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Direct Marketing of Louisiana Shrimp: A Cost-Earnings Analysis

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DIRECT MARKETING OF LOUISIANA SHRIMP: A COST-EARNINGS ANALYSIS

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ABSTRACT

Secondary data on cost and earnings from a 2012 survey of inshore Louisiana shrimpers was used as the foundation this partial budget analysis examining the feasibility of supplementing direct marketing (DM) strategies for Louisianan shrimp harvesters. Refinement of key variables for the analysis was conducted using supplemental surveys in 2014 of DM shrimp harvesters and DM consumers. The DM harvester survey (n= 72) produced information on actual price per pound for DM shrimp, as well as catch grade distribution, product marketing mix, and labor estimates. The DM consumer survey (n=255) yielded information on participants' preferences for DM shrimp, including actual and maximum prices paid by grade. Survey data was utilized to refine partial budget template and spreadsheet simulations were conducted to examine the potential impacts of key variables under DM allocation scenarios of 5%, 15%, 30%, and 50% of total catch.

Results of these simulations suggest that the average inshore shrimp harvester in Louisiana could potentially augment net income from operations (NIFO) (estimated at -$220 in 2012) by allocating as little as an additional 5% of their annual catch to direct marketing. Operations best suited for this practice are owner-operated vessels that have: annual harvest revenues exceeding $43,000, access to sufficient population base (123 DM transactions annual capacity); and, potential for dockside, vessel-based sales to be completed within twelve hours post trip. Labor was found to have the greatest impact on feasibility, with increasing units of labor resulting in negative NIFO from DM beyond 48 hours for most operations. Product mix simulations indicate that combinations involving Large and Medium grade shrimp were the most profitable, most likely due greater availability for these grades. Finally, participation in DM could be diminished in brief

periods of substantial prices rise increases in the commodity market, a situation that existed briefly in 2013 when dockside prices of shrimp more than doubled across all grades due to a reduction in shrimp imports. The partial budget constructed in this analysis constitutes a decision tool for existing and prospective investors and will allow firm specific analyses of DM feasibility based on location, regulatory constraints, economic status, and marketing strategy.

CHAPTER 1: INTRODUCTION

1.1 The Louisiana Shrimp Fishery

Louisiana is the largest supplier of marine products in the Gulf of Mexico (Gulf) (Texas, Louisiana, Mississippi, Alabama, and west Florida), with 1billion pounds of finfish and shellfish landed in 2013. (NMFS, 2014). While menhaden comprise a substantial portion of the Louisiana harvest, shrimp is the second highest volume of fisheries harvested with 96.4 million pounds of white shrimp (*Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*) in 2013 (Figure 1.1) These two species accounted for more than 97 percent of the state's annual shrimp harvest and 44 percent of the total dockside revenue generated from the state's domestic fisheries (NMFS, 2014). There are two seasons for harvesting shrimp in the state's inshore waters, one usually from early to mid-May through July; and the other from mid-August through December. Fishing is also allowed in Louisiana territorial waters, which are typically open year round with a few exceptions; and federal waters which are open year round (Louisiana Department of Wildlife and Fisheries, 2013).

Three major gear types are utilized in the Louisiana shrimp fishery. Shrimp trawls utilize a bridle attached to a set of doors that open to a large funnel-shaped net that is towed behind the vessel on or near the seafloor. Butterfly nets, also called "wing nets", consist of a large square metal frame attached to a net that tapers back to a closed end, sometimes with a series of smaller frames to help maintain the shape of the net. Skimmer nets combine elements of the two previous gears to increase efficiency, by maintaining a portion of the frame out of the water to catch shrimp that would normally jump over the net.

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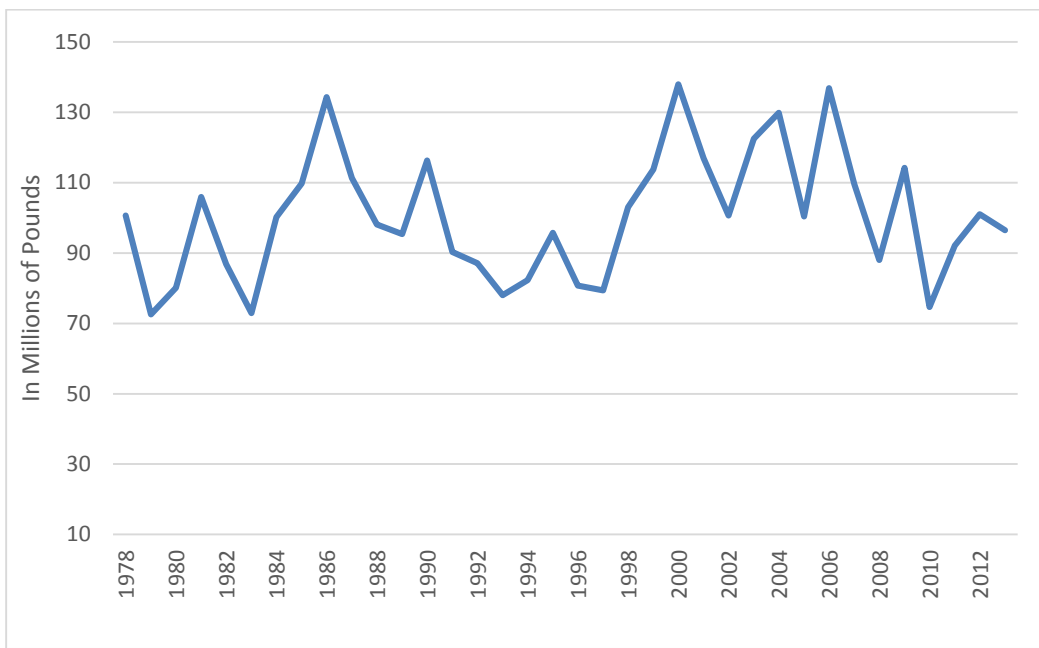
Figure 1.1 Head-on volume of Louisiana landed brown and white shrimp

In the last decade, the Louisiana coast has seen some of the most costly disasters in recent history. In 2005 Hurricane Katrina caused at billions of dollars in property damage and one month later, the destruction to the Louisiana coastal community was compounded by Hurricane Rita, one the most intense tropical cyclone ever observed in the Gulf. Three years later in 2008, Louisiana was hit again by hurricanes Gustavand Ike causing more flooding and coastal damage, though not to the extent experienced in 2005. Two years later in 2010, a British Petroleum (BP) oil platform off the coast of Louisiana exploded, spilling million barrels of crude oil into the Gulf over the course of three months. Studies are still being conducted on the biological impacts of the spill on the Gulf flora and fauna; however, short-term economic impacts have been documented. In the immediate period following the spill, the production of Gulf-harvested seafood experienced a decrease due to fisheries closures and contamination concerns. More than one third of the federal fishing

grounds were closed and many of the commercial vessels were utilized to help with clean up efforts.

Imported seafood has been another market influence on the Louisiana shrimp industry over the last 20 years. In 1990, aproximately 500 million pounds of farm-raised shrimp were imported to the U.S. (Figure 1.2). By 2010, U.S. imports of, aquacultured shrimp had more than doubled to 1.2 billion pounds annually (Haby, Rickard and Falconer 2010, NMFS 2011).
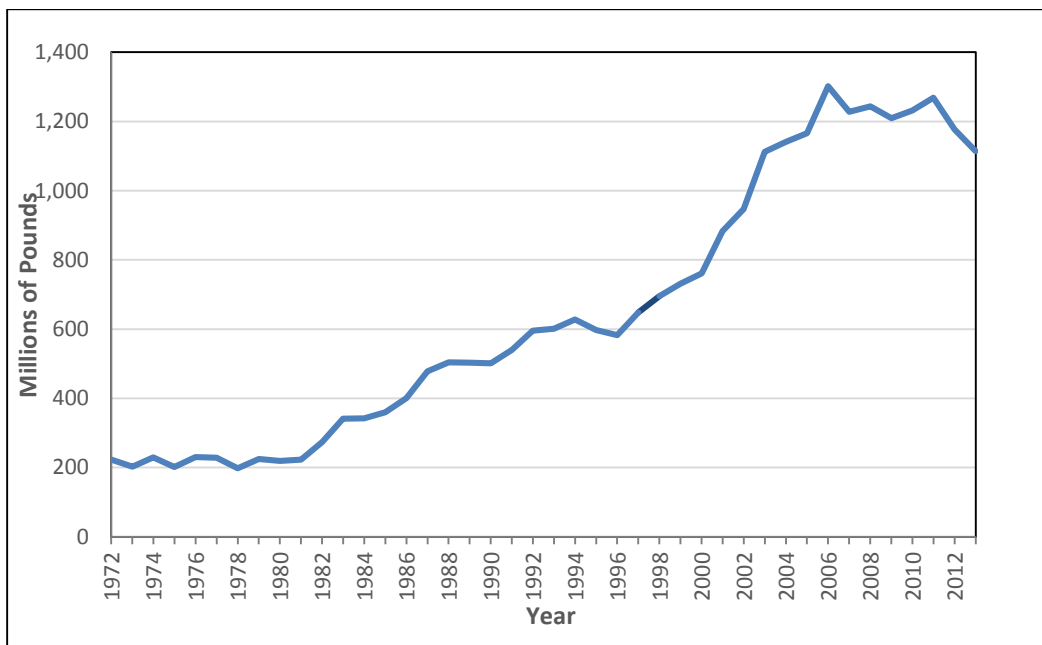
Figure 1.2 Pounds of shrimp imported to the U.S. 1972-2013(all product forms) (NMFS, 2014)

Shrimp now make up nearly 30% of the United States' total seafood import value, and constitute almost 90% of the supply of shrimp in the U.S. (NMFS, 2011; Angione, 2007). About 76% of these shrimp imports arrive from Asia and 15% from South America (NMFS, 2011). The introduction of large volumes of imported shrimp in the U.S. market has driven down the price of domestically harvested wild shrimp. In 2004, the Gulf States along with South Carolina, North Carolina and Georgia, filed a petiton for legal action to regulate the

large quantities of imported shrimp. In 2005, the U.S. began imposing duties on many shrimp imports. In 2010, another petition was filed to further regulate the importation of additional product forms not covered in the 2004 petition (Haby, Rickard and Falconer, 2010).

Despite some less than favorable conditions, the Louiana shrimp industry has begun to see improvements in the last two years. The moratorium imposed after the 2010 oil spill may have provided a protected situation for the domestic stock to rebound to numbers higher than before the spill (van der Ham and de Mutsert, 2014). In addition a number of the foreign producers have begun to experience significant losses due to a disease known as Early Mortality Syndrome (EMS), which can result in shrimp farming operations losing up to 100% of their crops (Tran *et al.* 2013). Due to EMS, some global leaders in aquacultured shrimp (e.g. Thailand and Vietnam) have experienced downturns in annual production yeilds in recent years (Figure 1.3). The EMS losses have been at least partially responsible for the noticable decrease in shrimp imports (Figure 1.2) coenciding with the rebounding of dockside prices from the 30-year adjusted low in 2009 (Figure 1.4).

1.3 Direct Marketing

In an effort to offset low commodity prices, farmers and seafood harvesters have been known to market a portion of their harvest directly to end-users. This "direct marketing" practice is not a new strategy, and has been gaining in momentum since its European resurgence in the 1960s (Adam, 2006) which was carried over to the U.S. in the late 1970s with the passing of the Farmer-to-Consumer Direct Marketing Act (Brown, 2002). Since then, producer to consumer sales
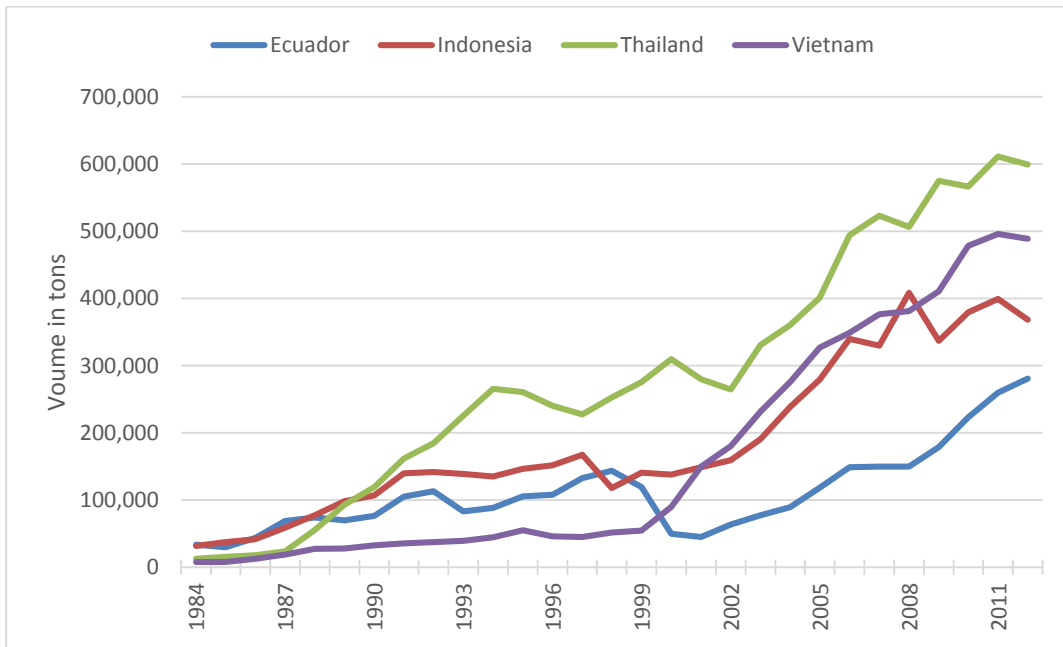
Figure 1.3 Shrimp production in tons1984-2012 in Thailand, Viet Nam, Ecuador and Indonesia (FAO, 2014)
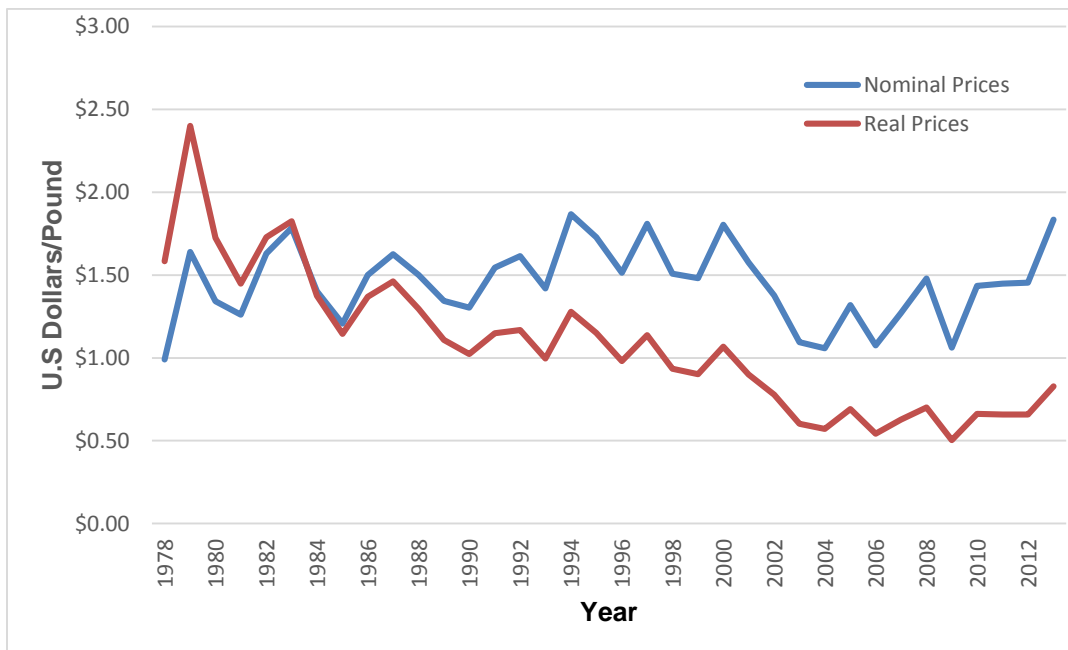
Figure 1.4 Dockside prices of head-on shrimp in Louisiana from 1978 through 2013 (1984 base year)

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interactions have dramatically increased through outlets such as community supported agriculture (CSA) programs and farmers markets.

The use of CSA programs began to take root in the United States in the mid-late 1980's (Adam, 2006). A CSA program typically involves interested individuals or "shareholders" paying a farmer a regular fee in exchange for fresh seasonal produce from the farmer's harvest(Cooley and Lass, 1998). The shareholders may pay the entire sum up front or in smaller increments depending on the set up of the program. In this method, the farmers are guarenteed money from the shareholders and, in some cases, may receive a price higher than they would get from a wholesaler. In exchange, the shareholders get produce that is expected to be of a higher quality than that found at a typical grocery store.

Community supported fisheries (CSF) are a relativly new innovation that have stemmed from the CSA model. Consumers pay an upfront fee to harvesters or an orgainized harvester alliance in exchange for scheduled seafood deliveries. Because it is such a relatively new innovation, examples of these types of programs are somewhat limited.

In 2010, Brinson, Lee and Roundtree (2011) identified 14 CSF programs that were up and running, the majority of which were in the Northeastern United States. Of those 14, eight are still in operation, one was discontinued and five were unable to be reached by the authors. Since then the total number of CSFs in the nation has increased according to Freshcatch.org, which lists 30 CSFs across the country as working partners (LocalCatch.org, 2012).

Port Clyde Fresh Catch in Port Clyde, ME, formed in 2007 by area fishermen, was the first CSF program in the United States. Harvesters in the port were suffering economic hardship as a result of depleted fisheries and uncertain wholesale market prices (Brown,

2012). To maintain viablility, harvesters opted for a new business model. They began to

process their own fish and sell their catch directly to consumers, bypassing the processors

and wholesalers. The group also redesigned their nets and adjusted their target species.

Instead of harvesting a single species in large quantities, they began to harvest a more

diverse catch, which included fishes previously thought to be less desirable, such as hake

and squid. This allowed the Port Clyde harvesters to receive a price at or above the cost

of production, which made it possible for them to sustain smaller scale businesses (Brown,

2012). The Port Clyde Fresh Catch program has been in operation for five years and has

been positivly percieved by the harvesters involved.

1.4 Direct Seafood Marketing

In 1981, Alaska instituted the Direct Marketing License allowing harvesters to sell their

catches directly from their boats. There was also a provision for processing and joint

harvesting and processing. This license was established mainly to benefit Alaskan

harvesters in the salmon industry who had previously been overshadowed by companies

out of Seattle, WA (Alaska Department of Fish and Game, 2012). Since then, Alaska has

created a number of resources for harvesters interested in direct marketing. As of

November 2012, Alaska had 169 Direct Marketing permits listed of those 133 permits were

still active (Alaska Department of Environmental Conservation, 2012).

The predominant model for direct marketing used in Lousiana is slightly different than CSA

or CSF models. Instead of purchasing shares, consumers purchase seafood products at

will, paying at the time the product is recieved. This approach requires less of a

commitment and allows the consumer to adjust consumption in accordance with

individuals tastes and budget constraints. This practice has been prevelant along the Gulf

coast for a number of years in the form of what has become known as the "Ice Chest

Market". These opportunistic transactions typically involved coastal anglers or tourists purchasing fresh seafood to carry back to their inland residences. Such informal interactions were rarely documented as there was no forum to facilitate the interaction and little regulation of the practice.

