UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Fisheries Science Center
75 Virginia Beach Drive
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Mr. Steven Atran
Population Dynamics Statistician
Gulf of Mexico Fishery Management Council
2203 N. Lois Avenue, Suite 1100
Tampa, FL 33607

Dear Steve:

This letter is in response to your request for the SEFSC to address two items that arose during the last Gulf Council meeting: 1) "Can the Science Center provide any new information [SEDAR 10 was completed in 2006] on the recent male to female ratio of gag in the Gulf of Mexico, and comparisons with earlier years? Of particular interest is whether any changes have been observed since implementation of the Madison-Swanson and Steamboat Lumps marine reserves in 2000", and 2) " ... whether there has been any observed change in the average age or size of gag transition from female to male. Assuming that mechanism for triggering a change in sex is at least partially socially induced, it seems reasonable that if there has been any increase in the proportion of males, there would be less incentive for a female to transition, and the average age/size of transitioning would increase".

With regard to question 1, SEDAR 10 documents contain gag sex ratio data through the 2004 reef fish survey. The data from 2005, and possibly 2006, can be added but will require several weeks to get "copperbelly" gag identified. The 2006 data point would be using data that has not yet undergone QA/QC, so it could contain errors. As far as the MPA project data goes, the Center doesn't collect fish from Madison-Swanson or Steamboat Lumps, as this is strictly video data. Therefore we do not have histology data to assess sex ratio questions. Making sex determinations from visual imagery is risky, as we know that not all copperbellies are males. We can report to the Council how many gag we have seen in M-S and SL and what their distribution is, however size information is scarce as only fish swimming through the paired laser portion of the field of view are measured. The sample size for length data is small, and a power test likely would show it to be statistically inadequate for some uses. In 2008, we hope to employ stereo cameras which will allow size determinations for all fish in the field of view. This will help for the future but does nothing for the current question. As well, the MPAs have not even been in effect for 10 years yet, the time scale at which we might begin to see changes in this longer-lived species. So the bottom line is: there are no sex data available from the MPA project while there are two additional years of data available from the Gulf-wide reef fish

survey beyond that used in SEDAR 10. However, it will take weeks to produce the number you seek. A possible alternate source of information is Dr. Chris Koenig at FSU. Your request was relayed to him but he has not yet responded to us by either phone or e-mail.

With regard to question 2, although you examined reproductive work done in the South Atlantic Bight (SEDAR10-DW-15), a more appropriate reference would be SEDAR10-DW-3 in which Fitzhugh et al. address gag reproduction in the Gulf of Mexico. The latter report shows that transition (size-age) in samples collected during 1997-2002 from the eastern Gulf does not reflect any change from that reported by Hood and Schlieder (from their 1977-1980 samples). While the size-age at transition data are robust (the same result was obtained with two independent methods), the question of overall stock sex ratio estimated from field samples is somewhat difficult (and non-trivial) because sex ratio depends on gear, depth, location, year-class strength, and assumptions about random sampling. This report indicates that much reproductive sampling is, and has been, dependent on a variety of sample sources which were rather unqualified. If this question of sex ratio remains of interest to the Council, we could assemble more recent data and have our assessment team address your question with the necessary caveats.

Given that we just completed the gag SEDAR in 2006, and we have many other species already in line for assessment or update, I suggest that we address these questions in a future gag update the timing of which could be decided upon at the next SEDAR steering committee meeting.

Cordially,

Alex Chester,
Acting Center Director