Understanding the Texas Shrimping Industry Using Social and Economic Indicators

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ABSTRACT

Shrimping is big business in Texas. In 2001, commercial landings of all shrimp species totaled 37,326.3 metric tons with a value of US$195,006,060. This, however, does not mean that Texas shrimpers are having an "easy time of it." In its 2001 session, the Texas Legislature mandated a study of the shrimp industry and its fishery resources, including the "social and economic health" of the industry. To fulfill these requirements, a mail survey was conducted of all Texas shrimp fishers that held a Gulf, bay, and/or bait shrimp license in 2001. Rather than trying to get detailed business information from each licensee, an indicator approach was used to gauge how the industry was doing in social and economic terms. Questions that would yield conclusions regarding the health of the industry were asked in an effort to not be too obtrusive. Some reported their operation was profitable (49 %) but indicators showed the industry and its participants may be economically marginal. For example, 47 % indicated they did not have insurance for themselves or their families and 63 % reported no insurance on their primary boat. Further, 83 % would not encourage young people to enter the shrimping business. Almost one-half (48 %) reported a gross household income of less than US$40,000. Results on other variables were fairly consistent with those from previous social science studies of the shrimping industry in the region.

KEY WORDS: shrimping, socio-economic indicators, Texas

El Estudio de la Industria Camaronera de Tejas Atravez del Uso de Indicadores Económicos

Los camarones son un negocio muy grande en Tejas. En 2000, los aterrizajes comerciales de todas las especies del camarón sumaron 93.420.567 libras, con un valor de $267.114.510. Esto, sin embargo, esto no significa que los camoneros en Texas esten pasando por un buen periodo. En su sesión 2001, de Tejas legislatura asignó un estudio por mandato incluyendo la de la industria del camarón y sus recursos, del social y salud económica. de la industria. Para satisfacer estos requisitos, terminamos una encuesta sobre correo de todo el camarón de Tejas que ladran los pescadores que sostuvo un golfo, y/o licencia del camarón del cebo en 2001. Mientras que las entrevistas personales pudieron haber producido understandings más ricos la industria y su estado económico, de los costes y del

tiempo requeridos eran demasiado grandes para los plazos de la reunión impuestos por la legislatura de Tejas. Más bien que intentando conseguir la información detallada de cada concesionario, que del negocio habría conducido a un non_response más alto, utilizamos un acercamiento del indicador para calibrar cómo la industria hacía en términos sociales y económicos. Intentamos ser tan discretos como sea posible; preguntamos por consiguiente las preguntas que rendirían conclusiones con respecto a la salud de la industria, es decir si tenían seguro en su negocio y para sí mismos y/o sus familias. Los resultados demuestran que la industria pueden ser según se informa provechosos para algún (el 49 %) pero los indicadores demostraron esta industria y sus participantes pueden ser económicamente marginales. Por ejemplo, el 47 % lo indicaron no tenían seguro para sí mismos o sus familias y 63 % divulgaron no tener seguro en su barco primario. Además, el 83 % no animarían a gente joven que incorporara el negocio shrimping. Casi una mitad (el 48 %) divulgó una renta gruesa de la casa de menos de $40.000. Los resultados en otras variables eran bastante constantes con estudios sociales anteriores de la ciencia de la industria comercial a lo largo de la costa del golfo. Las recomendaciones para los estudios futuros se proporcionan junto con las implicaciones de la gerencia de los resultados.

PALABRAS CLAVES: Industria pesquera del camarón, indicadores económicos, Tejas

INTRODUCTION

Shrimping is big business in Texas. In 2001, commercial landings of all shrimp species totaled 37,326.3 metric tons with a value of US$195,006,060 (NMFS 2002). The Texas commercial shrimp fishery includes the shrimp fishery resource itself, habitat, harvesters in three license categories (Gulf, bay, and bait), and those involved in the sale (wholesale and bait shrimp dealers), distribution, and processing of shrimp for the market place. Just as it is not possible to know everything about the quality and quantity of shrimp resources in one single study, no one study can provide all possible social and economic insights to the Texas shrimp industry. The purpose of this paper was to investigate some basic indicators of the social and economic health of the Texas shrimp fishery.

In its 2001 session, the Texas Legislature mandated a Texas Parks and Wildlife Department (TPWD) sponsored study and legislative report on the "shrimp industry and resources." In addition to the more traditional study focus on the status of shrimp populations, marine resources, habitat, and conservation measures, the Legislature addressed the need for a social and economic perspective too, one that focused on "the economic health of the shrimp industry" and solicited feedback from a wide range of stakeholders.

