

**SUPPORTING STATEMENT
SOUTHEAST REGION OFFICE SOCIOECONOMIC SURVEY OF GULF SHRIMP
FISHERMEN
OMB CONTROL NO.: 0648-0476**

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g. establishments, State and local governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.

The population of interest is all the vessels fishing for penaeid shrimp in the federal waters of the Gulf of Mexico, i.e. off the States of Texas, Louisiana, Mississippi, Alabama and Florida, during one calendar year. In contrast to prior efforts, there will be an excellent sampling frame available for this and future survey efforts, because starting in 2003 these vessels were required to have a federal permit. This sampling frame was not available earlier, which explains some of the difficulties the prior surveys encountered with successfully contacting respondents.

For the 2007 survey effort, the sampling frame will consist of all fishermen holding a federal shrimp permit anytime during 2006. Their contact information will be updated with the help of the new, ongoing moratorium permit application database. The population is separated into two subgroups, active and inactive vessels in the Gulf shrimp fishery. The groups will be identified with the help of the dealer database, which is a mandatory reporting requirement and hence should cover all shrimp transactions. This information will be available by April, 2007.

Starting March 27, 2007 any shrimp vessel fishing in the federal waters of the Gulf of Mexico will need to have a moratorium permit, and October 26, 2007 is the final day to apply for a moratorium permit. The survey efforts in 2008 and 2009 will rely entirely on this new database as the sampling frame and this should be a further improvement.

In total, we will sample 825 vessels in order to arrive at 600 completed surveys based on an expected overall response rate of 73%. Within the active group of vessels, we are aiming for 500 completed surveys, as most analyses will focus on this group. Based on other required surveys and reporting efforts in the region, we might expect a response rate somewhere between 70-90%. Assuming an 80% response rate will require contacting 625 vessels. Inactive vessels are clearly less important than the active ones for the majority of analyses. Yet little is known about these vessels in this fishery, so in order to explore this group and understand possible biases, we aim to collect 100 completed surveys from this group. Given that these vessels are *not fishing for Gulf shrimp*, we expect a larger segment of them to be permanently out of the industry and hence difficult to reach or not motivated to participate in our survey. Under these conditions we believe assuming a 50% response rate is more appropriate; requiring us to sample 200 vessels. In total, we will sample 825 vessels in order to arrive at 600 completed surveys, leading to an expected overall response rate of 73%.

Due to the management and political importance attributed to delineation by state, we will stratify each of the above groups of vessels by state. Within each stratum we will randomly sample vessels in proportion to each stratum's weight in the population. At this time the final sampling frame with stratification is not yet available. The final sampling frame will use all the information available just prior to the survey implementation. The previous, complex sampling design proved problematic in light of the low response rate. By sticking to a simple, straight forward design, we hope to avoid potential problems. A much better sampling frame and up-to-date contact information will also help.

Currently, the closest estimate of the final sampling frame consists of 2,666 vessels. Table 1 (attached below) breaks down this preliminary sampling frame into the strata, offers some descriptive data for the vessels in each, and generates the tentative number of respondents sampled and surveys completed in each. Of the 2,666 vessels, 1,806 were active in the Gulf shrimp fishery during 2005. Over two thirds of the active vessels hail from Texas and Louisiana. There is significant variation within the industry across various variables, but none seems to further divide the population into discrete groups (offering no advantage of further stratification). These numbers are unlikely to change much in 2006. For the 2008 and 2009 efforts, the actual number of permit holders and active participants in the fishery can change due to new entrants (until 10/07 if they qualify), owners and vessels leaving the fishery, or changes in vessel ownership and fisheries in which that vessel engages.

As mentioned in the introduction, the prior collections have met with little success. Due to a variety of factors, it was difficult to contact the fishermen. Further, fishermen outside of Texas did not cooperate with the effort. This forced us to fundamentally re-evaluate our approach and has led to the substantial changes requested in this document. The response rates for the voluntary, in-person interview data collections in Texas and the rest of the Gulf are reported in Table 2 (attached below).

2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.

Separately for active and inactive vessels, we will assign each vessel a random number generated by an advanced statistical program (Statistical Analysis System (SAS) or equivalent). We will then stratify the population by state and sort by the random numbers. In each stratum, a number of vessels at the top of the list will be proportionally sampled (see also table 1). Overall, the approach is equivalent to simple random sampling (proportional) within each strata and should require only simple adjustments to the inclusion probabilities used for the estimation of population means and other aggregate statistics (if non-response is significant or skewed across the strata). In the few cases where active and inactive boats might be collectively analyzed, the estimates will need to take account of the different inclusion probabilities of these two subpopulations.

The owner of each vessel selected will be contacted by mail. The letter will contain a cover letter, instructions, the two page survey instrument and a return envelope. They will be asked to

return the completed survey instrument to us in the enclosed, pre-paid envelope. If no response is received within 30 or 60 days, up to two further letters will be sent (including additional survey instruments). Finally, we will attempt to contact the remaining non-responders by phone shortly after the third mailing and urge them to return the survey. Information will not be collected during the phone call, and a further survey instrument will be sent – by mail or email – if requested.

