6/10/2013

Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico

Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

Abbreviated Framework Action to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters

June 2013

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

FRAMEWORK ACTION TO ESTABLISH FUNDING RESPONSIBILITIES FOR THE ELECTRONIC LOGBOOK PROGRAM IN THE SHRIMP FISHERY OF THE GULF OF MEXICO

Including Regulatory Impact Review, Regulatory Flexibility Act Analysis, and Social Impact Assessment

Type of Action

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

Responsible Agencies and Contact Persons

Gulf of Mexico Fishery Management Council (Council)
2203 North Lois Avenue, Suite 1100
Tampa, Florida 33607
Carrie Simmons (Carrie.Simmons@gulfcouncil.org)

813-348-1630
813-348-1711 (fax)
gulfcouncil@gulfcouncil.org
http://www.gulfcouncil.org

National Marine Fisheries Service (Lead Agency)
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701
Susan Gerhart (Susan.Gerhart@noaa.gov)

727-824-5305
727-824-5308 (fax)
http://sero.nmfs.noaa.gov

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1. INTRODUCTION

1.1 Purpose and Need

The purpose of this action is to maintain the National Marine Fisheries Service's (NMFS) ability to monitor and document offshore effort for the Gulf of Mexico (Gulf) shrimp fleet through an electronic logbook (ELB) program. The need is to base conservation and management measures on the best scientific information available and to minimize bycatch to the extent practicable, as required by the Magnuson-Stevens Fishery Conservation and Management Act.

1.2 Background

The Gulf shrimp fishery is one of the nation's most economically valuable fisheries, and the most valuable fishery in the Gulf. The ELB program provides data on Gulf shrimp fishing effort that is critical to both the Gulf of Mexico Fishery Management Council (Council) and NMFS in performing annual assessments of the status of shrimp stocks. The ELB program is the best method to obtain shrimp effort data critical to assessing the status of shrimp stocks.

The ELB program is also a key component in the Council's red snapper rebuilding plan because accurate estimates of juvenile red snapper mortality attributable to the shrimp fishery are essential to the rebuilding plan. Time/area closures of the shrimp fishery would be implemented to reduce red snapper bycatch mortality if annual estimates of shrimp fishing effort exceed management caps established for juvenile red snapper habitat areas. This management strategy requires closures in the geographic areas where juvenile red snapper are most abundant, and the ELB program provides these estimates effectively and efficiently. If NMFS does not have a reliable way to estimate effort, they cannot effectively implement management measures, including potential closures.

Accurate estimates of shrimp fishing effort from the ELB program are also used to generate mortality estimates on a number of other species captured as bycatch in the shrimp fishery. Some of these species include overfished blacknose sharks, endangered and threatened species of sea turtles (green, hawksbill, Kemp's ridley, leatherback, and loggerhead), and endangered smalltooth sawfish. In particular the effort information from the ELB program is used to estimate and monitor incidental sea turtle takes. The NMFS historically used the number of hours actually spent fishing from interview data with vessel captains to develop reports as 24-hour days fished. These estimates were controversial and not well understood because the effort reported did not necessarily reflect the number of active vessels in the fleet. Implementation of the shrimp ELB program has provided much more accurate estimates of shrimp fishing effort. Without such effective monitoring, the conclusions in the governing biological opinion, as well as the ability to comply with the terms and conditions, would be undermined.

Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico United States Waters (GMFMC 2005) established the requirement for the ELB program. The program is administered by NMFS and is a cost effective way to accurately determine the amount and location of effort occurring in the shrimp fishery of the Gulf exclusive economic

zone (EEZ). Current regulations require participation in the ELB program, if selected by the Science and Research Director (SRD):

§ 622.51 Recordkeeping and reporting.
(a) Commercial vessel owners and operators--(1) General reporting requirement. The owner or operator of a vessel that fishes for shrimp in the Gulf EEZ or in adjoining state waters, or that lands shrimp in an adjoining state, must provide information for any fishing trip, as requested by the SRD, including, but not limited to, vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition (heads on/heads off), fishing areas and depths, and person to whom sold.
(2) Electronic logbook reporting. The owner or operator of a vessel for which a Federal commercial vessel permit for Gulf shrimp has been issued and who is selected by the SRD must participate in the NMFS-sponsored electronic logbook reporting program as directed by the SRD. In addition, such owner or operator must provide information regarding the size and number of shrimp trawls deployed and the type of bycatch reduction device (BRD) and turtle excluder device used, as directed by the SRD. Compliance with the reporting requirements of this paragraph (a)(2) is required for permit renewal.

Vessels selected to participate must carry data recording devices which are simple time-stamped global positioning system (GPS) units that record and hold a vessel's location at 10-minute time intervals. From these time-stamped locations, vessel speed between points can be estimated and then evaluated with mathematical algorithms (i.e., stopped, towing, moving between towing points). Thus, effort by location can be calculated for a given fishing trip. Shrimp catch data for the trip is then used to estimate catch-per-unit-effort for the trip at various fishing locations. Monthly shrimp effort estimates for various locations, time periods, or vessels are provided to NMFS each trimester (i.e., 4-month time period). Vessels selected for the program must also provide the size and number of shrimp trawls deployed for each set and the type of bycatch reduction device and turtle excluder device used. The NMFS will not allow renewal of permits for selected vessels that do not participate in the ELB program.

Continuation of the ELB Program
The NMFS' Southeast Fisheries Science Center (SEFSC) is currently exploring ways to improve and continue the shrimp ELB program. To date, NMFS has funded the deployment of ELB units on approximately 500 shrimp vessels, roughly one-third of the offshore fleet. The current contract with LGL Ecological Research Associates, Inc. (LGL) expired on March 31, 2013; an extension of the contract through the Gulf States Marine Fisheries Commission will continue the program until December 31, 2013. The program will lapse if additional funding is not available. However, units using more modern and efficient technology are now available that would not require a contract for NMFS to obtain and use. To continue the program, regardless of the equipment used, industry may need to share in the cost of the program.

In the process of exploring options for the ELB units, engineers from SEFSC found an off-the-shelf unit that could meet the objectives of the ELB program. The device would include the capability to capture and store vessel position every 10 minutes and transmit those data to agency servers via a cellular phone connection activated when the vessel is within non-roaming cellular range. This capability reduces handling costs of the current protocol, which requires a technician

to meet returning vessels to pull and program the memory card. However, SEFSC must hire a full-time programmer/data analyst because after the contract with LGL expires, SEFSC will assume full responsibility for data acquisition, management, analysis, and archiving for the data from the program. Other personnel from SEFSC will also contribute time working on the ELB program.

The SEFSC has obtained the new units and has begun programming and testing. The SEFSC staff are in the process of programming: 1) the units to acquire the desired positional data and store it until cell coverage is detected; 2) the communications package to transmit the data once a signal is detected; and 3) the server to receive and store the data. The deployment of the units is anticipated to happen in three phases:

1. Deploy units on NOAA, state, and possibly volunteer commercial vessels to field test the units, and continue software development.

2. Deploy units on shrimp vessels that are already carrying the current ELB to enable calibration of the two systems. This step is necessary to ensure the integrity of the shrimp effort time series. At this time, full calibration is scheduled beginning July 2013 on 10 vessels. Additional vessels may be equipped with the new ELB units for testing without data transmission.

3. Deploy units on 100% of the Gulf federally-permitted shrimp fleet in lieu of the existing system. After some period of time, reduce participation in the program to a sub-sample of vessels.

Funding Options

The shrimp ELB methodology and technology used in two previous contract actions were originally developed as prototypes by LGL, while the company was subcontracted to the Gulf and South Atlantic Fisheries Foundation, Inc. Funding for these contracts was through a series of financial assistance awards from NMFS. Since 2004, NMFS has covered the cost of the ELB program including the cost of the units. However, the contract with LGL has expired, and an extension through the Gulf States Marine Fisheries Commission will end December 31, 2013. Newer, more efficient and economical units are now available that have been purchased and implemented by NMFS without a contract to an external source.

Option 1. NMFS would fund the entire ELB program. This option would only be possible if funds are available to cover all costs in Table 1.1. The SEFSC does not have any direct designated funding to continue the ELB program. To support the program, funds would need to be shifted from other priority programs such as the observer programs or stock assessments, an unlikely and unreasonable scenario. Based on the current budget, the ELB program could not continue if this option is selected.

Option 2. Industry would fund the entire ELB program. This option could have an economic impact on fishermen, especially those with small-scale operations. In addition to the burden on a fishery already facing economic problems, collection of funds for software development and data analysis would be logistically difficult. Support could come from other funding sources, such as

the Natural Resource Damage Assessment (NRDA), or states could use funding from their portion of the fines they may receive under the Clean Water Act as a result of the RESTORE Act. In October 2012, the Council sent a letter to the National Oceanic and Atmospheric Administration supporting proposals submitted to the NRDA program that would contribute funding to the shrimp ELB program.