METHODS

To fulfill the study requirements of the Texas legislature, a mail survey was sent to each license holder that held one or more of three commercial shrimp licenses in 2001: a Gulf shrimp license, a bay shrimp license, and/or a bait shrimp license. In order to complete the study and have a report available to TPWD in June 2002, a mail survey design was used rather than personal interviews. The latter approach has been used most frequently for studying commercial fisheries previously. To enhance rate of response, since shrimp fishers often held more than one license, each shrimper was sent only one questionnaire regardless of how many licenses they held.

Texas Parks and Wildlife provided us with a complete list of the aforementioned shrimp license holders for fiscal year 2001(September 1, 2000-August 31, 2001). The survey was sent to the entire population of license holders to elicit as large a sample as possible. This provided each shrimper an opportunity to be heard on the issues rather than just those able to attend public hearings or those that would have been selected if we had sampled the population. The questionnaire was developed in response to the language provided by the Texas Legislature and made use of questions used previously in other studies of commercial fisheries in the U.S. Gulf of Mexico. Input was also received from personnel in the TPWD Coastal Fisheries Division as to their particular data needs in support of the decision making process. The questionnaire was seven pages in length (two legal sized sheets of paper folded in a booklet format). The questionnaire was also translated into Vietnamese in an effort to increase response from this large segment of the shrimping industry.

Mail survey procedures recommended initially by Dillman (1978) and further refined by Salant and Dillman (1994) were used. All letters were mailed on Texas A&M letterhead designed specifically for this project. The envelope also had an identifier that made it clear that it contained a "Shrimp Fisherman Study" to enhance response rate. All mailings were personalized to the greatest extent possible; the names and addresses were printed directly on the envelope and the letters were addressed to "Dear Fred:" instead of "Dear Shrimper." A postage paid envelope was included with the questionnaire to facilitate the return of the survey to Texas A&M University.

The results presented in this paper are based on respondents only. Accordingly, results may be biased if non-respondents were found to differ from respondents. Names were randomly selected from the list of non-respondents and their phone numbers were located via the Internet. Names were randomly selected and telephoned until enough non-response surveys were completed to minimize Type I and Type II errors when testing for differences between the two groups. Overall, we contacted 98 non-respondents and asked only 12 questions from the questionnaire to maximize the likelihood they would answer our questions over the telephone.

There were statistically significant differences between non-respondents and respondents on the following three questions: the number of years they have been in commercial shrimping (d.f. = 392, F = 8.84, p = 0.0031), the average size of the crew on their primary boat "in the previous 12 months" (d.f. = 386, F = 6.78, p =

0.0096) and the type of business organization they have (d.f. = 5, χ^2 = 12.0571, p = 0.034). Respondents had fewer years of experience in commercial shrimping, a larger sized crew on average, and were more likely to be corporations rather than sole owners. There were no statistically significant differences on the following three items which asked "since this time last year": whether they earned income from work other than shrimping, whether their spouse (if married) earned income from work other than shrimping, and the total number of days they have commercially shrimped on their primary boat in Texas waters. There were also no statistically significant differences on the following six items: the percentage of their gross household income that comes from shrimping activities, the percentage of their gross household income that comes from other commercial fishing activities, the percentage of their gross household income that comes from non-fishing activities, whether they consider themselves to be full-time or part-time shrimp fishers, the total pounds of shrimp harvested per year, and the estimated value of their primary boat.

We can make no claims as to the characteristics of non-respondents, only that there are statistically significant differences between respondents and non-respondents on those items collected from both groups. Therefore, generalizations about the population of shrimp fishers cannot be made.

RESULTS

Of the 2,309 questionnaires mailed to Texas shrimp fishers, responses were received from 361 individuals. Only 326 of these were returned usable; 441 questionnaires were returned by the U.S. Postal Service as non-deliverable. This resulted in an effective response rate of 19.3 %. Questionnaires that were returned but were unusable included refusals or those people that indicated they were no longer in the shrimping business. This response rate is extremely low compared to what Dillman (1978) indicates from other surveys using his "total design survey methodology" and response rates from other studies completed by the TAMU Human Dimensions of Fisheries Research Lab.

Most (33 %) shrimpers were between the ages of 41 and 50, with an average age of 52 years. A majority (96 %) were male. Most (58 %) graduated from high school, with the mean highest grade completed of 11th grade. It is notable that 42 % did not graduate from high school. A majority (64 %) considered themselves white and a sizable percentage (28 %) considered themselves Vietnamese. Most (38 %) have two persons living in their household, with an average of three persons (Table 1).

