Agenda
Shrimp Management Committee

Gulf of Mexico Fishery Management Council

Marriot Beachside Hotel
Flagler Ballroom
Key West, Florida

Wednesday, June 10th 2015
9:30 a.m. - 11:00 a.m.

I. Adoption of Agenda **(Tab D, No. 1)** – Perret

II. Approval of Minutes **(Tab D, No. 2)** – Perret

III. Action Guide and Next Steps **(Tab D, No. 3)** - Kilgour

IV. Final Action Shrimp Amendment 15 – Status Determination Criteria for Penaeid Shrimp and Adjustments to the Shrimp Framework Procedure **(Tab D, No. 4a)** – Kilgour
   a. Shrimp Amendment 15 codified text **(Tab D, No. 4b)** – NMFS
   b. Committee recommendations- Perret

V. Options Paper for Shrimp Amendment 17 – Addressing the Expiration of the Shrimp Permit Moratorium **(Tab D, No. 5)** - Kilgour
   a. Committee recommendations- Perret

VI. Other Business – Perret

Members:
Perret, Chair
Pearce, V. Chair
Bosarge
Crabtree/Branstetter
Donaldson
Pausina/Fischer
Riechers/Robinson

Staff: Kilgour

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GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

SHRIMP MANAGEMENT COMMITTEE

Golden Nugget Casino Hotel Biloxi, Mississippi

April 1, 2015

VOTING MEMBERS

Corky Perret.....Mississippi
Leann Bosarge.....Mississippi
Roy Crabtree.....NMFS, SERO, St. Petersburg, Florida
Dave Donaldson.....GSMFC
Myron Fischer (designee for Randy Pausina).....Louisiana
Harlon Pearce.....Louisiana
Lance Robinson (designee for Robin Riechers).....Texas

NON-VOTING MEMBERS

Kevin Anson (designee for Chris Blankenship).....Alabama
Martha Bademan (designee for Nick Wiley).....Florida
Doug Boyd.....Texas
Jason Brand.....USCG
Pamela Dana.....Florida
Dale Diaz (designee for Jamie Miller).....Mississippi
John Greene.....Alabama
Campo Matens.....Louisiana
John Sanchez.....Florida
Greg Stunz.....Texas
David Walker.....Alabama
Roy Williams.....Florida

STAFF

Steven Atran.....Senior Fishery Biologist
Assane Diagne.....Economist
John Froeschke.....Fishery Biologist/Statistician
Doug Gregory.....Executive Director
Karen Hoak.....Administrative and Financial Assistant
Morgan Kilgour.....Fishery Biologist
Ava Lasseter.....Anthropologist
Mara Levy.....NOAA General Counsel
Cathy Readinger.....Administrative Officer
Ryan Rindone.....Fishery Biologist/SEDAR Liaison
Bernadine Roy.....Office Manager
Charlotte Schiaffo.....Research & Human Resource Librarian
Bryan Schoonard.....GIS Analyst

OTHER PARTICIPANTS

Pam Anderson.....Panama City, FL
Holly Binns.....Pew Charitable Trusts
Randy Boggs.....Orange Beach, AL
Steve Branstetter.....NMFS
Rick Burris.....MDMR
Shane Cantrell.....Galveston, TX
Kim Chauvin.....Chauvin, LA
Bubba Cochrane.....Galveston, TX
Dean Cox.....
Rick Hart.....NMFS
Ben Hartig.....SAFMC
Bill Kelly.....FKCFA, FL
Will Patterson.....GMFMC SSC
Bonnie Ponwith.....SEFSC
Bill Staff.....Orange Beach, AL
Steve Tomeny.....LA
David Veal.....Biloxi, MS
Bob Zales.....Panama City, FL

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The Shrimp Management Committee of the Gulf of Mexico Fishery Management Council convened at the Golden Nugget Casino Hotel, Biloxi, Mississippi, Wednesday morning, April 1, 2015, and was called to order at 8:30 a.m. by Chairman Corky, Perret.

ADOPTION OF AGENDA
APPROVAL OF MINUTES
ACTION GUIDE AND NEXT STEPS

CHAIRMAN CORKY PERRET: If everyone is in the audience would care to take a seat and tone it down, please. The good news is, after consultation with Dr. Crabtree, Chairman Anson, Executive Director Gregory and myself, we are not going to take up anything today and we have the day off. It's April Fools and so April Fool's Day. Now, that's done.

The Shrimp Committee, we have Mr. Perret, Mr. Pearce is here, Ms. Bosarge is here, Dr. Crabtree is here, Mr. Donaldson, Mr. Fischer, Mr. Robinson. Ms. Kilgour, are you hooked up on the phone?

DR. MORGAN KILGOUR: Yes, I am here.

CHAIRMAN PERRET: Dr. Hart, are you on or will be on shortly?

DR. RICK HART: Yes, Corky, I'm here.

CHAIRMAN PERRET: Tab D, Number 1, the first thing is D-1,

Adoption of the Agenda. Any modifications or changes to the agenda? I have two. Under Other Business, I would just like to add TED Compliance Enforcement Workshop Report. Mr. Jason Brand, myself, and Dr. Crabtree will just summarize that.

Second is we have a letter that was forwarded to us through Dr. Nance from the Port Arthur Shrimp Association and, Charlotte or Karen, does everybody on the Shrimp Committee have a copy of that letter? If not, I would like for you to make a copy for everyone so we can just have a brief discussion on that. That's the two additions. With that, I will entertain a motion for adoption.

MR. HARLON PEARCE: So moved.

MS. LEANN BOSARGE: Second.

CHAIRMAN PERRET: It's moved by Mr. Pearce and seconded by Ms. Bosarge. Any discussion? Hearing none, the agenda is adopted. Next on the agenda is the minutes of D-2 and I need a motion for approval, unless there is any modifications.

MS. BOSARGE: So moved.

CHAIRMAN PERRET: It's moved by Ms. Bosarge and seconded by Mr. Pearce. All those in favor say aye; opposed like sign. The minutes are approved. Next is the Action Guide and that's simply the steps that we need to go through today. That is Tab D, Number 3. Any questions or comments on the action guide? Thank you.

Next is Item IV, the Biological Review of the Texas Closure, Tab D-4, and Dr. Hart is going to give us that presentation and are you ready, Dr. Hart?

DR. HART: Yes and can you hear me?

CHAIRMAN PERRET: We can hear you fine and thank you and proceed, please.

BIOLOGICAL REVIEW OF THE TEXAS CLOSURE

DR. HART: Thank you, Mr. Chairman, for having me here today and so I'm just going to go through the Texas closure review for 2014. This slide shows catch by month. We are seeing a stable catch for the last several years of around ten-million pounds. It's trending towards more of the catch, as you can see in the more recent years, appearing in August.

This is also showing May through August by size and you see low catches in May and June and starting to see more in July and then the primary catch is in August. Of note is the low number of the real small shrimp in the smallest, greater than sixty-seven count. Primarily it's some of the larger shrimp being harvested.

The next few slides are going to be percentage of the landings by port. This is the upper Texas coast ports. We are seeing about 25 percent of the total landings being landed in Jefferson County, followed by Chambers County.

This is similar, but for the middle Texas coast. You can see in the last ten or fifteen years Palacios becoming more of the dominant port where shrimp are being landed in the middle Texas coast.

Here we have the lower Texas ports and primarily it's in recent years been Brownsville has seemed to be having more of the landings being done at Brownsville and overtaking Aransas in recent years.

This is July offshore white shrimp catch and we're seeing a lot more of the larger size shrimp in the fifteen to twenty count in recent years. These are the larger, over-wintering shrimp. We are seeing more of those dominating the catch. This is August offshore white shrimp catch and, again, the larger size shrimp are dominating the catch.

Kind of in summary, the environmental factors are important for the growth and abundance of shrimp. We would expect the below average and this is from Dr. Scott-Benton's prediction. Brown shrimp catch off of Texas was a little bit below average and the size of the shrimp off of Texas, about only 2.8 percent of the shrimp are in that greater than sixty-seven count size. These are more of the bay shrimp and probably about three weeks behind.

With the closure, we're seeing an increase in pounds, an increase in yield, with the 2014 closure, between zero and 17 percent. Some changes in the landings distribution in Texas ports and the white shrimp catch off of Texas seems to be a little below average during both July and August. That's really all. If you have any questions about that, I would be happy to entertain questions, Mr. Chairman.

CHAIRMAN PERRET: Thank you, Dr. Hart. Do any members have

questions for Dr. Hart? Rick, I have one. Looking at the landings at the various ports, where are the bulk of the shrimp being caught, the central Texas coast, northern, southern, or is it equally distributed?

DR. HART: You know, I would -- It's probably more equally distributed. I would hazard to really answer that without having those data at my fingertips, because the landings by port is an indication of where they are fishing, but some folks do land in areas where they haven't fished. It's not as much now as in the past, but without having actually the catch of where they're actually caught, I would hate to answer that question.

CHAIRMAN PERRET: Okay. Fair enough. Anybody got any questions for Dr. Hart? Okay, Dr. Hart, what else have you got for us?

DR. HART: That's it.

CHAIRMAN PERRET: Okay. The biological review of the Texas closure, I want to read one thing and take it a little bit out of order, since we're on the Texas closure. We are going to have the Shrimp Advisory Panel report coming up, but just since we're on this item, I did want to let you know now, because we're going to need a motion as to whether or not to recommend the Texas closure for the coming year or not, but the Shrimp Advisory Panel met last month in Tampa, at the council office.

There were about twelve people there and the motion that they passed unanimously was the Shrimp AP recommends that the 200-mile Texas closure be continued for the coming year. That was input from our council advisory panel. With that, what's the pleasure of the committee relative to the Texas closure for the coming year?

MS. BOSARGE: I think the Texas closure is a great success story and I think pretty much anybody in the industry would tell you so. **I would like to make a motion that we recommend to have the Texas closure concurrent with the date that they recommend out to 200 miles for the 2015 season.**

CHAIRMAN PERRET: We are getting that motion on the board. I need a second.

MR. PEARCE: Second.

CHAIRMAN PERRET: It's seconded by Mr. Pearce. The motion is to recommend to have the Texas closure concurrent with the date they recommend, they being the State of Texas recommends, out to

200 miles for the 2015 season. Discussion? Are you ready to vote? **All those in favor signify by saying aye; opposition. Hearing none, so ordered. With that, the motion carries and we recommend the closure for the coming year.** I think Mr. Anson and Mr. Gregory now need to make an announcement.

MR. KEVIN ANSON: Thank you, Mr. Chairman. We have had some requests to shuffle some items during full council, primarily Reef Fish, to move that up. Also, due to the webinar, there is some uncertainty, with the way the schedule is now, that the staff will be able to turn on the webinar and then turn it off after we go into closed session for the morning, later on this morning.

What we're going to do is to move the closed session into first thing tomorrow morning and then with the hour that we will have in the schedule for today, move a few of the committee reports that are completed into that one-hour time slot and so anybody who is out in the audience, if they have anybody they think will be interested in any of the committee reports, we are going to probably do the SEDAR Committee, Sustainable Fisheries, and Law Enforcement, at least.

Then possibly Administrative Policy and Budget. Those committee reports will be done this morning for the time that was previously scheduled for the closed session from 10:25 to 11:30. Then we will have closed session first thing tomorrow morning for the hour, starting at 8:30 A.M. I just wanted to get that announcement out so people will be aware for this morning.

MR. PEARCE: Mr. Chairman, my report is fairly short on Data too and so if you want to try and --

MR. ANSON: Okay and whatever we can fit in that hour, we will try to accommodate. That's it, Mr. Chair, and thank you.

CHAIRMAN PERRET: Thank you. Next on the agenda is the Summary of the Shrimp Advisory Panel Meeting, D-5. Morgan, are you on?

DR. KILGOUR: Yes, I am here.

CHAIRMAN PERRET: I see we've got you and are you going to give us a report or I guess read the AP panel summary you prepared? Are you ready to do that?

SUMMARY OF THE SHRIMP ADVISORY PANEL MEETING

DR. KILGOUR: I sure am. I wasn't going to read the full

report, because the first part goes into Shrimp Amendment 17 and what the council will be seeing with Shrimp Amendment 17, but I was going to go basically more into the discussion.

There was a lot of discussion on Shrimp Amendment 17 on how some permit holders are not compliant with mandatory data collection and it was noted that the annual landings survey is important for states where trip tickets are not mandatory.

This led to discussion of the consolidation of the permit and data gathering form into a single permit packet and the AP discussed how permits were distributed and they thought that it would be probably more efficient to have all of your data needs and your permit in one packet, but that was -- It sounded like, from the NMFS Permits Office, that that might be a little bit of a nightmare and the Permits Office is currently working on streamlining the process so that they can see if all of the data, the mandatory data collection, from a permit holder has been collected before a permit can be renewed. That's an ongoing process and there wasn't a formal motion made on that, since NMFS is addressing this problem already.

There was an AP member that presented about the shrimp permit catch per unit effort and from 2000 to 2014 and a lot of this information was gathered using the Gulf shrimp survey and the shrimp electronic logbook data and so the Shrimp AP spent a significant amount of time looking at the CPUE over time, the catch over time, the effort over time.

They discussed the number of latent permits that have persisted over time and they thought that that needed to be investigated for the upcoming permit moratorium.

The AP was concerned about the future of the fishery and currently they thought that building a new boat was cost prohibitive and so the AP discussed how vessels are classified and the process for replacing boats. There was a lot of concern that this is an aging fleet and that further reductions in the permits would prevent new entrants into the fishery and so they wanted -- They wanted to look at Shrimp Amendment 17.

For most of the morning, they discussed the motion that they made and the motion is the AP recommends that the current requirements of the shrimp permit moratorium remain in effect until October 26, 2026, except that any shrimp permits that were valid or renewable as of December 31, 2014 and is not renewed before the close of the one-year period after the expiration date of that permit shall not permanently expire and shall

instead by held by NMFS in the Gulf shrimp permit reserve. NMFS shall reactivate and issue any permit in the Gulf shrimp permit reserve upon receipt of a qualified application and payment of the applicable fee on a first-come-first-served basis and to be qualified, an application must meet the following criteria.

Applicant qualifications are must be a U.S. citizen or U.S. corporation and they discussed at length a vessel qualification so that a vessel to which permit is attached must be no less than X feet and they did not come up with an actual foot dimension, because they couldn't agree on what would be appropriate and thought that perhaps by going to scoping there could be more information given by permit holders on what an appropriate vessel length would be.

A major concern would be that people would apply a shrimp permit to a canoe and not be actively shrimping and so that permit would not be being used to its full capacity. Are there any questions on this part?

CHAIRMAN PERRET: Any questions for Morgan?

MR. PEARCE: Corky, basically what I'm seeing here is that we won't lose any permits with this, but they are just going to reserve so that we can pull them out as we need them down the road for new fishermen?

CHAIRMAN PERRET: This option would allow for those that, through December 31 of 2014, would go into a pool and do we know the number yet, Steve? We don't know that number now of who didn't renew during -- They have got a year to renew?

DR. STEVE BRANSTETTER: In the RA's report, it's through -- There was one for January that would have been through January 5. I can look it up for you, but I don't have it right off the top of my head.

DR. KILGOUR: I do have -- It's in the Shrimp 17 document. As of I think it was March, early March, there were 1,470 current permits that either were current or could be renewed and so that number will change, I think, but that's our best estimate for right now.

CHAIRMAN PERRET: Thank you. Any other questions? Go ahead, Morgan.

DR. KILGOUR: After that motion was made, the AP discussed including that option in the scoping document and staff informed

them that typically we don't have options quite that specific in a scoping document, but the Shrimp AP made the recommendation to request that the council include the prior motion as adopted by the AP recommending Amendment 17 measures in the public scoping document. That motion carried with no opposition. We already went over the Texas closure and so is it all right with the committee if I skip that paragraph?

CHAIRMAN PERRET: Continue.

DR. KILGOUR: Okay. The AP also was presented with the outcomes of the MSY/ABC Control Rule Working Group. We are going to go a little bit farther into detail with that with Shrimp Amendment 17, but basically for white and pink shrimp, the MSY and FMSY had to be calculated by getting the value from the model and multiplying it by twelve, because those are monthly inputs.

Brown shrimp is a seasonal model and so the FMSY and MSY produced did not need to be multiplied by twelve and it was clarified that these values are for Gulf of Mexico shrimp only, because there was concern from the AP that these were including South Atlantic shrimp.

Pending the outcome of the SSC meeting, the Shrimp AP recommends that the council adopt the new MSY alternatives based on the Stock Synthesis Model.

The last thing was the AP got an update on the ELB program from Rick Hart and they just wanted to know the status of the ELB program and how many were active and how many were inactive and how many had repairs.

Then the last part was the group was presented with a Coral Working Group summary and so the council had requested that convene a group of coral -- Can you guys hear me or is there a lot of feedback?

CHAIRMAN PERRET: Go ahead.

DR. KILGOUR: Okay. I heard a lot of feedback and I apologize. The Coral Working Group met back in December and the next step was to convene the Coral Working Group or the Coral SSC and Coral AP with members of industry and law enforcement. Since we currently don't have a royal red shrimper on the Shrimp AP, I presented the information to the AP and asked them for their guidance on who the appropriate members from industry would be.

Based on the discussion, the AP felt the whole Shrimp AP and

Shrimp SSC should meet with the Coral AP and Coral SSC instead of having just representatives and the AP made the motion to recommend that the council permit the Special Shrimp SSC and Shrimp AP to meet jointly with the Special Coral SSC and Coral AP and the motion carried with no opposition.

CHAIRMAN PERRET: Thank you, Morgan. Any questions for Morgan?

MR. PEARCE: I don't really have a question, but I know this AP is recommending some things that we put into the scoping document and do we want to do that at this time?

DR. KILGOUR: You are welcome to do that. We have already included those general options of a vessel length and U.S. citizenship qualifications in the scoping document. What we don't have is the specific line-by-line option, because that seems to be appropriate for an options paper, but it's up to the committee what the committee suggests, but we have included everything that the Shrimp AP recommended into the scoping document and it's already in there as part of the options for how the council may proceed.

CHAIRMAN PERRET: Thank you, Morgan. Any other questions for Morgan on this issue? Morgan, I think you're up next with -- We need no action on that at this time, because we're going to take that Amendment 17 recommendation up on a later agenda item, but the next item is Report on the Penaeid Shrimp MSY-ABC Control Rule Workshop, Tab D, Number 6, and then the SSC Recommendations are D-7. Morgan, would you proceed, please?

REPORT ON THE PENAEID SHRIMP MSY-ABC CONTROL RULE WORKSHOP

DR. KILGOUR: No problem and this is going to be really short and sweet. It was a really short and sweet working group. Basically, Rick Hart presented the MSY estimates from the models for all penaeid shrimp stocks and went through how he had done that. Again, pink shrimp and white shrimp were calculated by the model generating something for a monthly value and then that value was multiplied by twelve.

Brown shrimp were calculated using a seasonal model and so that value was not multiplied by twelve and that was just the standing value, but the working group had agreed on the annual MSY in pounds of tails for pink shrimp at 17,345,130 and an annual fishing mortality rate at MSY for pink shrimp at 1.35.

White shrimp, the annual MSY was 89,436,907 pounds of tails and the annual fishing mortality at MSY is 3.48 and for brown

shrimp, the annual MSY was calculated at 146,923,100 pounds of tails and the MSY at 9.12.

It was noted that there is a pretty big spread of the FMSY, but that's because the models are parameterized slightly differently, but those values are consistent with what we already have in the Shrimp Amendment 15 document. There is a pretty large spread there too, because of the differences in the pink, white, and brown shrimp models. That table pretty much summarizes the conclusions of the group and are there any questions?

CHAIRMAN PERRET: Any questions for Morgan?

MR. PEARCE: Do we need a motion or anything on this one or that's pretty much done?

CHAIRMAN PERRET: I don't think we need a motion on any of this at this time, do we, Morgan?

DR. KILGOUR: No, I don't think so. I think it would be more appropriate when we discuss the Shrimp Amendment 15, on whether or not to include an MSY action and an FMSY alternative.

CHAIRMAN PERRET: Thank you. Any other questions? Where are we now? Let's see.

DR. KILGOUR: I think Will Patterson was going to present on the SSC Recommendations on that MSY Working Group.

CHAIRMAN PERRET: Sorry, but could you say that again?

DR. KILGOUR: Was Will Patterson going to present the SSC recommendations?

CHAIRMAN PERRET: Dr. Patterson. Thank you.

SSC RECOMMENDATIONS

DR. WILL PATTERSON: The SSC, at our last meeting in early March, we met and we reviewed the working group's report and what you see on the screen here are the FMSY and yield at MSY at the top for pink and brown shrimp.

We discussed both the approach, which we had discussed previously, and we concurred that it was an appropriate approach. Obviously Rick Methot had quite a bit of input on parameterizing the SS Model on a monthly or seasonal time step

for the various penaeid shrimp stocks, pink, brown, and white.

We talked about those technical details some and we noticed, in the case of pinks, for example, that the blue line, the horizontal line on the plot here at the top for pink, and then to the right for brown, that is the MSY estimate that Morgan had just mentioned for these two stocks coming from the SS work that Rick Hart was the chief analyst for.

One question was raised about how we could have, in the case of pinks, in the middle part of the time series here, an estimate that the yield was above the MSY, but if you look on the plot below, you can see that the F for that year was estimated to be below FMSY and so that was a question that was raised and it was also raised again for whites.

However, what we have to realize is that the biomass is fluctuating for these annual species based on environmental parameters and so what we don't see in these plots and wasn't present in the report is what the biomass is doing across time.

Once we had that discussion, that concern was alleviated and so, again, here we have, on the right, the brown MSY estimates and the relative Fs and the related Fs for those years. Then the next two plots, these are for white shrimp.

The conclusion would be that we don't have an history of overfished or overfishing, but, more importantly, in the context of MSY/ABC for penaeid shrimps, the SSC accepts the MSY advice resulting from the Gulf penaeid shrimp assessments as the best available science and finds them suitable for management.

This motion was unanimous and so Morgan just gave me these values, but for the three different stocks, pink, white, and brown, the annual MSY then would be the numbers here in pounds of tails and then the annual FMSY on the right, expressed as an annual rate for these stocks.

The Fs, you can see here, are quite high relative to Fs we typically deal with, but, again, we have an annual species and therefore, most of the animals will die or be caught in that one year of life. A few do actually survive into a second year of life or longer, but for most of the animals, they are going to be either caught or die naturally in that one year of life.

Lastly, the committee concurred with the recommendation from the Penaeid Shrimp MSY-ABC Control Rule Workgroup that ABC should be set equal to MSY for Gulf shrimp stocks. This was a

recommendation that was made by the panel and the SSC voted unanimously to support that recommendation and that concludes our comments on shrimp.

CHAIRMAN PERRET: Thank you, Dr. Patterson. 1.3 to 9.1 on FMSY between two penaeid -- That just seems like a tremendous difference and a possible explanation is brown shrimp are more distributed or widely distributed and pink are -- Any other?

DR. PATTERSON: We had quite a bit of discussion on that. That was one concern that I raised. It was kind of a head scratcher and then if you actually look at what the BMSY estimates for browns -- It's a much lower number than for pinks and so we talked to Jim Nance and Rick Hart, who are the penaeid shrimp experts in life history and population dynamics.

They did point out differences in their life histories and another thing that we need to remember is that for pink shrimp it's basically an offshore fishery. The animals leave their inshore nursery areas and so they are at a fairly large size. There's quite a bit of natural mortality that has already occurred.

Because you have fewer numbers and you are prosecuting that fishery, it's actually a lower F, but for the brown shrimp in particular, there is a large inshore fishery in different parts of the region and so these animals are being harvested at young ages and small sizes and considerably higher Fs.

This also speaks to where the MSY values are. If we can go back maybe two slides, for example, to brown shrimp, you will note that the landings history, the catch values have been well below that equilibrium MSY estimate and so one of the things we talked about is does this then indicate that effort could be ramped up in order to more fully extract the available yield and whether that would be the signal from this information.

Again, we need to consider that, in the case of brown shrimp, for example, there is a large inshore fishery. You just talked about the Texas closure, which is really set up to maximize yield per recruit in that part of the Gulf of Mexico, but other parts of the Gulf have different models, where you have more inshore catch.

In order to approach maximum yield, it's not really an effort issue, but it's more an issue of allowing the shrimp, that cohort, to reach its maximum biomass before it's harvested and so there is -- I wasn't really going to touch upon that until

the question, but that's -- We really think that's part of the information here that's not necessarily intuitive or apparent on the surface.

CHAIRMAN PERRET: Let me say one other thing. Dr. Hart, are you still on?

DR. HART: Yes, I'm on, Corky.

CHAIRMAN PERRET: We've got three species of penaeid shrimp and environmental factors, I think we all agree, are the controlling thing relative to growth and survival and so on. Years ago, when pink production seemed to be down, we were tying it into lack of fresh water getting into the estuaries in Florida and that sort of thing.

DR. HART: Correct.

CHAIRMAN PERRET: Has that estuarine condition or lack of fresh water, is that still a problem like it was back in the 1970s and early 1980s or is the system getting adequate fresh water for the habitat for the pinks in Florida?

DR. HART: That's a good question, Corky. One thing that -- I'm sure it's still an issue with habitat. It's still being degraded, of course, but the reason we moved to this Stock Synthesis modeling framework is we'll be able to include environmental parameters, which is the goal to do, especially with the pink model. I am working on that now, to include things like that freshwater inflow indices. Hopefully that will better inform the model in the coming years.

CHAIRMAN PERRET: Thank you. Thank you, Dr. Patterson. Any other questions for Dr. Patterson or Dr. Hart? Thank you very much, both of you. I appreciate it, Will. Thanks a lot. Morgan, anything else on this item?

DR. KILGOUR: No and I had failed to mention that the working group set MSY or MSY equal to ABC, but we will cover it and so thank goodness for that.

CHAIRMAN PERRET: Yes and this was information only, I think, right?

DR. KILGOUR: Correct.

CHAIRMAN PERRET: Okay. Let's move on then to Item VII, Update on Shrimp Amendment 15 - Status Determination Criteria for

Penaeid Shrimp and Adjustments to the Shrimp Framework Procedure. That would be D-8 and, Morgan, go ahead, please.

UPDATE ON SHRIMP AMENDMENT 15 - STATUS DETERMINATION CRITERIA FOR PENAEID SHRIMP AND ADJUSTMENTS TO THE SHRIMP FRAMEWORK PROCEDURE

DR. KILGOUR: Okay and so based on some of the discussion at the October council meeting, it was my impression that the committee and the council wanted to see an MSY-based action in the status determination criteria and so I have drafted this and I apologize for the "draft" in the background, but this is an MSY-based action for Action 1.1.

The no action alternative is to keep the MSY values as they currently are, which are based on the VPA model, which is not what the stock assessment biologists use anymore.

Alternative 2 would just change those MSY values to the penaeid shrimps, to the stocks that came out of the MSY working group. If the committee would like me to add this to the document, I would probably need a motion, but let me read Alternative 2, since that's the new alternative.

The MSY values for the penaeid shrimp stocks are values produced by the Stock Synthesis Model approved by the SSC. Species-specific MSY values will be recomputed during update assessments, but only among the years 1984 through 2012. The values for each species will be updated every five years through the framework procedure, unless changed earlier by the Gulf of Mexico Fishery Management Council.

Currently, the Stock Synthesis Model produces the following values. For brown shrimp, MSY is 146,923,100 pounds of tails; white shrimp, MSY is 89,436,907 pounds of tails; and pink shrimp, MSY is 17,345,130 pounds of tails. To add this to the document, again, I would need a motion from the committee.

CHAIRMAN PERRET: Thank you, Morgan. Now, is that the alternative that you are recommending or that we should recommend as a preferred?

DR. KILGOUR: Yes and I would recommend that you would choose Alternative 2 as the preferred, because it's based on the new Stock Synthesis Model. The other alternative is based on a model we don't use anymore.

CHAIRMAN PERRET: Thank you. With that, Mr. Pearce.

MR. PEARCE: I would like to make a motion that we add to Action 1, Alternative 2 to the document and that that be the preferred alternative for that action.

CHAIRMAN PERRET: Thank you. We have a motion on the floor and do we have a second? It's seconded by Ms. Bosarge and is there discussion on including Alternative 2 as the preferred alternative and I don't think I need to read the motion.

DR. KILGOUR: Before you vote, could you actually change the motion to add Action 1.1? It's a whole entire new action and so the Action 1.1 with both alternatives, if that would be appropriate, but the whole Action 1.1 is new. We didn't have that in the document before.

CHAIRMAN PERRET: Since I am having a difficult time, my Vice Chairman, did you hear that, because I didn't. Would you do whatever the suggestion is?

MR. PEARCE: Yes and basically she just said that we should add that whole action in its entirety, which is Alternative 1 and Alternative 2, the preferred. **I would modify my motion that we include the whole Action 1.1 to modify the maximum sustainable yield of MSY for penaeid shrimp, Alternative 1 and Alternative 2, with Alternative 2 being the preferred alternative.**

CHAIRMAN PERRET: You had seconded and do you -- Okay. Does everybody understand the motion? Is the discussion?

MS. BOSARGE: Essentially, Morgan, let me make sure I know what we're doing. We are adding this action in because we wanted some MSY-based options in here and so the first one is obviously in the new action and it's going to be no action, leave it like it is. Then the second alternative, which we may choose as our preferred alternative, is the one that's going to specify these MSY values for each of the three penaeid shrimp and is that correct?

DR. KILGOUR: That's correct.

CHAIRMAN PERRET: Thank you, Leann. Discussion?

MR. PEARCE: Just for the record, I attended that meeting and it was very obvious that this was the best way to go. I mean we had a meeting that was scheduled for a day-and-a-half and in two hours, we knocked it out, pretty much, because this was clearly the right way to go.

CHAIRMAN PERRET: Thank you, Mr. Pearce. Morgan, the SSC supported this action, right?

DR. KILGOUR: Right and Will Patterson just went over that the SSC approved those MSY values and so that's correct.

CHAIRMAN PERRET: Thank you. Any other discussion on the motion? The motion is to add new Action 1.1 to the Shrimp Amendment 15 and to make Alternative 2 of this action the preferred alternative. **All those in favor signify by saying aye, please; all opposed like sign. The motion passes.** Thank you. Go ahead, Morgan.

DR. KILGOUR: Also based on the shrimp MSY workshop, the working group produced an MSY-based F and so I have added an alternative to Action 1.2, Alternative 4. Preferred Alternative 2 and Alternative 3 are based on those monthly apical F values, but they are not based on MSY.

I have added an alternative, but the committee would need to formally ask me to put that in the document, that addresses that FMSY. Those would be the values that were approved by the working group and the SSC.

I just want to have a note here that it is not appropriate to compare the Alternatives 2 and 3 with those presented in Alternative 4. Alternative 4 is MSY-based and is derived from that annual computation. Alternatives 2 and 3 are model-based and they are derived from that apical monthly computation and so the highest monthly value over that 1984 to 2012 years, that is what is presented in Alternatives 2 and 3.

The new alternatives that I have drafted and am suggesting is that the maximum fishing mortality threshold, MFMT, for each penaeid shrimp stock is defined as the FMSY. Species-specific FMSY values will be recomputed during the updated assessments, but only among the fishing years 1984 through 2012.

The values for each species will be updated every five years through the framework procedure, unless changed earlier by the Gulf of Mexico Fishery Management Council. Currently, the values are: brown shrimp, 9.12; white shrimp, 3.48; and pink shrimp, 1.35.

CHAIRMAN PERRET: Any questions for Morgan?

MR. PEARCE: The first question is should we take Alternative 2

and 3 and have them considered but rejected or should we leave them in the document?

DR. KILGOUR: No, I think that they should probably stay in the document, because they're an alternative way of looking at that fishing mortality rate, but if you want to change your preferred alternative to that new Alternative 4, we would have to add it to the document and change that to the preferred alternative, if that's what the committee would like.

MR. PEARCE: With that said, I would like to, in Action 1.2, add an Alternative 4, which she just read to us, and make that the new preferred alternative.

CHAIRMAN PERRET: Do we have a second? It's seconded by Ms. Bosarge. The motion is in Action 1.2 to add an Alternative 4 and make that the preferred alternative. The Alternative 4 has been read and it's in the document. Is there discussion on the motion?

MS. BOSARGE: Just one quick question for Morgan. Morgan, the title of that Action 1.2 is "Modify the Overfishing Threshold for Penaeid Shrimp" and in the first alternative, it says the overfishing threshold is defined as blah, blah, blah, but the rest of them, we don't say anything about the overfishing threshold is and should we put anything in there to tie it back to the title, something about the overfishing threshold, or do you like it the way it is or are we essentially stating the same thing and stating it this way?

DR. KILGOUR: We can do that if that's what you would like. We can add that the overfishing threshold is defined as the MFMT at the beginning of all of the Alternatives 2, 3, and 4, to keep it consistent. That would be fine.

CHAIRMAN PERRET: Morgan, if that's appropriate, I guess we will give you editorial license to do that and is that all right with the committee? I see heads shaking yes up and down, Morgan, and so would you incorporate that, as appropriate, please?

DR. KILGOUR: No problem. The last little bit is I've actually had a lot of discussion with the SSC member, Will Patterson, about the proposed Alternative 4 on Action 1.3 to modify the overfished definition.

It's been decided that that is not an appropriate overfished definition and it would need to be the biomass at MSY and so I would not recommend adding that to the document after all, even

though it went to the IPT and the -- Anyway, I don't recommend adding that and so if there are any questions.

CHAIRMAN PERRET: So that we understand, that is under Action 1.3, Modify the Overfished Threshold for Penaeid Shrimp, and the new proposed language, Alternative 4, not be incorporated at this time.

DR. KILGOUR: Right and it's currently not in the document. These were all proposed things that the IPT had reviewed, but after discussion with Dr. Patterson, it was determined that that's not an appropriate overfished threshold for these.

He also brought to my attention that in this -- Earlier in the document, I used pounds of tails and in these two alternatives, I used metric tons of tails and so I would ask the committee if it would be acceptable if I just convert those to pounds of tails for the final document, but I don't think I need a formal motion to do that, as I am just making all of the metrics the same.

CHAIRMAN PERRET: Okay and so the proposed language in yellow, Alternative 4 that was in the handout for us to consider, is not in the document, but at this time it's not recommended that we include it, for some technical reasons, and is that basically what you're suggesting?

DR. KILGOUR: Yes.