In 1999, Louisiana instituted its Fresh Products License. This allowed holders to sell their catch directly to final consumers. The license must be renewed annually and does not authorize any type of processing - such as peeling or head removal (Louisiana State Legislature, 2012). The year following it's implementation 1,759 licences were purchased. The number of Fresh Products Licenses issued has since remained fairly constant, despite the decline in the number of licensed fishermen in Louisiana, with 1,773 license-holders registered in 2011 (LDWF, 2012).

While direct marketing has traditionally accounted only a fraction of harvester income, recent innovations may increase its potential. Widespread use of the internet has made it easier for consumers to find providors of fresh seafood and farmed products, while social media and cell phones facilitate communication. Direct marketing initiatives sunch as *Market Maker* and *Louisiana Direct Seafood* are examples of two such programs that have taken advantage of the internet's broad user base.

Market Maker is an online forum that covers all 50 states and the District of Columbia with 20 states as active Market Maker Partners. The program allows consumers to search by specfic limiting criteria to locate the goods or services the meet their specfic needs. At present, this includes 74 registered providers of fresh shrimp or shrimp products in Louisiana (Louisiana Market Maker 2015).

The Louisiana Direct Seafood Marketing program is based on the pilot program, *Delcambre Direct*, which began in 2009 as a joint venture between Port of Delcambre and Louisiana Sea Grant (Hymel and Caffey, 2011). This initiative was designed to help revitalize the shrimping fleet of Delcambre that had grappled with the previously mentioned obstacles. Delcambre Direct was positively received by the local shrimpers and has been put into action over the last few years. In addition to the already existing program in Delcambre, three other programs are in development to serve the coastal parishes of Cameron, Lafourche, Terrebonne, and Orleans (Hymel and Caffey, 2011). At present, this includes 55 registered providers of fresh shrimp or shrimp products in Louisiana (Louisiana Direct Seafood 2015).

The goal of these programs is to create a community-based seafood marketing networks. Web-based technology is used to profile member-harvesters on an electronic clearinghouse containing contact information, photos, and vessel-specific messages regarding incoming catches, arrival times, and price. Interested consumers contact the harvesters directly and travel to Delcambre to purchase fresh, seafood directly from the boat. Figures1.5 depicts customers in Delcambre, Louisiana purchasing shrimp directly from shrimp vessels in September 2014.

1.5 Recent Cost and Earnings Research

While there have been limited investigations into the economic viability and impact of direct marketing, there have been economic surveys of the general economic condition of the U.S. Gulf shrimp fleet. Liese and Travis (2013) conducted a cost-earnings survey of the Gulf offshore fleet in 2011, collecting data from 358 active offshore Gulf shrimping vessels, approximately 100 of which were from the state of Louisiana. The survey included questions on vessel and trip characteristics as well as a variety of economic questions.

Figure 1.4 Direct marketing of shrimp in Delcambre, LA, September 2014.

The survey indicated that the average offshore vessel in Louisiana had a net revenue from operations of -$20,000. These results were similar to those found by Miller and Isaacs (2014), who collected economic data from 280 inshore[1] Gulf shrimping vessels in 2012; 166 of which were from Louisiana. They disseminated a self-administered four page survey with questions concerning vessel characteristics and fishing trip information. The survey primarily focused on economic information including but not limited to assets and liabilities, cash inflows and outflows and profits and losses. The survey provided a baseline for the expenses incurred by an inshore Louisiana shrimping vessel as well as estimated income. The results of the survey indicated that the majority of the Gulf fleet vessels were operating with very low or negative net revenue, before taxes. The average Louisiana inshore vessel was estimated to operate at an average net income from operations of -$220.

1.6 Problem Statement

Given the economic pressures and the advent of direct marketing alternatives there is a need for targeted research of the cost and returns of this option. For example: *what are the cost and revenues associated with direct marketing of Louisiana shrimp? Will fishing vessels that engage in direct marketing have additional costs in labor, dock time and marketing?* In addition, *how will the anticipated differences in shrimp sale price, wholesale vs. direct marketing, affect revenue?* These factors and others must be examined to yield sufficient knowledge of the feasibility of direct marketing as a strategy for augmenting harvester income.

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[1] Inshore vessels are typically smaller than offshore vessels, with a smaller hold capacity and shorter trip times.

1.7 Goals and Objectives

The overall goal of this project is to examine the net income potential associated with direct marketing of shrimp from coastal Louisiana. Specific objectives include:

1. Construct a cost-earnings partial budget generator for examining the feasibility of direct marketing of shrimp in coastal Louisiana.

2. Parameterize key input variables through a survey of shrimp harvesters and examine direct marketing demand characteristics through a survey of shrimp consumers.

3. Conduct sensitivity analyses to examine changes in net income from operations under various cost and revenue assumptions.

Method 1: *Construct a cost-earnings, partial budget generator for examining the feasibility of direct marketing of shrimp in coastal Louisiana.*

In conjunction with the Louisiana Department of Wildlife and Fisheries (LDWF) and Gulf States Marine Fisheries Commission (GSMFC), disaggregated economic data were obtained for the Louisiana inshore shrimp harvest sector (Miller and Isaacs 2014). This modified enterprise budget provided the basis for examining the feasibility of direct marketing for Louisiana shrimp under various scenarios of scale. Scale was defined by specific costs and earnings under six scenarios: a state average and five annual income quintiles.

Method 2: *Parameterize key input variables through a survey of shrimp harvesters and examine direct marketing demand characteristics through a survey of shrimp consumers.*

A survey of Louisiana shrimp harvesters and a survey of Louisiana shrimp consumers were used to estimate values for decision variables associated with direct marketing (e.g. average and maximum price, lot size, labor, transaction time, product form, etc.). These

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variables were incorporated into a partial budgeting framework to refine the enterprise budget developed in objective 1.

Method 3: *Conduct sensitivity analyses to examine changes in net income from operations under various cost and revenue assumptions.* The feasibility of direct marketing was examined using the partial budget template derived from secondary data (objective 1) and primary data (objective 2). The template was used to examine net income from operations under a range of hypothetical scenarios related to scale, price differential, and product mix.

1.8 Implications

This research provides guidelines for potentially interested operators by establishing a baseline framework for examining the costs and returns that can be expected from direct marketing of seafood. It can also help those already engaged in the practice to examine their finances and make adjustments to improve operational efficiency. By establishing a generic costs template and parameterizing the key variables affecting the direct marketing of shrimp, this study can help to identify best management practices and provide insight to discourage less profitable scenarios. Moreover, the integration of objectives 1-3 into a firm-level decision tool can also provide a user-specific interface from which individual shrimpers can tailor feasibility questions specific to their operational structure

CHAPTER 2: BUDGET TEMPLATE DEVELOPMENT

2.1 Partial Budgeting

Partial enterprise budgets can be useful tools to estimate costs and returns in situations where some or the entire infrastructure is already established. The tool enables firms to estimate incremental changes by accounting for the costs and returns associated only those resources or strategies to be modified or added. As such, the primary goal of partial budgeting is to estimate the net change in income as a result of the proposed technological or operational modifications to the firm.

Examples of partial budgeting applications in fisheries include a variety of modifications to existing production and marketing practices. Examples in the literature cite the challenges associated with capital outlay, scale-based efficiency, and the opportunities for cooperative production and marketing. Cruz *et al.* (2000) conducted a study to estimate the feasibility of adding a tilapia culture system to an already existing alfalfa farm in Kuwait. In this particular instance only the costs and revenues associated with the tilapia culture system were considered as the alfalfa operation was already functioning and would continue to do so regardless of the addition of a tilapia culture system. The study found that tilapia culture would augment the profitably of the existing alfalfa production and add to the farm's income.

Partial budgeting can also help to estimate smaller changes such as the addition of new equipment to existing operations. Trimpey and Engle (2005) explored the potential benefits of utilizing an in-pond horizontal floating bar grader for cultured catfish (*Ictalurus punctatus*). For this study only the costs associated with the new equipment were considered against the change in revenue resulting from the addition of the grader. The

results indicated positive net revenues for the entire pond sizes tested in this study. This example illustrates a low cost capital outlay assessment, however in other cases technology adoption can be more cost prohibitive. Caffey and Tiersch (2000) developed a partial budget to examine the costs and returns associated with integrating cryopreservation technology into existing fish hatcheries. Case applications for the production of hybrid striped bass (*Marone saxatalis x Marone chrysops*) indicate the feasibility of the practice is scale-dependent, but could prove prohibitive given the high costs of commercial freezing equipment. The authors suggest production cooperatives as one potential method for alleviating this capital constraint.

Kam *et al.* (2006) utilized partial budget analysis to examine the profitability of ornamental fish producers in Hawaii marketing directly to wholesalers and retailers on the United States west coast. This study examined only the additional costs associated with shipping and marketing and revenues generated by the additional market. In this study, analysis indicated that selling directly to retailers was only beneficial for larger scale operations.

In each of the above examples, the partial budget serves as an overlay or modification to existing data on a firm's cost and earnings. In the case of shrimp harvesting, secondary data can provide the baseline economic information required for a partial budgeting application.

2.2 Baseline Budget Data

As previously mentioned, secondary data are available at the federal and state level for examining the costs and revenues of gulf shrimpers. The survey by Liese and Travis (2013) indicates the average federally-licensed vessel that was actively harvesting in 2011 averaged 66 feet in length and had $244,640 in shrimp revenue. Given the relatively large

size and volume of these vessels and landings, the time and capacity for direct marketing is limited. The offshore portion of Gulf shrimp fleet relies almost entirely on commodity-based sales. For this analysis, the smaller, inshore vessels were used for development of the partial budget template. Vessels sampled in Miller and Isaacs' 2012 survey of the Gulf inshore shrimp fishery had an average length of 37 feet and had $57,058 in shrimp revenue. This inshore survey was sent to harvesters from Texas through the west coast of Florida who held a state shrimping license but not a federal shrimping permit. The survey identified a random subsample of 1,557 harvesters that fit these criteria with substantial representation in each state. After data cleaning and evaluation 280 of the returned questionnaires were deemed usable for their economic analysis. Of the 280 useable surveys, 59.3% (n=166) were from Louisiana.

The useable surveys were grouped into five revenue categories, each containing between 50 and 60 respondents. For each of these revenue quintiles, averages were calculated for vessel specifications, fixed costs, and operational costs. From this data set, values from only the Louisiana respondents were extracted and used to generate a new data set for the state of Louisiana with each quintile containing between 30 and 36 respondents. Table 2.1 provides information on vessel characteristics, harvest effort, and operations for the state average and the income quintiles. It is worth noting that Net Income from Operations (NIFO) is negative for the state average and income quintiles 1-4.

Table 2.1 Louisiana Inshore Shrimper Cost and Earnings in 2012
(Adapted from Miller and Isaacs 2014)

	State Average	Q 1 <15,000	Q 2 15,001-43,000	Q 3 43,001-75,000	Q 4 75,001-120,000	Q 5 >120,001
		Income Quintiles				
# of observations	166	36	36	30	34	30
Vessel Characteristics						
Length (feet)	35.4	27.2	32.9	37	38.3	43.5
Horsepower	312.8	227.4	266.8	342.7	370.3	384.2
Year built	1992	1992	1992	1992	1992	1992
Year purchased	2003	2003	2002	2002	2003	2004
Fuel type – Diesel	84.9%	61.1%	83.3%	96.7%	91.2%	96.7%
Shrimp Harvesting Effort						
Total trips	93.3	34.1	79.3	80.4	138.4	143.1
Total days at sea	36.7	22.6	33.9	36.6	41.8	51.2
Vessel Operation						
Inflow – Total	$94,527	$7,403	$31,298	$59,002	$97,962	$276,739
Shrimp landings	$68,107	$6,378	$21,198	$44,022	$76,338	$192,047
Non-shrimp landings	$5,686	$586	$2,712	$1,239	$5,942	$17,931
Government payments (shrimp related)	$20,735	$439	$7,387	$13,741	$15,681	$66,761
Outflow –Total	$65,312	$14,991	$34,693	$54,428	$77,911	$143,695
Fuel	$19,640	$2,400	$9,219	$15,962	$25,848	$44,360
Oil	$2,104	$184	$771	$539	$1,709	$7,342
Ice	$4,100	$437	$1,679	$2,029	$3,390	$13,011
Salt	$1,060	$173	$440	$520	$1,127	$3,033
Groceries	$2,862	$499	$1,902	$2,005	$4,320	$5,488
Other supplies	$2,005	$333	$1,346	$1,108	$2,653	$4,543
Labor	$7,224	$1,692	$2,001	$6,226	$8,496	$17,621
Repairs (Regular)	$6,545	$2,171	$3,812	$5,851	$7,971	$12,826
Repairs (New Purchases)	$5,690	$1,461	$1,502	$8,082	$3,693	$13,846
Insurance	$96	$99	$147	$120	$113	$0
Overhead (excluding ins. & loan payments)	$13,287	$5,166	$11,577	$11,058	$17,537	$20,815
Interest payments made (on vessel loans)	$142	$32	$27	$165	$333	$140
Principal payments made (on vessel loans)	$557	$343	$273	$763	$721	$670
Net Cash Flow	$29,215	-$7,588	-$3,395	$4,574	$20,051	$133,044

Table 2.1 (Continued)

| | State Average | Income Quintiles | | | | |
		Q 1 <15,000	Q 2 15,001-43,000	Q 3 43,001-75,000	Q 4 75,001-120,000	Q 5 >120,001
# of observations	166	36	36	30	34	30
Owner's Vessel Time	$12,150	$3,726	$9,335	$11,767	$18,999	$16,466
Depreciation	$2,940	$962	$1,566	$3,446	$3,255	$5,448
Revenue from Operations	$73,792	$6,965	$23,911	$45,261	$82,281	$209,978
Operating Expenses	$74,012	$17,842	$43,792	$60,631	$95,418	$150,952
Net Income from Operations (NIFO)	-$220	-$10,877	-$19,881	-$15,370	-$13,137	$59,025

2.3 Partial Budget Template

Base Revenues and Costs

Developing a partial budget based on the existing inshore shrimp cost and earnings data requires the identification of relevant fixed and operational variables that would influence the economics of direct marketing (DM). This process begins with the basic net income calculation utilized in Miller and Isaacs (2014):

$$NIFO = R_1 - C_1$$

$$R_1 = R_s + R_o$$

$$C_1 = L + F + S + M + OH + OT + DP + I$$

where, the *NIFO* is net income from operations and R_1 is the revenue from shrimp landings[2] (R_s) and other seafood landings (R_o). Harvesting costs (C_1) consist of average annual estimates for labor (*L*), fuel and oil (*F*), supplies (*S*) such as groceries, ice and salt;

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[2] It should be noted that Miller and Isaacs (2014) did not specify in their questionnaire whether revenue from shrimp was from product sold head-on or head-off. For the purposes of this study, it was assumed that the shrimp income reported by that study for Louisiana participants was sold to docks head-on. This assumption has been verified by marine extension agents of the Louisiana Sea Grant College program, who assert that harvesters in the state's inshore shrimp fleet rarely de-head shrimp prior to sale (Hymel, 2014).

maintenance and repairs (*M*), insurance (*I*), overhead (*OH*), owner's vessel time (*OT)* and deprecation (*DP)*.

Shrimp Grades and Prices

Given that the 2012 inshore shrimp survey did not collect harvest volumes, an estimate of annual shrimp landings must be derived for each quintile. Deriving this volume estimates requires two assumptions: one in regards to the average distribution of catch by grade, and another for the average price by grade. Historical data on catch distribution and dockside prices by grade can be derived from LDWF harvester surveys and analyses of trip ticket data. A grade and price distribution specific to inshore Louisiana shrimpers is displayed in Table 2.2 (NMFS 2014).

Deriving DM Volumes

Based on the grade prices and distributions of Table 2.2, the 10 year average, head-on inshore dockside price was estimated at $1.09 per pound across all grades:

$$P_c = (P_{xl} * d_{xl}) + (P_l * d_l) + (P_m * d_m) + (P_s * d_s) + (P_b * d_b)$$

Where *Pc* is the weighted average inshore commodity price ($/lb) of shrimp derived from the average prices (*P*) and grade distributions (*d*) of shrimp classified as extra-large (*xl*), large (*l*), medium (*m*), small (*s*), and bait (*b*).

Using this average price, volume totals are derived for each quintile[3] of shrimp revenue (Q_{sq}) from Miller and Isaacs (2014), by:

$$Q_{sq} = Rs/P_c$$

Correspondingly, the relative proportions of shrimp sold to the direct and commodity markets are given by:

$$Q_{dm} = Qsq * x$$
$$Q_c = Q_{sq} - Q_{dm}$$

Where the quantity of Directly Marketed (DM) shrimp is Q_{dm}, x is a user-defined coefficient ranging from 0 to 1, and Q_c is the quantity of shrimp available for sale in the commodity market.

Estimating DM Income

The average price of directly marketed shrimp is given by:

$$P_{dm} = (P_{dmxl} * d'xl) + (P_{dml} * d'l) + (P_{dmm} * d'm) + (P_{dms} * d's) + (P_{dmb} * d'b)$$

where P_{dm} is the weighted average ($/lb) price of DM shrimp derived from survey data (displayed in Chapter 3) on the average prices (P) and grade distributions (d) of DM shrimp classified as extra-large (xl), large (l), medium (m), small (s), and bait[4] (b).

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[3] The estimate Q_{sq} does not include any portion of the harvest kept for home consumption and is derived solely from revenue generated from commercial sales.
[4] Comprised of the unspecified and others (mixed) categories

Table 2.2 Inshore Louisiana Shrimp Prices and Catch by Grade
(Head-on conversions from NMFS 2014[5]).

	2003	2004	2005	2006	2007	2008	2009	2011	2012	2013	AVG
X Large ($/lb)	$2.78	$2.78	$2.51	$1.99	$2.50	$2.92	$1.83	$2.97	$2.60	$3.70	$2.66
X Large (%)	1%	2%	2%	7%	7%	10%	7%	9%	6%	4%	6%
Large ($/lb)	$1.76	$1.59	$1.57	$1.34	$1.72	$2.06	$1.29	$2.14	$1.99	$2.79	$1.82
Large (%)	10%	11%	13%	12%	13%	15%	20%	15%	15%	14%	14%
Medium ($/lb)	$0.97	$0.89	$1.09	$0.82	$0.99	$1.07	$0.82	$1.09	$1.11	$1.56	$1.04
Medium (%)	14%	17%	20%	18%	17%	15%	17%	15%	20%	16%	17%
Small ($/lb)	$0.69	$0.66	$0.94	$0.72	$0.84	$0.78	$0.69	$0.77	$0.93	$1.21	$0.84
Small (%)	73%	69%	63%	63%	62%	59%	56%	61%	58%	65%	63%
Bait[6] ($/lb)	$0.32	$0.34	$0.38	$0.63	$0.50	$0.40	$0.39	$0.63	$0.40	$0.64	$0.46
Bait (%)	2%	2%	2%	0%	1%	1%	1%	0%	1%	1%	1%
Average ($/lb)	$0.85	$0.83	$1.08	$0.90	$1.09	$1.22	$0.91	$1.23	$1.22	$1.57	$1.09

Where (C_2) is a primarily a function of the opportunity costs associated with additional

labor (L_2), supplies (S_2), transportation(T) and permitting cost (P) required for direct

marketing.

