

**Characterization Study of
Texas Bait Shrimp Dealers,
1996**

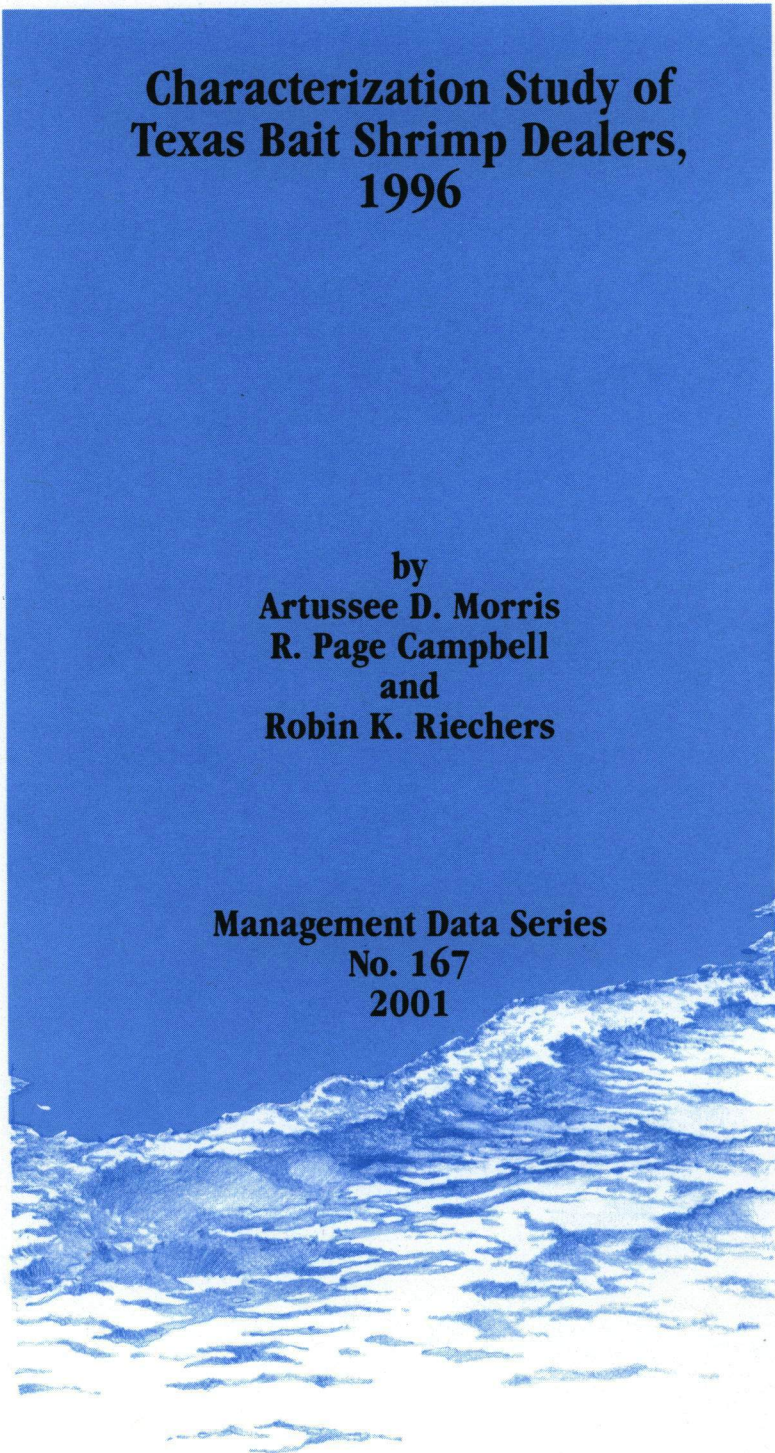
**by
Artussee D. Morris
R. Page Campbell
and
Robin K. Riechers**

**Management Data Series
No. 167
2001**



COASTAL FISHERIES DIVISION

4200 Smith School Road
Austin, Texas 78744



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ABSTRACT

Based on bait shrimp dealers concerns that regulations contribute to a lack of supply, Texas Parks and Wildlife profiled these dealers during the FY 1995-96 license year. A 13 question survey was administered to 203 licensed active bait shrimp dealers out of 367 Bait Shrimp Dealers License purchasers. Sixty eight percent of those bait dealers interviewed were active live bait shrimp dealers, whereas 32% were dead bait shrimp dealers. Most active live bait shrimp dealers had 7 or fewer live bait tanks, with 83% of these having a tank holding capacity of $\leq 17,033$ l. Shrimp (*Farfantepenaeus* and *Litopenaeus spp*) were the most popular bait sold by active live bait shrimp dealers, followed by live finfish, other dead bait, and crabs. Based on survey responses, the average bait shrimp dealer can hold 95 l of live shrimp/day and 373 kg of dead shrimp/day. On average, 1,219 Atlantic croaker (*Micropogonias undulatus*) could be kept alive. Most bait shrimp dealers (53%) did not own a vessel holding a commercial bait license. Most bait shrimp dealers (69%) indicated they bought bait from other non-owned vessels with 46% buying from other dealers. Those dealers that bought bait shrimp from other sources traveled on average 62 km (one way) and bought from \leq three other dealers. Survey results indicate the potential to meet angler demands for bait shrimp is present. However, it appears problems of lack-of-supply stems from common practices conducted by the bait shrimp fishermen themselves of selling bait shrimp in the food market. Possible solutions of lack-of-supply are to sell other popular baits, such as live finfish, or reduce the abuse of the bait shrimp license.