CHAIRMAN PERRET: Okay and so the committee heard that and does anybody have a desire to go against the suggestions of Dr. Patterson and Dr. Kilgour? Seeing no hands up, we will not add that to the document. What else do we need to do with this one, Morgan? We have a question from Ms. Bosarge.

MS. BOSARGE: I think we need to go back and vote on Harlon's motion, which is to -- There is two Alternative 4's, one in Action 1.2 and one in Action 1.3.

CHAIRMAN PERRET: I thought we had, but --

MS. BOSARGE: Harlon wanted to put --

CHAIRMAN PERRET: Harlon, you made two motions, right? We didn't vote on both of them? Okay. The motion on the floor is in Action 1.2 to add an Alternative 4 and make that the preferred alternative. Alternative 4 is the maximum fishing mortality threshold, MFMT, for each penaeid shrimp stock is

defined as the FMSY. Species-specific FMSY values will be recomputed during the updated assessments, but only among the fishing years 1984 through 2012. The values for each species will be updated every five years through the framework procedure, unless changed earlier by the Gulf of Mexico Fishery Management Council. Editorial license has been approved. Currently, the values are: brown shrimp, 9.12; white shrimp, 3.48; and pink shrimp, 1.35. That's the motion. Any discussion? **All in favor signify by saying aye, please; opposed like sign. The motion carries.** Now we have passed Mr. Pearce's second motion and, Morgan, go ahead.

DR. KILGOUR: Okay and so I think I have everything I need from you for this document. It's the intent to have the final document to you at the June council meeting and so as long as I can get the IPT together and we can get the writing assignments done, you should have a final document in June.

CHAIRMAN PERRET: That would be great, Morgan. At the Key West meeting in June, we should have a final document on 15. Any questions or any comments?

Let's move on. Next is Item VIII, Scoping Document for Shrimp Amendment 17, addressing the expiration of the shrimp permit moratorium. That is D-9 and Dr. Kilgour. The Shrimp Permit Working Group Summary is Dr. Kilgour is going to do that, which is D-10. Morgan, go ahead, please.

SCOPING DOCUMENT FOR SHRIMP AMENDMENT 17

DR. KILGOUR: Sure and I actually have a presentation. The permit moratorium, you have seen this presentation before. Again, the moratorium expires on October 26, 2016. To qualify for the permit, prior to the moratorium vessels must have been issued a valid permit by NMFS prior to and including December 6, 2003.

An exception was made for owners who lost the use of qualified vessels but who obtained a valid commercial shrimp vessel permit for the same vessel or another vessel prior to the date of publication of the final rule.

In 2001 to 2006, there were slightly over 2,900 permits. Of those, 2,666 qualified and 285 did not qualify and so when the permit moratorium went into effect, there were 1,933 moratorium permits issued.

The purpose of this amendment, for Shrimp Amendment 17, is to

determine if limiting access to permits is necessary for the Gulf shrimp fishery to prevent overcapacity and promote economic stability and the need for this action is to maximize efficiency of the Gulf shrimp resource and to help achieve optimum yield.

The options that the council has is to allow the moratorium to expire, to extend the moratorium, or to create a permanent limited access system, which would be effectively to make the moratorium permanent.

If the moratorium expires, the council would need to address -- The council will need to understand that it will become open access and we may not need a plan amendment, but we would need to address why a moratorium is no longer needed.

If the moratorium is extended, we will need to address for how many years should the moratorium be extended, are all current permits qualifying or do they need to requalify, and why is the temporary moratorium still needed, instead of, for instance, making it a limited access system?

The limited access system is the same as the moratorium extension, but it makes it permanent. Again, we would need to address do all current permits qualify or do they need to requalify and are there conditions for permits for renewal or transferability? We would need to address why a limited access program is needed.

Some possible qualifications are income and this has been something that was a qualification that’s been removed from other permits and landings. Latent permits perhaps don’t qualify for a new permit or perhaps you need to be at a certain number of landings in order to qualify for a permit.

Other things that have been suggested are things like U.S. citizenship or the vessel size. Again, those were from the Shrimp AP.

It has also been suggested that with the moratorium we have a permit pool and so if your permit expires, it goes into a pool so that somebody else can buy it from NMFS and it would maintain a number of permits, based on what the council chooses. Currently, one year after expiration if a permit is not renewed it is terminated and it is removed from the permit numbers and so this pool would keep a constant number of permits. The proposal by the council is that the permit is reserved instead of terminated and so the council would need to just decide what that magic number of permits would be.

Also addressed in the permit moratorium is the royal red shrimp endorsement and so the council would need to discuss whether or not this royal red shrimp endorsement should be still open to all shrimp permit holders. Currently, there are 283 valid endorsements, but only a maximum of seventeen vessels with landings have been in any of the past ten years and usually it's under ten, ten vessels that have royal red landings.

The things that the council may address in this permit moratorium document are they do want to maintain an open endorsement for royal red shrimp or does it want to limit the royal red shrimp endorsements based on landings or does it want to eliminate the endorsements altogether?

Where we are on the timeline, October of 2014, the council reviewed the original scoping document and requested input from the working group and AP. In February of 2015, the working group met to discuss the analysis that was needed and the AP met to discuss the document and, again, the AP was presented with a summary of the working group analyses and even some of the AP members actually sat in on the working group.

Right now we're at the scoping document to the council and hopefully the council requests an options paper for the June council meeting.

The Shrimp AP recommendations, we've already reviewed. They recommended that the moratorium be extended and there is a shrimp permit reserve and that in that permit reserve those permits are available on a first-come-first-served basis and that to be qualified for a shrimp permit you need to be U.S. citizen or a U.S. corporation and there should possibly be a vessel length. I think that's it and so are there any questions?

CHAIRMAN PERRET: Thank you, Morgan. Are there questions for Morgan? What we have with D-9 is a scoping document and if I understand, Morgan, we want to try and have something for you that you would be able to provide an options paper for us at the June meeting and is that correct, the June council meeting?

DR. KILGOUR: Yes, that's correct. I have gotten some feedback from letters from the State of Louisiana and the Shrimping Association about what options they would prefer and then I've gotten feedback from the Shrimp AP on options that they would prefer, but I haven't gotten feedback from the council, other than, at the last meeting, that they would like to see a permit

pool.

CHAIRMAN PERRET: Okay. That's where I was going next. We have the scoping document and we also have our Shrimp Advisory Panel recommendations for a potential option to be included and we have a letter from the Secretary of the Louisiana Department of Wildlife and Fisheries recommending specific numbers and specific methodology and Mr. Fischer, I am going to let you -- Myron, if you want to discuss the letter that your agency sent in just a minute, but I'm going through what correspondence I have received.

We've got the AP recommendations and the State of Louisiana has made a suggestion and we have a letter from the Southern Shrimp Alliance supporting the Shrimp Advisory Panel recommendation and that's the correspondence -- Louisiana Shrimp Task Force sent us something? I don't have it. What is it?

EXECUTIVE DIRECTOR DOUG GREGORY: I think we do.

CHAIRMAN PERRET: Mr. Gregory says we have something from the Louisiana Shrimp Task Force, but if we can get it to all of the members, because I have not seen that. With that, Myron, why don't you just summarize what your agency letter is, please?

MR. MYRON FISCHER: Thank you, Mr. Chairman. Our Secretary of the Louisiana Department of Wildlife and Fisheries forwarded a letter to the council and it basically describes some of the points laid out by the AP of creating a permit pool.

The question is we are now down to fourteen-hundred-and-change permits and when this started -- If you were on the council, as you were, Mr. Chairman, years ago, it was we had 5,000 vessels in the Gulf of Mexico with rumor, with anecdotal data, that when the Georgia and Carolina boats came around, that we had 7,000 and the industry was doing fine and we wanted to put permits to count and we only sold -- National Marine Fisheries Service only issued, I should say, around 3,000 permits, 2,900 permits.

As it became a moratorium and as permits were lost, we had seventy-two people who didn't qualify who did fish the EEZ when it became a moratorium, because they missed the control date. We have already been excluding people from the first day and so now we're down from 1,900 and over a few years later, we are down to 1,400 and we felt that if that 1,900 was a scientifically-valid number to support the infrastructure and support the industry, as American consumers are still eating ninety-plus percent imported shrimp, that the 1,400 could be

just a small measure short and we would like to see this pool have possibly the number of permits that were issued just a few years ago.

No set number. We can go back to the 2010-2012 permit numbers and that would satisfy a lot of fishermen seeking permits. I could go further, but it wasn't to debate it and I was just trying to summarize.

CHAIRMAN PERRET: Thank you very much, Mr. Fischer. Any questions for Mr. Fischer? I think we all have the letter that the Department of Louisiana sent and Mr. Fischer has done an excellent job summarizing it. Mr. Pearce, do you have a question?

MR. PEARCE: Yes and so what we're trying to do is add some of these to the options paper, probably?

CHAIRMAN PERRET: Just remember it's a scoping document now and we are in the very early stages and so we are discussing potential items to be included for the options paper and then I guess the next step was once we agree on that, we would have the public input and that sort of thing and so this early in the game, as you saw the schematic that Morgan showed earlier, I think.

Currently, in our scoping document, we have Option 1, the moratorium expires and we are wide open again. The moratorium extended is Option 2 and then Option 3 is a limited access system of some type of be implemented and so I guess what I am hearing from the AP motion is Option 2a or something like that, for extending the moratorium and some qualifications. Myron's discussion was similar, with some different numbers and so on.

DR. ROY CRABTREE: It seems to me to get to an options paper, at least the way I am thinking of it, we would have two actions. One would be to extend the moratorium and then there would be another action which I guess there's various ideas on where the cap the number of permits, but some reissuing of permits and so you would have a second action that would have to set up what that level is and how you would go about reissuing permits. At least that's how I'm thinking about it.

I would point out, and I think everybody needs to bear in mind, a couple of things. We have at least two important issues that are tied to effort levels in the shrimp fishery and one is in the biological opinion that was done in 2014 and the proxy that's used for the incidental take statement for sea turtles is

shrimp effort.

It also has another trigger that's based on TED compliance, but it has a shrimp effort in it that's like 132,900 days. To the extent that we increase the number of permits in the fishery, the chance that we exceed that I think goes up and if we did propose an action that was going to substantially increase the number of permits in the fishery above what's there now, I suspect it would trigger a whole new biological opinion and that whole process and keep in mind those biological opinions are always a big deal and they take a long time to do and they get a lot of scrutiny from folks.

The other thing we have in place was put in the red snapper rebuilding plan and there is a shrimp effort trigger based on ten to thirty-fathoms in the western Gulf on how much shrimp effort is in there and if that's hit or exceeded, there is a closure that automatically is triggered in that area.

Now, we've been below that, but prices are up a bit now and fuel prices are down and there are a lot of reasons to think that there is more reason for shrimpers to go fishing and more guys might go out.

If we're going to do anything to allow more vessels into this fishery, we need to be real careful about it, because there are these triggers that we potentially have to deal with.

The other thing I think you're going to have to think of is most of our commercial fisheries are under some sort of a permit moratorium right now and in every one of those, there is a gradual decline in the number of permits, because in every one of them, some fraction of fishermen don't renew their permits, for whatever reason.

We have never done anything like this to reissue permits or put them in a pool and so are you seeing a precedent here that you're going to do this in all of your fisheries, because that's going to be awfully complicated and there are a lot of reasons why you might not want to do that and so if you're going to do something like this with shrimp permits, I think you're going to explain why is it warranted here, but not everywhere else. Those are my initial thoughts of things that you ought to keep in mind as you think about this.

CHAIRMAN PERRET: Thank you for that, Dr. Crabtree. With that, committee members or council members, what is your pleasure?

MR. FISCHER: I think it's going to be what direction do we take on a scoping document as far as leading people to look at options or are we premature in choosing options and that should be done in an options paper? With that, the AP requested -- I don't know if they said it verbatim, but they requested that what they adopted be in the scoping document.

EXECUTIVE DIRECTOR GREGORY: With this document, which is pretty straightforward and addressing one issue and we have had working group input and the AP input and we are having public discussion at least between two council meetings, the staff feels like that's good enough for scoping and we can go straight to an options paper. If the council wants to put up more options now and if they want to pick a preferred now, that would be appropriate. We don't see a need to go on an extensive round of scoping hearings on this.

CHAIRMAN PERRET: That's the staff's opinion. Now, we are the council and nine out of seventeen members doesn't necessarily have to follow our staff's advice, but thank you for that input, Mr. Gregory.

MS. MARA LEVY: I don't know that it's appropriate to pick preferreds. I think what you want to do is give staff guidance about how the options paper should be set up and I think Roy made a suggestion of having an alternative that looks at the moratorium and whether to extend it, make it permanent, get rid of it, and then another sort of alternative or set of alternatives that looks at what to do with the permits and where you want to cap effort and things like that, whether you want to have a pool. You need to develop the options and then at a later date pick what your preferred option would be when we have some analysis of those.

DR. CRABTREE: I think that's right and I think we're at the stage now where we need to have staff put together an options paper and bring it back, because we do need to -- The clock is ticking on this. I think what Mara said makes sense, an action that looks at the moratorium and extending it and making it permanent and then another action that looks at various caps and pools.

Then we've got the AP's suggestion and we've got the Louisiana letter and probably others and then bring that back to us at the next meeting.

CHAIRMAN PERRET: Morgan, you are listening, I'm sure, and you are hearing that?

DR. KILGOUR: Yes, I am hearing that.

CHAIRMAN PERRET: What I am hearing, and, please, I have been wrong many times before, but what I am hearing from the committee is yes, it looks like we want to extend the moratorium and do we want to cap it at where it is today or do we want a few more boats or the Louisiana letter suggests up to 1,900 or whatever it is, but those could be options for consideration to go in a paper.

The Shrimp AP had a suggestion and that was supported by the Southern Shrimp Alliance and I am still waiting for the Louisiana Task Force. I don't know what happened there, but, Mr. Fischer, after Mr. Gregory, you're up.

EXECUTIVE DIRECTOR GREGORY: It came into our office and we treated it as public comment and it's on our website. We are now downloading it and we will email it to the full council.

CHAIRMAN PERRET: Can you tell us what -- Is their suggestion similar to the Department's suggestion or what is it?

EXECUTIVE DIRECTOR GREGORY: That I do not know.

DR. KILGOUR: I can answer that question. It's almost exactly the same as the State of Louisiana's suggestions and I just forwarded it to the council and it was forwarded on March 23, but I guess it didn't reach everybody.

CHAIRMAN PERRET: I am real proud of Myron. Somebody taught him well.

MR. FISCHER: For those of you all who don't know, Mr. Perret hired me in the mid-1970s and despite what many people told me about him, he was actually a great mentor. The letter, I have to give all credit to Ms. Katie sitting in the audience. She did a great job representing the state and she is writing our shrimp management plan and so she is highly involved in this and I have to look to her for advice.

What I had my hand up -- The suggestion was that if we could have an alternative that would create a bank or a pool of permits and then we could put options, starting at what the level was in 2014 and work backwards just a few years, work backwards to gain a few, or we could just put them in round numbers, but I am just trying to formulate a logical way to do it.

We see there was different amounts of permits that were lost through the years for different reasons and so I'm trying to come up with some type of method where the public could say they want to go back to the 2012 levels or they could make comments to choose what they would like.

CHAIRMAN PERRET: Thank you, Mr. Fischer. Morgan, you're getting all that.

DR. KILGOUR: Yes, I got all that.

MR. PEARCE: You know, I am a little bit confused. I understand where Myron is coming from, but then I look at what we've got and we're losing permits. We lost thirty, I think, this year that didn't reapply and that is kind of confusing to me why they didn't apply and it's only a twenty-five-dollar license and so I really wonder where we're going with those and I want to see more fishermen and there is no doubt about that, but I'm not sure if the industry understands what's going on and the industry understands that there's ways to get back in it right now that they're not taking advantage of.

I think maybe we're not doing a good job with our outreach or I don't know what it is, but we need to get it out to the industry that there are ways for them to get in.

CHAIRMAN PERRET: You know, I've asked industry people and I have asked others about this and permit renewal, as I appreciate it, is twenty-five dollars. At the Shrimp Advisory Panel meeting a couple of weeks back, one of members made phone calls and the price -- One person had bought a shrimp permit and it was $700 and another one paid $800, yet we have a document that says $7,000. Morgan, I am asking you and staff to see if you can come up with what are these things worth?

Whether they are worth $7,000 or $700, why are people -- This is the question that I have not got an answer. Why are people letting them go when all they have to do is pay twenty-five dollars if they are worth this? Dr. Crabtree may have an answer now.

DR. CRABTREE: Yes, because many of these people who do this call me up after they discovered they've lost their permit and it's invariably some family issue or they were just not paying any attention or they didn't understand and they lose the permit and it happens in every fishery we have that's under a permit moratorium, even permits that are much more valuable than shrimp

permits are.

CHAIRMAN PERRET: They have a year to renew the permit?

DR. CRABTREE: After the permit expires, they have a year to renew it, but if that year goes by and they haven't renewed it, then --

CHAIRMAN PERRET: That's when they lose it?

DR. CRABTREE: That's when they lose it.

CHAIRMAN PERRET: One year after the expiration date?

DR. CRABTREE: Yes. Now one thing I think you need to think about is somewhere, in one of these documents, it looks like we have about 200 permits that have zero landings over several years and so there are latent permits in this fishery and I think we need to think about if we have that many permits that are inactive, why do we need to reissue additional permits without doing something about those inactive permits or would you want to get rid of those inactive permits and then somehow reissue them? I think you need to think about that, but there are quite a few permits in this thing that I am -- What document is that?

DR. BRANSTETTER: This is the scoping document.

DR. CRABTREE: The scoping document and 211 permits with not landings between 2009 and 2012.

CHAIRMAN PERRET: You're suggesting that that may be something to include in this options paper?

DR. CRABTREE: It may be, but I mean if you have that many permits that aren't even fishing, why do we need to have more permits and issue more permits? It seems, to me, that's the --

CHAIRMAN PERRET: It would be in the analysis and that sort of thing.

MR. FISCHER: I know it's very premature to debate the specifics of these points. Many reasons, but my comment was if we are losing permits through all fisheries annually and people are calling the Permits Office that they forgot, I think there's also a large outreach and some type of reminder. When I had my permits, it was always the big fear of forgetting to renew, because I don't know how many reminders you get in 2014 and 2015

and I know Roy is going to make a comment to that, but the reasons people hold on to permits is you can't sell a boat.

You know you can't sell a boat and so you're going to hold a permit even though you're not fishing it, hoping that one day -- Then if you do lose the permit, then you can't sell the boat. I can see where there is latent permits, but those people have their right. It's their permit and they have their right to hold onto it.

The issue we're seeing is, and I am not certain what the other states are and I could tell you what's happening in our region, but we are just losing our fishery infrastructure. We are losing our ice houses and our fish plants.

We have one major shrimp buyer in Grand Isle and one in Leesville and one in Cocodrie. The other buyers are gone and there is no more Martin's Shrimp Company and there is no more Wayne Estay Shrimp Company, a staple in Grand Isle, and no more Collins. We are just losing our shrimp companies and as we lose permits, it will continue.

CHAIRMAN PERRET: Ms. Bosarge and Dr. Crabtree and I've got five minutes and I've got a couple more items under Other Business that will be very brief, but let's try and wrap this up and go forward with suggestions on how we want to proceed.

MS. BOSARGE: Obviously this is the fishery that I am in, that I come from and that I deal with on a day-to-day basis. Honestly, yes, I have my qualms with seeing these permits go back up. I think if you look at what has happened to this number of permits and this fishery since we implemented this moratorium, we essentially capped it at 1,933 permits when we implemented this moratorium, because that's how many were there and that's how many we issued and it couldn't go up from there.

Now, we haven't done anything as a quasigovernmental agency to shove those permits down to a lower number. We haven't done that. The industry -- That's what the economics and the market forces in this industry -- That's where it's at. It's trying to right-size itself, to get a point where it will have a long-term future.

We have already talked about what the reasons for that is and why is that industry still contracting today. Maybe there are a few people that forget to renew their permits, but I would say there's not somewhere between ninety and thirty every year that forget to renew their permits.

A lot of that is the industry still contracting because of the imports. Myron said 90 percent of the market is imports and I haven't looked up that figure, but I am sure that's probably pretty close to being accurate.

We can't compete with imported prices. You will never beat globalization. It's something you are not going to turn back the hands of time on and that you can't compete. It's a lot of the reason that you don't see certain other industries in this country anymore, because they can make clothes cheaper overseas than we can do it here.

Now, the industry has gotten itself to a point where it's starting to be able to survive. The CPUE has doubled since we put this moratorium into place. In other words, you have fewer boats out there landing more pounds, catching more pounds, per boat. Production, strangely enough, has really not decreased that far. We went from 1,933 boats down to fourteen-hundred-and-change right now.

The average production before we implemented the permit moratorium, your average landings were about 144 million and that's all three penaeid shrimp stocks and now it's at 138 million and it's decreased by less than 5 percent, even with that huge contraction.

We are still producing the product and the consumer is still getting their shrimp. I am not sure what's happening to this infrastructure, because domestic production has really not decreased that much, but the shrimp industry, those guys on the boat that are trying to make a living, are able to survive.

It gets a little better each year as the industry right-sizes itself a little more. Now, where do you stop? I don't know and there is a good question, but do you go backwards? That's a scary thought to me, to go backwards.

It is a scoping document that we're turning into an options paper and I want to see a full range of options and so I respect Myron's request. If we want to have one or two options that puts a cap in that's above the current level, the fourteen-hundred-and-something level, so that we can feedback on that, I think that's great.

I don't think we need six or seven options that goes through every year back from 2007 to now. Pick two numbers and let's go with that and then we have the option from the AP which says cap

it where it is now and then we'll develop a pool of anything that falls off from now on and put it in a pool.

If you want a full range of options, I mean if this industry on its own is still contracting, if it sees that as the way it's still going to right-size, maybe we need an option in there that says cap it and start the pool at whatever the level is in 2017, whatever that level of permits is.

I want to see a full range of options, but I don't want ten options going up. Does that make sense? Let's pick a couple of numbers. Myron, maybe you can help us with that, since that's a concern for Louisiana. Pick us two numbers and then we'll have two on the other side and then we'll have what the AP wanted and let's get some feedback. Where does the industry see itself going?

CHAIRMAN PERRET: Thank you, Ms. Bosarge. I think, Dr. Crabtree, did you have your hand up?

DR. CRABTREE: Yes and, first, I just want to say we do send reminders out to fishermen to renew their permits. We send them the renewal package and a lot of times we will call them. Nonetheless, people don't renew their permits and remember, when they lose it, their permit has been expired for a year and so they are presumably not fishing anyway and so I think a lot of these go by the wayside because they are not really fishing.

I think Leann makes some great points and I think those of us who have been in this business for a long time now remember how overcapitalized the shrimp fishery was and we needed to reduce effort and reduce capacity in that fishery and exactly where the right level is, I guess we can have those discussions, but we have got fairly stable landings with an awful lot less effort compared to what we've had in the past, but the CPUE, catch per unit effort, for these vessels has gone way up.

In today's competitive environment with shrimp imports and fuel prices -- Of course, that's all changed a lot in the last short while, but I think it's important to keep those CPUEs high, but we have historically had way more effort than was needed to catch the available shrimp in this fishery and I think we need to be real careful that we don't do something that brings us back into that overcapitalized condition as we move forward.

CHAIRMAN PERRET: Thank you, Dr. Crabtree. We are running out of time. No one has offered a motion yet and so let me see if I can summarize. I would suggest, Morgan, that we have options as

presented, number one, by the Shrimp Advisory Panel, by the State of Louisiana and its Task Force, the Department and the Task Force. If we have any others come forward, but I think we have to do something relative to the royal reds.

We haven't discussed that at all, but I forget -- I think there's seventeen active permits out of two-hundred-plus and so -- Have you got something?

DR. BRANSTETTER: No, but I was going to -- I will have to talk to you later.

CHAIRMAN PERRET: Are you trying to confuse me? Okay, but we need something relative to royal reds and anybody else at this time want to offer any suggestion to Dr. Kilgour and the staff for inclusion in, quote, unquote, scoping options paper?

EXECUTIVE DIRECTOR GREGORY: This committee report is going to come before the full council and so I would suggest thinking about it and we can accept options or suggestions at the full council or maybe even afterwards.

The guidance we get from NEPA is we need to consider a reasonable range of alternatives and not necessarily a full range of everything we can think of, but something -- We want something that we can analyze in a timely manner that is reasonable and that's the only advice I have.

CHAIRMAN PERRET: Thank you, Mr. Gregory. With that, the Chair is going to move on and be thinking about what Mr. Gregory just said so that at full council perhaps we will -- Hopefully we have other suggestions. Under Other Business --

DR. KILGOUR: Corky, we still have the Shrimp Permit Moratorium Working Group Summary, if you want me to go over that really briefly.

CHAIRMAN PERRET: Go ahead.

DR. KILGOUR: I will breeze through this, because it sounds like everybody has already kind of seen it. There is a presentation and it's the one that was open previously.

EXECUTIVE DIRECTOR GREGORY: Morgan, since this has already been reviewed by the AP in part of their AP report, please go through it quickly.

DR. KILGOUR: Right and so I am going to breeze through. This

is the catch per unit effort based on the Gulf of Mexico and that blue line shows that catch per unit effort has been relatively stable and you can see that it peaked in 2006. Effort is at an all-time low and landings have been relatively stable.

This is the permit activity status over time from the Permit Moratorium Working Group. It was discussed that we need to know if they're the same latent permits from year to year and have the latent permits increased or decreased and how many transfers are there per year, but this is deemed a low priority.

It was suggested by the AP that we also investigate vessel age and vessel owner age and the landings by permit. For the economic data, these are the shrimp landings and the nominal revenue in millions, but it's a more telling story in the next slide, where it's all been adjusted for the inflation-adjusted revenue. You can see that landings have remained the same, but the revenue has slightly peaked in the last couple of years, but it's a decrease since 1978.

We also went over a lot of economic data, including the price of shrimp, the price of fuel, the CPUE in terms of gallons of fuel, and the fuel costs per day and an annual fuel usage was also investigated.

Some of the things that were also investigated on an economic standpoint are the cash flow, the net revenue from operations, profit or loss, and the return on equity.

For social indices, the community makeup was presented by regional quotient. Shrimp dependency is not equal among communities and social vulnerability indices were investigated, as was resilience. Future analyses to hopefully incorporate in the document are how the regional quotient changes over time, the commercial engagement reliance measures, and comparisons of social vulnerability over time.

That was basically a brief summary of all the analyses that we were presented with at the Shrimp Permit Moratorium Working Group.

OTHER BUSINESS

CHAIRMAN PERRET: Thank you very much, Morgan. Any questions for Morgan? Okay, Morgan, thank you very much and hopefully we will have more input for you after the full council gets together and we will have more discussion in Key West.

Under Other Business, I added two items and the first is last week Dr. -- Is Jason here? Yes, there he is.

There was a TED compliance enforcement workshop and Dr. Crabtree, Jason Brand, and myself happened to be in attendance. It was convened by the Gulf and South Atlantic Foundation and NMFS had law enforcement personnel and Coast Guard personnel and each states' law enforcement representative was there giving a report relative to this subject matter.

There were members of the industry and lots of recommendations came forward relative to training by both law enforcement personnel and members of the fishing community to understand rules and regulations and all that kind of stuff.

Continue the outreach and certification of TEDs and the difficulty in -- TEDs can be put in the net properly and after one tow or something like that, things happen and the bar gets bent and various aspects of that and the level or degree of violation with the TEDs is -- A is street walking and Z is no TEDs in the net and so a violation is a violation, but there is lots of degrees in between.

With that, Dr. Crabtree or Jason, do you all want to add anything? Personally, I thought it was a very, very well-attended and participated meeting by all the people that were there.

LCDR JASON BRAND: I think you covered most of the highlights. We were able to come up and have all the states, all the leading shrimp folks in the shrimp industry, as well as NOAA and Coast Guard law enforcement, to kind of get together in a room and come up with some plans to improve the consistency of TED inspections throughout the state, Coast Guard, and NOAA Law Enforcement agencies.

I think everyone left with new ideas and a new appreciation that the law enforcement and industry is working together to come up with the best options for TED inspections and the results have been pretty good over the past couple of years. The compliance with TED inspections has exceeded 90 percent, which is good news to keep the turtles alive, as the TED violations have improved over the last three years as we've been working together on these issues.

We have a good plan in place. We're going to improve Coast Guard training by working with some of the NOAA Gear Management

Team to help us get some additional refresher training and we also have folks from our Coast Guard Fishery Training Center here that can also make improvements in working with the NOAA Gear Management Team to kind of bring the Coast Guard inspections up to the level that need be and I think it's been working over the past couple of years, as shown in the data.

CHAIRMAN PERRET: Thank you, Jason. Roy, do you want to add anything? Okay. With that, that issue is taken care of and Dr. Nance forwarded a letter that he received from the Port Arthur Shrimp Association and there is a couple of requests.

One is to close all of the Gulf of Mexico inside of three miles. That's a state issue and so each state director has got a copy of the letter and if you want to address it, that's fine. The other request I see in the letter is to close outside of the Gulf of Mexico for three months during December, January, and February. I assume that's a federal issue beyond three miles, other than Florida and Texas for the nine miles, and so my suggestion is state directors may want to address it at their level.

Lance has already got his Texas closure for nine miles and 200 miles during the summer and not during January and February and March and so Texas can take a look at it, since it comes from a Texas group, and, Shrimp Committee members, it's one request and I guess we should take it into account and I don't even know if we have a -- Yes, we have a title of the person, but there is no address and so, Mr. Gregory, if you get an address for this person, maybe we can respond that we're taking a look or considering this request. Does anybody have any other suggestions on how to handle it?

EXECUTIVE DIRECTOR GREGORY: We do not typically respond to comments that are provided to the council.

CHAIRMAN PERRET: Okay. If that's the way we want to go, that's the way we want to go. Dr. Hart is not still on?

DR. HART: Yes, I am.

CHAIRMAN PERRET: Tell Dr. Nance we appreciate him passing the ball on to us. Thank you.

DR. HART: I will do that. He will be happy to hear that, Corky. Actually, he did follow up with a letter to her and just indicated that it was forwarded to the council.

CHAIRMAN PERRET: Thank you very much, Dr. Hart and Dr. Kilgour. Anything else? We are adjourned. Thank you.

(Whereupon, the meeting adjourned at 10:30 a.m., April 1, 2015.)

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Shrimp Management Committee Meeting
June 10, 2015
Key West, FL

Shrimp Management Committee Meeting: Action Guide and Next Steps

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Agenda Item IV: Final Action Shrimp Amendment 15- Status Determination Criteria for Penaeid Shrimp and Adjustments to the Shrimp Framework Procedure

Timeline Status: Final Action

Committee Input and Next Steps:

- Review new alternative (alternative 4) under Action 1.3
- Affirmation of preferred alternatives for Shrimp Amendment 15
- Recommend Amendment 15 as necessary and appropriate, with editorial license authority given to staff and final approval authority given to the Council chair

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Agenda Item V: Options paper for Shrimp Amendment 17- Addressing the Expiration of the Shrimp Permit Moratorium

Timeline Status: Information

Committee Input and Next Steps:

- Review the purpose and need Section
- Review alternatives and suggest modifications, additions or deletions of new alternatives
- The Committee may select preferred alternatives or may wait until a public hearing draft is presented
- The next step will be to develop a public hearing draft for the October 2014 meeting based on the Council's guidance

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Agenda Item X: Other Business

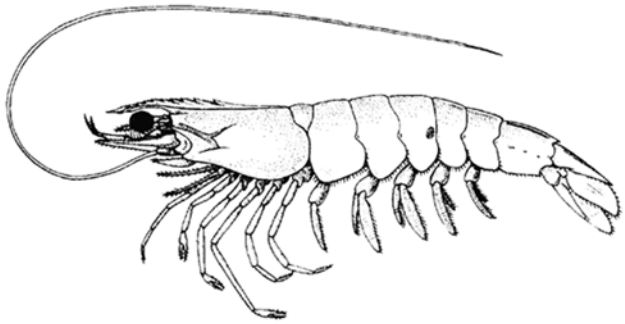
Timeline Status: Information

Committee Input and Next Steps:

- The Committee may discuss any non-agenda items here.

Back to Agenda

Status Determination Criteria for Penaeid Shrimp and Adjustments to the Shrimp Framework Procedure



Amendment 15

to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters

Final Draft

**Including Environmental Assessment,
Fishery Impact Statement, Regulatory Impact Review,
and Regulatory Flexibility Act Analysis**

June 2015

This is a publication of the Gulf of Mexico Fishery Management Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NMF4410011.

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STATUS DETERMINATION CRITERIA FOR PENAEID SHRIMP AND ADJUSTMENTS TO THE SHRIMP FRAMEWORK PROCEDURE

Amendment 15 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters Including Environmental Assessment, Fishery Impact Statement, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

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Type of Action

( ) Administrative
( ) Draft
( ) Legislative
(X) Final

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AM	accountability measure
APA	Administrative Procedure Act
BRD	bycatch reduction device
Council	Gulf of Mexico Fishery Management Council
CMP	coastal migratory pelagics
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
DWH	Deepwater Horizon MC 252
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EJ	environmental justice
ELB	Electronic Logbook Program
EIS	environmental impact statement
ESA	Endangered Species Act
F	instantaneous rate of fishing mortality
F_{MSY}	rate of fishing mortality at maximum sustainable yield
FIS	Fishery impact statement
FEIS	Final environmental impact statement
FMP	fishery management plan
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
HAPC	habitat area of particular concern
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
mp	million pounds
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing level
OMB	Office of Management and Budget
OY	optimum yield
PBR	potential biological removal
RA	Regional Administrator
RFA	Regulatory Flexibility Act
RFAA	Regulatory Flexibility Act analysis
RIR	regulatory impact review

RQ	regional quotient
Secretary	Secretary of Commerce
SEFSC	Southeast Fisheries Science Center
SEIS	supplemental environmental impact statement
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
Shrimp FMP	Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U. S. Waters
SPGM	federal Gulf shrimp moratorium permit
SSB_{MSY}	spawning stock biomass at maximum sustainable yield
SSC	Scientific and Statistical Committee
TED	turtle excluder device
USCG	United States Coast Guard
VOOP	Vessel of Opportunity Program
VPA	Virtual Population Analysis

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FISHERY IMPACT STATEMENT

The Magnuson-Stevens Fishery Conservation and Management Act requires that a fishery impact statement (FIS) be prepared for all amendments to fishery management plans. The FIS contains an assessment of the likely biological, social, economic, and administrative effects of the conservation and management measures on fishery participants and their communities. It also considers participants in the fisheries conducted in adjacent areas under the authority of another regional fishery management council, and the safety of human life at sea.