Industry representatives have indicated they would prefer to continue the current ELB program administered by LGL. If industry fully funds the program, they could choose either program. In either case, the number of vessels required to participate in the program would be determined by program managers using the same statistical methods as in the past. However, all fishermen who opt to join that program will be required to contribute their share of funding, regardless of whether they are chosen to participate. For the new ELB program, industry would be responsible for one-time and annual industry costs as well as annual agency costs from Table 1.1 (agency one-time costs have already been incurred). For the old ELB program, industry would be responsible for the cost of that program, estimated at approximately $1 million. Please see Chapter 2 for cost analysis under various scenarios.

If industry chooses to continue the old ELB program, they would need a third party trustee (e.g., Gulf and South Atlantic Fisheries Foundation, Inc.) to renew the contract with LGL. With either the NMFS program or the LGL program, a third party trustee would also be needed to collect funds from vessels owners. The trustee would be required to submit a list of participating vessels before the beginning of each fishing year. If a vessel owner does not pay their share of the cost, or if a vessel owner is selected and refuses to participate, the trustee must notify NMFS within 45 days of delinquency and the vessel would then be in violation of federal regulations. The trustee may charge a fee to cover overhead costs.

Option 3. NMFS and industry would share the cost of the ELB program. A logical division of costs would be for NMFS to cover the software development, data storage, effort estimation analysis, and archival activities, and for the fishing industry to cover the costs of installing and maintaining the units and the cost of data transmission from the units to a NOAA server. This division of costs is the same as for the Gulf reef fish vessel monitoring system (VMS) program. The VMS program has covered the initial costs to purchase the new ELB units for each of the shrimp permit holders in the Gulf. Vessel owners would only pay the installation, maintenance, and transmission costs. It is also possible, similar to Option 2, industry or the Council could arrange funding from other sources.

Currently, a subset of the Gulf shrimp permit holders has been selected to participate in the ELB program, but more accurate data could be obtained by including all permit holders. With a cost sharing program, this would also be fairer because all permit holders would be obligated for the industry share of the costs, instead of only the selected group. As of May 31, 2013, 1,525 vessels have federal Gulf shrimp permits, although only 70% are estimated to be active in a given year. Table 1.1 shows the estimated one-time and annual costs to NMFS and the fishing industry for the new system under this cost sharing scenario.

Table 1.1. Maximum estimated costs to NMFS and the shrimp industry for the proposed Electronic Logbook Program. Fleet-wide values are based on 1,500 vessels; however, 1) fewer vessels are actually active in the fishery and 2) not all vessels may be selected every year.

Activity	One-time Costs			Annual Costs		
	Agency[1]	Industry		Agency	Industry	
		Per Vessel	Fleet-wide		Per Vessel[2]	Fleet-wide
Contract extension until December 2013[3]	$800,000					
System program development	$100,000					
New programmer/analyst				$130,603		
Other NMFS Salary				$183,188		
ELB unit purchase	$1,100,000[4]					
Unit installation		$200	$300,000			
Data transmission fees					$720	$1,080,000
Total	$2,000,000	$200	$300,000	$313,791	$720	$1,080,000

1 All agency one-time costs have already been incurred.
2 Does not include repair/replacement cost for ELB unit. Please see Chapter 2 for details.
3 Contract with LGL through Gulf States Marine Fisheries Commission.
4 Includes unit, antenna, case, and USB and SD cards

CHAPTER 2. REGULATORY IMPACT REVIEW

2.1 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 proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866. This RIR analyzes the expected economic effects of a proposed framework action to continue the electronic logbook program (ELB).

2.2. Problems and Objectives

The purpose of this action is to maintain the National Marine Fisheries Service's (NMFS) ability to monitor and document offshore effort for the Gulf of Mexico (Gulf) shrimp fleet through an ELB program. The need is to base conservation and management measures on the best scientific information available and to minimize bycatch to the extent practicable, as required by the Magnuson-Stevens Fishery Conservation and Management Act. The ELB program is a very effective method of obtaining shrimp effort data critical to assessing the status of shrimp stocks as well as monitoring bycatch and bycatch mortality, particularly of juvenile red snapper. Accurate estimates of juvenile red snapper mortality attributable to the shrimp fishery are essential to the red snapper rebuilding plan.

2.3 Description of the Fishery

2.3.1 Introduction

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 2005); Shrimp Amendment 14/Reef Fish Amendment 27 (GMFMC 2007); Regulatory Impact Review and Regulatory Flexibility Act Analysis for Making Technical 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)]. The following provides updates of selected characteristics of the Gulf shrimp fishery.

2.3.2 Gulf Shrimp Fishery

Landings and Revenues

The Gulf shrimp fishery consists of three major sectors: harvesting sector, dealer/wholesaler sector, and processing sector. The current update focuses mainly on the harvesting sector, primarily because the ELB program directly affects vessels participating in the Gulf shrimp fishery.

The harvesting sector is composed of two types of fleet: 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 exclusive economic zone (EEZ). Subsequently, a moratorium on the issuance of new federal shrimp permit was established in 2007. Currently, vessels must possess a shrimp moratorium permit (SPGM) when fishing for penaeid shrimp in the Gulf EEZ.

The management unit of the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters (FMP) consists of brown, white, pink, and royal red shrimp. Seabobs and rock shrimp occur as incidental catch in the fishery. GMFMC (1997) described a number of additional species of primarily vertebrate finfish and invertebrates that are taken as bycatch. Total landings of shrimp in the last ten years (2003-2012) average at about 144 million pounds, heads off, with an ex-vessel value of approximately $395 million in 2011 dollars (Tables 1 and 2). Current values were adjusted for inflation using the consumer price index[1]. It is noted that these shrimp landings exclude shrimp for bait.

Brown shrimp has historically been the most important species in the U.S. Gulf shrimp fishery with principal catches made from June through October. The fishery extends offshore to about 40 fathoms. On average, brown shrimp has accounted for about 47.2% of total shrimp landings and 44.6% of total ex-vessel revenues in the last ten years (2003-2012).

White shrimp are found in near shore waters to about 20 fathoms from Texas through Alabama. There is a small spring and summer fishery for overwintering individuals, but the majority is taken from August through December. Historically, white shrimp has come in second to brown shrimp in landings and ex-vessel value. In the last ten years, this species has equaled or exceeded brown shrimp in landings or ex-vessel values. On average, this species has accounted for 46.8% of total shrimp landings and 49% of total ex-vessel values.

Pink shrimp, the third most important shrimp species, are found off all Gulf states but are most abundant off Florida's west coast and particularly in the Tortugas grounds off the Florida Keys. Most landings are made from October through May. In the northern and western Gulf states, pink shrimp are landed mixed with brown shrimp and are usually counted as browns. Most catches are made within 30 fathoms. On average, this species has accounted for 4.4% of total shrimp landings and 5.4% of ex-vessel revenues.

[1] 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/].

The commercial fishery for royal red shrimp has expanded in recent years with the development of local markets. This deep-water species is most abundant on the continental shelf from about 140 to 275 fathoms east of the Mississippi River. On average, this species has accounted for less than 1% of total shrimp landings and ex-vessel revenues.

The three principal species (penaeids) are short-lived and provide annual crops; however, royal red shrimp live longer, and several year classes may occur on the grounds at one time. The condition of each shrimp stock is monitored annually, and none has been classified as being overfished for over 40 years.

Table 2.1. Landings (pounds heads off) of shrimp from the Gulf of Mexico, 2003-2012.

	All Species	Brown (%)	White (%)	Pink (%)	Royal R (%)	Others (%)
2003	161,084,457	52.2%	37.9%	6.2%	0.2%	3.5%
2004	162,396,265	45.9%	44.9%	6.3%	0.2%	2.7%
2005	135,437,307	43.3%	48.3%	6.5%	0.1%	1.8%
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	156,438,862	48.4%	48.2%	3.0%	0.1%	0.4%
2010	112,200,683	40.4%	53.2%	5.2%	0.1%	1.0%
2011	138,511,940	52.8%	42.2%	3.4%	0.1%	1.4%
2012	132,201,551	45.6%	50.9%	2.7%	0.1%	0.7%
Average	144,142,440	47.2%	46.8%	4.4%	0.1%	1.4%

Source: NMFS GSS, James Primrose, pers. comm., 2013.

Table 2.2. Ex-vessel revenues (2011 dollars) from Gulf of Mexico shrimp fishery landings, 2003-2012.

	All Species	Brown (%)	White (%)	Pink (%)	Royal R (%)	Others (%)
2003	440,572,201	49.5%	39.3%	8.2%	0.3%	2.7%
2004	432,939,094	42.1%	48.3%	8.2%	0.3%	1.1%
2005	404,159,790	42.4%	49.0%	7.8%	0.2%	0.6%
2006	437,800,995	44.7%	48.2%	6.4%	0.2%	0.4%
2007	384,551,411	48.3%	48.0%	3.1%	0.3%	0.3%
2008	375,675,082	40.0%	55.4%	4.1%	0.2%	0.3%
2009	329,298,052	45.0%	50.2%	4.4%	0.3%	0.2%
2010	339,753,648	41.6%	52.5%	5.3%	0.2%	0.4%
2011	430,460,385	46.6%	48.4%	3.7%	0.3%	1.0%
2012	373,228,923	45.0%	51.2%	3.4%	0.3%	0.2%
Average	394,843,958	44.6%	49.0%	5.4%	0.3%	0.7%

Source: NMFS GSS, James Primrose, pers. comm., 2013.