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[5] Original data was provided in head-off volume. Grades and volumes were converted to head-on by a factor of 1.6 and then grouped into the appropriate size categories. Upon conversion to head-on grades, the lowest grade became an over 41 count which combining the medium and small size categories. The head off proportion of 90% small and 10% medium were used to parse out the small and medium volumes. Volume of the medium shrimp was added to the other medium shrimp grades and the price was weighted accordingly. Data from 2010 were excluded due to circumstances which caused anomalous landings and prices that year.
[6] Mixed and unspecified count combined

Additional labor (L2) is further defined as:

$$L_2 = L_d + L_i$$

$$L_d = r_1 * t_1 * trans$$

$$L_i = r_1 * t_2 * trips$$

Where the opportunity cost of direct labor (L_d) labor is estimated as the product of the

hourly labor wage rate (r_1) and the total time (t_1) dedicated annually to DM transactions,

including time to package product, collect payment, and interface with consumers; but

excluding travel and delivery time. Indirect labor (L_i) is calculated as a product of the

hourly labor wage rate (r_1) and (t_2), a volume-specified number of additional hours ranging

from 0-12 hours per trip. The indirect labor calculation is designed to encompass the

transaction time per trip as well as the period between transactions anticipated when

quantity of shrimp marketed directly per trip reaches a large volume. In this instance the

volume of 700 pounds per trip was selected at the bench mark to initiate indirect labor

costs in accordance with Table 2.3. This selected as the benchmark because the time to

market this volume was estimated at approximately 5 hours to distribute based on the

average time per transaction and lot size (see harvester survey results in Chapter 3).

While in some situations this distribution may occur all at once, in the interest of providing

a conservative estimate it was assumed an interim period occurred between transactions

to allow for gaps in consumer availability. The hourly wage rate was calculated based on

the estimated annual opportunity cost for an owner operator of a gulf shrimp vessel and an

8 hour work day (Liese and Travis 2013).

Table 2.3 Guide Lines for Indirect labor calculations

Estimated average pounds marketed directly per trip	Indirect labor hours per trip	Number of assumed laborers
701-900	8	1
901-1000	8	2
1001-1100	10	2
>1100	12	2

Additional supplies S_2 are further defined as:

$$S_2 = ((P_i * (Q_i/lot)) * trans) + ((P_b * (Q_b/lot)) * trans)$$

where additional supplies (S_2) are given by the price (P_i and P_b) and quantity (Q_i and Q_b) of ice and bags, respectively for an average sale quantity (*lot*), and the total number of annual sales (*trans*) and transportation for DM is further defined as:

$$T = (D * r_2) * trips$$

where (T) is a function of the average distance (D) traveled after each trip for off-site marketing and a standard expense rate (r_2) per mile.

Taken together, these additional revenues and costs produce the adjusted net income equation:

$$NIFO_{dm} = [(Q_c * P_c) - C_1] + [(Q_{dm} * P_{dm}) - C_2]$$

NIFO$_{dm}$ is the net income from operations resulting from shrimp sold on the commodity market and shrimp sold directly to the public.

2.4 Refining Assumptions

Table 2.4 includes a comprehensive list of variable descriptions and assumptions for the DM partial budget. While a large portion of these derive from previously collected data, many of the variables affecting direct marketing are assumed at this stage of model

development. Survey data on direct marketing practices collected from both the supply and demand side of these transactions can be used to provide a better understanding of the effects of direct marketing on revenue and costs for each quintile.

Table 2.4 Variable Descriptions for the DM partial Budget

Baseline Estimates for Inshore Shrimp Harvesting			
Variable	Description	Mean Value	Source/Comments
R_s	Revenue from shrimp landings	$68,107	Miller and Isaacs 2013
R_o	Revenue from other seafood	$5,686	Miller and Isaacs 2013
R_1	Total revenue from seafood	$73,793	Miller and Isaacs 2013
C_1	Harvesting costs	$65,318	Miller and Isaacs 2013
L	Labor cost	$7,224	Miller and Isaacs 2013
F	Fuel and oil	$19,640	Miller and Isaacs 2013
S	Supplies	$8,022	Miller and Isaacs 2013 (groceries salt and ice combined)
M	Maintenance and repairs	$6,545	Miller and Isaacs 2013
I	Insurance Premiums	$96	Miller and Isaacs 2013
OH	Overhead	$13,287	Miller and Isaacs 2013
OT	Owner's Vessel Time	$12,150	Miller and Isaacs 2013
DP	Depreciation	$,940	Miller and Isaacs 2013
$NIFO$	Net income from operations	-$220	Miller and Isaacs (2013)
P_c	Avg. price of commodity shrimp	$1.09	Weighted avg. price of inshore shrimp NMFS (2003-2103)
d	Harvest distribution by grade	Variable (see Table 2.2b)	Avg. landings by grade for inshore shrimp NMFS (2003-2103)
P_{xl}	Average commodity price of X-Large shrimp	$2.66	LA Inshore Shrimp (NMFS 2014)
P_l	Average commodity price of Large shrimp	$1.82	LA Inshore Shrimp (NMFS 2014)
P_m	Average commodity price of Medium shrimp	$1.04	LA Inshore Shrimp (NMFS 2014)
P_s	Average commodity price of Small shrimp	$0.84	LA Inshore Shrimp (NMFS 2014)
P_b	Average commodity price of Bait shrimp	$0.46	LA Inshore Shrimp (NMFS 2014)
d_{xl}	Percent of X-Large shrimp in sales distribution	6%	LA Inshore Shrimp (NMFS 2014)

Table 2.4 continued

	Estimates for Direct Marketing		
Variable	*Description*	*Mean Value*	*Source and Comments*
d_l	Percent of Large shrimp in sales distribution	14%	LA Inshore Shrimp (NMFS 2014)
d_m	Percent of Medium shrimp in sales distribution	17%	LA Inshore Shrimp (NMFS 2014)
d_s	Percent of Small shrimp in sales distribution	63%	LA Inshore Shrimp (NMFS 2014)
d_b	Percent of Bait shrimp in sales distribution	1%	LA Inshore Shrimp (NMFS 2014)
$NIFO_{dm}$	Net income from operations with direct marketing	variable	Simulated (Chapter 4)
d'	DM sales distribution by grade	variable	2013 DM Harvester Survey (Chapter 3)
C_2	Direct marketing costs	volume specific	Derived from 2013 DM Harvester Survey (Chapter 3)
T	Transportation costs	volume specific	Based on avg. distance (*D*) and trips (*trans*) identified in the 2013 DM Harvester Survey (Chapter 3)
P	Permitting costs	$15	LDWF Fresh Product License
L_2	DM labor costs	volume specific	2013 DM Harvester Survey (Chapter 3)
L_d	Direct labor costs for direct marketing ($)	volume specific	2013 DM Harvester Survey (Chapter 3)
L_i	Indirect labor costs for direct marketing ($)	volume specific	See table 2.4
r_1	Hourly wage rate	$15.75	Liese and Travis 2013
t_1	Time dedicated annually to direct labor (hours)	volume specific	2013 DM Harvester Survey (Chapter 3) Average time per transaction (20 mins) * (Q_{dm}/average lot size(50))
t_2	Time dedicated annually to indirect labor (hours)	volume specific	See table 2.4
$trans$	Estimated number of annual transactions	63	2013 DM Harvester Survey (Chapter 3)
$trips$	Number of trips annually	37	2013 DM Harvester Survey (Chapter 3)
S_2	Total cost of additional supplies ($)	variable	Derived from 2013 DM Harvester Survey (Ch. 3)
Pi	Price per pound of ice	$0.10	Commercial rate 2014
Qi	Quantity of ice used per pound of shrimp	.29	Ratios suggested in the Seafood Handbook by Louisiana Direct (2014)
Pb	Price per bag ($)	$0.02	Wholesale price of plastic bag (12"Lx 7"W x 21"D)
Qb	Quantity of bags used per DM transaction	5	Estimated by avg. bag volume and avg. lot size
D	Average number of miles traveled per trip	10	DM Harvester Survey (Chapter 3)

Table 2.4 continued

Estimates for Direct Marketing			
Variable	*Description*	*Mean Value*	*Source/Comments*
lot	Average lot size of transaction (lbs)	49	2013 DM Harvester Survey (Chapter 3)
r_2	Compensation rate per mile ($)	$0.51	Compensation rate for fuel, oil, and depreciation, based on Federal travel compensation rate
x	User defined fraction of shrimp directed to DM	0-100%	Simulated as 5%, 15%, 30%, and 50% (Chapter 4)
Qc	Quantity of commodity shrimp sold to dock	Variable	Simulated (Chapter 4)
Qdm	Quantity of DM shrimp sold to public	Variable	Simulated (Chapter 4)
Qsq	Total Shrimp Landings by Quintile	62,483 (5,851-176,190)	Volume of landings derived (R_1/P_c) per quintile (Miller and Isaacs 2014)
P_{dm}	Weighted average direct marketing price of shrimp	2.98	2013 DM Harvester Survey (Chapter 3)
P_{dmxl}	Average direct market price of X-Large shrimp	$4.89	2013 DM Harvester Survey (Chapter 3)
P_{dml}	Average direct market price of Large shrimp	$3.74	2013 DM Harvester Survey (Chapter 3)
P_{dmm}	Average direct market price of Medium shrimp	$2.73	2013 DM Harvester Survey (Chapter 3)
P_{dms}	Average direct market price of Small shrimp	$1.96	2013 DM Harvester Survey (Chapter 3)
P_{dmb}	Average direct market price of Bait shrimp	$1.68	2013 DM Harvester Survey (Chapter 3)
d'_{xl}	Percent of X-Large shrimp in direct market sales distribution	3%	2013 DM Harvester Survey (Chapter 3)
d'_l	Percent of Large shrimp in direct market sales distribution	35%	2013 DM Harvester Survey (Chapter 3)
d'_m	Percent of Medium shrimp in direct market sales distribution	39%	2013 DM Harvester Survey (Chapter 3)
d'_s	Percent of Small shrimp in direct market sales distribution	20%	2013 DM Harvester Survey (Chapter 3)
d'_b	Percent of Bait shrimp in direct market sales distribution	3%	2013 DM Harvester Survey (Chapter 3)

CHAPTER 3: DIRECT MARKETING SURVEYS

Two survey instruments - one targeting harvesters and the other, consumers - were developed by the LSU Center for Natural Resource Economics & Policy (CNREP) in concert with LDWF to collect additional information on practices associated with the direct marketing of shrimp. The goal of these instruments was to refine input parameters for the partial budget and to obtain supplemental information on the practices and preferences associated with the direct marketing (DM) of Louisiana shrimp.

3.1 DM Harvester Survey: Methods

Table 3.1 highlights milestones in the design and implementation of a supplemental survey for inshore shrimp harvesters. A draft questionnaire was developed in March 2013 in accordance with the Tailored Design Method (Dillman, 2000). A cover letter was also drafted providing background, purpose and contact information for the study.   In July 2013, copies of the draft instrument were provided to Sea Grant fisheries agents, commercial shrimpers, and seafood dealers for panel testing. This test panel provided suggestions on question wording, industry vocabulary and common industry practices. Panel recommendations were used to fine-tune the questionnaire. An optional, on-line version of the harvester survey was developed using Survey Monkey ver. 2014 and was accessible via a Uniform Resource Locator (URL) link provided in the cover letter.

The final harvester survey included 20 questions on topics covering vessel characteristics, harvest effort by grade, sales, product forms, demographics and location. To the extent possible, key questions were modeled after Miller and Isaacs (2008, 2013) to capture information on vessel size, age, and horsepower, and number of trips and days at sea.

Table 3.1 Milestones in DM Harvester Survey Design and Implementation

Time Frame	Time Frame
March-June 2013	Draft survey development
July-August 2013	Panel testing with shrimpers, retailers and extension agents
September 2013-February 2014	Survey refinement
	Online version of survey developed
March-May 2014	Intercept Administration at outreach events
May 2014	Online Version of survey initiated
	Intercept Administration at outreach events
June 2014	Data entry from first round of surveys completed
	Online Survey finalized
	Survey adjusted in accordance with LDWF request
	Request for Fresh Products License contact information initiated
July 2014	Fresh Products License holders contact information received
	Surveys sent to Fresh Products License holders

The remainder of the questionnaire solicited additional data on direct marketing quantities and prices by grade, sales logistics, and general comments. A ZIP code was collected in order to provide some geographic information while maintaining anonymity.

Initially the respondents to the Miller and Isaacs (2014) were examined for resampling; this ultimately proved unviable due to confidentiality. Another potential option was the 69 harvesters participating in Louisiana Direct along with the 111 harvesters participating in Market Maker. While these groups offer a population that is participating in direct marketing, the goal of the study was to examine how direct marketing affects the net revenue for the average shrimper. Participants in such programs as Market Maker and Louisiana Direct are likely to represent a small portion of the shrimping population that has

a stronger avidity bias for direct marketing. In this respect it was determined that intercept

data would provide a broader diversity of shrimping operations. Later the fresh products

license holders with some shrimp sales during 2013 were also used as a sample

population as they were known to participate in direct marketing. However the degree to

which they participated was expected to be more variable than those that participated in

Louisiana Direct or Market Maker.

 The first phase of harvester surveys was distributed via opportunistic intercept at marine

extension meetings held by the Louisiana Sea College Program in spring 2014. Survey

packets (i.e. cover letter, questionnaire, and pre-addressed and stamped envelope) were

distributed at 7 public meetings and workshops held in Iberia, Vermillion, St. Bernard,

Cameron, Terrebonne and Lafourche parishes. In total, 248 surveys were distributed. In

an effort to expand the sample, a second round of surveys were administered in summer

2014 in concert with LDWF. The expanded sampling effort targeted fresh product license

(FPL) holders who reported commercial shrimp sales in 2013 according to the trip ticket

data base of LDWF (n=167). As a condition of providing access to the FPL contacts,

LDWF requested the addition of one supplementary question related to FPL-relevant

licenses and permits. The amended survey is available in Appendix A. A follow-up

reminder was sent August 2014 as recommended by Dillman (2000). Given the anonymity

requirements of the contract agreement with LDWF, all FPL contacts received the survey

again with a request to complete and return if a respondent had not already done so. To

control for duplicate surveys, identical responses were flagged from recipients with the

same IP address or ZIP code, for internet and postal responses respectively. Results were

manually tabulated into Survey Monkey Version 2014 and then stored in a secure location.

Any information connecting the survey to the participating individual was destroyed in

compliance with the Louisiana State University Security of Data Agreement (IRB #E8829 [Appendix B]). Upon completion of data entry, responses were downloaded into MS Excel2013. Final data were checked for duplicate information and proof read for transcription errors.

3.2 DM Harvester Survey: Results

In the first phase of harvester survey, 29 questionnaires were returned for a little over a 10% response rate. Two surveys were determined to be duplicates and unusable. The second phase, postal survey yielded a total of 45 additional harvester surveys for a 27% response rate from the fresh products license holders. In total, 74 harvester surveys were returned for a combined response rate of 18%. Figure 3.1 displays a GIS depiction of the respondents' location by ZIP code. Upon reviewing the responses, several respondents appeared to have misunderstood question 4 indicating that their total number of days at sea for the year was less than their total number of trips. It was assumed respondents had indicated the number of days at sea per trip instead of total number of days at sea. In such cases the number of trips was multiplied by the number of days at sea indicated. There also appeared to be some confusion over question 5, the number of pounds landed per trip, where respondents denoted their total annual catch. To ensure the quality of the information gathered, answers to this question that fell outside of two standard deviations were divided by the number of annual trips for that respondent except in the instances where the number of trips was not recorded or that response was also an outlier. In these instances the value for number of pounds landed was discarded. In instances where the number of pounds landed per trip still fell outside of two standard deviations after it had been divided by the number of trips the value was discarded.
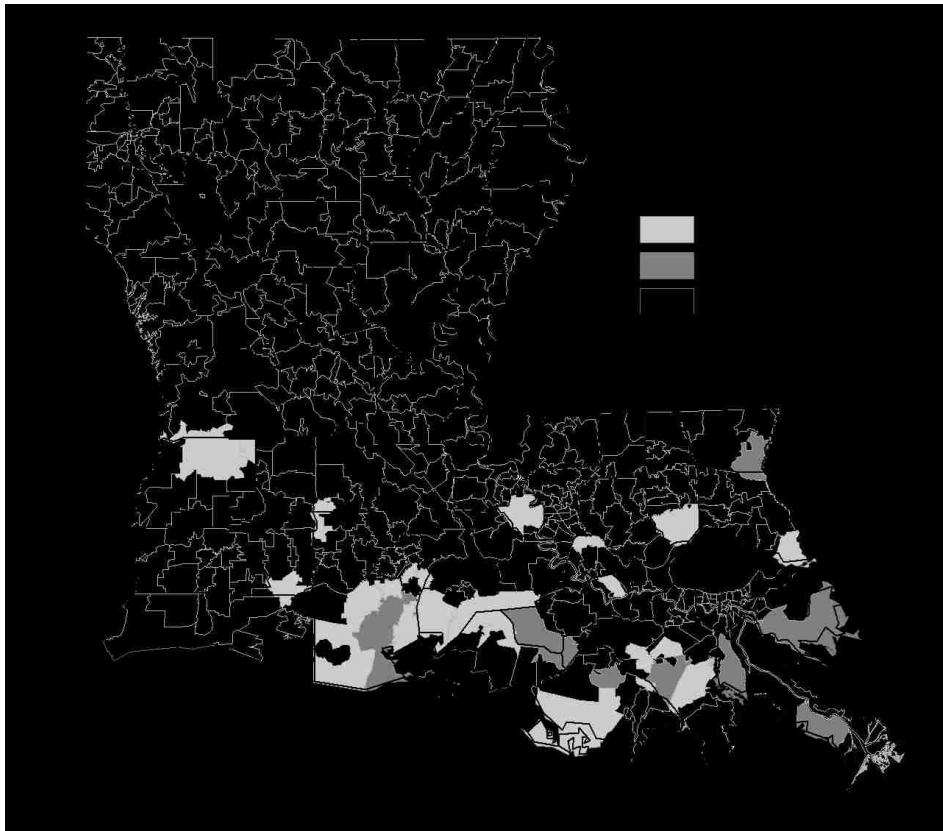
Figure 3.1 Distribution of DM Harvester Survey Respondents by ZIP Code

3.2.1 DM Harvester Descriptions

Table 3.2 includes descriptive statistics for the 72 respondents, of which 93% (N=67) indicated that they were primarily shrimp harvesters with the remaining 7% indicating they were primarily shrimp purchasers in 2013. The majority of the respondents (91%) indicated that they harvested from a single vessel. Average values yielded for vessel characteristics indicated a mean size of 41 feet, total horsepower of 375, and an average hull age of 24 years (built in 1990). The average number of annual trips was 25 for a total of 87 days at sea (2.3 days per trip) and a mean harvest per trip of 1,493 pounds of shrimp.

The bulk of the shrimp harvested (87%) fell into the *Large*, *Medium* and *Small* grades with average catches at 23%, 33% and 31%, respectively. The average catch was sold at a 56% to 35% split to the commodity dock (wholesale) and public market (marketed directly), respectively. The average respondent reported 55 direct market transactions annually with consumers somewhat evenly distributed among the categories of once per year, occasional (2-5 times per year), and frequent (> 5 times per year). The most common lot size 11-49 pounds (39%) with purchases of 100 pounds or more accounting for only 7 percent of sales.