ACKNOWLEDGEMENTS

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INTRODUCTION

Recreational fishing in Texas' coastal waters is a multi-billion dollar industry impacting the state economy by more than \$1.9 billion each year (Maharaj and Carpenter 1997). Based on the most current national estimates, more than 860,000 anglers spend over 13 million days fishing in Texas' coastal waters annually (United States Fish and Wildlife Service 1997). A majority of these anglers use some type of natural bait, primarily shrimp (*Farfantepenaeus* and *Litopenaeus spp.*) and fish during their fishing trips (Ditton et al. 1998, Morris et al. 2000).

Fishing pressure is increasing in Texas' coastal waters. The total saltwater fishing effort in Texas increased from 6.8 million days in 1991 to 13.0 million days in 1996 (U.S. Fish and Wildlife Service 1993, 1997). The supply of live bait may not be keeping pace with the increased demand from anglers. A plurality of anglers reported difficulties with finding live shrimp (45.5 % of anglers) and live fish (46.8% of anglers) when they needed it for their saltwater fishing (Ditton et al. 1998). In addition to anglers, bait shrimp dealers and live bait fishermen have expressed concerns over lack of bait availability and frequently solicit Texas Parks and Wildlife (TPW) to address problems they see in the Texas' coastal bait shrimp industry (TPW unpublished data, Austin, Texas).

It is unclear what effects existing regulations may have on availability of live shrimp for anglers. Furthermore, the live bait shrimp industry in Texas has not been extensively researched. Inglis and Chin (1966) described the bait shrimp industry in Galveston Bay in the mid-1960s, reporting that circular holding tanks had become recently popular. Baxter et al. (1988) also described the bait shrimp industry in the Galveston Bay complex from 1959-87, noting that bait shrimp fishermen exert only as much effort as necessary to supply the demand for bait shrimp. Osborn and Spiller (1991) estimated bait shrimp landings from sport angler interviews and suggested that not all shrimp landed under the auspices of a bait shrimp license are sold as bait. Additionally, bait shrimp landings reported as part of TPW's Marine Aquatic Products Report program provides evidence that bait shrimp harvest (pounds) is exceeding the demand for bait shrimp; much of these landings are apparently used for human consumption (Robinson et al. 1998; TPW unpublished data, Austin Texas).

Problems associated with supplying bait, primarily shrimp, to recreational anglers and leakage of bait shrimp into the food shrimp market, have caused complications in managing the Texas bait shrimp fishery. Furthermore, bait shrimp dealers and bait shrimp fishermen contend that current bait shrimp regulations are too constraining to satisfy the demand for bait shrimp.

To better prepare for future discussion about these issues, TPW Coastal Fisheries personnel conducted a study to characterize bait shrimp dealers of Texas in fall 1996. This study was designed to profile the bait shrimp industry in Texas coastal waters and to obtain information that would be useful in addressing issues relating to supply problems in the bait shrimp industry. The study was designed to provide information on types of live and/or dead bait

shrimp facilities utilized, quantity held, other types of baits sold, sources of bait, types of licenses held by each dealer, and suggestions for future bait regulations.

MATERIALS AND METHODS

From 4 September to 15 November 1996, TPW Coastal Fisheries personnel conducted a survey of all bait shrimp dealers along the Texas coast who purchased a Bait Shrimp Dealer License (n=367) from TPW in the FY 1995-96 license year. Interviews were not conducted with dealers who did not sell bait, were no longer in business, were uncooperative, or where there were language barriers.

Personal interviews were conducted with the owner of the individual facility or with a knowledgeable employee. Individuals were asked 13 questions regarding their facility, holding capacity, and licensing purchase patterns (Appendix A). In addition, all holding tanks were physically inspected by the interviewer and measured to the nearest 2.54 cm to determine total holding capacity. Only responses from active live bait dealers (those that sold live and dead shrimp or other types of live bait), active dead bait dealers (those that sold dead shrimp or other types of dead bait), or individual bait dealers (those that sold live and/or dead shrimp or other bait types, but did not operate out of a permanent facility) were used in this summary.

RESULTS

Interviews were attempted with 367 licensed bait shrimp dealers (Table 1). Two hundred and three interviews were used in the final summation. Of these, 138 (68%) were categorized as active live bait shrimp dealers, 64 (32%) were dead bait dealers, and one was an individual bait shrimp dealer.

Active live bait shrimp dealers used a variety of holding facilities for shrimp. Most (56%) had outdoor tanks, 47% had indoor tanks, 20% had cages in water, and 3% had other types. Number of tanks per active live bait shrimp dealer ranged from 1 to 14, with 113 dealers (83%) having 7 or fewer tanks (Figure 1). Tank holding capacity per active live bait shrimp dealer ranged from 500 to 43,500 l, with 83% having a tank holding capacity of $\leq 17,033$ l (Figure 2). All 138 (100%) active live bait shrimp dealers indicated they used rectangular holding tanks, whereas, 34 (2%) indicated they also used round holding tanks. Galveston Bay and lower Laguna Madre had the highest number of active live bait dealers interviewed with 55 and 18, respectively (Figure 3).

Most active live bait shrimp dealers sold live shrimp (95%), dead shrimp (93%) and live finfish (70%) (Figure 4). Most active dead bait shrimp dealers sold dead shrimp (91%), followed

by other baits (38%), and crabs (8%).