Amendment 15 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U. S. Waters consists of four management actions developed by the Gulf of Mexico Fishery Management Council (Council). The first action (Action 1.1) addresses the maximum sustainable yield for penaeid shrimp stocks (brown, white, and pink shrimp). The second action (Action 1.2) addresses the overfishing threshold for penaeid shrimp stocks. The third action (Action 1.3) addresses the overfished threshold for penaeid shrimp stocks. The fourth action (Action 2) addresses changes to the framework procedure by removing obsolete terms and adjusting how accountability measures for royal red shrimp can be changed or implemented.

Biological Effects

The proposed modifications are anticipated to have little to no effect on the physical and biological environment. The first three actions are in response to a change in the model used to assess penaeid shrimp stocks. The shrimp fishery will continue to affect the surrounding environment by both trawling and bycatch; however, these actions are not expected to modify how the fishery is prosecuted. Because there is a moratorium on new permits, effort in the shrimp fishery may remain at levels similar to present conditions, but the permit moratorium will expire in 2016 unless the Council takes action. The fourth action would make editorial changes to the framework procedure, adjust how accountability measures (AMs) could be implemented and what changes could be made to AMs; currently, accountability measures only apply to royal red shrimp. This action allows for more management flexibility and is expected to increase the efficiency of management which can indirectly benefit the physical and biological environments.

Economic Effects

Economic effects are not expected to result from any of the first three actions because no changes to harvest levels or to other customary uses of penaeid shrimp are anticipated. The fourth action is expected to result in indirect economic benefits by affording a swifter response to implementation of management measures that may be beneficial to the stock with associated economic benefits.

Social Effects

There are not likely to be direct social effects from the first three actions. The first action provides a maximum sustainable yield (MSY) that incorporates current stock assessment methodologies. The second action provides a metric to establish the overfishing threshold of penaeid shrimp stocks. The third action provides a metric to determine if the stock is overfished. All actions could indirectly benefit the fishery because they provide status determination criteria for the penaeid shrimp fishery that can enable management measures to be implemented in a timely manner.

Positive social impacts may be expected from the fourth action because it incorporates more changes that could be implemented using a framework procedure. This increases management flexibility to respond to changes and, therefore, minimizes delays that may constrain fishing activities or negatively affect business activities.

Safety at Sea

None of the actions in this amendment are anticipated to require vessels to participate in the fishery under adverse weather or ocean conditions. Therefore, no additional safety-at-sea issues would arise.

CHAPTER 1. INTRODUCTION

National Standard 1 in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery. The Magnuson-Stevens Act defines OY as the amount of fish that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, while taking into account the protection of marine ecosystems.

The Magnuson-Stevens Act establishes maximum sustainable yield (MSY) as the basis for fishery management. Each fishery management plan (FMP) must specify MSY, which is the largest long-term average catch that can be taken from a stock under prevailing conditions.

Each FMP must also specify objective and measurable status determination criteria for identifying when the fishery is overfished and undergoing overfishing. Overfishing occurs whenever the rate of removal (fishing mortality rate) is too high. A stock or stock complex is considered overfished when its population abundance (biomass) is too low.

Optimum Yield

The harvest level for a species that achieves the greatest overall benefits, including economic, social, and biological considerations.

Maximum Sustainable Yield

The largest average catch that can continuously be taken from a stock under existing environmental conditions.

Maximum Fishing Mortality Threshold

One of the status determination criteria. It will usually be equivalent to the fishing mortality corresponding to the maximum sustainable yield. If current fishing mortality rates are above the fishing mortality threshold, overfishing is occurring.

Minimum Stock Size Threshold

Another of the status determination criteria. The minimum stock size at which rebuilding will occur within 10 years while fishing at the maximum fishing mortality threshold. If current stock size is below the stock size threshold the stock is overfished.

The maximum fishing mortality threshold (MFMT) is the maximum rate of fishing mortality above which the stock is considered to be undergoing overfishing. The minimum stock size threshold (MSST) is the level of biomass below which the stock is considered to be overfished. By evaluating the fishing mortality rate and biomass of a stock in relation to MFMT and MSST, fishery managers can determine the status of a fishery and assess whether management measures are maintaining healthy stocks and achieving OY.

These parameters (OY, MSY, MSST, and MFMT) are difficult to apply to penaeid shrimp (brown, *Farfantepenaeus aztecus*; pink, *Farfantepenaeus duorarum*; and white, *Litopenaeus setiferus*) because they are short-lived shrimp populations influenced by environmental factors in addition to effort and catch rates. For Gulf of Mexico (Gulf) penaeid shrimp stocks, Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters (Shrimp FMP) (GMFMC 2005a) established MSST as the minimum parent stock size known to have produced MSY the following year. Amendment 13 to the Shrimp FMP also established MFMT for each of the three penaeid species in terms of a parent stock level. The MSY was set based on the lowest and highest landings taken annually from 1990-2000 and is equal to the OY.

Historically, Gulf shrimp stocks were assessed with a virtual population analysis (VPA), which reported output in terms of number of parents. The National Marine Fisheries Service (NMFS) has monitored the stock levels for all three penaeid species since 1970. The parent stock numbers for these species remained higher the than the overfished threshold and lower than the overfishing threshold throughout this monitoring period; therefore, these stocks were not considered overfished or undergoing overfishing. However, scientists working for NMFS began investigating new stock assessment models for assessing the Gulf shrimp stocks (Hart and Nance 2010) after the 2007 pink shrimp stock assessment VPA incorrectly determined pink shrimp were undergoing overfishing because the model could not accommodate low effort (Nance 2008). The stock assessment analysts concluded that the Stock Synthesis model (Methot 2009) was the best choice for modeling Gulf shrimp. The Stock Synthesis model outputs parent stock size in terms of spawning biomass and also calculates a fishing mortality rate (Methot and Wetzel 2013).

The Gulf of Mexico Fishery Management Council's (Council) Scientific and Statistical Committee (SSC) accepted this new model, but the outputs were not comparable to the established stock status parameters. This resulted in an unknown status for the three species relative to overfished and overfishing. Thus, with the acceptance of a new assessment modeling approach, MSY, MFMT, and MSST must now be revised to be comparable to the model outputs and determine the status of the stocks.

Who's Who?

- Gulf of Mexico Fishery Management Council – Engages in a process to determine a range of actions and alternatives, and recommends action to the National Marine Fisheries Service
- National Marine Fisheries Service and Council staffs – Develop alternatives based on guidance from the Council, and analyze the environmental impacts of those alternatives
- Secretary of Commerce – Will approve, disapprove, or partially approve the amendment as recommended by the Council.

Framework procedures for a fishery management plan allow changes in specific management measures and parameters, such as overfished and overfishing thresholds, that can be made more efficiently than changes made through a full plan amendment. These changes are generally considered routine updates based on a new stock assessment, survey results, or other similar information. Three framework procedures have been developed for the Shrimp FMP through various amendments, the most recent of which was implemented through the Generic Annual

Catch Limit/Accountability Measures Amendment[1] (GMFMC 2011). Subsequent to that amendment, the Council determined that modifications to accountability measures (AMs) should be included in the frameworks for their FMPs; therefore, the reef fish framework procedure was modified in Amendment 38 to the Reef Fish FMP (GMFMC 2012) and the coastal migratory pelagics (CMP) framework was modified in Amendment 20B to the CMP FMP (GMFMC/SAFMC 2013). Amendment 15 to the Shrimp FMP would make the same modifications to the recent shrimp framework.[2] In addition, this amendment would update language in that framework procedure that is now out of date.

1.2 Purpose and Need

Purpose for Action

The purpose of this amendment is to adjust stock status determination criteria to be consistent with the new population metrics for penaeid shrimp and modify the framework procedure for the Shrimp FMP.

Need for Action

The needs for the proposed actions are to determine the overfished and overfishing status of each penaeid shrimp stock while using the best available science, and to streamline the management process for Gulf shrimp stocks.

1.3 History of Management

The Shrimp FMP, supported by an environmental impact statement (EIS), was implemented on May 15, 1981. The FMP defined the shrimp fishery management unit to include brown shrimp, white shrimp, pink shrimp, royal red shrimp (*Pleoticus robustus*), seabobs (*Xiphopenaeus kroyeri*), and brown rock shrimp (*Sicyonia brevirostris*). Seabobs and rock shrimp were subsequently removed from the FMP. The actions implemented through the FMP and its subsequent amendments have addressed the following objectives:

1. Optimize the yield from shrimp recruited to the fishery.
2. Encourage habitat protection measures to prevent undue loss of shrimp habitat.
3. Coordinate the development of shrimp management measures by the Gulf of Mexico Fishery Management Council (GMFMC) with the shrimp management programs of the several states, when feasible.

[1] Full title: Final Generic Annual Catch Limits/Accountability Measures Amendment for the Gulf of Mexico Fishery Management Council's Red Drum, Reef Fish, Shrimp, Coral and Coral Reefs Fishery Management Plans.
[2] Accountability measures are only established for royal red shrimp; penaeid shrimp are exempt from the requirement for accountability measures because they have annual lifecycles.

4. Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act.
5. Minimize the incidental capture of finfish by shrimpers, when appropriate.
6. Minimize conflict between shrimp and stone crab fishermen.
7. Minimize adverse effects of obstructions to shrimp trawling.
8. Provide for a statistical reporting system.

The purpose of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. The main actions included: 1) establishing a cooperative Tortugas Shrimp Sanctuary with Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; 2) a cooperative 45-day seasonal closure with Texas to protect small brown shrimp emigrating from bay nursery areas; and 3) a seasonal closure of an area east of the Dry Tortugas to avoid gear conflicts with stone crab fisherman.

Amendment 1/environmental assessment (EA)(1981) provided the Regional Administrator (RA) of the NMFS Southeast Regional Office (SERO) with the authority (after conferring with the Council) to adjust by regulatory amendment the size of the Tortugas Sanctuary or the extent of the Texas closure, or to eliminate either closure for one year.

Amendment 2/EA (1983) updated catch and economic data in the FMP.

Amendment 3/EA (1984) resolved a shrimp-stone crab gear conflict on the west-central coast of Florida.

Amendment 4/EA (1988) identified problems that developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas Sanctuary was simplified, and the Council and RA review for the Texas closure was extended to February 1. A provision that white shrimp taken in the exclusive economic zone (EEZ) be landed in accordance with a state's size/possession regulations to provide consistency and facilitate enforcement with Louisiana was to have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This provision was disapproved by NMFS with the recommendation that it be resubmitted under the expedited 60-day Secretarial review schedule after Louisiana provided for a bycatch of undersized white shrimp in the directed fishery for seabobs. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

In July 1989, NMFS published revised guidelines for FMPs that interpretatively addressed the Magnuson-Stevens Act (then called the Magnuson Fishery Conservation and Management Act) National Standards (50 CFR 602). These guidelines required each FMP to include a scientifically measurable definition of overfishing and an action plan to arrest overfishing should it occur.

In 1990, Texas revised the period of its seasonal closure in Gulf waters from June 1 to July 15 to May 15 to July 15. The FMP did not have enough flexibility to adjust the cooperative closure of federal waters to accommodate this change, thus an amendment was required.

Amendment 5/EA (1991) defined overfishing for Gulf brown, pink, and royal red shrimp and provided measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were deleted from the management unit. The duration of the seasonal closure to shrimping off Texas was adjusted to conform to the changes in state regulations.

Amendment 6/EA (1992) eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally opened areas within the sanctuary continue to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by NMFS because it was not based on the best available data.

Amendment 7/EA (1994) defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data become available. A total allowable level of foreign fishing for royal red shrimp was eliminated; however, a redefinition of overfishing for this species was disapproved.

Amendment 8/EA (1995), implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch for royal red shrimp to be set up to 30% above MSY for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act amendment to the Magnuson-Stevens Act that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY, and does not allow OY to exceed MSY.

Amendment 9, supported by a supplemental environmental impact statement (SEIS) (1997), required the use of a NMFS certified bycatch reduction device (BRD) in shrimp trawls used in the EEZ from Cape San Blas, Florida (85° 30' W. Longitude) to the Texas/Mexico border, and provided for the certification of BRDs and specifications for the placement and construction. The purpose of this action was to reduce the bycatch mortality of juvenile red snapper by 44% from the average mortality for the years 1984 through 1989. This amendment exempted shrimp trawls fishing for royal red shrimp seaward of the 100-fathom contour, as well as groundfish and butterfish trawls, from the BRD requirement. It also excluded small try nets and no more than two ridged frame roller trawls of limited size. Amendment 9 also provided mechanisms to change the bycatch reduction criterion and to certify additional BRDs.

Amendment 10/EA (2002) required BRDs in shrimp trawls used in the Gulf east of Cape San Blas, Florida. Certified BRDs for this area are required to demonstrate a 30% reduction by weight of finfish.

Amendment 11/EA (2001) required owners and operators of all vessels harvesting shrimp from the EEZ of the Gulf to obtain a federal commercial vessel permit. This amendment also prohibited the use of traps to harvest royal red shrimp from the Gulf and prohibited the transfer of royal red shrimp at sea.

Amendment 12/EA (2001) was included as part of the Generic Essential Fish Habitat (EFH) Amendment that established EFH for shrimp in the Gulf.

Amendment 13/EA (2005) established an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp; defined the overfishing threshold and the overfished condition for royal red shrimp; defined MSY and OY for the penaeid shrimp stocks in the Gulf; established bycatch reporting methodologies and improved collection of shrimping effort data in the EEZ; required completion of a Gulf Shrimp Vessel and Gear Characterization Form by vessels with federal shrimp permits; established a moratorium on the issuance of federal commercial shrimp vessel permits; and required reporting and certification of landings during the moratorium.

Amendment 14/EIS (2007) was a joint amendment with Reef Fish Amendment 27. It established a target red snapper bycatch mortality goal for the shrimp fishery in the western Gulf and defined seasonal closure restrictions that can be used to manage shrimp fishing efforts in relation to the target red snapper bycatch mortality reduction goal. It also established a framework procedure to streamline the management of shrimp fishing effort in the western Gulf.

The Generic Annual Catch Limits (ACL)/Accountability Measures (AMs) Amendment/EIS (2011) set ACLs and AMs for royal red shrimp. Penaeid shrimp were not included in this amendment because their annual lifecycles exempt them from the Magnuson-Stevens Act requirement for these management measures.

The Shrimp Electronic Logbook Framework (2013) established a cost-sharing system for the electronic logbook program, and described new equipment and procedures for the program.

Amendment 16/Supplemental EIS (2015) eliminated duplicative accountability measures and the quota for royal red shrimp. It set the ACL equal to the acceptable biological catch (ABC) and established a post-season accountability measure.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Modify Stock Status Determination Criteria for Penaeid Shrimp Stocks (Brown, White, and Pink)

Action 1.1 - Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

Alternative 1. No Action. The MSY values for the penaeid shrimp stocks fall within the range of values defined by the lowest and highest landings taken annually from 1990-2000 that does not result in recruitment overfishing as defined herein:

- Brown shrimp: MSY is between 67,000,000 and 104,000,000 lbs of tails
- White shrimp: MSY is between 35,000,000 and 71,000,000 lbs of tails
- Pink shrimp: MSY is between 6,000,000 and 19,000,000 lbs of tails

Preferred Alternative 2. The MSY values for the penaeid shrimp stocks are values produced by the stock synthesis model approved by the Science and Statistical Committee (SSC). Species specific MSY values will be recomputed during updated assessments, but only among the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Gulf of Mexico Fishery Management Council (Council).
Currently, the stock synthesis model produces the following values:

- Brown shrimp: MSY is 146,923,100 lbs of tails
- White shrimp: MSY is 89,436,907 lbs of tails
- Pink shrimp: MSY is 17,345,130 lbs of tails

Discussion:
Historically, the penaeid (brown, white, and pink) shrimp stock has been assessed using a virtual population analysis (VPA) model. Recently, the National Marine Fisheries Service (NMFS) changed the model from VPA to the Stock Synthesis model to determine Gulf of Mexico (Gulf) shrimp status after the VPA was determined inadequate to account for the low fishing effort for pink shrimp (Nance 2008; Hart and Nance 2010). Evaluations of new stock assessment models by the Council's SSC determined that the Stock Synthesis model was the best available model. One value estimated by the stock synthesis model is MSY. Penaeid shrimp stocks are influenced primarily by environmental conditions and are annual crops, but the model is parameterized with monthly inputs, thus, MSY is difficult to predict. The Council has two options: to maintain MSY in terms of the old model, or to update MSY to reflect values of the new model. Any other alternatives would be arbitrary and would differ from what the SSC considered the best available science.

Alternative 1 would continue to use MSY values based on the VPA model which is not the model that has been accepted as the best available science by the SSC. These values are ranges and do not coincide with the values produced by the stock synthesis model. Amendment 13 (GMFMC 2005a) established these MSY values for each species. The MSY values were defined

as the highest and lowest landings values taken annually from 1990-2000, because a true numerical value could not be calculated. The biological characteristics that affect sustainable yields for penaeid shrimp are unusual. They live for only one year. There is no demonstrable stock-recruitment relationship and currently it is not feasible that too many shrimp will be taken to provide an adequate supply for the following year. Because of these characteristics, fishing mortality and yield in one year do not affect yield in the following year.

Preferred Alternative 2 would establish MSY in terms of the current model, the Stock Synthesis model. The new Stock Synthesis model produces MSY in monthly time steps for pink shrimp and white shrimp, and is an annual model with seasons for brown shrimp. Therefore, the outputs of the model for pink shrimp and white shrimp are multiplied by 12 to get an annual MSY. For brown shrimp, an annual MSY is produced, so no multiplication factor is used (Hart et al. 2014). This alternative is based on the best available science and was supported by the SSC.

Council Conclusions:

The Council chose **Preferred Alternative 2** because it based on the best assessment model for the shrimp fishery as determined by the Council's SSC. The Council did not choose **Alternative 1** because that would leave MSY in terms of an outdated assessment model.

Action 1.2 – Modify the Overfishing Threshold for Penaeid Shrimp

Alternative 1: No Action – The overfishing threshold is defined as a rate of fishing that results in the parent stock number being reduced below the MSY minimum levels listed below:

- Brown shrimp- 125 million individuals, age 7+ months during the November through February period
- White shrimp- 330 million individuals, age 7+ months during the May through August period
- Pink shrimp- 100 million individuals, age 5+ months during the July through June period

Alternative 2: The overfishing threshold is defined as the maximum fishing mortality threshold (MFMT). The MFMT for each penaeid shrimp stock is defined as the maximum apical fishing mortality rate (F) computed for the fishing years 1984 to 2012 plus the 95% confidence limits. Species specific MFMT values will be recomputed during updated assessments, but only among the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: the apical F value of the model output (3.54) plus the confidence limit (0.14); effective F: 3.68
- White shrimp: the apical F value of the model output (0.76) plus the confidence limit (0.01); effective F: 0.77
- Pink shrimp: the apical F value of the model output (0.20) plus the confidence limit (0.03); effective F: 0.23

Alternative 3: The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the maximum apical F computed for the fishing years 1984 to 2012. Species specific MFMT values will be recomputed during updated assessments, but only among the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: 3.54
- White shrimp: 0.76
- Pink shrimp: 0.20

Preferred Alternative 4. The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}). Species specific F_{MSY} values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

Currently, the values are:

- Brown shrimp: 9.12
- White shrimp: 3.48
- Pink shrimp: 1.35

NOTE: It is not appropriate to compare values from **Alternatives 2 and **3** with those presented in **Preferred Alternative 4**. **Preferred Alternative 4** is MSY based and is derived from an annual computation. **Alternatives 2** and **3** are model based that are derived from the apical monthly computation. Further, it is not appropriate to multiply values from **Alternatives 2** and **3** by twelve and compare with **Preferred Alternative 4** because the apical F is not a mean. Therefore, the methods of calculation should be compared, rather than the resulting numbers.*

Response to Possible Overfishing

If the MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline.

Discussion:

The guidelines for National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) require one of two thresholds be developed to determine if a stock is undergoing overfishing: the MFMT or the overfishing limit (OFL). The MFMT is the maximum rate of fishing mortality above which the stock is considered to be undergoing overfishing. The OFL is the catch level associated with fishing at MFMT. Because the model produces outputs in terms of fishing mortality rates, MFMT is the appropriate threshold to use for penaeid shrimp species. The Council's SSC approved the use of MFMTs for the overfishing thresholds (Figures 2.1.1-2.1.3). However, the new Stock Synthesis model produces overfishing estimates as fishing mortality rates (F), which are not comparable with current overfishing thresholds which are based on parent stock numbers.

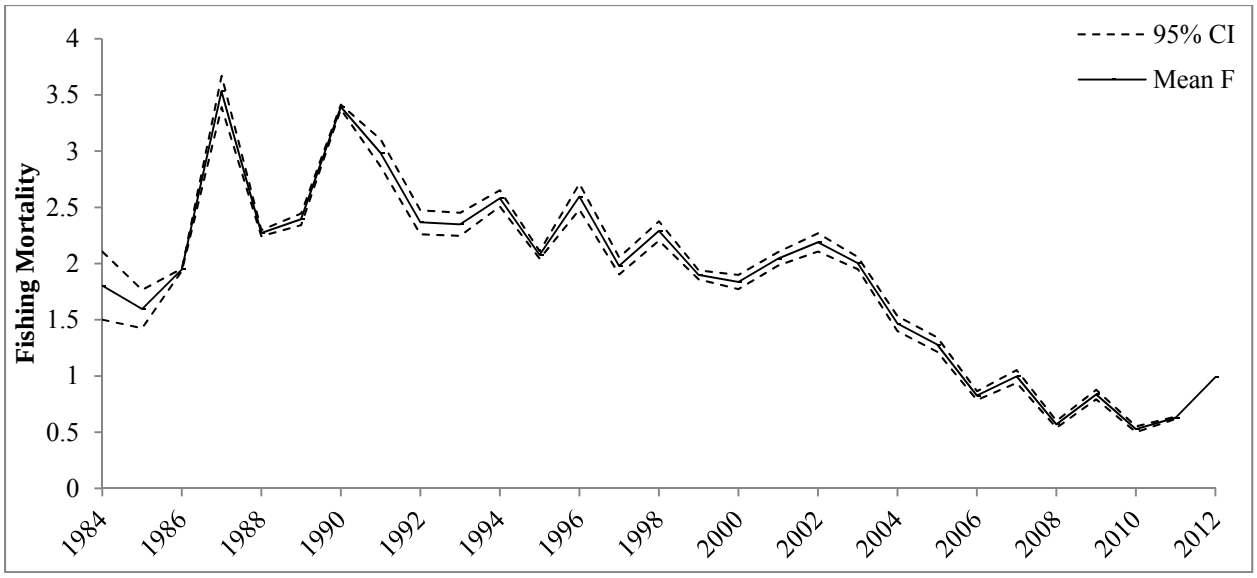

Figure 2.1.1. Brown shrimp F-values modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean F-value calculated for brown shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.2, the highest F-value was used (**Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Alternative 2**).

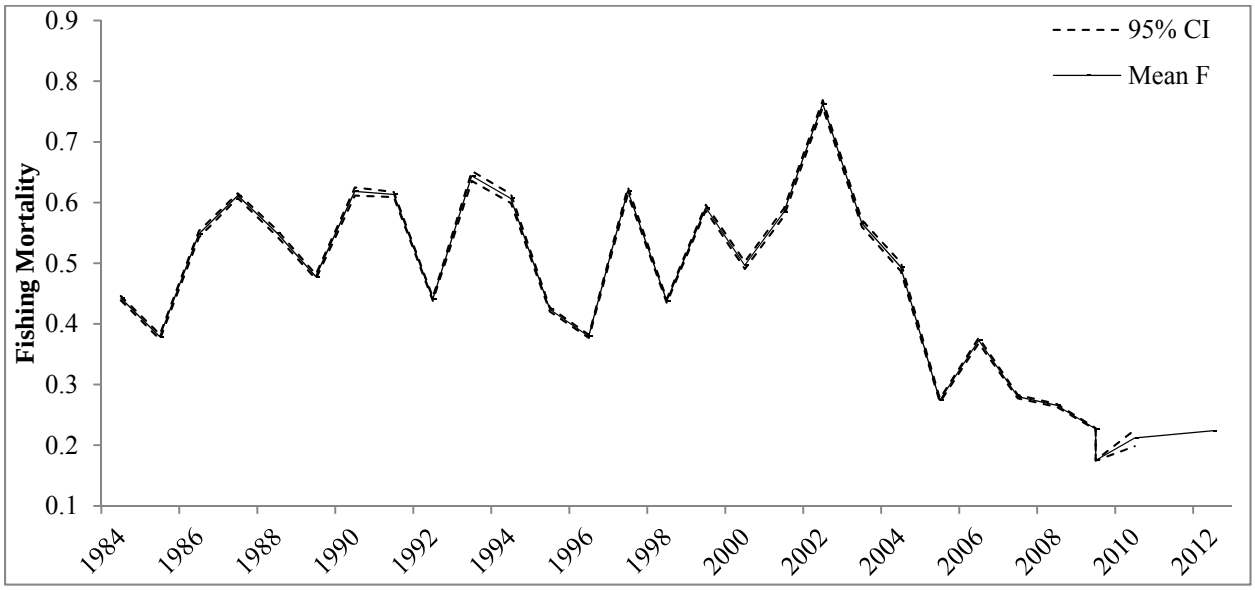

Figure 2.1.2. White shrimp F-values modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean F-value calculated for white shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.2, the highest F-value was used (**Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Alternative 2**).

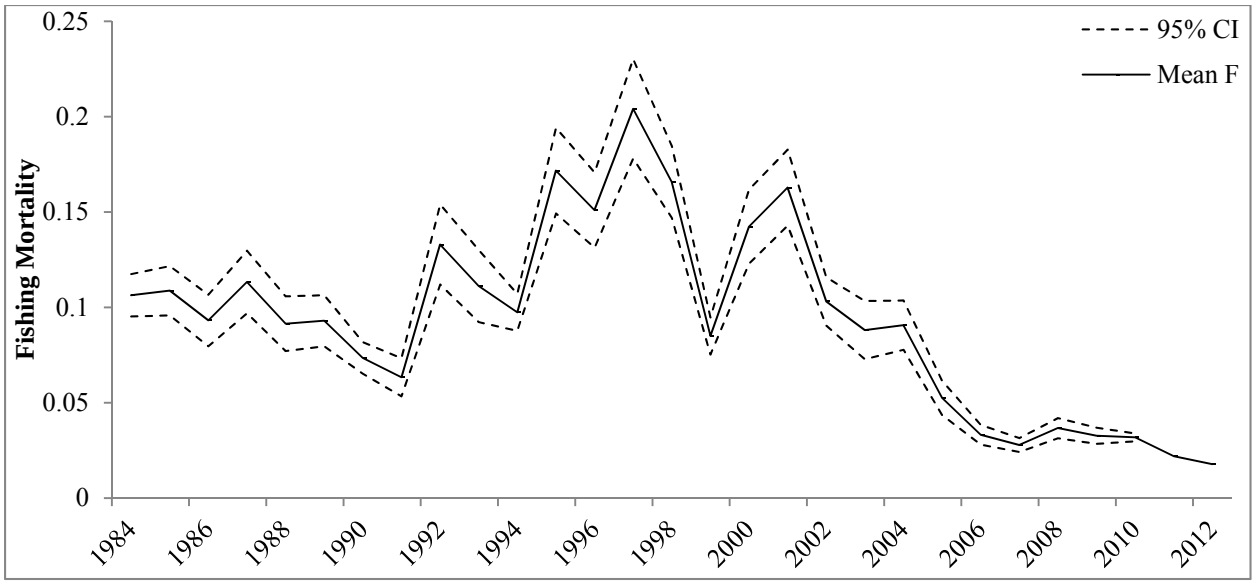

Figure 2.1.3. Pink shrimp F-values modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean F-value calculated for pink shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.2, the highest F-value was used (**Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Alternative 2**). Only six months of data were available for 2012, not the full year.

Alternative 1 would continue to use overfishing thresholds based on parent stock levels that are incompatible with current population metrics produced by model assessments and are based on the estimated number of individuals harvested. This would leave the overfishing status as unknown. The VPA model defines overfishing in terms of the number of sexually mature individuals during the reproductive period of each stock. Brown and white shrimp are sexually mature at 7 + months of age; pink shrimp are sexually mature at 5+ months of age. This alternative is contingent upon using the VPA model to assess penaeid stocks; the VPA model is no longer used to assess penaeid stocks.

Alternative 2 would establish each MFMT as the highest F for each species currently produced by the Stock Synthesis model. The apical F is the largest value of fishing mortality estimated by the model over the course of the model data years. The model produces monthly F values, and the maximum (or apical) monthly output is what is used for **Alternative 2** and **Alternative 3**. Because the values are the absolute maximum monthly values over a twenty-eight year period, it would be inappropriate to multiply the values by twelve; this would result in an unrealistic MFMT. The model is stochastic - when new data are added, the apical F may change slightly. Using the 95% confidence limit to define a range about the highest F is intended to address this variation and reduce the risk of model-driven overfishing designations. Additionally, the values for each species and subsequent ranges should be re-evaluated periodically because of variation in the model when new data are added. This re-evaluation would ensure the MFMT is reflective of the most current data. The MFMT is a rate, and therefore a numerical value of the yield cannot be calculated during the season. This rate is derived after the effort and landings have been reported for the fishing season.

Alternative 3 is similar to **Alternative 2**, but does not take into account the variability of the model (confidence limits). With this alternative, the MFMTs may need to be revaluated by the Council and SSC more often than every five years if the F-value for a year exceeds the F-value stated in the document. Because the alternative does not account for the sensitivity of the model parameters to new data, it is more likely to result in an overfishing determination than **Alternative 2**.

Preferred Alternative 4 would establish F in terms of MSY produced by the Stock Synthesis model. For pink and white shrimp, a monthly output is multiplied by twelve to calculate the yearly F_{MSY}. It is appropriate to multiply by 12 to convert the value from a monthly output to an annual value for the F_{MSY} because this is the F_{MSY} for all years, not the highest value; thus, such a multiplication would not artificially inflate the F_{MSY}. Brown shrimp had a seasonal output, so no multiplication factor was used. These values are not comparable to **Alternatives 2** and **3** as those are based on the apical monthly outputs of the stock synthesis model. Additionally, **Alternatives 2** and **3** are based on the highest monthly outputs from the time series. Just as in **Alternatives 2** and **3**, the F_{MSY} value should be re-evaluated periodically to account for variability in the model.

The Shrimp Advisory Panel recommended that values exceeding F for two years in a row designate the stock as undergoing overfishing, as a solitary year exceeding F might be indicative of productive stocks and not necessarily overfishing. In the Sustainable Fisheries Act (SFA) Amendment (GMFMC 1999), the response to possible overfishing was set to trigger only when overfishing persisted for two consecutive years. This was primarily in response to the biology of the shrimp stocks and the environmental influence on the stocks; penaeid shrimp rarely live longer than 18 months and stock size is driven by annual variability in environmental conditions. Therefore, this same provision for responding to overfishing is continued in the current amendment.

Council Conclusions:

The Council chose **Preferred Alternative 4** because it is an MSY based fishing mortality rate and based on the best assessment model as determined by the Council's SSC. The Council did not choose **Alternative 1** because that would leave the overfishing threshold of the fishery as unknown under the current stock assessment model. The Council did not choose **Alternatives 2** or **3** because these alternatives were based on the apical monthly value and not on MSY.

Action 1.3 – Modify the Overfished Threshold for Penaeid Shrimp

Alternative 1: No Action - An overfished condition would result when a parent stock number falls below one-half of the overfishing definition listed below.

- Brown shrimp - 63 million individuals, age 7+ months during the November through February period
- White shrimp - 165 million individuals, age 7+ months during the May through August period
- Pink shrimp - 50 million individuals, age 5+ months during the July through June period

Preferred Alternative 2: The overfished threshold is defined as the minimum stock size threshold (MSST). The MSST for each penaeid shrimp stock is defined as the minimum total annual spawning biomass minus the 95% confidence limit for the fishing years 1984 to 2012. Species specific MSST values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: the MSST value of the model output (24,616,232) minus the confidence limit (490,210); effective MSST value: 24,126,023 lbs of tails
- White shrimp: the MSST value of the model output (277,054,011) minus the confidence limit (1,275,673); effective MSST value: 275,796,338 lbs of tails
- Pink shrimp: the MSST value of the model output (37,593,545) minus the confidence limit (7,642,354); effective MSST value: 29,951,191 lbs of tails

Alternative 3: The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum total annual spawning biomass for the fishing years 1984 to 2012. Species specific MSST values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: 24,616,232 lbs of tails
- White shrimp: 277,054,011 lbs of tails
- Pink shrimp: 37,593,545 lbs of tails

Alternative 4: The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}). SSB_{MSY} values for the penaeid shrimp stocks are values produced by the stock synthesis model. Species specific SSB_{MSY} values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council. Currently, the stock synthesis model produces the following values:

- Brown shrimp: SSB_{MSY} is 6,098,868 lbs of tails
- White shrimp: SSB_{MSY} is 365,715,146 lbs of tails
- Pink shrimp: SSB_{MSY} is 23,686,906 lbs of tails

Discussion:

In October 2013, the SSC approved setting the overfished thresholds at the MSST (Figures 2.2.1-2.2.3), defined as the minimum spawning biomass from annual data points (from 1984-2011) (**Preferred Alternative 2** and **Alternative 3**), and the Council accepted the updated values based on data through 2012 at its October 2013 meeting. The MSST is the level of biomass below which the stock is considered to be overfished. Fishery managers can determine the status of a fishery at any given time and assess whether management measures are maintaining healthy stocks and achieving OY by evaluating the biomass of a stock in relation to MSST.