Comparisons between this survey and those obtained from Miller and Isaacs (2014) are given in Table 3.3. Values for length, horsepower, year built, and days per trip are fairly consistent between surveys. Annual trips and days at sea have slightly lower values than those provided by Miller and Isaacs (2014). Values for distribution of harvest disposal are less consistent, with the portion of catch marketed directly being higher in the harvester survey (35%) compared to the inshore shrimp survey (11.6%). This difference is likely due to the targeted subjects of the second round of the DM harvester survey being exclusively those who held a Fresh Products license in 2013.

3.2.2 DM Harvester Prices and Operations

Table 3.4 displays survey results pertaining to average prices and grades and product forms of DM shrimp. The majority of DM shrimp (92%) marketed was fresh (never frozen). Prices ranged from $4.89 for *X-Large* shrimp to $2.00 per pound for *Small* shrimp. Large shrimp (16/20-26/30 count per pound) accounted for the largest allocation of shrimp sold by grade to DM buyers (49% of the available catch), followed by *medium* (37% of available catch). These prices levels are substantially higher than the 10-year average dockside

Table 3.2 Harvester Descriptors of the DM Survey

	N	Mean	Stdev	Max	Min
Primary Category	72				
Harvesters	67				
Purchasers	5				
Shrimp Source	70				
Boats Harvested from	66	1	1	10	1
Boats Purchased from	7	4	5	9	1
Vessel Characteristics					
Length (ft.)	67	41	16	85	14
Horsepower	64	375	230	1040	20
Year Built	58	1990	13	2013	1953
Effort					
Trips	61	25	18	75	2
Days at sea	61	87	74	262	2
Pounds per trip	60	1493	1771	6940	30
Catch Distribution (%)					
X-Large (U-9- 10/15 count)		6	10	50	0
Large (16/20-26/30 count)		23	18	85	0
Medium (31/35 to 40/50 count)		33	19	80	0
Small (Over 50 count)		31	23	100	0
Bait		7	17	100	0
N/A		0	2	20	0
Sales Distribution (%)	70				
Commodity		56	42	100	0
Home		9	17	100	0
DM		35	37	100	0
N/A		0	2	20	0
DM Transactions	50	55	68	300	0
DM Consumer Frequency (%)	50				
One Time		29	34	100	0
Occasional (2-5 times/yr)		38	29	100	0
Frequent (> 5 purchases/yr)		33	36	100	0
DM Lot Size (%)	49				
Small (10 lbs. of shrimp or less)		31	33	100	0
Medium (11-49 lbs. of shrimp)		39	30	100	0
Large (50-100 lbs. of shrimp)		23	23	100	0
X-Large (> 100 lbs. of shrimp)		7	18	100	0
N/A		0	1	10	0

Table 3.3 Comparisons of the Inshore Shrimp Survey and DM Survey

	Miller and Isaacs 2014 (2012 data)	2014 DM Survey (2013 data)
Vessel Characteristics	N=166	N=72
Length	35.4	42
Horsepower	312.8	363
Year Built	1992	1990
Trips	36.7	25
Days at Sea	93.3	87
Days per Trip	3.4	3.5
Marketing of Catch		
Docks or Processors	80.3%	56%
Directly to the Public	11.6%	35%
Kept for Self or Given Away	8.1%	9%

prices reported by NMFS (2014) and represent DM premiums ranging from $1.00 to $1.80 across all grades. Variations on this premium were greatest for X-Large shrimp (std = $1.62) with sales reported as high as $8 per pound and as low as $2.5 per pound. A large portion of variation in price within grades is most likely due to consumer preferences, which may also be influenced by location, income, education and social norms. Consumers with limited access, and higher levels of disposable income and with more knowledge of seafood quality would be more likely to value directly marketed shrimp higher. Also social norms and local prices may affect how consumers' value directly marketed shrimp.   A visual comparison of the average, maximum and minimum values for these three price estimates is provided in Figure 3.4.

Responses to a question pertaining to commercial licensing and permitting were relatively low, with only half of respondents participating. This lower rate of participation is likely due the late addition of this question in phase two of the survey at the request of LDWF. It may

Table 3.4 Price, Distribution and Product Forms of DM Shrimp

	N	Mean	Stdev	Max	Min
DM Price ($)					
X-Large (U-9- 10/15 count)	22	4.89	1.62	8	2.5
Large (16/20-26/30 count)	44	3.74	1.09	7	1.5
Medium (31/35 to 40/50 count)	43	2.73	0.77	4.1	1.5
Small (Over 50 count)	31	1.96	0.65	3.8	1
Bait	16	1.68	0.92	3.8	0.47
DM grade Distribution (% of available)	49				
X-Large (U-9- 10/15 count)		20	36	100	0
Large (16/20-26/30 count)		49	36	100	0
Medium (31/35 to 40/50 count)		37	35	100	0
Small (Over 50 count)		21	32	100	0
Bait		13	30	100	0
Product Forms (%)	51				
Fresh		92	27	100	0
Fresh Frozen		2	11	80	0
Frozen		2	14	100	0
N/A		4	20	100	0
Permits Held	36				
Commercial License	36	1			
Fresh Products License	33	0.92			
Scale certification	18	0.5			
Permit to operate	8	0.22			
Retail/Wholesale	5	0.14			
Parish Specific	5	0.14			
HACCP plan	1	0.03			
Other	3	0.08			

also be due to individual respondent concerns over a lack of compliance and concerns over survey anonymity. Of the respondents to this question (n=36) 100% held a commercial fishing license, with 92% of these individuals holding a fresh products license. Scale certifications were held by 50% with successively lower reporting of operating permits (22%) retail/wholesale licenses (14%), parish-specific licenses (15%) and approved Hazard Analysis and Critical Control Point (HACCP) plans (3%).

3.2.3 DM Harvester Logistics and Services

Data collected on the logistics and services of direct marketing are captured in Table 3.5. Responses indicated that on average 67% of respondents sold shrimp directly from their home, followed by 42% selling from their vessel. Participants were allowed to select more than one location for this response yielding response percentages that do not sum to 100. Most of the respondents' direct sales transactions involved the customer coming to the harvester to pick-up product (85%), with a smaller amount (15%) of delivery services provided. Advertising was reported to be primarily word of mouth (78%), followed by the use of signage (14%), online ads (5%) or farmer's markets (4%). A large majority of respondents supplied ice (83%) and plastic bags (62%) free of charge to customers. Fee-based services such as deheading were made available by 35% of harvesters.

In an effort to capture labor costs associated with individuals transactions, respondents were asked to estimate average times required in minutes for sales of small (10 lbs or less), medium (11-49 lbs) and large lot sizes (over 50 lbs). At 17, 21 and 23 minutes respectively, these transaction times did not appear to be substantially different. Given that this question fails to capture information on the interval of time between transactions, an indirect labor variable (L_i) was included in the partial budget template (Section 2.3).

Finally, while shrimp was the primary product of DM transactions, 22 respondents also reported sales of other types of fresh seafood. The highest of these supplementary sales was blue crab, with 43% of responding harvesters indicating at least some DM sales of blue crab in 2013. Reported sales of finfish such as flounder (18%) and black drum (12%) were much lower, possible due to the seasonal nature of those catches.

Table 3.5 Logistics and Services for DM Shrimp

	N	Percent	Mean	Stdev	Max	Min
Sales Location	36					
House	24	67%				
Vessel	15	42%				
Vehicle	5	14%				
Other	8	22%				
Customer Interface (%)	52					
Pick-up			85	28	100	0
Delivery			15	28	100	0
Advertising (%)	52					
Word of Mouth			78	34	100	0
Online			5	18	100	0
Farmers Market			4	15	90	0
Sign			13	26	100	0
Provided Services	52					
Ice	43	83%				
Plastic Bags	32	62%				
De-heading	18	35%				
Ice Chests	13	25%				
Peeling	3	6%				
Other	2	4%				
N/A	5	1%				
Time per lot size (Minutes)	43					
Small (10 lbs. of shrimp or less)	38		17	22	120	1
Medium (11-49 lbs. of shrimp)	43		21	20	120	2
Large (Over 50 lbs. of shrimp)	38		23	15	70	2
Other seafood sold	51					
Crab	22	43%				
Flounder	9	18%				
Black Drum	6	12%				
Squid	6	12%				
Oysters	4	8%				
Other	5	1%				
N/A	25	49%				

Additionally on the final page of the survey, respondents were given the option to include any comments they felt necessary, these can be found in Appendix E.

3.3 DM Consumer Survey: Methods

As a complement to the harvester survey, an open-access, web-based consumer survey was drafted and implemented to better understand the characteristics of purchasers of DM shrimp. While this non-random approach prohibited the use of inferential statistics, its use here is intended primarily to provide supplementary information for the price and demand parameters identified in the harvester survey. Table 3.6 highlights milestones in the consumer survey design and implementation process.

A draft of the consumer questionnaire was developed in August 2013 in accordance with the Tailored Design Method (Dillman, 2000). A cover letter was also drafted providing

Table 3.6 Milestones in consumer survey design and implementation

Time Frame	Time Frame
August 2014	Draft survey development
August 2014- February 2014	Survey Refinement
	Secondary survey developed
	Online version of survey developed
March-June 2014	Online survey banner with link posted to RodnReel.com
May 2014	Survey web link posted to Facebook
	Survey web link posted to Louisiana Direct Websites
	E-mail sent to Louisiana Direct listserv with survey web link
June 2014	Reminder e-mail to Louisiana Direct listserv with survey link
August 2014	Survey web link posted to Lagniappe newsletter website
August 2014	E-mail to Lagniappe newsletter subscribers with survey link

background, purpose and contact information for the study.   Over the next few months survey questions were refined based on input from fisheries economists at LDWF and CNREP. Members of the public with little or no experience with the shrimping industry were also recruited to ensure that the questions would be easily understood by individuals from a variety of backgrounds. The final consumer survey included 25 questions targeting consumers who had purchased shrimp directly at least once in the previous year.

Once the draft consumer survey had been completed it was replicated to an online format using Survey Monkey Version 2014. In an effort to capture a broader range of consumer information a secondary survey was developed for consumers who had never purchased shrimp directly, but might be interested in doing so. Finally, a third option was developed for consumers who indicated they had never purchased shrimp directly and had no interest in doing so. The survey version that respondents were given was based on their answer to Question 1 and subsequently Question 2 if they had never purchased shrimp directly.

Figure 3.2 provides a schematic for the questionnaire selection process. The questionnaire addressed consumers of DM shrimp in 2013 and consisted of 15 questions focused mainly on purchasing behavior and preferences (Appendix C). Survey questions addressed information on size categories, lot sizes, prices and purchase frequency. Respondents were also asked about product form preferences and factors influencing their decision to purchase shrimp directly. The final section requested basic demographic information on age, education level, household income, and ZIP code.

Respondents who indicated that that had not purchased shrimp but were interested in doing so were asked similar questions to those who had purchased shrimp directly. This survey consisted of 13 questions (Appendix D).
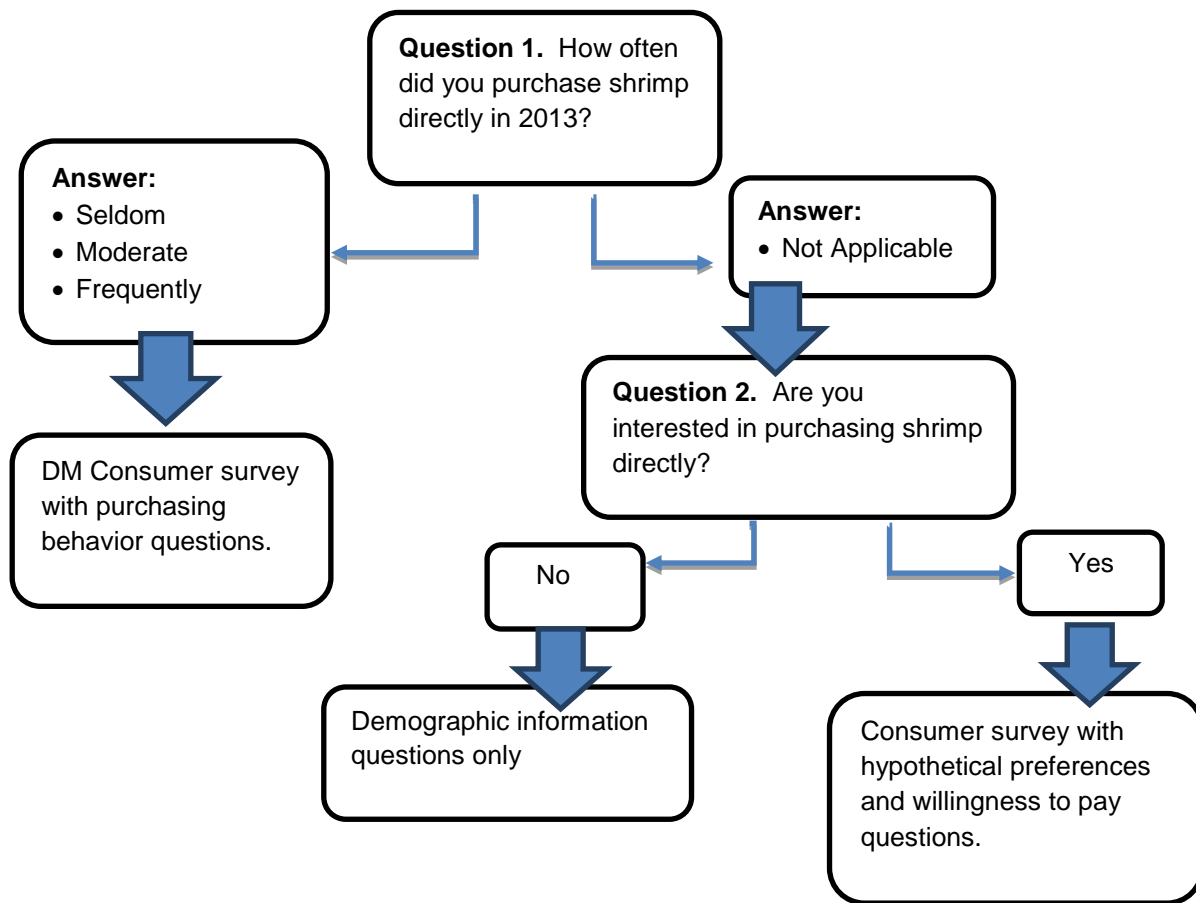
Figure 3.2 Schematic for survey questionnaire selection process

Questions included Information on willingness to pay by grade and preferences for specific product forms, lot sizes, and important factors when purchasing direct. Respondents were also asked the same demographic information as those that had purchased DM shrimp. Respondents who indicated that they had not purchased DM shrimp in 2013 and were not interested in doing so were only asked to provide demographic information in parallel with the two previous respondent groups. All respondents were given the option of leaving additional comments at the end of the survey.

Individual web links were created via Survey Monkey Version 2014 for each web-based location where the survey was made available. This allowed for tracking and data collection by location. From March through June, the survey was made available online

via banner display on RodnReel.com, the Louisiana Direct website, and the Salty Shrimper Facebook page. Email notices were sent to the Lagniappe Newsletter and Louisiana Direct in May-June 2014.

Upon completion of data collection, responses were downloaded into MS Excel 2013. Any information connecting the survey to the participating individual was destroyed in compliance with the Louisiana State University Security of Data Agreement (IRB #E8829 [Appendix B]) Final data were checked for duplicate information and proof read for transcription errors.

3.4 DM Consumer Survey: Results

A total of 255 useable responses were received over the course of four months, with 124 responses from the Rodnreel.com, 12 from Louisiana Direct and Salty Shrimper Facebook pages, 9 responses from the Louisiana Direct website and 82 responses from the Louisiana Direct e-mail list. Figure 3.3 presents a geographical depiction of respondents' locations by ZIP code. Table 3.7 displays the results of the first question dealing with purchase frequency; 64% of the respondents (n=162) had purchased shrimp directly in the last year, with roughly half (51%) of those respondents purchasing seldom (1-2 times) and the other half purchasing equally either moderately (3-5 times, 21%) or frequently (more than 5 times, 28%) throughout the year. These numbers are comparable with the results of the harvester survey which reported a lower proportion of one time purchasers (29%), a higher percentage (38%) of occasional purchasers (2-5 times a year) and a comparable percentage (33%) of frequent purchasers (more than 5 times annually). Some of the discrepancy between these survey results may be due to the variation in purchaser categories between surveys. The respondent group that purchased shrimp directly in 2013 is referred to hereafter as "DM purchasers".

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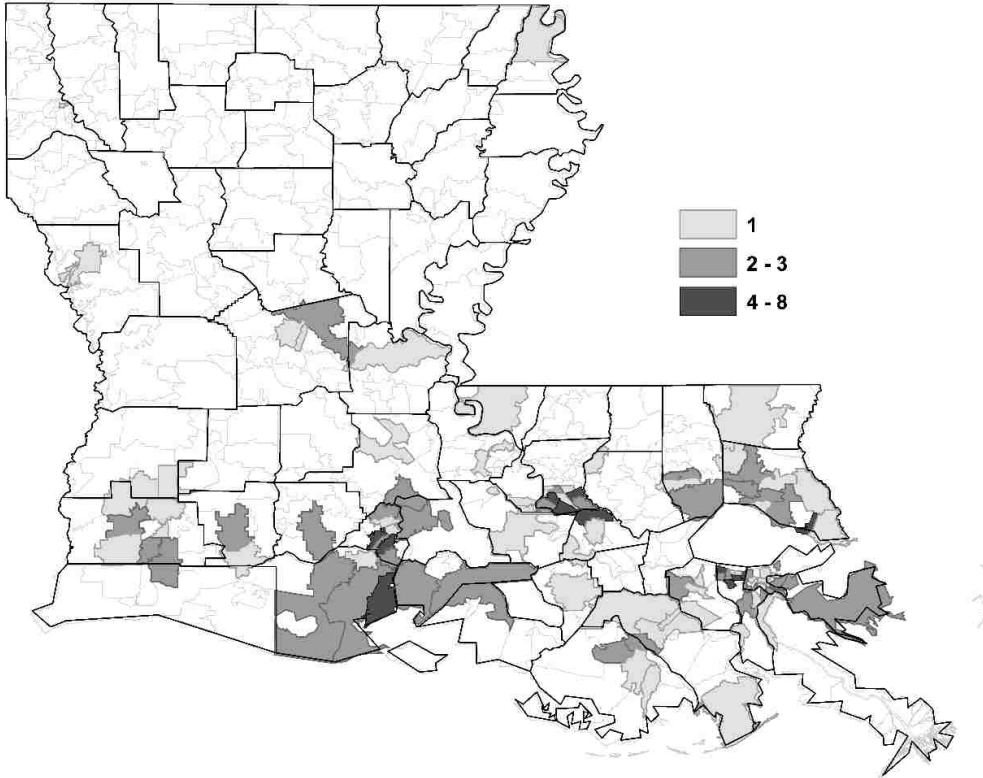
Figure 3.3 Geographic location by ZIP code of respondents to consumer survey

Table 3.7 Frequency of Directly Marketed Shrimp Purchases

	N	Percent
DM Purchasers	162	64%
Frequency of DM Purchases		
Seldom (1-2 times/yr)	82	51%
Moderate (3-5 times/yr)	34	21%
Frequent (>5 times/yr)	46	28%
Non Purchaser Interest	93	36%
Interest in DM Shrimp		
Yes	77	83%
No	16	17%

Of the 36% of respondents (n=93) who indicated they had not purchased DM in 2013, 83% indicated they would be willing to do so in the future. These respondents were directed to the prospective purchaser survey and are referred to as "potential DM purchasers." 17% of respondents indicated they had not purchased shrimp and had no interest in doing so.