Table 1. Percent Distribution of Texas Shrimpers By Age, Grade Level, Race, And Number Of People In Household

AGE	% (n = 303)	GRADE LEVEL	% (n = 326)	RACE	% (n = 310)	NUMBER OF PEOPLE	% (n = 304)
21 to 30	2.6	Less than 8th grade	23.6	White	64.2	One	8.9
31 to 40	15.8	Some high school	18.7	Black or African American	1.3	Two	37.8
41 to 50	33.0	High school graduate	34.7	American Indian or Alaskan native	1.0	Three	16.5
51 to 60	24.4	Some college	15.3	Vietnamese	28.1	Four	13.8
61 to 70	14.5	College Graduate	5.5	Other Asian	1.3	Five	10.5
71 +	9.6	Graduate	2.2	Other race	4.2	Six +	12.5
TOTAL	100.0		100.0		100.0		100.0
Mean	51.6		11.2				3.3

Almost one-half (48 %) reported a gross household income of less than US$40,000. Most (47 %) Texas shrimp fishers reported that they did not have health insurance; 41 % reported that they had health insurance for themselves and their family (Table 2). A majority (59 %) of shrimpers did not earn any income from work other than shrimping "since this time last year." There were nearly equal proportions of shrimpers that indicated that their spouse (if married) earned income (44 %) or did not earn income (43 %) from work other than shrimping "since this time last year" (Table 3).

A majority (64 %) of shrimpers purchased their primary boat from another owner. For those shrimpers that bought their primary boat new (n = 112), most (30 %) bought it from 1979 to 1984; nearly equal percentages bought their boat prior to 1978 or within the last five years (24 % and 22 %, respectively). For those shrimpers that bought their primary boat from another owner (n = 195), most (43 %) of the boats were built prior to 1978 (Table 4).

Table 2. Percent distribution of Texas shrimpers by gross household income and whether they have health insurance for themselves and/or their family

Income	% (n = 280)	Insurance?	% (n = 311)
Under $39,999	47.5	No Insurance	46.9
$40,000 to $99,999	40.4	Self only	8.1
$100,000 to $159,999	8.2	Family only	4.2
Above $160,000	3.9	Self and family	40.8
Total	100.0		100.0

Table 3. Percent distribution of Texas shrimpers by whether they or their spouses earned any income from work other than shrimping "since this time last year"

Earned Income?	Themsieves (n = 314)	Their Spouse (n = 311)
Yes	40.8	43.7
No	59.2	43.1
No spouse	--	13.2
Total	100.0	100.0

Table 4. Percent distribution of those Texas shrimpers that bought their primary boat new (including having it built) or used by the year in which it was bought

Year	Bought New (n = 112)	Bought Used (n = 195)
Older than 1978	24.11	42.57
1979 to 1984	30.36	28.72
1985 to 1989	9.82	15.38
1990 to 1995	13.39	6.15
1996 to 2001	22.32	7.18
Total	100.00	100.00

Most (38 %) reported that between 91 % and 100 % of their household's gross annual income comes from shrimping activities. Similarly, a majority (85 %) indicated that none of their household's gross annual income comes from other commercial fishing activities, and half of the respondents indicated that none of their household's gross annual income comes from non-fishing activities (Table 5). It is notable that 11 % responded that between 91 % and 100 % of their income comes from non-fishing activities.

Table 5. Percent distribution of Texas shrimpers by the percentage of their household's gross annual income that comes from listed activities (n = 284)

Percentage	Shrimping Activities	Other Commercial Fishing Activities	Non-fishing Activities
0	9.9	85.5	50.0
1 to 10	9.2	5.3	3.9
11 to 20	3.5	1.4	5.6
21 to 30	7.4	1.4	4.2
31 to 40	3.2	0.7	3.9
41 to 50	9.5	1.8	5.3
51 to 60	5.6	1.4	2.5
61 to 70	3.9	0.7	4.2
71 to 80	7.0	0.7	4.9
81 to 90	2.8	0.4	4.6
91 to 100	38.0	0.7	10.9
Total	100.0	100.0	100.0

A majority (71 %) of shrimpers consider themselves to be full time. A majority (63 %) of shrimpers do not carry insurance on their primary boat. A majority (83 %) would not encourage young people to enter the shrimping business; however, the majority (77 %) of shrimpers do expect to be shrimping in four years. Finally, almost half (49 %) indicated that their shrimping operation is profitable (Table 6).