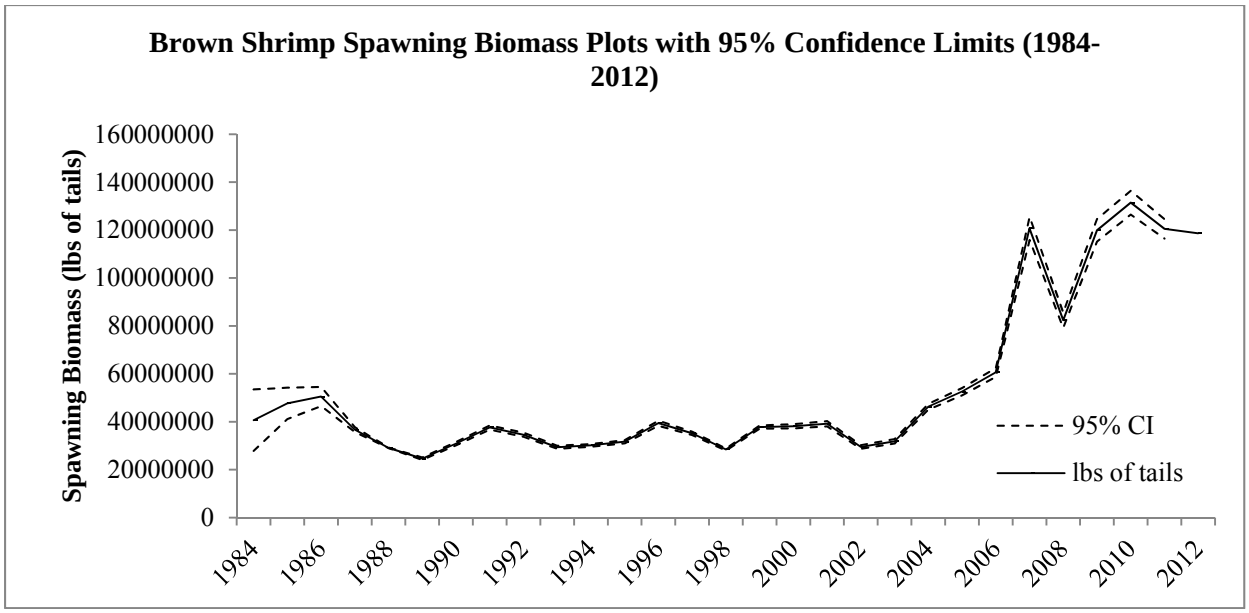

Figure 2.2.1. Brown shrimp MSST modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean spawning stock biomass calculated for brown shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.3, the lowest MSST value was used (**Preferred Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Preferred Alternative 2**).

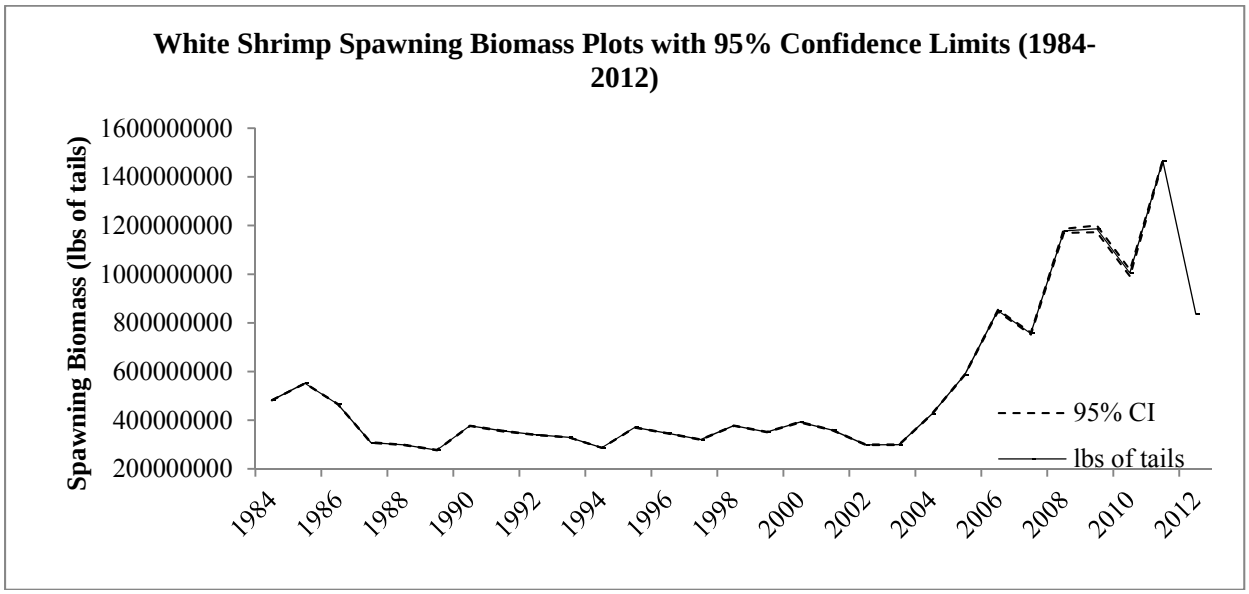

Figure 2.2.2. White shrimp MSST modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean spawning stock biomass calculated for white shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.3, the lowest MSST value was used (**Preferred Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Preferred Alternative 2**).

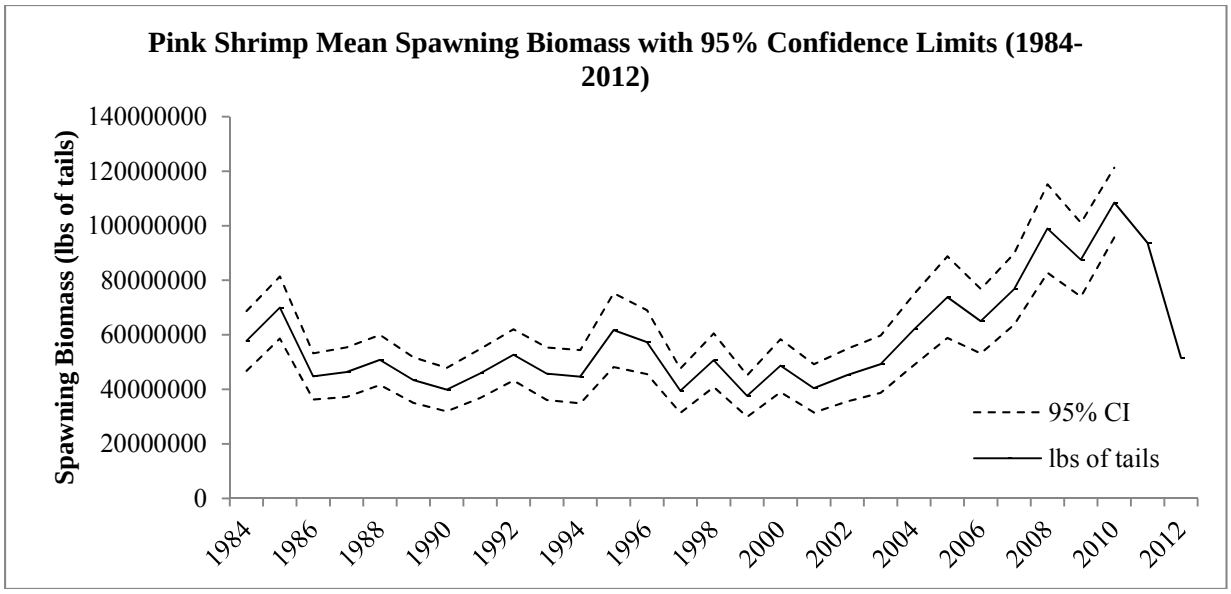

Figure 2.2.3. Pink shrimp MSST modeled using the Stock Synthesis model with data 1984-2012. The solid line is the mean spawning stock biomass calculated for pink shrimp and the dashed lines are the 95% confidence limits about the mean. For Action 1.3, the lowest MSST value was used (**Preferred Alternative 2** and **Alternative 3**) with the corresponding confidence limits (**Preferred Alternative 2**). Only six months of data were available for 2012, not the full year.

Alternative 1 would continue to use an overfished threshold that is incompatible with current model outputs and would leave the overfished condition of the three penaeid shrimp species unknown. The VPA model defines overfished in terms of the number of sexually mature individuals during the reproductive period of each stock. Brown and white shrimp are sexually mature at 7 + months of age; pink shrimp at 5+ months of age. This alternative is contingent upon using the VPA model to assess penaeid stocks; the VPA model is no longer used to assess penaeid stocks.

Preferred Alternative 2 would be the lowest MSST value for each species currently produced by the Stock Synthesis model minus the 95% confidence limit. The MSST outputs are monthly and the values for **Preferred Alternative 2** and **Alternative 3** are the absolute lowest values produced by the model from the years 1984-2012; multiplying these values by twelve to produces an "annual" value would artificially depress the MSST and would be more likely to result in an overfished status. Because the model has slight fluctuations in values when new data are added, the use of the 95% confidence limits to define a range less than the least MSST value is intended to reduce the risk of model-driven overfished designations. Because this value and subsequent range may fluctuate with the addition of data, it is appropriate that the MSST values and 95% confidence limits be re-assessed periodically. The MSST is an index derived after the effort and landings have been reported for the fishing season and is calculated using the Stock Synthesis model after the fishing season has concluded.

Alternative 3 is similar to **Preferred Alternative 2**, but does not take into account the variability of the model. Because this alternative does not take into account the sensitivity of the

model when new data are added, it is more likely that a stock could be determined to be overfished.

Alternative 4 would establish the overfished threshold in terms of spawning stock biomass based on the MSY produced by the stock synthesis model. For pink and white shrimp a monthly output is multiplied by twelve to calculate the yearly SSB_{MSY}. An annual SSB_{MSY} is appropriate because it is a number based on all years of data, not based on the minimum monthly value from all years of data. Brown shrimp had a seasonal output, so no multiplication factor was used. These values are not comparable to **Alternatives 2** and **3** as those are based on the minimum monthly outputs of the stock synthesis model. Additionally, **Alternatives 2** and **3** are based on the lowest monthly outputs from the time series. Just as in **Alternatives 2** and **3**, the SSB_{MSY} value should be re-evaluated periodically to account for variability in the model.

The Shrimp Advisory Panel recommended that values below MSST for two years in a row designate the stock as overfished, as a solitary year below MSST might be indicative of environmental conditions and not necessarily an overfished condition. Unlike for overfishing, the SFA did not have a two year provision for responding to an overfished determination (GMFMC 1999). In the Magnuson-Stevens Act, if a stock is determined to be overfished, NMFS must notify the Council and the Council must begin developing conservation and management measures to rebuild the stock. The Council is required to implement management measures within two years of being notified. Because of the biology of the shrimp stock, variability in environmental conditions, and the two-year timeframe to implement these measures, the stock may no longer be considered overfished by the time management measures are in effect. However, if the spawning biomass is below MSST, then the Council would already have management measures in development.

Council Conclusions:

The Council chose **Preferred Alternative 2** because it accounts for variability in the model by incorporating confidence limits into the minimum stock size threshold. The Council did not choose **Alternative 1** because that would leave the overfished threshold of the fishery as unknown under the current stock assessment model. The Council did not choose **Alternative 3** because it did not account for variability in the model.

2.2 Action 2 – Modify the Shrimp Fishery Management Plan (FMP) Framework Procedure

Alternative 1. No Action – Do not modify the shrimp management measures framework procedure adopted through the Generic Annual Catch Limits (ACL)/Accountability Measures (AMs)* Amendment.

Preferred Alternative 2. Modify the shrimp management measures framework procedure to include changes to AMs* for the royal red shrimp fishery through the standard documentation process for open framework actions, and make editorial changes to the framework procedure to reflect changes to the Council advisory committees and panels. Accountability measures* that could be implemented or changed would include:

In-season AMs

- Closure and closure procedures
- Trip limit implementation or change
- Implementation of gear restrictions

Post-season AMs

- Adjustment of season length
- Implementation of closed seasons/time periods
- Adjustment or implementation of trip or possession limits
- Reduction of the ACL/Annual Catch Target (ACT) to account for the previous year overage
- Revoking a scheduled increase in the ACL/ACT if the ACL was exceeded in the previous year
- Implementation of gear restrictions
- Reporting and monitoring requirements

Alternative 3. Modify the shrimp management measures framework procedure to include changes to AMs* for the royal red shrimp fishery through the standard documentation process for open framework actions, and make editorial changes to the framework procedure to reflect changes to the Council advisory committees and panels. Accountability measures* that could be implemented or changed would include:

In-season AMs

- Closure procedures
- Trip limit reductions or increases

Post-season AMs

- Adjustment of season length
- Adjustment of trip or possession limits

**Note: The portions of the current framework procedure regarding ACLs, ACTs, and AMs apply only to royal red shrimp because penaeid shrimp species have annual lifecycles and, therefore, are not required to have these management measures.*

Discussion:
The Council currently has three different regulatory vehicles for addressing fishery management issues. First, it may develop a fishery management plan or plan amendment to establish management measures. The amendment process can take one to three years depending on the analysis needed to support the amendment actions. Second, the Council may vote to request an interim or emergency rule that could remain effective for 180 days with the option to extend it for an additional 186 days. Interim and emergency rules are only meant as short-term management tools while permanent regulations are developed through an amendment. Third, the Council may prepare a framework action based on a predetermined procedure that allows changes to specific management measures and parameters. Typically, framework actions take less than a year to implement and, like plan amendments, are effective until amended.

Three framework procedures have been developed for the shrimp FMP: 1) Amendment 9 (GMFMC 1997) established a framework procedure for modifying bycatch reduction criteria, bycatch reduction device (BRD) certification and decertification criteria, and testing protocols for certifying BRDs; 2) Amendment 14 (GMFMC 2007) established a framework procedure for adjusting shrimp target effort and closed seasons relative to red snapper; and 3) the Generic ACL/AM Amendment (GMFMC 2011) established a framework procedure to change other management measures. Subsequent to the last amendment, the Council determined that modifications to AMs should be included in the frameworks for all of their FMPs; therefore, the reef fish framework procedure was modified in Amendment 38 to the Reef Fish FMP and the coastal migratory pelagics (CMP) framework was modified in Amendment 20B to the CMP FMP. The current action proposes to make those same changes to the shrimp framework established in the Generic ACL/AM Amendment as indicated in the highlighted sections below. The other two framework procedures would remain unchanged. The AM provisions currently apply only to royal red shrimp because penaeid shrimp are not required to have AMs.

Proposed Language for Updated Framework Procedure

This framework procedure provides standardized procedures for implementing management changes pursuant to the provisions of the fishery management plan (FMP). There are two basic processes, the open framework process and the closed framework process. Open frameworks address issues where there is more policy discretion in selecting among various management options developed to address an identified management issue, such as changing a size limit to reduce harvest. Closed frameworks address much more specific factual circumstances, where the FMP and implementing regulations identify specific action to be taken in the event of specific facts occurring, such as closing a sector of a fishery after their quota has been harvested.

Open Framework:

1. Situations under which this framework procedure may be used to implement management changes include the following:
    a. A new stock assessment resulting in changes to the overfishing limit, acceptable biological catch, or other associated management parameters.

In such instances the Gulf of Mexico Fishery Management Council (Council) may, as part of a proposed framework action, propose an annual catch limit (ACL) or series of ACLs and optionally an annual catch target (ACT) or series of ACTs, as well as any corresponding adjustments to maximum sustainable yield (MSY), optimum yield (OY), and related management parameters.

b. New information or circumstances.
The Council will, as part of a proposed framework action, identify the new information and provide rationale as to why this new information indicates that management measures should be changed.

c. Changes are required to comply with applicable law such as Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Endangered Species Act (ESA), Marine Mammal Protection Act, or are required as a result of a court order.
In such instances the Regional Administrator (RA) will notify the Council in writing of the issue and that action is required. If there is a legal deadline for taking action, the deadline will be included in the notification.

2. Open framework actions may be implemented in either of two ways, abbreviated documentation, or standard documentation process.
   a. Abbreviated documentation process. Regulatory changes that may be categorized as a routine or insignificant may be proposed in the form of a letter or memo from the Council to the RA containing the proposed action, and the relevant biological, social and economic information to support the action. If multiple actions are proposed, a finding that the actions are also routine or insignificant must also be included. If the RA concurs with the determination and approves the proposed action, the action will be implemented through publication of appropriate notification in the Federal Register. Actions that may be viewed as routine or insignificant include, among others:
      i. Reporting and monitoring requirements,
      ii. Permitting requirements,
      iii. Gear marking requirements,
      iv. Vessel marking requirements,
      v. Restrictions relating to maintaining fish in a specific condition (whole condition, filleting, use as bait, etc.),
      vi. Size limit changes of not more than 10% of the prior size limit,
      vii. Vessel trip limit changes of not more than 10% of the prior trip limit,
      viii. Closed seasons of not more than 10% of the overall open fishing season,
      ix. Restricted areas (seasonal or year-round) affecting no more than a total of 100 square nautical miles,
      x. Respecification of ACL, ACT or quotas that had been previously approved as part of a series of ACLs, ACTs or quotas,
      xi. Specification of MSY, OY, and associated management parameters (such as overfished and overfishing definitions) where new values are calculated based on previously approved specifications,
      xii. Gear restrictions, except those that result significant changes in the fishery, such as complete prohibitions on gear types,

xiii. Quota changes of not more than 10%, or retention of portion of an annual quota in anticipation of future regulatory changes during the same fishing year,

b. Standard documentation process. Regulatory changes that do not qualify as a routine or insignificant may be proposed in the form of a framework document with supporting analyses. Non-routine or significant actions that may be implemented under a framework action include:

i. Specification of ACTs or sector ACTs, and modifications to ACL/ACT control rule,
ii. Specification of acceptable biological catch (ABC) and ABC control rules,
iii. Rebuilding plans and revisions to approved rebuilding plans,
iv. Changes specified in section 4(a) that exceed the established thresholds.
v. Changes to AMs including:

In-season AMs

1. Closures and closure procedures
2. Trip limit changes
3. Implementation of gear restrictions

Post-season AMs

4. Adjustment of season length
5. Implementation of closed seasons/time periods
6. Adjustment or implementation of trip or possession limits
7. Reduction of the ACL/ACT to account for the previous year overage
8. Revoking a scheduled increase in the ACL/ACT if the ACL was exceeded in the previous year
9. Implementation of gear restrictions
10. Reporting and monitoring requirements

3. The Council will initiate the open framework process to inform the public of the issues and develop potential alternatives to address the issues. The framework process will include the development of documentation and public discussion during at least one Council meeting.

4. Prior to taking final action on the proposed framework action, the Council may convene its advisory committees and panels, as appropriate, to provide recommendations on the proposed actions.

5. For all framework actions, the Council will provide the letter, memo, or the completed framework document along with proposed regulations to the RA in a timely manner following final action by the Council.

6. For all framework action requests, the RA will review the Council's recommendations and supporting information and notify the Council of the determinations, in accordance with the Magnuson-Stevens Act and other applicable law.

Closed Framework:

1. Consistent with existing requirements in the FMP and implementing regulations, the RA is authorized to conduct the following framework actions through appropriate notification in the Federal Register:
   a. Close or adjust harvest any sector of the fishery for a species, sub-species, or species group that has a quota or sub-quota at such time as projected to be necessary to prevent the sector from exceeding its sector-quota for the remainder of the fishing year or sub-quota season,
   b. Reopen any sector of the fishery that had been prematurely closed,
   c. Implement AMs, either in-season or post-season.

Alternative 1 would retain the current shrimp management measures framework procedure without any changes. This framework procedure was established in the Generic ACL/AM Amendment (GMFMC 2011) and provides the Council and NMFS the flexibility to respond quickly to changes in the shrimp fishery. The framework has both open and closed components. The open components provide more policy discretion, whereas the closed components address more specific, well-defined circumstances. Measures that can be changed under the procedure are identified, as well as the appropriate process needed for each type of change.

Preferred Alternative 2 and **Alternative 3** would allow changes to AMs under the standard documentation process of the open framework procedure, and would amend language in the framework that refers to the Socioeconomic Panel, which no longer exists under that name due to reorganization of the SSC. Each alternative contains a list of the specific AMs that could be changed through the process. **Preferred Alternative 2** is a more comprehensive list that includes all AMs currently in place. **Alternative 3** would limit the types of AMs that could be changed through a framework action. The AM provisions in **Preferred Alternative 2** and **Alternative 3** currently apply only to royal red shrimp because penaeid shrimp are not required to have AMs. Both alternatives would also allow changes to the portion of the regulations detailing the framework procedures which would clarify the procedures and remove outdated terminology.

It is important to note that some items included in **Preferred Alternative 2** and **Alternative 3** are currently listed in the abbreviated process section of the open framework procedure as management measures. Although similar, AMs differ from management measures because they are tied in some way to the ACL. For example, through the abbreviated process, the Council and NMFS may implement closed seasons of not more than 10% of the overall open fishing season. The reason for the closed season may be to protect spawning populations or to extend a fishing season later into the year. This is a management measure and would remain in effect until changed through another framework action. On the other hand, **Preferred Alternative 2** would allow the Council and NMFS to implement a measure through the standard process whereby the RA has the authority to set a closed season in the year following a year in which the ACL is exceeded. In this case, the reason for the closed season is to prevent another overage of the ACL. This is an AM, and the closed season would only be in effect temporarily. Therefore, the current framework (**Alternative 1**) allows changes to management measures, but the **Preferred**

Alternative 2 and **Alternative 3** would also allow changes to AMs, including adding new accountability measures to the existing suite.

Council Conclusions:

The Council chose **Preferred Alternative 2** to allow maximum flexibility and timeliness in making adjustments to management and AMs that may be needed as a result of a new stock assessment or other new information or circumstances. The Council did not choose **Alternative 1** because that would require a plan amendment to modify AMs and would leave inaccurate terminology in the framework. The Council did not choose **Alternative 3** because the Council determined it did not supply enough flexibility in the AMs that could be modified through a framework.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Fishery

The Final Environmental Impact Statement (FEIS) for the original shrimp fishery management plan (FMP) and the FMP as revised in 1981 contain a description of the Gulf of Mexico (Gulf) shrimp fishery. This material is incorporated by reference and is not repeated here in detail. Amendment 9 (GMFMC 1997) with supplemental environmental impact statement (SEIS) updated this information. The management unit of this FMP consists of brown, white, pink, and royal red shrimp. Seabobs and rock shrimp occur as incidental catch in the fishery.

Brown shrimp is the most important species in the U.S. Gulf shrimp fishery with most catches made from June through October. Annual commercial landings in 2003 through 2013 have ranged from about 45 to 88 million pounds (mp) of tails (Table 3.1.1). The fishery is prosecuted to about 40 fathoms and is highly dependent on environmental factors such as temperature and salinity.

White shrimp are found in nearshore waters to about 20 fathoms from Texas through Alabama. The majority are taken from August through December though there is a small spring and summer fishery. From 2003 through 2013, annual commercial landings have ranged from approximately 55 to 87 mp of tails (Table 3.1.1).

Pink shrimp are found off all Gulf states but are most abundant off Florida's west coast, particularly in the Tortugas grounds off the Florida Keys. Annual commercial landings in 2003 through 2013 have ranged from approximately 3 to 11 mp of tails (Table 3.1.1); most landings are made from October through May in 30 fathoms of water. In the northern and western Gulf states, pink shrimp are sometimes mistakenly counted as brown shrimp.

The commercial fishery for royal red shrimp is most abundant on the continental shelf from about 140 to 275 fathoms east of the Mississippi River. Thus far, landings have not reached the current maximum sustainable yield (MSY) estimate of 392,000 lbs of tails in the year 2003 through 2013 and have ranged from approximately 130,000 to 353,000 lbs of tails (Table 3.1.1).

Table 3.1.1. Landings (pounds of tails) of shrimp from the Gulf, 2003-2013.

Year	All Species	Brown	White	Pink	Royal R	Others
2003	161,010,611	84,077,981	61,029,451	9,992,981	279,013	5,631,185
2004	162,372,773	74,512,744	72,992,775	10,245,766	278,519	4,342,969
2005	135,418,633	58,658,224	65,399,784	8,784,798	150,316	2,425,511
2006	182,981,364	87,471,753	86,229,598	7,691,431	163,323	1,425,259
2007	139,962,049	70,675,513	64,350,692	3,459,355	229,024	1,247,465
2008	120,209,917	50,344,159	63,738,475	4,919,903	138,116	1,069,264
2009	154,642,342	75,372,722	74,431,059	4,113,970	173,065	551,526
2010	110,491,956	44,951,233	59,032,638	5,243,681	127,358	1,137,046
2011	136,543,421	72,387,001	57,969,171	4,070,606	195,354	1,921,289
2012	136,717,883	64,674,384	67,787,889	3,213,402	177,658	864,550
2013	123,471,746	62,475,827	55,869,792	3,241,638	103,076	1,781,413
Average	142,165,699	67,781,958	66,257,393	5,907,048	183,166	2,036,134

Source: NMFS Gulf Shrimp Survey, James Primrose, pers. comm., 2014; Rick Hart, pers. comm. 2013.

The three species of penaeids are short-lived and provide annual crops; royal red shrimp live longer, and several year classes may occur on the fishing grounds at one time. Penaeid shrimp are not required to have annual catch limits (ACLs) or accountability measures (AMs) because of their annual life cycle; royal red shrimp are the only shrimp species in the Gulf that currently have an ACL and AMs. The condition of each penaeid shrimp stock is monitored annually, and none has been overfished for more than 40 years.

Cooperative management of penaeid shrimp species include: simultaneous closure in both state and federal waters off the coast of Texas, the Tortugas Shrimp Sanctuary, and seasonally closed zones for the shrimp and stone crab fisheries off the coast of Florida. The royal red shrimp fishery is only prosecuted in deeper waters of the exclusive economic zone (EEZ). As of May 7, 2015, there were 1,468 valid or renewable federal Gulf shrimp permits and 289 endorsements for royal red shrimp. There has been a moratorium on the issuance of new Gulf shrimp permits since 2007. Permits are fully transferrable, and renewal of the moratorium permit is contingent upon compliance with recordkeeping and reporting requirements. State licenses may vary and vessels may have more than one state license. If selected, a vessel with a Gulf shrimp permit must carry a National Marine Fisheries Service (NMFS) approved observer. The size of the shrimp industry and its total effort has been substantially reduced since the benchmark 2001-2003 time period. This effort reduction reflects both a reduction in the number of vessels estimated to be participating in the fishery, and a reduction in the level of activity for those vessels remaining in the fishery.

Commercial shrimp vessels are classified by NMFS as part of either a nearshore or an offshore fleet. Vessel size categories range from under 25 feet to over 85 feet. More than half of the commercial shrimp vessels fall into a size range from 56 to 75 feet. The number of vessels in the fishery at any one time varies because of economic factors such as the price and availability of shrimp and cost of fuel. In addition to the federal shrimp vessel permits, NMFS maintains two types of vessel files, both of which are largely dependent on port agent records. One, the shrimp

landings file, is for vessels that have been recorded as landing shrimp; the other is the vessel operating units file that lists vessels observed at ports. In the past, NMFS estimated fishing effort independently from the number of vessels fishing. NMFS used the number of hours actually spent fishing from interview data with vessel captains to develop reports as 24-hour days fished. NMFS currently uses the electronic logbook program from the selected number of vessels fishing and the number of hours spent towing to calculate effort.

A shrimp trawl fishery occurs seasonally inside state waters. However, not all states have a permitting system for shrimping in state waters and not all states track the amount of bait shrimp landed. In 2012, there were approximately 4,000 shrimp permits for Texas, Louisiana and Mississippi; Florida and Alabama do not require special shrimp permits for state waters. There are about 3,500 small boats participating using trawls up to 16 feet in width. More than 75% of the state licenses are in Louisiana.

Bait landings of juvenile brown, pink, and white shrimp, occur in all states. Estimates from 2012 suggest landings of at least 2.5 mp (whole weight). Total values for this component of the fishery cannot be calculated as not all states estimate values.

Various types of gear are used to capture shrimp including but not limited to: cast nets, haul seines, stationary butterfly nets, wing nets, skimmer nets, traps, and beam trawls. The otter trawl, with various modifications, is the dominant gear used in offshore waters, and there has been a decline in the number of otter trawls in recent years (NMFS 2014). Details about the specifics of each gear type as well as the historical development of the fishery can be found in Shrimp Amendment 14 (GMFMC 2007).

Although the industry continuously works to develop more efficient gear designs and fishing methods, the quad rig is still the primary gear used in federal waters; each gear type is well outlined in Shrimp Amendments 13 and 14 (GMFMC 2005a, 2007). In recent years, the skimmer trawl has become a major gear in the inshore shrimp fishery in the northern Gulf. All trawls used in federal waters are required to have bycatch reduction devices (BRDs) unless: the vessel is fishing for and catching more than 90% royal red shrimp; the vessel is using a try net; the trawl is a rigid frame roller trawl; the vessel is trawling within the tow-time restrictions; or the vessel is testing the efficacy of a BRD under an authorization by NMFS.

3.2 Description of the Physical Environment

The FEIS for the original Shrimp FMP and the FMP as revised in 1981 contains a description of the physical environment. The physical environment for penaeid shrimp is also detailed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2005b). This material is incorporated by reference and is not repeated here in detail.

The Gulf is a semi-enclosed oceanic basin of approximately 600,000 square miles (Gore 1992). It is connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel. Oceanic conditions are primarily influenced by the Loop Current, the discharge of freshwater into the northern Gulf, and a semi-permanent, anticyclonic gyre in the western Gulf. Gulf water temperatures range from 12º C to 29º C (54º F to 84º F) depending of

depth and season. In the Gulf, adult penaeid shrimp are found in nearshore and offshore on silt, mud, and sand bottoms; juveniles are found in estuaries.

Several area closures, including gear restrictions, may affect targeted and incidental harvest of penaeid shrimp species in the Gulf. These are described in detail in Amendment 13 (GMFMC 2005a) and incorporated by reference. The areas include:

- Cooperative Texas Shrimp Closure
- Tortugas Shrimp Sanctuary
- Southwest Florida Seasonal Closure
- Central Florida Seasonal Closure
- Longline/Buoy Gear Area Closure
- Madison-Swanson and Steamboat Lumps Marine Reserves
- The Edges Marine Reserve
- Tortugas North and South Marine Reserves
- Tortugas Shrimp Sanctuary
- Alabama Special Management Zone

Reef and bank areas designated as Habitat Areas of Particular Concern (HAPCs) in the northwestern Gulf include: East and West Flower Garden Banks, Stetson Bank, Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, McGrail Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank, Florida Middle Grounds HAPC and Pulley Ridge HAPC.

Generic Amendment 3 addressed EFH requirements (GMFMC 2005b) and established that a weak link in the tickler chain is required on bottom trawls for all habitats throughout the Gulf EEZ. A weak link is defined as a length or section of the tickler chain that has a breaking strength less than the chain itself and is easily seen as such when visually inspected. The amendment established an education program on the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen.

The Deepwater Horizon MC252 oil spill in 2010 affected at least one-third of the Gulf from western Louisiana east to the Florida Panhandle and south to the Campeche Bank of Mexico. Millions of barrels of oil flowed from the ruptured wellhead (www.restorethegulf.gov 2010). The impacts of the Deepwater Horizon MC252 oil spill on the physical environment may be significant and long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants (both at the surface and at the wellhead), oil was also suspended within the water column (Camilli et al. 2010; Kujawinski et al. 2011). Floating and suspended oil washed onto coastlines in several areas of the Gulf along with non-floating tar balls. Suspended and floating oil degrades over time, but tar balls persist in the environment and can be transported hundreds of miles (Goodman 2003).

Surface or submerged oil during the Deepwater Horizon MC252 oil spill event could have restricted the normal processes of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column affecting the long-standing hypoxic zone located west of the Mississippi River on the Louisiana continental shelf (NOAA 2010). Microbial biodegradation of hydrocarbons in the water column may have occurred without substantial oxygen drawdown

(Hazen et al. 2010). Residence time of hydrocarbons in sediments is also a concern. The indices developed for past oil spills (Harper 2003) and oil spill scenarios (Stjernholm et al. 2011) such as the "oil residence index" do not appear to have been used during the assessment of the Deepwater Horizon MC252 oil spill.

3.3 Description of the Biological/Ecological Environment

The FEIS for the original Shrimp FMP and the FMP as revised in 1981 contains a description of the biology of the shrimp species. In its appendix, the FEIS of February 1981 includes the habitats, distribution, and incidental capture of sea turtles. This material is incorporated by reference and is not repeated here in detail. Amendment 9 (GMFMC 1997) updated this information which has essentially remain unchanged.

3.3.1 Target Species

Brown, white, and pink shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults (GMFMC 1981). Brown shrimp eggs are demersal and occur offshore. Post-larvae migrate to estuaries through passes on flood tides at night mainly from February until April; there is another minor peak in the fall. Post-larvae and juveniles are common in all U.S. estuaries from Apalachicola Bay, Florida to the Mexican border. Brown shrimp post-larvae and juveniles are associated with shallow, vegetated estuarine habitats, but may occur on silt, sand, and non-vegetated mud bottoms. Adult brown shrimp occur in marine waters extending from mean low tide to the edge of the continental shelf and are associated with silt, muddy sand, and sandy substrates. More detailed discussion on habitat associations of brown shrimp is provided in Nelson (1992) and Pattillo et al. (1997).

White shrimp eggs are demersal and larval stages are planktonic in nearshore marine waters. Post-larvae migrate through passes mainly from May until November with peaks in June and September. Juveniles are common in all Gulf estuaries from Texas to the Suwannee River in Florida. Post-larvae and juveniles commonly occur on bottoms with large quantities of decaying organic matter or vegetative cover such as mud or peat. Juvenile migration from estuaries occurs in late August and September and is related to juvenile size and environmental conditions (e.g., sharp temperature drops in fall and winter). Adult white shrimp are demersal and inhabit nearshore Gulf waters to depths of 16 fathoms on soft bottoms. More detailed information on habitat associations of white shrimp is available from Nelson (1992) and Pattillo et al. (1997).

Pink shrimp eggs are demersal, and early larvae are planktonic, and post-larvae are demersal in marine waters. Juveniles inhabit almost every U.S. estuary in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass where they burrow into the substrate by day and emerge at night. Adults inhabit offshore marine waters with the highest concentrations in depths of 5 to 25 fathoms.

Royal red shrimp occur exclusively in the EEZ, live longer than penaeid shrimp and many year classes may be present on fishing grounds at one time. The fishery occurs in water depths of 80 to 300 fathoms.

3.3.2 Bycatch

Between 2007 and 2010, 185 species were observed as bycatch in the shrimp fishery (Scott-Denton et al. 2012). By weight, approximately 57% of the catch was finfish, 29% was commercial shrimp, and 12% was invertebrates. The species composition is spatially and bathymetrically dependent, but for the Gulf overall, Atlantic croaker, sea trout, and longspine porgy are the dominant finfish species taken in trawls (approximately 26% of the total catch by weight). Other commonly occurring species include portunid crabs, mantis shrimp, spot, inshore lizardfish, searobins, and Gulf butterfish. Although red snapper comprise a very small percentage (0.3% by weight) of overall bycatch, the mortality associated with this bycatch affects the recruitment of older fish (age 2 and above) to the directed fishery and ultimately the recovery of the red snapper stock.