Selected Characteristics of Participating Vessels in the Shrimp Fishery

Selected characteristics of participation in the Gulf shrimp fishery in 2006 through 2010 are summarized in Table 2.3. 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. About 25% to 30% of active vessels are permitted vessels (vessels with SPGM permit). Despite being fewer in number, permitted vessels have accounted for the majority of shrimp landings and

revenues 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 2010.

Table 2.3. Selected characteristics of participation in the Gulf shrimp fishery, 2006-2010.

	2006	2007	2008	2009	2010
Number of active vessels	4,889	4,678	4,121	4,725	4,495
Permitted vessels (%)	30%	30%	30%	26%	25%
Non-permitted vessels (%)	70%	70%	70%	74%	75%
Number of permitted vessels*	1,919	1,915	1,890	1,707	1,628
Active (%)	85%	72%	65%	71%	70%
Inactive (%)	15%	28%	35%	29%	30%
Total shrimp landings (million lbs, heads off)	182	141	119	157	112
Total revenues (million 2011 dollars)	$436	$388	$374	$329	$340
Permitted vessels (% landings)	70%	66%	68%	69%	63%
Permitted vessels (% revenues)	78%	77%	78%	77%	74%

*The number of 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.
Source: Liese et al. Various years. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

2.3.3 Economic and Financial Characteristics of Federally Permitted Shrimp Vessels

The following descriptions are solely based on a series of annual reports on the economics of the federal Gulf shrimp fishery for the years 2006 through 2010 (Liese et al., various years). 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 2011 report is yet to be completed and the 2012 data are presently being collected and processed.

The type of economic data the survey collected 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[2].

A balance sheet, which is a snapshot of a company's financial condition, has three parts: assets, liabilities, and the owner's equity. The asset side of a balance sheet lists all assets of a company (e.g., market value of the vessel) and the liability side lists the various sources of money invested to acquire these assets (e.g., loans). Equity is the difference between assets and liabilities.

[2] For more detailed descriptions of these three financial statements, see Liese et al. 2009. 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.

A cash flow statement shows a company's inflow and outflow of money. The difference between inflow and outflow---the net cash flow---reflects the vessel owner's liquidity or solvency and is useful in determining the short-term viability of a company.

An income statement, sometimes called the profit and loss statement, is intended to help owners and investors determine the true economic performance of a company over a specified period of time.

To provide various perspectives on vessel performance, vessels are grouped into three categories/fleets, which are not necessarily mutually exclusive (i.e., a vessel may fall into two or more categories). The categories are: 1) Total permitted fleet: Commercial fishing vessels holding a federal Gulf shrimp permit; 2) Active Gulf shrimp fleet: Commercial shrimp vessels reporting landings in the Gulf shrimp fishery; and, 3) Inactive Gulf shrimp fleet: Idle commercial shrimp vessels not fishing in the particular year.

The year 2010 was unique for the operations of many shrimp vessels in the Gulf due to the Deepwater Horizon MC252 (DWH) oil spill. 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. To address this issue, two financial statements are presented for 2010, one (2010C) focuses only on commercial fishing and the other (2010D) includes DWH-related costs and revenues.

Total Permitted Fleet

The average vessel in this fleet shows a fair amount of equity that, except for a dip in 2007, rose through the years (Table 2.4). This resulted from a combination of an increasing market value of the asset (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. Revenues from shrimp were the major source of cash inflows, whereas fuel and labor (crew and hired captain) costs were the top sources of cash outflows.

The income statement reflects the fragile financial condition of an average permitted shrimp vessel. Net revenues from fishing operations were generally negative. As is true of most averages, many shrimp vessels deviated from the average and were profitable. With the exception of 2006, net receipts from non-operating (non-fishing) activities did not materially reverse the losses from fishing operations. Variable costs accounted for a majority of expenses, and within the variable cost category, about two-thirds were non-labor costs (mainly fuel cost).

A very different financial scenario characterized the average shrimp vessel when including DWH-related activities, as depicted in the last column (2010D) of Table 2.4. These activities materially affected the cash flow and income statement of the average vessel. Net cash flow was significantly positive — about five times the highest net cash flow which occurred in 2006. In addition, the bottom line profit (net revenue before tax) was about 30 times the highest profit which also occurred in 2006.

Table 2.4. Economic and financial characteristics of vessels with federal shrimp permits (SPGM), 2006-2010.

Year	2006	2007	2008	2009	2010C	2010D
Number of observations	484	505	497	427	429	429
Balance Sheet						
Assets	198,234	218,225	213,952	219,459	237,504	237,504
Liabilities	103,267	92,588	74,325	64,189	51,440	51,440
Equity	94,966	125,638	139,627	155,270	186,065	186,065
Cash Flow						
Inflow	256,753	212,460	224,311	222,434	214,489	346,878
Outflow	237,210	218,732	219,782	213,765	212,457	248,378
Net cash flow	19,542	(6,272)	4,530	8,670	2,033	98,500
Income Statement						
Revenue (commercial fishing operations)	243,856	205,103	221,574	217,868	212,568	---------
Expenses	246,743	224,033	226,624	217,109	214,256	249,295
Variable costs – Non-labor	124,852	110,896	121,697	108,772	102,843	105,701
Variable costs – Labor	63,906	56,456	57,336	58,837	61,920	81,270
Fixed costs	57,985	56,904	47,591	49,501	49,493	62,324
Net revenue from operations	(2,886)	(18,931)	(5,050)	759	(1,688)	---------
Net receipts from non-operating activities	5,848	860	(2,124)	479	---------	---------
Net revenue before tax (profit or loss)	2,961	(18,071)	(7,174)	1,238	(2,480)	94,279

Notes: 2010C includes commercial fishing only; 2010D includes DWH-related revenues/costs.
Parentheses indicate negative values and all values are averages in 2011 dollars.
Source: Liese et al. Various years. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

Active Gulf Shrimp Fleet

This fleet includes permitted vessels actively fishing in the Gulf shrimp fishery. This fleet is a subset of the Gulf shrimp fleet by excluding vessels that did not commercially fish in a given year.

The average vessel in this fleet also exhibits steadily increasing equity over time, with a relatively large gain in 2010 from the year before (Table 2.6). Asset values neither increased substantially nor were they steadily increasing over the 2006-2010 period. Meanwhile, liabilities fell steeply, by more than one-half, from 2006 to 2010.

Unlike the total permitted fleet, but similar to the Gulf shrimp fleet, the average vessel's net cash flow turned negative in two out of five years. In terms of magnitudes, the average vessel's positive net cash flows were lower while negative net cash flows were higher than those of the average vessel in the total permitted fleet. Net cash flows for the average vessel in this fleet were generally higher than those in the Gulf shrimp fleet.

Like the Gulf shrimp fleet, the average vessel in this fleet exhibits negative net revenues and profits for all years. Except for 2007, losses from operations for an average vessel in this fleet were lower than those of the Gulf shrimp fleet but higher than those of the total permitted fleet. After adding in net receipts from non-operating activities, losses for the average vessel in this fleet were higher than those of the Gulf shrimp fleet in three out of five years and higher than those of the total permitted fleet in all years.

As in the case of the total permitted and Gulf shrimp fleets, DWH-related activities materially altered the financial condition of the average vessel in this fleet (column 2010D of Table 2.5). Net cash flow and bottom line profit (net revenue before tax) were significantly higher than their highest levels in previous years. The average vessel in this fleet had about the same level of net cash flow and bottom line profit as the total permitted fleet but slightly lower than the Gulf shrimp fleet.

Table 2.5. Economic and financial characteristics of vessels with federal shrimp permits (SPGM) reporting landings (active) in the Gulf shrimp fishery, 2006-2010.

