips with hogfish catch fell well within the range of sample weights for intercepted trips with no catch of hogfish. In 2014 Wave 1, sample weights for intercepted angler trips with hogfish ranged from 587 to 2793, while intercepted trips without hogfish catch had sample weights ranging from 148 to 6491. In 2015 Wave 2, sample weights for intercepted hogfish trips ranged from 163 to 4534, while intercepted trips without hogfish catch had sample weights from 39 to 10201. We did not detect any outlier sample weights associated with the hogfish trips.

2.2 Spearfishing

As part of our investigation, we also took a look at the prevalence of spearfishing trips in the APAIS data going back to 2004, and there are two findings of particular interest here. Over this time period, there appears to be a fairly consistent increasing trend in spearfishing prevalence, most notably in Florida. The following figure illustrates this trend, providing the estimated proportion of total private/rental boat effort comprised by spearfishing on the Atlantic coast of Florida in the two ocean areas combined (State Territorial Seas, Federal Exclusive Economic Zone).



Given this increase, we might anticipate increases in trips with catches of species targeted by spearfishers. Despite this increasing trend, spearfishing remains a relatively rare event in APAIS, and so, the catch estimates for these species will likely remain imprecise showing similarly variable changes (mostly increases) in the estimates.

The other finding on spearfishing is a noticeable change in the temporal distribution of spearfishing trips, again for private/rental mode on the Atlantic coast of Florida. For years prior to 2013, we found that spearfishing trips ending before 4 pm made up almost 87% of the total intercepted spearfishing trips, and those ending at 4 pm or later accounted for the remaining 13%. Since 2013, those percentages have been very different with trips ending before 4 pm reduced to 59% and trips ending at 4 pm or later increased to 41%. The most probable cause for this seeming shift in effort to later in the day is the 2013 APAIS design change. While a number of significant improvements were implemented in the 2013 design change, one of the biggest was the more complete coverage of trips ending in late afternoon and early evening hours. Prior to 2013, the MRFSS intercept design focused sampling on peak activity hours with incomplete or inconsistent coverage of late afternoon and evening hours. Separate work on potential design change effects strongly suggests that this temporal undercoverage in the MRFSS APAIS design was a likely source of bias in the MRFSS estimates.

2.3 Recommendations

Based on these findings, it may be worth considering use of a calibrated time series of hogfish landings. These estimates would incorporate the calibration approach jointly developed by MRIP and SEDAR to address effects introduced by the 2013 APAIS design change. The direction of changes in the temporal distribution of spearfishing trips, before and after the 2013 design change, suggests that calibrating the time series could result in an increase in hogfish landings prior to 2013. In the context of a calibrated time series, the 2014 and 2015 estimates might appear somewhat less extreme and perhaps less disruptive to both management and to the fishery itself.

While none of the findings indicated a problem that would require revising the survey data or the estimates for 2014 and 2015, it is clear that the wave-level landings estimates for hogfish in the South

Atlantic region are highly imprecise in general with percent standard errors frequently well over 50% (irrespective of the size of the point estimate). This level of imprecision could result in highly variable changes in the time series, particularly at the 2-month wave level, and may continue to be a source of concern moving forward.

For this reason, it may be worth further consideration of alternative approaches for improving precision on catch estimates for rare event species that John Foster presented to the Council's SSC in October. These approaches may be broadly summarized by the following list:

- Increasing samples sizes, particularly APAIS sample sizes
- Optimizing APAIS sample allocations among strata
- Adjustments to APAIS design elements:
    - Further stratification of site-time sample units
    - Adjustments to sample unit selection probabilities
- Design and implementation of a specialized survey program
- Custom estimation methods

While the numerous technical details and trade-off considerations of each approach are beyond the scope of this letter, these approaches could all provide some measure of improvement in the precision of catch estimates for hogfish and other rare event species.

We are committed to sustained improvement in the quality of information products provided by MRIP and are happy to continue working with the Council to discuss ideas on how best to meet the needs for recreational fisheries statistics in the South Atlantic region. Please let us know if you have any questions about the information we have provided here.

Sincerely,

David A. Van Voorhees, Ph.D.
Chief, Fisheries Statistics Division
Office of Science and Technology