

Texas Trawl Gear Characterization

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INTRODUCTION:

Part of evaluating the fisheries impact by gear is an assessment of effort geographically and temporally. However, Texas Parks and Wildlife Department (TPWD) does not track effort in commercial fisheries directly, nor does this agency maintain "days away from port" and "trip number" data. The agency does maintain license sales and landings information. NOAA Fisheries maintains some shrimp effort, and where applicable, NOAA data has been included in this report. A commercial trip ticket program, currently under beta testing in Texas, will reveal some trip-level effort when the program is fully implemented that will greatly enhance our ability to evaluate the impact of commercial fishing gear in temporal and spatial ways not currently available.

TPWD does not manage any observer programs. TPWD relies on data collected by NOAA fisheries for any on-board information from commercial harvesters. However, during the past year TPWD outreach specialists interviewed commercial fishermen in each fishery along the Texas coast to learn first hand how fishermen used various gear. This type of information was gathered from recreational fishermen during structured interviews as part of the agency's harvest program creel.

This report describes the types of gear used in Texas, the fisheries where they are used, and the regulatory efforts of TPWD supporting the long-term goal of sea turtle recovery.

TEXAS COMMERCIAL FISHING GEAR TYPES

Otter Trawls and Beam Trawls

An otter trawl (Figure 11) is a

“...device constructed of twine webbing so that when fully assembled and rigged, it will take the shape of a huge funnel while being towed. To spread the mouth so that it will cover the largest possible area, each wing is fastened to a trawl ‘door’. Each door is fitted with chains to be attached to a towing cable from the trawling vessel. The resistance of the water to the forward motion of the doors, as they are towed at

different angles, forces them to pull in opposite directions and thus keep the mouth of the net open.” (NMFS trawl definition).

Beam trawls are very similar in construction, but rely on a metal frame instead of doors to spread the mouth of the net (Figure 12). This gear is not designed to contact the substrate.

Three types of commercial shrimp boat licenses are available. Those licensed as Gulf Shrimp Boats are restricted from operating in the bays and estuaries of Texas. Bay Shrimp Boats trawl the bays and estuaries for “table” shrimp (shrimp intended for human consumption). Bait Shrimp Boats also operate in the bays and estuaries, but may take only shrimp intended to be used as bait. The primary difference between the two is that bait shrimp fishermen must keep 50% of their catch alive and they may fish in “bait bays” with certain net mesh restrictions. The shrimp fishery is managed on a regional and seasonal basis with gear requirements; catch limits, and legal hours varying with location, season, and license type (Figure 7). Texas primarily regulates these gears by setting maximum widths for the mouth (measured by the leadline on otter trawls and by the width of the frame on beam trawls) and regulating allowable mesh sizes. (Appendix A). Bycatch Reduction Devices (BRDs) and Turtle Excluder Devices (TEDs) are required in many of these management schemes. Several designs of BRDs and TEDs have been approved for use in Texas (Appendix B).

In summary, TED regulations reflect federal laws:

All shrimp boats fishing in Texas "outside waters" must have an approved TED installed in each trawl that is rigged for fishing. "Approved TED" definition is a device designed to be installed in a shrimp trawl forward of the cod end (tail bag) for the purpose of excluding sea turtles from the net and that meets the dimensions and specifications of an approved device as described in 50 CFR Part 223 §223.207. "Outside waters" are all waters contiguous to and seaward from the shoreline and out nine miles. Vessels are exempt if they have no power net retrieval system, have only a pusher-head trawl, skimmer trawl, or wing net rigged for fishing, or substitute tow-time restrictions in lieu of using a TED. The only other gear that is exempted are try-nets 21 feet wide or narrower and beam trawls that have ridged vertical bars fitted no more than 4 inches apart. TEDs are only required on gears used for shrimp fishing.

Recreational fishing license holders with an Individual Bait-Shrimp Trawl Tag may use an otter trawl to capture shrimp for personal use. They are allowed one trawl which may not be greater than 20 ft in width, with a stretched mesh not smaller 1-3/4 in, and with doors not larger than 450 in². Recreational shrimping is also subject to regulations varying with season and location.

