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Gulf Shrimp Fishery: Analytical requirements, program updates and reporting options

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Gulf Shrimp Analytical Requirements

4 types of shrimp data are required to complete a wide array of SEFSC/SERO outputs, including regulatory requirements & annual Council & industry requests:

- 1. Effort data**
- 2. Bycatch rates**
- 3. Landings data**
- 4. Additional data, for economic and regulatory analysis**

❖ **Note: please refer to the supporting document for specific parameters needed under each of the data types listed above**

Gulf Shrimp Analytical Requirements

Current data collections:

Bycatch rates

- Bycatch information is currently acquired through an observer program, intended to provide a representative estimate of the average catch per tow of sea turtles, red snapper, and other selected species
- Though current funding levels permit ~2% coverage of offshore trips, which leads to imprecise estimates of the take for most species

❖ Refer to the supporting document for specific parameters needed under each of the data types

Gulf Shrimp Analytical Requirements

Current data collections:

Landings, Economic, and Regulatory Data

- The landings, economic, and regulatory data are collected through dealer reported state Trip Tickets and/or annual Gear, Landings, and Economic Surveys
- The Gear, Landings, and Economic surveys are paper surveys, mailed annually to permit holders (i.e., not the most efficient)
- Shrimp landings are currently required to be submitted monthly on state Trip Tickets (as opposed to species like Gulf reef fish, Red Drum and Spiny Lobster, which get submitted weekly)

Gulf Shrimp Analytical Requirements & Program Updates

Current data collections:

Effort data

- Currently, tow-by-tow effort is derived from time-stamped GPS coordinates using 3G cellular electronic logbooks (cELBs)
- cELB coverage is less than 40% of the Gulf shrimp fleet
- Since 3G technology is being discontinued beginning January 1, 2021, **new shrimp effort data collection methods and reporting requirements are warranted**

❖ Refer to the supporting document for specific parameters needed under each of the data types

Dealer Permitting

- A Gulf shrimp dealer is a person who purchases shrimp from a vessel or person, that fishes for shrimp in the Gulf EEZ or in adjoining state waters, or that lands shrimp in an adjoining state
 - Currently, shrimp dealers are required by states to report monthly, but not electronically
 - Requiring federal shrimp dealers to have a GSAD permit and adhere to submitting weekly, electronic reports, would ensure NMFS receives timely and accurate shrimp data (e.g. blank market size category fields have increased in state reporting), and that SERO could enforce dealer reporting requirements
- ❖ [Refer to the supporting document for a detailed list of current dealer requirements](#)

A Review of Current Vessel Reporting (cELB Program)

- The unit of shrimp effort (used in various regs/requests) is days fished (where a day fished = 24 hrs of towing time) & is derived by an algorithm developed by LGL Ecological Associates
- cELB GPS data is transmitted electronically via 3G cellular signal to NMFS, establishing a 'trip' (start/stop) that can be matched to a state Trip Ticket using a 24 hour match window established in the algorithm. Match efficiency using the algorithm ranges from 50-80% across years
- Time-stamped GPS data, recorded at 10 minute intervals by the cELB are used in the algorithm to estimate vessel speed, which is then used to infer time spent trawling (i.e., effort in units of days fished)
- ❖ Unmatched trips do not get used in the effort estimation, and cELBs are mostly on offshore vessels. This may bias the estimate

Options for vessel reporting

SEFSC has established four possible options for vessel reporting moving forward.

The potential for each option to provide data sufficient to meet regulatory and analytical requirements is summarized in the following slides

Option 1: no vessel reporting

Requires: no effort data through vessel reporting

- Under option 1, analyses needing data types 1-4 could be based *only* on state Trip Ticket data, which appears to not capture all trips reported to NMFS and has less spatially explicit information (i.e., effort estimation would become inferior to even the status quo)
- Further, effort could only be estimated as total days at sea, which would be incomparable to historic units of effort used as the basis for various regulations (Shrimp Biological Opinion, NMFS 2014; Gulf Shrimp Amendment 14; Gulf Shrimp FMP)

Option 2 (A & B): GPS vessel reporting

In general, option 2 requires; “status quo” vessel reporting, where permitted shrimp vessels would need to electronically transmit time-stamped GPS data at 10 min intervals (or less), w/ the trip start/stop date and time, upon returning to port

With option 2A:

- In addition (to above), requires a Trip Ticket link (e.g. a Trip Ticket # transmitted with GPS report)
- Survey-level GPS reporting (e.g. currently 40% coverage) still requires an algorithm approach to derive effort, but the link would improve the match efficiency of the algorithm
- Survey-level reporting may still poorly reflect inshore fishing activity

With option 2B:

- In addition to the general requirements of option 2, would require census level coverage (i.e., 100%) of federally permitted shrimp vessels
 - A census provides greater coverage of inshore effort - important in various regulations (e.g. Turtle BiOp)
 - A census would improve the accuracy of total shrimp effort estimates, as no algorithm would be needed to estimate effort
 - With a census, there is no need to link to the state Trip Tickets to estimate effort. However, establishing a link to the Trip Ticket would allow for validation purposes

Option 3: Enhanced vessel reporting

Requires; (in addition to the requirements in option 2A or 2B), vessels to electronically report gear information upon returning to port

- Gear information is currently required to be reported annually via a 12 page, mailed, paper survey
- The electronic reporting application could be developed such that gear information could be saved - eliminating the need to update gear data (unless something changes), and then transmitted with the GPS and trip ticket # upon the vessel returning to port
- This option leads to more accurate gear data (i.e., trip-level) and would be more efficient than the paper survey

Option 4: Tow-by-tow vessel reporting

Requires: (in addition to the requirements in Option 3), vessels to electronically report landings in weight by shrimp species at a tow-by-tow level

- Currently effort is derived by matching cELB effort to trip ticket landings, where $\text{Effort} = \text{Catch} / \text{CPUE}$, and then CPUE gets distributed to area/stat zone using the SN pooling method (NMFS-SEFSC-300, 1992)
- With tow-by-tow landings, an exact measure of effort for each tow (by precise stat/depth zone) could be derived, improving the accuracy of effort estimates used in the Turtle BiOp and Red Snapper Bycatch analyses

Summary

- With 3G technology being discontinued at the end of 2020, a new shrimp data collection program and vessel reporting requirements are warranted
- For the Council's consideration, NMFS has presented 4 options for updating the current shrimp vessel reporting requirements
 - Option #1 would produce incomparable units of effort, and those estimates would be coarse and less accurate
 - Option #2A and B would achieve status quo vessel reporting, with refinements
 - Option #3-4 would provide enhanced vessel reporting, incrementally improving the accuracy of analytical outputs

Council Consideration

- The Council will need to pursue an Amendment if it chooses to make changes to the expiring cELB effort data collection program and/or to require shrimp dealer permits and all permitted shrimp dealers to submit weekly electronic reports to NMFS