To address finfish bycatch issues, especially bycatch of red snapper, the Gulf of Mexico Fishery Management Council (Council) initially established regulations requiring BRDs, specifically to reduce the bycatch of juvenile red snapper. In 1998, all shrimp trawlers operating in the EEZ, inshore of the 100-fathom contour, west of Cape San Blas, Florida were required to use BRDs. Only two Gulf states (Florida and Texas) require the use of BRDs in state waters. Shrimp trawls fishing for royal red shrimp seaward of the 100-fathom contour are exempt from the requirement for BRDs. The shrimp fishery is also a source of bycatch mortality on sea turtles (see Section 3.3.3). Bycatch is currently considered to be reduced to the extent practicable in the Gulf shrimp fishery. The actions in this amendment are not likely to change bycatch in the shrimp fishery. Bycatch levels and associated implications will continue to be monitored and issues will be addressed based on new information.

3.3.3 Protected Species

Species in the Gulf protected under the Endangered Species Act (ESA) include: five marine mammal species (sei, fin, humpback, sperm whales, and manatees); five sea turtles (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); two fish species (Gulf sturgeon and smalltooth sawfish); and four coral species (elkhorn coral, lobed star coral, boulder star coral, and mountainous star coral). Seven species of fish and invertebrates in the Gulf are currently listed as species of concern.

Otter trawls may directly affect smalltooth sawfish that are foraging within or moving through an active trawling location via direct contact with the gear. The long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in any type of netting gear, including the netting used in shrimp trawls.

Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and are known to occur in areas subject to shrimp trawling. Bycatch of the species by commercial fisheries is a major contributor to past declines and a potential threat to future recovery (NMFS and USFWS 1991, 1992a, 1992b, 2008; NMFS et al. 2011). Historically, southeastern U.S. shrimp fisheries (both Gulf and South Atlantic) have been the largest threat to benthic sea turtles. Regulations requiring turtle excluder devices (TEDs) have reduced

mortalities from trawl fisheries on sea turtles. During a four year study period, 55 sea turtles were captured in shrimp trawls; 80% were released alive and conscious (Scott-Denton et al 2012).

The most recent biological opinion evaluated was the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. Shrimp Fisheries in Federal Waters (NMFS 2014). The Gulf shrimp fishery was considered specifically as part of this larger consultation. The biological opinion, which was based on the best available commercial and scientific data, concluded the continued authorization of the Southeast U.S. Shrimp Fisheries in Federal Waters (including the Gulf shrimp fishery) is not likely to jeopardize the continued existence of threatened or endangered species (NMFS 2014). The biological opinion implemented measures to minimize the impacts of incidental take to sea turtle or smalltooth sawfish. After the completion of the biological opinion, NMFS designated new critical habitat for the Northwestern Atlantic distinct population segment of loggerhead sea turtles defined by 5 specific habitat types. Two of those habitat types (nearshore reproductive and *Sargassum)* occur within the GMFMC's jurisdiction. NMFS determined that all federal Gulf fisheries operate outside the nearshore reproductive habitat and will not affect it. Gulf fisheries (including the shrimp fishery) could overlap with the *Sargassum* habitat. However, NMFS determined any effects from those fisheries would be insignificant and were not likely to adversely affect the *Sargassum* habitat unit.

The shrimp fishery is classified in the 2015 List of Fisheries as a Category II fishery (79 FR 77919; January 28, 2015). This classification indicates the annual mortality and serious injury of a marine mammal stock is greater than 1% but less than 50 % of the stocks potential biological removal (PBR), not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. This fishery was elevated to Category II from Category III (mortality or serious injury to <1% of the PBR) in 2011 based on increased interactions reported by observers, strandings, and fisheries research data.[3]

3.3.4 Status of the Shrimp Stocks

The three species of penaeid shrimp harvested by the shrimp fishery are short-lived and provide annual crops; royal red shrimp live longer (2-5 years) and multiple year classes can be found on the same fishing grounds. The condition of each shrimp stock is monitored annually, and none has been classified as overfished or undergoing overfishing (Hart 2013). Specific landings and values are provided in Table 3.1.1.

3.4 Description of the Economic Environment

Descriptions of the Gulf shrimp fishery are contained in previous amendments and NMFS regulatory actions and are incorporated herein by reference [see Shrimp Amendment 13 (GMFMC 2005a); Shrimp Amendment 14/Reef Fish Amendment 27 (GMFMC 2007); Regulatory Impact Review and Regulatory Flexibility Act Analysis for Making Technical

[3] http://www.nmfs.noaa.gov/pr/pdfs/fisheries/lof2012/southeastern_us_atlantic_gulf_shrimp_trawl.pdf).

Changes to TEDs to Enhance Turtle Protection in the Southeastern United States Under Sea Turtle Conservation Regulations (NMFS 2002); Regulatory Impact Review and Regulatory Flexibility Act Analysis, and Social Impact Assessment for the Proposed Rule to Revise the Gulf/South Atlantic Bycatch Reduction Device Testing Manual and Modify the Bycatch Reduction Criterion for Bycatch Reduction Devices Used in the Penaeid Shrimp Fishery West of Cape San Blas, Florida (NMFS 2006), Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico (GMFMC 2013), Shrimp Amendment 16 (GMFMC 2014)]. The following discusses certain key characteristics of the Gulf shrimp fishery.

Total Landings and Dockside Revenues

The Gulf shrimp fishery consists of three major sectors: harvesting sector, dealer/wholesaler sector, and processing sector. The following discussion focuses on the harvesting sector, primarily because the current amendment would directly affect vessels participating in the Gulf shrimp fishery.

The harvesting sector is composed of two types of fleets: 1) an inshore segment, mostly active in state waters and very diverse; and 2) an offshore segment, largely active in federal waters and almost always using trawl gear. In 2003, a federal shrimp permit was instituted requiring vessels to possess the permit when fishing for penaeid shrimp in the Gulf EEZ. A moratorium on the issuance of new federal shrimp permits was established in 2006. Currently, vessels must possess a shrimp moratorium permit (SPGM) when fishing for penaeid shrimp in the Gulf EEZ. In addition, a royal red shrimp endorsement, which is an open access permit for those holding a SPGM, is required for harvesting royal red shrimp in the Gulf. As of April 20, 2015, there were 1,339 valid SPGM permits and 288 valid royal red shrimp endorsements.

Total landings of shrimp from 2006 through 2013 averaged about 138 mp, heads off, with a dockside value of approximately $399 million in 2012 dollars (Table 3.3.1). Current values were adjusted for inflation using the consumer price index.[4] The year 2012 is chosen for converting nominal revenues to real revenues so that inflation adjustment in Table 3.3.1 would be consistent with that in Tables 3.3.2 and 3.3.3. Landings estimates include shrimp catches from inshore and offshore waters in the Gulf. It is noted that these shrimp landings exclude shrimp for bait.

On average (2006-2013), brown shrimp accounted for about 47.8% of total shrimp landings and 45.4% of total dockside revenues; white shrimp accounted for 47.9% of total shrimp landings and 50.0% of total dockside revenues; pink shrimp accounted for 3.3% of total shrimp landings and 3.9% of dockside revenues; royal red shrimp accounted for less than 1% of total shrimp landings and dockside revenues; and, other shrimp species accounted for 1.4% of total shrimp landings and less than 1% of dockside revenues.

[4] U.S. Department of Labor, Bureau of Labor Statistics. Consumer Price Index: all urban consumers, all goods, U.S. average [Available from http://www.bls.gov/cpi/].

Table 3.3.1. Landings and dockside revenues from the Gulf of Mexico shrimp fishery, 2006-2013, and their percent distribution by species.

	All Species	Brown (%)	White (%)	Pink (%)	Royal R (%)	Others (%)
Landings (lbs heads off)						
2006	182,981,364	47.8%	47.1%	4.2%	0.1%	0.8%
2007	139,962,049	50.5%	46.0%	2.5%	0.2%	0.9%
2008	120,209,917	41.9%	53.0%	4.1%	0.1%	0.9%
2009	154,642,342	48.7%	48.1%	2.7%	0.1%	0.4%
2010	110,491,956	40.7%	53.4%	4.7%	0.1%	1.0%
2011	136,543,421	53.0%	42.5%	3.0%	0.1%	1.4%
2012	136,717,883	47.3%	49.6%	2.4%	0.1%	0.6%
2013	123,471,746	50.6%	45.2%	2.6%	0.1%	1.4%
Average	138,127,585	47.8%	47.9%	3.3%	0.1%	0.9%
Dockside Revenues (2012 dollars)						
2006	$446,861,067	44.7%	48.2%	6.4%	0.2%	0.4%
2007	$392,509,509	48.3%	48.0%	3.1%	0.3%	0.3%
2008	$383,449,489	40.0%	55.4%	4.1%	0.2%	0.3%
2009	$332,022,953	45.4%	50.3%	3.9%	0.3%	0.2%
2010	$342,361,026	41.8%	52.8%	4.8%	0.2%	0.4%
2011	$433,860,601	46.8%	48.7%	3.2%	0.3%	1.0%
2012	$397,547,514	47.1%	49.5%	2.9%	0.3%	0.2%
2013	$461,776,160	47.8%	48.4%	2.9%	0.2%	0.8%
Average	$398,798,540	45.4%	50.0%	3.9%	0.2%	0.5%

Note: Landings are estimates from inshore and offshore water catches in the Gulf.
Source: James Primrose, pers. comm., 2014; Rick Hart, pers. comm., 2014.

Selected Characteristics of Participating Vessels in the Shrimp Fishery

Selected characteristics of participation in the Gulf shrimp fishery in 2006 through 2012 are summarized in Table 3.3.2. Estimates of the total number of active shrimp vessels are based on the number of unique vessels landing shrimp as recorded in the Gulf Shrimp System (GSS) database. The number of active permitted vessels was generated by cross referencing GSS landings data with SPGM permit list. The number of active vessels (permitted and non-permitted) is likely to be underestimates of the "actual" number of active vessels/permits based on other research (Travis 2010). However, this determination of active vessels provides a means of standardizing active participation in the Gulf shrimp fishery over a longer time frame.

The number of permitted and non-permitted active vessels (i.e., vessels reporting landings in the Gulf shrimp fishery) has generally been above 4,000 (Table 3.3.2). Approximately 22% to 30% of active vessels are federally permitted vessels (vessels with SPGM permit). Despite being fewer in number, federally permitted vessels have accounted for the majority of shrimp landings (63% to 70%) and revenues (74% to 79%) by all active vessels. Of all the vessels with federal shrimp permits, 65% to 85% have been active in the Gulf shrimp fishery between 2006 and 2012.

Table 3.3.2. Selected characteristics of participation in the Gulf shrimp fishery, 2006-2012.

	2006	2007	2008	2009	2010	2011	2012
Number of active vessels	4,889	4,678	4,121	4,725	4,495	5,237	5,152
Federally permitted vessels (%)	30%	30%	30%	26%	25%	23%	22%
Non-permitted vessels (%)	70%	70%	70%	74%	75%	77%	78%
Number of federally permitted vessels*	1,919	1,915	1,890	1,707	1,628	1,578	1,527
Active (%)	85%	72%	65%	71%	70%	75%	75%
Inactive (%)	15%	28%	35%	29%	30%	25%	25%
Total shrimp landings (mp, heads off)	182	141	119	157	112	139	137
Total revenues (million 2012 dollars)	$436	$388	$374	$329	$340	$432	$399
Federally permitted vessels (% landings)	70%	66%	68%	69%	63%	68%	64%
Federally permitted vessels (% revenues)	78%	77%	78%	77%	74%	79%	74%

*The number of federally permitted vessels each year was based on permit counts in the year the survey was undertaken. These numbers would slightly differ from what is currently known about the number of permits issued for those survey years. "Active" vessels are those landing shrimp as recorded in the GSS database.
Source: Liese, 2011, 2013, 2014; Liese and Travis, 2010; Liese et al., 2009a, 2009b. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

Key Economic and Financial Characteristics of Federally Permitted Shrimp Vessels

The following descriptions are based on a series of annual reports on the economics of the federal Gulf shrimp fishery for the years 2006 through 2012 (Liese 2011, 2013, 2014; Liese and Travis 2010; Liese et al. 2009a, 2009b). These reports present the results of the Annual Economic Survey of Federal Gulf Shrimp Permit Holders. The first survey, which was administered in 2007, collected data for the 2006 fishing year. The 2013 report is yet to be completed and the 2014 data are presently being collected and processed.

The type of economic data the survey collects is based on an accounting framework of money flows and values associated with the productive activity of commercial shrimping. With these data, three financial statements, the balance sheet, the cash flow statement, and the income statement, are prepared to give a comprehensive overview of the financial and economic situation of the offshore shrimp fishery.[5] Table 3.3.3 shows a summary of these three financial statements. In this table, financial statements for 2010 and onward include costs and revenues related to the Deepwater Horizon MC 252 (DWH) oil spill. Dollar values are averages in 2012 dollars.

The year 2010 was unique for the operations of many shrimp vessels in the Gulf because of the DWH oil spill. This oil spill and BP's responses had a confounding effect on the economics of the Gulf shrimp fishery in 2010 and onward. In 2010, the majority of vessels (66%) reported

[5] For more detailed descriptions of these three financial statements, see Liese et al. 2009a. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Report on the Design, Implementation, and Descriptive Results for 2006. NOAA Technical Memorandum NMFS-SEFSC-584.

receiving oil spill-related revenues. The two primary sources of this revenue were damage claims (passive income) and revenue generated by participation in BP's vessel of opportunity program (VOOP) where vessels were hired to clean up oil. Of the surveyed vessels in 2010, 28% participated in the VOOP. Both sources provided substantial revenue for participating vessels, thereby obscuring the economics of the Gulf shrimp fishery. Further, vessels participating in VOOP incurred non-negligible costs unrelated to commercial fishing. For more details on DWH-related revenues, see Liese (2011, 2013, and 2014).

It is noted that some shrimp vessels continued to receive DWH-related revenues in 2011 and 2012, but the amounts in these later years were small relative to that received in 2010. On average, DWH-related revenues per vessel were approximately $132,388 in 2010, $7,816 in 2011, and $58,167 in 2012. All dollar figures are in 2012 dollars.

The average vessel shows a fair amount of equity that, except for a dip in 2008, rose through the years (Table 3.3.3). This resulted from a combination of an increasing market value of the assets (vessel being the main asset) and declining liabilities (mainly loans).

Except for 2007, the average vessel shows positive net cash flows. The absolute amount of net cash flows may be relatively low in general, but it does indicate a certain level of solvency for continued operation in the shrimp fishery, at least in the short term. Cognizant of the importance of the DWH-related revenues, the three years after the DWH oil spill recorded the three highest net cash flows for the years 2006 through 2012. Revenues from shrimp were the major source of cash inflows while fuel and labor (crew and hired captain) costs were the top sources of cash outflows.

The income statement generally reflects the relatively fragile financial condition of an average permitted shrimp vessel. Before the occurrence of DWH-related activities, net revenues from fishing operations were generally negative, except for 2009. As is true of most averages, many shrimp vessels deviated from the average and were profitable. A very different financial scenario characterized the average shrimp vessel when including DWH-related activities, as in the years 2010 and thereafter. These activities materially affected the cash flow and income statement of the average vessel. Net cash flows were significantly positive for these years relative to those of the previous years. In addition, the bottom line profits (net revenue before tax) were also relatively high for these years.

The future economic and financial prospects for the shrimp industry could revert to those of the previous years as DWH-related activities dwindle. It may only be noted that shrimp imports have fallen in recent years as a result of diseases (early mortality syndrome) that affected cultured shrimp in some major exporting countries, allowing domestic prices for shrimp to increase. In addition, fuel prices, a major cost item for shrimp vessel operation, have fallen in recent months, but it is not known if prices would rebound in the near future.

Table 3.3.3. Economic and financial characteristics of an average vessel with federal shrimp permit (SPGM), 2006-2012. DWH-related costs and revenues are included for 2010, 2011, and 2012. Dollar values are averages in 2012 dollars.

Year	2006	2007	2008	2009	2010	2011	2012
Number of observations	484	505	497	427	429	456	442
Assets	$202,336	$222,741	$218,380	$224,001	$242,419	$298,519	$290,047
Liabilities	$105,404	$94,504	$75,863	$65,517	$52,505	$42,072	$49,619
Equity	$96,931	$128,238	$142,517	$158,483	$189,916	$256,447	$240,428
Inflow	$262,066	$216,857	$228,953	$227,037	$354,056	$322,973	$374,742
Outflow	$242,119	$223,259	$224,330	$218,189	$253,518	$286,964	$305,427
Net cash flow	$19,946	-$6,402	$4,624	$8,849	$100,538	$36,010	$69,315
Revenue (commercial fishing operations)	$248,902	$209,348	$226,159	$222,377	---------	$307,676	$310,890
Expenses	$251,849	$228,669	$231,314	$221,602	$254,454	$293,585	$306,962
Variable costs – Non-labor	$127,436	$113,191	$124,215	$111,023	$107,888	$140,333	$159,620
Variable costs – Labor	$65,229	$57,624	$58,523	$60,055	$82,952	$93,947	$86,563
Fixed costs	$59,185	$58,082	$48,576	$50,525	$63,614	$59,305	$60,778
Net revenue from operations	-$2,946	-$19,323	-$5,155	$775	---------	$14,091	$3,929
Net receipts from non-operating activities	$5,969	$878	-$2,168	$489	---------	$12,674	$60,846
Net revenue before tax (profit or loss)	$3,022	-$18,445	-$7,322	$1,264	$96,230	$26,765	$64,775

Source: Liese, 2011, 2013, 2014; Liese and Travis, 2010; Liese et al., 2009a, 2009b. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

3.5 Description of the Social Environment

Descriptions of the social environment associated with the Gulf shrimp fishery have been provided in previous amendments (GMFMC 2005a, 2007) and are incorporated herein by reference. These descriptions are updated here using recent community information on penaeid shrimp landings.

The regional quotient (RQ) is a way to measure the relative importance of a given species across all communities in the region and represents the proportional distribution of commercial landings of a particular species. This proportional measure does not provide the number of pounds or the value of the catch, data which might be confidential at the community level for many places. The RQ is calculated by dividing the total pounds (or value) of a species landed in a given community, by the total pounds (or value) for that species for all communities in the region.

Depending upon which shrimp species is being targeted, the pounds and value for RQ vary considerably by community. In Figure 3.5.1, except for Bayou LaBatre, Alabama, the top five ranking communities are in Texas. In fact, communities in Texas and Louisiana dominate brown shrimp landings and thus, have higher RQ scores. Louisiana communities tend to have higher landings but lower value. This may be indicative of size differentiation, with smaller shrimp sizes landed by inshore vessels in Louisiana, and Texas vessels primarily targeting penaeid shrimp offshore.

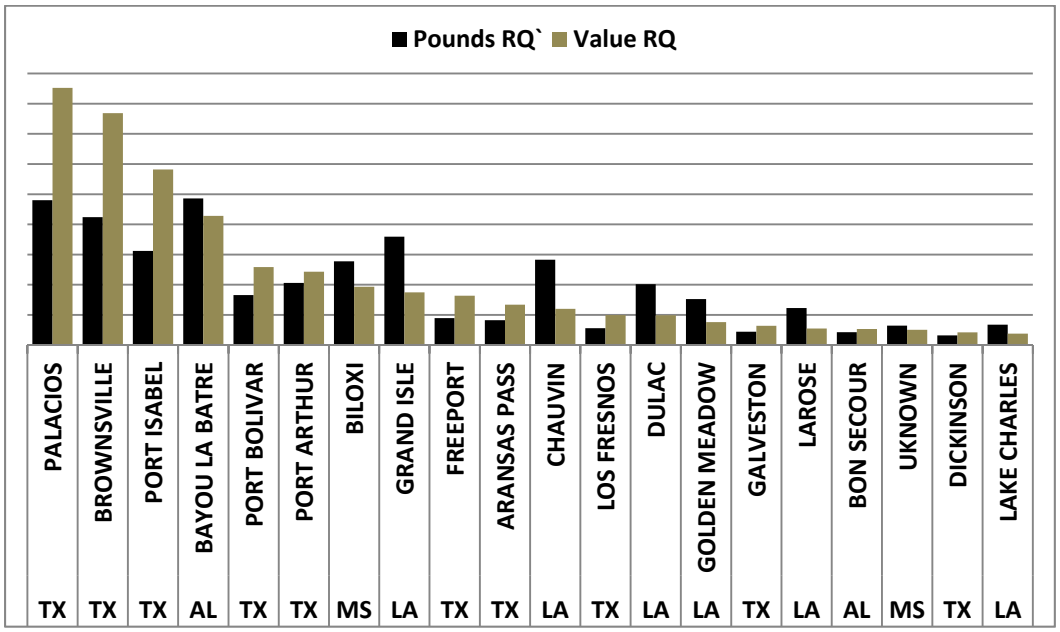

Figure 3.5.1. Top twenty brown shrimp communities based on the RQ for pounds and value, Gulf-wide.
Source: Southeast Regional Office, Accumulated Landings System 2011.

Pink shrimp are primarily landed in Florida with the majority landed in Fort Myers Beach (Figure 3.5.2). Tampa, Tarpon Springs, and Key West follow, with Bayou LaBatre, Alabama placing fifth. There are several Texas communities within the top twenty, although pink shrimp landed in Texas may have been harvested elsewhere as the majority of pink shrimp are harvested off the west coast of Florida and may be transported back to Texas by large freezer vessels.

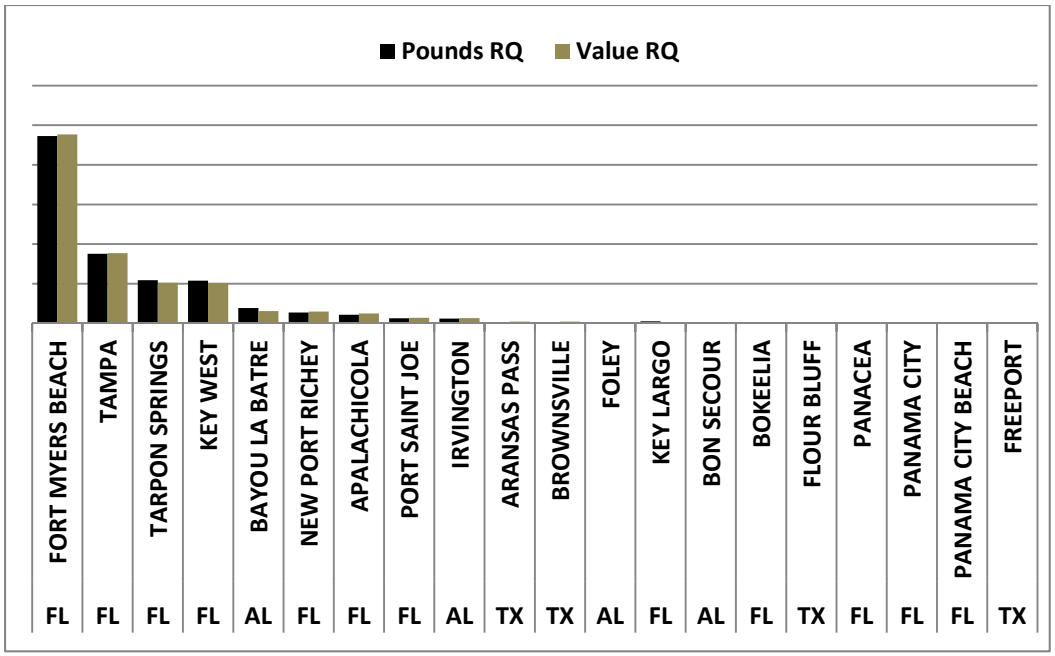

Figure 3.5.2. Top twenty pink shrimp communities based on the RQ for pounds and value, Gulf-wide.
Source: Southeast Regional Office, Accumulated Landings System 2011.

White shrimp (Figure 3.5.3) are primarily landed in the northern and western Gulf with Port Arthur, Texas having the highest RQ in terms of value. Although other communities have comparable RQs with regard to volume (pounds landed), the proportional value of white shrimp Gulf-wide is highest in Port Arthur.

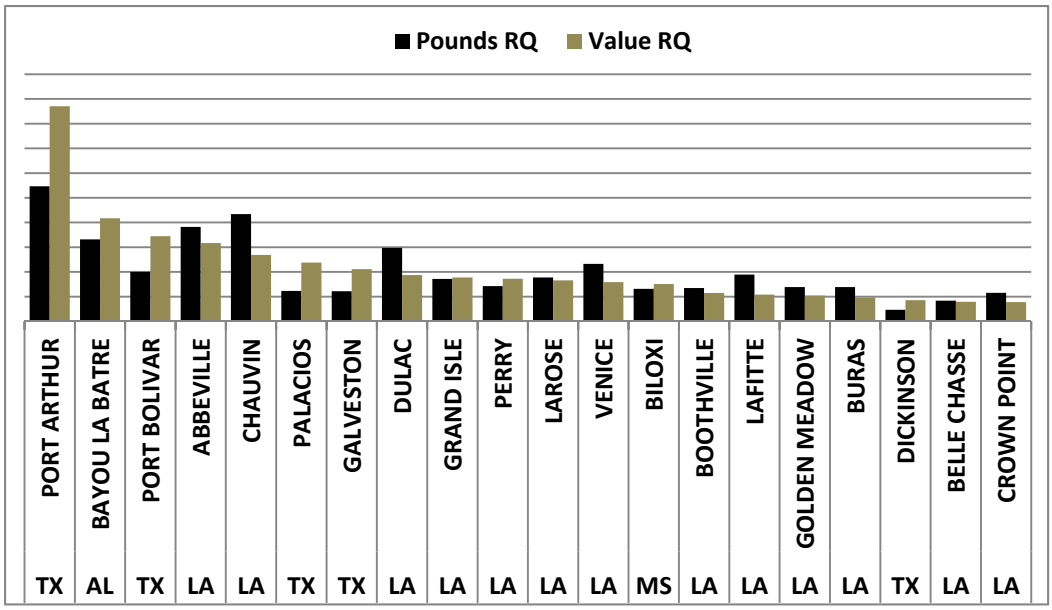

Figure 3.5.3. Top twenty white shrimp communities based on the RQ for pounds and value, Gulf-wide.
Source: Southeast Regional Office, Accumulated Landings System 2011.

Figure 3.5.4 provides the RQ in pounds and value for penaeid shrimp landings, combined. The five communities with the highest RQ for pounds and value of combined penaeid shrimp landings include four communities from Texas and Bayou La Batre, Alabama. The next five communities, all of which are in Louisiana except one, rank higher for pounds RQ than the value RQ, which is the opposite for the top five Texas communities. Again, this is likely due to price differences for smaller shrimp that are harvested by a large inshore fleet in Louisiana.

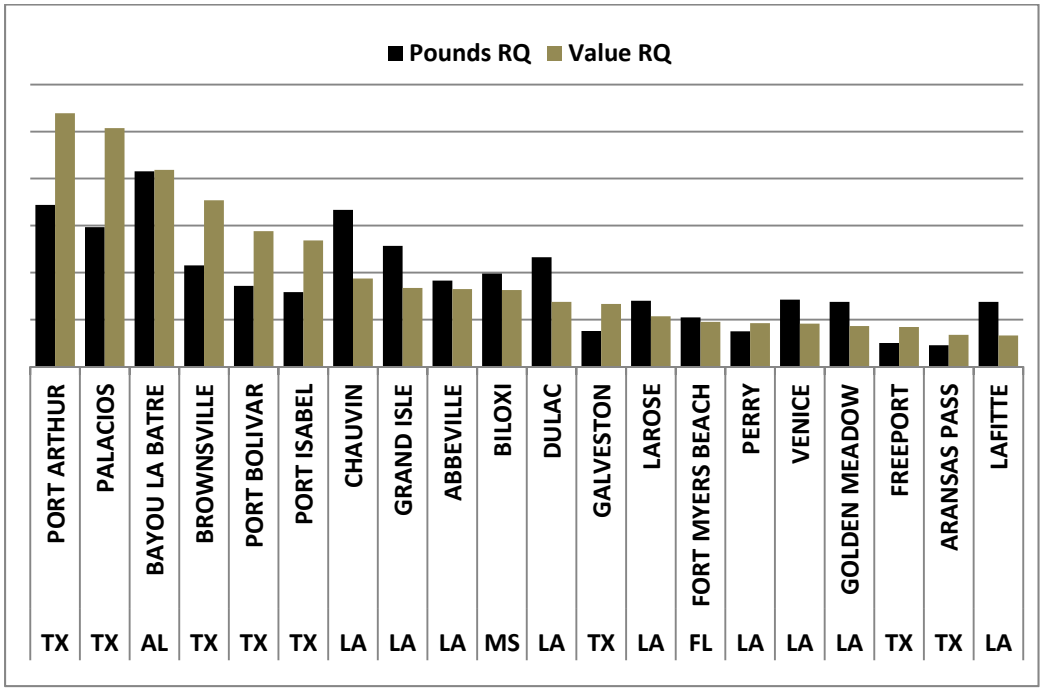

Figure 3.5.4. Top twenty shrimp communities based on the RQ for pounds and value for all penaeid shrimp, Gulf-wide.
Source: Southeast Regional Office, Accumulated Landings System 2011.

Demographics and Fleet Characteristics

While fleet landings can be characterized with regard to those communities that have high RQs for pounds landed and value, it is more difficult to characterize the fleet in terms of its labor force, specifically regarding demographics and places of residence for captains and crew of vessels. There is little to no information on captains and crew, including demographic makeup of crew. Thus, a description regarding the engagement and reliance of fishing communities and their social vulnerability is provided.

To better understand how Gulf shrimp fishing communities are engaged and reliant on fishing overall, several indices composed of existing permit and landings data were created to provide an empirical measure of fishing dependence (Colburn and Jepson 2012; Jacob et al. 2012). Fishing engagement uses the absolute numbers of permits, landings, and value, while fishing reliance includes many of the same variables as engagement, but divides by population to give an indication of the per capita impact of this activity.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Factor scores of both engagement and reliance on commercial fishing for the top 20 communities from Figure 3.5.4 were plotted onto radar graphs (Figure 3.5.5). Each community's factor score is located on the axis radiating out from the center of the graph to its name. Factor scores are connected by colored lines and are standardized, therefore the mean is zero. Two thresholds of 1 and ½ standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. Because the factor scores are standardized, a score above 1 is also above 1 standard deviation.

In Figure 3.5.5, all communities exceed either one or both of the thresholds of ½ or 1 standard deviation, which means they are highly engaged or reliant on commercial fishing. Those that exceed thresholds for both indices have a substantial component of their local economy dependent upon commercial fishing. The ten communities that exceed both thresholds are: Bayou LaBatre, Alabama; Fort Myers Beach, Florida; Chauvin, Dulac, Golden Meadow, Grand Isle, Lafitte, and Bootheville-Venice, Louisiana; and Port Isabel and Palacios, Texas. More in-depth profiles of some of these communities are included in previous amendments (GMFMC 2005a, 2007).

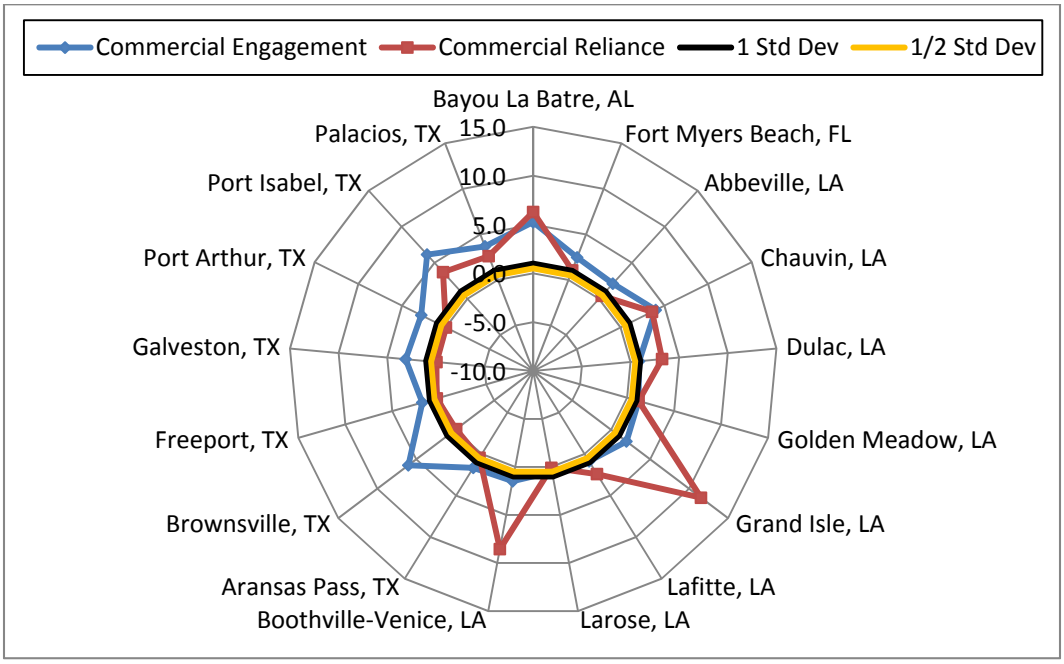

Figure 3.5.5. Commercial fishing engagement and reliance indices for the top twenty communities in terms of pounds and value RQ for peneaid shrimp Gulf-wide.
Source: Southeast Regional Office, Social Indicator Database.

There have been relatively few, if any, recent descriptions of the social characteristics of the Gulf shrimp fishery. Liese and Travis (2010) have provided the most recent analysis of fleet-wide economic performance, but there is little information concerning the demographic makeup or characterization of the fleet. Without demographic information for captains and crew, a technique has previously been used as a proxy for estimating the number of vessels that may have minorities of southeast Asian descent, which entails counting the surnames from the vessel permit file that appear to be of southeast Asian origin. For example, in a memorandum to the

Shrimp Management Committee dated March 28, 2003, Dr. Wayne Swingle indicated that of the 1,836 federally permitted shrimp vessels, 524 (or 28.7%) had owners with southeast Asian surnames or corporate names. A similar count conducted by the Southeast Regional Office (SERO) in 2009 resulted in 484 out of 1853[6] (or 26.1%) of permit owners with southeast Asian surnames. Unfortunately, it is not possible to know if these are active vessels, whether the crew is also of southeast Asian ancestry, and how those individuals identified as southeast Asian based on their last names actually self-identify. We cannot say that 26% of the active Gulf fleet owners and crew are of southeast Asian descent nor are we able to suggest what percentage of participation in all aspects of the Gulf shrimp fishery is by individuals who identify as being of southeast Asian descent. However, this provides a very rough indication of the participation rate of southeast Asian immigrants within the Gulf shrimp fishery. With regard to other minorities, there are a considerable number of Hispanic or Latinos that participate in the fishery, especially as crew on Texas shrimp vessels, but no similar attempt has been made to derive a number or proportion of participants.