Responses to the question concerning hold capacity of each bait type the bait shrimp dealer could keep per day were divided into three categories: live shrimp, dead shrimp, and live Atlantic croaker, (*Micropogonias undulatus*). The average response for live shrimp was 95 l and ranged from 1 to 454 l. Dead shrimp amounts averaged 373 kg/day and ranged from 2 to 5,443 kg. Live Atlantic croaker averaged 1,220 individual fish per day and ranged from 36 to 8,000 fish.

When asked whether they owned a vessel with a bait shrimp fishing license, 53% of the bait shrimp dealers stated that they did not own a vessel licensed for bait shrimping, 30% stated that they owned one vessel licensed for bait shrimping, and 17% owned more than one vessel licensed to bait shrimp. When asked "How many of these vessels also hold a commercial bay license?", 66% of the dealers responded none, 24% responded as having one bay license, and 10% held >one bay license (Figure 5).

Most dealers (69%) responded they purchased bait from vessels they did not own; of these, 71% responded as purchasing bait from ≤ 4 vessels. Roughly half (46%) of the dealers indicated they purchased bait from other dealers, with the majority (68%) purchasing from \leq three other dealers. Sixty five percent of the dealers responded as traveling to other sources to purchase bait shrimp, traveling on average 62.1 km (one way), with distances ranging from 1.6 to 643.6 km/trip.

Depending upon size and diversity of an individual business, additional licenses may be required. Dealers were asked if they possessed a Retail Fish Dealer License or a Wholesale Fish Dealer License, with 72% and 21% responding yes, respectively.

DISCUSSION

Demographic factors will likely result in more saltwater anglers in the future (Murdock et al. 1992). As a result, demand for natural baits, particularly live shrimp and live fish, is likely to increase. Live fish use among Texas anglers has risen dramatically in recent years (Morris et. al 2000). Accordingly, live bait dealers and other related businesses along the coast would prosper if they can supply these increasing needs.

It appears a relatively small number (~200) of bait shrimp dealers provide most of the supply of bait shrimp purchased by Texas saltwater anglers. Almost half (45%) of the licensed bait shrimp dealers contacted did not sell bait shrimp or were not participating in the fishery. This indicates there are a number of dealers that could potentially contribute to the bait supply. However, it is likely they do not sell bait shrimp because of inadequate facilities, lack of supply, poor location, or other reasons not identified in the present survey.

Bait shrimp dealers surveyed did not appear to have sufficient storage facilities to meet the demand for live bait fish, a possible alternative bait to live shrimp. Rectangular holding tanks, either indoor or outdoor, were observed more often among live bait dealers, whereas round tanks (often used for holding live fish) were observed less frequently. Historically, rectangular holding tanks are popular among bait dealers for holding shrimp. Round holding tanks started to first appear in the fishery in the early 1960's (Inglis and Chin 1966, Baxter et. al. 1988). If it is assumed that those live bait dealers surveyed possessing round holding tanks (2% of dealers) primarily use these for holding live bait fish, then handling live bait fish may not be as popular among dealers. Bait fish are typically more difficult to capture, harder to keep alive, more costly for the dealer to purchase, and more difficult to maintain than shrimp.

Nevertheless, angler demand for using live fish, particularly Atlantic croaker, for bait is growing among Texas anglers. According to a bait use study conducted from 1987-97, live fish use ranked third in use behind live shrimp and worm jigs, respectively (Morris et al. 2000). Results of a similar study conducted from 1983-87 (Weixelman and Chai 1991), ranked live fish 10th in overall use. It is probable that dealers can offset some of the demand for live shrimp with live fish. Field observations indicate that Atlantic croaker, pigfish (*Orthopristis chrysoptera*), pinfish (*Lagodon rhomboides*), striped mullet (*Mugil cephalus*), and various killifish (*Fundulus spp.*), are the most common bait fish currently sold on the live bait market. Additional research needs to be conducted to determine the feasibility of a directed bait fishery on these species.

A common concern voiced by active bait dealers is the lack of bait shrimp available to supply the market. If demand for bait shrimp is greater than supply, possible solutions for dealers may be to 1) purchase bait shrimp from more vessels, or 2) catch their own shrimp by purchasing a vessel and bait shrimp license from an existing shrimper. Also, if all shrimp landed under a bait shrimping license were sold to bait dealers, then the supply would come closer to meeting the demand. Furthermore, enhanced enforcement efforts could result in making it more difficult to sell shrimp caught under a bait shrimp license to enter the food market, thus increasing bait availability.

A majority of the bait shrimp dealers indicated they did not purchase bait shrimp from other dealers. If certain dealers have an excess of shrimp and could facilitate their sales to other dealers, specific demands by geographic region could be met. Again, this may be a problem of bait shrimp fishermen choosing not to sell all bait shrimp catches to the bait market, rather electing to sell much of their catch to the food market (TPW unpublished data, Austin, Texas). This practice of selling bait shrimp to the food shrimp market is not a prudent choice by bait shrimp fishermen; food shrimp ex-vessel prices are 14% less than live bait shrimp ex-vessel prices (Robinson et al. 1998).

Most dealers held a Retail Fish Dealer License but did not hold a Wholesale Fish Dealer License. A Retail Fish Dealer License allows the holder to sell aquatic products to consumers. A Wholesale Fish Dealer License allows the holder to sell aquatic products to other wholesale fish dealers or retailers. This indicates either 1) a reluctance to sell bait to other

competing dealers; 2) dealers do not have excess product; or 3) the cost of the wholesale license (\$525 vs. \$46 for retail license) simply outweighs benefits of the purchase. We suspect that because bait shrimp dealers are willing and able to transport bait along the coast to react to shifting demands that excess product is probably not available for sale to other bait shrimp dealers.