Year	2006	2007	2008	2009	2010C	2010D
Number of observations	386	388	383	348	332	332
Balance Sheet						
Assets	215,274	201,808	191,858	203,941	216,102	216,102
Liabilities	116,707	101,956	71,875	68,999	52,327	52,327
Equity	98,568	99,852	119,982	134,943	163,774	163,774
Cash Flow						
Inflow	289,698	241,658	250,724	241,875	242,049	375,192
Outflow	271,595	248,132	247,028	235,631	242,831	276,283
Net cash flow	18,103	(6,473)	3,695	6,244	(782)	98,909
Income Statement						
Revenue (commercial fishing operations)	274,455	232,929	247,388	236,363	239,894	---------
Expenses	282,744	254,228	256,442	239,898	244,453	276,891
Variable costs – Non-labor	145,896	134,741	145,146	125,706	124,182	127,093
Variable costs – Labor	71,534	60,761	62,059	60,934	66,491	85,282
Fixed costs	65,314	58,473	49,237	53,257	53,535	64,516
Net revenue from operations	(8,289)	(21,299)	(9,054)	(3,534)	(4,560)	---------
Net receipts from non-operating activities	7,277	1,253	(1,429)	1,076	---------	---------
Net revenue before tax (profit or loss)	(1,012)	(20,045)	(10,483)	(2,459)	(5,264)	94,849

Notes: 2010C includes commercial fishing only; 2010D includes DWH-related revenues/costs.
Parentheses indicate negative values and all values are averages in 2011 dollars.
Source: Liese et al. Various years. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

Inactive Gulf Shrimp Fleet

This fleet consists of idle vessels or vessels not commercially fishing in a particular year. The level of equity for the average vessel in this fleet may be much lower than that of the other fleets, but it still appears to be a relatively good amount (Table 2.6). The value of the vessel is much lower but so is the liability. Equity for the average vessel in this fleet more than doubled in 2007 but subsequently lost more than half its value the following year. Equity did recover in the succeeding years although the 2010 level was still lower than the 2007 level.

Net cash flows for the average vessel in this fleet were negative throughout the 2006-2010 period. Because vessels in this fleet did not commercially fish, fishing revenues, which are the major source of cash inflow, were virtually non-existent. Cash inflows mostly came in the form of government payments. Vessel repairs, maintenance, and overhead costs were the major sources of cash outflows.

Negative net operating revenues and profits, which characterize the average vessel in this fleet, can generally be expected of inactive vessels, because revenues are virtually non-existent while costs, particularly fixed costs, continue to be incurred. A vessel with the type of income statement as depicted in Table 2.6 cannot remain inactive for long.

Similar to the case with the other fleets, the financial condition of the average vessel in this fleet materially changed with the inclusion of DWH-related activities (column 2010D of Table 2.6). Net cash flow and bottom line profit (net revenue before tax) were significantly higher than their highest levels in previous years. The average vessel in this fleet recorded the highest levels of net cash flow and bottom line profit among all fleets in 2010.

Table 2.6. Economic and financial characteristics of vessels with federal shrimp permits (SPGM) that were idle or not fishing, 2006-2010.

Year	**2006**	**2007**	**2008**	**2009**	**2010C**	**2010D**
Number of observations	**69**	**89**	**80**	**54**	**71**	**71**
Balance Sheet						
Assets	84,391	123,509	79,772	85,433	124,547	124,547
Liabilities	23,691	10,497	26,389	17,406	27,007	27,007
Equity	60,700	113,012	53,384	68,027	97,540	97,540
Cash Flow						
Inflow	4,104	2,270	648	413	1,460	167,659
Outflow	12,513	12,560	10,393	8,586	3,877	61,819
Net cash flow	(8,410)	(10,290)	(9,745)	(8,173)	(2,418)	105,840
Income Statement						
Revenue (commercial fishing operations)	591	387	56	10	0	---------
Expenses	13,307	12,161	9,982	8,894	5,144	61,667
Variable costs – Non-labor	2,675	936	90	178	118	3,885
Variable costs – Labor	772	207	130	36	154	26,578
Fixed costs	9,847	11,030	9,763	8,680	4,871	31,203
Net revenue from operations	(12,716)	(11,774)	(9,927)	(8,883)	(5,144)	---------
Net receipts from non-operating activities	2,249	1,098	(173)	(205)	---------	---------
Net revenue before tax (profit or loss)	(10,467)	(10,676)	(10,099)	(9,089)	(3,696)	105,181

Notes: 2010C includes commercial fishing only; 2010D includes DWH-related revenues/costs.
Parentheses indicate negative values and all values are averages in 2011 dollars.
Source: Liese et al. Various years. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.

2.4. Economic Effects of Funding Alternatives

The proposed action is to continue the ELB program. The benefits of this program in improving the estimation of effort in the Gulf shrimp fishery are documented in several studies (e.g., LGL Ecological Research Associates, Inc., 2012; Nance et al., 2008; Cole et al., 2006; Gallaway et al., 2003). The ELB-enhanced effort estimation in the Gulf shrimp fishery has been vital in assessing the status of the shrimp stock as well as in estimating bycatch, particularly of juvenile red snapper. Improved effort estimation in the Gulf shrimp fishery has enabled the design of conservation and management measures based on valid scientific information.

No other alternative to the ELB program has been considered. However, alternatives considered for the current purpose refer to the program's funding. There are three funding options: 1) NMFS would fund the entire ELB program; 2) the industry would fund the entire ELB program; and 3) NMFS and the industry would share the funding of the ELB program.

There are three key issues about funding and the nature of the ELB program. First, the federal government, through a contract with LGL, has been funding the ELB program since 1999 when pilot studies were conducted. The NMFS, through a contract with LGL, has administered the ELB program when it was established under Amendment 13 to the Shrimp FMP (GMFMC 2005). At present, roughly 500 ELB units are deployed on 500 shrimp vessels in the Gulf. The contract with LGL expired on March 31, 2013 but has been extended through December 2013 at a cost of about $800,000 through a grant to the Gulf State Marine Fisheries Commission. Contract funding will cease after December 2013. The NMFS has determined that continuing the ELB program necessitates the deployment of new ELB units using more modern and efficient technology that would not require entering into a contract with a third party. These new units are capable of capturing and storing vessel position every 10 minutes and transmitting those data to NMFS servers via a cellular phone connection. This connection is activated when the vessel is within non-roaming cellular range. For this purpose, NMFS has already secured 1,500 ELB units at a total cost of $1.1 million and developed the necessary systems program at a cost of $100,000. The NMFS has completed testing the new unit on NOAA vessels. Subsequently the new units would be deployed on 50 vessels that presently carry the old ELB units for calibration of the two systems. Finally, the new units would be deployed on all permitted shrimp vessels (currently estimated at about 1,500 vessels). Second, industry representatives have indicated that if the shrimp industry were to fully fund the ELB program, it would prefer to do so through the continuation of the existing ELB program, presumably through LGL. The NMFS has estimated that the cost of continuing the current ELB program, with about 500 ELB units deployed, is currently about $975,000 annually. The cost is expected to increase with the deployment of more than 500 ELB units. Third, NMFS has already expended for some items of the new ELB program, and thus the following may be considered sunk costs: $1.1 million for 1,500 ELB units and $100,000 for system program development.

Noting the key issues discussed, the following funding scenarios emerge: 1) NMFS cannot fund the entire ELB program, either using the old or new units, due to lack of funds; 2) the industry would fund the entire ELB program by continuing the existing program or by switching to the new program; and, 3) NMFS and the industry would share the funding of the new ELB program.

Since the total cost of the ELB program partly depends on the number of ELB units deployed, several cost scenarios are presented in Table 2.7.

Table 2.7. Cost scenarios for the ELB program.

Scenario	ELB Units	Cost Item	Costs		
			One-Time	Annual	Periodic[2]
S-1	500	Old ELB program *Entire program* *Unit replacement @ $425 per unit*		$975,000	$21,250
S-2	500	New ELB program *Unit installation @ $200 per unit* *Data transmission @ $720 per unit* *Program management* *Unit replacement @ $425 per unit*	$100,000	$360,000 $313,791	$0[3]
S-3	1,050[1]	New ELB program *Unit installation @ $200 per unit* *Data transmission @ $720 per unit* *Program management* *Unit replacement @ $425 per unit*	$210,000	$756,000 $313,791	$0[3]
S-4	1,500	New ELB program *Unit installation @ $200 per unit* *Data transmission @ $720 per unit* *Program management* *Unit replacement @ $425 per unit*	$300,000	$1,080,000 $313,791	$63,250

[1]Deployment of ELB units only on active vessels, assumed to be 70% of 1,500 total permitted vessels.
[2]Assumes a 10% unit breakdown rate every 5 years.
[3]Cost is zero because of available extra units already purchased by NMFS.

A few explanations are in order regarding some of the cost items in Table 2.7. First, the distinction between old and new ELB program pertains mainly to the type of the ELB unit used. Second, it is almost inevitable for an electronic equipment, such as the ELB unit, to break down due to a variety of reasons. Any component of the unit, or the entire unit itself, may malfunction. It is difficult to forecast the number of units, or parts thereof, which may break down. For the current purpose, the whole unit, instead of just parts of it, would be replaced assuming a 10% breakdown rate every 5 years. The replacement cost of $425 per unit may be considered a minimum. Third, the number of active vessels is assumed to be 70% of total permitted vessels. As shown earlier in Table 2.3, the number of active vessels during 2006-2010 ranged from 65% to 85%, so the 70% participation rate is in the middle of this range. Indeed, the number of active shrimp vessels has declined over the years as also shown in Table 2.3. Coupled with the likelihood that the total number of permitted vessels has also declined, the total number of active permitted vessels in the Gulf shrimp fishery may be lower than that used in S-3. Fourth, the total unit replacement costs under scenarios S-2 (50 units) and S-3 (105 units) may be considered zero because extra units are available because NMFS purchased 1,500 ELB units. It should be noted, however, that the individual vessels under S-2 and S-3 may vary from year to year.