As mentioned above, Liese and Travis (2010) provide the most recent measurement of fleet economic performance for the Gulf fleet. Miller and Isaacs (2011) conducted similar research on the Gulf inshore shrimp fishery. A slight improvement in the economics of the overall shrimp fleet in 2008 was reported; however, many vessels still report negative rates of return for both the 2008 and 2009 fishing years (Liese and Travis 2010, updated in 2011). Miller and Isaacs (2011) described the shrimpers' situation as "economically unsustainable." In 2009, there were more vessels reporting positive returns, yet this rate of return varied considerably by state and whether inshore or offshore fishing. In any case, the overall economic performance of the Gulf shrimp fleet remains precarious, except when examined alongside the economic benefits realized by the fleet following the DWH oil spill. (Thomas et al. 1995; NMFS 2011). Any future hazard, whether human induced or ecologically induced could exacerbate any stability that has currently halted the downward trend. It may be assumed that the economic stressors experienced by shrimpers correspond with decreased well-being. Although this financial situation has been repeatedly called unsustainable, this does not take into consideration other types of financial income shrimping households may have relied on, including VOOP funds, during these stressful economic times. Although vessels are often considered business entities, many fishing households have multiple wage and income earners who contribute to an overall household economy that may be able to cope with these downward economic trends. However, without information on shrimping households, it is not possible to determine household resilience or decreasing well-being at the individual or household level.

3.5.1 Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal

[6] This is a snapshot of permits at one point in time and not exclusive to shrimp vessels, so numbers may vary at different points in time. This is a very rough estimate of the number of vessels with owners of Indochinese background. It is not a precise count of persons involved in the fishery who may be of Indochinese descent or other minorities.

agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

To assess whether a community may be experiencing EJ issues, a suite of indices created to examine the social vulnerability of coastal communities (Colburn and Jepson 2012; Jacob et al. 2012) is presented in Figure 3.5.1.1. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of vulnerable populations. These indicators are closely aligned to previously used measures of EJ which used thresholds for the number of minorities and those in poverty. Again, for those communities that exceed the threshold, it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

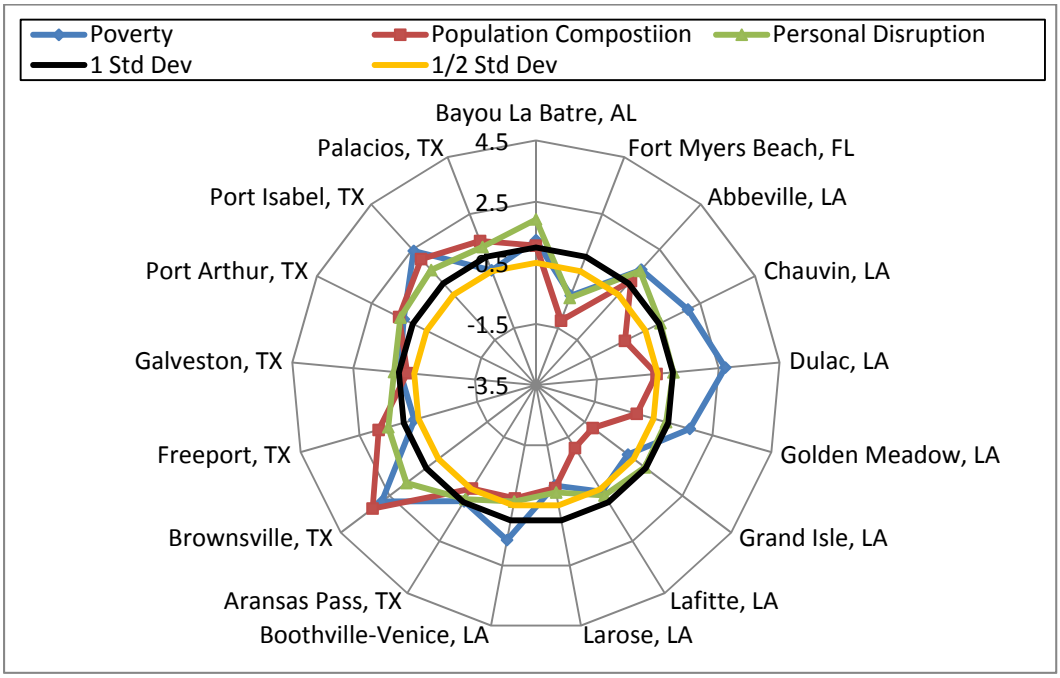

Figure 3.5.1.1. Social vulnerability indices for top twenty communities in terms of pounds and value RQ for peneaid shrimp Gulf-wide.
Source: SERO Social Indicator Database.

In terms of social vulnerabilities, several of the top shrimping communities exhibit medium to high vulnerabilities. In fact, only four communities are below the thresholds for two or more indices and do not exhibit vulnerabilities. Those that exceed both thresholds for two or more indices are: Bayou LaBatre, Alabama; Abbeville, Chauvin, Dulac, Golden Meadow, and Boothville-Venice, Louisiana; and Aransas Pass, Brownsville, Freeport, Galveston, Port Isabel, and Palacios, Texas. It would be expected that these communities would be especially vulnerable to any social or economic disruption because of regulatory change, depending upon

their engagement and reliance upon commercial fisheries. Because most of these communities are either highly engaged or reliant on commercial fishing, it is likely that any negative social effects from regulatory changes will have an impact. Whether that impact will be long-term or short -term would depend upon the regulatory change.

3.6 Description of the Administrative Environment

3.6.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act, and with other applicable laws summarized in Appendix B. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Florida and Texas, and the three-mile seaward boundary of the states of Alabama, Mississippi, and Louisiana. The Council consists of 17 voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. Non-voting members include representatives of the U.S. Fish and Wildlife Service, U.S. Coast Guard (USCG), and Gulf States Marine Fisheries Commission.

The Council uses its Science and Statistical Committee to review data and science used in assessments and fishery management plans/amendments. Regulations contained within FMPs are enforced through actions of the NMFS' Office for Law Enforcement, the USCG, and various state authorities.

The public is involved in the fishery management process through participation at public meetings, on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

3.6.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the five states exercises legislative and regulatory authority over their state's natural resources through discrete administrative units. Although each agency listed below is the primary administrative body with respect to the state's natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. The states are also involved through the Gulf States Marine Fisheries Commission in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries.

NMFS' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act). Additionally, it works with the Gulf States Marine Fisheries Commission to develop and implement cooperative State-Federal fisheries regulations.

Texas Parks & Wildlife Department - http://www.tpwd.state.tx.us
Louisiana Department of Wildlife and Fisheries http://www.wlf.louisiana.gov/fishing
Mississippi Department of Marine Resources http://www.dmr.state.ms.us/
Alabama Department of Conservation and Natural Resources
http://www.outdooralabama.com/fishing-alabama
Florida Fish and Wildlife Conservation Commission http://www.myfwc.com

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1: Modify Stock Status Determination Criteria for Penaeid Shrimp Stocks (Brown, White, and Pink)

Action 1.1 - Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

Alternative 1. No Action. The MSY values for the penaeid shrimp stocks fall within the range of values defined by the lowest and highest landings taken annually from 1990-2000 that does not result in recruitment overfishing as defined herein:

- Brown shrimp: MSY is between 67,000,000 and 104,000,000 lbs of tails
- White shrimp: MSY is between 35,000,000 and 71,000,000 lbs of tails
- Pink shrimp: MSY is between 6,000,000 and 19,000,000 lbs of tails

Preferred Alternative 2. The MSY values for the penaeid shrimp stocks are values produced by the stock synthesis model approved by the SSC. Species specific MSY values will be recomputed during updated assessments, but only among the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Gulf of Mexico Fishery Management Council.
Currently, the stock synthesis model produces the following values:

- Brown shrimp: MSY is 146,923,100 lbs of tails
- White shrimp: MSY is 89,436,907 lbs of tails
- Pink shrimp: MSY is 17,345,130 lbs of tails

Action 1.2 – Modify the Overfishing Threshold for Penaeid Shrimp

Alternative 1: No Action – The overfishing threshold is defined as a rate of fishing that results in the parent stock number being reduced below the MSY minimum levels listed below:

- Brown shrimp- 125 million individuals, age 7+ months during the November through February period
- White shrimp- 330 million individuals, age 7+ months during the May through August period
- Pink shrimp- 100 million individuals, age 5+ months during the July through June period

Alternative 2: The overfishing threshold is defined as the maximum fishing mortality threshold (MFMT). The MFMT for each penaeid shrimp stock is defined as the maximum apical fishing mortality rate (F) computed for the fishing years 1984 to 2012 plus the 95% confidence limits. Species specific MFMT values will be recomputed during updated assessments, but only among

the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: the apical F value of the model output (3.54) plus the confidence limit (0.14); effective F: 3.68
- White shrimp: the apical F value of the model output (0.76) plus the confidence limit (0.01); effective F: 0.77
- Pink shrimp: the apical F value of the model output (0.20) plus the confidence limit (0.03); effective F: 0.23

Alternative 3: The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the maximum apical F computed for the fishing years 1984 to 2012. Species specific MFMT values will be recomputed during updated assessments, but only among the years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: 3.54
- White shrimp: 0.76
- Pink shrimp: 0.20

Preferred Alternative 4. The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the F_{MSY}. Species specific F_{MSY} values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

Currently, the values are:

- Brown shrimp: 9.12
- White shrimp: 3.48
- Pink shrimp: 1.35

NOTE: It is not appropriate to compare values from **Alternatives 2 and **3** with those presented in **Preferred Alternative 4**. **Preferred Alternative 4** is MSY based and is derived from an annual computation. **Alternatives 2** and **3** are model based that are derived from the apical monthly computation. Further, it is not appropriate to multiply values from **Alternatives 2** and **3** by twelve and compare with **Preferred Alternative 4** because the apical F is not a mean. Therefore the methods of calculation should be compared, rather than the resulting numbers.*

Response to Possible Overfishing

If the MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline.

Action 1.3 – Modify the Overfished Threshold for Penaeid Shrimp

Alternative 1: No Action - An overfished condition would result when a parent stock number falls below one-half of the overfishing definition listed below.

- Brown shrimp - 63 million individuals, age 7+ months during the November through February period
- White shrimp - 165 million individuals, age 7+ months during the May through August period
- Pink shrimp - 50 million individuals, age 5+ months during the July through June period

Preferred Alternative 2: The overfished threshold is defined as the minimum stock size threshold (MSST). The MSST for each penaeid shrimp stock is defined as the minimum total annual spawning biomass minus the 95% confidence limit for the fishing years 1984 to 2012. Species specific MSST values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: the MSST value of the model output (24,616,232) minus the confidence limit (490,210); effective MSST value: 24,126,023 lbs of tails
- White shrimp: the MSST value of the model output (277,054,011) minus the confidence limit (1,275,673); effective MSST value: 275,796,338 lbs of tails
- Pink shrimp: the MSST value of the model output (37,593,545) minus the confidence limit (7,642,354); effective MSST value: 29,951,191 lbs of tails

Alternative 3: The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum total annual spawning biomass for the fishing years 1984 to 2012. Species specific MSST values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council.

- Brown shrimp: 24,616,232 lbs of tails
- White shrimp: 277,054,011 lbs of tails
- Pink shrimp: 37,593,545 lbs of tails

Alternative 4: The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}). SSB_{MSY} values for the penaeid shrimp stocks are values produced by the stock synthesis model. Species specific SSB_{MSY} values will be recomputed during the updated assessments, but only among the fishing years 1984-2012. The values for each species will be updated every 5 years through the framework procedure, unless changed earlier by the Council. Currently, the stock synthesis model produces the following values:

- Brown shrimp: SSB_{MSY} is 6,098,868 lbs of tails
- White shrimp: SSB_{MSY} is 365,715,146 lbs of tails
- Pink shrimp: SSB_{MSY} is 23,686,906 lbs of tails

4.1.1 Direct and Indirect Effects on the Physical Environment and the Biological Environment

Action 1.1, Action 1.2 and Action 1.3 are in response to a change in the model used to predict overfishing and overfished designations, respectively. Because these actions are not in response to a change in the fishery, there will likely be little change in the effect to either the physical, biological or ecological environment. Additionally, it is unlikely to affect how the fishery is prosecuted and how much shrimp is caught at the current time because both actions are setting status determination criteria (i.e. overfishing and overfished thresholds) in response to a change in model not a change in the fishery.

Trawling is recognized for its impacts to benthic environments because the heavy doors drag along the bottom and the tickler chains scrape along the sea floor. The shrimp fishery is prosecuted primarily over soft substrates such as mud or silt that are more resilient to disturbance than other bottom types. Areas that have been closed to shrimp trawling seasonally, such as the Texas closure, are not physically altered relative to areas continuously open to shrimp trawling, and longer term parameters such as currents and storms may have more effects on the physical characteristics of an area (Sheridan and Doerr 2005). The proposed actions will not modify the way the fishery is prosecuted, but will update the status determination criteria to be consistent with model outputs that have been accepted. For Action 1.1, **Alternative 1** would leave MSY in terms of an outdated assessment model, the virtual population analysis (VPA) model. The MSY value for brown shrimp and white shrimp produce by the VPA model is less than that produced by the stock synthesis model. However, the MSY produced for pink shrimp by the VPA model is more than that produced by the stock synthesis model. Neither alternative in Action 1.1 would leave the MSY unknown, but one is based on the best available science (stock synthesis model) while the other is based on a model that has been replaced. Currently, the shrimp fishery is operative well below MSY and with the limited permits available, it is unlikely that this will change. Additionally, effort in the shrimp fishery is closely monitored to not exceed bycatch limits, so if the number of permits were to change, this monitoring will effectively limit how the fishery is prosecuted to keep bycatch to acceptable levels. **Alternative 1** in both Action 1.2 and Action 1.3 would leave the status of the penaeid shrimp stocks unknown. This unknown status could result in detrimental effects on the shrimp stocks as stocks could undergo overfishing or become overfished and the metrics used to determine these statuses are incompatible with metrics used to evaluate the stock.

If the shrimp fishery begins to expand, it is unlikely that fishing mortality will exceed historical levels or that the spawning biomass be below the threshold. If the permit moratorium is allowed to expire in 2016, red snapper and other bycatch (as described in Section 3.3) may be affected if the expiration of the permit moratorium results in the issuance of more permits and an expansion in the shrimping industry. However, trends such as effort and fishing mortality have decreased over time and the number of permit renewals has been decreasing since the institution of the permit moratorium, it is unlikely that effort will resume to historical levels. Therefore, none of the proposed alternatives in Actions 1.1, 1.2 and 1.3 are likely to have significant physical, biological and ecological effects.

Action 1.1 Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

The effort in the fishery is currently well below historical levels. With the shrimp permit moratorium, increased fuel costs, and decreased number of vessels prosecuting the fishery, it is unlikely that the MSY proposed in Action 1.1 to values consistent with the current stock synthesis models will affect the physical environment differently than how the fishery is currently prosecuted. This may change if the effort resumes to level observed historically (in the 1990s), but this is unlikely with the current state of the fishery. Vessels are ageing, fuel prices are inconstant, and shrimp imports have increased. **Preferred Alternative 2** increases the MSY for both brown shrimp and white shrimp, but decreases the maximum MSY for pink shrimp. Ultimately, **Preferred Alternative 2** decreases ambiguity because it provides for a maximum number (not a range) and is produced by the stock assessment model that currently assesses the status of penaeid shrimp. MSY values of the fishery for all shrimp species have been below the proposed MSY values in **Preferred Alternative 2** since 2000, which was before the implementation of the shrimp permit moratorium. For brown and white shrimp, MSY has not exceeded the proposed values in **Preferred Alternative 2** since 1985.

Action 1.2 Modify the Overfishing Threshold for Penaeid Shrimp

It is unlikely that the MFMT proposed in Action 1.2 for either **Alternative 2**, **Alternative 3,** or **Preferred Alternative 4** will result in additional physical impacts unless the number of permitted vessels and effort increases to those observed in the 1990s (see Figures 2.1.1, 2.1.2, and 2.1.3). If the permit moratorium is allowed to expire and effort resumed to that observed in the 1990s, there could be greater impacts to the environment. If such is the case, the Council may decide to initiate action to prevent overfishing from occurring. Additionally, the overfishing threshold was based on historical effort, so the impacts to the environment are not likely to be unprecedented.

Alternative 2 incorporates the variability in the model and is less likely to result in an overfishing designation. Both **Alternative 2** and **Alternative 3** provide metrics to determine if overfishing is occurring which may have direct benefits to the stocks because overfishing can be defined and managed. Compared to the overfishing threshold set in **Alternative 2**, the lower MFMT allowed under **Alternative 3** could potentially benefit the stock in the short-term if overfishing is actually occurring. However, the threshold set in **Alternative 3** does not take into account the variability in the model and is more likely to falsely produce an overfishing designation. **Preferred Alternative 4** sets the upper fishing mortality in terms of MSY and is based on an annual value. **Preferred Alternative 4** addresses the overfishing threshold in terms of an annual MSY and is not directly comparable to **Alternative 2** nor **Alternative 3** because both are monthly values. Additionally, compared to **Alternatives 2** and **3**, this value is the least likely to affect the stock. Theoretically, the fishery could operate at or just below the F values produced by both **Alternatives 2** and **3** for every month of the year, but would still not be undergoing overfishing, because no single month exceeded the MFMT value. This is unlikely to occur, but with increased fishery activity it is possible. The response to overfishing is explained in Section 2 and takes into account that the status of the shrimp stock if heavily influenced by environmental factors and fishing mortality and yield are unlikely to create overfishing conditions two years in a row.

Action 1.3 Modify the Overfished Threshold for Penaeid Shrimp

In Action 1.3, it is unlikely that **Preferred Alternative 2, Alternative 3** or **Alternative 4** will result in additional physical, or biological impacts for the same reasons stated for Action 1.2. **Preferred Alternative 2** offers the greater management flexibility because it takes into account variability in the model by including the lower 95% confidence interval; this will be less likely to result in an overfished designation than **Alternative 3.** Both **Preferred Alternative 2** and **Alternative 3** provide metrics to determine if a stock is overfished which may have indirect benefits to the stocks because an overfished designation would be defined and could be managed. **Alternative 4** addresses the overfished threshold in terms of an annual MSY and is not directly comparable to **Preferred Alternative 2** nor **Alternative 3** because both are monthly values.

4.1.2 Direct and Indirect Effects on the Economic Environment

Action 1.1. Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

Modifications to the MSY values for penaeid shrimp stocks proposed in this action would set MSY values compatible with the models currently used in stock assessments. **Alternative 1**, no action, would not be accepted as best available science because it would continue to rely on an outdated modelling approach to define MSY values. However, **Alternative 1** would not affect the harvest and other customary uses of penaeid shrimp resources. Therefore, **Alternative 1** would not be expected to result in direct economic effects. **Preferred Alternative 2** would establish MSY values which are compatible with the current stock assessment models. Direct economic effects are not expected to result from **Preferred Alternative 2** because it would not affect the harvest or customary uses of penaeid shrimp. In addition, **Preferred Alternative 2** would likely not be expected to result in indirect economic effects because penaeid shrimp landings have consistently been well below the MSY values considered in this action.

Action 1.2 Modify the Overfishing Threshold for Penaeid Shrimp

Modifications to overfishing thresholds for penaeid shrimp stocks considered in this action would allow for the definition of thresholds compatible with the models currently used in stock assessments. **Alternative 1**, no action, would continue to use overfishing thresholds based on parent stock levels and would not affect the harvest and other customary uses of penaeid shrimp resources. Therefore, **Alternative 1** would not be expected to result in direct economic effects. However, the overfishing status of penaeid shrimp would continue to be listed as unknown because **Alternative 1** would maintain overfishing thresholds that are incompatible with the models currently used to assess penaeid shrimp stocks. As a result, overfishing could occur and remain undetected, potentially resulting in adverse effects to the stocks and associated indirect adverse economic effects.

Alternatives 2 and **3** and **Preferred Alternative 4** would establish overfishing thresholds which are compatible with the current stock assessment models. Direct economic effects are not expected to result from these alternatives because neither **Alternatives 2** or **3** nor **Preferred Alternative 4** would affect the harvest or customary uses of penaeid shrimp. Maximum fishing mortality thresholds (MFMT) defined in **Alternatives 2** and **3** and **Preferred Alternative 4** would allow for the determination of overfishing status of penaeid shrimp stocks. Current stock assessment methods in conjunction with the pre-determined MFMTs would allow NMFS to determine whether overfishing is occurring. Should overfishing occur, mitigating management measures could be established in a timely manner. The establishment of corrective measures is expected to be beneficial to the penaeid stocks and result in indirect benefits to the economic environment. **Alternative 2** accounts for the stochastic nature of the MFMT estimate and sets a higher overfishing threshold compared to **Alternative 3**. Compared to the overfishing threshold set in **Alternative 3**, the higher MFMT allowed under **Alternative 2** could potentially benefit shrimpers in the short-term, and result in greater indirect benefits to the economic environment. **Preferred Alternative 4** is the least likely to affect the stock because it establishes the overfishing threshold based on an annual MSY. In contrast, **Alternatives 2** and **3** are based on monthly values.

Action 1.3 Modify the Overfished Threshold for Penaeid Shrimp

Changes to overfished thresholds for penaeid shrimp proposed in this action would allow for the definition of thresholds compatible with the models currently used in stock assessments. **Alternative 1**, no action, would maintain the use of overfished thresholds based on parent stock levels and would not affect the harvest and other customary uses of penaeid shrimp resources. Therefore, **Alternative 1** would not be expected to result in direct economic effects. However, the overfished status of penaeid shrimp would continue to be listed as unknown because **Alternative 1** would maintain overfished thresholds that are not compatible with models currently used to assess penaeid shrimp stocks. As a result, an overfished condition could occur and remain undetected, potentially resulting in adverse effects to the stocks and associated indirect adverse economic effects.

Preferred Alternative 2 and **Alternatives 3** and **4** would establish overfished thresholds which are compatible with the current stock assessment models. **Preferred Alternative 2** accounts for the stochastic nature of the MSST estimate. Direct economic effects are not expected to result from these alternatives because neither **Preferred Alternative 2** nor **Alternatives 3** or **4** would affect the harvest or customary uses of penaeid shrimp resources. Current stock assessment methods in conjunction with the pre-determined MSSTs would allow NMFS to determine whether a given penaeid stock, e.g., brown shrimp stock, is overfished. If a given stock is overfished, corrective management measures could be designed and implemented in a timely manner. The establishment of corrective measures is expected to benefit the penaeid stocks and result in indirect benefits to the economic environment.

4.1.3 Direct and Indirect Effects on the Social Environment

Although additional effects would not be expected from retaining **Alternative 1**, the model used to provide the MSY values under **Alternative 1** has been inadequate for incorporating periods of low effort. The new model used for providing MSY values under **Preferred Alternative 2,** approved by the Council's SSC as the best available science, has been shown to better incorporate changes in fishing behavior, thus more accurately reflecting stock status.

Compared with **Alternative 1**, the MSY values resulting from the model runs are greater under **Preferred Alternative 2** for brown shrimp and white shrimp. For pink shrimp, the MSY value under **Preferred Alternative 2** is within the range of MSY values under **Alternative 1**. Generally, larger catch allowances are associated with benefits to the social environment as more fishing activity is allowed to take place, provided the catch limits are not exceeded. Thus, the increased MSY values, improved accuracy of the model, and the adoption of a more expedient process (**Preferred Alternative 2**) would be expected to result in greater social benefits than **Alternative 1**.

Action 1.2 Modify the Overfishing Threshold for Penaeid Shrimp

Modifications to the overfishing threshold for penaeid shrimp stocks considered in this action would allow for the definition of thresholds compatible with the models currently used in stock assessments. **Alternative 1**, no action, would continue to use overfishing thresholds based on parent stock levels and would not affect the harvest and other customary uses of penaeid shrimp resources. Therefore, **Alternative 1** would not be expected to result in direct effects. However, the overfishing status of penaeid shrimp would continue to be listed as unknown because **Alternative 1** would maintain overfishing thresholds that are incompatible with the models currently used to assess penaeid shrimp stocks. As a result, overfishing could occur and remain undetected, potentially resulting in adverse effects to the stocks and associated indirect adverse social effects to individuals and businesses. Those adverse social effects would likely stem from economic loss and the ensuing repercussions as a result of lost income and changes in fishing strategies. Because of the tenuous economic status of the shrimp fishery (see Section 3.5), this might entail exit from the fishery if the losses were significant. However, this is only speculation as at this time we are unable to calculate how those losses would translate into adverse social effects.

Alternatives 2-4 would establish overfishing thresholds which are compatible with the current stock assessment models. Direct social effects are not expected to result from these alternatives because none of these alternatives would affect the harvest or customary uses of penaeid shrimp. The MFMTs defined in **Alternatives 2, 3,** and **Preferred Alternative 4** would allow for the determination of overfishing status of penaeid shrimp stocks after one year, but a response by the Council only after two consecutive years of exceeding the threshold. Current stock assessment methods in conjunction with the pre-determined MFMTs would allow NMFS to determine whether overfishing is occurring. Should overfishing occur, mitigating management measures could be established in a timely manner, through the framework procedure. The establishment of corrective measures is expected to be beneficial to the penaeid stocks and result in indirect benefits to the social environment. Those indirect benefits may result from a better economic

environment which would have positive social effects in mitigating losses that the industry has been experiencing and provide stability for the industry in the long term.

Alternative 2 accounts for the stochastic nature of the MFMT estimate and sets a higher overfishing threshold compared to **Alternative 3**. Compared to the overfishing threshold set in **Alternative 3**, the higher MFMTs allowed under **Alternative 2** could potentially benefit shrimpers in the short-term, resulting in greater benefits to the social environment. In either case, the provision to respond only after the threshold is exceeded for two consecutive years allows for the environmental variability that is found with shrimp stocks. Compared with the approaches of **Alternatives 2** and **3**, the values derived for **Preferred Alternative 4** are not comparable as they are based on different temporal calculations. **Preferred Alternative 4** is MSY-based and is derived from the Stock Synthesis assessment model, recommended by the SSC as the best available science. Broad social benefits would be expected from adopting **Preferred Alternative 4, as** the model responds better to changes in fishing practice and behavior, than the model used for **Alternatives 2** and **3**.

Action 1.3 Modify the Overfished Threshold for Penaeid Shrimp

Modifications to the overfished threshold for penaeid shrimp stocks considered in this action would allow for the definition of thresholds compatible with the models currently used in stock assessments. **Alternative 1**, no action, would continue to define an overfished condition based on parent stock levels and would not affect the harvest and other customary uses of penaeid shrimp resources. Therefore, **Alternative 1** would not be expected to result in direct effects. However, the overfished status of penaeid shrimp would continue to be unknown because **Alternative 1** would maintain the overfished thresholds that are incompatible with the models currently used to assess penaeid shrimp stocks. As a result, an overfished condition could occur and remain undetected, potentially resulting in adverse effects to the stocks and associated indirect adverse social effects.

Preferred Alternative 2, Alternative 3, and **Alternative 4** would establish overfished thresholds which are compatible with the current stock assessment models. Direct social effects are not expected to result from these alternatives because neither **Preferred Alternative 2** nor **Alternatives 3** or **4** would affect the harvest or customary uses of penaeid shrimp. The MSSTs defined in these alternatives would allow for the determination of overfished status of penaeid shrimp stocks. Current stock assessment methods in conjunction with the pre-determined MSSTs would allow NMFS to determine whether a penaeid stock is overfished. Under the Magnuson-Stevens Act, a rebuilding plan must be developed within two years should overfished status occur. If the rebuilding plan development takes over two years, it may not be established before the following year's determination is available. If the biomass does not drop below the MSST in the second year, the rebuilding plan could be suspended, but would be in development if the overfished determination remains for the second year. The establishment of corrective measures would be expected to be beneficial to the penaeid stocks and result in indirect benefits to the social environment.

Preferred Alternative 2 accounts for the stochastic nature of the MSST estimate and sets a lower threshold for overfished status compared to **Alternative 3**. Compared to the overfished

threshold set in **Alternative 3**, the lower MSST allowed under **Preferred Alternative 2** could potentially benefit shrimpers in the short-term and result in greater indirect benefits to the social environment.

4.1.4 Direct and Indirect Effects on the Administrative Environment

The Magnuson-Stevens Act requires that a fishery management plan specify objective and measurable criteria, or reference points, for determining when a stock is subject to overfishing or overfished. Since 1996, NMFS has reported on the status of stocks quarterly (http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/).

Alternative 1 for Action 1.1-1.3 do not account for changes in the stock assessment model from VPA to stock synthesis and would not be using the best available science. **Alternative 1** for Action 1.2 and Action 1.3 would not allow for a determination of the overfished or overfishing status of these shrimp stocks. Therefore, the status of the stock would be reported as "unknown." **Preferred Alternative 2** in Action 1.1 redefines MSY using the stock synthesis model which has been determined by the Council's SSC as the best available science. **Alternative 2**, **Alternative 3**, and **Alternative 4** for Actions 1.2 and 1.3 would also account for the new model and allow the actual status of the stocks to be known and reported. **Alternative 4** in Actions 1.2 and 1.3 is based on the MSY established in Action 1.1, which is the best available science.

4.2 Action 2: Modify the Shrimp Fishery Management Plan (FMP) Framework Procedure

Alternative 1. No Action – Do not modify the shrimp management measures framework procedure adopted through the Generic Annual Catch Limits (ACL)/Accountability Measures (AM)* Amendment.

Preferred Alternative 2. Modify the shrimp management measures framework procedure to include changes to AMs* for the royal red shrimp fishery through the standard documentation process for open framework actions, and make editorial changes to the framework procedure to reflect changes to the Council advisory committees and panels. Accountability measures* that could be implemented or changed would include:

In-season AMs

- Closure and closure procedures
- Trip limit implementation or change
- Implementation of gear restrictions

Post-season AMs

- Adjustment of season length
- Implementation of closed seasons/time periods
- Adjustment or implementation of trip or possession limits
- Reduction of the ACL/Annual Catch Target (ACT) to account for the previous year overage

- Revoking a scheduled increase in the ACL/ACT if the ACL was exceeded in the previous year
- Implementation of gear restrictions
- Reporting and monitoring requirements

Alternative 3. Modify the shrimp management measures framework procedure to include changes to AMs* for the royal red shrimp fishery through the standard documentation process for open framework actions, and make editorial changes to the framework procedure to reflect changes to the Council advisory committees and panels. Accountability measures* that could be implemented or changed would include:

In-season AMs

- Closure procedures
- Trip limit reductions or increases

Post-season AMs

- Adjustment of season length
- Adjustment of trip or possession limits

**Note: The portions of the current framework procedure regarding ACLs, ACTs, and AMs apply only to royal red shrimp because penaeid shrimp species have annual lifecycles and, therefore, are not required to have these management measures.*

4.2.1 Direct and Indirect Effects on the Physical Environment and the Biological Environment

The impacts on the physical environment from shrimp fishing are detailed in Section 4.1.1. No direct physical or biological effects would be expected from modifications of the framework procedure. Changes in harvest levels would change effort levels, either increasing or decreasing the impact on the physical and biological environments. If modifications increase the ease with which regulations can be implemented as needed, long-term benefits would increase.

Preferred Alternative 2 and **Alternative 3** offer greater management flexibility by allowing a more timely response to new information and, therefore, are expected to offer greater long-term benefits than **Alternative 1**. **Preferred Alternative 2** has a larger range of actions that can be taken through a framework procedure and thus offers more flexibility than **Alternatives 1** and **3** to respond to changes in the stock. Therefore, **Preferred Alternative 2** offers the greatest efficiency and effectiveness of management change and the largest expected long-term indirect benefit to the physical and biological environments.

4.2.2 Direct and Indirect Effects on the Economic Environment

Modifications to the framework procedure considered herein are administrative actions. Other than **Alternative 1**, the proposed alternatives would expand the range of management measures that the Council can implement without a full plan amendment but are not expected to directly affect the harvest and other customary uses of the resource. Therefore, management measures considered under this action are not expected to result in direct effects on the economic environment. However, the proposed changes to the framework procedure could result in a

speedier implementation of management measures that may be beneficial to the stocks, with associated economic benefits, or otherwise result in increased economic benefits to fishermen and associated businesses. These would be indirect positive economic effects of the proposed changes. **Preferred Alternative 2** would add a broader array of changes to the framework procedure compared to **Alternative 3** and, as a result, is expected to result in greater indirect economic benefits than **Alternative 3**. A quantitative evaluation of alternatives considered under this action would require additional information on the specific management measures to be implemented, expected changes to the stocks and/or participants in the fishery, and, anticipated time savings that would result from the use of the framework procedure. While unknown, the relative speed at which beneficial regulatory changes can be implemented under **Preferred Alternative 2** and **Alternative 3** would determine the magnitude of the anticipated indirect economic benefits.

4.2.3 Direct and Indirect Effects on the Social Environment

The proposed modifications to the framework procedure for the shrimp fishery would not be expected to result in any direct social effects. Rather, indirect effects would be expected and would result in broad, long-term social benefits, and minimal negative social effects. Any effects from this action relative to accountability measures would be limited to royal red shrimp harvesters only, as penaeid shrimp stocks do not require accountability measures.

Accountability measures for shrimp are not included in the framework procedure currently in place (**Alternative 1**). To adopt or change an accountability measure requires following the full plan amendment process, which is lengthier than the standard documentation process for open framework actions. **Preferred Alternative 2** and **Alternative 3** propose to add in-season and post-season accountability measures to the list of management measures that may be modified through the standard documentation process for open framework actions. This would enable the Council to respond to management needs in a more timely fashion. The relative speed at which beneficial regulatory changes can be implemented under **Preferred Alternative 2** or **Alternative 3,** would determine the magnitude of the anticipated indirect social benefits which would be a transparent process and timely management to address problems in the fishery. With this added flexibility, minimizing any delays that may constrain fishing activities or reduce business flexibility and profitability may be minimized. Public participation and the review process would continue as part of the framework procedure under all alternatives.