3.4.1 Preferences Obtained from the DM Consumer Survey

Respondents were asked to rank their most preferred grades of DM shrimp with one being most preferred and 5 being least preferred (Table 3.8). Both DM purchases and potential DM purchasers rated the *Large* grade highest[7] with an over 50% of respondents in both groups ranking it first in preference for an average rank of 1.5 and 1.56 for purchasers, and potential purchasers; respectively.

Medium grade was found to be the second most preferred, with around 20% in each group ranking it first in preference and an average rank of 2.17 for DM purchasers and 2.2 for potential DM purchasers. Grade *X-Large* ranked third in both groups, however almost 30% of Potential Purchasers ranked this grade first as compared with 17% of Purchasers. In addition, grade *X-Large* received an average rank of 2.23 from Potential Purchasers, whereas it received an average rank of 2.69 from Purchasers. This finding is consistent with field-based accounts of marine extension agents who report a strong preference for medium and large size grades in the direct market.

Both DM purchasers and potential DM purchasers showed strong preferences for fresh, never frozen shrimp, whereas frozen shrimp was ranked fourth highest in both groups. Preference measures for peeled and de-headed shrimp ranked lowest among both groups.

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[7] Lower composite scores indicate greater preference.

The top four determinants of demand in both groups were: 1^s *freshness of product*, 2nd *price* of product, 3rd convenience of *location*; and 4th *supporting local businesses*. These criteria are consistent with findings of similar surveys that rank product quality, price, and

Table 3.8 Consumer Preferences of the DM Survey

	DM Purchasers		Potential DM Purchasers	
	Rank	Score	Rank	Score
Grade Preferences				
Large (16/20-26/30 count)	1st	1.5	1st	1.56
Medium (31/35 to 40/50 count)	2nd	2.17	2nd	2.2
X-Large (U-9- 10/15 count)	3rd	2.69	3rd	2.23
Bait	4th	3.52	4th	3.7
Small (Over 50 count)	5th	4.01	5th	3.88
Product Form				
Fresh	1st	1.15	1st	1.91
Deheaded	2nd	2.81	3rd	3.43
Fresh Frozen	3rd	3.4	2nd	3.42
Frozen	4th	3.72	4th	3.5
Peeled-Deheaded	5th	3.96	5th	4.14
Determinants of Demand				
Freshness of Product	1st	1.53	1st	1.51
Price	2nd	2.38	2nd	2.21
Location	3rd	2.65	3rd	2.96
Supporting Local Business	4th	3.48	4th	3.54
Relationship with Harvester	5th	3.60	6th	4.32
Lack of Chemicals	6th	3.63	5th	3.63
Environmentally Friendly	7th	4.96	7th	4.71
Method Used to Find Harvester				
Word of Mouth	1st	1.48		
Drive by	2nd	2.70		
Contacted by Shrimper	3rd	2.98		
Website	4th	2.99		
Farmer's Market	5th	3.10		

location attributes among the most important factors of demand for locally sourced foods (Bond et al 2006; Thilmany *et al.* 2008).

The next question was only made available to DM purchasers. Respondents were asked to identify the method used in 2013 to locate harvesters. *Word of mouth* was the most common method of harvester location with 55% of respondents ranking it first and an average rank of 1.48. This was followed by *drive by/signage* which received an average rank of 2.7, *contacted by shrimper* 2.98, *website* 2.99 and *farmers market*, 3.10. Preferences obtained in the DM consumer surveys cannot be construed as indicative of the Louisiana population at large. While the non-random nature of this survey makes it impossible to know for sure, it is plausible that these individuals are avid seafood consumers who are primarily older, with higher than average incomes and education levels. Indeed, respondent demographics (Table 3.9) indicate that a large majority of respondents considered themselves recreational fishermen (86%) with over 60% between the ages of 51- 70 a notably disproportionate from the 20% of Louisiana residents 16 years and older who claimed to hold a recreational fishing license in 2011(U.S. Census, 2014, U.S.F.W.S., 2014) and the estimated 23% of Louisiana Residents that fell into that age group in 2013 (U.S. Census, 2014). The average number of persons per household for survey respondents was consistent with the state average of 2.6 inhabitants. Nearly half (49%) had an annual household income of over $91,000, more than double the average Louisiana household income of $44,874 (U.S. Census, 2014). More than half of each group had received a college education with 23-28% having completed a graduate program, and 100% having higher than a high school education, notably higher than the Louisiana state average of 21% holding a bachelor's degree or higher and 82% holding a high school diploma or higher. This information could suggest that the target market for

directly marketed shrimp would fall in the older age brackets and tend to have a higher

income and a higher education level than typical Louisiana residents. It also suggest a

positive correlation between recreational fishing and purchasing shrimp directly most likely

due to the frequency of trips to the coast where directly marketed shrimp is most likely

Table 3.9 Respondent Demographics from the DM Consumer Survey

	DM Purchasers			Potential DM Purchasers		
	N	Percent	Global	N	Percent	Global
Age	N=154			N=75		
Under 20	0	0%		0	0%	
21-30	2	1%		2	3%	
31-40	14	9%		10	13%	
41-50	27	18%		12	16%	
51-60	50	32%		25	33%	
61-70	54	35%		20	27%	
Over 71	7	5%		6	8%	
Household	N= 152			N=73		
Adults (0ver 18)			2.23			2.16
Children (Under 18)			0.34			0.26
Income	N= 145			N=66		
<$20K	3	2%		4	6%	
$21K-$30K	7	5%		3	5%	
$31K-$40K	12	8%		4	6%	
$41K-$50K	10	7%		4	6%	
$51-$60	9	6%		7	11%	
$61K-$70K	9	6%		5	8%	
$71K-$90K	24	17%		10	15%	
$91K-$150K	46	32%		16	24%	
>$150K	25	17%		13	20%	
Education	N=154			N=72		
Elementary	0	0%		0	0%	
Middle School	0	0%		0	0%	
High School	40	26%		24	33%	
Associates	**32**	21%		9	13%	
Bachelors	46	30%		19	26%	
Graduate	36	23%		20	28%	
Recreational fisherman	N=152			N=74		
Yes	131	86%		55	74%	
No	21	14%		19	26%	

more available. However, due to the self selected nature of this survey, these target

market assumptions should be heeded with caution, and in the future a survey of a more

random population may prove useful to supplement these results.

3.4.2 Prices Obtained from the DM Consumer Survey

The actual and prospective prices reported for DM shrimp represents one of the more

interesting facets of the consumer survey. Table 3.10 show that the average price paid for

X-Large, *Large* and *Medium* shrimp was $4.85, $3.87 and $3.14 respectively. These prices

are fairly consistent with the results of the DM harvester survey, with X-Large, Large and

Medium prices of $4.89, $3.74 and $2.73 respectively.

. Conversely the maximum WTP prices were considerably higher, with premiums ranging

from $1.65-$2.61 extra per pound (DM purchasers) and from $2.41 to $2.73 per pound

(potential DM purchasers) for grades ranging from *small* to *X-Large*. In all cases, actual

prices paid were consistently lower than the maximum WTP prices for both DM purchasers

and potential DM purchasers, except for the case of bait shrimp. This was also the only

instance where the potential DM purchaser maximum WTP was lower than the DM

purchaser maximum WTP price.

Within grades there was a noticeable amount of price variation for example Large prices

ranged from $1.75/lb to $13.00/lb and bait ranged from $0.25/lb to $20.00/lb. As with the

harvester survey the majority of variation is most likely due to a number of factors including

but not limited to consumer preferences, location, income, education and social norms.

The variation among values is displayed in Figure 3.4.

As seen in the harvester survey, the preferred lot size was medium (10-50 pounds), preferred by 42% of DM purchasers and 54% of potential DM purchasers. When asked how many sources were used for direct marketing, 50% of DM purchasers indicated that they used only one source, while 46% indicated that they used a few sources (2-3).

Given these data derive from self-selected respondents; they should be used with caution when informing any potential marketing strategies for existing or prospective investors. Moreover, their application within the partial budget for DM shrimp is limited to a best-case, upper bound scenario for calculating $NIFO_{dm}$.

At the conclusion of this survey, respondents were asked to leave any additional comments they felt necessary on the subject. These comments, as of yet have not been analyzed but are included in Appendix F.

Table 3.10 Prices and Purchase Sources for DM Shrimp

|	DM Purchasers						Potential DM Purchasers					
	N	Percent	Mean	Stdv	Max	Min	N	Percent	Mean	Stdv	Max	Min
Price Paid												
X-Large	62		$4.85	$1.47	$10.00	$3.00						
Large	114		$3.87	$1.30	$10.00	$2.00						
Medium	77		$3.14	$1.27	$9.00	$1.00						
Small	31		$2.48	$1.30	$6.00	$0.80						
Bait	40		$3.31	$1.30	$20.00	$0.25						
Max Willingness to Pay												
X-Large	71		$5.70	$2.01	$12.00	$3.00	52		$5.82	$2.53	$15.00	$1.85
Large	115		$4.52	$1.48	$10.00	$2.50	59		$4.83	$2.39	$13.00	$1.75
Medium	80		$3.54	$1.33	$9.00	$1.00	49		$4.02	$2.06	$10.00	$1.65
Small	37		$2.68	$1.40	$8.00	$1.00	36		$3.44	$1.89	$8.00	$1.00
Bait	44		$3.45	$3.83	$20.00	$0.40	36		$1.86	$1.14	$5.00	$0.25
Lot Size	N=153											
Small	34	22%					21	28%				
Medium	65	42%					41	54%				
Large	41	27%					14	18%				
X-Large	12	8%										
N/A	1	1%										
Number of Purchase Sources	N=154											
One	77	50%										
Few	71	46%										
Many	6	4%										
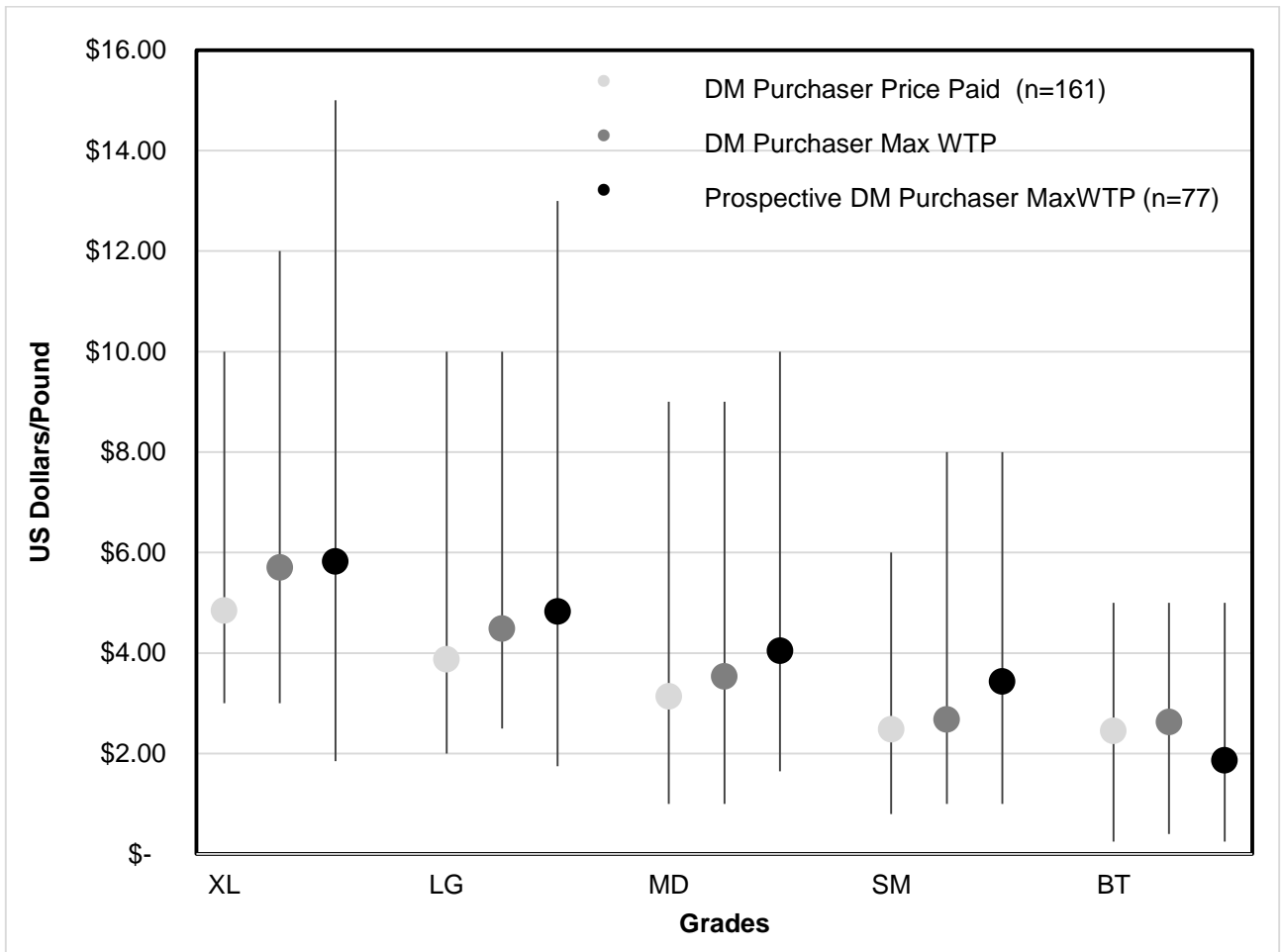
Figure 3.4 Actual and Prospective Prices for DM Shrimp 2013

CHAPTER 4: SIMULATIONS

Using the data collected from the surveys discussed in Chapter 3, the parameters of the budget template outlined in Chapter 2 were refined to more closely reflect Louisiana shrimper direct marketing situations. The following chapter examines hypothetical operating scenarios based on the $NIFO_{dm}$ framework.

4.1 DM Allocation Scenarios

In order to estimate impacts of direct marketing on Louisiana shrimpers, operational scenarios must be devised and applied to each quintile as well as the state average obtained from Miller and Isaacs (2014). While numerous allocation fractions are possible, in the interest of practicality only four were analyzed. Operational scenarios were based on DM allocations of 5, 15, 30, and 50 percent of total catch - here forward referred to as cases 1, 2, 3 and 4, respectively. These cases represent a reasonable range of allocation strategies consistent with the context of this study in which DM is examined as an income-supplementing practice. These allocations were constrained by grade proportions based on results of the harvester survey. In some instances the quantity of shrimp marketed directly exceeded the quantity of shrimp available for sale. In these instances the maximum grade volume available for sale was used. This issue was only experienced in case 4 and resulted in less than 50% total available volume being sold directly. Table 4.1 depicts the simulated returns for the four case study scenarios. In each case, the base NIFO is -$220, the baseline estimate for the state average of Louisiana inshore shrimpers in 2012 reported by Miller and Isaacs (2014). As the fraction of catch sold on to DM channels increases from 5-50%, units (man hours) of labor and other costs not shown increase. Units of labor increase from 15 to 294 units for volumes of DM shrimp ranging from 3,124 to 27,289 pounds annually, consistent with the labor calculation methods

discussed in Section 2.3. In this base case comparison, $NIFO_{dm}$ ranges from \$5,123 to \$44,402 annually; however, these estimates reflect the state average. The feasibility of DM strategies, however, is income- and volume-specific. Estimated $NIFO_{dm}$ is either negative or extremely low (less than \$100) for cases 1 and 2 of the lowest income quintiles. The feasibility of Case 1-4 allocations is specifically detailed for quintiles 1-5 in Appendix E.

Table 4.1 Simulated returns from DM with standard prices and grade distributions

Case 1: 5% Direct Marketing 20 units of labor

	Catch Dist.	Assumed DM Prices	DM Dist.	Avg Dockside Price
X-Large	6%	$4.89	3%	$2.66
Large	14%	$3.74	35%	$1.82
Medium	17%	$2.73	39%	$1.04
Small	63%	$1.96	20%	$0.84
Bait	1%	$1.68	3%	$0.46
Wgtd Avg Price		$2.98		$1.09
			NIFO	($220)
			NIFO_{dm}	$5,213

Case 2: 15% Direct Marketing 121 units of labor

	Catch Dist.	Assumed DM Prices	DM Dist.	Avg Dockside Price
X-Large	6%	$4.89	3%	$2.66
Large	14%	$3.74	35%	$1.82
Medium	17%	$2.73	39%	$1.04
Small	63%	$1.96	20%	$0.84
Bait	1%	$1.68	3%	$0.46
Wgtd Avg Price		$2.98		$1.09
			NIFO	($220)
			NIFO_{dm}	$15,156

Case 3: 30% Direct Marketing 242 units of labor

	Catch Dist.	Assumed DM Prices	DM Dist.	Avg Dockside Price
X-Large	6%	$4.89	3%	$2.66
Large	14%	$3.74	35%	$1.82
Medium	17%	$2.73	39%	$1.04
Small	63%	$1.96	20%	$0.84
Bait	1%	$1.68	3%	$0.46
Wgtd Avg Price		$2.98		$1.09
			NIFO	($220)
			NIFO_{dm}	$30,548

Case 4: 50% Direct Marketing 294 units of labor

	Catch Dist.	Assumed DM Prices	DM Dist.	Avg Dockside Price
X-Large	6%	$4.89	3%	$2.66
Large	14%	$3.74	35%	$1.82
Medium	17%	$2.73	39%	$1.04
Small	63%	$1.96	20%	$0.84
Bait	1%	$1.68	3%	$0.46
Wgtd Avg Price		$2.98		$1.09
			NIFO	($220)
			NIFO_{dm}	$44,402

4.2 DM-Dockside Spread

As previously noted, prices reported in the DM harvester and DM consumer surveys indicated substantial premiums over the 10 year average commodity market prices for Louisiana shrimp. These premiums, which are the driving force behind the appeal of direct marketing, display a range of about two dollars per pound, depending on grade. Table 4.2 shows the price "spread" between the 10 year average commodity market price and prices collected for 2013 in the DM surveys. In this example, the 10 year average dockside price by grade (A) is compared to the 2013 average prices from the DM harvester survey (B) and the maximum WTP estimates reported in the DM consumer survey (C).

Table 4.2 Price Spread Between DM and Commodity Shrimp Market

	A. Average Price (NMFS (2014)	**B.** Harvester DM Prices	**C.** Max WTP DM Prices	**D.** Spread (B-A)	**E.** Spread (C-A)
X-Large	$2.66	$4.89	$5.82	$2.23	$3.16
Large	$1.82	$3.80	$4.83	$1.98	$3.01
Medium	$1.04	$2.78	$4.02	$1.74	$2.98
Small	$0.84	$196	$3.44	$1.12	$2.60
Bait	$0.46	$1.68	$1.86	$1.22	$1.40

These spreads are important as they provide insight into the marketing margin between commodity shrimp prices and directly marketed shrimp prices. They are also important when considering the labor versus leisure argument, where the possibility that the harvester would choose leisure over labor increases as the spread decreases. An example of this occurred during the course of this study (2013) where the dockside "commodity" price of shrimp rose sharply coinciding with declining imports. As noted in Chapter 1, this price increase was associated with world-wide supply reductions following

an outbreak EMS in shrimp major shrimp producing regions. At the peak of the shortage, domestic shrimp prices at Louisiana docks were more than twice their 10 year average per grade. This concept is explored further in section 4.2.1.

