

Louisiana Trawl Gear Characterization
Prepared by Louisiana Department of Wildlife and Fisheries, Marine
Fisheries Division

(Please note: Since information in this report is provided on a per-fishery basis, information on some gears other than trawls is included below. However, this section of the report was excerpted to focus review on the trawl fisheries occurring in LA.)

Shrimp Fishery

Species Targeted

The shrimp fishery is based on two species, white shrimp, *Litopenaeus setiferus* and brown shrimp, *Farfantepenaeus aztecus*. Three other species are also harvested to a much lesser degree: seabobs *Xiphopenaeus kroyeri*, pink shrimp *Farfantepenaeus duorarum* and royal red shrimp *Hymenopenaeus robustus*. Louisiana is the center of abundance of white shrimp and sea bobs; Texas is the center of abundance of brown shrimp. None of these five species are restricted to Louisiana's waters (LDWF, 1992).

Several management plans have provided detailed information about Louisiana's shrimp fishery (Christmas and Etzold, 1977; GMFMC, 1980; LWDF, 1992), including factors affecting landings and other aspects of the fishery.

White shrimp, brown shrimp, and seabobs have accounted for most of Louisiana shrimp landings since 1950. Over that period white and brown shrimp were landed in almost equal weight; seabobs accounted for 3% of total shrimp landings. About 91% of the landings reported from shrimp fishery gear over the years have been shrimp; somewhat less than 7% of landings were finfishes used as bait or animal food (Table SH1). In the database used in this report, NOAA landings did not differentiate between white and brown shrimp from 1950-1977; shrimp were categorized as "Shrimp, Marine, Other". Fifty nine other species accounted for about 2% of landings from 1950-2004 (Table SH1).

These white and brown shrimp are harvested from the state's estuarine and territorial seas, as well as similar waters of adjacent states and the adjoining federal waters of the Gulf. Seabobs spend their entire life in the Gulf of Mexico and are usually harvested in association with white shrimp (LDWF, 1992). They are primarily harvested in the Territorial Sea and are not a part of federal fishery shrimp management.

Historical Gear

Statutory law allows saltwater shrimp to be taken by trawls, butterfly nets, skimmer nets, cast nets, dip nets (bait shrimp only), bait traps (bait shrimp only), and bait seines (bait shrimp only).

NOAA has used several designations for shrimp harvesting gear since 1950, including Shrimp Otter Trawl, Unspecified Trawl, Shrimp Beam Trawl, Chopstick Beam Trawl, Butterfly Net, and Cast Net (Table SH2). In analyzing these landings, some gear (i.e. brush trap, common dip net and crab trap) were combined with Shrimp Otter Trawl because landings were so small or because they are believed to be classification errors. Landings classified as "Not Coded", primarily from 1978 to 1982, were combined with Shrimp Otter Trawl as that category accounts for the bulk of coded landings in adjacent years. Beam trawl (shrimp and chopstick), although accounting for very small landings over the period, were separated because of their historical interest.

From 1950-2004, trawls and butterfly nets were the primary gears used in harvesting Louisiana's shrimp (Table SH3). Trawls account for over 92% of Louisiana's reported shrimp landings during that period; butterfly nets caught almost 9% of shrimp landed. The Trawl accounted for the bulk of the landings of all three major species; Butterfly Net was the second most used gear for all three species (Tables SH4, SH5, and SH6).

The "Unspecified Trawl" category was primarily utilized in the 1950's, although some landings from 2001-2004 were coded using this category (Table SH2). The bulk of landings assigned to this category were coded as "Other Marine Shrimp" (Table SH1). As the distribution of species in this category reflects that of Shrimp Otter Trawl (i.e., roughly equal landings of brown and white shrimp, minor catches of other species) it is believed this category includes primarily catches from Shrimp Otter Trawls.

Beam Trawls obviously target white shrimp; 74% of landings from shrimp beam trawls and 97% of landings from chopstick beam trawls were white shrimp (Tables SH1).

Recent Gear

From 1999-2004, about 60% of shrimp were landed with Shrimp Otter Trawls. About 37% of landings were from Skimmer nets, and 3.3% from Butterfly Nets (Table SH7). Cast nets accounted for only about 100,000 pounds of landings during this period. The distribution of effort (in trips) during this period (Table SH8) reflects landings, with less than 0.1% effort coming from cast nets. The Shrimp Otter Trawl was the primary gear for all the major species (Table SH7), accounting for the majority of landings for each species. Skimmer Nets were important in the landings of both brown and white shrimp, accounting for over 1/3 of white shrimp landings and almost 40% of brown shrimp landings.

Butterfly nets caught about 3% of landings for both brown and white shrimp (Table SH7).

Shrimp Trawl

Description of Gear and Fishing Method

"Trawl" is legally defined (56:8(100)) as "any net, generally funnel-shaped, pulled through the water or along the bottom with otter boards to spread the mouth open while being fished. The term trawl also means and includes plumb staff beam trawls that do not exceed sixteen feet, that do not use otter boards but are held open laterally by a horizontal beam and vertically by two vertical beams (plumb staffs), and that are used while the vessel is under way." Statutory law specifies allowable trawl net and mesh sizes (Appendix 5-1)

Christmas and Etzold (1977) described the shrimp trawl used in the Gulf of Mexico Shrimp Fishery:

"There are three basic designs employed in the otter trawl: flat, two-seam semi-balloon and four-seam semi-balloon. The otter trawl consists of: (1) a heavy mesh bag in which the shrimp are gathered in the tail or cod end; (2) wings on each side of the bag for funneling the shrimp into it; and (3) trawl doors or otter board at the end of each wing for holding the mouth of the net open. A lead line extends from door to door on the bottom of the trawl while a cork line is similarly attached at the top of the net. With flat nets the mouths are rectangular with the lead and cork lines being close to the same length. With the semi-balloon nets, the float line forms a pronounced arch. This type of net prevents white shrimp from escaping when they jump off the bottom. The semi-balloon trawls also have a much wider throat which prevents "choke-off" so that the catch does not build up in the body.

"A chain, somewhat shorter than the lead line, is attached between the trawl doors resulting in a tickler which tows just ahead of the net. This chain is used to frighten shrimp off the bottom. The lead lines of larger nets are weighted with a ¼ to 3/8-inch loop chain attached at about 1 foot intervals with a 14- to 16- inch drop. Many larger nets are also equipped with rollers on the lead line. This keeps the lead line from digging into the mud.

The most common mesh sizes in nets range from 1 ½- to 2-inch stretch mesh, with a 3 ½- to 4-inch stretch mesh chafing gear tied around the bag for protection." (Christmas and Etzold, 1977)

Landings and Effort

Landings

White shrimp (48.7%), brown shrimp (43.0%), and seabobs (6.0%) together made up almost 98% of the landings reported from Shrimp Trawls in recent years (Table SH9). Seventy-five (75) species composed the remaining 2+% of reported landings.

The offshore SubBasins accounted for 53.7% of 1999-2004 landings; the coastal SubBasins contributed 37.7% of landings during that period (Table SH10).

Effort

Annual effort averaged about 28,350 trips from 1999-2004, but showed a declining trend from 34+ thousand trips in year 1999 to less than 21

thousand trips in year 2004 (Figure SH1). Shrimp Trawls accounted for 29.5% of total shrimp fishery effort during the period (Table SH8).

Mean monthly effort averaged about 2,360 trips over the period, ranging from about 440 trips in February to almost 5,600 trips in May (Figure SH2). There were 2 pulses in effort: 36+% of effort occurred in May-June; 33+% of effort in the August-October period. Only 8.7% of effort occurred in January-April (Table SH11).

SubBasin distribution of effort differed somewhat from SubBasin distribution of catch. Relatively more effort was expended in the coastal SubBasins. Only 26+% of effort was expended in the offshore waters (Table SH12), resulting in the 53.7% of landings noted above. The 60+% of effort expended in the coastal SubBasins resulted in 37.7% of landings.

License and Permit Requirements

A commercial Shrimp Trawl gear license is required for each individual net used; no license is required for test trawls when used with another trawl for which the gear fee has been paid. The fisherman must have a commercial fisherman's license. The vessel must be licensed. A valid commercial gear license may be transferred for temporary use to a person holding a valid commercial fisherman's license and having the same residency status as indicated on the license being transferred.

Special bait dealer's permits are issued for the harvest and sale of bait shrimp before the opening of the spring inshore shrimp season.

Federal permits are required for vessels shrimping in federal waters.

Laws Affecting Effort and Fishing Operations

The Legislature has reserved to itself the right to determine legal gear, licenses and fees, legal sizes, and other aspects of the fishery.

Statutory law restricts size and number of Otter Trawls based on the area of use. Except for Breton-Chandeleur Sound (see "Appendix 5-2, "Breton-Chandeleur Sound Two-Trawl Area"), only a single net can be pulled in inside waters. The shrimping waters of the state are divided into inside and outside waters (see Appendix 5-2, "Inside-Outside Shrimping Waters"). Up to four trawls can be pulled at once in outside waters.

Mesh size varies based on location and season (Appendix 5-1).

Trawls may be fished day or night, except for portions of Cameron and Vermilion parishes.

Use of trawls is allowed only during the open shrimp seasons.

The Louisiana Wildlife and Fisheries Commission sets seasons for the harvest of shrimp. There are typically two inshore shrimp seasons

during the year: a spring season, lasting from mid-May to the beginning of July for the harvest of brown shrimp, and a fall season from mid-August to mid-December, to harvest white shrimp. The offshore state waters (from the coastline to 3 miles offshore) are occasionally closed for varying periods to protect shrimp too small for commercial harvest.

Federal law requires the use of Turtle Excluder devices in trawls. Louisiana does not enforce any federal law or regulation which requires any commercial or recreational fishermen to use TEDs in Louisiana waters.

Skimmer Net

Description of Gear and Fishing Method

"Skimmer Net" is statutorily defined as "a net attached on two sides to a triangular frame and suspended from or attached to the sides of a boat, with one corner attached to the side of the boat and one corner resting on the waterbottom. A ski and one end of the lead line are attached to the corner of the frame that rests on the waterbottom and the other end of the lead line attached to a weight which is suspended from the bow of the boat." The statutes also include skimmer nets in the description of "stationary shrimp net" which is any net for taking shrimp that is attached to the water bottom, bank, or a fixed structure. Statutory law specifies allowable skimmer net and mesh sizes (Appendix 5-1)

Epperly et al. (2002) discussed the use of skimmer nets:

"Developed in coastal Louisiana in the early 1980's, the skimmer trawl has gained widespread popularity throughout the southeastern U.S. shrimp fishery. Skimmer trawls are pushed by the vessel rather than towed. The trawls are always fished in pairs, from the sides of the vessel. An advantage of the skimmer trawl over an otter trawl is that they are more maneuverable, especially in small bays and bayous and can fish more selectively, i.e. along channel edges. An additional advantage of the gear is that while retrieving the cod end, the frame, or mouth of the trawl, remains in a fishing configuration, thus little effort and time is required to dump the catch.

"The trawl is held open by a metal framework and is fished on the bottom. A skimmer trawl consists of an "L" shaped frame constructed from metal pipe with a shoe or skid on the outboard leg. The outboard wing edge and headrope of the trawl is attached around the frame. The inboard wing edge of the trawl is sewn to a line suspended from the frame and terminates at a weight or bullet, which, when deployed, rides slightly off the bottom. A chained footrope and tickler chain are used. When fishing, the outboard shoe rides along the bottom, allowing the trawl to rise and fall with the bottom contour. The vertical height of the skimmer trawl varies depending on the target shrimp species, and may be as much as 12-ft in overall height.

"Skimmer trawls are used exclusively in inshore waters in all states where the gear is allowed. Originally designed to catch white shrimp by fishing the entire water column, today skimmers may also be rigged with low opening nets and are used to target brown shrimp. Within the last decade, an increasing number of inshore fishermen in North Carolina, Louisiana, Mississippi and Alabama have either fully converted their vessels from otter trawls to skimmer rigs, or switch out their gear on a seasonal basis. Although the TED exemption likely has caused many Louisiana fishermen to convert their gear to skimmer trawls, Hein and Meier (1995) described the introduction of skimmer nets into the Louisiana shrimp fishery and indicated that its development and widespread adaptation was in response to the prohibition on the use of "chopstick nets" as well as increased catch rates, less debris and bycatch and lower fuel consumption rates. Citing unpublished LDWF data, these authors reported that skimmer nets were outcatching trawls by a factor of 3:1 in western Terrebonne Parish in the fall of 1988.