At the conclusion of an interview, bait dealers were asked to briefly describe their concerns or suggestions for future bait shrimp regulations. Most responses were to increase fishing times, open more areas to fishing, and/or increase bag limits. These responses indicate, in the dealers opinion, that the reasons for supply shortages are all regulation related. Recent TPW studies indicate shrimp stocks in Texas are growth overfished due to excess effort. Accordingly, these dealer suggestions would only exacerbate the situation. Abuse of the intent of the bait shrimp license by selling bait shrimp in the food market indicates that additional bait supply is available.

Sport fishing in Texas coastal waters contributes more than \$1.9 billion annually to the Texas economy and measures to insure the future of the bait fishing industry should be maintained. It appears the potential to supply the current angler demand for bait is present. Nevertheless, due to supply constraints, market constraints, and abuse of the bait shrimp license, there remain problems within the bait industry. It is clear the bait industry in Texas should be provided with the means to supply demand, however, any management changes should be carefully reviewed to avoid abuse, overfishing, and increased effort in the bait shrimp fishery.

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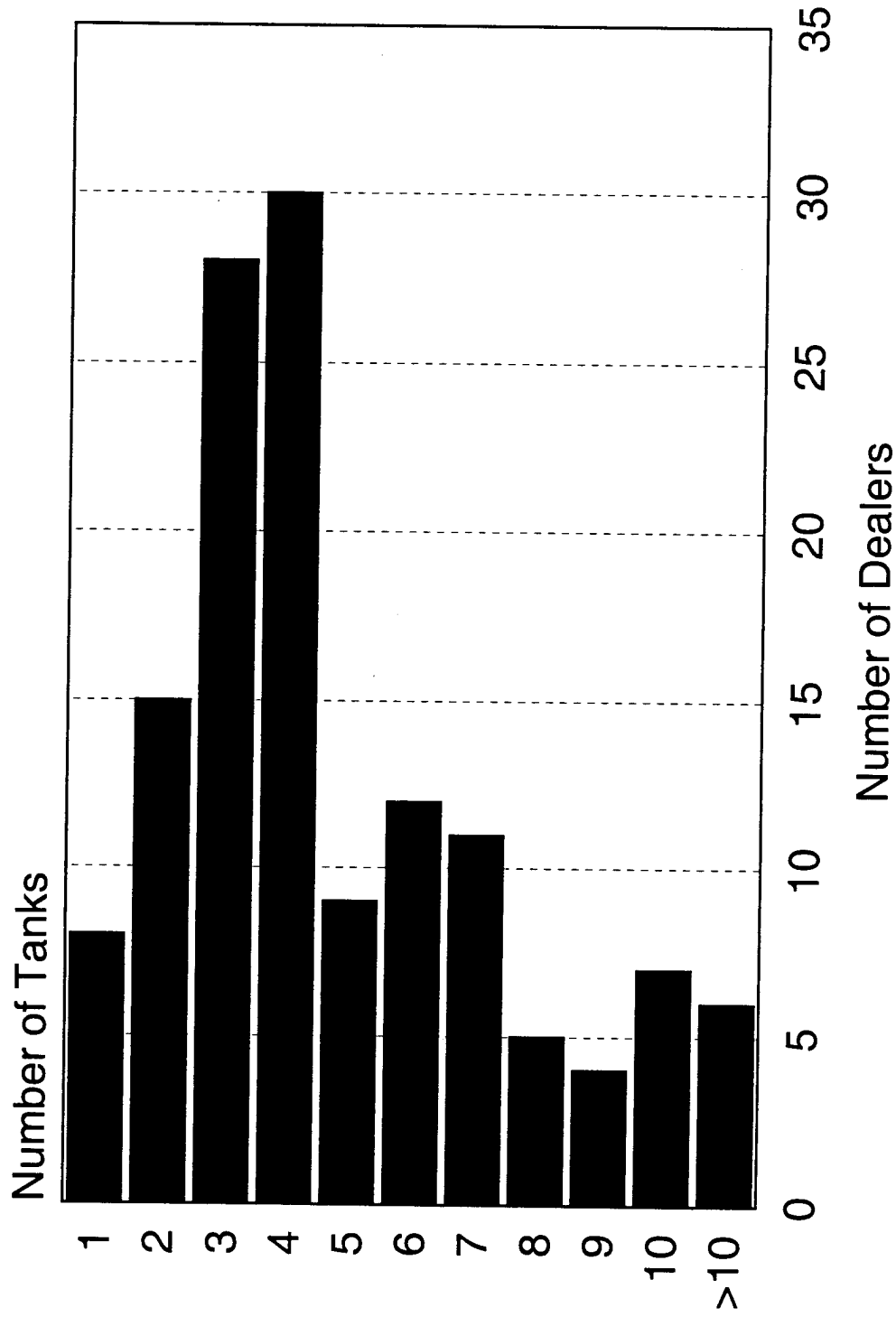


Figure 1. Coastwide number of live bait tanks per live bait shrimp dealer.