If the industry were to fund the entire ELB program, shrimp fishermen would have to incur all the costs identified in Table 2.7 under each cost scenario. If NMFS and the industry were to

share the cost of the ELB program, NMFS has indicated it could afford only the cost of program management. As mentioned earlier, S-1 would continue the old ELB program for which NMFS does not have the necessary funds. It is also worth reiterating here that NMFS has already expended about $1.2 million for securing 1,500 ELB units, including system program development.

Industry Costs of the ELB Program

The annual and the five-year total cost to the industry of funding the ELB program are shown in Table 2.8. A five-year period is chosen to accommodate non-annual costs, such as the one-time cost on the first year of the program and the unit replacement cost on the fifth year of the program. A shorter (at least more than one year) or longer period could also be chosen, but it is likely to provide the same insights as the five-year period. Although an ELB unit can malfunction at any time during the five-year period, all replacements are assumed to occur on the fifth year of the program for simplicity of cost accounting. For the sole purpose of comparing costs, S-1 may be considered as a benchmark.

For the same number of ELB units deployed, S-2 would cost the industry less than S-1 even if the industry were to shoulder the entire cost of the program. If the ELB units were deployed only on active vessels (S-3), costs to the industry would be less under a cost-sharing structure; otherwise, costs to the industry would be higher. Only when the ELB program includes all permitted vessels (S-4) will the costs to the industry be higher even under a cost-sharing structure.

During 2006-2010, the share of total revenues from Gulf shrimp accounted for by vessels with federal shrimp permit ranged from 63% to 85%, or about $214 million to $340 million in 2011 dollars (see Table 2.3). Keeping this annual range of revenues constant over a five-year period would yield total revenues of about $1,071 million to $1,700 million. At the low end of this revenue range, the industry's cost of funding the entire ELB program as a percent to total revenues would be around 0.46% under S-1, 0.32% under S-2, 0.52% under S-3, and 0.68% under S-4. With NMFS and the industry sharing the cost of ELB program, the corresponding percentages would 0.46% under S-1, 0.18% under S-2, 0.37% under S-3, and 0.54% under S-4. At the high end of the revenue range, the corresponding percentages if industry were to fund the entire ELB program would be 0.29% under S-1, 0.20% under S-2, 0.33% under S-3, and 0.43% under S-4. With cost sharing, the corresponding percentages would be 0.29% under S-1, 0.11% under S-2, 0.23% under S-3, and 0.34% under S-4. In sum, the industry's cost of the ELB program would be less than 1% of total revenues from Gulf shrimp generated by federally permitted vessels whether or not NMFS and the industry would share the cost of the ELB program.

Table 2.8. Industry cost of funding the ELB program over 5 years.

	Without Cost Sharing				With Cost Sharing			
	Cost Item				Cost Item			
	One-time	Annual	Periodic	TOTAL	One-time	Annual	Periodic	TOTAL
S-1: Old ELB Program with 500 ELB Units Deployed								
Year 1	$0	$975,000	$0	$975,000	$0	$975,000	$0	$975,000
Year 2	$0	$975,000	$0	$975,000	$0	$975,000	$0	$975,000
Year 3	$0	$975,000	$0	$975,000	$0	$975,000	$0	$975,000
Year 4	$0	$975,000	$0	$975,000	$0	$975,000	$0	$975,000
Year 5	$0	$975,000	$21,250	$996,250	$0	$975,000	$21,250	$996,250
TOTAL	$0	$4,875,000	$21,250	**$4,896,250**	$0	$4,875,000	$21,250	**$4,896,250**
S-2: New ELB Program with 500 Units Deployed								
Year 1	$100,000	$673,791	$0	$773,791	100,000	$360,000	0	460,000
Year 2	$0	$673,791	$0	$673,791	$0	$360,000	$0	$360,000
Year 3	$0	$673,791	$0	$673,791	$0	$360,000	$0	$360,000
Year 4	$0	$673,791	$0	$673,791	$0	$360,000	$0	$360,000
Year 5	$0	$673,791	$0	$673,791	$0	$360,000	$0	$360,000
TOTAL	$100,000	$3,368,955	$0	**$3,468,955**	$100,000	$1,800,000	$0	**$1,900,000**
S-3: New ELB Program with 1,050 Units Deployed								
Year 1	$210,000	$1,069,791	$0	$1,279,791	$210,000	$756,000	$0	$966,000
Year 2	$0	$1,069,791	$0	$1,069,791	$0	$756,000	$0	$756,000
Year 3	$0	$1,069,791	$0	$1,069,791	$0	$756,000	$0	$756,000
Year 4	$0	$1,069,791	$0	$1,069,791	$0	$756,000	$0	$756,000
Year 5	$0	$1,069,791	$0	$1,069,791	$0	$756,000	$0	$756,000
TOTAL	$210,000	$5,348,955	$0	**$5,558,955**	$210,000	$3,780,000	$0	**$3,990,000**
S-4: New ELB Program with 1,500 Units Deployed								
Year 1	$300,000	$1,393,791	$0	$1,693,791	$300,000	$1,080,000	$0	$1,380,000
Year 2	$0	$1,393,791	$0	$1,393,791	$0	$1,080,000	$0	$1,080,000
Year 3	$0	$1,393,791	$0	$1,393,791	$0	$1,080,000	$0	$1,080,000
Year 4	$0	$1,393,791	$0	$1,393,791	$0	$1,080,000	$0	$1,080,000
Year 5	$0	$1,393,791	$63,250	$1,457,041	$0	$1,080,000	$63,250	$1,143,250
TOTAL	$300,000	$6,968,955	$63,250	**$7,332,205**	$300,000	$5,400,000	$63,250	**$5,763,250**

Notes: 1. All machine replacements are assumed to occur on the fifth year of the program.
2. No discounting is applied on the 5-year total costs.

Per Vessel Costs of the ELB Program

The cost of the ELB program at the vessel level would partly depend on the number of vessels sharing the industry cost (Table 2.9). For the current purpose, it is assumed that the number of vessels sharing the industry cost of the ELB program would be equal to or more than the number of vessels carrying ELB units. If 500 ELB units were deployed, industry costs could be shared among the vessels with ELBs (500), vessels considered active in the Gulf shrimp fishery (1,050), or all federally permitted vessels (1,500). If ELBs were deployed on all active vessels, industry costs could be shared among these active vessels (1,050) or among all federally permitted vessels. All federally permitted vessels would share the industry cost if all of them were required to carry ELB units. There is also the possibility, though not among the options currently considered, that only some high earning vessels would bear the cost of the ELB program. Naturally, there is a host of issues associated with this type of cost financing. This possibility is excluded from the various scenarios presented in Table 2.9.

It is readily apparent that a combination of few ELB units deployed and more vessels sharing the cost would result in lower cost per vessel. The lowest per vessel cost is associated with S-2 with NMFS and the industry sharing the total cost of the program and 1,500 vessels sharing the industry cost ($1,267 per vessel over 5 years), and the highest is with S-1 with total cost borne by the industry and 500 vessels sharing the cost ($9,793 per vessel over 5 years).

As described in Section 2.3, the average vessel in the Gulf shrimp fishery has been in dire financial condition. An additional cost item that would not improve the vessel's operations would have a material adverse impact on the operations and solvency of an average vessel. Understandably, there are vessels with substantially better, as well as vessels with worse, financial condition than the average vessel. It is possible that some vessels with worse financial condition than the average vessel would exit the Gulf shrimp fishery even without incurring additional costs due to the ELB program. It is also possible that some vessels in better financial condition would be brought down to the average vessel condition or worse with the imposition of additional costs due to the ELB program. Moreover, it is likely that some vessels with substantially better financial performance than the average vessel would be able to absorb the costs of the ELB program under any of the cost scenarios. It is not known at this time how many vessels belong to the various levels of financial performance. Results from the economic survey of permitted shrimp vessels are presented in averages, but certain general conclusions can be inferred from the survey results.

Inactive vessels have relatively large negative net revenue from operations and net revenue before tax (Table 2.6). In addition, these vessels also have relatively large negative net cash flows. The large, positive net revenue and net cash flow of an average vessel in this category in 2010 due to the DWH-related activities are a one-time event that is unlikely to be repeated in the near future. Most likely, many of these vessels currently on the verge of exiting the shrimp fishery would be compelled to exit the fishery when required to shoulder part of the cost of the ELB program under most, if not all, of the cost scenarios outlined in Table 2.10.

Active vessels are in a slightly better financial condition than inactive vessels (Table 2.5). Between 2006 and 2010 (excluding DWH-related activities), the average vessel in this category had three years of positive net cash flow. Its negative net cash flows were less than those of the

average inactive vessel. The average active vessel had negative net operating revenues in each year between 2006 and 2010. However, these negative net operating revenues were lower than those of inactive vessels with the exception of 2007. Thus, while the average active vessel and other active vessels below the average in terms of financial performance may be placed in difficult financial condition by the ELB program, there is a good possibility that several vessels in this category could absorb the cost of the ELB program especially under those cost scenarios with lower per vessel cost requirement.