"Skimmer trawls are exempt from TED regulations and must be fished in accordance with tow time restrictions. Skimmers were exempted from TEDs under the assumption that the trawl bags were typically retrieved at intervals that would not be fatal to sea turtles."

Landings and Effort

Landings

Species distribution of landings in Skimmer Nets showed the same pattern as that of Shrimp Trawls, except that brown shrimp (49%) made up a slightly larger portion of the catch than did white shrimp (47%); seabobs made up 2+% of landings (Table SH13). Together, those 3 species accounted for almost 99% of reported landings.

In contrast to Shrimp Trawls, landings by Skimmer Nets from the offshore waters made up only 4+% of total 1999-2004 landings (Table SH14). The coastal SubBasins accounted for almost 84% of landings for the period.

Effort

Effort with Skimmer Nets averaged about 60,750 trips per year, ranging from about 81,700 trips in year 2000 to 49,000 trips in year 2004; effort was stable from 2002-2004 (Figure SH3). Skimmer net effort accounted for over 63% of total effort with shrimp fishery gear (Table SH8).

Mean monthly effort averaged 5,000+ trips, ranging from less than 90 trips in February to 13,800+ trips in May (Figure SH4). There were 2 pulses on effort: May-June accounted for almost 42% of effort; 32+% of effort was expended from August-October. Only 3.5% of effort was expended from December-April (Table SH15).

SubBasin distribution of effort mirrored SubBasin distribution of catch: 72+% of effort occurred in the Terrebon_S and Baratari_S SubBasins resulting in 72+% of landings (Table SH16). Only 3+% of effort was reported from the offshore SubBasins.

License and Permit Requirements

A commercial Skimmer gear license is required for each individual net used. The fisherman must have a commercial fisherman's license. The vessel must be licensed. A valid commercial gear license may be transferred for temporary use to a person holding a valid commercial fisherman's license and having the same residency status as indicated on the license being transferred.

No federal permits are required for the use of this gear; there is little or no use of this gear in Federal waters.

Laws Affecting Effort and Fishing Operations

The Skimmer Net is primarily used on a moving fishing vessel, although it is included in the statutory definition of "stationary shrimp net"

The maximum allowable number and size of the gear is specified by law. Minimum mesh size is five-eighth inch square (Appendix 5-1).

The gear may be fished almost anywhere other shrimping gear may be used, however it may not be used over any privately leased oyster

bedding ground, as the method of fishing would damage the oysters on those grounds.

Use of this gear is allowed only during the open shrimp seasons. It may be fished day or night.

Federal law requires the use of Turtle Excluder devices in trawls. Louisiana does not enforce any federal law or regulation which requires any commercial or recreational fisherman to use TEDs or fish excluder devices by commercial fishermen in Louisiana waters.

Butterfly Net

Description of Gear and Fishing Method

"Butterfly net" is statutorily defined as "a fixed, frame-mounted net, used to fish the near-surface waters, which is suspended from the side or sides of a boat, pilings, floats, rafts, or shore installation." Butterfly nets are also known as wing nets. Statutory law specifies size and configuration requirements of the net frames, as well as mesh size (Appendix 5-1).

Christmas and Etzold (1977) described the basic construction of the butterfly net:

"Butterfly nets are hung on rectangular frames and attached to the sides of a boat. Similar to trawls, these nets vary in size and are used in areas where there is a strong tidal flow. The boat anchors itself heading against the current and lowers the nets at right angles from the sides of the boat, letting the current sweep into the mouth of the net. The cod end or tail of the net is lifted, without removing the frame, through the use of a lazy line and the catch emptied on the boat and then replaced."

Epperly et al. (2002) discussed the use of butterfly nets:

"Butterfly nets, sometimes called "wing nets" consist of a square metal frame that forms the mouth of the net. Webbing is attached to the frame and tapers back to a cod end. The nets can be fished from a stationary platform or a pair of nets can be attached to either side of a vessel. The vessel is then anchored in a tidal current to capture emigrating shrimp, or the nets are pushed through the water by the vessel (Hein et al., 1995). In Louisiana, some shrimpers use them singly on a wharf or platform attached to the shore in man-made passes, bayous, or canals (Horst et al., 2002). The primary difference in fishing butterfly nets and skimmer trawls, is that the former is not fished on the bottom. Butterfly nets are typically set, or pushed so that the top of the frame, and net are exposed above the surface of the water. As with skimmer trawls, the catch may be picked up and dumped without raising the entire net out of the water. Vessels fishing with butterfly nets typically operate in the deeper parts of rivers, channels and canals, avoiding gear contact with the sloping banks.

"Butterfly nets are exempt from TED regulations and must be fished in accordance with regulated tow times. Like skimmer trawls, the gear is capable of incidental sea turtle capture. Because the gear is fished of the bottom, in deeper parts of channels, the chance of turtle interaction with this gear may be somewhat less than skimmer gear."

Landings and Effort

Landings

White shrimp made up a higher portion of Butterfly Net landings (51.9%) than brown shrimp (45.1%). Seabobs comprised only 1% of 1999-2004 landings. Together these 3 species accounted for 98% of landings

during the period; a total of 23 other species made up the remaining 2% (Table SH17).

Over 52% of landings were reported from the coastal SubBasins; almost 28% of landings were reported from the offshore SubBasins (Table SH18).

Effort

Effort with Butterfly Nets averaged about 6,900 trips per year, ranging from about 9,900 trips in year 2000 to less than 5,200 trips in year 2004; effort showed a declining trend from year 1999 to year 2004 (Figure SH5). Butterfly net effort accounted for only 7+% of total effort with shrimp fishery gear (Table SH8).

Mean monthly effort averaged 575 trips, ranging from less than 6 trips in February to 1,550 trips in June (Figure SH6). There were 2 pulses on effort: May-June accounted for 44+% of effort; 34% of effort was expended from August-November. Only 2+% of effort was expended from December-April (Table SH19).

SubBasin distribution of effort mirrored SubBasin distribution of catch: 63+% of effort occurred in the Terrebon_S and Calcasie_S SubBasins resulting in 42+% of landings (Table SH20). Only 9% of effort was reported from the offshore SubBasins.

License and Permit Requirements

A commercial Butterfly Net gear license is required for each individual net used. The fisherman must have a commercial fisherman's license. The vessel must be licensed. A valid commercial gear license may be transferred for temporary use to a person holding a valid commercial fisherman's license and having the same residency status as indicated on the license being transferred.

No federal permits are required for the use of this gear; there is little or no use of this gear in Federal waters.

Laws Affecting Effort and Fishing Operations

The Butterfly Net may be used either as a stationary net attached to the waterbottom, bank or fixed structure; or on a moving fishing vessel. The maximum allowable size of the gear differs based on that use. Minimum mesh size is five-eight inch square (Appendix 5-1).

The gear may be fished almost anywhere other shrimping gear may be used; fixed gear is specifically prohibited in portions of Lake Pontchartrain and Lake Borgne, and in the Rigolets and Chef Menteur Passes connecting those bodies of water. All use of Butterfly Nets is prohibited in Lake Charles, Moss Lake, Prien Lake, and parts of the Calcasieu Lake and in Sabine Lake.

Use of this gear is allowed only during the open shrimp seasons. It may be fished day or night.

Cast Net

Description of Gear and Fishing Method

"Cast Net" is legally defined as "a light circular net of vegetable or synthetic materials and weighted around its perimeter that is thrown by hand over the water." (Appendix 5-1)

Christmas and Etzold (1977) described the basic construction and use of the cast net:

"These nets are circular, usually having a spread of 1.8 to 3.7 m (6 to 12 feet), with a lead line running around the outside edge. A cord line extends through a ring in the center of the net, and then radiates numerous small cords fastened at regular intervals to the lead line. These cast nets are usually constructed of nylon webbing with a ¼- to ¾- inch mesh. Some nets are made of monofilament. "

"The net is thrown so that it will fall in a circular pattern on the water and then sink to the bottom. After the net has settled, the cord line is pulled in, drawing the smaller lines into the center forming a bag to hold the shrimp."

Landings and Effort

Landings

Brown shrimp made up over 56% of Cast Net landings; white shrimp were 26% of 1999-2004 landings. Three other species comprised more than 1% of landings: Gizzard shad (7%), striped mullet (4%), and menhaden (3%) (Table SH21). These are primarily bait species; much of the shrimp caught in this gear were probably also used as bait.

Over 62% of landings were reported from the Calcasie_S and Terrebon_S SubBasins (Table SH 22).

Effort

Effort with Cast Nets averaged only 85 trips per year, indicating that is it a very minor commercial gear (Figure SH7); there was no trend in the 1999-2004 period. Cast net effort accounted for only 0.09% of total effort with shrimp fishery gear (Table SH8).

Mean monthly effort averaged only 7 trips, with almost 47% of effort occurring May-June (Figure SH8, Table SH23)

Three SubBasins, Calcasie_S, Terrebon_S Baratari_S accounted for 47.6% of total effort during the period (Table SH24).

License and Permit Requirements

The fisherman must have a commercial fisherman's license. A fisherman with a commercial fisherman's license is allowed to use a cast net less than 8 feet 6 inches in diameter to catch minnows, shrimp and other baits allowed by law; a license is required for each individual net used.

A cast net larger than 8 feet 6 inches is allowed with the possession of the Dip/Cast Net gear license.

Federal permits are not required for the use of this gear

Laws Affecting Effort and Fishing Operations

Commercial use of the Cast Net is limited to catching bait.

A Cast Net may be used in the closed shrimp season to catch bait shrimp.

Status of the fishery

The shrimp fishery is Louisiana's most valuable commercial fishery; from 1950 to 1998 it accounted for 10% of Louisiana average annual fisheries landings, and 56% of the average value of the fisheries. It is the major component of the shrimp and shellfish industry, the 1996 economic value of which has been estimated to be \$1.9 billion (LDWF, 2000). From 1950-2004, Louisiana Shrimp landings have varied from 31 million to 147 million pounds, averaging about 87.5 million pounds (Figure SH9).

The shrimp stocks of the Gulf of Mexico are not considered to be biologically overfished; however the Gulf fishery is in a state of economic decline. All sectors of the Gulf shrimp fishery, regardless of vessel size, state, or gear, have faced with economic losses since 2002. Imports resulting rapidly declining shrimp prices are the primary cause of these losses. The increase in imports resulted in the domestic industry's share of the U.S. shrimp market to decrease from 44.6% to 14.8% between 1980 and 2001 (GMFMC, 2005).

The effects of this decline are reflected in the decrease in effort for all three of the major shrimp gear (Figures SH1, SH3, and SH6). Likewise the decline of the industry is reflected in the declining number of gear licenses sold during the 1999-2004 period (Table SH25, Figure SH10). The number of resident trawl gear licenses sold for this gear decreased from 15,533 in 1989 to 4810 in 2004; the number of non-resident licenses decreased from 1,597 to 604 during the same period. (Table SH25; Figure SH10). The number of resident Butterfly Net gear licenses sold decreased from 4,059 in 1989 to 809 in 2004; the number of non-resident licenses decreased from 23 in 1991 to 5 in 2004 during the same period.

In Louisiana, federal TED and Bycatch Reduction Device (BRD) requirements may have led to decrease use of trawls and increase use of Skimmer Nets, which are a versatile gear that can be used anywhere a butterfly net is used, and in many situation where a trawl can be used (Horst and Holloway, 2002). However, as stated previously,

increased use of skimmer nets is related to increase catch and efficiency. The number of resident gear licenses sold for this gear increased from 1,836 in 1992 to 3,653 in 2004 (Prior to 1992, the Skimmer Net was licensed as a Butterfly net); the number of non-resident licenses increased from 20 to 41 during the same period. (Table SH25; Figure SH10).

The number of resident Dip/Castnet gear licenses increased from 348 in 1990 to 620 in 2004; most years no non-resident licenses are sold.