The Texas shrimp fishery targets four penaeid species; white shrimp (*Litopenaeus setiferus*), brown shrimp (*Farfantepenaeus aztecus*), pink shrimp (*Farfantepenaeus duorarum*), and seabobs (*Xiphopanaeus kroyeri*).

Trawl potential impacts on sea turtles is covered under Sea Turtles below.

SEA TURTLES

Texas shrimp fishermen are not required to keep logbook records of turtle encounters. During TPWD outreach interviews, commercial fishermen agreed that sea turtle encounters are more prevalent in Gulf waters than in bay waters, and that they believed the sea turtles encountered in the bays are more likely to be juvenile than adult. The interviews revealed that fishermen could not readily recognize the different species of sea turtles. For example, a shrimp fisherman may describe a turtle as, "a green one," or "not a green one." TPWD outreach interviews did not provide reliable information related to takes of sea turtles by commercial fishermen, but it is likely the vast majority that have been taken fell to trawls before the introduction of TEDs and BRDs in the Gulf shrimp fishery.

TPWD has a rigorous fisheries independent monitoring program. TPWD uses 600-ft experimental gillnets during the spring and fall each year. TPWD uses experimental otter trawls, 18.75-ft headrope, throughout the year in the Texas Territorial Sea and the bays. Other gears, used without turtle takes, include sixty-foot bag seines, and 19.5-in oyster dredge. During 30 years of TPWD fisheries independent monitoring, only 39 sea turtle takes have been recorded. The composition of these sea turtle interactions is comprised of four loggerhead, 24 green, ten Kemp's ridley, and one unidentified sea turtle. Thirty of the 39 takes were taken from experimental gillnets. Gillnets are not a legal fishing gear in Texas, but are used as part of the fisheries independent survey program. The nine interactions from experimental trawls were distributed throughout the inshore and offshore waters. Thirty-one of the 39 turtle interactions occurred during the last 10 years (Tables 6 and 7).

Although most Texas fishermen, individually, have a negligible impact on sea turtles, Texas is taking a proactive role in conserving these animals. TPWD has a basic, three-pronged program: 1) partnering with others to protect nesting females and nests on Texas beaches along with documenting all strandings in Texas; 2) partnering with others to protect nesting females and their nests on Gulf nesting beaches in the State of

Tamaulipas, Mexico; 3) regulating the Gulf shrimping fleet for sustainability of marine resources, including shrimp and sea turtles along with other non-targeted species. Partners include state and federal governments (National Park Service, U.S. Fish and Wildlife Service, NOAA Fisheries), private industry (e.g., shrimp fishermen and seafood dealers etc.), conservation organizations, and NGOs on both sides of the national border.

Since 1998, TPWD has financially supported recovery efforts going to both the Tamaulipas and Texas projects. Support is ongoing and is expected to continue.

Regulating shrimp with respect to turtle conservation is primarily done through effort reduction in the nearshore area by the use of seasonal shrimping closures (e.g., South Texas Closure and the Texas Closure) and, in addition to TED and BRD requirements, the restriction of using no more than two trawls with no more than 130-feet of headrope in the sensitive near-shore zone. The commission approved these shrimping regulations in August 2000.

Turtle protection efforts are concentrated along the Texas and Mexican Gulf beaches and nearshore Gulf where sea turtles are most abundant. The vast majority of sea turtles are found inside 20 fathoms, and most of those are typically inside 10 fathoms. Both beach conservation projects are long established, low cost, efficient programs and TPWD has joined forces to collaborate with these established programs rather than design independent programs.

TPWD's goal is to protect and conserve threatened and endangered sea turtles in state waters. The Kemp's ridley is the most endangered sea turtle in the world and this species uses Texas beaches and waters for migrating, feeding and nesting. TPWD also has considerable interest in establishing a secondary nesting population on Padre Island to reduce the risks of a natural or man-made disaster in Mexico.

Nesting is up and strandings are down since shrimping regulations were implemented in 2000. Sea turtle populations in Texas appear to be increasing. The Kemp's ridley population is expanding 14-17% a year. Still, shrimp trawling is the leading cause of sea turtle mortalities. Turtle excluder devices in the trawls have definitely helped save juvenile and adult sea turtles. Shrimping effort is believed to have dropped due to high fuel prices and low prices in the domestically produced shrimp market. TPWD expects fewer strandings as effort in the shrimping industry declines. At the current rate, this species could be down-listed from endangered to threatened within the next decade if project funding and recovery trends continue.