Alternative 3 includes a shorter list of accountability measures that may be modified through the open framework action compared to **Preferred Alternative 2**. Thus, compared to **Alternative 1**, **Preferred Alternative 2** would be expected to result in greater potential indirect benefits than **Alternative 3**, by including a greater range of accountability measures that may be modified through the open framework action process.

Preferred Alternative 2 and **Alternative 3** would also make editorial changes to the framework procedure to accommodate name changes of the Council advisory committees and panels. The names of some advisory groups have changed and certain management processes invoke participation of these groups by name. The proposed changes would allow the Council to continue to receive the information and advice from these groups, regardless of their current

name or future name change, necessary to support better informed management decisions. Absent the proposed change, these and future groups may have reduced opportunity for participation in the management process. This may adversely affect the quality of resultant management decisions, with associated reduction in social benefits arising from the lack of input from these advisory groups. As a result, these proposed editorial changes of **Preferred Alternative 2** and **Alternative 3** would be expected to result in increased indirect benefits compared to **Alternative 1**.

4.2.4 Direct and Indirect Effects on the Administrative Environment

Alternative 1 would be the most administratively burdensome of the alternatives being considered, because any modifications to accountability measures would need to be implemented through a plan amendment, which is a more laborious and time consuming process than a framework action. **Preferred Alternative 2** and **Alternative 3** would give NMFS and the Council flexibility by allowing for an adjustment of accountability measures through a framework action. Framework actions generally require less time and staff effort than plan amendments and would lessen the administrative burden on the agency. **Preferred Alternative 2** and **Alternative 3** would also reduce the administrative burden because the updated language is generic enough to incorporate future changes in the name of a committee or panel. Thus, development of a plan amendment and the associated time and work associated with it would be avoided. **Preferred Alternative 2** would provide the most flexibility, resulting in the least administrative burden on the agency.

4.3 Cumulative Effects Analysis

As directed by the National Environmental Policy Act (NEPA), federal agencies are mandated to assess not only the indirect and direct impacts, but cumulative impacts of actions as well. The NEPA defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect occurs when the combined effects are greater than the sum of the individual effects. The following are some past, present, and future actions that could impact the environment in the area where the Gulf of Mexico (Gulf) shrimp fishery is prosecuted.

Past Actions

In 2003, regulations were instituted requiring vessels to possess a federal shrimp permit when fishing for penaeid shrimp in the Gulf exclusive economic zone (EEZ). Subsequently, a moratorium on the issuance of new federal shrimp permit was established in 2007. Currently, vessels must possess a federal Gulf shrimp moratorium permit (SPGM) when fishing for shrimp in the Gulf EEZ. During 2006 through 2010, an average of 4,582 vessels fished for shrimp in the Gulf, of which 20% were federally permitted vessels and the rest, non-permitted vessels. Despite being fewer in number, federally permitted vessels accounted for an average of 67% of

total shrimp landings and 77% of total ex-vessel revenues. As of May 7, 2015, there were 1,468 valid or renewable SPGMs, which is a significant decline from 1,933 that qualified for a permit when the moratorium was implemented. As of the same date, there were 289 valid or renewable endorsements for royal red shrimp.

Joint Reef Fish Amendment 27/Shrimp Amendment 14 (effective 2008) established a target effort-reduction goal of 74% less than the benchmark years of 2001-2003 as a proxy for juvenile red snapper mortality reduction. The amendment established a closure procedure for the northern and western Gulf within the 10- to 30-fathom zone in conjunction with the beginning of the annual Texas closure, if fishing effort does not meet the reduction target. However, effort has remained below the target level and NMFS was able to relax the effort restrictions to a 67% reduction in 2012 because the red snapper stock was rebuilding on schedule. This change was estimated to allow shrimpers to fish an additional 5,800 days.

In April 2010, an explosion occurred on the Deepwater Horizon MC 252 (DWH) oil rig, resulting in the release of millions of barrels of oil into the Gulf. In addition, over a million gallons of Corexit 9500A dispersant were applied as part of the effort to constrain the spill. The cumulative effects from the oil spill and response may not be known for years. The oil spill affected more than one-third of the Gulf area from western Louisiana east to the Panhandle of Florida and south to the Campeche Bank in Mexico. The impacts of the DWH oil spill on the physical environment are expected to be significant and may be long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants, oil was also documented as being suspended within the water column, some even deeper than the location of the broken well head. Floating and suspended oil washed onto shore in several areas of the Gulf as well as non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls persist in the environment and can be transported hundreds of miles.

In a study by Murawski et al. (2014), researchers found a higher frequency of skin lesions on fish in the northern Gulf in the area of the 2010 oil spill compared to other areas. Studies are continuing to check whether the sick fish suffer from immune system and fertility problems. Indirect and inter-related effects on the biological and ecological environment of the shrimp fishery in concert with the DWH oil spill are not well understood. Changes in the population size structure could result from shifting fishing effort to specific geographic segments of populations, combined with any anthropogenically induced mortality that may occur from the impacts of the oil spill. The impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future. Effects on shrimp from the oil spill may affect other species that prey upon shrimp.

Sections of the Gulf were closed to all fishing during the oil spill event. These areas were opened after the well was capped and testing determined seafood from each area was safe for human consumption. In November 2010, a fisherman reported tarballs in his net while trawling for royal red shrimp in an area opened five days before. NMFS reclosed the area and conducted additional seafood sampling. NMFS re-opened the area in February after testing shrimp and finfish from the area and finding that all seafood samples passed both sensory and chemical testing.

The DWH oil spill and BP's responses had a confounding effect on the economics of the Gulf shrimp fishery in 2010. The majority of vessels (66%) reported receiving oil spill-related revenue. The two primary sources of this revenue are damage claims (passive income) and revenue generated by participation in BP's vessel of opportunity program (VOOP) where vessels were hired to clean up oil. Of the surveyed vessels, 28% participated in the VOOP. Both sources provided substantial revenue for participating vessels, thereby obscuring the economics of the fishery. Further, vessels participating in VOOP incurred non-negligible costs unrelated to commercial fishing.

Bycatch reduction devices (BRDs) have been required for use since 1998 in the western Gulf and since 2004 in the eastern Gulf. Since 2010, some new BRDs were certified, while others were decertified. The intent of these modifications to BRD regulations was to provide additional flexibility to the fishery. BRDs may have different capabilities according to different fishing conditions, and having a wider variety of BRDs for use in the fisheries allows fishermen greater flexibility to choose the most effective BRD for the specific local fishing conditions. Regulations for turtle excluder devices, BRDs specifically designed to decrease turtle bycatch, were first implemented in 1987 and have been expanded in the years since then.

Since 2001, there has been a decrease in effort in southeast U.S. shrimp fishery. The decline has been attributed to low shrimp prices, rising fuel costs, competition with imported products, and the impacts of 2005 and 2006 hurricanes in the Gulf. This was exacerbated by the financial meltdown and consequent recession in the U.S. economy in 2007-2008. The economy has started to recover, though slowly, in the last few years. In addition, shrimp prices have increased in the last two years, partly due to reductions in shrimp imports as shrimp farms in some of the major exporting countries were hit with diseases. Reductions in shrimp imports, however, may be just temporary and imports could recover to their previous high levels in the future. Given that the shrimp fishery still faces many of the challenges that contributed to the effort declines, effort is not expected to increase substantially in the near future.

Present Actions

In December 2013, NMFS implemented a rule outlining a cost share plan between NMFS and shrimp vessel permit holders to support the electronic logbook (ELB) program. The ELB program provides data on Gulf shrimp fishing effort that is critical to both the Council and NMFS in performing annual assessments of the status of shrimp stocks, obtaining accurate estimates of juvenile red snapper mortality attributable to the shrimp fishery, and generating mortality estimates on a number of other species captured as bycatch in the shrimp fishery (see Section 3.3). The cost per vessel is approximately $240 per year. Because the average vessel in the Gulf shrimp fishery has been in poor financial condition, an additional cost item that would not improve the vessel's operations could have a material adverse impact on the operations and solvency of an average vessel. The Southeast Fisheries Science Center has selected 500 vessels to participate in the program for 2014 and is in the process of validating the program.

The shrimp fishery is closed annually in state waters off Texas to allow brown shrimp to reach a larger and more valuable size prior to harvest and to prevent waste of brown shrimp that might otherwise be discarded due to their small size. The closing and opening dates of the Texas

closure are based on the results of biological sampling by the Texas Parks and Wildlife Department. Historically, the closure is from about May 15 to July 15. NMFS closes federal waters off Texas concurrent with this action each year, at the request of the Council.

Reasonably Foreseeable Future Actions

The Council has one action in development.

- Amendment 17 will address the expiration of the shrimp permit moratorium in October 2016. The Council will need to determine if the moratorium should be extended, allowed to lapse, or converted to a permanent limited access system. The Council may also consider changing the requirements for the royal red shrimp endorsement.

Climate Change

The Environmental Protection Agency's climate change webpage (http://www.epa.gov/climatechange/) provides basic background information on measured or anticipated effects from global climate change. A compilation of scientific information on climate change can be found in the United Nations Intergovernmental Panel on Climate Change's Fifth Assessment Report (IPCC 2013). Those findings are incorporated here by reference and are summarized. Global climate change can affect marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise, and through increases in wave height and frequency, loss of sea ice, and increased risk of diseases in marine biota. Decreases in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions may impact a wide range of organisms and ecosystems, particularly organism that absorb calcium from surface waters, such as corals and crustaceans. These influences could affect biological factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. These climate changes could have significant effects on southeastern fisheries; however, the extent of these effects is not known at this time (IPCC 2014).

In the southeast, general impacts of climate change have been predicted through modeling, with few studies on species specific effects. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures exceed survivable ranges (Needham et al. 2012). Higher water temperatures may also allow invasive species to establish communities in areas they may not have been able to survive previously. An area of low oxygen, known as the dead zone, forms in the northern Gulf each summer. Climate change may contribute to this dead zone by increasing rainfall that in turn increases nutrient input from rivers. This increased nutrient load causes algal blooms that, when decomposing, reduce oxygen in the water (Kennedy et al. 2002; Needham et al. 2012). Other potential impacts of climate change in the southeast include increases in hurricanes, decreases in salinity, altered circulation patterns, and sea level rise. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). Actions from this amendment are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing.

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic Basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. However, while these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

The cumulative biological, social, and economic effects of past, present, and future actions as described above may be described as limiting fishing opportunities in the short-term, with some exceptions of actions that alleviate some negative social and economic impacts. The intent of this amendment is to improve prospects for sustained participation in the respective fisheries over time and the proposed actions in this amendment are expected to result in some important long-term benefits to the commercial fleet, as well as fishing communities and associated businesses. The proposed changes in management for the Gulf shrimp fishery are not related to other actions with individually insignificant but cumulatively significant impacts.

Monitoring

The effects of the proposed action are, and will continue to be, monitored through collection of landings data by NMFS, annual stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations.

The proposed action relates to the harvest of an indigenous species in the Gulf and Atlantic, and the activity being altered does not itself introduce non-indigenous species, and is not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, it does not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

CHAPTER 5. REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866. This RIR analyzes the impacts this action would be expected to have on the Gulf of Mexico shrimp fishery.

5.2 Problems and Objectives

The problems and objectives addressed by this framework action are discussed in Section 1.2.

5.3 Description of Fisheries

A description of the Gulf of Mexico shrimp fishery is provided in Section 3.4.

5.4 Impacts of Management Measures

5.4.1 Action 1: Modify Stock Status Determination Criteria for Penaeid Shrimp Stocks

5.4.1.1 Action 1.1 – Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.1.3 and is incorporated herein by reference. **Preferred Alternative 2** would establish MSY values which are compatible with the current stock assessment models. Direct economic effects are not expected to result from **Preferred Alternative 2** because it would not affect the harvest or customary uses of penaeid shrimp. In addition, **Preferred Alternative 2** would likely not be expected to result in indirect economic effects because penaeid shrimp landings have consistently been well below the MSY values considered in this action.

5.4.1.2 Action 1.2 – Modify the Overfishing Threshold for Penaeid Shrimp

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.1.3 and is incorporated herein by reference. **Preferred Alternative 4** would establish overfishing thresholds which are compatible with the current stock assessment models. Direct economic effects are not expected to result from **Preferred Alternative 4** because it would not

affect the harvest or customary uses of penaeid shrimp. Maximum fishing mortality thresholds (MFMT) defined in **Preferred Alternative 4** would allow for the determination of overfishing status of penaeid shrimp stocks. Current stock assessment methods in conjunction with the pre-determined MFMTs would allow NMFS to determine whether overfishing is occurring. Should overfishing occur, mitigating management measures could be established in a timely manner. The establishment of corrective measures is expected to be beneficial to the penaeid stocks and result in indirect benefits to the economic environment. **Preferred Alternative 4** is the least likely to affect the stock because it establishes the overfishing threshold based on an annual MSY.

5.4.1.3 Action 1.3 Modify the Overfished Threshold for Penaeid Shrimp

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.1.3 and is incorporated herein by reference.

Preferred Alternative 2 would establish overfished thresholds which are compatible with the current stock assessment models and accounts for the stochastic nature of the MSST estimate. Direct economic effects are not expected to result from **Preferred Alternative 2** because it would not be expected to affect the harvest or customary uses of penaeid shrimp resources. Current stock assessment methods in conjunction with the pre-determined MSSTs would allow NMFS to determine whether a given penaeid stock, e.g., brown shrimp stock, is overfished. If a given stock is overfished, corrective management measures could be designed and implemented in a timely manner. The establishment of corrective measures is expected to benefit the penaeid stocks and result in indirect benefits to the economic environment.

5.4.2 Action 2: Modify the Shrimp Fishery Management Plan Framework Procedure

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.2.3 and is incorporated herein by reference. **Preferred Alternative 2** would expand the range of management measures that the Council can implement without a full plan amendment but is not expected to directly affect the harvest and other customary uses of the resource. Therefore, **Preferred Alternative 2** is not expected to result in direct effects on the economic environment. However, **Preferred Alternative 2** could result in a speedier implementation of management measures that may be beneficial to the stocks, with associated economic benefits, resulting in increased indirect economic benefits to fishermen and associated businesses.

5.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs associated with this action include:

Council costs of document preparation, meetings, public hearings, and information dissemination…….. $25,000

NMFS administrative costs of document preparation, meetings and review ….....$15,000

TOTAL ….....$40,000

The estimate provided above does not include any law enforcement costs. Any enforcement duties associated with this action would be expected to be covered under routine enforcement costs rather than an expenditure of new funds.

5.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: 1) an annual effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order. Based on the information provided above, this action has been determined to not be economically significant for the purposes of E.O. 12866.

CHAPTER 6. REGULATORY FLEXIBILITY ACT ANALYSIS

6.1 Introduction

The purpose of the Regulatory Act Analysis (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the fishery management plan (FMP) or amendment (including framework management measures and other regulatory actions) and to ensure the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

The RFA requires agencies to conduct a Regulatory Flexibility Act Analysis (RFAA) for each proposed rule. The RFAA is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. An RFAA is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." The RFAA provides: 1) A description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; 6) a description and estimate of the expected economic impacts on small entities; and 7) an explanation of the criteria used to evaluate whether the rule would impose "significant economic impacts".

6.2 Statement of the need for, objective of, and legal basis for the proposed action

The need for and objective of this proposed action are provided in Chapter 1. The purpose of this action is to adjust stock status determination criteria to be consistent with the new population metrics for penaeid shrimp and modify the framework procedure for the Shrimp FMP. The needs are to determine the overfished and overfishing status of each penaeid shrimp stock while using the best available science, and to streamline the management process for Gulf of Mexico (Gulf) shrimp stocks. The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for this proposed action.

6.3 Description and estimate of the number of small entities to which the proposed action would apply

This proposed rule is expected to directly affect commercial fishermen with valid or renewable federal Gulf shrimp permits. The Small Business Administration established size criteria for all major industry sectors in the U.S. including fish harvesters and for-hire operations. A business involved in shellfish harvesting is classified as a small business if independently owned and operated, is not dominant in its field of operation (including its affiliates), and its combined annual receipts are not in excess of $5.5 million (NAICS code 114112, shellfish fishing) for all of its affiliated operations worldwide.

The federal shrimp permit for the commercial harvest of penaeid shrimp in the Gulf exclusive economic zone has been placed under a moratorium since 2007. At the start of moratorium, 1,933 vessels qualified and received the shrimp permits, and over time the number of shrimp permitted vessels declined. According to the Southeast Regional Office Website, the Constituency Services Branch (Permits) unofficially listed 1,468 holders of valid or renewable shrimp permits as of May 7, 2015.

During 2006-2012, an average of 4,757 vessels fished for shrimp in the Gulf, of which 27% were federally permitted vessels and the rest, non-federally permitted vessels. Despite being fewer in number, federally permitted vessels accounted for an average of 67% of total shrimp landings and 77% of total ex-vessel revenues. An average federally permitted vessel in the shrimp fishery generated revenues from commercial fishing of approximately $254,000.

Based on the revenue figures above, all federally permitted shrimp vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities.

6.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed action, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

The proposed rule is not expected to change current reporting, record-keeping and other compliance requirements.

6.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed action

No duplicative, overlapping, or conflicting Federal rules have been identified with this proposed rule.

6.6 Significance of economic impacts on a substantial number of small entities

Substantial number criterion

This proposed action would be expected to directly affect all shrimp vessels that possess a valid or renewable Gulf shrimp permit. As a result, this proposed action is determined to meet the substantial number criterion

Significant economic impacts criterion

The outcome of "significant economic impact" can be ascertained by examining two issues: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities that are expected to be affected by this proposed rule are considered small entities, so the issue of disproportional effects on small versus large entities does not presently arise.

Profitability: Do the regulations significantly reduce profit for a substantial number of small entities?

Modifying the maximum sustainable yield, overfishing threshold, and overfished threshold for penaeid shrimp would make the definition of these parameters consistent with the models currently used in stock assessment for penaeid shrimp species. Because modifications of these parameters would not affect the harvest of shrimp or restrict the operations of shrimp vessels, no direct economic effects would ensue from this action. Modifying the framework procedure for the Shrimp FMP would streamline the process for changing certain regulations affecting the shrimp fishery. This action would improve the administrative aspects of developing regulations for the shrimp fishery but would have no direct economic effects on the operations of affected shrimp vessels.

In essence, the measures contained in this proposed rule would have no effects on the profits of all affected shrimp vessels. Therefore, it is concluded the proposed rule would not have significant economic impacts on a substantial number of small entities in the Gulf shrimp harvesting sector.

6.7 Description of the significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

Because the measures contained in this proposed rule are not expected to have any adverse impacts on a substantial number of small entities, the issue of significant alternatives to the proposed action is not pertinent.

CHAPTER 7. LIST OF PREPARERS

Name	Expertise	Responsibility	Agency
Morgan Kilgour	Fishery Biologist	Co-Team Lead - Amendment development, biological analyses	GMFMC
Susan Gerhart	Fishery Biologist	Co-Team Lead - Amendment development, biological analyses, cumulative effects analysis	SERO
Assane Diagne	Economist	Economic analyses	GMFMC
Tony Lamberte	Economist	Economic analyses	SERO
Ava Lasseter	Anthropologist	Social analyses	GMFMC
Mike Jepson	Anthropologist	Social analyses	SERO
Carrie Simmons	Fishery biologist	Reviewer	GMFMC
Mara Levy	Attorney	Legal review	NOAA GC
Noah Silverman	Natural Resource Management Specialist	NEPA review	NMFS
Steve Branstetter	Fisheries Biologist	Reviewer	SERO
Rick Hart	Fisheries Biologist	Statistical analyses, reviewer	SEFSC

GMFMC = Gulf of Mexico Fishery Management Council; NMFS= National Marine Fisheries Service; NOAA GC= National Oceanic and Atmospheric Administration General Counsel; SEFSC= Southeast Fishery Science Center; SERO = Southeast Regional Office of the National Marine Fisheries Service

CHAPTER 8. LIST OF AGENCIES, ORGANIZATIONS AND PERSONS CONSULTED

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office
- Office for Law Enforcement

NOAA General Counsel

Environmental Protection Agency
United States Coast Guard
United States Fish and Wildlife Services
Texas Parks and Wildlife Department
Alabama Department of Conservation and Natural Resources/Marine Resources Division
Louisiana Department of Wildlife and Fisheries
Mississippi Department of Marine Resources
Florida Fish and Wildlife Conservation Commission

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Appendix A. Other Applicable Law

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the Exclusive Economic Zone. However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making include the Endangered Species Act (Section 3.3 and 4.3), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5). Other applicable laws are summarized below.

Administrative Procedures Act
All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect. Proposed and final rules will be published before implementing the actions in this amendment.

Coastal Zone Management Act
Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NOAA regulations at 15 CF.R. part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. The determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Data Quality Act
The Data Quality Act (DQA) (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget (OMB) to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: 1) ensure information quality and develop a pre-dissemination review process; 2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and 3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of fishery management plans (FMPs) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Magnuson-Stevens Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data presented in this amendment has undergone quality control prior to being used by the agency and will be subject to a pre-dissemination review.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, (Public Law 89-665; 16 U.S.C. 470 *et seq.*) is intended to preserve historical and archaeological sites in the United States of America. Section 106 of the NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects for sites on listed on, or eligible for listing on, the National Register of Historic Places and aims to minimize damage to such places.

Historical research indicates that over 2,000 ships have sunk on the Federal Outer Continental Shelf between 1625 to 1951; thousands more have sunk closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated by archaeologists for the benefit of generations to come. Further information can be found at: http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

The proposed action does not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places nor is it expected to cause loss or destruction of significant scientific, cultural, or historical resources. In the Gulf, the *U.S.S. Hatteras*, located in federal waters off Texas, is listed in the National Register of Historic Places. Fishing activity already occurs in the vicinity of this site, but the proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a

Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and, to the extent permitted by law, ensure actions that they authorize, fund, or carry out do not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat, which established additional HAPCs and gear restrictions to protect corals throughout the Gulf of Mexico. There are no implications to coral reefs by the actions proposed in this amendment.

E.O. 13132: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too). No Federalism issues have been identified relative to the action proposed in this amendment. Therefore, consultation with state officials under Executive Order 12612 is not necessary.

Appendix B. Summary of Public Hearing Comments

Summary Public Hearings

August 27, 2014- Gulf of Mexico Fishery Management Council Meeting, Biloxi, Mississippi, Public Comment

No comments.

October 22, 2014- Gulf of Mexico Fishery Management Council Meeting, Mobile, Alabama, Public Comment

No comments.

June 10, 2015- Gulf of Mexico Fishery Management Council Meeting, Key West, Florida, Public Comment

[to be completed after June 2015 Council meeting]

Summary of written comments

As of May 15, 2015, there have been no written comments.

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Tab D, 4b

For the reasons set out in the preamble, 50 CFR part 622 is proposed to be amended as follows:

PART 622--FISHERIES OF THE CARIBBEAN, GULF OF MEXICO, AND SOUTH ATLANTIC

1. The authority citation for part 622 continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq*.

2. In § 622.60, paragraphs (a) and (b) are revised to read as follows:

§ **622.60 Adjustment of management measures.**

*** * * * ***

(a) *Gulf penaeid shrimp*. For a species or species group: reporting and monitoring requirements, permitting requirements, size limits, vessel trip limits, closed seasons or areas and reopenings, quotas (including a quota of zero), MSY (or proxy), OY, management parameters such as overfished and overfishing definitions, gear restrictions (ranging from regulation to complete prohibition), gear markings and identification, vessel markings and identification, allowable biological catch (ABC) and ABC control rules, rebuilding plans, restrictions relative

Commented [SS1]: Added the word penaeid here to clarify that para (a) applies to penaeid shrimp vs royal red. Clarification to the public.

to conditions of harvested shrimp (maintaining shrimp in whole condition, use as bait), target effort and fishing mortality reduction levels, bycatch reduction criteria, BRD certification and decertification criteria, BRD testing protocol and certified BRD specifications.

(b) *Gulf royal red shrimp*. Reporting and monitoring requirements, permitting requirements, size limits, vessel trip limits, closed seasons or areas and reopenings, annual catch limits (ACLs), annual catch targets (ACTs), quotas (including a quota of zero), accountability measures (AMs), MSY (or proxy), OY, management parameters such as overfished and overfishing definitions, gear restrictions (ranging from regulation to complete prohibition), gear markings and identification, vessel markings and identification, ABC and ABC control rules, rebuilding plans, and restrictions relative to conditions of harvested shrimp (maintaining shrimp in whole condition, use as bait).

Commented [SS2]: We clarify this language here to be a little more clear as the framework procedures don't actually certify BRDs but the specs for them are here in para (a).

Commented [SS3]: Action 2, Preferred Alt 2. List of framework measures for royal red shrimp.

Commented [SS4]: Also, included in the draft text in (a) and (b), but not highlighted, are the removal of text for transfer at sea provisions that was accidently added in the Generic ACL rule and TAC which is a term no longer in use for shrimp.

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Addressing the Expiration of the Shrimp Permit Moratorium

Draft Options for Amendment 17
to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters

June 2015

This is a publication of the Gulf of Mexico Fishery Management Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NMF4410011.

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Gulf of Mexico Shrimp 17

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Type of Action

( ) Administrative
(X) Draft
( ) Legislative
( ) Final

ABBREVIATIONS USED IN THIS DOCUMENT

ACL	annual catch limit
AM	accountability measure
AP	advisory panel
BRD	bycatch reduction device
CPUE	catch per unit effort
Council	Gulf of Mexico Fishery Management Council
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELB	electronic logbook
ESA	Endangered Species Act
FMP	Fishery Management Plan
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
lbs	pounds
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
RA	Regional Administrator
Reserve Pool	Gulf Shrimp Vessel Permit Reserve Pool
SEFSC	Southeast Fisheries Science Center
SEIS	Supplemental Environmental Impact Statement
SERO	Southeast Regional Office of NMFS
SPGM	federal Gulf commercial shrimp permit

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FISHERY IMPACT STATEMENT

[This statement is completed after selection of all preferred alternatives.]

CHAPTER 1. INTRODUCTION

1.1 Background

The Gulf of Mexico Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) began managing the shrimp fishery in the Gulf of Mexico (Gulf) in 1981. Four species are included in the fishery management plan: brown shrimp, *Farfantepenaeus aztecus*; pink shrimp, *Farfantepenaeus duorarum*; white shrimp, *Litopenaeus setiferus*; and royal red shrimp, *Pleoticus robustus*.

In 2001, the Council established a federal commercial permit for all vessels harvesting shrimp from federal waters of the Gulf through Amendment 11. Approximately 2,951 vessels had been issued these permits by 2006. After the establishment of the permit, the shrimp fishery experienced economic losses, primarily due to high fuel costs and reduced prices from competition with imports. These economic losses resulted in the exodus of vessels from the fishery, and consequently, reduction of effort. The Council determined that the number of vessels in the offshore shrimp fleet would likely decline to a point where the fishery again became profitable for the remaining participants, and new vessels might want to enter the fishery. That additional effort could negate or at least lessen profitability for the fleet as a whole. Consequently, the Council established a 10-year moratorium on the issuance of new federal shrimp vessel permits through Amendment 13 (GMFMC 2005). The final rule implementing the moratorium was effective October 26, 2006; permits became effective in March 2007.

To be eligible for a commercial shrimp vessel permit under the moratorium, vessels must have been issued a valid permit by NMFS prior to and including December 6, 2003. An exception was made for owners who lost use of a qualified vessel, but who obtained a valid commercial shrimp vessel permit for the same vessel or another vessel prior to the date of publication of the final rule. NMFS estimated 285 of the 2,951 vessels would not meet the control date; thus, the number of permitted vessels under the moratorium would be 2,666. Of those 285 ineligible vessels, 126 were inactive during 2002 (the last year of data available during the time the Council deliberated on this issue). Of the remaining 159 active vessels, only 72 operated in federal waters and were excluded under the moratorium. Of those 72 vessels, 45 were large and 27 were small. The large vessels were expected to be the most affected because the small vessels could continue to fish in state waters.

Vessel owners had one year to obtain the new permit; NMFS issued 1,933 moratorium permits in that time. As of December 31, 2014, 1,470 moratorium permits were valid or renewable (within one year of expiration); therefore, the number of permits has decreased by 463 since the moratorium began (Table 1.1.1). These permits have been permanently removed and are no longer available to the fishery. A permit is valid if it has been renewed; a permit is renewable one year from its expiration. After a year with no renewal, a permit is permanently removed from the permit pool.

Table 1.1.1. Number of valid, surrendered, and terminated Gulf commercial shrimp permits as of December 31 each year since implementation of the moratorium. Valid permits are those that were fishable at least one day each year. Surrendered permits are those that were voluntarily returned to NMFS by the permit holder – these permits were valid for part of the year, before being lost from the fishery. Terminated permits are those that were lost from the fishery due to non-renewal by the permit holder.

Year	Number of Valid Permits Each Year	Number of Surrendered Permits Each Year	Number of Permits Terminated Each Year*	Cumulative Number of Permits Lost from the Fishery
2007	1,933	0	NA	NA
2008	1,907	0	26	26
2009	1,722	1	184	211
2010	1,633	1	88	300
2011	1,582	0	51	351
2012	1,534	0	48	399
2013	1,501	0	33	432
2014	1,470	0	31	463

Source: NMFS Southeast Regional Office (SERO) Permits Database

The permit moratorium will expire October 26, 2016. The Council may choose to: 1) allow the moratorium to expire and revert all federal shrimp permits to open access; 2) extend the moratorium for another period of time; or 3) establish a permanent limited access system for Gulf shrimp permits. The Council may also consider creating reserve permits instead of allowing permits to expire, establishing qualification requirements to eliminate latent permits, and changing the status of the royal red shrimp endorsement.

1.2 Purpose and Need

Purpose for Action

The purpose of this amendment is to determine if limiting access to federal permits is necessary to prevent overcapacity, promote economic efficiency and stability, and to protect federally managed Gulf shrimp stocks. Another purpose is to determine if the endorsement to harvest royal red shrimp is still necessary to monitor participation and activity in that component of the fishery.

Need for Action

The need for this action is to maintain increases in catch efficiency while preventing overfishing and to obtain the best available information with which to manage the fishery.

1.3 History of Management

The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters (FMP), supported by an environmental impact statement (EIS), was implemented on May 15, 1981. The FMP defined the shrimp fishery management unit to include brown shrimp, white shrimp, pink shrimp, royal red shrimp, seabobs (*Xiphopenaeus kroyeri*), and brown rock shrimp (*Sicyonia brevirostris*). Seabobs and rock shrimp were subsequently removed from the FMP. The actions implemented through the FMP and its subsequent amendments have addressed the following objectives:

1. Optimize the yield from shrimp recruited to the fishery.
2. Encourage habitat protection measures to prevent undue loss of shrimp habitat.
3. Coordinate the development of shrimp management measures by the Gulf of Mexico Fishery Management Council (Council) with the shrimp management programs of the several states, when feasible.
4. Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act.
5. Minimize the incidental capture of finfish by shrimpers, when appropriate.
6. Minimize conflict between shrimp and stone crab fishermen.
7. Minimize adverse effects of obstructions to shrimp trawling.
8. Provide for a statistical reporting system.

The purpose of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. The main actions included: 1) establishing a cooperative Tortugas Shrimp Sanctuary with Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; 2) a cooperative 45-day seasonal closure with Texas to protect small brown shrimp emigrating from bay nursery areas; and 3) a seasonal closure of an area east of the Dry Tortugas to avoid gear conflicts with stone crab fishermen.

Amendment 1/environmental assessment (EA)(1981) provided the Regional Administrator (RA) of the NMFS Southeast Regional Office (SERO) with the authority (after conferring with the Council) to adjust by regulatory amendment the size of the Tortugas Sanctuary or the extent of the Texas closure, or to eliminate either closure for one year.

Amendment 2/EA (1983) updated catch and economic data in the FMP.

Amendment 3/EA (1984) resolved a shrimp-stone crab gear conflict on the west-central coast of Florida.

Amendment 4/EA (1988) identified problems that developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas Sanctuary was simplified, and the Council and RA review for the Texas closure was extended to February 1. A provision that white shrimp taken in the exclusive economic zone (EEZ) be landed in accordance with a state's size/possession regulations to provide consistency and facilitate enforcement with Louisiana was to have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This provision was disapproved by

NMFS with the recommendation that it be resubmitted under the expedited 60-day Secretarial review schedule after Louisiana provided for a bycatch of undersized white shrimp in the directed fishery for seabobs. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

In July 1989, NMFS published revised guidelines for FMPs that interpretatively addressed the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (then called the Magnuson Fishery Conservation and Management Act) National Standards (50 CFR 602). These guidelines required each FMP to include a scientifically measurable definition of overfishing and an action plan to arrest overfishing should it occur.

In 1990, Texas revised the period of its seasonal closure in Gulf waters from June 1 to July 15 to May 15 to July 15. The FMP did not have enough flexibility to adjust the cooperative closure of federal waters to accommodate this change, thus an amendment was required.

Amendment 5/EA (1991) defined overfishing for Gulf brown, pink, and royal red shrimp and provided measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were removed from the management unit. The duration of the seasonal closure to shrimping off Texas was adjusted to conform to the changes in state regulations.

Amendment 6/EA (1992) eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally opened areas within the sanctuary continue to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by NMFS because it was not based on the best available data.

Amendment 7/EA (1994) defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data become available. A total allowable level of foreign fishing for royal red shrimp was eliminated; however, a redefinition of overfishing for this species was disapproved.

Amendment 8/EA (1995), implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch for royal red shrimp to be set up to 30% above maximum sustainable yield (MSY) for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act amendment to the Magnuson-Stevens Act that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY, and does not allow OY to exceed MSY.

Amendment 9, supported by a supplemental environmental impact statement (SEIS) (1997), required the use of a NMFS certified bycatch reduction device (BRD) in shrimp trawls used in the EEZ from Cape San Blas, Florida (85° 30' W. Longitude) to the Texas/Mexico border, and provided for the certification of BRDs and specifications for the placement and construction. The purpose of this action was to reduce the bycatch mortality of juvenile red snapper by 44%

from the average mortality for the years 1984 through 1989. This amendment exempted shrimp trawls fishing for royal red shrimp seaward of the 100-fathom contour, as well as groundfish and butterfish trawls, from the BRD requirement. It also excluded small try nets and no more than two ridged frame roller trawls of limited size. Amendment 9 also provided mechanisms to change the bycatch reduction criterion and to certify additional BRDs.

Amendment 10/EA (2002) required BRDs in shrimp trawls used in the Gulf east of Cape San Blas, Florida. Certified BRDs for this area are required to demonstrate a 30% reduction by weight of finfish.