Shrimp Fishery Figures and Tables

Table SH1. Species Distribution In Major Shrimp Gear, 1950-2004

Species	Beam Trawls, Chopsticks	Butterfly Nets	Cast Nets	Otter Trawl Bottom, Fish	Otter Trawl Bottom, Shrimp	Trawls, Unspecified	Total
Shrimp, Marine, Other	0.000%	11.882%	0.611%	23.655%	33.703%	81.938%	40.844%
Brown Shrimp	3.172%	48.460%	24.174%	6.689%	29.600%	6.361%	24.412%
White Shrimp	96.828%	37.257%	13.781%	0.000%	29.542%	6.807%	22.981%
Finfishes, Unc Bait And Animal Food	0.000%	0.000%	0.000%	67.880%	0.520%	2.511%	6.748%
Shrimp, Seabob	0.000%	2.242%	0.031%	0.260%	4.487%	0.307%	3.089%
Blue Crab	0.000%	0.047%	0.000%	0.314%	0.424%	0.236%	0.346%
King Whiting	0.000%	0.000%	0.000%	0.198%	0.262%	0.458%	0.275%
Flatfish	0.000%	0.022%	0.000%	0.088%	0.270%	0.204%	0.221%
Sheepshead	0.000%	0.008%	0.000%	0.490%	0.232%	0.106%	0.211%
Black Drum	0.000%	0.003%	0.000%	0.220%	0.273%	0.078%	0.207%
Atlantic Croaker	0.000%	0.000%	0.000%	0.002%	0.143%	0.530%	0.198%
Shrimp, Atlantic & Gulf, Roughneck	0.000%	0.002%	0.000%	0.000%	0.182%	0.000%	0.115%
Red Snapper	0.000%	0.000%	0.000%	0.063%	0.079%	0.062%	0.068%
Sea Catfishes	0.000%	0.000%	0.000%	0.029%	0.040%	0.122%	0.052%
Sand Seatrout	0.000%	0.000%	0.000%	0.028%	0.044%	0.043%	0.039%
Finfishes, Unc General	0.000%	0.007%	59.337%	0.058%	0.027%	0.020%	0.035%
Red Drum	0.000%	0.000%	0.000%	0.000%	0.030%	0.003%	0.020%
Atlantic Cutlassfish	0.000%	0.000%	0.000%	0.000%	0.000%	0.087%	0.018%
Spanish Mackerel	0.000%	0.000%	0.000%	0.001%	0.026%	0.001%	0.017%
Shellfish	0.000%	0.043%	0.023%	0.000%	0.016%	0.000%	0.013%
Shrimp, Pink	0.000%	0.003%	0.000%	0.003%	0.019%	0.001%	0.013%
Striped Mullet	0.000%	0.000%	1.361%	0.000%	0.008%	0.028%	0.011%
Other Species	0.000%	0.023%	0.682%	0.022%	0.071%	0.095%	0.068%
Total	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%

Table SH2. Louisiana Landings of Saltwater Penaeid Shrimp by Reported Gear, 1950-2004

Year	Beam Trawls, Chopsticks	Beam Trawls, Shrimp	Brush Trap	Butterfly Nets	Cast Nets	Dip Nets, Common	Not Coded	Otter Trawl Bottom, Fish	Otter Trawl Bottom, Shrimp	Pots And Traps, Crab, Blue	Trawls, Unspecified	Total
1950											77,835,100	77,835,100
1951											85,718,200	85,718,200
1952											83,103,700	83,103,700
1953											86,941,300	86,941,300
1954											83,607,800	83,607,800
1955											71,993,600	71,993,600
1956					3,800						60,788,300	60,792,100
1957											34,102,800	34,102,800
1958											41,007,700	41,007,700
1959											57,353,000	57,353,000
1960			1,800								61,756,100	61,757,900
1961											31,027,000	31,027,000
1962			1,600					43,583,700				43,585,300
1963			11,300					80,797,400				80,808,700
1964									59,365,000			59,365,000
1965									62,578,700			62,578,700
1966				1,856,300					60,413,100			62,269,400
1967				4,570,500					70,746,600			75,317,100
1968									67,768,200			67,768,200
1969				1,379,800					81,500,800			82,880,600
1970			9,100						90,938,900			90,948,000
1971				3,272,700					89,203,500			92,476,200
1972				4,698,000					78,333,800			83,031,800
1973				3,664,700					54,981,800			58,646,500
1974				4,975,200					54,605,600			59,580,800
1975				2,019,400					51,114,200			53,133,600
1976				7,997,500					74,357,900			82,355,400
1977				10,272,200					93,772,800			104,045,000

Table SH2. Louisiana Landings of Saltwater Penaeid Shrimp by Reported Gear, 1950-2004

Year	Beam Trawls, Chopsticks	Beam Trawls, Shrimp	Brush Trap	Butterfly Nets	Cast Nets	Dip Nets, Common	Not Coded	Otter Trawl Bottom, Fish	Otter Trawl Bottom, Shrimp	Pots And Traps, Crab, Blue	Trawls, Unspecified	Total
1978							104,530,217					104,530,217
1979							78,449,456					78,449,456
1980							90,102,408					90,102,408
1981							112,254,721					112,254,721
1982							90,442,723					90,442,723
1983							77,716,868					77,716,868
1984									106,674,461			106,674,461
1985	1,919			3,736,756	9,498				112,776,289			116,524,462
1986	108,188			9,269,213	49,371				137,590,846			147,017,618
1987				11,759,309	60,732				105,907,392			117,727,433
1988				9,408,331	589				93,184,891			102,593,811
1989				6,056,982	23				94,225,257			100,282,262
1990				9,006,100	3,283				110,442,445			119,451,828
1991	2,151			8,088,391					86,995,922			95,086,464
1992	562			17,657,389	5,718				79,966,533			97,630,202
1993				16,339,113					71,354,708			87,693,821
1994				16,323,404	14,576				73,694,206			90,032,186
1995				17,430,555			10,134		80,926,998			98,367,687
1996				16,241,959					74,366,521			90,608,480
1997				17,337,218	6,151				75,891,027			93,234,396
1998	1,718			23,580,616	16,697				88,396,576			111,995,607
1999		1,388		31,107,503	1,617				89,881,013			120,991,521
2000				55,394,477	10,611	145	16,473		89,962,827			145,384,533
2001				50,233,054		16			74,579,700			124,812,770
2002	105	2,660		3,592,860	5,586		173,675		68,281,035		35,739,000	107,794,921
2003				4,045,944	44,621		228,673		78,288,579		43,122,343	125,730,160
2004				4,346,793	7,165	65	140,011		81,149,338	390	48,646,351	134,290,113

Source: NOAA Fisheries Web Site; January, 2006

Gear	%
Otter Trawl Bottom, Shrimp	67.119%
Trawls, Unspecified	21.154%
Butterfly Nets	8.803%
Otter Trawl Bottom, Fish	2.915%
Cast Nets	0.006%
Beam Trawls, Chopsticks	0.003%
4 Other Gears	0.001%
Source: NOAA Fisheries Web Site; January, 2006	

Gear	%
Otter Trawls	84.0%
Butterfly Nets	16.0%
1 Minor Gears	>0.1%
Total	100.00%
Source: NOAA Fisheries Web Site; January, 2006	

Gear	%
Otter Trawls	87.0%
Butterfly Nets	13.1%
3 Minor Gears	0.02%
Total	100.00%
Source: NOAA Fisheries Web Site; January, 2006	

Gear	%
Otter Trawls	94.1%
Butterfly Nets	5.9%
2 Minor Gear	>0.1%
Total	100.00%
Source: NOAA Fisheries Web Site; January, 2006	

Gear	Brown Shrimp	Pink Shrimp	Rock Shrimp	Royal Red	Seabob	Trachy-Penaeus	White Shrimp	All Species
Shrimp Otter Trawl	56.7%	89.0%	99.3%	90.5%	78.5%	99.7%	60.7%	59.7%
Skimmer Nets	39.9%	10.2%	0.7%	9.5%	20.7%	0.3%	35.7%	36.9%
Butterfly Nets	3.2%	0.7%	0.0%	0.0%	0.7%	0.0%	3.5%	3.2%
Other Gear	0.2%	0.1%	0.0%	0.0%	0.2%	0.0%	0.1%	0.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Source: LDWF Trip Ticket Data								

Gear	Total
Skimmer Nets	63.23%
Shrimp Otter Trawl	29.50%
Butterfly Nets	7.18%
Cast Nets	0.09%
Total	100.00%
Source: LDWF Trip Ticket Data	

Species	%
White Shrimp	48.7%
Brown Shrimp	43.0%
Seabob	6.0%
75 Species	2.3%
Total	100.0%

Source: LDWF Trip Ticket Data

Figure SH1. Annual Shrimp Trawl Effort, 1999-2004

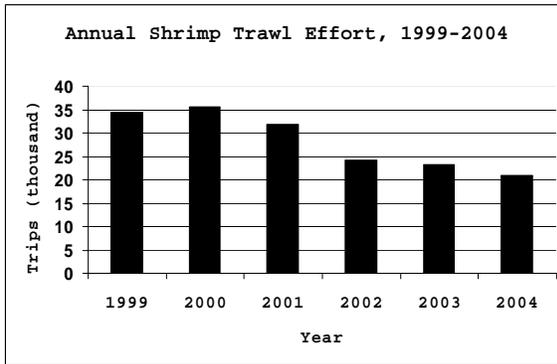


Figure SH2. Mean Monthly Shrimp Trawl Effort, 1999-2004



SubBasin	Total
Offshore14	15.0%
Offshore15	15.0%
Offshore13	13.0%
Terrebon_S	12.9%
Baratari_S	12.2%
Offshore16	7.4%
Pontchar_S	5.6%
Offshore17	3.3%
Calcasie_S	2.5%
Vermtech_I	1.9%
Mississi_S	1.9%
Atchafal_I	1.8%
Vermtech_S	1.3%
Mermenta_S	1.3%
38 SubBasins	4.9%
Total	100.0%

Source: LDWF Trip Ticket Data

Month	Effort
January	2.8%
February	1.6%
March	1.7%
April	2.6%
May	19.7%
June	16.9%
July	7.4%
August	11.0%
September	11.0%
October	11.6%
November	8.9%
December	4.9%

Source: LDWF Trip Ticket data

SubBasin	Effort
Baratari_S	18.8%
Terrebon_S	17.5%
Calcasie_S	11.1%
Pontchar_S	7.6%
Offshore15	7.3%
Offshore13	6.8%
Offshore14	6.7%
Vermtech_I	4.7%
Pontchar_I	3.4%
Offshore16	3.1%
Mississi_S	2.4%
Offshore17	2.4%
Mermenta_S	1.7%
Vermtech_S	1.2%
Baratari_I	1.2%
Atchafal_I	1.2%
34 SubBasins	3.2%
Total	100.0%

Source: LDWF Trip Ticket Data

Table SH13. Species Distribution Of Skimmer Net Landings, 1999-2004

Species	%
Brown Shrimp	49.4%
White Shrimp	46.9%
Seabob	2.6%
67 Species	1.1%
Total	100.0%

Source: LDWF Trip Ticket Data

Figure SH3. Annual Skimmer Net Effort, 1999-2004

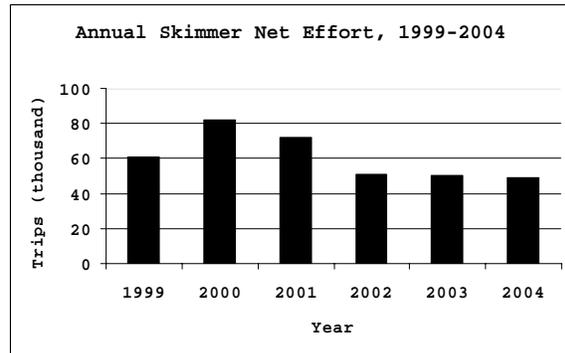


Figure SH4. Mean Monthly Skimmer Net Effort, 1999-2004

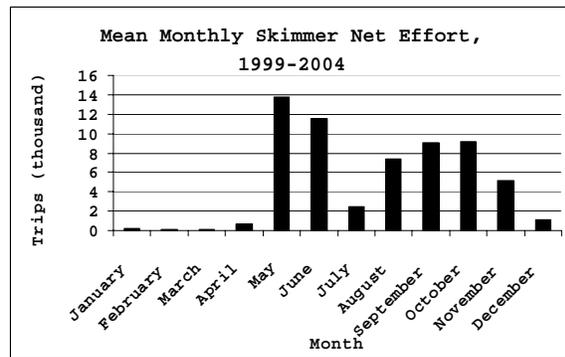


Table SH14. SubBasin Distribution Of Skimmer Net Landings, 1999-2004

SubBasin	Total
Baratari_S	37.9%
Terrebon_S	34.2%
Mississi_S	6.0%
Pontchar_S	5.8%
Pontchar_I	2.5%
Offshore13	2.2%
Baratari_I	2.2%
Offshore14	2.2%
Mississi_I	1.6%
Terrebon_I	1.1%
41 SubBasins	4.2%