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Figure 7. Texas Shrimping Zones

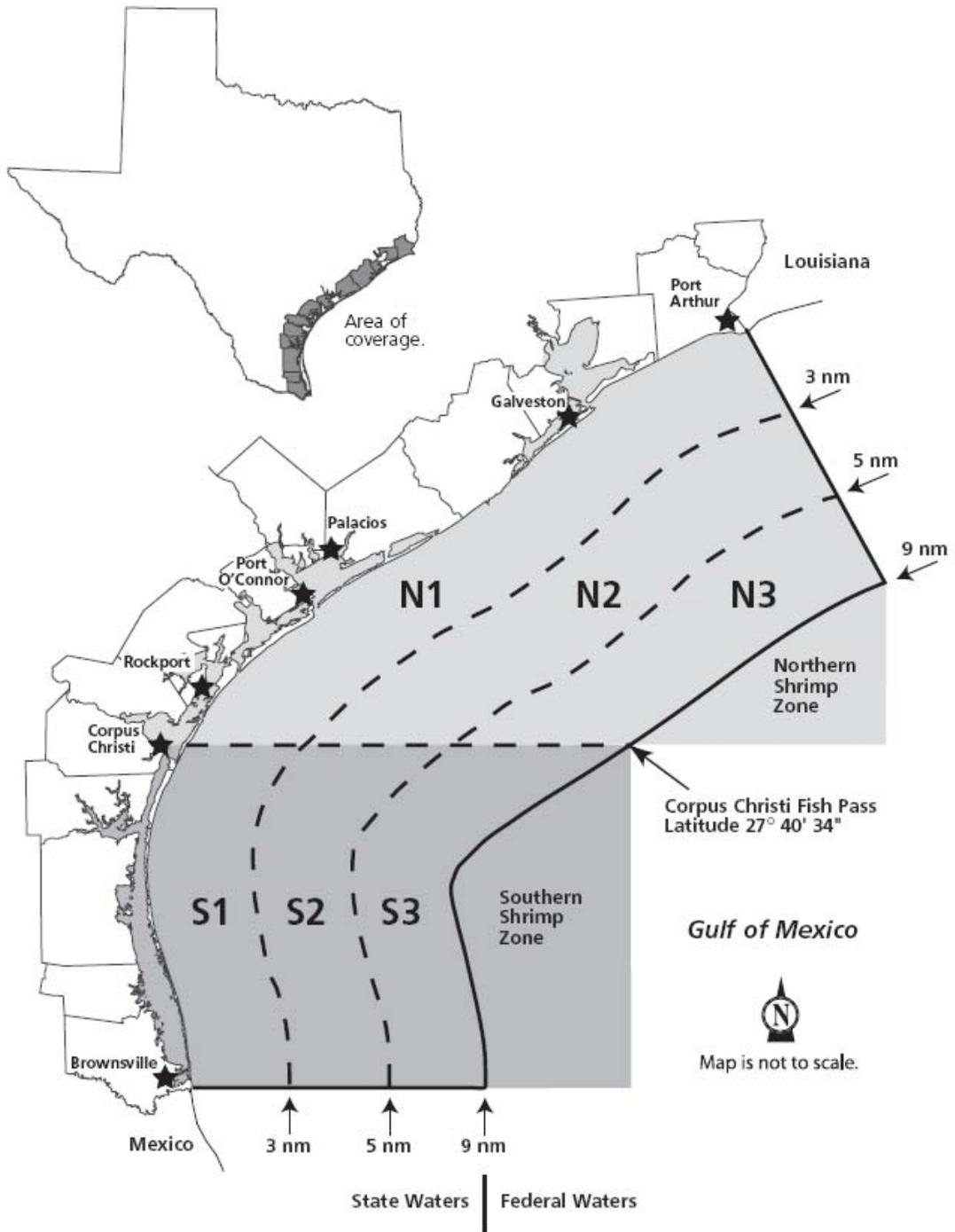


Figure 11. Otter Trawl

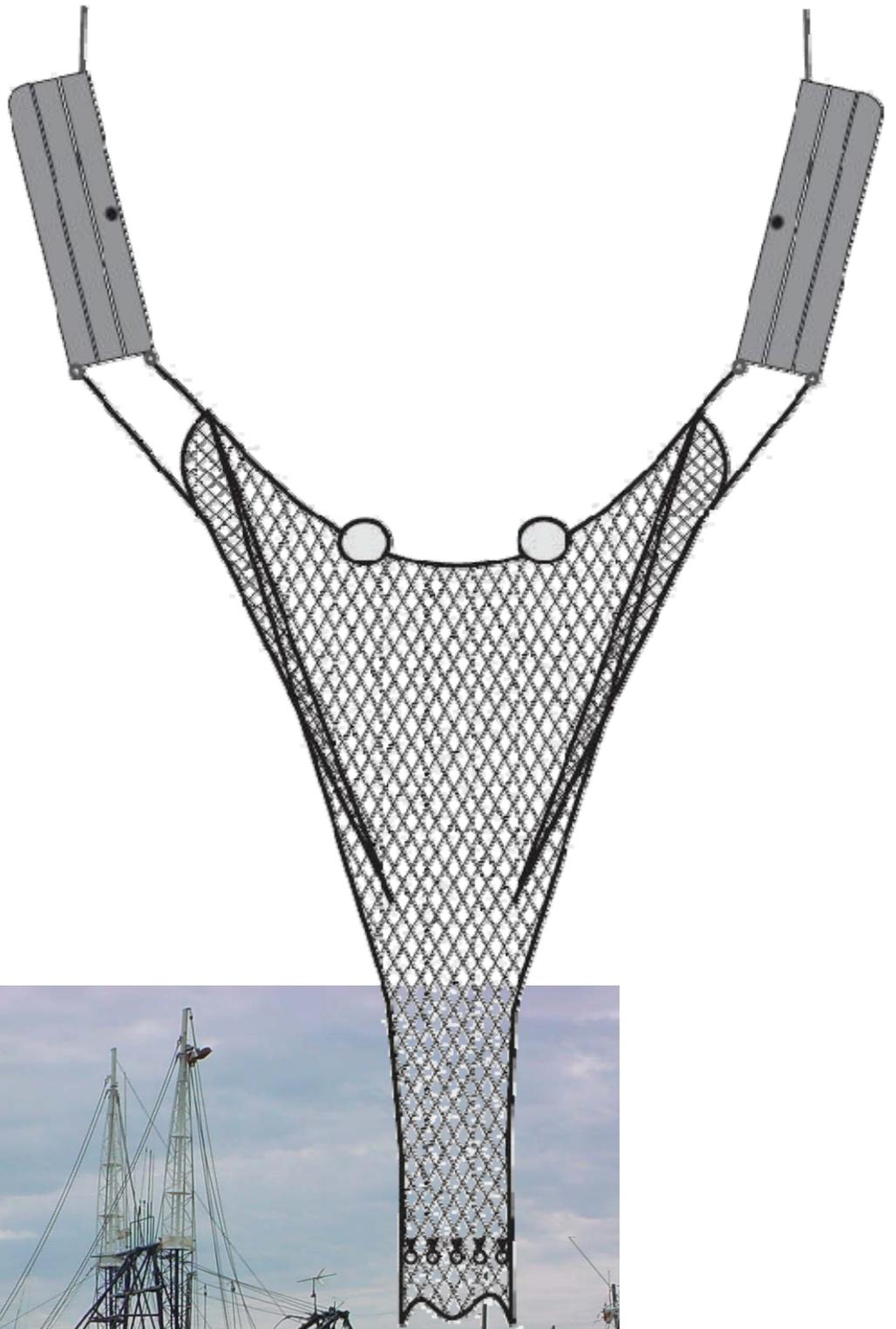


Figure 12. Beam Trawl



Table 1. Commercial License Sales by Actual License Year

Type of License or Stamp	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Class B Menhaden Boat License	n/a	n/a	n/a	n/a	49	42	33	25	26	22	22
Commercial Crab Trap Tags	90618	86127	88222	90740	83731	n/a	n/a	n/a	n/a	n/a	n/a
Commercial Fishing Boat (Menhaden Only)	13	14	17	55	24	21	17	15	13	14	11
Dup. Res. Comm. Crab Fisherman's Lic.	n/a	32	29	0	0						
Dup. Resident Finfish Fisherman's License.	n/a	n/a	n/a	n/a	n/a	n/a	0	7	13	0	0
Duplicate Res. Bait Shrimp Boat Lic. Plates #	4	19	14	24	16	15	16	10	4	0	0