Amendment 11/EA (2001) required owners and operators of all vessels harvesting shrimp from the EEZ of the Gulf to obtain a federal commercial vessel permit. This amendment also prohibited the use of traps to harvest royal red shrimp from the Gulf and prohibited the transfer of royal red shrimp at sea.

Amendment 12/EA (2001) was included as part of the Generic Essential Fish Habitat (EFH) Amendment that established EFH for shrimp in the Gulf.

Amendment 13/EA (2005) established an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp; defined the overfishing threshold and the overfished condition for royal red shrimp; defined maximum sustainable yield and optimum yield for the penaeid shrimp stocks in the Gulf; established bycatch reporting methodologies and improved collection of shrimping effort data in the EEZ; required completion of a Gulf Shrimp Vessel and Gear Characterization Form by vessels with federal shrimp permits; established a moratorium on the issuance of federal commercial shrimp vessel permits; and required reporting and certification of landings during the moratorium.

Amendment 14/EIS (2007) was a joint amendment with Reef Fish Amendment 27. It established a target red snapper bycatch mortality goal for the shrimp fishery in the western Gulf and defined seasonal closure restrictions that can be used to manage shrimp fishing efforts in relation to the target red snapper bycatch mortality reduction goal. It also established a framework procedure to streamline the management of shrimp fishing effort in the western Gulf.

The Generic Annual Catch Limit (ACL)/Accountability Measures (AMs) Amendment/EIS (2011) set an ACL and AM for royal red shrimp. Penaeid shrimp were not included in this amendment because their annual lifecycles exempt them from the Magnuson-Stevens Act requirement for these management measures.

The Shrimp Electronic Logbook (ELB) Framework (2013) established a cost-sharing system for the ELB program, and described new equipment and procedures for the program.

Amendment 16/SEIS (2015) eliminated duplicative accountability measures and the quota for royal red shrimp. It set the ACL equal to the acceptable biological catch and established a post-season AM.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Address the Expiration of the Federal Shrimp Permit Moratorium in the Gulf of Mexico

Alternative 1- No Action. The moratorium on the issuance of new Gulf of Mexico (Gulf) federal commercial shrimp vessel permits expires on October 26, 2016. With expiration of the federal Gulf commercial shrimp permit moratorium, the commercial shrimp vessel permits would become open access permits, as they were prior to the moratorium, and therefore be available to any eligible applicants.

Alternative 2 – Extend the moratorium on the issuance of federal Gulf commercial shrimp vessel permits. The moratorium would be extended for:

Option a. 5 years
Option b. 10 years

Alternative 3 – Create a federal limited access permit for commercial shrimp vessels in the Gulf. To be eligible for a commercial shrimp vessel permit under the limited access system, vessels must have a valid or renewable federal Gulf commercial shrimp vessel permit on October 26, 2016. Federal Gulf commercial shrimp vessel permits will need to be renewed every year and all previous renewal, transfer, and reporting requirements would still be in effect.

*NOTE: Action 2.1, Action 2.2, Action 2.3 are relevant only if **Alternative 2** or **Alternative 3** in Action 1 is selected by the Council*

Discussion: The moratorium on the issuance of federal Gulf commercial shrimping permits (SPGM) was established in Shrimp Amendment 13 (GMFMC 2005). The purpose of the amendment was to help stabilize the shrimp fishery. Increasing fuel costs, decreasing shrimp prices and increasing foreign shrimp imports all contributed to the overcapitalization of the commercial shrimp fleet. Since the implementation of the SPGM, the number of permits has decreased each year with terminations peaking in 2009, when initially issued SPGMs were terminated due to non-renewal (Table 1.1.1). Vessels were expected to continue to exit the fishery until the reduced number of permits allowed the resource to be harvested profitably (GMFMC 2005). Effort in the offshore fishery has decreased, and landings have slightly declined (Figure 2.1.1). Additionally, the catch per unit effort (CPUE) for the offshore fishery has remained relatively constant since the implementation of the SPGM.

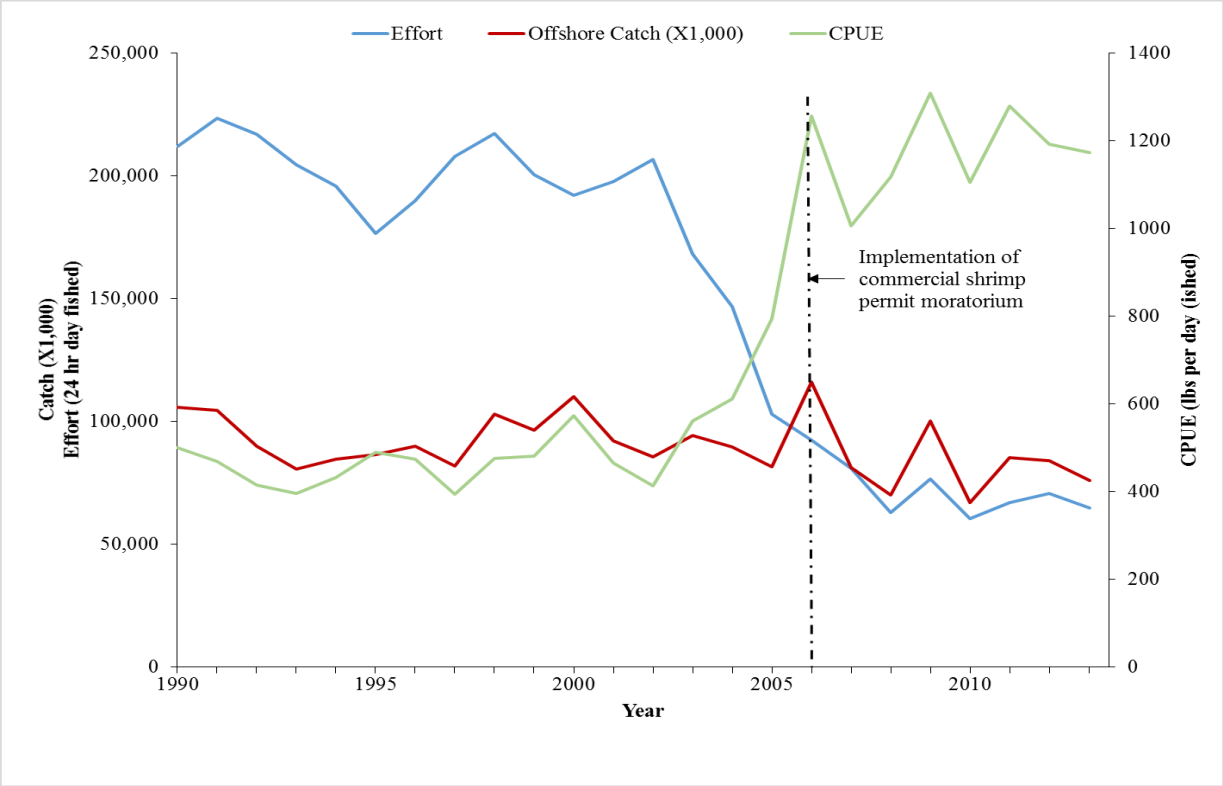

Figure 2.1.1. Catch, effort and CPUE from 1990-2013 for all shrimp caught in offshore waters[1] and landed in Gulf ports.

Alternative 1 would allow the moratorium to expire and federal Gulf shrimp permits would be open access. This would allow new entrants into the commercial shrimp fishery and could have negative effects if the fishery became overcapitalized. This (overcapitalization and/or effort increases) could lead to increases in protected resources bycatch and potentially result in additional requirements for bycatch reduction. This action could undo any positive effects of the moratorium and revert the fishery back to an open access fishery. Under this alternative permits would no longer be transferrable.

Alternative 2 would extend the permit moratorium for a specified number of years. This could contract the fishery more if additional permits are terminated. Extending the moratorium for an additional 5 years (**Option a**) would require the Council to review the status of the fishery sooner than if the 10 year option (**Option b**) was selected. **Option a** gives the least flexibility as the time required to produce an amendment to address yet another expiration would be between 18 and 24 months, thus not allowing for more than 3 or 4 years of data to be incorporated before re-

[1] Offshore waters are waters outside the COLREGS lines. The COLREGS lines are the set of demarcation lines that have been established by the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (commonly called COLREGS). COLREGS define boundaries across harbor mouths and inlets for navigation purposes.

evaluating the expiration of the SPGM extension. **Option b** would allow for more data collection and may result in a stable number of permits if fewer fishermen exit the fishery. The number of permits that have been terminated declined from 2010 until 2014, but the number of permits has not yet reached a minimum as the number of terminated permits per year has not reached zero.

Alternative 3 would create a federal limited access permit for commercial shrimp vessels in the Gulf. Current permit holders would receive the limited access permit if their vessel has a valid or renewable federal Gulf commercial shrimp permit on October 26, 2016. Federal Gulf commercial shrimp vessel permits would need to be renewed every year and all previous renewal, transfer, and reporting requirements would still be in effect. This alternative would make the federal commercial shrimp fishery a limited access fishery until the Council takes action to change that status, unlike the moratorium which has an expiration date. Additionally, the number of permits could continue to decline due to non-renewal of permits unless the Council implemented other measures (such as Action 2.1). For both **Alternative 2** and **Alternative 3**, persons wishing to enter the fishery could purchase a valid permit from another permit holder. Permits that have expired but are still renewable cannot be transferred unless and until they are renewed prior to termination; a permit must be valid to be transferred.

2.2 Action 2 – Disposition of Non-Renewed Commercial Shrimp Permits

Action 2-1. Target Number of Gulf Shrimp Vessel Permits and Creation of a Gulf Shrimp Vessel Permit Reserve Pool

Alternative 1. No Action. Any Gulf shrimp vessel permit not renewed within one year of the expiration date on the permit will be terminated and no longer available for purchase or use.

Alternative 2. Set a target number of Gulf shrimp vessel permits (number of permits to be determined) based on effort needed to attain aggregate maximum sustainable yield (MSY) in the offshore fishery. If the number of permits reaches the target number, any permits that are not or were not renewed within one year of the expiration date on the permit will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Alternative 3. Set a target number of Gulf shrimp vessel permits based on the number of valid or renewable permits at the beginning of the moratorium (1,933 permits). Any permits that are not or were not renewed after December 31, 2007, will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Alternative 4. Set a target number of Gulf shrimp vessel permits based on the number of valid or renewable permits at the end of 2014 (1,470 permits). Any permits that are not or were not renewed after December 31, 2014, will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Alternative 5. Set a target number of Gulf shrimp vessel permits based on the number of valid or renewable permits at the end of the initial moratorium (number of permits unknown). Any permits that are not or were not renewed after October 26, 2016, will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Alternative 6. Set a target number of Gulf shrimp vessel permits (number of permits to be determined) based on effort needed to maintain the gains in catch per unit effort (CPUE) in the offshore fishery during the moratorium without substantially reducing landings. If the number of permits reaches the target number, any permits that are not or were not renewed within one year of the expiration date on the permit will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Alternative 7. Set a target number of Gulf shrimp vessel permits (number of permits to be determined) based on the number of active permitted vessels (those with landings from offshore waters) when effort was highest during the moratorium in the area monitored for red snapper juvenile mortality but without reaching the bycatch reduction target and triggering closures. If the number of permits reaches the target number, any permits not renewed within one year of the expiration date on the permit will go into a Gulf Shrimp Vessel Permit Reserve Pool.

Discussion: Currently any federal permit issued by the NMFS Southeast Regional Office is only valid for one year. After the expiration date, the holder of a limited access or moratorium permit has an additional year to renew the permit. If a permit is not renewed within one year of the expiration date, it is terminated; i.e., it is no longer renewable or transferable, and effectively ceases to exist. Through non-renewal, 463 Gulf shrimp permits have been terminated during the moratorium. This action is only appropriate if Alternative 2 (continue the moratorium) or Alternative 3 (create a limited access permit) is chosen in Action 1, because Alternative 1 (no action) would result in the permit becoming an open access permit, for which anyone can apply and does not need to be renewed.

A decrease in the number of permits is an inherent part of a moratorium or limited access permit. The federal Gulf commercial shrimp permit moratorium was based on the likelihood that, at some point in time, the number of vessels in the offshore shrimp fleet would decline to a point where the fishery again became profitable for the remaining participants, and there was a need to prevent new effort from entering the fishery and thus negating, or at least lessening, profitability when that time came. Various members of the Council, the Council's Shrimp Advisory Panel (AP), and the public have suggested that the fishery has reached that point, and the decline in permits should end. Others have suggested that the time is past, or that it is in the near future. In any case, the Council may decide to set a target number of permits for the Gulf shrimp fishery. If so, when that target is reached, NMFS would need a way to maintain permits that would normally be terminated.

Alternative 1 would continue the practice of terminating permits that were not renewed within one year of the expiration date. The number of Gulf shrimp permits would be expected to continue to decrease over time, although the rate of decrease would be expected to slow as fewer inactive permits are left. The AP was concerned that the fleet would also continue to shrink because of vessel age and the high cost of replacement. New U.S. Coast Guard (USCG) requirements for certification may be difficult and expensive to meet for anyone building a new vessel. These factors could cause the rate of attrition to increase in the future.

Alternatives 2-7 would set a target number of permits for the shrimp fishery and create a Gulf Shrimp Vessel Permit Reserve Pool (Reserve Pool). If the number of permits reaches the target, permits that normally would be terminated, revoked, or surrendered would instead be transformed into "reserved" permits that could be re-issued. The NMFS Pacific Islands Regional Office maintains a similar pool for the American Samoa longline limited access permits, wherein if a permit is relinquished, revoked, or not renewed, the Regional Administrator makes that permit available for re-issuance. Action 2-2 addresses the issuance of Gulf shrimp permits from the reserve pool, if created. **Alternatives 2-4** would be expected to set a target number of permits above the number expected to be valid or renewable when measures in this amendment would be implemented, and would require NMFS to create new permits for the Gulf Shrimp Vessel Permit Reserve Pool. **Alternatives 5-7** would be expected to set a target number of permits below the current number, which would delay the creation of the Gulf Shrimp Vessel

Permit Reserve Pool until the target is reached. Any reserved permit in the Reserve Pool would not have a landings history associated with it, regardless of whether it was newly created or transformed from a regular permit; in other words, permits in the Reserve Pool will act as new permits without associated catch history.

Alternatives 3-5 and **7** base the target number of permits on the number of permits at a certain period of time or under certain conditions; **Alternatives 2** and **6** base the target number of permits on a level of effort needed to achieve a specific management goal. The Council does not directly control effort in the offshore fishery, so the relationship between permits and/or vessels and effort needs to be determined. That is, it would be helpful to know how many permits/vessels are needed to achieve alternative levels of effort that may be desired by the Council. Research into this relationship is not yet complete. However, some preliminary findings are available and are discussed below.

Alternative 2 is an attempt to calculate the maximum number of permits that could harvest the aggregate MSY for the offshore shrimp fishery. The estimated yield curve for the offshore fishery produced by the model indicates that aggregate MSY is 109,767,035 pounds (tails) and effort at MSY is 145,012 days fished.[2] The model results should only be used within the range of the observed data, and thus should not be used to predict what catch/landings would be at effort levels above or below observed levels, as they are subject to year to year variations in the abundance of shrimp stocks.

The level of effort needed to achieve aggregate MSY in the offshore fishery was most closely observed in 2004. Recent levels of effort have been well below the level needed to achieve aggregate MSY in the offshore fishery. Based on observed effort in 2013, effort would need to increase by more than 126% from current levels to achieve aggregate MSY. The number of vessels needed to attain this effort is not available at this time, but would be calculated if this alternative remains in the amendment. However, this alternative would be expected to have the highest target number of permits.

Alternative 3 presumes the number of permits at the beginning of the moratorium (1,933) was, in fact, the appropriate number of permits to maintain in the shrimp fishery, and the decrease in permits since then was undesirable. Many of the lost permits may have been inactive permits, but how many has not been determined at this time. The highest number of terminated permits was in 2009. This was two years after initial issuance of the moratorium permits and is when those initial permits would have terminated if they never were renewed. This suggests that those vessels were not actively fishing in offshore or federal waters. This situation will be explored further with development of this amendment.

[2] Personal communication, Rick Hart, NMFS Galveston Laboratory, May 12, 2015. Aggregate MSY calculated using : Catch = 1513.903389 * effort + -0.005219927 * effort. Please note that aggregate MSY is not equal to the sum of each species' MSY

Alternative 4 presumes the number of permits at the end of 2014 (1,470) was the appropriate number of permits to maintain in the shrimp fishery. This represents a 24% decrease from the number of permits at the beginning of the moratorium. The Council will need to provide rationale for why this is the appropriate target number of permits.

Alternative 5 presumes the number of permits at the end of the moratorium will be the appropriate number of permits to maintain in the shrimp fishery. This represents an unknown decrease from the number of permits at the beginning of the moratorium. In the last two years, the number of permits lost has leveled at around 32 permits per year. If we assume a similar loss in 2015 and 2016, the number of permits at the end of 2016 would be around 1,406, a decrease of 27% from the beginning of the moratorium. Again, the Council will need to provide rationale for why this is the appropriate target number of permits.

Alternative 6 is an attempt to calculate the number of permits needed to maintain the level of effort that has produced the high CPUE values attained during the moratorium, without allowing total landings to decrease substantially. Economic conditions have led to substantial consolidation in this industry creating significant efficiency gains for the remaining participants. This consolidation and the resulting efficiency gains for fishermen would be locked in by maintaining the number of vessels that could harvest at a high CPUE. This was the objective of the moratorium as stated in Amendment 13 (GMFMC 2005). However, the average observed landings from 2004-2006 (95.75 mp) compared to the average during the moratorium (80.51 mp) show a 16% reduction in offshore landings. Landings reductions would be expected to cause adverse economic impacts in the onshore sector (i.e., dealers and processors) as profitability in that sector is mainly determined by physical volume and total sales value.

Observed CPUE and observed landings during the moratorium were highest in 2009 (Table 2.2.1); however, care must be exercised in relying on trends in observed landings as they are subject to year to year variations in abundance of the shrimp stocks. For example, although observed landings were highest in 2006, this was due to abundance being above the long-term average. The level of effort in 2006 would not be expected to generate that level of landings under long-term average levels of abundance. Thus, observed levels should not be used to predict what would be expected under average abundance conditions in the future. The same caution applies to using observed levels of CPUE. Although observed CPUE was highest in 2009, this result was similarly driven by above average abundance. It is not prudent to expect or rely on above average abundance conditions in the future.

Table 2.2.1. Effort, landings, CPUE, predicted CPUE, and predicted landings for offshore landings are in pounds.

Year	Effort	Observed Landings	Observed CPUE	Predicted Landings	Predicted CPUE
2000	192,073	110,035,005	573	98,206,293	515
2001	197,644	91,972,896	465	95,306,890	486
2002	206,621	85,433,710	413	89,954,177	439
2003	168,135	94,372,801	561	106,975,942	640
2004	146,624	89,637,517	611	109,753,463	751
2005	102,840	81,611,212	794	100,483,450	979
2006	92,372	115,991,846	1,256	95,303,048	1,034
2007	80,733	81,228,888	1,006	88,199,291	1,094
2008	62,797	70,084,487	1,116	74,484,336	1,187
2009	76,508	100,070,591	1,308	85,271,120	1,116
2010	60,518	66,782,194	1,104	72,501,053	1,199
2011	66,777	85,357,173	1,278	77,817,764	1,167
2012	70,505	84,071,805	1,192	80,789,736	1,147
2013	64,764	75,992,480	1,173	76,152,288	1,177

Models for landings and CPUE can be used to generate predicted values[3] that account for changes in abundance over time and thus are more reliable with respect to determining the actual trends in those values and expected values in the future. Predicted CPUE was at its highest level in 2010, but this finding must be viewed with caution given the effects of the Deepwater Horizon event on fishing behavior in 2010. It would be safer to conclude that CPUE was at its maximum in 2008. The highest level of predicted landings was in 2007, the first year of the moratorium. However, average predicted landings during the moratorium (79.32 mp) were 22% less than average predicted landings in 2004-2006 (101.80 mp). These results suggest that additional effort reductions would be expected to further reduce landings. The number of vessels needed to attain this effort is not available at this time, but will be calculated if this alternative remains in the amendment.

Alternative 7 takes into account the target effort level in specific areas of the western Gulf (10-30 fathoms) to protect juvenile red snapper. This target was set in Amendment 14 (GMFMC 2007) as 74% less than the effort in the benchmark years of 2001-2003. That target was reduced in 2012 to 67% less than the benchmark years because the red snapper rebuilding plan was proceeding as planned. If effort in the area increases above this target, selected areas of the EEZ would be closed to shrimp fishing. In 2011, the effort level for the area was very near to exceeding the target effort level (Figure 2.2.1). Therefore, the number of active vessels in that

[3] Personal Communication, Rick Hart, NMFS Galveston Laboratory, May 12, 2015. Regression of CPUE versus effort: $y = -0.0052x + 1513.9$, $R^2 = 0.9116$.

year could be considered a reasonable target for the maximum number of permits in the shrimp fishery. This alternative is expected to produce the lowest number of permits because it is based on active vessels only.

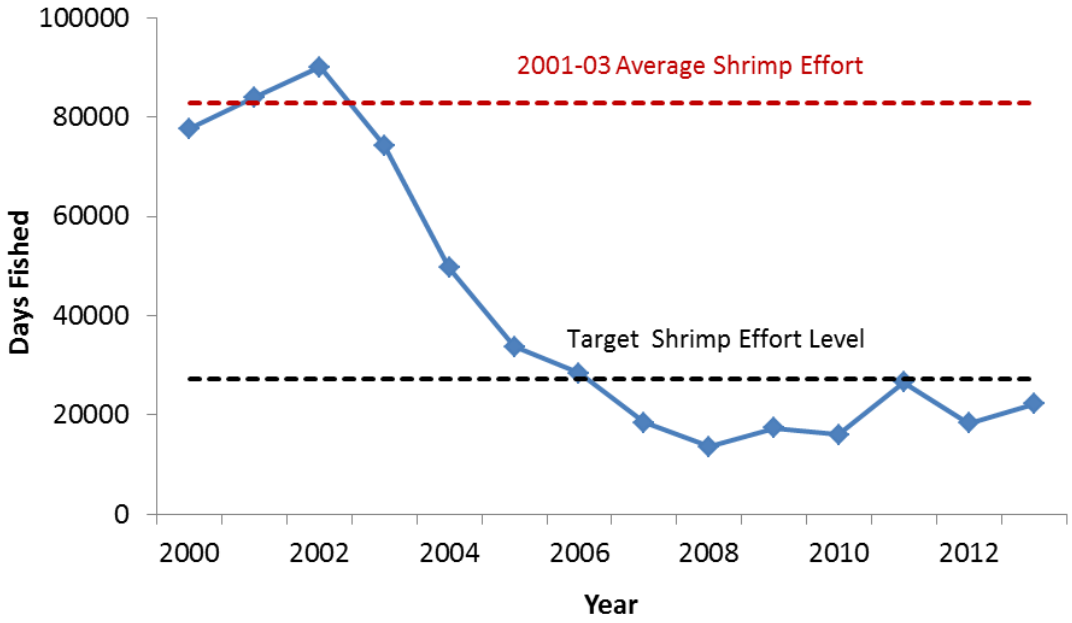

Figure 2.2.1. Offshore Gulf shrimp effort in Statistical Zones 10-21, 10-30 fathoms relative to target effort levels to reduce red snapper juvenile mortality.
Source: SEFSC, Galveston.

Alternatives 2-4 would increase the number of Gulf shrimp permits above where they are expected to be when the measures in this amendment are implemented. This could allow effort to increase, which could provide a greater chance of harvesting more shrimp. On the other hand, increased effort increases the risk of exceeding the target bycatch mortality of juvenile red snapper and protected species in shrimp trawls. The effort[4] in 2009 was the baseline effort level used for the most recent biological opinion to evaluate the present and future effect of the shrimp fishery on ESA-listed species (NMFS 2014). The biological opinion concluded that this level of effort would not jeopardize the continued existence of protected sea turtles, small-tooth sawfish, and sturgeon. If effort levels are expected to increase above this level, a new biological opinion would be needed; and if captures of protected species increase, additional requirements for bycatch reduction could result.

Alternatives 5-7 would allow a passive reduction in the number of permits from where they are now. Fewer permits could result in a lower number of vessels actively fishing, decreasing bycatch and impacts on the environment. If fewer vessels could maintain the same level of total

[4] Effort from otter trawls only, in onshore and offshore waters.

landings, each remaining vessel would have more landings and greater benefit. However, the data in Table 2.2.1 suggests vessels cannot increase CPUE and landings have been declining as the effort has decreased in recent years. If the number of vessels is severely limited, shrimp harvest may not be able to support the industry infrastructure.

The expected effects of these alternatives are dependent on changes in fishing effort, which may or may not change based on the number of permits. Inactive permits during the moratorium years have provided an opportunity for increased effort, either by the owners of those vessels starting to fish or by transferring permits to new entrants that intended to fish. Yet effort has not increased. Reasons to maintain a permit that is not being used to harvest shrimp include waiting for fishing to be more economical, to account for bycatch of shrimp when trawling for other purposes, or speculating that the value of the permit will increase in the future. This last reason would be negated by a permit pool as reserve permits could be purchased from NMFS for only $25 each.

Action 2-2. Issuance of Reserved Gulf Shrimp Vessel Permits

Note: Action 2-2 presumes Alternative 2 or Alternative 3 in Action 2-1 is chosen. If Alternative 1 in Action 2-1 is chosen, Action 2-2 is not applicable.

Alternative 1. No action. Individuals must submit a completed application to NMFS to be issued a Reserved Gulf Shrimp Vessel Permit. Eligible applicants will receive a Gulf Shrimp Vessel Permit Reserve Pool permit if one is available.

Alternative 2. The Reserved Gulf Shrimp Vessel Permits will be available from NMFS once per year and will be issued to eligible applicants in the order in which applications are received. Individuals must submit a completed application to NMFS to be issued a Reserved Gulf Shrimp Vessel Permit. To be eligible for a Reserved Gulf Shrimp Vessel Permit the applicant must also:

Option a - be a U.S. citizen or business

Option b - assign the permit to a vessel that is of at least X length on the application

Option c - assign the permit to a vessel with a USCG Certificate of Documentation on the application (five net ton minimum)

Alternative 3. The Reserved Gulf Shrimp Vessel Permits will be available from NMFS once per year. If the number of applicants is greater than the number of Reserved Gulf Shrimp Vessel Permit, NMFS will conduct a lottery to determine which individuals may be issued the available permits. Individuals must submit a completed application to NMFS to be eligible for the lottery. To be eligible for a Reserved Gulf Shrimp Vessel Permit the applicant must:

Option a - be a U.S. citizen or business

Option b - assign the permit to a vessel that is of at least X length

Option c - assign the permit to a vessel with a USCG Certificate of Documentation on the application (five net ton minimum)

Note: *All current permit renewal/transferability and recordkeeping/reporting requirements would remain in place regardless of the alternative chosen. These requirements can be found in detail in 50 CFR 622.4 and 622.51.*

Discussion: If a reserve pool for Gulf shrimp permits is created through Action 2-1, distribution of those permits must also be considered. That distribution could follow the regular permit application process with no additional restrictions with **Alternative 1**. The Reserved Gulf Shrimp Vessel Permits would be distributed as any open access permit by submitting a completed application and the appropriate application fee (currently $25 for the first permit, $10 for each additional permit on the application). If a Reserved Gulf Shrimp Vessel Permits is available, it would be assigned to the applicant.

With **Alternative 2**, NMFS would hold all Reserved Gulf Shrimp Vessel Permits in the pool until a specific date, when a notice would be published in the *Federal Register* announcing the availability of those permits. NMFS would also distribute a Southeast Fisheries Bulletin. The permits would be distributed to entities submitting a completed application and the appropriate fee ($25/$10) on a first come, first served basis. If one or more of the options are selected, NMFS would only accept applications from certain entities. The AP suggested these options to help prevent people from obtaining reserve permits on speculation.

Alternative 3 is similar to **Alternative 2** in that NMFS would hold all Reserved Gulf Shrimp Vessel Permits in the pool until a specific date, when a notice would be published in the *Federal Register* announcing an application period for those permits. NMFS would also distribute a Southeast Fisheries Bulletin announcing the application period. Applications would be held until the end of the announced application period before being issued. If NMFS received more completed applications and fees ($25/$10) than the number of available Reserved Gulf Shrimp Vessel Permits, a lottery would be conducted to determine which qualified applicants would receive a permit. As with **Alternative 2**, if one or more of the options are selected, NMFS would only accept applications from applicants who met the eligibility requirements.

The AP was concerned that if Reserved Gulf Shrimp Vessel Permits were available to anyone for $25 from NMFS, some people might buy all available permits to control the cost of permits on the market. A permit must be attached to a vessel, but the vessel could be of any size, such as a canoe. To help ensure Reserved Gulf Shrimp Vessel Permits are only issued to entities intending to use them for fishing, the AP suggested qualifications be established, such as U.S. citizenship (**Alternatives 2** and **3**, **Option a**) and a minimum vessel size (**Alternatives 2** and **3**, **Options b** and **c**).

The AP considered various minimum vessel lengths, but deferred making a recommendation until information about vessel lengths associated with current permits could be available. Two

methods of classifying vessels by length are presented in Table 2.2.2. Method 1 is based on a longstanding distinction between large and small vessels in historical economic analyses as a proxy between vessels used to harvest shrimp in offshore versus inshore waters. Method 2 separates vessels into four classes by 25-foot lengths to allow a finer distinction. The Council should choose which method to use for **Alternatives 2** and **3**, **Option b**.

Table 2.2.2. Proportion of vessels with valid or renewable SPGM permits in each size class (as of January 6, 2015). Methods are explained in the text.

	Method 1			
Vessel Length	**< 60 ft**	**≥ 60 ft**		
Proportion of Vessels	24.3%	75.7%		
	Method 2			
Vessel Length	**<25 ft**	**25 - <50 ft**	**50 - <75 ft**	**≥75 ft**
Proportion of Vessels	2.8%	13.6%	42.8%	40.8%

Source: NMFS SERO permits database.

The AP also discussed USCG regulations certifying only vessels of five net tons or larger. Vessel documentation (**Option c**) is a national form of vessel registration issued by the USCG. Vessels which engage in either coastwise trade or the fisheries on navigable waters of the U.S. or in the EEZ, must be documented, subject to certain exclusion or exemption provisions. Vessels of less than five net tons are excluded from such documentation. Thus, **Option c** would only allow applications for vessels of at least five net tons. However, vessels not engaged in commercial fishing or owned by foreign entities may also be certified, so the Council may wish to use this option in conjunction with another option. Currently, federally permitted vessels can be registered with the USCG or a state, and the state-registered vessels are not required to submit the tonnage; therefore, the number of current federally permitted vessels below five net tons cannot be determined.

Additional options the Council may consider:

Option d - have X lb shrimp landings associated with the vessel via a state permit or another federal permit (e.g. South Atlantic) – This option would restrict Reserved Gulf Shrimp Vessel Permits to vessels already harvesting shrimp elsewhere.

Option e - include a vessel that has not been issued a SPGM permit during the last 5 years (unless the current owner purchased the vessel in a market or arms-length transaction during this time) – This option would prevent a current permit holder from moving their permit to a small vessel, then applying for a Reserved Gulf Shrimp Vessel Permits with the original vessel, circumventing Option b or c.

2.3 Action 3 – Royal red shrimp endorsement

Alternative 1 – No Action. Continue to require a royal red shrimp endorsement to the federal Gulf shrimp vessel permit to harvest royal red shrimp from the Gulf EEZ. Endorsements are open access for entities with a federal Gulf shrimp vessel permits

Alternative 2 – Discontinue the royal red shrimp endorsement. Only the Gulf shrimp vessel permit will be required to harvest royal red shrimp.

Alternative 3 – To renew a royal red shrimp endorsement, the applicant must have had a minimum royal red shrimp landings during one of the three calendar years preceding the application

Option a: 300 lbs
Option b: 1,000 lbs
Option c: 10,000 lbs

Discussion:
In Amendment 13 to the FMP for the Shrimp Fishery in the Gulf of Mexico (GMFMC 2005), an endorsement for royal red shrimp was required to conduct commercial harvest. The purpose was to help inform data collectors about who the royal red shrimpers were and collect better information about the fishery. Royal red shrimp are primarily harvested from deep waters, so historically, only a small number of boats has been engaged in harvesting them. Information for the fishery was lacking particularly for catch, effort, operating costs and maximum sustainable yield estimates. With the extensive number of endorsements (Table 2.3.1) and the limited number of actively royal red shrimping vessels (Table 2.3.1), it is unclear if the establishment of the endorsement has helped with collecting the desired data outlined in Shrimp Amendment 13.

Table 2.3.1. Number of royal red shrimp endorsements and the number of vessels actively landing royal red shrimp (as of May 26, 2015).

Year	Number of Royal Red Shrimp Endorsements	Number of Unique Vessels Actively Landing Royal Red Shrimp
2003		17
2004		17
2005		12
2006		6
2007	369	8
2008	388	8
2009	339	6
2010	325	7
2011	331	8
2012	351	7
2013	332	15
2014	323	7

Source: NMFS Southeast Fisheries Science Center (SEFSC).

Alternative 1 would continue the royal red shrimp endorsement requirement. This would require anyone with a federal Gulf commercial shrimp permit to also have a royal red shrimp endorsement to shrimp for royal red shrimp. These endorsements are available to anyone with a federal commercial shrimp permit. This alternative would continue to provide a readily accessible royal red shrimp database.

Alternative 2 would eliminate the requirement for a royal red shrimp endorsement; however, a federal Gulf commercial shrimp permit would still be required to harvest royal red shrimp. This would mean that an economic database specific to royal red shrimp would not be created unless the current survey was modified. This may hinder data collection in the future on this fishery. However, royal red shrimp landings are still collected.

Alternative 3 would require landings to be eligible to be issued a royal red shrimp endorsement. **Option a** is the minimum landings that have been recorded from a vessel in the past 5 years. **Options b** and **c** are larger values that indicate that the fisher is targeting royal red shrimp at least sometime during the year. In 2013, the landings for royal red shrimp were below 200,000 lbs of tails (GMFMC 2014). The maximum landings recorded for royal red shrimp (from the years 1962-2013) was 336,710 lbs of tails in 1994. **Alternative 3** would prevent new entrants into the fishery from gaining a royal red endorsement and would eliminate latent endorsements.

CHAPTER 3. REFERENCES

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