Source: LDWF Trip Ticket Data

Table SH15 Monthly Distribution Of Skimmer Net Effort, 1999-2004

Month	Effort
January	0.3%
February	0.1%
March	0.2%
April	1.1%
May	22.7%
June	19.0%
July	4.0%
August	12.2%
September	14.9%
October	15.1%
November	8.5%
December	1.9%

Source: LDWF Trip ticket data

Table SH16. SubBasin Distribution Of Skimmer Net Effort, 1999-2004

SubBasin	Effort
Terrebon_S	38.4%
Baratari_S	33.9%
Mississi_S	5.4%
Pontchar_S	4.6%
Pontchar_I	4.4%
Baratari_I	3.0%
Offshore13	1.7%
Terrebon_I	1.6%
Offshore14	1.6%
Mississi_I	1.3%
Vermtech_I	1.0%
38 SubBasins	3.1%
Total	100.0%

Source: LDWF Trip Ticket Data

Table SH17. Species Distribution Of Butterfly Net Landings, 1999-2004	
Species	%
White Shrimp	51.9%
Brown Shrimp	45.1%
Seabob	1.0%
23 Species	2.0%
Total	100.00%
Source: LDWF Trip Ticket Data	

Figure SH5. Annual Butterfly Net Effort, 1999-2004

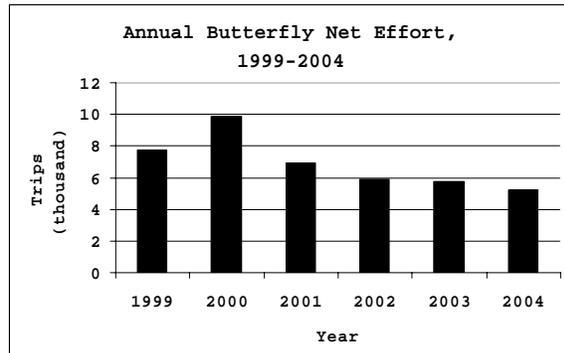


Figure SH6. Mean Monthly Butterfly Net Effort, 1999-2004

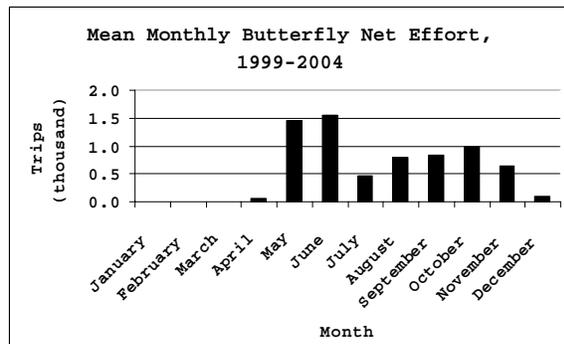


Table SH18. SubBasin Distribution of Butterfly Net Landings, 1999-2004	
SubBasin	Total
Terrebon_S	24.7%
Calcasie_S	17.5%
Offshore14	17.3%
Vermtech_I	9.9%
Offshore13	8.1%
Baratari_S	4.6%
Pontchar_I	4.5%
Vermtech_S	3.6%
Offshore15	2.3%
Pontchar_S	1.7%
32 SubBasins	5.9%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table SH19. Monthly Distribution of Butterfly Net Effort, 1999-2004	
Month	Effort
January	0.1%
February	0.0%
March	0.1%
April	0.9%
May	21.1%
June	22.5%
July	6.9%
August	11.5%
September	12.0%
October	14.2%
November	9.4%
December	1.3%
Source: LDWF Trip ticket data	

Table SH20. SubBasin Distribution Of Butterfly Net Effort, 1999-2004	
SubBasin	Effort
Terrebon_S	35.3%
Calcasie_S	27.9%
Pontchar_I	6.7%
Offshore14	6.2%
Baratari_S	4.7%
Vermtech_I	4.0%
Offshore13	3.0%
Pontchar_S	2.2%
Mermenta_I	2.0%
Vermtech_S	1.2%
Terrebon_I	1.2%
Baratari_I	1.0%
29 SubBasins	4.6%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table SH21. Species Distribution Of Cast Net Landings, 1999-2004	
Species	%
Brown Shrimp	56.2%
White Shrimp	26.2%
Gizzard Shad	7.3%
Striped Mullet	4.5%
Menhaden	3.2%
9 Species	2.6%
Total	100.0%

Figure SH7. Annual Cast Net Effort, 1999-2004

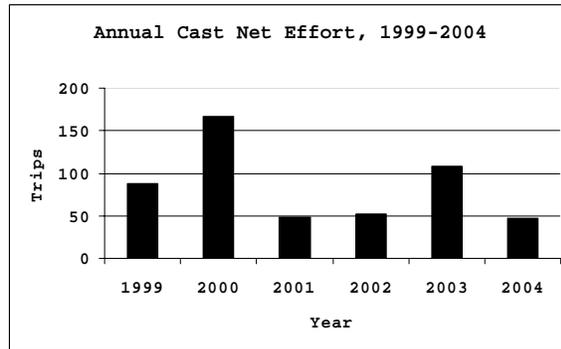


Table SH22. SubBasin Distribution of Cast Net Landings, 1999-2004	
SubBasin	Total
Calcasie_S	41.0%
Terrebon_S	21.6%
Atchafal_F	8.0%
Baratari_S	7.1%
Mermenta_I	4.2%
Pontchar_F	3.2%
Terrebon_I	3.2%
Mermenta_S	2.9%
Pontchar_S	2.5%
Offshore17	1.7%
11 SubBasins	4.6%
Total	100.0%
Source: LDWF Trip Ticket Data	

Figure SH8. Mean Monthly Cast Net Effort, 1999-2004

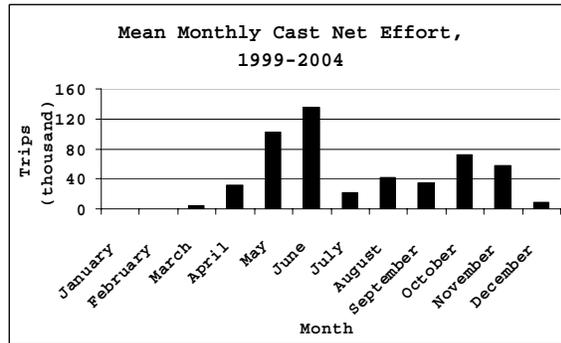


Table SH23. Monthly Distribution Of Cast Net Effort, 1999-2004	
Month	Effort
January	0.0%
February	0.0%
March	0.8%
April	6.1%
May	20.0%
June	26.7%
July	4.3%
August	8.2%
September	6.7%
October	14.1%
November	11.4%
December	1.8%
Source: LDWF Trip ticket data	

Table SH24. SubBasin Distribution Of Cast Net Effort, 1999-2004	
SubBasin	Effort
Calcasie_S	34.5%
Terrebon_S	28.5%
Baratari_S	10.5%
Mermenta_I	5.4%
Mermenta_S	5.0%
Pontchar_I	3.2%
Baratari_I	3.0%
Atchafal_F	2.4%
Terrebon_I	1.8%
Pontchar_S	1.2%
Offshore17	1.2%
9 SubBasins%	3.3%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table SH25. Louisiana Shrimp Fishery Gear Licenses, 1989-2004.

Year	Resident Shrimp Trawl	Non-Resident Shrimp Trawl	Resident Butterfly Net	Non-Resident Butterfly Net	Resident Skimmer Net	Non-Resident Skimmer Net	Resident Dip/Cast Net	Non-Resident Dip/Cast Net license
1989	15,533	1,597	4,059	16	0	0	10	0
1990	13,742	1,527	3,981	16	0	0	348	0
1991	11,987	1,329	3,887	23	0	0	325	1
1992	10,969	1,189	2,385	14	1,836	20	347	0
1993	8,712	1,072	1,924	10	2,248	25	341	1
1994	7,734	1,033	1,640	18	2,386	24	340	1
1995	7,465	1,070	1,521	18	2,655	32	373	1
1996	7,266	1,079	1,419	10	2,768	52	428	1
1997	6,588	970	1,226	1	2,639	34	472	0
1998	6,830	901	1,263	2	2,818	22	533	1
1999	7,100	888	1,270	3	3,181	19	631	0
2000	7,371	816	1,337	5	3,655	27	577	0
2001	6,957	885	1,229	20	4,119	56	554	1
2002	6,459	798	1,051	7	4,126	50	568	1
2003	5,601	724	912	5	3,948	42	592	0
2004	4,810	604	809	5	3,653	41	620	0

Source: Herb Holloway, LDWF

Figure SH9. Louisiana Shrimp Landings, 1950-2004

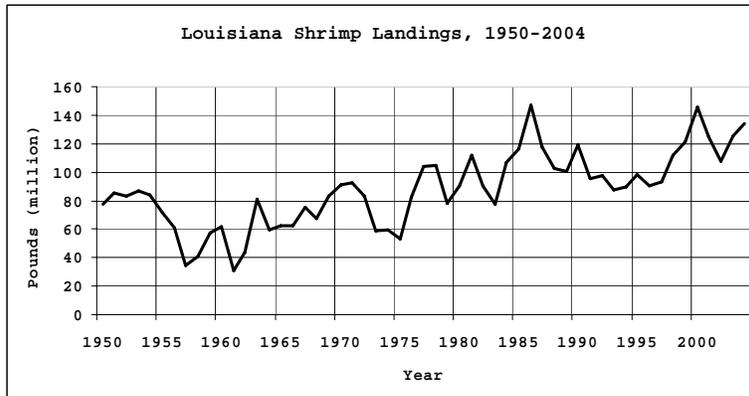
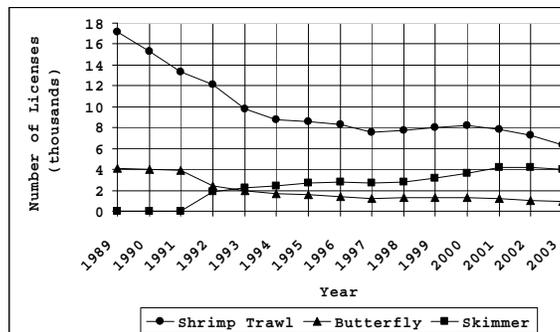


Figure SH10. Louisiana Shrimp Fishery Major Gear Licenses



Blue Crab Fishery

Species Targeted

The management plan for the Gulf of Mexico blue crab fishery (Guillory et. al., 2001) presents information on this fishery. The blue crab, *Callinectes sapidus*, is the target species of this fishery. Blue crabs are estuarine-dependant. Mating occurs in the brackish waters of the coastal estuaries; spawning occurs in the higher salinity nearshore waters. Larval forms drift back into the estuaries, where juveniles grow into adults. The blue crab fishery in Louisiana occurs primarily in state waters. Little landings are from the Federal EEZ waters.

Almost 99% of blue crabs are landed in the hard shell stage; a little over 1% of landings are in the soft and peeler category (Table BC1).

Historical Gear

In Louisiana, crabs may be taken legally with Crab Traps, Crab Dropnets, Trawls, Trotlines, Handlines, Bushlines, Dip nets, and Cast nets. Blue Crabs landings from 1950-2004 have been reported from a wide variety of gears (Table BC2), however Crab Traps, Trot Lines, Dip Nets, Trawls, and Bush Traps are the only gears of significance (Table BC3). Traps were used for 56% of historical landings; the almost 30% of landings listed under "Other Gear" are primarily composed of "Not Coded" and "Combined Gears" categories. During the 1990's, the database used for this report allocated most of Blue Crab landings to those two categories (Table BC5).