Table 2.9. Cost per vessel of funding the ELB program over 5 years.

	Without NMFS/Industry Cost Sharing			**With NMFS/Industry Cost Sharing**		
	Number of Vessels Sharing Cost			**Number of Vessels Sharing Cost**		
	500	**1,050**	**1,500**	**500**	**1,050**	**1,500**
S-1: Old ELB Program with 500 ELB Units Deployed						
Year 1	$1,950	$929	$650	$1,950	$929	$650
Year 2	$1,950	$929	$650	$1,950	$929	$650
Year 3	$1,950	$929	$650	$1,950	$929	$650
Year 4	$1,950	$929	$650	$1,950	$929	$650
Year 5	$1,993	$949	$664	$1,993	$949	$664
TOTAL	**$9,793**	$4,663	$3,264	$9,793	$4,663	$3,264
S-2: New ELB Program with 500 Units Deployed						
Year 1	$1,548	$737	$516	$920	$438	$307
Year 2	$1,348	$642	$449	$720	$343	$240
Year 3	$1,348	$642	$449	$720	$343	$240
Year 4	$1,348	$642	$449	$720	$343	$240
Year 5	$1,348	$642	$449	$720	$343	$240
TOTAL	$6,938	$3,304	$2,313	$3,800	$1,810	**$1,267**
S-3: New ELB Program with 1,050 Units Deployed						
Year 1	N/A	$1,219	$853	N/A	$920	$644
Year 2	N/A	$1,019	$713	N/A	$720	$504
Year 3	N/A	$1,019	$713	N/A	$720	$504
Year 4	N/A	$1,019	$713	N/A	$720	$504
Year 5	N/A	$1,019	$713	N/A	$720	$504
TOTAL	N/A	$5,294	$3,706	N/A	$3,800	$2,660
S-4: New ELB Program with 1,500 Units Deployed						
Year 1	N/A	N/A	$1,129	N/A	N/A	$920
Year 2	N/A	N/A	$929	N/A	N/A	$720
Year 3	N/A	N/A	$929	N/A	N/A	$720
Year 4	N/A	N/A	$929	N/A	N/A	$720
Year 5	N/A	N/A	$971	N/A	N/A	$762
TOTAL	N/A	N/A	$4,888	N/A	N/A	$3,842

N/A – not applicable.

2.5 Public and Private Costs of Regulations

[**To be completed**]

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

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

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

NMFS costs of the ELB program…..……...$

Industry costs of the ELB program ……...$

TOTAL……..……...$

2.6 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 proposed action has been determined to not be economically significant for the purposes of E.O. 12866.

CHAPTER 3. REGULATORY FLEXIBILITY ACT ANALYSIS

To be completed.

CHAPTER 4. SOCIAL IMPACT ASSESSMENT

4.1 Social Environment

Regional Quotients by Community

Descriptions of the social environment associated with the Gulf of Mexico (Gulf) shrimp fishery have been provided in previous amendments and documents (GMFMC 2005, 2007) and will be incorporated herein by reference where appropriate. However, recent descriptions of the Gulf shrimp fishery social environment are dated; therefore, more recent figures for regional quotient of several shrimp species are provided.

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 volume and value for regional quotient varies considerably by community. In Figure 4.1, except for Bayou LaBatre, Alabama, the top five communities are in Texas. In fact, Texas and Louisiana communities dominate brown shrimp landings. Louisiana communities tend to have higher landings but lower value which may be indicative of size differentiation, with smaller sizes being landed from inshore fisheries in Louisiana.

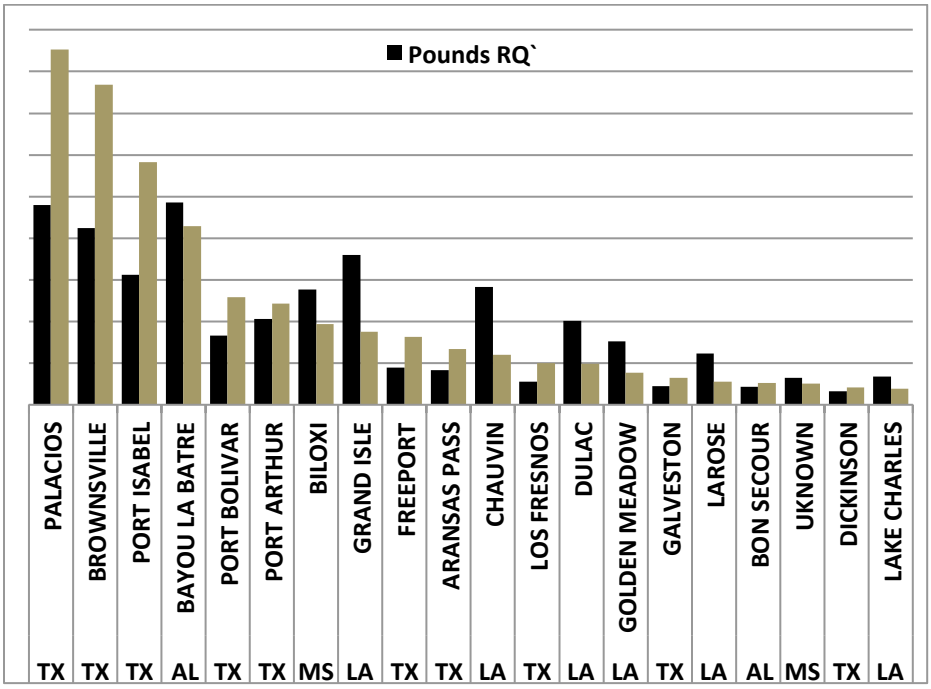

Figure 4.1. Top twenty communities based upon pounds and value regional quotient (RQ) for brown shrimp in the Gulf.
Source: SERO ALS 2011

Pink shrimp landings are primarily in Florida with the majority of landings in Fort Myers Beach (Figure 4.2). 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 since the majority of pink shrimp are harvested off the west coast of Florida.

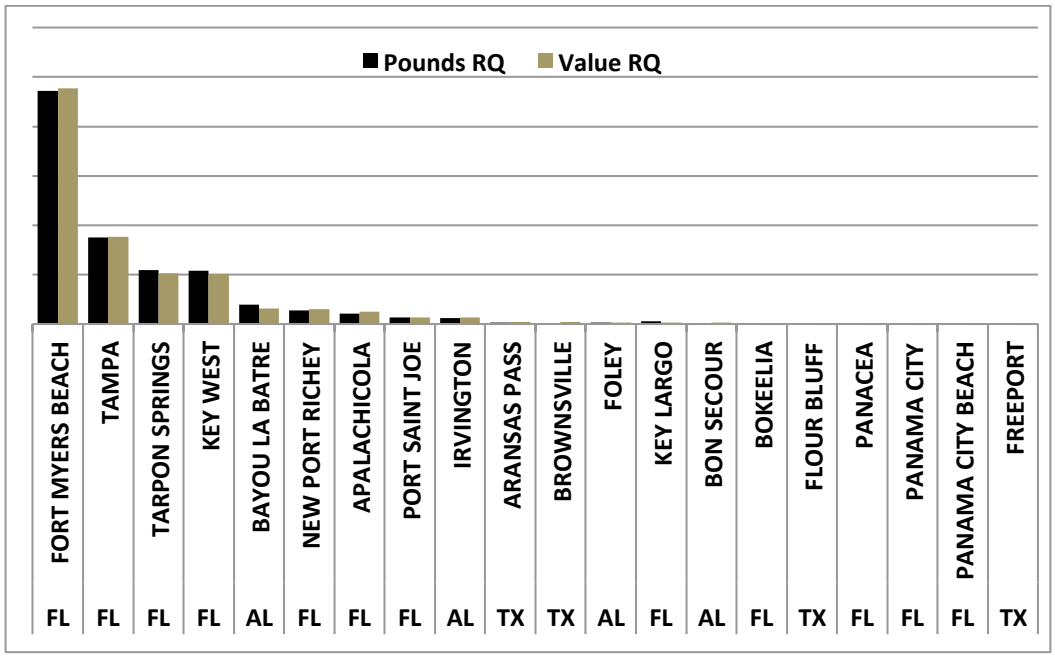

Figure 4.2. Top twenty communities based upon pounds and value regional quotient (RQ) for pink shrimp in the Gulf.
Source: SERO ALS 2011

White shrimp landings (Figure 4.3) are primarily in the northern and western Gulf with Port Arthur, Texas having the highest regional quotient in terms of value. Other communities have comparable regional quotients with regard to pounds landed but not near the value quotient found in Port Arthur.