Following the scenarios described in the preceding section, the spread calculation comes into play as an estimate of the difference in basic NIFO and NIFO$_{dm}$. A positive spread indicates a direct marketing premium per pound yielding a higher net income than the base scenario. A negative spread indicates the point at which direct marketing results in a lower net income than the base case operating scenario. Table 4.3 details the results of the state average NIFO scenario from Miller and Isaacs 2014 for Case 1 - in which 5% of the harvested shrimp is allocated to the direct market with an additional 15 units of labor. The table includes a range of spread calculations resulting from commodity (dockside) price fluctuations ranging from 25% below to 200% above the 10 year average. In this scenario, the spread between NIFO and NIFO$_{dm}$ remains positive until the average commodity price exceeds 150% of the 10 year average.

Similar trends are evident for Cases 2-4 (Table 4.4, Table 4.5, Table 4.6) where a dockside prices increase of 200% over the 10 year average produces a negative spread calculation. More specifically, the spread estimate in each of these comparisons appears to be turning negative somewhere between a 150% and 200% increase of dockside prices. These findings were fairly consistent among all quintiles (Appendix G) except for Case 4 scenarios for quintiles 2-4 and Case 3 and 4 scenarios for quintile 5 where the spread became negative after a 150% increase in dockside price.

Equally important in assessing direct market operations is the NIFO$_{dm}$. This value was consistently negative for all cases in Quintile 1 except when dockside price was equal to

200% of the 10 year average. The instances of a positive $NIFO_{dm}$ increased with quintile, culminating in all positive values for Quintile 5.   This information yields some indication of the potential for direct marketing to supplement commodity sales and affect the total NIFO (Appendix G)

4.2.1 Marketing Margin

While the simulations show an important trend in the decrease of profitability of direct marketing as the dockside price increases, it does not fully take into account the marketing margin, and its impact on the direct marketing prices. Presumably as the dockside price increases the direct market price would also increase as the commodity shrimp is essentially an input for the directly marketed shrimp and as input costs rise so do the retail prices (Tomeck and Robinson 2003).   While there is not sufficient information at this time to fully estimate the long term marketing margin for directly marketed Louisiana shrimp, the maximum willingness to pay price from the consumer surveys may provide some indication for price at which the demand for directly marketed shrimp could approach zero, in the short term, however it is expected that consumer's maximum willingness to pay would fluctuate over time with changes in retail price. When the dockside prices approached the maximum willingness to pay prices it is possible that results similar to the spread simulations could be seen. For example, a substantial reduction in vessels selling via DM in the port of Delcambre, LA during 2013 was likely a result of the labor versus leisure trade off.   In this instance the rapid decrease in the spread between the dockside price and harvester perceptions of consumers' willingness to pay encouraged harvesters to sell most or all of their catches to the dock at a lower time investment and rather than market directly which would require investing more time to receive a comparable price per pound (Hymel 2014).

Table 4.3 Case 1. State Average with 5% direct marketing with 15 additional units of labor

3,124 pounds marketed directly	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10y Avg Dock Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Wgtd dockside ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,866)	($17,406)	($220)	$16,966	$34,152	$67,887	$102,259	$135,994
NIFO w/DM				($35,152)	($10,814)	$5,213	$21,240	$37,860	$69,914	$102,562	$134,616
Spread				$7,557	$6,276	$5,433	$4,589	$3,715	$2,027	$309	($1,378)

Table 4.4 State Average with 15% direct marketing with 44 additional units of labor

9,372 pounds marketed directly	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10y Avg Dock Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Wgtd dockside ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,866)	($17,406)	($220)	$16,966	$34,152	$67,887	$102,259	$135,994
NIFO w/DM				($20,959)	$816	$15,156	$29,496	$44,367	$73,047	$102,258	$130,938
Spread				$21,750	$17,907	$15,376	$12,846	$10,221	$5,160	$5	($5,056)

Table 4.5 State Average with 30% direct marketing with 177 additional units of labor

18,745 pounds marketed directly	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10y Avg Dock Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Wgtd dockside ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,866)	($17,406)	($220)	$16,966	$34,152	$67,887	$102,259	$135,994
NIFO w/DM				$806	$18,738	$30,548	$42,357	$54,604	$78,223	$102,279	$125,898
Spread				$43,514	$35,829	$30,768	$25,707	$20,458	$10,336	$26	($10,096)

Table 4.6 State Average with 50% direct marketing with 292 additional units of labor

31,241 Pounds Marketed Directly	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Wgtd dockside ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,866)	($17,406)	($220)	$16,966	$34,152	$67,887	$102,259	$135,994
NIFO w/DM				$20,470	$34,899	$44,402	$53,904	$63,758	$82,763	$102,119	$121,124
Spread				$63,179	$51,990	$44,622	$37,253	$29,612	$14,876	($134)	($14,870)

In price situations such as those seen in 2013 where the dockside price approached what the harvesters has been receiving for directly marketed shrimp, of labor versus leisure is a particularly important concept. In these instances the harvesters value the utility they would receive from the added income from direct marketing less than the utility they receive from the added leisure time they receive by unloading all of their catch quickly at one location. This decrease in supply can also have an impact on the price of directly marketed shrimp and subsequently, quantity demanded.

4.3 Labor

Upon investigating the costs and returns from direct marketing, it was found that the In these expanded labor simulations, the state average the $NIFO_{dm}$ base-case labor calculation is compared to per trip DM labor requirements of 6, 8, 12, 24 and 48 hours. For each of these scenarios catch distribution, direct market product mix, dockside commodity price and direct market price were held constant and only one laborer was assumed. Table 4.7 displays the results of this expanded simulation. As expected, $NIFO_{dm}$ decreases as labor per trip increases and becomes negative in the 5% allocation scenario

Table 4.7 State Average Labor Simulations for DM Shrimp per trip

	Weighted DM Price	Weighted Dockside Price	Base Scenario~ 20 mins per transaction	6 hrs per trip	8 hrs per trip	12 hrs per trip	24 hrs per trip	48 hrs per trip
	$2.98	$1.09						
Base NIFO			($6)	($6)	($6)	($6)	($6)	($6)
NIFO dm (5%)			$133	$47	$16	($47)	($236)	($614)
NIFO dm (15%)			$429	$362	$330	$267	$78	($300)
NIFO dm (30%)			$873	$833	$801	$738	$549	$171
NIFO dm (50%)			$1,323	$1,234	$1,203	$1,140	$951	$573

at 12 hours per trip. For cases 2 (15% DM allocation), the marginal impact of 6, 8, and 12 hours of additional labor reduces profitability by 16%, 24%, and 38% respectively. Only the largest DM allocation scenarios (30% and 50%) depict positive $NIFO_{dm}$ estimates at 48 hours. This indicates that the most efficient approach to DM sales is to distribute the product to the consumers as quickly as possible, ideally less than 6-8 hours post trip. This may be possible in locations such as Delcambre, LA where a fluid direct market has evolved for the local shrimp fleet (see Figure 1.4). Such efficiency might not yet be logistically feasible in regions and ports where the direct market is less developed. greatest cost associated with direct marketing is labor. This is also one of the costs that fluctuates the most as it is subject to a number of factors such as marketing infrastructure, skill and disposition of harvester and deck hands, lot sizes, and the availability and disposition of consumers. As such, an expanded labor case scenario was developed to further examine the impact of labor costs on the returns received from direct marketing. These case scenarios were similar to the ones discussed in the previous section with Cases 1-4, but with an expanded range of labor units reflecting changing conditions.

4.4 Product Mix

Finally, an important variable in the direct marketing template is the product mix, or portion of each grade marketed directly. This variable, representing the amount of each grade available for direct market (*d'*) is limited by the quantity of specific grade available for sale in the total market (both commodity market and direct market) (*d*). In addition to the proportion of grades marketed, the price spread for each grade has a notable influence the product mixes that are the most profitable. Table 4.8 displays the results of a simulation that explores the feasibility of marketing each grade exclusively for Cases 1-4 under state average scenario. For this simulation cases were defined consistent with previous

sections, representing DM allocations of 5%, 15%, 30% and 50% respectively. For some grades the volume marketed directly was constrained by the estimated volume available for sale in the total market, in these instances the $NIFO_{dm}$ was calculated by marketing the entire estimated available volume only. As seen in Table 4.2, the premium is highest for X-Large grade shrimp at $3.16. The direct market availability of the X-Large grade shrimp is also one of the most tightly constrained based on total market availability. These factors are reflected in the high $NIFO_{dm}$ produced by the X-Large grade in Case 1, however due to availability constraints these results are not sustainable for Cases 2-4. Large shrimp produced the highest $NIFO_{dm}$ for Case 2; however this also becomes unsustainable in Cases 3 and 4 due to volume availability constraints. Following succession, Medium grade shrimp provide the highest $NIFO_{dm}$ in Case 3 and Small is the only grade able to sustain all 4 cases, however the $NIFO_{dm}$ is comparable to selling Large only with 15% DM which may ultimately be a more efficient practice.

The next simulation explored the impact of grade proportion mix on $NIFO_{dm}$ and spread for Cases 1-4 in order to identify most potentially profitable grade mixes. Again, catch distribution, direct market price, dockside commodity price and labor were all held constant with dockside price at the 10 year average and labor at the base scenario calculation. Table 4.10 displays the results of this product mix scenario. A mix of 25% X-Large and 75% Large yielded the highest $NIFO_{dm}$ at for Cases 1 ($8,709) and 2 ($25,205) however; as DM allocations increase $NIFO_{dm}$ begins to decrease, most likely due to grade availability constraints. In Case 3 DM the product mix of 50% Large and 50% Medium and 25% X-Large and 75% Large produced comparable $NIFO_{dm}$ with the latter just over $250 more than the former. Finally in Case 4 the product mix of 50% Large and 50% Medium generated the highest $NIFO_{dm}$ ($35,810) by a margin of just over $2,000. These results

are most likely due to the similar availability of both Large and Medium shrimp, combined

with higher direct market price received for Large and Medium grades. Given this

comparable abundance and the relatively high opportunity costs selling a combination of

Large and Medium through the commodity market, it is logical that shrimpers engaging in

DM strategies might want to promote sales of a combination of these grades as a means

of maximizing profitability.

Table 4.8 State Average $NIFO_{dm}$ Scenarios DM of exclusive grades

	Case 1	Case 2	Case 3	Case 4
Fraction of catch sold via DM				
100% X-Large	$11,184	$13,468	--	--
100% Large	$7,591	$20,789	--	--
100% Medium	$4,436	$12,824	$14,566	--
100% Small	$2,030	$5,608	$11,450	$20,965

Table 4.9 State Average Spread Scenarios of DM product mixes

	Case 1	Case 2	Case 3	Case 4
Fraction of catch sold via DM				
25% X-Large/75% Large				
Spread	$8,709	$25,205	$34,331	--
50% Large/50% Medium				
Spread	$6,233	$17,778	$34,068	$35,810
75% Medium/25% Large				
Spread	$5,444	$15,411	$26,049	$33,557

CHAPTER 5: SUMMARY AND CONCLUSIONS

5.1 Summary and Conclusions

The primary purpose of this research was to assess factors affecting the economic feasibility of direct marketing in the Louisiana shrimping industry. Data collected by Miller and Isaacs (2014) in conjunction with the data collected through both a DM harvester survey and DM consumer surveys were used to develop a partial budget template. This template was used explore of the impact of direct marketing costs and returns on shrimping operations of different scales as well as the impacts of external factors such as dockside price and product mix on revenue potential.

The 2014 DM harvester survey indicated that respondent sample was relatively consistent with the respondents of Miller and Isaacs (2014) with the exception of harvest allocation where the survey respondents indicated a higher percentage of direct market allocation, most likely due to the survey's target audience of fresh product license holders who are more likely to have a higher percentage of direct marketing. The DM harvester survey also indicated that the grade sold most frequently was Large shrimp, followed by Medium, not the premium X-Large shrimp as previously hypothesized. This was confirmed by the consumer survey, in which both purchasers and potential purchasers indicated their highest preference for Large shrimp. Purchasers and Potential Purchasers also indicated a higher willingness to pay price than the actual paid price reported by harvesters for all grades, except Bait. The data collected from these two sets of surveys was used to parameterize the partial budget template based on Miller and Isaacs (2014) data. This template was the base for the investigative simulations described in Chapter 4.

Premiums for DM shrimp in the DM harvester and DM consumer survey ranged from approximately $1.00 to $.2.73 per pound, depending on grade and source of estimate. This spread created by this premium was found to be more important than estimates $NIFO_{dm}$, especially as this spread approaches zero. This issue became apparent during the course of this study when the domestic commodity shrimp process ion Louisiana rose sharply in response to a disease-induced reduction in farm-raised shrimp imports. At the peak of the shortage, domestic shrimp prices at Louisiana docks exceeded more than twice their 10 year average price per grade.

Simulations of this spread effect indicate that as dockside price increases between 50 to 100% above the 10 year commodity price average, harvesters are unlikely to see a higher $NIFO_{dm}$ than if they were to sell their entire catch directly to the dock. Simulations results also indicated that as labor per trip increases, $NIFO_{dm}$ decreases and can quickly reduce profitability to zero for lower DM allocations (5%-15%) having DM sales periods that exceed 12 hours post trip. Finally, simulations focused on product mix, indicated that DM sales relying heavily on Large and medium shrimp appeared to be the most profitable. This was most likely due to lesser volume constraints on these grades, as well as elevated price increase factors for both grades.

The information gathered in this thesis can provide some guidance when developing best management practices for those interested in pursuing direct marketing. While these findings can offer some guidance when developing a direct marketing plan it is important to remember that these numbers are generated from models and hypothetical scenarios and real world applications can have very different outcomes if under varying circumstances.

The first point to address is the matter of which quintiles benefit the most from direct marketing. While it was first hypothesized that the lower quintiles would see the greatest benefit from direct marketing, simulations indicated that while these case scenarios do see a benefit from mitigating some of the losses incurred, but direct marketing does not typically enable them to attain a positive $NIFO_{dm}$. It is not until Quintile 3 (harvest revenues above $43,000) with 30% additional direct marketing that a positive NIFO is attained as a result of direct marketing. Thus $NIFO_{dm}$ business models may be best suited for those operations that exhibit characteristics of the upper quintiles reported by Miller and Isaacs (2014).

Dockside price is another strongly influential factor in the apparent benefits of direct marketing. In all cases the spread between the bases $NIFO_{dm}$ became negative as the dockside price approached twice the 10 year average. Thus it would indicate that as the weighted commodity price approaches the average direct marketing price, operations may do better to market their entire catch directly to the dock rather than incur the additional expenses from direct marketing. It should also be noted that both DM consumers and potential DM consumers reported a higher average willingness to pay for each grade (other than bait), than the reported price paid by DM purchasers and the prices reported in the DM harvester survey. In addition the direct marketing price could increase along with the commodity price to a point, which would likely make direct marketing feasible beyond the dockside price simulations in this study. However more research would be required to understand just how much the direct marketing price could increase before demand decreases enough to make the practice infeasible. While the maximum willingness to pay for each grade does give some indication of the current upper bound for the direct marketing prices, actual maximum market prices may also be influenced by perceived

social norms based on retail and dockside price. This may also indicate a potential area for increased revenues for harvesters are willing to experiment with increasing DM prices.

Labor was by and large the principal cost incurred as a result of direct marketing and simulations reveal that additional time and laborers can have a significant impact on $NIFO_{dm}$. The most successful simulations were those with the lowest time expended and fewest laborers.   This indicates that successful direct marketing operations will dispose of their directly marketed catch quickly and with the fewest laborers needed to maintain efficiency. These findings also raise some questions about the feasibility of marketing large percentages of catch from higher producing boats such as those in quintile 5, and whether they would be able to maintain such an operation while managing labor costs.

The final consideration is that of the product mix. Initially concern was raised that operations practicing direct marketing would save their largest premium shrimp for their direct market customers and unload the smaller grades on the docks and processors. While data indicated that this is likely not the case, simulation findings also indicated that this may not be the most beneficial product mix scenario for operations marketing a high percentage of their catch directly. Because X-Large shrimp make up only a small percentage of the total annual catch, direct marketers may do better to market grades that are available in larger volumes, such as Large and Medium shrimp. In addition, consumer surveys indicated that Large shrimp preferred over X-Large shrimp and Medium shrimp were preferred over or equal to X-Large shrimp. Product mix simulations also suggested that at higher percentages of direct marketing combinations of Large and Medium shrimp only are more feasible than those involving X-Large shrimp.

5.2 Limitations and Future Research

A primary limitation of this study is the combination of secondary and primary data in the development of the partial budget DM template. While the Miller and Isaacs (2014) survey was very thorough it did not include a physical descriptor for the volume of shrimp harvested, which was integral requirement for DM allocation calculations. In order to extrapolate the required information, shrimp harvest volume had to be derived as an average weighted price and the average income by quintile.

In addition due to the small sample size of the harvester survey, the wide variations in data had a noticeable impact on means and standard deviations. This was especially apparent in the questions dealing with days at sea, number of trips and volumes harvested. While the majority of the outliers were eliminated, a larger sample size could have mitigated the impacts of outliers or facilitated the ability to delineate clear groups for a more tailored analysis.

An additional limitation existed with regards survey populations. While an attempt was made in the DM harvester survey to primarily query Louisiana's inshore shrimpers, the first round of intercept surveys yielded few responses. A second round of DM harvester surveys sent to holders of a 2013 fresh products license more than tripled the initial number of responses (n=72), but this targeted sample may have excluded additional shrimp harvesters who may have practiced direct marketing without a fresh products license.

With regards to the consumer survey, the respondent number was much higher; however participants were self-selected creating a non-random sample. The DM consumer survey was made available on web locations that catered to subjects who would likely have a

substantial avidity bias in regards to the practice of DM purchasing. Thus the conclusions drawn from this portion of the data should not be construed as representative of shrimp consumers in the general public. Despite these limitations, a more robust statistical analysis of the DM harvester and DM consumer data is warranted. At a minimum, variations in the actual and maximum WTP prices of DM shrimp could be regressed against descriptors for location, services provide, and advertising methods for DM harvesters; and against descriptors of location, preferences, and demographics of DM consumers.

Case scenario models developed to estimate direct marketing under consistent harvest to market situations do not account for what has been described as "episodic" situations in which shrimpers are able to sell all of their DM allocation in very short periods of time. While these scenarios are thought to be less common, they may be a source of future research to estimate their impacts on NIFO. Future research of this episodic phenomena model my provide situation specific insight into the costs and revenues of shrimping operations that follow this model on a regular basis. In addition further investigations should further delve into the logistical costs associated with the energy requirements of on-site cooler or freezers sued in support of direct marketing operations.

The legality of direct marketing is another issue that should be taken into account when considering it as a business option.   In some Louisiana parishes and other coastal states the sale of seafood products directly from harvester to consumer is prohibited or requires further permits infrastructure. Before any stakeholder begins to explore this as a viable operation option it is imperative that extensive research regarding the legal guidelines concerning direct marketing in the planned business location. Development of a DM screening tool would integrate the decision criteria from this study to aid stakeholders in

firm-specific decision making. Such a tool would help existing and prospective investors explore direct marketing based on the specific characteristics of their set-up and make informed decisions on the potential costs and benefits associated with adopting or modifying a direct sales model.

Finally, useful information could also be obtained to examining direct marketing trends by statewide or multistate scale to identify opportunities and constraints specific to the direct marketing of seafood. Along with regional trends, the effects specific marketing initiatives such as *Louisiana Direct* and other harvester-to-consumer programs should be examined to better understand how these programs affect both harvester sales performance and consumer perception and demand for locally-sourced seafood.