After data entry, verification and cleaning, descriptive statistical analysis will be conducted on the relevant variables collected (costs and profits). Results will be reported by State and by other relevant post-stratifications (such as size of operation). The accuracy for the population level totals and means of the important variables should exceed the standard $\pm 5\%$ confidence interval at a 95% significance level. This level of accuracy would be the best ever collected on these variables in the shrimp fishery. Given the overall uncertainty inherent to policy assessments of economic conditions in fisheries and given the quality and accuracy of other data used, the standard accuracy should suffice. The accuracy of the results for larger subpopulations (>100 observations) will likely be significant as well.

Since the method being employed is new in this fishery; statistically meaningful data is urgently needed by the Council; and developments in this fishery have recently been occurring fast and are leading to large economic impacts, this data collection will be repeated annually for the first two or three years. The use of periodic instead of annual collection will be considered in the future. The burden on the public will depend on how frequently significant changes occur in this industry. Optimally, an annual survey with an adaptive sampling design could minimize this burden and yet retain the flexibility to generate timely and accurate data. Such advantages would need to be weighed against the administrative complexity and the required resources.

3. Describe the methods used to maximize response rates and to deal with nonresponse. The accuracy and reliability of the information collected must be shown to be adequate for the intended uses. For collections based on sampling, a special justification must be provided if they will not yield "reliable" data that can be generalized to the universe studied.

The central approach to maximizing the response rate is to make answering a very concise and simple survey a requirement for future permit renewal. The first cover letter will politely emphasize this point. The second and third reminder letters will be more explicit. Finally, the telephone call will also explain the consequences of not complying. The call has the further advantage of being a different mode of contact and should discover nonresponse due to an incorrect address. Given the potential loss of permit, we expect compliance from all fishermen wanting to continue to fish for shrimp in federal waters. The behavior by those who have left the fishery by the time of the survey, or are planning to leave it before their current permit expires, will not be influenced by the implicit threat. This is why we assume a lower response rate for inactive vessels. Since the data will be used primarily for assessments and predictions about future developments, under-reporting by individuals leaving the fishery is less problematic.

An excellent sampling frame, with recently updated contact information (through the ongoing moratorium permit registration), will help to reduce the non-contact component of non-response. Also, the study population has shifted somewhat; from offshore Gulf shrimp vessels to vessels fishing in federal waters. Vessels fishing federal waters are a subset of all offshore shrimp

fishing vessels and operate further from shore. This leads to an increase in the average size of surveyed operations, which should result in a higher ratio of “professional” fishermen who might be more likely to return a survey. At the conclusion of the survey, we will contact port agents (local federal employees who collect data and report from a limited area) and ask them for any information on non-responding vessels/individuals. Should non-response be a significant factor, we might even ask port agents to inquire themselves, and/or we will debrief a few (<10) individuals about reasons for not responding in order to establish potential non-response biases.

Beyond the above, we will take every action available to us to facilitate completing and returning the survey by the fishermen. General survey design techniques (Dillman method) and experience from the previous surveys will guide us. Noteworthy actions include:

- Timing of the survey during the slow shrimp fishing season (winter and spring) and following tax time, when business records are being consulted and financial concerns are “top of mind.”
- Conducting outreach in advance of the survey, including on NMFS and Council websites and through meetings, radio, shrimp association newsletters and the grapevine.
- Creating and disseminating together with the survey effort-specific outreach material (see Figure 1 for an example of the outreach material).
- Using plain language and translating the survey into “language” spoken by Gulf shrimp fishermen.

The statistical design and size of this sample survey will allow for valid generalizations of the results to the population and larger subpopulation levels. The anticipated accuracy of the results is discussed in more detail in the last question (part B, question 3).

4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.

We have drawn extensively on the experience generated by the very similar annual cost data collection effort in the Gulf finfish fishery (OMB Control No.: 0648-0016). Beyond consulting with Gulf shrimp fishery experts about the survey instrument and design (see questions 4 and 8), we have sent the survey instrument for review to port agents throughout the Gulf. The port agents’ proximity and familiarity with the Gulf fishery, especially their extensive contact with fishermen, makes their recommendations very valuable. They have advised us on the feasibility of collecting this data, the expected response, and the language on the survey instrument and raised useful questions.

5. Provide the name and telephone number of individuals consulted on the statistical aspects of the design, and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Individual consulted on the statistical aspects of the design:

James R. Waters, Ph.D.
National Marine Fisheries Service
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(252) 728-8710

Persons who will actually collect and analyze the information:

Christopher Liese, Ph.D.