Trot lines have been decreasing in influence over the years (Figure BC1; Table BC5) to the point that no landings were reported during the 1970's and '80's; with the advent of the Trip Ticket system, Blue Crabs have been reported with this gear, but only about 27 thousand pounds per year from 2000-2004. Likewise, since the mid 1970's, trawls, bush traps and dipnets have been minor gears in the Blue Crab fishery (Figure BC2; Table BC5).

From 1999-2004, in excess of 99% of Blue Crabs commercially harvested in Louisiana waters were caught in crab traps (Table BC4). According to Guillory et al (2001), during the 1980's and 1990's, crab traps accounted for 99-100% of the commercial blue crab landings in the Gulf of Mexico.

Recent Gear

Crab Trap

Description of Gear and Fishing Method

The construction of crab traps is described in Guillory et al (2001):

"Crab traps consist of the following: a floor and ceiling; two to four tapered conical entrance funnels located one mesh above the floor; an arched or gull wing shaped apron, which separates the inner and outer chambers and serve as an effective means of crab retention; and an inner cylindrical shaped bait chamber fastened to the center of the floor and containing an exterior door. Bait chambers are usually constructed of smaller 0.5" by 1.0" vinyl-coated mesh. Trap size, number of funnels, size of inner chamber relative to outer chamber and bait chamber (presence or absence) varies to yield a wide variety of trap sizes and configurations. The number of entrance funnels may range from two to four. Although dimensions may vary from less than 24" to more than 36" in length and width, most traps average 24" wide and deep and 14.5" high. The inner chamber may occupy the entire floor of the trap, half of the floor, or even be absent in some traps. Traps are usually constructed of 1.5" hexagonal, black vinyl-coated mesh, although 1.5" square mesh and different colors (green, orange, red) have become increasingly popular. Some blue crab fishermen weight their traps by attaching 0.5" - 0.75" diameter reinforcing iron bars (re-bar) or bricks to the trap base. Lines of varying length, depending upon water depth, are attached to the top corner of the trap and lead to a buoy generally made of polystyrene or plastic. Traps are usually set in a line and baited with fish; the preferred bait is gulf menhaden (*Brevoortia patronus*) or striped mullet (*Mugil cephalus*)."

"Crab Trap" is defined in Louisiana statutory Law as "a cube-shaped device which is constructed of wire and is no larger than thirty inches on any side with entrance funnels extending no further than seven inches into the inside of the trap and either a bait box or materials providing cover or shelter for peeler crabs, which is used for the sole purpose of taking crabs or stone crabs. This device shall be fished in a stationary, passive manner with the openings to the entrance funnels such that the horizontal diameter of each opening on the vertical wall of the trap is at least one and one-half times the vertical diameter of the opening." 56:8(28)

Landings and Effort

Landings

There is little reported bycatch from crab traps. From 1999-2004, over 99% of the harvest from these traps was blue crabs (Table BC6).

No significant landings were reported from the offshore SubBasins. The coastal SubBasins accounted for 53% of landings between 1999-2004; 38 % of landings for that period were reported from the intermediate SubBasins. The SubBasins with the highest percentage of catch was Terrebon_S (26.0%), followed by Baratari_S (13.7%), and Pontchar_I (12.2%) (Table BC7).

Effort

There was no trend in effort from 1999-2004 (Figure BC3). Effort averaged about 133 thousand trips per year.

Mean monthly effort averaged about 11 thousand trips per month, ranging from a minimum of 5600 trips in February to over 17 thousand trips in July (Figure BC4). July accounted for 13% of total effort, February for 4.2%. (Table BC8).

Distribution of effort by SubBasin mirrored distribution of landings. Terrebon_S SubBasin reported 29.0% of total annual effort, followed by Baratari_S (14.7%) and Pontchar_I (12.1%) (Table BC9). About 56% of effort was expended in the coastal SubBasins; 36% was expended in the intermediate SubBasins.

License and Permit Requirements

Horst and Holloway (2002) discussed the licensing requirements of the blue crab fishery. Permits are not required for the use of Crab Traps, however crab fishermen must have a commercial fisherman's license; the vessel must be licensed. There are two types of license, crab trap gear licenses which allow the user to fish an unlimited number of traps, and crab trap on trotline licenses, which cost \$1 per trap to a maximum cost of 25\$, which allows the user to fish an unlimited number of traps. As a license entitles the holder to fish an unlimited number of traps the number of license holders is an imperfect measure of effort; likewise the number of trips is an imperfect estimate of effort as it is unknown how many traps the fisherman worked during the trip.

A valid commercial gear license may be transferred for temporary use to a person holding a valid commercial fisherman's license and having the same residency status as indicated on the license being transferred.

Laws Affecting Effort and Fishing Operations

A summary of the statutes and regulations affecting crab traps is presented in Appendix 5-1.

There is no limitation on the number of crab traps which may be used by a commercial fisherman.

There is no season for the use of crab traps, although between February 1 and March 31, areas of the coast may be closed to remove damaged or unusable traps. Most of the coastal waters are open to the use of crab traps.

At times during the year the traps must possess escape rings to release undersized crabs. Crab traps cannot be set in navigable channels or entrances to streams. Crab traps cannot be tended at night.

Status of the fishery

Gulfwide, the blue crab population seems to be biologically stable. In Louisiana there has been a significant increase in mortality rates, a significant decline in CPUE of crabs fully recruited to the fishery, and a decrease in average size over time; however increases in landings since 1966 (Figure BC9), and frequency of occurrence in samples indicate no significant trend over time. (Guillory et al, 2001).

The number of commercial fishermen harvesting blue crabs increased dramatically from 1980 to 1991. This led to economic capitalization, increased number of traps, and a decline in catch per effort (Guillory et al, 2001). Participation has continued to increase since that time. The number of Crab Trap licenses sold has increased from about 2,750 in the early 1990's to about 3,400 in the early 2000's; non-resident licensed have varied from 17-65 during the period. Resident Trot-line licenses have varied from 14-48 from 1989-2004 (Table BC10).

Blue Crab Figures and Tables

Table BC1. Crab Categories In Louisiana Landings, 1950-2004	
Species	%
Blue Crab	98.94%
Blue Crab, Soft And Peeler	0.87%
Blue Crab, Peeler	0.16%
Blue Crab, Soft	0.02%
Florida Stone Crab, Claws	0.01%
Total	100.00%
Source: NOAA Fisheries Web Site. January, 2006	

Table BC2. Gear Distribution of Blue Crab Landings, 1950-2004	
Gear	%
Pots And Traps, Crab, Blue	55.8%
Combined Gears	18.6%
Not Coded	11.2%
Lines Trot With Baits	10.6%
Dip Nets, Common	1.5%
Otter Trawl Bottom, Shrimp	0.9%
Dip Nets, Drop	0.5%
Brush Trap	0.4%
Trawls, Unspecified	0.2%
Pots, Unclassified	0.2%
Otter Trawl Bottom, Fish	0.1%
Pots And Traps, Fish	0.0%
Haul Seines, Beach	0.0%
Butterfly Nets	0.0%
Pots And Traps, Crab, Other	0.0%
Pots And Traps, Cmb	0.0%
Fyke And Hoop Nets, Fish	0.0%
Tongs and Grabs, Other	0.0%
Trammel Nets	0.0%
Pots And Traps, Crayfish	0.0%
Gill Nets, Stake	0.0%
Total	100.0%
Source: NOAA Fisheries Web Site. January, 2006	

Table BC3. Blue Crab Landings By Major Gear, 1950-2004	
Gear	%
Traps	56.0%
Trot Lines	10.6%
Dip Nets	2.1%
Trawls	1.2%
Bush Traps	0.4%
Other Gear	29.8%
Total	100.0%
Source: NOAA Fisheries Web Site. January, 2006	

Table BC4. Gear Distribution of Blue Crab Landings, 1999-2004	
Gear	%
Crab Trap	99.3%
25 Gears	0.7%
Total	100.0%
Source: LDWF Trip Ticket Data	

Figure BC1. Blue Crab Landings with Trot Lines, 1950-2004

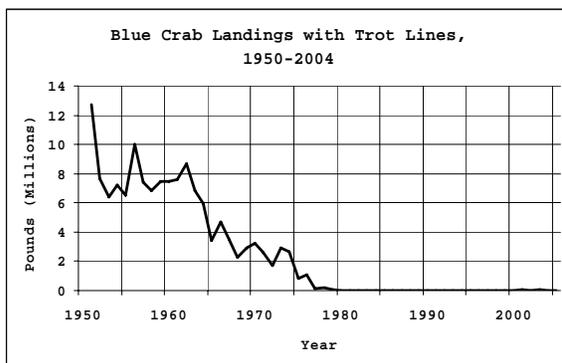


Figure BC2. Blue Crab Landings with Minor Gear, 1950-2004

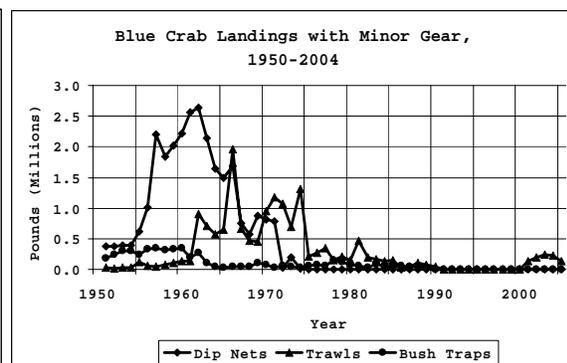


Table BC5. Louisiana Blue Crab Landings by Major Gear, 1950-2004

Year	Traps	Trot Lines	Dip Nets	Trawls	Bush Traps	Other Gear	Total
1950	60,000	12,738,600	383,600	25,500	187,600	74,200	13,469,500
1951	749,700	7,653,700	371,000	20,700	242,900	22,000	9,060,000
1952	624,600	6,402,000	395,700	37,000	298,900	23,700	7,781,900
1953	625,500	7,243,000	389,800	33,500	296,200	31,000	8,619,000
1954		6,525,100	617,100	119,600	247,100	31,600	7,540,500
1955		10,007,200	1,002,600	54,700	327,300		11,391,800
1956		7,423,200	2,195,200	40,500	343,300		10,002,200
1957	16,800	6,862,100	1,841,900	73,100	316,800		9,110,700
1958	12,700	7,449,600	2,014,600	98,400	337,500		9,912,800
1959	19,300	7,470,200	2,209,700	136,600	339,700		10,175,500
1960	37,600	7,615,600	2,570,300	139,800	200,000		10,563,300
1961	38,400	8,681,600	2,632,500	903,900	273,800		12,530,200
1962	56,600	6,857,100	2,137,700	708,700	106,700		9,866,800
1963	81,600	5,965,500	1,643,800	568,100	51,600		8,310,600
1964	320,200	3,408,700	1,489,700	648,900	24,100		5,891,600
1965	1,132,400	4,675,000	1,687,700	1,952,900	39,800		9,487,800
1966	3,145,200	3,508,300	752,900	669,000	37,900		8,113,300
1967	4,331,700	2,283,000	575,000	463,800	51,500		7,705,000
1968	5,501,600	2,908,200	870,200	448,600	106,200		9,834,800
1969	6,747,300	3,218,300	809,900	945,100	77,900		11,798,500
1970	5,763,100	2,572,900	789,300	1,181,400	37,100		10,343,800
1971	9,416,000	1,734,000	35,800	1,070,300	56,500		12,312,600
1972	11,330,000	2,916,500	200,000	694,600	43,700		15,184,800
1973	19,207,800	2,629,600	15,100	1,309,700	37,400		23,199,600
1974	19,631,600	832,900	5,500	208,200	57,300		20,735,500
1975	15,816,800	1,089,200	2,500	268,400	77,400		17,254,300
1976	14,738,400	129,900	6,200	354,000	56,500		15,299,200
1977	15,862,500	201,700	3,400	152,700	153,000		16,379,000

Table BC5. Louisiana Blue Crab Landings by Major Gear, 1950-2004

Year	Traps	Trot Lines	Dip Nets	Trawls	Bush Traps	Other Gear	Total
1978	14,829,499	37,803		214,602	125,345		15,207,249
1979	21,253,842			148,148	75,890		21,477,880
1980	17,763,555			473,800	62,342		18,299,697
1981	16,085,474			203,153	37,430		16,326,057
1982	17,124,748			159,695	97,360		17,381,803
1983	19,486,293			130,497	49,858		19,666,648
1984	29,479,119			146,964	52,222		29,678,305
1985	29,845,761			29,739	55,090		29,930,590
1986	31,602,171			43,051	45,050		31,690,272
1987	52,332,727			99,143	61,762		52,493,632
1988	53,613,349			82,153	26,535		53,722,037
1989	33,506,299			45,915	6,873		33,559,087
1990	38,886,408					249,325	39,135,733
1991						51,287,672	51,287,672
1992						51,984,138	51,984,138
1993						45,945,372	45,945,372
1994						36,764,750	36,764,750
1995						36,966,523	36,966,523
1996						40,001,240	40,001,240
1997						43,534,029	43,534,029
1998						43,659,071	43,659,071
1999						46,678,276	46,678,276
2000	51,843,683	64,696		141,892		38,672	52,088,943
2001	41,562,681	30,836		194,102		28,807	41,816,426
2002	49,784,502	31,960		243,583		46,705	50,106,750
2003	47,795,371	18,945		231,030		41,612	48,086,958
2004	44,231,241	7,432		128,158		30,978	44,397,809

Source: NOAA Fisheries Web Site. January, 2006

Fish Otter Trawl

Description of Gear and Fishing Method

Fish Otter Trawls are constructed and utilized in the same manner as Shrimp Otter Trawls. Webbing sizes may differ between fish and shrimp trawls.