Duplicate Res. Bay Shrimp Boat Lic. Plates #	1	30	16	15	23	20	13	16	0	0	0
Duplicate Res. Commercial Fishing Boat Lic. Plates	4	11	7	13	11	6	4	5	2	0	0
Duplicate Res. Commercial Oyster Boat Lic. Plates	1	1	1	1	3	1	0	1	2	0	0
Duplicate Resident Gulf Shrimp Boat Lic. Plates #	3	6	3	0	6	3	0	6	3	0	0
Fishing Guide #	1278	1472	1643	1636	1639	1676	1818	1887	1862	1895	n/a
Individual Bait Shrimp Trawl Tags	1147	991	991	839	887	835	776	697	628	585	522
Non-Res. Saltwater Fishing Guide											3
Non-Resident Commercial Bait Shrimp Boat	0	0	1	1	1	0	0	0	0	0	0
Non-Resident Commercial Bay Shrimp Boat	0	0	2	1	2	1	2	1	0	1	0
Non-Resident Commercial Crab Fisherman	n/a	n/a	n/a	n/a	n/a	1	0	0	0	0	0
Non-Resident Commercial Finfish Fisherman's	6	11	4	6	5	5	2	1	1	1	1
Non-Resident Commercial Fishing Boat	27	35	59	37	23	27	22	13	14	20	20
Non-Resident Commercial Gulf Shrimp Boat	403	465	495	487	383	401	426	469	480	360	254
Non-Resident Commercial Oyster Boat	7	12	13	11	10	19	25	17	10	6	85
Non-Resident Commercial Oyster Boat Captain's	9	18	14	13	9	18	21	16	6	5	93
Non-Resident Commercial Oyster Fisherman's	0	0	0	0	0	0	0	0	0	0	0
Non-Resident Commercial Shrimp Boat Captain's	n/a	n/a	394	447	322	373	371	421	428	319	230
Non-Resident General Commercial Fisherman's	43	45	61	31	32	34	21	15	22	22	19
Non-Resident Shell Buyer's	0	1	2	0	3	1	1	1	1	0	0
Non-Resident Sport Oyster Boat #	0	1	1	0	0	0	0	1	0	0	0
Resident Commercial Bait Shrimp Boat #	1475	1787	1588	1500	1484	1401	1318	1265	1172	1090	984
Resident Commercial Bay Shrimp Boat #	1589	1841	1643	1569	1522	1460	1344	1288	1191	1100	985