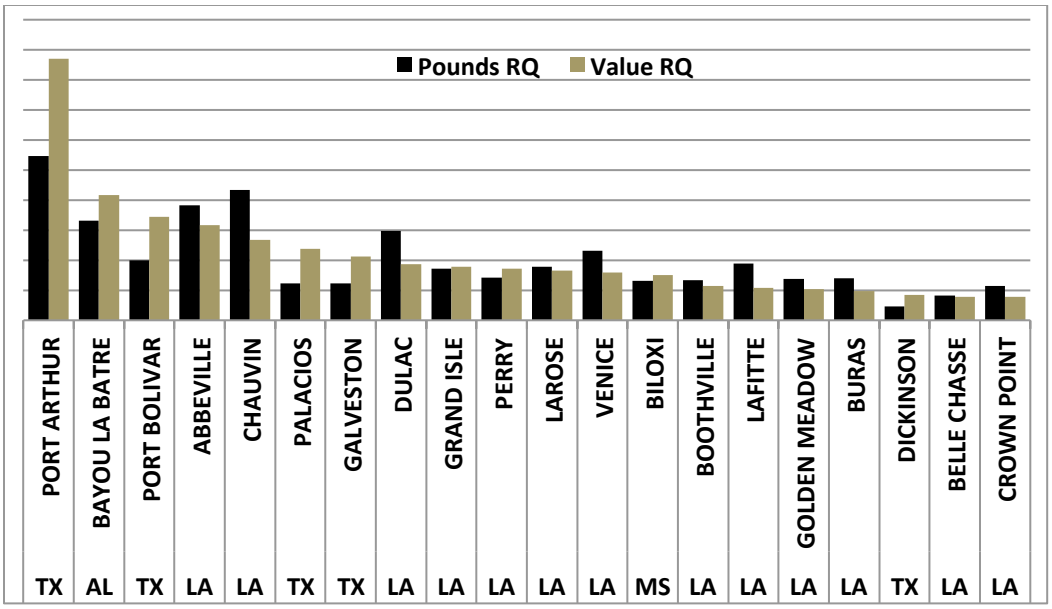

Figure 4.3. Top twenty communities based upon pounds and value regional quotient (RQ) for white shrimp in the Gulf.
Source: SERO ALS 2011

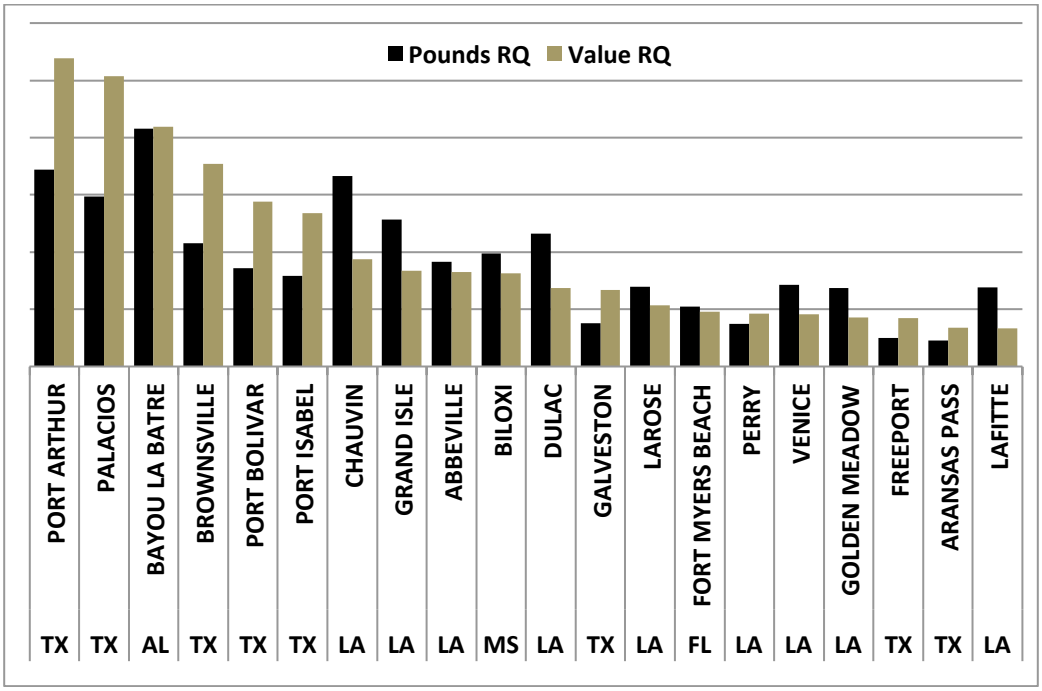

Figure 4.4. Top twenty communities based upon pounds and value regional quotient for total shrimp in the Gulf.
Source: SERO ALS 2011

Demographics and Fleet Characteristics

While we can characterize the fleet landings with regard to those communities that have high regional quotients for landings and value, it is more difficult to characterize the fleet and its labor

force 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, so we are left with descriptions regarding the engagement and reliance of fishing communities and their social vulnerability.

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 a more 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 4.1.4 were plotted onto radar graphs (Figure 4.5). 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 one standard deviation.

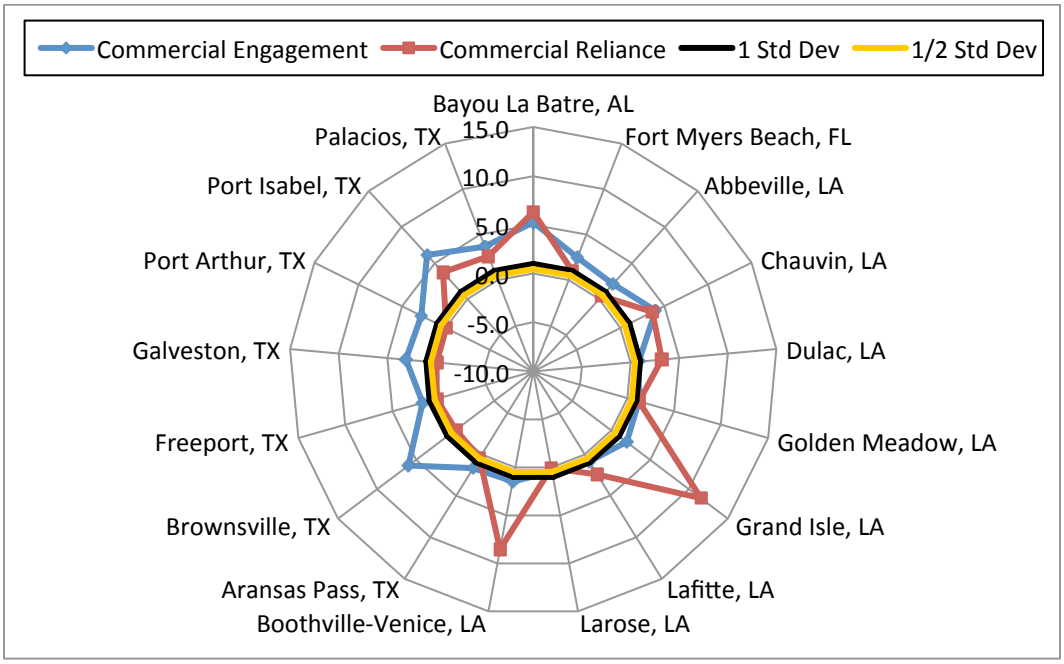

Figure 4.5. Commercial fishing engagement and reliance indices for top twenty communities in terms of pounds and value regional quotient for total shrimp in the Gulf.
Source: SERO Social Indicator Database

In Figure 4.5, 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, AL; Fort Myers Beach, FL; Chauvin, LA; Dulac, LA; Golden Meadow, LA; Grand Isle, LA; Laftite, LA; Bootheville-Venice, LA; Port Isabel, TX; and Palacios, TX. More in-depth profiles of some of these communities appear in previous amendments (GMFMC 2005, 2007).

There have been relatively few if any recent descriptions of the Gulf shrimp fishery. Liese and Travis (2010) have provided the most recent economic analysis of fleet-wide economic performance, but there is little information concerning the demographic makeup or characterization of the fleet. While we do not have demographics for captains and crew, we can identify a proxy for the number of vessels that may have minorities associated with the vessel by looking at surnames from the permit file and counting those that are Indochinese in their origin. This technique was first utilized in a memorandum from Gulf Council Director Wayne Swingle to the Shrimp Management Committee dated March 28, 2003. In that memorandum Dr. Swingle indicated that of the 1,836 federally permitted shrimp vessels, 524 (or 28.7%) had owners with Indochinese surnames or corporate names. A similar count conducted by SERO in 2009 resulted in 484 out of 1853[3] (or 26.1%) of permit owners with Indochinese surnames. Unfortunately, we do not know if these are active vessels and whether the crew is also of Indochinese ethnicity. However, this does give a rough indication of the participation rate of Indochinese within the Gulf shrimp fishery. Although we cannot say that 26% percent of the active Gulf fleet owners and crew are of Indochinese descent nor are we able to suggest what percentage of participation in the ELB program is by owners of Indochinese descent.