Landings and Effort

Landings

The major component of landings reported with Fish Otter Trawls in the 1960's and 1970's were finfish used for bait and processed for animal food. Sheepshead, Black Drum and King Whiting were important components of the catch (Table CF3).

Sheepshead (65.4%) and Black Drum (25%) accounted for over 90% of landings reported from Fish Otter Trawls in recent years (Table CF14). Shrimp made up significant bycatch (6.4%) reported with this gear. Over 60% of the Sheepshead landed in recent years was caught with otter trawls (Table CF19); some years more Sheepshead are caught in Fish Otter Trawls; other years more is caught in Shrimp Otter Trawls (Figure CF11). Almost 27% of Black Drum was landed with otter trawls (Table CF18); usually more are caught in Shrimp Otter Trawls than in Fish Otter Trawls (Figure (CF10)).

The Pontchartrain and Mississippi River SubBasins accounted for 74% of reported landings with this gear from 1999-2004. The rest of landings were primarily from the Barataria and Terrebonne coastal and offshore waters (Table CF15).

Effort

Annual effort reported with this gear varied widely from the over 1300 trips reported in year 1999 to the 200+ trips reported in year 2002. Average annual effort for 2000-2004 was 541 trips, although the large effort in year 1999 distorts the average value (Figure CF5).

Mean monthly effort ranged from 12 trips in April to 70 trips in March (Figure CF6, Table CF16). Major effort occurred from December-March (48% of total annual effort), with a major drop in effort from April-May, rising to 10.6% of total effort in August. This pattern reflects a change in targeted species, with the same gear which was categorized as a shrimp trawl in the open shrimp season, being designated as a Fish Otter Trawl and used to harvest finfish during the closed shrimp season.

Effort tracked landings, with over 82% of effort occurring in the Pontchartrain and Mississippi River SubBasins (Table CF17).

License and Permit Requirements

Fish otter trawls are licensed as shrimp Otter Trawls; there are no special license or permit requirements for the use of fish otter trawls. A gear license is required for each individual net used. The fisherman must have a commercial fisherman's license. The vessel must be licensed. A valid commercial gear license may be transferred for temporary use to a person holding a valid commercial fisherman's license and having the same residency status as indicated on the license being transferred.

Laws Affecting Effort and Fishing Operations

Fish trawls may be used anywhere shrimp otter trawls are used; additionally they may be used to take finfish in outside waters during the closed shrimp season.

Table CF3. Species Distribution in Fish Otter Trawls, 1950-1989		
Species	%	% without Finfish, Unc. and Shrimp
Finfishes, Unc Bait and Animal	68.1%	--
Shrimp, Marine, Other	23.7%	--
Brown Shrimp	6.7%	--
Sheepshead	0.5%	33.5%
Shrimp, Seabob	0.3%	17.8%
Black Drum	0.2%	15.0%
King Whiting	0.2%	13.5%
Flatfish	0.1%	6.0%
Red Snapper	0.1%	4.3%
Finfishes, Unc General	0.1%	4.0%
Sea Catfishes	0.0%	2.0%
Sand Seatrout	0.0%	1.9%
21 Other species%	0.0%	1.9%
Total	100.0%	100.0%
Source: NOAA Fisheries Web Site. January, 2006		

**Table CF5. Annual Landings with Trot Lines
and Fish Otter Trawls**

Year	Trot Lines	Fish Otter Trawls
1950	12,738,600	
1951	7,653,700	
1952	6,402,000	
1953	7,243,000	
1954	6,525,100	
1955	10,007,200	
1956	7,423,200	
1957	6,862,100	
1958	7,449,600	
1959	7,470,200	
1960	7,615,600	
1961	8,681,600	
1962	6,857,100	47,568,000
1963	5,965,500	89,065,200
1964	3,408,700	8,166,000
1965	4,675,000	13,165,000
1966	3,508,300	224,500
1967	2,283,000	26,105,100
1968	2,908,200	31,262,400
1969	3,218,300	29,895,900
1970	2,572,900	26,068,800
1971	1,734,000	21,137,600
1972	2,916,500	19,662,200
1973	2,629,600	18,744,400
1974	832,900	32,984,700
1975	1,089,200	19,875,300
1976	129,900	12,381,000
1977	201,700	7,007,400
1978	37,803	
1984	13,762	
1986		111,552
1988		66,761
1989		

Table CF14. Species Distribution In Fish Otter Trawl, 1999-2004

Species	%
Sheepshead	65.4%
Black Drum	25.0%
Brown Shrimp	3.3%
White Shrimp	3.1%
36 Species	3.2%
Total	100.0%
Source: LDWF Trip Ticket Data	

Figure CF5. Annual Fish Otter Trawl Effort, 1999-2004

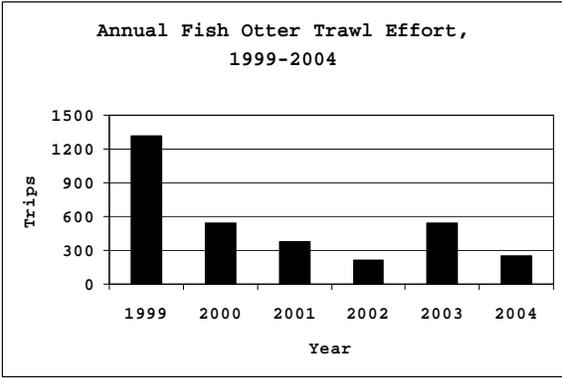


Figure CF6. Mean Monthly Fish Otter Trawl effort, 1999-2004

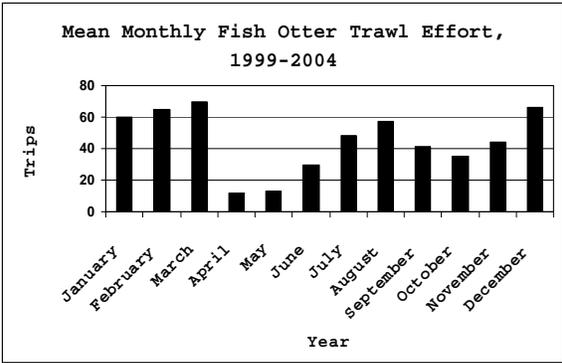


Table CF15. SubBasin Distribution Of Fish Otter Trawl Landings, 1999-2004

SubBasin	%
Pontchar_I	29.9%
Pontchar_S	22.0%
Mississi_S	20.5%
Baratari_S	6.4%
Terrebon_S	5.8%
Offshore14	3.9%
Offshore13	3.3%
Baratari_I	2.4%
Mississi_I	1.6%
20 SubBasins	4.2%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table CF16. Monthly Distribution Of Fish Otter Trawl Effort, 1999-2004

Month	%
January	11.0%
February	11.9%
March	12.9%
April	2.2%
May	2.4%
June	5.5%
July	8.9%
August	10.6%
September	7.6%
October	6.5%
November	8.2%
December	12.2%
Source: LDWF Trip Ticket Data	

Table CF17. SubBasin Distribution Of Fish Otter Trawl Effort, 1999-2004

SubBasin	%
Pontchar_I	38.0%
Pontchar_S	29.1%
Mississi_S	15.0%
Terrebon_S	5.8%
Baratari_S	4.0%
Offshore14	1.6%
Offshore13	1.2%
21 SubBasins	5.3%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table CF18. Distribution of Black Drum Landings by Gear, 1999-2004	
Gear	%
Trot Lines	58.4%
Otter Trawl, Shrimp	19.8%
Hand Lines	7.4%
Otter Trawl, Fish	7.0%
Skimmer Nets	4.2%
Rod & Reel	1.1%
14 Other Gears	2.1%
	100.0%
Source: LDWF Trip Ticket Data	

Table CF19. Distribution of Sheepshead Landings by Gear, 1999-2004	
Otter Trawl, Shrimp	32.9%
Otter Trawl, Fish	27.7%
Hand Lines	26.4%
Skimmer Nets	7.7%
Trot Lines	3.3%
16 Other Gears	2.1%
Total	100.0%
Source: LDWF Trip Ticket Data	

Table CF20. Distribution of Mullet Landings by Gear, 1999-2004	
Gillnets, Strike	97.5%
Skimmer Nets	1.1%
16 Other Gears	1.4%
Total	7.7%
Source: LDWF Trip Ticket Data	

Table CF21. Distribution of Florida Pompano Landings by Gear, 1999-2004	
Gillnets, Strike	58.7%
Hand Lines	15.5%
Trammel Nets	6.4%
Manual Reel	5.4%
Rod & Reel	4.5%
Gillnets, Stake	4.4%
Electric / Hydraulic Reel	3.6%
11 Other Gears	1.5%
Total	100.0%
Source: LDWF Trip Ticket Data	

Figure CF10. Black Drum Landings in Otter Trawls, 1999-2004

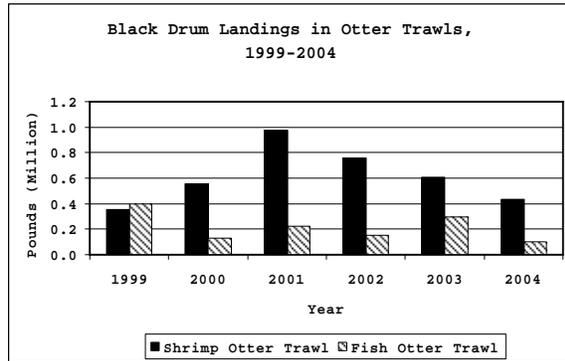
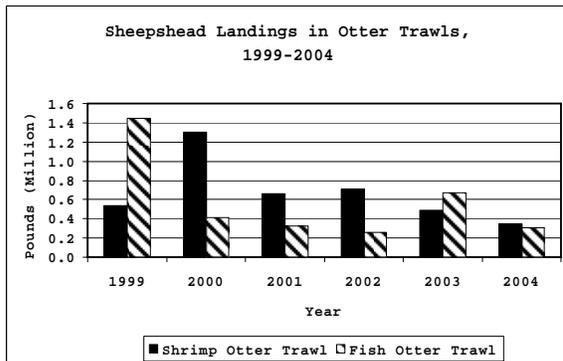