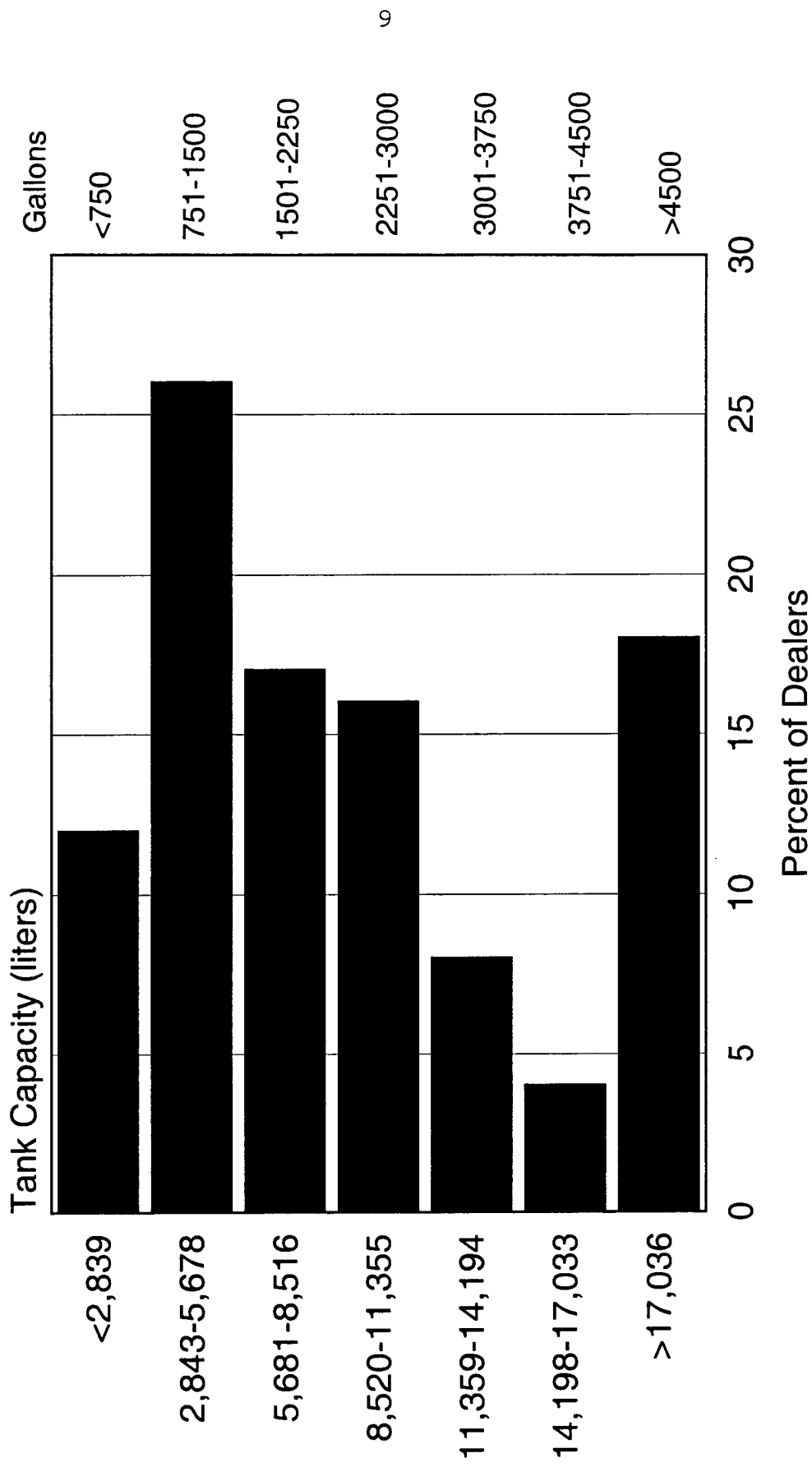


Figure 2. Coastwide tank holding capacity of active live bait shrimp dealers (n=138).