Table 6. Percent distribution of Texas shrimpers by selected economic indicators

Economic Indicator	Yes	no
Full time (n = 311)	71.4	28.6
Insurance on primary boat (n = 311)	37.3	62.7
Encourage young people to enter shrimping business (n = 316)	17.1	82.9
Expect to be shrimping in four years (n = 317)	77.3	22.7
My operation is profitable (n = 290)*	48.6	51.4

* This item was measured on a 5-point Likert type scale ranging from "Strongly Disagree" to "Strongly Agree." The percentage was calculated by summing "Agree" and "Strongly Agree" for 'Yes,' and "Neutral," "Disagree," and "Strongly Disagree" for 'No.'

DISCUSSION

Despite every effort at making the mail questionnaire as "user-friendly" as possible, a relatively low response rate was achieved. The low response rate, coupled with the differences between the respondents and the non-respondents, limits the ability to generalize these results to the entire population of license holders, but does provide valuable information in support of decision-making. Some shrimp industry leaders have suggested that the comprehensive data collection and longitudinal analysis approach currently being employed by Haby (2000) with a limited number of Gulf shrimp boat operators on the lower coast might be a more preferred method for this study. While Haby (2000) may provide a more in-depth profile, it also suffers from the ability to expand to the entire population and is a profile based on even fewer respondents. While our response rate is lower than preferred, it is similar to response rates to mail surveys used in previous commercial fisher studies (Acheson 2001 [24.5 %]; Guillory et al. 2001 [23 %]).

Despite the aforementioned limitations, many of our results are comparable to those from other social and economic studies of the commercial fishing industry in the region. This provides an additional check on non-respondent bias and some additional comfort with respondent data. In terms of the social and demographic characteristics of shrimpers, for instance, our finding that 74 % of Texas shrimp fishers were between 31 and 60 years of age is comparable to 75 % of commercial blue crab fishers being between the ages of 31 and 59 (Guillory et al. 2001). This study found differences from those of Maril (1983) as it reports 18 % of Texas shrimp fishers (overall) are under 40 years of age. The Maril (1983) study reported that 34 % of Gulf shrimp fishers are less than 35 years old, perhaps a result of the time lapse between studies. The mean age of Maril's (1995) sample was 42 years old; the mean age reported for this study was 52 years old. This is plausible given that the population of shrimpers is aging. Maril (1995) also reports that about one-third of his sample were 50 years or older; findings for this study indicate 49 % were in that category. A study of Louisiana fishers found similar results, as the average age reported for Louisiana shrimp fishers was 47 years old (Deseran 1997) compared to 51 years old for Texas shrimp fishers. In Louisiana, less than 17 % were under 35 years of age with more than 30 % over 54 year of age. Finally, the average age of Texas spotted seatrout and red drum commercial fishers was similar (44 years of age) (Ferguson 1986) to the average age of shrimpers in this study (52).

Level of education between our sample and those in previous studies can also be compared. In Louisiana, 43 % of the shrimp fishers reported they attained a high school diploma (Deseran 1997) compared to 58 % of the shrimpers in Texas. About 30 % of blue crab fishers did not graduate from high school (Guillory et al. 2001) with slightly more (42 %) Texas shrimp fishers in this same category. Commercial gill netters in Florida also reported limited education levels (Thunberg et al. 1994).

Maril (1995) reported that his sample of Texas bay shrimpers was 68 % white, 15 % Mexican, 10 % Vietnamese, and 7 % black or African-American. Similar results for all license holders were found in this study. Texas shrimp fishers license holders were 64 % white, 12 % Mexican-American, and only 1 % black or African-

American; 28 % considered themselves to be Vietnamese. This may be due to an increasing number of Vietnamese Gulf license holders; Maril (1983) reported no Vietnamese Gulf shrimpers in his sample. Also, as Deseran (1997) reported, most (29 %) Louisiana shrimp fishers have two persons in their household, which compared favorably with the finding that 38 % of Texas shrimp fishers have two persons in their household.

In Louisiana, 37 % earned income from work other than shrimping and 31 % of their spouses earned income from work other than shrimping (Deseran 1997); 41 % and 44 % were reported in these same categories, respectively, in Texas. Previously, Maril (1995) reported that only 24 % earned income from other kinds of work. The heavy dependence on the fishery for income is also comparable to commercial gill netters in Florida; the average percentage of the household income from their respective fishery was 73 % for commercial gill netters (Smith 1994) compared to 61 % for Texas shrimp fishers. The 41 % of Louisiana shrimp fishers that shrimp full time (Roberts 1989) is in sharp contrast to the 71 % of shrimp fishers that consider themselves full time shrimpers in Texas.