Figure CF11. Sheepshead Landings in Otter Trawls, 1999-2004



References

- Barnette, M.C. 2001. A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat. NO AA Technical Memorandum NMFS-SEF SC-44 9, 62pp.
- Berrigan, Mark et al. 1991. The Oyster Fishery of the Gulf of Mexico, United States: A Regional Management Plan. Gulf States Marine Fisheries Commission. Ocean Springs, Mississippi.
- Christmas, J. Y., and D. J. Etzold. 1977. The shrimp fishery of the Gulf of Mexico United States: a regional management plan. Gulf Coast Res. Lab., Ocean Springs, Miss., Tech. Report Ser. No. 2:128 pp.
- Deseran, F. and C. Riden. 2000. Louisiana Oystermen - Surviving in a Troubled Fishery. Louisiana Sea Grant Program, Baton Rouge, LA. 66pp.
- Epperly, S., L. Avens, L. Garrison, T. Henwood, W. Hoggard, J. Mitchell, J. Nance, J. Poffenberger, C. Sasso, E. Scott-Denton, and C. Yeung. 2002. Analysis of sea turtle bycatch in the commercial shrimp fisheries of southeast U.S. waters and the Gulf of Mexico. U.S. Department of Commerce, NOAA Technical Memorandum NMFSSEFSC-490, 88 pp.
- GMFMC. 1980. Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters. Gulf of Mexico Fishery Management Council, 3018 U.S. Highway 301 N., Suite 1000, Tampa, Florida 33619. Prepared by Center for Wetland Resources, Louisiana State University, Baton Rouge, Louisiana 70803.
- GMFMC. 2005. Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters, with environmental assessment, regulatory impact review, and initial regulatory flexibility analysis. February, 2005. Gulf of Mexico Fishery Management Council, Tampa, Florida.
- Guillory, Vincent, Harriet Perry, and Steve VanderKooy (eds.). 2001. The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan. Gulf States Marine Fisheries Commission, Ocean Springs, Mississippi.
- Horst, Jerald and Herb Holloway. 2002. Louisiana License Statistics and Trends, 1987-2000: Commercial Fishing, Recreational Gear, Commercial Wildlife, and Related Industries. Louisiana SeaGrant College Program, Louisiana State University, Baton Rouge, Louisiana. 161pp.
- Keithly, W. and H. Diop. 2001. The demand for Eastern Oysters, *Crassostrea virginica*, from the Gulf of Mexico in the Presence of *Vibrio vulnificus*. Marine Fisheries Review, 63(1), 47-53.

- LDWF. 1992. A Fisheries Management Plan for Louisiana's Penaeid Shrimp Fishery, Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana.
- LDWF. 2000. The Louisiana Shrimp Industry: A Preliminary analysis of the Industry's Sectors. , Prepared by Socioeconomic Research and Development Section, Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana. SRD Publication #6: 32 pp.
- LDWF. 2004a. Trip Ticket Procedures Manual. February 3, 2004. Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana. 32pp.
- LDWF. 2004b. Final Report for Louisiana's Oyster Shell Recovery Pilot Project. Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana.
- VanderKooy, Steven J. and Joseph W. Smith. 2002. The Menhaden Fishery of the Gulf of Mexico, United States: A Regional Management Plan, 2002 Revision. Gulf States Marine Fisheries Commission, Ocean Springs, Mississippi.

Section 1 - Louisiana's Coastal Recreational Fisheries

Chapter 3-1 Introduction

Recreational fishing is an important component of Louisiana's economy. Total economic impacts generated from marine recreational fishing expenditures in Louisiana in 1999 were estimated to be about \$738,000,000, with \$708,000,000 of that amount being produced by residents (Steinback et al, 2004). About 77.5% of economic impacts are generated by fishing from private boats, 17.5% from shore fishing and 5% from charter boat fishing (Gentner et al, 2001). The total economic effect of saltwater fishing in 2003 was almost \$800,000,000, with about \$700,000,000 of that being produced by Louisiana residents, and the remainder by non-residents (Southwick Associates, 2005).

Chapter 3-2 Data and Methods

A major source of information on Louisiana's recreational fisheries is the Marine Recreational Fishery Statistics Survey (MRFSS) which has been conducted by the National Marine Fisheries Service since 1979. This survey provides information on participation and effort of fishermen and numbers and size distribution of each fish species caught in the fishery.

A complete description of MRFSS procedures is presented in the MRFSS Data User's Manual (NOAA Fisheries Web Site: <http://www.st.nmfs.gov/st1/recreational/overview/overview.html#preface>). MRFSS includes of two independent surveys: a telephone survey of households and an intercept survey of anglers at fishing access sites. Data from the two independent surveys are combined to produce estimates of:

- participation (the number of participants in recreational fishing activities);
- effort (the number of fishing trips taken by individual anglers);
- catch (the number and weight of finfish caught, and either landed or released alive).

The telephone survey is used to collect data on number of trips made in the previous two months, locations fished, and dates on which those trips were made. This survey is aimed at households located in parishes extending within 25 miles of the coastline, including major bays or estuaries. Sampling effort during May through October is expanded to include households in parishes within 50 miles of the coast.

Estimates of **Participation** in saltwater angling are derived from the intercept data and the estimated total fishing effort by coastal parish residents. Estimates of participation are made annually on a state

basis. Estimates of participation are also produced in bimonthly and annual forms, however bimonthly estimates are not additive in producing annual estimates. Only annual estimates of participation are used in this report.

The intercept survey gathers information on the actual catch such as species identity, number, and weights and lengths of fish caught. The resulting information is stratified by fishing mode, fishing area, and bimonthly period. The intercept survey gathers information on type of gear used (e.g., dip net, cast net gill net, seine, trawl, trap, spear, hand); however recreational fishermen using gear other than rod & reel are encountered so infrequently in the survey that insufficient data is available breakdown results by gear. The intercept survey also records Parish and water area fished (e.g., sound, river, bay, specific estuary), however that information was not analyzed in this report.

The intercept survey consists of on-site interviews which gather catch and demographic data from marine recreational anglers in three fishing

Modes:

- charter boat
- private/rental boat
- shore based (e.g., man-made structures, i.e. piers, docks, jetties, bridges; beaches; and banks).

Catch and effort information is divided into three **Fishing Areas:**

- inland coastal waters;
- state territorial seas, or inshore ocean waters less than or equal to three miles from shore;
- offshore ocean waters greater than three miles from shore.

The survey distinguishes between several catch types:

- fish brought ashore in whole form which are available for inspection by the interviewer (Type A Catch)
- fish not brought ashore in whole form (Type B Catch)
 - o bait, filleted, or discarded dead (Type B1 Catch)
 - o released alive (Type B2 Catch)

Total harvest is defined as Type A plus B1 catches; Total Catch is defined as Type A plus B1 plus B2 catches. This report uses Total Catch.

Estimates of catch and effort are produced in bi-monthly **Waves** which are additive to produce annual estimates; The Waves are identified in this report as:

WAVE NUMBER	MONTHS
1	January-February
2	March-April
3	May-June
4	July-August
5	September-October
6	November-December

The database used in this report combined some like types of fish into groups, e.g., "Other Flounders" or "Other Snappers". For this report these groups of fish are included in the designation of **Species**.

Chapter 3-3 Results and Discussion

Gear

Louisiana requires a Saltwater Angler's License in order to fish in the Saltwater areas of the state. This license allows the fisherman to use the following gear:

- Rod and reel
- Bow and arrow
- A barbed or barbless spear
- Scuba Gear
- Hook & line (trot line)
- Cast net with a radius not to exceed 8 ft. 6 in.
- Frog gig/catcher

Use of other types of recreational gear in the saltwater areas is allowed with purchase of the appropriate recreational gear license:

- Crab Traps (limit 10 traps, fished singly or on trot line)
- Slat Traps (limit 5 traps)
- Trawls (up to 16 feet)
- Trawls (over 16 feet, up to 25 feet)
- Oyster Tong
- Crawfish Traps (limit 35 traps)
- Pipes/Drums (limit 5)
- Cans/Buckets (limit 5)

The number of gear licenses sold for the three major saltwater gears is shown in Table RF2. In the last 6 years, about 5,000 Trawl Licenses, 4,800 Crab Trap Licenses, and 70 Oyster Tong Licenses were sold per year. These numbers are a relatively small percentage of the estimated number of resident saltwater participants: 0.73%, 0.04%, and 0.01%, for trawls, crab trap, and oyster tongs, respectively.

It is therefore understandable that recreational gear other than hook and line is encountered infrequently in MRFSS surveys. This is apparent in Table RF1 which shows that 99.2% of MRFSS intercepts are with fishermen using Hook and Line. Only 0.4% was using a trawl; even fewer using other gear.

Therefore the information presented in this Section essentially pertains only to hook and line; there were too few intercepts with other gear to justify separate analysis.

Participation

In addition to the annual Saltwater Angler's License, a number of other types of recreational license are sold which allow the fishermen to fish in the saltwater areas of the state. These include, but are not

limited to Senior Fish/Hunt Licenses (for fishermen older than 60 years old), Disabled Fishing Licenses (for disabled fishermen), Special Active Military Licenses, and Lifetime Fishing Licenses. As a result participation in saltwater fishing based on all license sales is greater than the number of saltwater angling licenses sold each year (Table RF2). Additionally, fishermen younger than 16 years of age and residents who have reached 60 years of age prior to June 1, 2000 and have lived in the state for two years prior to application are not required to obtain licenses. For these reasons participation figures based on license sales are less than those based on the MRFSS survey, which includes all fishermen regardless of age or license status.

MRFSS estimates of participation in Louisiana's recreational fisheries increased from about 500,000 in the early 80's to about 900,000 in the early 2000's (Figure RF1). Trend analysis indicates that this increase is statistically significant (Figure RF2) with an annual increase of about 14,700 participants. This increase has occurred in all three classes of participants identified by MRFSS: Coastal (Figure RF3), Noncoastal (Figure RF4), and Nonresident (Figure RF5). Over the period, the three classes increased an average of about 6,700, 2,400, and 5,600 per year, respectively.

In both Coastal and Non-coastal participation there was a rapid increase to a peak in the mid 80's, and then a slight reduction in participation to the relatively steady 90's, followed by a strong increase in the early 2000's. Participation of Non-residents also increased strongly in the early 2000's.

Milon (2000) has projected that the number of marine recreational fishing participants in Louisiana will increase from 530,000 in the year 2000 to 566,000 in the year 2025, at a rate of about 1,440 per year (Figure RF6).

MRFSS gathers information on all recreational gear used, however data collected on gear other than Rod & Reel is so sparse that no conclusions could be drawn on those gear. The analyses presented essentially refer only to the use of Rod & Reel.

Effort

Annual Effort

Recreational fishing effort has increased from an annual average of about 2 million in the early 80's to an annual average of about 4 million in the early 2000's. Trend analysis indicated that the increase in annual effort is statistically significant (Figure RF7) with an average increase of about 79,000 trips per year over the period.

Effort by Fishing Area

MRFSS partitions fishing effort into three Fishing Areas: Inland, Territorial Sea, and Offshore. Inland Area waters are those which

primarily lie north of Louisiana's coastline; Territorial Sea Area is waters are those which extend from the coastline out three miles into Gulf of Mexico waters; Offshore Area is waters extending from three miles out to 200 miles from Louisiana's coastline. The Offshore Area corresponds to the federal Fishery Conservation Management Zone. Over the 1981-2004 periods, about 75% of fish trips were made in the Inland Area, about 19% of trips were made in the Territorial Sea Area, and the remaining 6% in the Offshore Area.

In the early 2000's, the majority of fishing effort occurred in Inland Area (Figure RF8). This area is the only fishing area in which fishing effort increased during the 1981-2004 period (Figure RF11). During this period, effort in Inland Area increased steadily from about 1.2 million trips per year in the early 1980's to about 3.5 million trips per year in the early 2000's.

Fishing effort decreased in both the Territorial Sea Area and the Offshore Area from 1981-2004 (Figures RF9, RF10). In the Territorial Sea Area, fishing effort averaged about 300,000 trips per year in the early 2000's, down from about 700,000 trips per year in the early 1980's. In the Offshore Area, fishing effort decreased from an average of about 275,000 trips per year in the early 1980's to about 100,000 trips per year in the early 2000's.

Effort by Mode

MRFSS records recreational fishing data in three different Modes: Private, Charter, and Shore. Private Mode includes fishing which takes place from a private or rental boat, Charter Mode fishing occurs from a charter boat; Shore Mode fishing takes place from a man-made structure or watercourse bank. Over the 1981-2004 period, about 74% of total trips were in the Private Mode, 24% were in the Shore Mode, and 2% were in the Charter Mode (Figure RF12). All three Modes show a strong increase in effort from 1981-2004. The rate increase was highest in the Private Mode, with Shore Mode and Charter Mode showing smaller, but still significant increases (Figures RF13, RF14, RF15, and RF16).