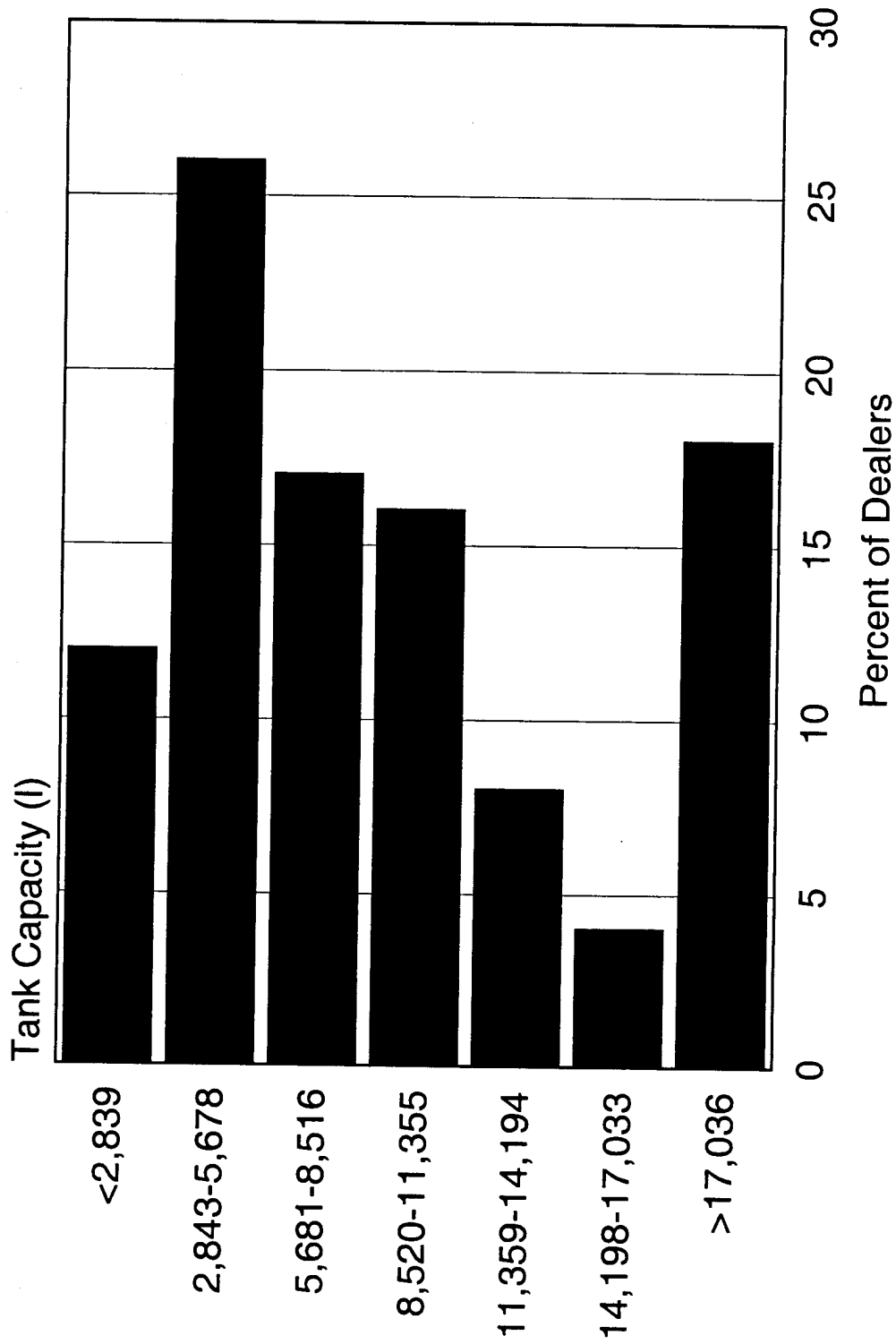


Figure 2. Coastwide tank holding capacity (liters) of active live bait shrimp dealers (n=138).

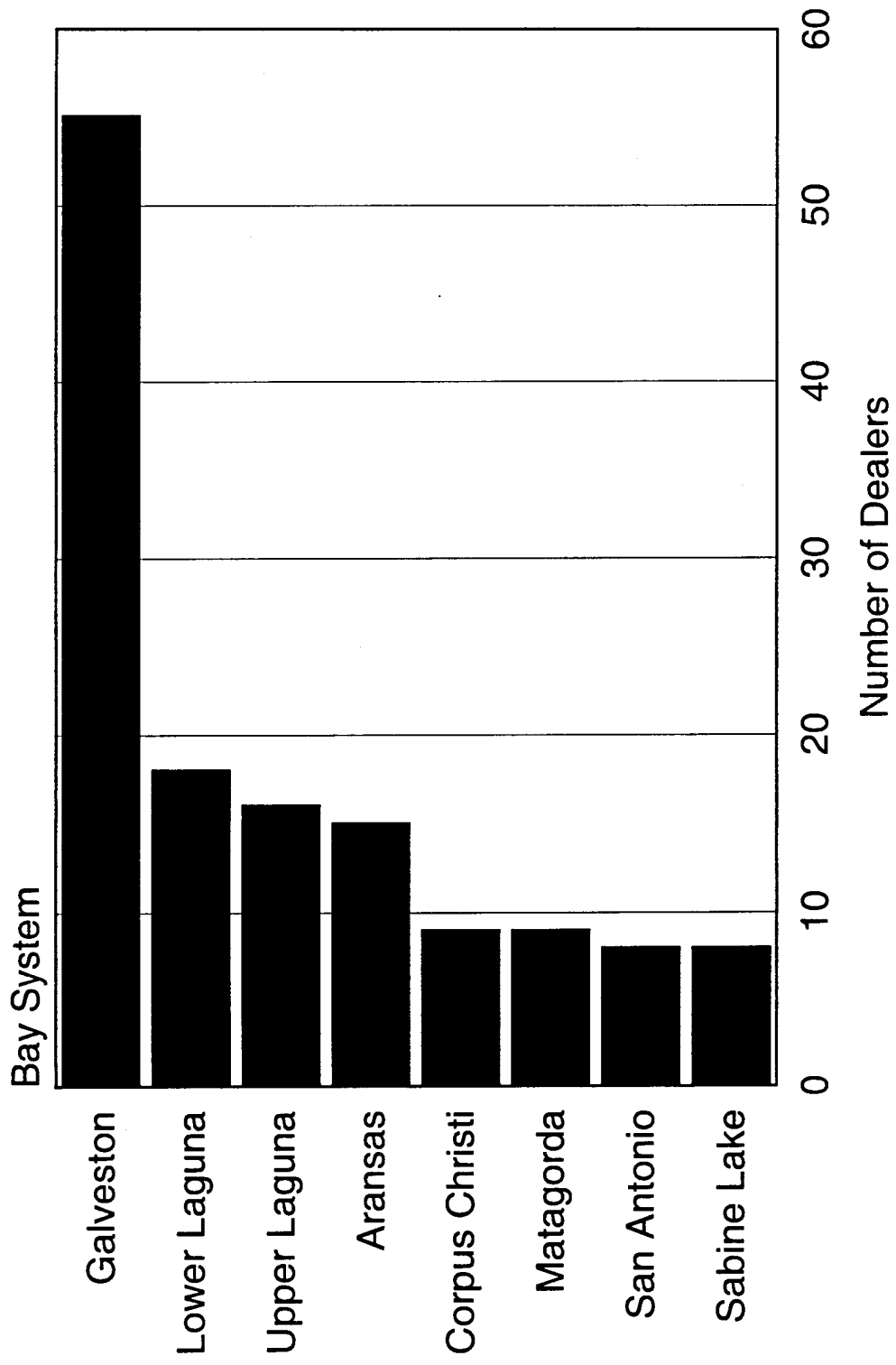


Figure 3. Number of active live bait shrimp dealers per bay system.