Table 1.Cont'd. Commercial License Sales by Actual License Year

Type of License or Stamp	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Resident Commercial Crab Fisherman	n/a	n/a	n/a	n/a	n/a	302	277	255	230	234	229
Resident Commercial Finfish Fisherman's	1282	1525	986	876	784	800	734	548	495	502	432
Resident Commercial Fishing Boat	1459	1561	1681	1488	1332	959	876	315	326	285	279
Resident Commercial Gulf Shrimp Boat #	1421	1376	1343	1267	1142	1174	1188	1344	1266	1003	1086
Resident Commercial Mussel & Clam Fisherman's	77	113	458	198	32	11	26	22	9	22	16
Resident Commercial Oyster Boat	312	352	325	404	360	297	294	293	281	319	381
Resident Commercial Oyster Boat Captain's	386	412	409	543	488	423	414	413	368	433	554
Resident Commercial Oyster Dredge #	n/a										
Resident Commercial Oyster Fisherman's	13	4	5	8	8	3	5	3	2	5	1
Resident Commercial Shrimp Boat Captain's	n/a	n/a	3286	3127	3094	3156	3093	3116	2810	2537	2350
Resident Freshwater Fishing Guide											601
Resident General Commercial Fisherman's	4733	4564	3201	2621	2312	1887	1611	1148	1022	768	778
Resident Saltwater Commercial Fishing Boat #	n/a										
Resident Saltwater Fishing Guide											900
Resident Shell Buyer's	2	6	10	9	4	1	2	1	1	1	0
Resident Sport Oyster Boat #	149	138	98	82	71	67	73	53	47	47	58
Transfer of Res. Comm. Bait Shrimp Boat Lic.	n/a	n/a	58	109	96	76	163	133	14	0	0
Transfer of Res. Comm. Bay Shrimp Boat Lic.	n/a	n/a	68	114	105	83	168	141	16	0	0
Transfer of Resident Commercial Fishing Boat Lic.	n/a	19	37	22	9	8	6	5	1	0	0
Transfer of Resident Commercial Oyster Boat Lic.	n/a	14	6	2	6	8	14	1	1	0	0
Transfer of Resident Commercial Shrimp Boat Lic.	n/a	282	35	22	15	17	13	30	1	0	0
Transfer Res. Comm. Finfish Fisherman's Lic.	n/a	34	12	0	0						

Table 3. Texas Commercial Finfish and Shellfish Landings (lb X 1000), (in press)

		Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Finfish	Black Drum	1822.8	2915.6	4253	3866.2	2690.6	2838	2837.1	2501.1	2330.7	1676.7	1717.1	
	Flounder	211	274.2	218.2	184.5	217.9	287.8	159.5	121.2	173.3	158.5	151.1	
	Sheeps-head	39.5	54.1	103.2	94.8	117.2	118.2	106.9	85.3	92.6	67.6	68.3	
	Snapper	1164.4	1244.1	1687	2023.9	1626.6	1629.4	1553.6	1658.9	1698.9	1807.1	2505.1	
	Other	1348.8	1961.8	1616.3	1812.6	1616.7	1762.6	1719.2	1362.5	1611.9	1391.9	1276.8	
	Total	4586.5	6449.9	7877.8	7981.9	6269	6635.8	6376.4	5728.9	5907.3	5101.8	5718.4	
Shellfish	Shrimp	Brown & Pink	33215.2	31216.2	28818.8	24259	32829.5	25624.2	36529.7	30582.2	25360.9	26430.6	21238.4
		White	8920.7	7465.1	8748.7	8956.4	9446.8	9158.1	9576	9347.7	10942.6	8019	9558
		Other	1513.6	1377.8	1933.8	2458.8	1581.1	612	317.2	1360.7	412.3	714.4	353.1
	Total	43649.4	40059	39501.3	35674.2	43857.4	35394.3	46422.8	41290.6	36715.8	35164	31149.6	
	Blue Crab	5154.4	5786.5	6311.4	7083.8	6988.5	6472.1	4653.3	5168.2	7037	4811.3	3960.9	
	Oyster	4581.5	4670.6	5705.4	4687	3437.9	6411.2	6187.8	4775.4	4708	6833.4	5519.5	
	Other	41.9	56.1	127.5	75.3	84.7	97.7	106.3	109.6	93.1	94.2	80.9	
	Total	53427.2	50572.1	51645.6	47520.3	54368.6	48375.3	57370.2	51343.9	48553.9	46902.9	40710.8	
Grand Total		58013.7	57022	59523.4	55502.2	60637.5	55011.2	63746.6	57072.9	54461.2	52004.7	46429.2	

Table 6. Sea Turtle takes from TPWD experimental otter trawls			
Area	Date	Seaturtle Species	Length
Matagorda Bay	18-Apr-88	Loggerhead	690
Gulf - off Aransas	27-Apr-04	Loggerhead	690
Matagorda Bay	06-Aug-01	Kemp's Ridley	629
Gulf - off Sabine	16-Sep-97	Kemp's Ridley	240
Gulf - off Aransas	16-Jul-97	Kemp's Ridley	600
Lower Laguna Madre	07-Jul-97	Green	560
Lower Laguna Madre	11-Jun-98	Green	293
Lower Laguna Madre	22-Mar-01	Green	341
Gulf - off Sabine	27-Apr-92	Unidentified	N/A