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APPENDIX A

July 1, 2014

Louisiana Sea Grant and the LSU AgCenter are requesting the assistance of Louisiana shrimpers as part of an economic study of direct marketing practices. Direct Marketing is a strategy in which harvesters sell a portion of their catch directly to "end-customers" in an effort to obtain additional revenue. End-customers include (but are not limited to) individual consumers, restaurants or chefs, friends, or family members. End-customers do not include wholesale docks, dealers, or processors.

Your expertise will help us to better understand how direct marketing is affecting your industry. Your input will be used to develop recommendations for increasing the profitability of this strategy as well as identifying those situations in which it might not prove feasible. If you have already taken this survey at a different time please do not take it again.

Please note that this survey is completely voluntary and all responses are confidential. At no time will the information that you provide be connected to you in any way or be used for anything other than research. Information from the questionnaire will only be released in summarized form.

If you harvested shrimp commercially in 2013, please take a few minutes to complete the attached questionnaire. You can return it to us via the postage-paid addressed envelope provided. Or if you would like you can take the survey online at:
https://www.surveymonkey.com/s/LAShrimpHarvester

Thank you in advance for your time and consideration.
Sincerely,

Rex Caffey   Jill Christoferson
Louisiana Sea Grant and LSU AgCenter   Louisiana Sea Grant and LSU AgCenter
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This study has been approved by the LSU Institutional Review Board (IRB). For questions concerning participant rights, please contact the IRB Chair, Dr. Dennis Landin, 578-8692, or irb@lsu.edu.

Direct Marketing Survey: Louisiana Shrimp in 2013

Direct Marketing involves selling directly to "end-customers" such as individual consumers, restaurants, chefs, friends or family. End-customers do not include wholesale docks, dealers, or processors.

1. In 2013, would you consider yourself *primarily* a <u>shrimp harvester</u> or a <u>shrimp buyer</u>?
We realize some of you may do both, but which did you do the most of? (please check only one)

☐ I was primarily a shrimp harvester
☐ I was primarily a shrimp buyer

2. How many boats did you harvest or buy shrimp from in 2013?

_____# Number of boats you harvested from
_____# Number of boats you purchased from

3. We realize that you might have harvested or purchased shrimp from more than one vessel in 2013, however, we would like you to describe the one <u>PRIMARY</u> vessel that you harvested or purchased the most from last year.

_____ (ft) Length _____ (#) Total horsepower _____ Year hull was <u>originally</u> built

4. In 2013, please estimate how many shrimping trips you took on the boat you used most often and approximately how many days total you spent at sea.

_____ (#) Fishing Trips _____ (days) Days at sea

5. In 2013, what is the approximate number of pounds of shrimp that you harvested from your primary vessel per trip?

_____(#) Number of Pounds

6. In 2013 what percentage of your total catch fell into the following size classes?
Percent by grade of total catch

_____% **X-Large** (U-9- 10/15 count)
_____% **Large** (16/20-26/30 count)
_____% **Medium** (31/35 to 40/50 count)
_____% **Small** (Over 50 count)
_____% **Bait shrimp**
= 100% (should add up to 100%)
☐ Not applicable

7. What portion of your overall shrimp catch in 2013 went to the following?

_____% **Commodity Sales** (bulk sales to docks and/or processors)
_____% **Home Use** (retained for your family's consumption)
_____% **Direct Marketing** (sold directly end-customers)
= 100% (should add up to 100%)
☐ Not applicable

8. How many times did you sell shrimp directly to end-customers in 2013?

_____# of sales (please estimate)
☐ Not applicable

9. **What percentage of your end-customers in 2013 were the following types:**

_____% **One-time buyers** (purchased from me one time during the season)

_____% **Occasional buyers** (purchased 2-5 times during the season)

_____% **Frequently buyers** (> 5 purchases during the season)

= 100% (should add up to 100%)

☐ Not applicable

10. **How much of your shrimp sold to end-customers fell into the lot sizes below?**

_____% **Small lots** (10 lbs. of shrimp or less)

_____% **Medium lots** (11-50 lbs. of shrimp)

_____% **Large lots** (50-100 lbs. of shrimp)

_____% **X-Large lots** (> 100 lbs. of shrimp)

= 100% (should add up to 100%)

☐ Not applicable

11. **In 2013, what were the average prices you received for the shrimp you sold directly to end-customers, by grade?**

The average price I charged to end-consumers:

_____($/lb) **X-Large** (U-9- 10/15 count)

_____($/lb) **Large** (16/20-26/30 count)

_____($/lb) **Medium** (31/35 to 40/50 count)

_____($/lb) **Small** (Over 50 count)

_____($/lb) **Bait shrimp**

☐ Not applicable

12. **What portion of each size class that you caught in Question 6 did you market directly?**

Please estimate the percent marketed directly from each size class

_____% **X-Large** (U-9- 10/15 count)

_____% **Large** (16/20-26/30 count)

_____% **Medium** (31/35 to 40/50 count)

_____% **Small** (Over 50 count)

_____% **Bait shrimp**

☐ Not applicable

13. **What product forms of shrimp did you sell through Direct Marketing to end-customers?**

_____% **Fresh** (Never Frozen)

_____% **Fresh** (previously frozen, then thawed)

_____% **Frozen**

= 100% (should add up to 100%)

☐ Not applicable

14. **Where did you typically sell your catch?**

Please check all that apply

☐ My house   ☐ Another permanent structure

☐ My car   ☐ Another mobile structure

☐ My vessel   ☐ Other (Please specify

☐ A mobile trailer   _____)

                    ☐ Not Applicable

15. Where did you meet your end-customers?
Indicate 0-100% in each blank, both blanks should add up to 100%

           _____% **They came to me** (home, vessel, or dock)

           _____% **I delivered to them** (Average miles traveled per delivery: _____)

      = 100% (should add up to 100%)
- ☐ Not applicable

16. How did you advertise your Direct Marketing to end-customers in 2013?
Indicate 0-100% in each blank, both blanks should add up to 100%

           _____% **Word of Mouth**

           _____% **Online** (websites, email, social media)

           _____% **Farmer's Market**

           _____% **Drive by (**Signage)

      = 100% (should add up to 100%)
- ☐ Not applicable

17. Please indicate the following supplies or services that you provided for end-customers.
Please check all that apply

- ☐ Plastic bags
- ☐ Ice
- ☐ Ice chests (disposable)
- ☐ De-heading
- ☐ Peeling/de-veining
- ☐ Other
- ☐ Not applicable

18. How much time did it take (on average) to complete a sale to an end-customers?
Estimate the average time required for the sale of a *small*, *medium*, or *large* lots of shrimp. This estimate should include the total time required for communicating with the customer, weighing and packaging shrimp. Please do <u>not</u> include any travel time in your estimates.

           _____ Avg. time *in minutes* for **Small lots** (10 lbs. of shrimp or less)

           _____ Avg. time *in minutes* for **Medium lots** (11-50 lbs. of shrimp)

           _____ Avg. time *in minutes* for **Large lots** (> 50 lbs. of shrimp)
- ☐ Not applicable

19. Other than shrimp, what other seafood did you sell directly to end-customers in 2013?
Please check all that apply

- ☐ Oysters
- ☐ Crab
- ☐ Flounder
- ☐ Black drum
- ☐ Squid
- ☐ Other commercial fish species
- ☐ Not applicable

20. What types of permits and certifications did you hold in 2013?
Please check all that apply

- ☐ Fresh Products License (LDWF)
- ☐ Commercial Fishing License (LDWF)
- ☐ Retail/Wholesale Seafood Dealer License (LDWF)
- ☐ HACCP Certification (LDHH)
- ☐ Permit to Operate (LDHH)
- ☐ Scale Certification (LDAF)
- ☐ Parish Specific License
- ☐ Other

21. What is your ZIP code and primary port used?

_____ (Home ZIP code) _____ (Primary port of vessel(s))

22. **If you have any questions or comments on Direct Marketing please express them below.**

APPENDIX B

Internal Review Board Certificate

ACTION ON EXEMPTION APPROVAL REQUEST

LSU

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

TO: Rex Caffey
        Agricultural Economics

FROM: Dennis Landin
        Chair, Institutional Review Board

DATE: June 19, 2014

RE: IRB# E8829

TITLE: Louisiana Direct Seafood Marketing Networks

New Protocol/Modification/Continuation: New Protocol

Review Date: 6/19/2014

Approved____X____ Disapproved_____

Approval Date: 6/19/2014 Approval Expiration Date: 6/18/2017

Exemption Category/Paragraph: 2a

Signed Consent Waived?: Yes

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable): 37951

Protocol Matches Scope of Work in Grant proposal: (if applicable) _____

By: Dennis Landin, Chairman _____

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants; including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. SPECIAL NOTE:
*All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb

APPENDIX C

Louisiana Sea Grant and the LSU AgCenter are requesting your assistance as part of an economic study of direct marketing of seafood. Direct Marketing is a strategy in which harvesters sell a portion of their catch directly to "end-customers" in an effort to provide a fresh quality product and obtain additional revenue. This can include sales right from the vessel, on the side of the road, from their vehicle or at a farmers market.

Your input will help us to better understand how direct marketing is affecting the shrimping industry as well as seafood consumers.

Please note that this survey is completely voluntary and all responses are confidential. At no time will the information that you provide be connected to you in any way or be used for anything other than research. Information from the questionnaire will only be released in summarized form.

We are interested both in the actions of individuals who purchased shrimp directly from a harvester in 2013 and the views and perceptions of those who did not. Please take a few minutes to complete this brief survey. If you have specific questions, please feel free to contact us, information is provided below.

Thanks in advance for your time and consideration.
Sincerely,

Rex Caffey   Jill Christoferson
Louisiana Sea Grant and LSU AgCenter   Louisiana Sea Grant and LSU AgCenter
rcaffey@agcenter.lsu.edu   jchristoferson@agcenter.lsu.edu
(225) 578-2393

Direct Marketing Shrimp Survey-Consumer

Direct Marketing describes when shrimp is sold by the harvester directly to the end consumer, such as individual customers, restaurants, family, without involving processors or wholesalers or any other intermediate entities.

1. **How often did you purchase shrimp directly from a harvester in 2013?**
   Please check one

   ☐ **Seldom** – I only purchased shrimp directly from the harvester once or twice during the last year.

   ☐ **Frequently** - I purchased shrimp directly from the harvester many times during the last year

   ☐ **Moderate** – I purchased shrimp directly from the harvester monthly during the season.

   ☐ **Not applicable**: I did not purchase any shrimp to directly from harvesters in 2013

2. **When you purchased shrimp directly in 2013, which grades did you prefer to purchase?**
   Please rank your top 3 grades with 1 being the highest and 3 being the lowest

   _____ **X-Large** (U-9- 10/15 count)
   _____ **Large** (16/20-26/30 count)
   _____ **Medium** (31/35 to 40/50 count)
   _____ **Small** (Over 50 count)
   _____ **Bait**

3. **When you purchased shrimp directly in 2013, what is the price per pound you paid for head-on shrimp? In the second column please denote the price per pound you would have been willing to pay.** (Head on)

   $/lb. paid for each size you purchased direct
   $ _____ /lb **X-Large** (U9- 10/15 count)
   $ _____ /lb **Large** (16/20-26/30 count)
   $ _____ /lb **Medium** (31/35- 40/50 count)
   $ _____ /lb **Small** (Over 50 count)
   $ _____ /lb **Bait**

   $/lb you were willing to pay for each size
   $ _____ /lb **X-Large** (U9- 10/15 count)
   $ _____ /lb **Large** (16/20-26/30 count)
   $ _____ /lb **Medium** (31/35- 40/50 count)
   $ _____ /lb **Small** (Over 50 count)
   $ _____ /lb **Bait**

4. **When you purchased shrimp directly what percentage of the time did your purchase fall into the lot sizes below?** Indicate 0-100% in each blank, all blanks should add up to 100%

   _____ % **Small lots** (10 lbs. of shrimp or less)
   _____ % **Medium lots** (11-50 lbs. of shrimp)
   _____ % **Large lots** (50-100 lbs. of shrimp)
   _____ % **X-Large lots** (> 100 lbs. of shrimp)
   =100% (should add up to 100%)

5. **When you purchased shrimp directly in 2013, how many harvesters did you purchase from?** Please check one

     ☐ **One**-I bought from the same harvester each time
     ☐ **A Few**-I purchased from 2 or 3 different harvesters during the year
     ☐ **Many**- I purchased from more than 3 different harvesters during the year

6. **What characteristics most affected your choice of whether to purchase direct?**
    Please rank these in order of preference; 1 being the highest and 7 being the lowest

_____	Location	_____	Supporting local business
_____	Freshness of product	_____	Relationship with harvester
_____	Price of product	_____	More environmentally friendly
_____	Less chemicals	☐	None of these

7. **What product forms of shrimp are you most interested in purchasing directly from harvesters?** Please rank these in order of preference; 1 being the highest and 5 being the lowest

_____	**Fresh** (never frozen)	_____	**De-headed**
_____	**Fresh Frozen** (frozen, then thawed)	_____	**Peeled and de-headed**
		☐	None of these
_____	**Frozen**		

8. **How did you typically find a harvester to purchase from?**
    Please indicate 0-100% in each blank, all blanks should add up to 100%

     _____ % **Word of mouth**
     _____ % **Online** (websites, social media, e-mail)
     _____ % **Contacted by shrimper** (door to door/phone call)
     _____ % **Farmer's Market**
     _____ % **Drive by** (sign or roadside stand)
     =100% (should add up to 100%)
     ☐ None of these

9. **What is your current age?**
    Please check one

☐ Under 20	☐ 51-60
☐ 21-30	☐ 61-70
☐ 31-40	☐ Over 71
☐ 41-50	

10. **How many people are in your household?**

     _____**Adults** (0ver 18)   _____**Children** (Under 18)

11. **What is the gross annual income of your household?**
    Please check one

☐ Under $20, 000	☐ $51,000-$60,000
☐ $21,000-$30,000	☐ $61,000-$70,000
☐ $31,000-$40,000	☐ $71,000-$90,000
☐ $41,000-$50,000	☐ $91,000-$150,000
	☐ Over $150,000

12**. What is your highest level of education?**
    Please check one

☐ Elementary School	☐ Associates Degree
☐ Middle School	☐ Bachelor's Degree
☐ High School	☐ Graduate School

13. **Are you a recreational fisherman?**

☐ Yes
☐ No

14. **What is your home ZIP code?** _____

APPENDIX D

Direct Marketing Shrimp Survey-Potential Consumer

Direct Marketing describes when shrimp is sold by the harvester directly to the end consumer, such as individual customers, restaurants, family, without involving processors or wholesalers or any other intermediate entities.

1. **How often did you purchase shrimp directly from a harvester in 2013?**
   Please check one

   ☐ **Seldom** – I only purchased shrimp directly from the harvester once or twice during the last year.

   ☐ **Frequently** - I purchased shrimp directly from the harvester many times during the last year

   ☐ **Moderate** – I purchased shrimp directly from the harvester monthly during the season.

   ☐ **Not applicable**: I did not purchase any shrimp to directly from harvesters in 2013

2. **Would you be interested in purchasing shrimp directly from a harvester?**
   Please check one
   ☐ Yes
   ☐ No

3. **If you were to purchase shrimp directly from a harvester, which grades did you prefer to purchase?**
   Please rank your top 3 grades with 1 being the highest and 3 being the lowest

   _____ **X-Large** (U-9- 10/15 count)
   _____ **Large** (16/20-26/30 count)
   _____ **Medium** (31/35 to 40/50 count)
   _____ **Small** (Under 50 count)
   _____ **Bait**

4. **If you were to purchase shrimp directly from a harvester what is the price per pound you would be willing to pay?** (Head on)

   $ _____ /lb **X-Large** (U-9- 10/15 count)
   $ _____ /lb **Large** (16/20-26/30 count)
   $ _____ /lb **Medium** (31/35- 40/50 count
   $ _____ /lb **Small** (Under 50 count)
   $ _____ /lb **Bait**

5. **If you were to purchase shrimp directly from a harvester what would be the size lot you would be most likely to purchase?** Please check one

   ☐ **Small lots** (10 lbs. of shrimp or less)
   ☐ **Medium lots** (11-50 lbs. of shrimp)
   ☐ **Large lots** (> 50 lbs. of shrimp)

6. **What characteristics would most affect your choice of whether to purchase directly from a harvester?**
    Please rank these in order of preference; 1 being the highest and 7 being the lowest

_____	Location	_____	Supporting local business
_____	Freshness of product	_____	Relationship with harvester
_____	Price of product	_____	More environmentally friendly
_____	Less chemicals	☐	None of these

7. **What product forms of shrimp would you be most interested in purchasing directly from harvesters?** Please rank these in order of preference; 1 being the highest and 5 being the lowest

_____	**Fresh** (never frozen)	_____	**De-headed**
_____	**Fresh Frozen** (frozen, then thawed)	_____	**Peeled and de-headed**
		☐	None of these
_____	**Frozen**		

8. **What is your current age?**
    Please check one

☐ Under 20   ☐ 51-60
☐ 21-30   ☐ 61-70
☐ 31-40   ☐ Over 71
☐ 41-50

9. **How many people are in your household?**

_____**Adults** (0ver 18)   _____**Children** (Under 18)

10. **What is the gross annual income of your household?**
    Please check one

☐ Under $30, 000   ☐ $131,000-$180,000
☐ $31,000-$80,000   ☐ $181,000-$230,000
☐ $81,000-$130,000   ☐ Over $230,000

11**. What is your highest level of education?**
    Please check one

☐ Elementary School   ☐ Associates Degree
☐ Middle School   ☐ Bachelor's Degree
☐ High School   ☐ Graduate School

12. **What is your home ZIP code?** _____

APPENDIX E

Comments from Harvester Survey

- You could get also of information form trip tickets turned in to LDWF it take time to fill out these forms-this is my second one this year
- Direct marketing is time consuming, stressful and more f***ing trouble than its worth. I'm 30 grand in the hole and can't quit unless I can sell my friging boat
- Thanks Rex! Trudy Luke
- People which ride and go house to house, knocking on doors for sales of their shrimp which they purchase from others (Docks ect). Should not be able by law to do this. Because a lot of my customers complain they don't get the amount of product by the # they pay for.
- It only works for a small percent of the industry, it is not the savior of the industry. but it will help.
- Traveled 100 miles to farmers market for sales
- Didn't sell to no one in 2013. Just sold to docks.