National Marine Fisheries Service

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Table 1: Sampling Frame, Sampling Strata, Population Characterization, Response Rate and Sample Size

Active (68%)	State	Population	Population	Vessel Size	Vessel Refridg.	Vessel Construct.	Catch	Catch	Catch	Price	E(Completed Surveys)	E(Response Rate)	# to be Sampled
		Total	% of Active	Large*	Use Ice	Steel Hull	Total	Small Vessel	Large Vessel	Mean of Mean			
	TX	705	39%	96%	26%	94%	51,415	8,062	53,209	3.32	195	0.8	244
	LA	546	30%	57%	74%	74%	58,289	33,077	77,627	2.19	151	0.8	189
	MS	166	9%	80%	49%	87%	53,624	10,419	64,752	2.58	46	0.8	58
	AL	141	8%	63%	48%	65%	44,177	13,143	62,310	2.92	39	0.8	49
	FL	223	12%	89%	33%	33%	41,659	8,454	45,851	3.12	62	0.8	78
	Other	25	1%	100%	12%	80%	36,618	-	36,618	2.88	7	0.8	9
	Total	1,806	100%	79%	45%	77%	51,722	24,771	58,808	2.85	500		627

InActive (32%)	State	Population	Population	Vessel Size	Vessel Refridg.	Vessel Construct.	E(Completed Surveys)	E(Response Rate)	# to be Sampled
		Total	% of InActive	Large*	Use Ice	Steel Hull			
	TX	275	32%	75%	59%	68%	32	0.5	64
	LA	128	15%	62%	68%	74%	15	0.5	30
	MS	60	7%	47%	72%	58%	7	0.5	14
	AL	82	10%	50%	61%	49%	10	0.5	20
	FL	263	31%	39%	53%	18%	31	0.5	62
	Other	52	6%	90%	35%	65%	6	0.5	12
	Total	860	100%	59%	58%	51%	100		202

Note:
* Large = greater 60 foot
E() indicates expectation of.

Table 2: Past Response Rates

	Population	Sampled	Unreachable	Ineligible	Refused	Completed	Response Rate (raw)	Reachable	Refusal Rate
Texas	1,109	359	162	69	38	90	25.1%	54.9%	29.7%
Rest of Gulf	3,257	2,001	1,344	78	522	57	2.8%	32.8%	90.2%

Figure 1: Information material (draft)

**Your information is treated as
confidential.**

Your information will not be released.

**We are interested only in
industry-wide economic indicators.**

**Your information will be
combined with the information from
other fishermen.**

**With statistical methods
we will estimate industry averages and
industry totals.**

**The results of this research will be
made available to you.**

Why we need to Know

Fishery Managers need up-to-date information about the economic health of the Gulf shrimp fishery in order to make sound decisions, such as producing Fishery Management Plan Amendments that take account of the economic situation and contribution of this important industry.

Most importantly, we, the scientists collecting and analyzing this data, need to know the total profit (or loss) generated by the industry. This information enables us to calculate the value of the shrimp fishery to fishermen and to the nation. Other things we report to the Council, decision makers, fishermen and the public include:

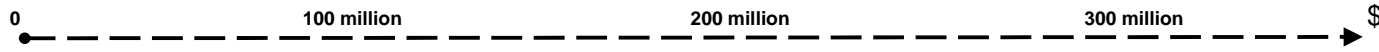
- Income shares of owners and crew *in the industry*
- Overall capital invested and total debt *in the industry*
- Financial risk *the industry* is exposed to
- The impact of fluctuating fuel and ice prices *on the industry*

There is no simple way to explain why we are asking the particular questions in the survey, since some business and accounting skills are needed. Our best attempt is inside this brochure. It looks more complicated than it is!

Annual Report of the Gulf Shrimp Fishery

Industry Income Statement:

Why we want to Know:



Total Shrimp Revenue (known)											
Fixed Costs			Variable Costs				Profit				
Depreciation	Annual Costs		Labor Costs		Trip Costs		Return to Owners' Time	Return to Owners' Net Equity		"Pure" Profit	
Depreciation	Overhead	Vessel & Gear Costs	Crew	Captain	Fuel	Ice	Other	Owners' captain's pay and salaries		Loan Principal Repaid	Investment in Vessel
(Q12a, Q14, Q15)			Q1	Q2	Q3	Q5	Q6	Q2 + Q9			

- ⇒ Economic understanding of the industry
- ⇒ To create models that predict the impact of proposed regulations
- ⇒ How is the industry affected by input **price changes**? What is the **crew's share** of the industry?

Q13c			(Q8)
Q10		Q7	

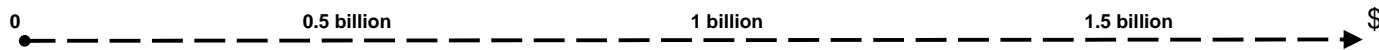
Q# is Survey Question collecting this information
 * () calculated indirectly from survey data

Most Important Result:



⇒ Overall Income can be used to calculate the **VALUE of the shrimp fishery** to fishermen and the nation. Very important for Resource Management.

Industry Balance Sheet



Total Capital Invested in Vessels (at Purchase Price) (Q12b)			
Capital Stock (in Vessels at Market Value) Q12a		Net of Cumulative Depreciation (-) and Re-Investment (+)	
Loans Q13a	Net Equity of Owners		
Insured Q11	Uninsured		

- ⇒ How much **capital** is invested in the industry?
- ⇒ How in **debt** is the industry?
- ⇒ How much **risk** is the industry exposed to?