With regard to fleet characteristics, as mentioned earlier, Liese and Travis (2010) provide the most recent measurement of fleet economic performance for the Gulf fleet. Miller and Isaac (2012) 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). 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 is still dire and has been following a downward trend for some time with no sign of overall recovery. This financial situation has been repeatedly called unsustainable; however, this does not take into consideration other types of financial income households may have relied on during these bleak economic times for the shrimp fleet. 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 withstand downward economic trends. Because we do not have information from fishing households we are unable to project whether this is the case or whether the resilience of some sectors of the shrimping fleet may be due to these circumstances.

[3] 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 Indochinese or other minorities.

4.2 Environmental Justice

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 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).

In order 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 4.6. 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.

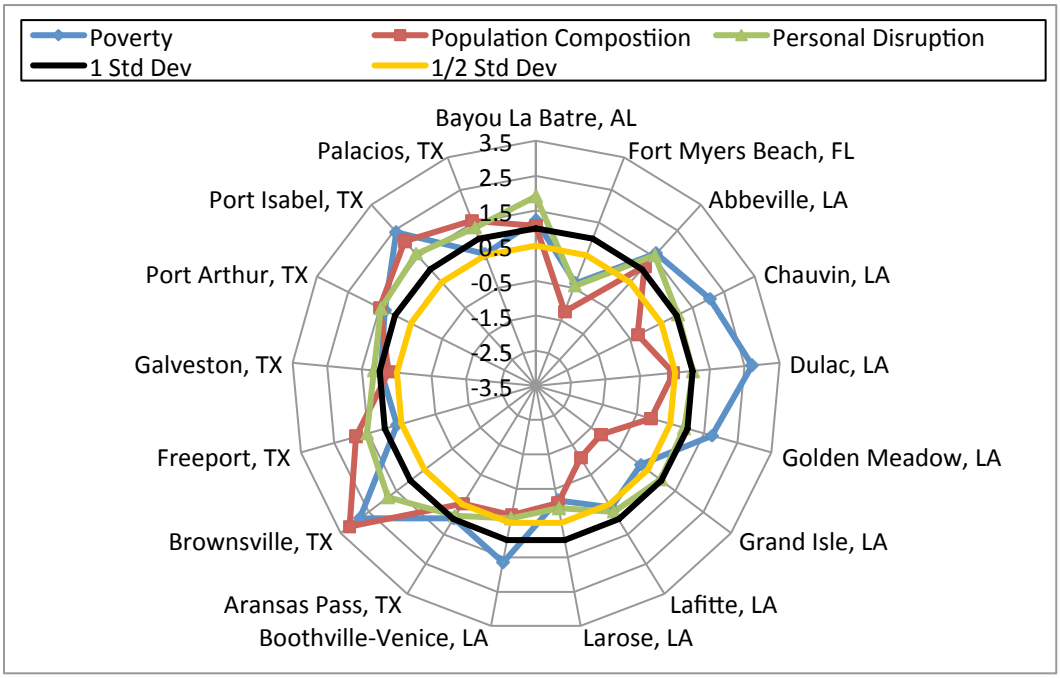

Figure 4.6. Social Vulnerability indices for top twenty communities in terms of pounds and value regional quotient for total shrimp in the Gulf.
Source: SERO Social Indicator Database

In terms of social vulnerabilities, several of the top shrimp fishing 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 in Louisiana; Aransas Pass, Brownsville, Freeport, Galveston, Port Isabel, and Palacios in 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.

4.3 Direct and Indirect Impacts on the Social Environment

The impacts on the social environment of the proposed action would be expected to mirror the economic impacts described in Chapter 2. In summary, continuing the ELB program with administration through NMFS Southeast Fisheries Science Center (SEFSC) would seem to result in few social impacts beyond those that accrue from the increased costs involved in program administration if industry is required to pay for annual costs of data recovery. However, there is anecdotal evidence from comments during a recent Gulf Shrimp Advisory Panel meeting that some distrust of an agency run program may exist (S. Gerhart, SERO, pers. comm.). The intention to require ELB on all active shrimp vessels may also be met with some resistance, which could affect the overall results of data collection. With the current economic status of the Gulf shrimp fleet combined with some of the social vulnerabilities of Gulf shrimp fishing communities, the possibility of negative social effects from implementation of the program does exist. Comments from industry representatives indicate that there is a sentiment of top-down federal management forcing the industry to accept this new program. The previous ELB program was voluntary and participants have expressed some partiality toward the current program, noting a personal connection with data collectors and the program. Yet, with limited budgets, the agency can no longer fund the program as structured. The options outlined here offer differing impacts with regard to both placement of financial burdens and perceptions toward management.

With Option 1 there would be fewer negative social effects because the burden of costs would be shifted entirely to the federal agency. Unfortunately, this would require funds to be taken from other programs within the SEFSC and with budgets already constrained, it is unlikely that funds would be located to allocate to the program. With industry funding the entire program through Option 2, the negative social effects would likely be the highest with a significant cost burden being placed upon an already financially stressed fishing fleet. Such a burden may reverberate through the communities already experiencing vulnerabilities that are likely related to the downward economic trends in shrimp fishing, but may also be linked to recent hurricanes and coastal hazards like the Deepwater Horizon MC252 oil spill. As noted above, the majority of those communities with the highest regional quotients for all shrimp are experiencing vulnerabilities that may signify difficulties to absorb the negative impacts as a result of regulatory change. The types of negative social effects might be loss of business, unemployment,

relocation to another community, changes in household employment patterns and increased stress due to financial difficulties. Such a requirement might also inspire more resentment from the industry and could hamper efforts for data collection if that resentment translates into civil disobedience. Sharing costs for the program as outlined in Option 3 may result in the fewest combined negative social effects for both the agency and the industry. By sharing the burden of costs for the program, the agency and the industry would each incur fewer negative effects. There is still the new expanded program that may meet some resistance and have added costs to the industry. While not as substantial as before, it still may be a burden depending upon the size of the entity and current economic status of the business or household. As mentioned earlier in Chapter 2, even the relatively small annual costs of maintaining the program per vessel with all vessels participating could force some out of the fishery.

CHAPTER 5. REFERENCES

Cole, J.G., B.J. Gallaway, L. R. Martin, J. M. Nance, and M. Longnecker. 2006. Spatial allocation of shrimp catch based on fishing effort: adjusting for the effects of the Texas Opening. North American Journal of Fishery Management 26:789-792.

Colburn, L.L. and M. Jepson. 2012 Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment. Coastal Management 40(3): 289-300.

Gallaway, B. J., J. G. Cole, L. R. Martin, J. M. Nance, and M. Longnecker. 2003. An evaluation of an electronic logbook (ELB) as a more accurate method of estimating spatial patterns of trawling effort and bycatch in the Gulf of Mexico shrimp fishery. North American Journal of Fishery Management 23:787-809.

GMFMC. 2005. Final Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf with Environmental Assessment, Regulatory Impact Review and Regulatory Flexibility Act Analysis. Gulf Fishery Management Council, 2203 N. Lois Ave, Tampa, Florida 33607.

GMFMC. 2007. Final Amendment 27 to the Reef Fish Fishery Management Plan and Amendment 14 to the Shrimp Fishery Management Plan (Including Supplemental Environmental Impact Statement, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. Gulf Fishery Management Council, 2203 N. Lois Ave, Tampa, Florida 33607.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2012. Development and Evaluation of Social Indicators of Vulnerability and Resiliency for Fishing Communities in the Gulf of Mexico. Marine Policy 26(10): 16-22.

LGL (LGL Ecological Research Associates, Inc.). 2012. Estimation of shrimp fishing effort in the Gulf of Mexico—2011. Final Annual Effort Report for January-December 2011 submitted to NMFS, Galveston Laboratory, Galveston, Texas.

Liese, C.P. 2013. 2010 Economics of the Federal Gulf Shrimp Fishery Annual Report. NOAA Fisheries, Southeast Fisheries Science Center, Miami Laboratory, 75 Virginia Beach Drive, Miami, Florida 33149.

Liese, C.P. 2011. 2009 Economics of the Federal Gulf Shrimp Fishery Annual Report. NOAA Fisheries, Southeast Fisheries Science Center, Miami Laboratory, 75 Virginia Beach Drive, Miami, Florida 33149.

Liese, C., and M.D. Travis. 2010. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2008. NOAA Technical Memorandum NMFS-SEFSC-601.

Liese, C., M.D. Travis, and J.R. Waters. 2009. The Annual Economic Survey of Federal Gulf Shrimp Permit Holders: Implementation and Descriptive Results for 2007. NOAA Technical Memorandum NMFS-SEFSC-590.

Liese, C., M.D. Travis, D. Pina, and J.R. Waters. 2009. 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.

Miller, A.L., and J.C. Isaacs. 2011. An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008. Gulf States Marine Fisheries Commission Publication Number 195.

NMFS. 2006. Regulatory Impact Review, Regulatory Flexibility Act Analysis, and Social Impact Assesment 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. 2002. Regulatory Impact Review and Regulatory Flexibility Act Analysis for Making Technical Changes to TEDs to Enhance Turtle Protection in the Southeastern United States Under Sea Turtle Conservation Regulations. National Marine Fisheries Service, 9721 Executive Center Drive North, St. Petersburg, FL 33702.