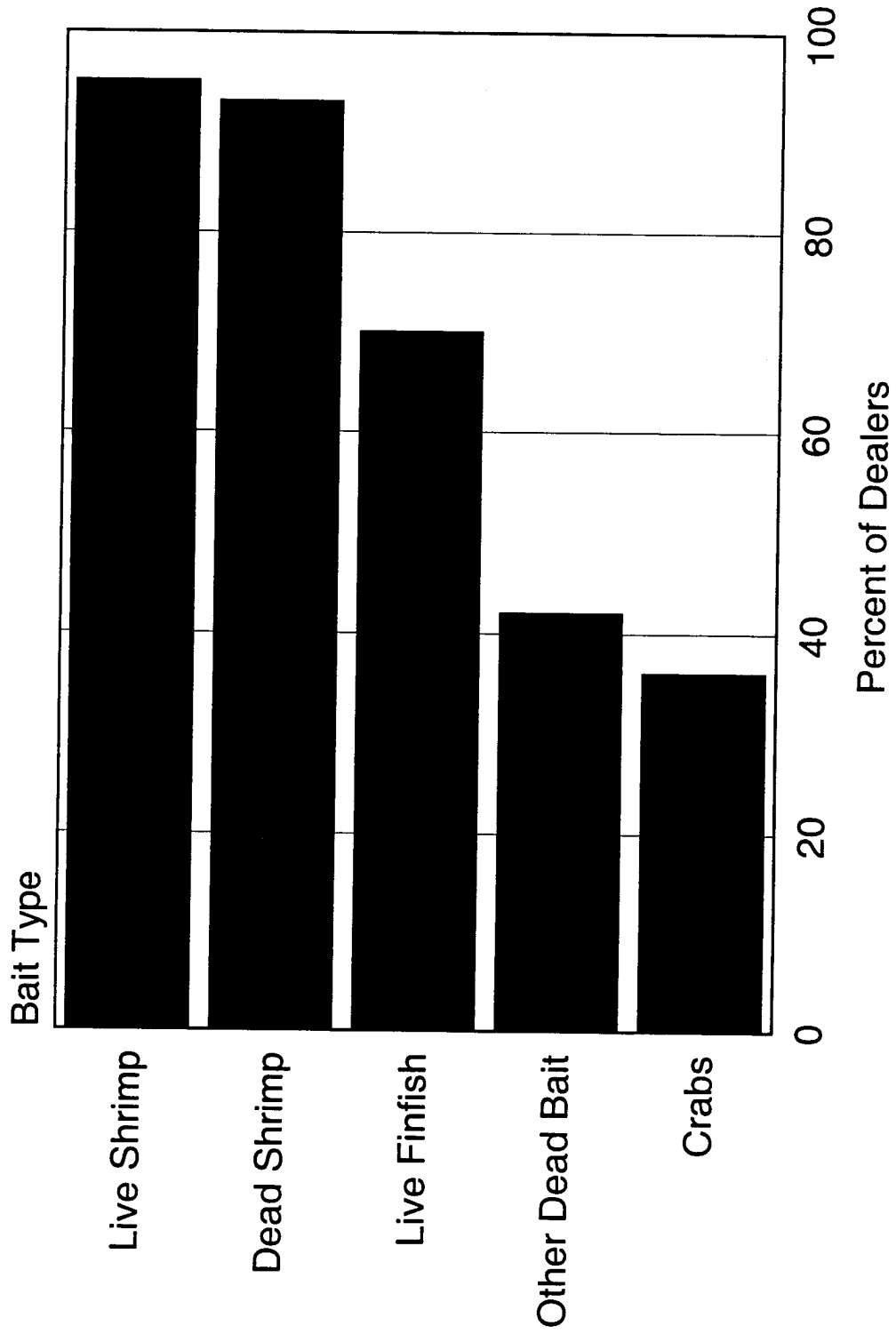


Figure 4. Coastwide percentage of active live bait shrimp dealers (n=138) selling by bait by type.