Effort in the Private Mode increased from an average of about 1.7 million trips per year in the early 1980's to an average of about 2.9 million trips per year in the early 2000's, an average increase of about 57,000 trips per year over the period.

Effort in the Shore Mode increased from an average of about 400,000 trips per year in the early 1980's to an average of about 900,000 trips per year in the early 2000's, an average increase of about 20,000 trips per year over the period.

Effort in the Charter Mode increased from an average of about 66,000 trips per year in the early 1980's to an average of about 110,000 trips per year in the early 2000's, an average increase of about 2,400 trips per year over the period.

Effort by Wave

Over the 1981-2004 period effort increased significantly in Waves 1-4 (January-August) (Figures RF17, RF18, RF19, and RF20). Increase in effort in Wave 5 (September-October) was strong but not statistically significant at the 5% level (Figure RF21). Effort in Wave 6 (November-December) did not increase during the period (Figure RF-22).

Catch

Annual Catch

Sixty (60) species or species groups have been reported from Louisiana in the MRFSS Survey (Table RF3). Total Catch of all species has averaged about 31.4 million fish per year. Trend analysis indicates that this number has remained stable over the 1981-2004 period (Figure RF23). However, catch trends for each species have varied (Table RF4, independent variable=year; dependent variable=number of fish in millions). Annual catch for some have increased over the years (Gray Snapper, Kingfishes, Red Drum, Spotted Seatrout, Sheepshead, etc.). Annual catch for others have decreased (Atlantic Croaker, Bluefish, Red Snapper, Saltwater Catfishes, etc.). Some show a stable annual catch pattern over the period (Black Sea Bass, Crevalle Jack, Florida Pompano, Red Porgy, etc.).

Catch by Fishing Area

Table RF5 lists the 1981-2004 Total Catch broken down by Fishing Area for each species. The Inland Area accounted for almost 66% of the Total Catch by number (Figure RF24); 27% were caught in the Territorial Sea Area, and 7% in the offshore Area.

There are 24 species in which more than 50% of the Total Catch occurred in Inland fishing area (Table RF6). For 9 species, 80% or more of the catch was Inland: Other Temperate Basses, Striped Bass, Freshwater Catfishes, Other Wrasses, Skates/Rays, Red Drum, Black Drum, Sheepshead, Eels.

For 7 species, 50% or more of the Total Catch was in the Territorial Sea Area, and for 22 species 50% or more of the catch was in the Offshore Area (Table RF6).

Catch by Mode

Almost 82% of the Total Catch (1981-2004) was taken in the Private Mode (Figure RF25). Shore Mode accounted for almost 5% of the catch; Charter Mode for over 3%.

There were 56 species (or species groups) in which more than 50% of the total 1981-2004 catch occurred in the PRIVATE Mode (Table RF7). Species in which more than 50% of the catch occurred in SHORE Mode are Kingfishes, Mulletts, Pinfishes and White Grunt. Species in which more than 50% of the catch reported was in CHARTER Mode are Other Cods/Hakes, Red Porgy, White Perch, and Yellowtail Snapper (Table RF7).

The distribution of Total Catch by Mode for individual species is given in Table RF8.

Catch by Wave

Total Catch by Wave is shown in Figure RF26. The Wave with largest catch was Wave 4 (July-August), followed closely by Wave 5 (September-October). The smallest catch occurred in Wave 1 (January-February). Catch distribution by Wave for all species is shown in Table RF9.

WAVE 1 (January-February)

There were no species for which at least 33% of Total Catch was taken in Wave 1. The Lane snapper is the species with the highest proportion of Total Catch in Wave 1 (27.6%). Species for which at least 10% of the catch occurs in wave 1 are Lane Snapper, Other Porgies, Gulf Flounder, Triggerfishes, Sheepshead, Little Tunny/Atlantic Bonito, Red Snapper, Black Drum, Florida Pompano, Bluefish, and Vermilion Snapper.

WAVE 2 (March-April)

There are no species for which the highest proportion of catch occurs in Wave 2 or for which at least 33% of Total Catch was taken in this Wave. The species with the highest proportion of catch in this Wave were Other Sea Basses (19.5%) and Mycteroperca Groupers (20.5%).

WAVE 3 (May-June)

For 11 species, the highest proportion of catch occurred in Wave 3: White Grunt; Silver Perch; Dogfish Sharks; Dolphins; Red Porgy; Summer Flounder; Spot; Kingfishes; Puffers; Mycteroperca Groupers, and Skates/Rays. For these species 30-100% of Total Catch occurs in this WAVE. For 10 species, at least 33% of Total Catch occurred in this Wave (Table RF10).

WAVE 4 (July-August)

For 30 species the highest proportion of catch occurred in Wave 4. For 25 species, at least 33% of the Total Catch occurred in this Wave. (Table RF10).

WAVE 5 (September-October)

Fifteen (15) species have major catches in Wave 5: Sand Seatrout, Southern Flounder, Pinfishes, Red Drum, Toadfishes, Herrings, Freshwater Catfishes, Other Sea Basses, Other Tunas/Mackerels, Other Temperate Basses, Black Drum, Striped Bass, Other Flounders, Other Porgies, and Black Sea Bass. For these species 26-96% of annual catch occurs in Wave 5. For 12 species, at least 33% of Total Catch occurred in this Wave (Table RF10).

WAVE 6

For only Eels and Sheepshead is Wave 6 the Wave of maximum catch; 24.5% and 36.5% respectively of annual catch of each species occurs in this Wave. Other species with a high proportion of catch in this Wave are: Striped Bass (35.5%), Black Drum (23.0%), Spotted Seatrout (22.8%), and Red Drum (22.7%).

Major Species

Figures detailing annual catch trend, distribution by Fishing Area, by Mode, and by Wave are shown for the 10 major species. These 10 species account for over 89% of all fish landed from 1981-2004.

Annual catch of Spotted Seatrout has increased over the 1981-2004 period (Figure RF27). Spotted Seatrout are primarily caught in the Private Mode (Figure RF28) and Inland Fishing Area (Figure RF29). Wave 4 has the most catch; however Waves 3, 5, and 6 also show strong catches (Figure RF30).

Annual catch of Saltwater Catfishes has decreased over the 1981-2004 period (Figure RF31). Saltwater Catfishes are primarily caught in the Private Mode (Figure RF32) and Inland Fishing Area (Figure RF33). Wave 4 has the most catch; however Waves 3 and 5 also show strong catches (Figure RF34).

Annual catch of Red Drum has increased over the 1981-2004 period (Figure RF35). Red Drum are primarily caught in the Private Mode (Figure RF36) and Inland Fishing Area (Figure RF37). Wave 5 has the most catch; however Waves 4 and 6 also show strong catches (Figure RF38).

Annual catch of Atlantic Croaker has decreased over the 1981-2004 period (Figure RF39). Atlantic Croaker are primarily caught in the Private Mode (Figure RF40) and Inland Fishing Area (Figure RF41), although over 1/3 are caught in the Territorial Sea. Wave 4 has the most catch; however Waves 3 and 5 also show strong catches (Figure RF42).

Annual catch of Sand Seatrout has decreased over the 1981-2004 period (Figure RF43). Sand Seatrout are primarily caught in the Private Mode (Figure RF44), with about 90% of the catch split between the Inland and Territorial Sea Fishing Areas (Figure RF45). Wave 5 has the most catch, with catch building up from Wave 3 to Wave 5 (Figure RF46).

Annual catch of Herrings has decreased over the 1981-2004 period (Figure RF47). Herrings are primarily caught in the Private Mode with a strong component in the Shore Mode (Figure RF48); almost 2/3 of the catch is from the Inland Fishing Area, with the remaining third from the Territorial Sea (Figure RF49). Wave 5 has over 50% of the catch (Figure RF50).

Annual catch of Black Drum has increased over the 1981-2004 period (Figure RF51). Black Drum are primarily caught in the Private Mode (Figure RF52) and Inland Fishing Area (Figure RF53). Wave 5 has the

most catch; however catch is well distributed among all Waves (Figure RF54).

Annual catch of Sheepshead has increased over the 1981-2004 period (Figure RF55). Sheepshead are primarily caught in the Private Mode (Figure RF56) and Inland Fishing Area (Figure RF57). Over 1/3 of the catch is in Wave 6, with the rest of the catch distributed fairly uniformly among the other Waves (Figure RF58).

Annual catch of Southern Flounder has decreased over the 1981-2004 period (Figure RF59). Southern Flounder are primarily caught in the Private Mode (Figure RF60); about 2/3 of the catch is in the Inland Fishing Area, and about 1/3 is in the Territorial Sea (Figure RF61). Wave 5 has about 1/3 of the catch; with Waves 3 and 4 also show strong catches (Figure RF62).

Annual catch of Red Snapper has decreased over the 1981-2004 period (Figure RF63). About 2/3 of Red Snapper are caught in the Private Mode and 1/3 are caught in the Charter Mode (Figure RF64); almost 92% are caught in the Offshore Fishing Area (Figure RF65). Although Wave 4 has the most catch, all Waves except Wave 6 show strong catches (Figure RF66).

References

- Gentner, Brad, Michael Price, and Scott Steinback. 2001. Marine Angler Expenditures in the Southeast Region, 1999. U. S. Department of Commerce. NOAA Technical Memorandum NMFS-F/SPO-48. 57pp.
- Milon, J. Walter. 2000. Current and Future Participation in Marine Recreational Fishing in the Southeast U.S. Region. NOAA Technical Memorandum MNFS-F/SPO-44. 44pp.
- Steinback, Scott, Brad Gentner, and Jeremy Castle. 2004. The economic importance of marine angler expenditures in the United States. NOAA Prof. Paper NMFS 2, 169 p.
- Southwick Associates. 2005. The Economic Benefits of Fisheries, Wildlife and Boating Resources in the State of Louisiana. Southwick Associates, Alexandria, VA... 34pp.

Section 2 - Gear-Sea Turtle Interactions

Chapter 4-1 Introduction

Encounters between the public and marine sea turtles are rare enough to warrant the occasional newspaper article or web site picture. Less is known about the frequency and result of encounters between commercial fishermen and sea turtles. The LDWF has in the past surveyed sections of the coast and reported the results to NMFS Sea Turtle Stranding and Salvage Network. Most of the sea turtles encountered by the LDWF were dead on the beach, and the incident resulting in the death of the turtles could only be inferred.

Chapter 4-2 Data and Methods

To determine if there is a compilation of undocumented interactions between sea turtles and fishing activities in Louisiana, inquiries (Exhibit 1) were sent to 76 individuals who might have such information, including LDWF biologists, NMFS Port Agents, LSU extension agents, university personnel, heads of commercial fishing and recreational fishing organizations, and other interested persons (Exhibit 2). These individuals were asked to describe any interaction they have had with sea turtles and to provide contact information for any other individuals who may have information on sea turtles in Louisiana (Exhibit 3).

Chapter 4-3 Results and Discussion

There were 26 responses to the survey; three inquiries were returned because of bad address. Seventeen (17) replies had no information; seven (8) gave general statements which yielded no useful information. One respondent reported sighting a sea turtle in Lake Borgne during August, 2004, but apparently had no contact with it. The other respondents gave general information as to sea turtle encounters, but no information given was specific enough to allow determination of time, location, and consequence of the encounter.

Hurricanes Katrina and Rita severely impacted most of Louisiana's coast. This affected individuals who might be expected to provide information concerning interactions with sea turtles; the three surveys returned for bad address were Houma and LaRose zip codes, areas which were severely impacted by the hurricanes.

Although all those surveyed had close ties to coastal Louisiana and/or the coastal fisheries most do not keep detailed records on sea turtle/gear interactions and provided information based on their recollections.

Commercial fishermen have no incentive to report interactions with sea turtles as they expect adverse impacts from providing such information.

One fisherman at a 2006 GMFMC Reef Fish Amendment Scoping meeting did state that he had been fishing for 47 years and had caught only 15 turtles, all of which were released alive.

A recreational fisherman reported catching a sea turtle in Pointe au Chene during June, 2005; the turtle was released alive.