APPENDIX F

Comments from Consumer Survey

- In the north east there is no advertising about wild caught USA shrimp. Most people think foeign &/or farm raised shrimp is all thats left.
- I would welcome any information for a wholesaler daniels.bobileigh@gmail.com 919-854-4567
- i am a retired shrimper. i owned shrimp boats and fished here in ga. when i was younger i ran boats for others and fished in key west and the northern gulf. i like our east coast white shrimp the most. and demand them when i eat at resturants. NO FARMED SEAFOOD FOR ME.
- The price the boats are paid is way too low. They shojld get a better price acordingly. To many middle men
- What I'm willing to pay for shrimp is based on the market.
- Have lived on the gulf and know how good the seafood is Got shrimp from an ice boat night fisherman, shrimp, shark, snapper, flounder, tuna, whatever they ran into while they were out off freezer boat, you can't beat it. I fished either off my boat, friends pier, Coast Guard rec platform, pretty much anywhere there was water every day. What we are getting up here is from the far east almost entirely the US market in this area is almost non existent. What has happened to our seafood boards that they are allowing this to happen? Other countries are fishing in our waters or right outside and walking off with them but most of what we get are farm raised pond raised. You need to get your heads together and stump these politicians all the way up to feds get some of the restrictions reduced we have capable fisherman and companies so why have you allowed this to continue instead of fighting to keep our fresh seafood in this country and distributed across the entire US
- Yes. Although I currently have an income < $20,000, I am a high tech Entrepreneur...and highest income year reached around $100,000 and have made in $50,000-$90,000 per year around 7 years with the first year being 1996..and $21,000-$50,000 per year around another 6 years with the first year being circa 1982. I worked in the Silicon Valley "Start-up" Circuit during the "dot-com Era" as an embedded Software Developer/Designer...and transitioned to Web Software Development and Design immediately after the 2001 dot-com crash (what timing). I was a large (IBM-compatible) peripheral, switching and system (hardware) troubleshooter first in Austin, TX...later traveling throughout the Western U.S. based out of Denver...and worked on many of the largest corporate and government systems in the World. Therefore, I have eaten all types of seafood in many places...and hope to do so again! However, due to inability to negotiate the different agencies that must be touched to start a business in Louisiana (without current ability to afford a lawyer)...and the great expense required to fish saltwater (charter only, no party/head boats), I will likely return to my native Texas soon. That is a pity because I am nearing completion of a new product/service I will be deploying on the Web shortly. I had left California because it had turned from an entrepreneurial empire into a hopeless Communist state...and come to Louisiana to do development because Bobby Jindal said it was a Capitalist Republican State....but as it turns out it has been contaminated with the Communist disease...and your Communists are more violent and desperate than those in California! Email: tish@tishwoodwebservices.com   Good Luck to Us All!
- AS OF THIS DATE INSIDE SHRIMPING IS NOT OPEN as per statement made in Mike Lane's RodNreel!
- I purchased bait 15-20 times in 2013 from the Hopedale (BSM) or Shell Beach (Campo) owners of the Marina/launch. They usually harvest live and fresh dead bait or have an arrangement with a bait boat/ trawler. They also have frozen bait shrimp available during winter months when fresh bait is scarce.

- My income is none of your Business.......
- That's about the craziest survey ever asking how much to pay, u pay the price at the store for a gallon of milk loaf of bread. For once we as fishermen(of which I happen to be shrimper) we are getting a price that equals everybody else cost of living increase. Our shrimp are the best out there and we should get paid not the foreign crap.
- I work for the federal government which we have it the the library for customer to look at.
- Although I am not a recreational fisherman, a family member is a recreational fisherman
- I don't usually do personal business with someone I don't know. I consider buying from a harvester to be of a personal nature, so I almost always look for referrals or references from people I know - unless I'm desparate for fresh shrimp.
- I would love to purchases direct from the harvester and establish a relationship.
- Hope you find this helpful.
- question where a little confusing with the 1&2 most preferred stuff. i live in covington, i buy my shrimp from guys who drive down south and get them from the boats. if the boats where closer i would buy directly from them. just saying, if my answers where misleading.
- time consuming to complete
- The retail seafood market is being squeezed out of the business more and more by actions such as this. Local government will lose sales tax money as these types of sales are cash only. During crawfish and crab season our home product is shipped out all over the country creating shortages locally and driving prices to unprecedented levels. Big box stores and small convenience stores sell crawfish now, further squeezing out the local seafood markets. It is also time to open up the local rules regarding the sale of locally caught fish, speckled trout, flounder and redfish specifically. The fisheries for these species have more then recovered so why are our laws stricter then surrounding states that have fewer resources then does Louisiana. This would make more product available to the consumer at a lower cost. The recreational fishermen wanting to sell their catch would have to purchase a special license generating additional funds for LDWF. It would also allow the fisherman to recover some of their costs for what has become very expensive fishing trips due to the high costs of fuel. This would make more trips affordable and the ripple effect through out the industry would be beneficial to everyone involved.   Alan Jones 985-201-8583
- Am a recreational fisherman as well as a commercial fisherman. The only way I will have any shrimp is if I catch them myself. With the recent problem we have had with the BP spill, my shrimp consumption has been altered. This also affects my children and grand-children.
- Often buy 5lbs of shrimp at Rouse's if they are large and look fresh. Whenever I travel to the gulf areas of golden Meadow or Grand Isle I bring a big ice chest and look for a roadside shrimp seller to "load up". Hope that helps. Dustin Goodwin in Mandeville.
- I fully support the coastal master plan of dredging and diverting river sediment.
- Big Al & Cheryl were yhe most friendly and gave me the best prices and a little lagniappe!!!
- I love buying a large amount of fresh shrimp directly from a fisherman and then stocking my freezer. I used to go down to Grand Isle every year for work and would purchase some then, but I no longer go down there. I'd like to try the Delcambre market - it's just a bit of a drive from Lafayette and I just don't have the time now. I wish someone would sell at the Horse Farm Farmer's Market in Lafayette.
- i contacted fishermen twice and was supposed to get phone call when harvest available and never got return phone call
- UNITED STATES SHRIMPERS CAN ONLY PROVIDE ABOUT 8 % OF THE DEMAND IN T6HE UNITED STATES. IT IS A FACT. PLUS THEY ARE TEARING UP THE BOTTOM OF THE GULF OF MEXICO. SHRIMP FARMING IS THE FUTURE.

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- I buy my seafood from Gary and Louella Lombas, Owner-Operators at Delcambre Crab House. They direct market crab, crawfish and fish. I get shrimp from them, but don't consider them direct marketers for the purpose of your survey. AND.....I'm not paying $20 for a pound of VERMILLION BAY SWEET. I understand a reasonable profit, but you must be marketing that to out of state folks and high end restaurants. I'll check the DDS site this year for off-the-boat prices.
- We really like and use the Louisiana Direct Seafood website
- I will not spend more than $3.50 per pound again for large.
- no.............am looking now for fishermen to start buying shrimp, crabs, fish
- Keep our fishermen and women in business. Less government regulations.
- LOUISIANA SEAFOOD IS THE BEST IN THE WORLD KEEP IT THAT WAY
- I like the web site, La. Direct Glad to see the State attempting to help the Fisherman.
- I love La. Shrimp
- usually purchase fresh shrimp when I go fishing on the coast.
- keep informed.
- Believe encouraging direct sales would benefit harvester and consumer without affecting traditional marketing channels adversely. Such should be promoted in my view.
- Restaurants should be required to state whether or not their shrimp are wild, Gulf-caught, or if they are imported.   It should be a crime with stiff penalties if restaurants, markets, or any wholesale or retail establishments are caught selling shrimp labelled as local/wild caught, but it is discovered that they are imports.   Foreign farm-raised shrimp or similar crustaceans should be labelled as such.   Foreign farm-raised shrimp/crustaceans should be routinely tested at or near point of entry, for toxic organisms, pollutants, hormones, and antibiotics. Those that fail U.S. food, health, and safety standards should be rejected at the expense of the shipper/seller, and the shipper/seller fined.   Repeat violators should be considered criminals, should be heavily fined and should serve time in prison.   After major coastal disasters, such as hurricanes or oil spills, our shrimpers should be given a little more help , especially from the federal government, than they got. They've had a very hard time this last decade or so.
- direct marketing is the best way for shrimpers to increase their profits from their effort - and better way to get freshest product to consumer markets should be established in larger cities to make fresh seafood available to consumers without having wholesalers add cost and add a step to the process that only delays fresh seafood from reaching the market but also makes it more expensive
- Shrimp that have not been "salted" are a priority with my purchases.
- I don't buy LA shrimp at this time. BP has caused widespread contamination that has not been shown clean in many peoples opinions. I have essentially stopped eating seafood since the spill with the exception of freshwater fish and US salmon. I avoid all foreign seafood.
- Why don't they do a survey on speckled trout. The numbers have really fallen off. I started fishing trout in 1970 when they had no limit. The 25 limit needs to be lowered. Shrimping is part of the reason for the decline of trout. There needs to be a large area of water where no shrimping is allowed. Retired veterinarian.   Dr Low 225-241-7616
- I want to buy fresh white shrimp most of the time. I will buy the large brown shrimp when the price is good.
- I would purchase directing if I lived closer to a source. At times there are trucks parked on the side of the road in my area selling shrimp. I am six hours away from the coast so I don't know what the seller means by "fresh".
- I really love fresh shrimp. I do not purchase as often as I would like because of the tremendous amount of bycatch associated with traditional shrimping.   If there was a way to reduce the bycatch and a seller could promote that this method was used to

harvest the shrimp for sale, I would be willing to pay twice the normal rate. In addition, I would promote this seller to anyone willing to listen and act. Thanks for your survey!

- I buy all of my shrimp from wholesalers at Grand Isle Louisiana at Blanchard's Incorporated.
- i like la direct seafood because you can see the people you buy from and the product. i actually buy from one fishermans house because he lives in lafayette and it saves me a lot of mileage. i take orders from my work and drive down and pickup several hundred pounds a trip. but i also sell them at cost less fuel. its about quality most of all....
- We enjoy traveling from Arkansas to the New Iberia, Abbeyville area, doing things and getting shrimp, going to Avery Island, getting crayfish and sausage.
- I'm originally from South Louisiana but now live in East Texas. I'll drive down for "Good" shrimp!
- what might be the possibility of starting a - boat to shipping customer operation??

APPENDIX G

NIFO and Spread Simulations by Quintile

Quintile 1 Inflow of less than $15,000

Case 1: *5% of Harvest direct marketed,1.4 units direct labor*

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($14,857)	($12,458)	($10,878)	($9,298)	($7,660)	($4,500)	($1,282)	$1,878
NIFO w/DM				($14,163)	($11,884)	($10,383)	($8,883)	($7,326)	($4,324)	($1,267)	$1,735
Spread				$694	$574	$495	$416	$334	$176	$15	($143)

Quintile 1 Inflow of less than $15,000

Case 2: *15% of Harvest direct marketed,4.1 units direct labor*

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($14,798)	($12,458)	($10,878)	($9,298)	($7,660)	($4,500)	($1,282)	$1,878
NIFO w/DM				($12,746)	($10,707)	($9,364)	($8,021)	($6,629)	($3,943)	($1,207)	$1,478
Spread				$2,111	$1,751	$1,514	$1,277	$1,031	$557	$74	($400)

Quintile 1 Inflow of less than $15,000

Case 3: 30% of Harvest Direct marketed, 8 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($14,857)	($12,458)	($10,878)	($9,298)	($7,660)	($4,500)	($1,282)	$1,878
NIFO w/DM				($10,621)	($8,941)	($7,835)	($6,730)	($5,583)	($3,371)	($1,118)	$1,094
Spread				$4,236	$3,517	$3,043	$2,569	$2,077	$1,129	$164	($784)

Quintile 1 Inflow of less than $15,000

Case 4: 50% of Harvest direct marketed,14 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($14,857)	($12,458)	($10,878)	($9,298)	($7,660)	($4,500)	($1,282)	$1,878
NIFO w/DM				($8,781)	($7,429)	($6,540)	($5,650)	($4,727)	($2,947)	($1,134)	$645
Spread				$6,076	$5,028	$4,338	$3,648	$2,933	$1,553	$147	($1,233)

Quintile 2 Inflow of less than $15,000-$43,000

Case 1: 5% of Harvest direct marketed, 4.5 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($33,109)	($25,136)	($19,885)	($14,634)	($9,189)	$924	$12,009	$22,511
NIFO w/DM				($30,768)	($23,193)	($18,204)	($13,216)	($8,043)	$1,564	$12,095	$22,072
Spread				$2,342	$1,943	$1,681	$1,418	$1,146	$640	$86	($439)

Quintile 2 Inflow of less than $15,000-$43,000

Case 2: 15% of Harvest Direct marketed, 13.6 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($33,109)	($25,136)	($19,885)	($14,634)	($9,189)	$924	$12,009	$22,511
NIFO w/DM				($26,054)	($19,276)	($14,813)	($10,350)	($5,721)	$3,205	$12,297	$21,224
Spread				$7,056	$5,860	$5,072	$4,284	$3,468	$1,892	$288	($1,287)

Quintile 2 Inflow of less than $15,000-$43,000

Case 3: 30% of Harvest Direct marketed, 27 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($33,109)	($25,136)	($19,885)	($14,634)	($9,189)	$924	$12,009	$22,511
NIFO w/DM				($18,983)	($13,402)	($9,726)	($6,050)	($2,239)	$5,112	$12,600	$19,951
Spread				$14,126	$11,734	$10,159	$8,584	$6,950	$3,799	$591	($2,560)

Quintile 2 Inflow of less than $15,000-$43,000

Case 4: 50% of Harvest Direct marketed, 91 units direct laborer

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($33,109)	($25,136)	($19,885)	($14,634)	($9,189)	$924	$12,009	$22,511
NIFO w/DM				($13,726)	($9,235)	($6,277)	($3,320)	($253)	$5,662	$11,687	$17,602
Spread				$19,383	$15,901	$13,608	$11,314	$8,936	$4,349	($322)	($4,909)

Quintile 3: Inflow of $43,001 to $75,000

Case 1: 5% of 9 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,833)	($26,275)	($15,370)	($4,465)	$6,843	$28,652	$50,865	$72,674
NIFO w/DM				($37,954)	($22,223)	($11,864)	($1,504)	$9,239	$29,957	$51,060	$71,778
Spread				$4,880	$4,052	$3,506	$2,961	$2,396	$1,305	$195	($896)

Quintile 3: Inflow of $43,001 to $75,000

Case 2: 15% of Harvest Direct marketed 28 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,833)	($26,275)	($15,370)	($4,465)	$6,843	$28,652	$50,865	$72,674
NIFO w/DM				($28,165)	($14,090)	($4,821)	$4,448	$14,060	$32,598	$51,479	$70,016
Spread				$14,669	$12,185	$10,549	$8,913	$7,217	$3,946	$614	($2,658)

Quintile 3: Inflow of $43,001 to $75,000

Case 3: 30% of Harvest Direct marketed, 113 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,833)	($26,275)	($15,370)	($4,465)	$6,843	$28,652	$50,865	$72,674
NIFO w/DM				($14,712)	($3,121)	$4,512	$12,145	$20,061	$35,327	$50,876	$66,143
Spread				$28,121	$23,153	$19,882	$16,611	$13,218	$6,675	$12	($6,531)

Quintile 3: Inflow of $43,001 to $75,000

Case 4: 50% of Harvest Direct marketed, 189 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($42,833)	($26,275)	($15,370)	($4,465)	$6,843	$28,652	$50,865	$72,674
NIFO w/DM				($2,562)	$6,764	$12,906	$19,048	$25,418	$37,702	$50,213	$62,497
Spread				$40,271	$33,039	$28,276	$23,514	$18,575	$9,050	($652)	($10,177)

Quintile 4: Inflow of $75,001 to $120,000

Case 1: 5% of Harvest direct marketed, 16 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,762)	($32,047)	($13,138)	$5,771	$25,381	$63,200	$101,719	$139,538
NIFO w/DM				($52,289)	($25,011)	($7,047)	$10,917	$29,547	$65,474	$102,068	$137,996
Spread				$8,473	$7,037	$6,091	$5,146	$4,165	$2,274	$348	($1,542)

Quintile 4: Inflow of $75,001 to $120,000

Case 2: 15% of Harvest Direct marketed, 49 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,762)	($32,047)	($13,138)	$5,771	$25,381	$63,200	$101,719	$139,538
NIFO w/DM				($36,382)	($11,974)	$4,099	$20,172	$36,840	$68,986	$101,727	$133,873
Spread				$24,380	$20,073	$17,237	$14,400	$11,459	$5,786	$8	($5,665)

Quintile 4: Inflow of $75,001 to $120,000

Case 3: 30% of Harvest Direct marketed, 197 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,762)	($32,047)	($13,138)	$5,771	$25,381	$63,200	$101,719	$139,538
NIFO w/DM				($11,986)	$8,114	$21,350	$34,587	$48,314	$74,787	$101,750	$128,223
Spread				$48,775	$40,161	$34,488	$28,815	$22,932	$11,587	$31	($11,315)

Quintile 4: Inflow of $75,001 to $120,000

Case 4: 50% of Harvest Direct marketed, 328 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,762)	($32,047)	($13,138)	$5,771	$25,381	$63,200	$101,719	$139,538
NIFO w/DM				$8,216	$22,573	$32,028	$41,483	$51,288	$70,197	$89,457	$108,366
Spread				$68,978	$54,621	$45,166	$35,711	$25,906	$6,997	($12,263)	($31,172)

Quintile 5: Inflow more than $120,000

Case 1: 5% of Harvest direct marketed, 41 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,784)	$11,454	$59,025	$106,596	$155,929	$251,072	$347,976	$443,119
NIFO w/DM				($39,447)	$29,179	$74,372	$119,565	$166,431	$256,817	$348,876	$439,261
Spread				$21,337	$17,726	$15,347	$12,968	$10,502	$5,745	$899	($3,858)

Quintile 5: Inflow more than $120,000

Case 2: 15% of Harvest Direct marketed, 248 units direct labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,784)	$11,454	$59,025	$106,596	$155,929	$251,072	$347,976	$443,119
NIFO w/DM				$4,331	$65,733	$106,169	$146,604	$188,538	$269,409	$351,778	$432,649
Spread				$65,115	$54,279	$47,144	$40,008	$32,608	$18,337	$3,801	($10,470)

Quintile 5: Inflow more than $120,000

Case 3: 30% of Harvest Direct marketed, 409 units indirect labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,784)	$11,454	$59,025	$106,596	$155,929	$251,072	$347,976	$443,119
NIFO w/DM				$56,559	$107,125	$140,425	$173,725	$208,258	$274,858	$342,691	$409,291
Spread				$117,343	$95,672	$81,400	$67,129	$52,329	$23,786	($5,285)	($33,828)

Quintile 5: Inflow more than $120,000

Case 4: 50% of Harvest Direct marketed, 1229 units indirect labor

	Catch Dist	Assumed DM Prices	DM Dist	-50%	-25%	10 Yr Avg Dksd Price	25%	50%	100%	150%	200%
X-Large (%)	6%	$4.89	3%	$1.33	$2.00	$2.66	$3.33	$3.99	$5.32	$6.65	$7.98
Large (%)	14%	$3.74	35%	$0.91	$1.37	$1.82	$2.28	$2.73	$3.64	$4.55	$5.46
Medium (%)	17%	$2.73	39%	$0.52	$0.78	$1.04	$1.30	$1.56	$2.08	$2.60	$3.12
Small (%)	63%	$1.96	20%	$0.42	$0.63	$0.84	$1.05	$1.26	$1.68	$2.10	$2.52
Bait (%)	1%	$1.68	3%	$0.23	$0.35	$0.46	$0.58	$0.69	$0.92	$1.15	$1.38
Dksd ($)		$2.98		$0.41	$0.82	$1.09	$1.36	$1.64	$2.18	$2.73	$3.27
Base NIFO				($60,784)	$11,454	$59,025	$106,596	$155,929	$251,072	$347,976	$443,119
NIFO w/DM				$111,234	$151,922	$178,717	$205,511	$233,298	$286,887	$341,468	$395,057
Spread				$172,019	$140,469	$119,692	$98,915	$77,368	$35,815	($6,509)	($48,062)

VITA

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