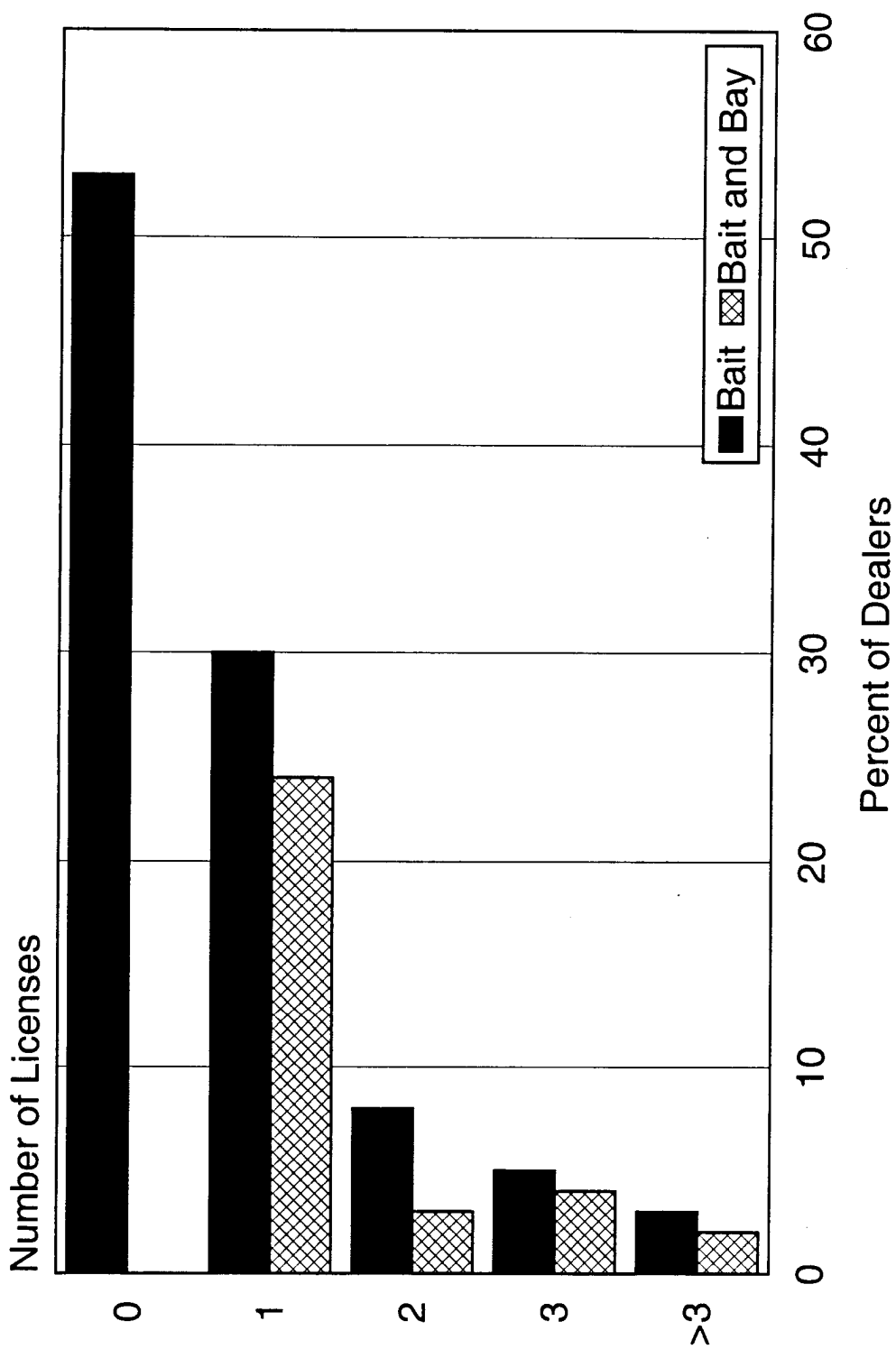


Figure 5. Coastwide percentage of active live bait shrimp dealers (n=138) that owned a vessel with a bait shrimp license or a bait and bay shrimp license.

APPENDIX A. Copy of Bait Dealer Survey conducted 4 September to 15 November 1996 in Texas.

Name of Surveyor _____

Dealer Number (License #) _____

Date and Time _____

Major Area (City/County) _____

QUESTIONNAIRE

1. Name _____
First Name Last Name

2. Physical Street Address of Facility: (If no street address describe by nearest street intersection). Mailing Address: (if different than physical address).

Street or Rural Route (Apartment Number) Street or Rural Route (Apartment Number)

City, State Zip Code City, State Zip Code

3. What type of live bait holding facilities do you have? (check all that apply)

_____ cages in water _____ indoor tanks
_____ outdoor tanks _____ other (please describe)

4. How many of these live bait holding facilities do you have and what are there approximate dimensions? Approximate Dimensions of Tanks - Please list (length, width and height) or (diameter and height) and # tanks with those dimensions. If there are more tanks than the blanks provided add them to the side or on the back.

1. _____ Length x _____ Width x _____ Height _____ # of tanks
2. _____ Length x _____ Width x _____ Height _____ # of tanks
3. _____ Length x _____ Width x _____ Height _____ # of tanks
4. _____ Length x _____ Width x _____ Height _____ # of tanks
5. _____ Diameter _____ Height _____ # of tanks

5. What type of bait do you sell? (circle all that apply)

Live shrimp Dead Shrimp Crabs Live finfish (list species)
Other (list) _____

6. If you had an unlimited supply of product, what is the most of each bait type that you could keep per day? (record in whatever units the individual provides)

Type of Product Volume/day Type of Product Volume/day
1. _____ 3. _____
2. _____ 4. _____

8. How many vessels have commercial bait licenses that are owned or possessed by you or who ever holds the bait dealers license at this location? _____

9. How many of these vessels also hold a commercial bay license? _____

10. Do you purchase bait from other vessels at anytime during the year? Y N
If yes, how many different vessels? _____

11. Do you purchase bait from other bait dealers at anytime during the year? Y N
If yes, how many different dealers? _____

11. If you purchase bait shrimp from other sources away from this location, how far on average do you travel to obtain these shrimp? (one-way distance) _____

12. Do you have a Retail Dealers License for this business? Y N

13. Do you have a Wholesale Dealers License for this business? Y N

QUESTIONNAIRE
(Cont'd.)

Name of Surveyor: _____

A. Could you briefly describe your concerns or suggestions for future bait shrimp regulations?

B. Additional Comments from interviewer.

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