Whether or not shrimpers have some form of health care coverage in these times of rapidly escalating medical costs should indicate something about their ability to take care of themselves. While Maril (1995) reported that only 1 % of his sample had health insurance when he completed his study, 53 % reported they had some form of health insurance for themselves and/or their families. This may be due to TexCare, health insurance from the state of Texas for those families who make too much money to qualify for Medicare but cannot afford commercial health insurance. It is notable, however, that this type of insurance is only for children. Other explanations involving increased Medicare coverage could also be the reason for the improved coverage. Lastly, there may have been differences in the respondents between the two surveys with a higher percent of those having insurance choosing to respond or it could be based on different survey enumeration techniques.

Prior studies report that the median income for captains on Gulf shrimp boats was US$22,400 (1979 dollars, or US$58,500 when adjusted to 2001 dollars) (Maril 1983), current results indicate that most licensed shrimp fishers in Texas earn between US$20,000 and US$39,999. Maril (1995) reported that the average earnings from a bay shrimp boat to be around US$20,000 (1988 dollars, or US$29,900 when adjusted to 2001 dollars).

Not only is the population of shrimpers aging but so too are their vessels. As Haby et al. (2000) reported, "a large proportion of the boats that comprise the Gulf shrimp fleet are approaching twenty years of service." This is consistent with our findings: 54 % of the boats that were bought new were bought prior to 1985 and 71 % of the boats that were bought used were built prior to 1985. It is notable that most Louisiana shrimp boats were built in the 1970s or 1980s, or about the same time as most Texas shrimping vessels (Deseran 1997). Maril (1995, p.61) reported that "bay shrimp boats are not usually insured"; we found that 63 % of all shrimp boats are not insured. Whether they are unable to get insurance on their boats or to pay the high costs of boat insurance, the finding that nearly 2/3 of the boats are

uninsured provides insight to the economic health of this industry. Being able to cover the costs of fuel and labor is essential but apparently financial returns after expenses are insufficient to cover the cost of insuring their business facility.

The results of this study on some of the social and economic indicators can also be compared with Texas population estimates from the U.S. Census Bureau. For instance, 58 % of Texas shrimp fishers reported completing high school. The percentage of the Texas population age 25 years and over that graduated from high school was estimated at 79 % (U.S. Census Bureau 2000a). Also, it is estimated that 79 % of all Texans are covered by some sort of health insurance (U.S. Census Bureau 2000b). This is considerably higher than the 53 % of Texas shrimp fishers with some sort of health insurance.

These results indicate a certain amount of social and economic marginality for the shrimping industry, i.e. this is a group that appears to produce goods at a rate that barely covers production costs. It was surprising that about one-half (49 %) reported that their shrimping activity is profitable. Other indicators show that they may not have what some would consider basic necessities of life (i.e., health insurance). It is also disturbing that high percentages of this group would not encourage young people to enter into the business, perhaps a reflection of the growing complexities of fisheries management and realization that their profits are shrinking in an increasingly global economy. While many of the shrimpers and the industry that they support may not be able to work other jobs due to their lack of education, the next generation may feel that shrimping is not a viable work alternative. With the growing number of shrimp licenses being retired due to the limited entry program in Texas (TPWD 1999), perhaps they will see their profits will grow in the future. Only with future monitoring of the social and economic indicators presented here will decision makers be able to determine the effects of the many influences affecting the businesses of these commercial fishers. Regulations, imports, world markets, costs of fuel, ice, etc. all can affect their profitability and livelihoods.

MANAGEMENT IMPLICATIONS

If an indicator approach to understanding the economic health of the industry had not been used, but instead a survey of detailed social and economic data like that provided on income tax returns, the response rate for this study would probably have been even lower. A common refrain that was heard when talking about this survey to industry members was: "The more we talk to people like you [University and government researchers] and provide you with information and data, the more rules and regulations that affect shrimping get put in place." These conversations and comments provided by respondents and non-respondents indicate a distrust of government-sponsored studies relevant to this industry.

Due to the issues of mistrust, it may be extremely difficult to collect data with adequate sample sizes and comparability on this industry through time. Other data collection methods may have to be examined. Licensing requirements could require

a higher level of data reporting. Vessel monitoring systems to collect effort data may be an alternative to questionnaires. Use and refinement of this type of indicator approach may provide valuable insights into the health of the fishery while being more palatable to industry.

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