

SEINE AND TROTLINE TAG PURCHASES BY
LICENSED COMMERCIAL SALTWATER FINFISH
FISHERMEN DURING SEPTEMBER 1984-AUGUST 1987

by

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ABSTRACT

About 167 licensed commercial saltwater finfish fishermen purchased about 3,676 seine tags annually during fiscal years 1985-1987 (1 September 1984-31 August 1987). Seine tag purchases were concentrated in counties bordering the Galveston, Aransas and Corpus Christi Bay systems. During the same period about 98 licensed commercial saltwater finfish fishermen purchased about 1,099 trotline tags annually. Trotline tag purchases were concentrated in counties bordering the Corpus Christi, upper Laguna Madre and lower Laguna Madre Bay systems. The September 1988 ban on use of nets and seines to catch fish in Texas saltwaters will affect about 167 licensed commercial saltwater finfish fishermen annually.

INTRODUCTION

Nets in various forms have been used by commercial finfish fishermen in Texas saltwaters for over 100 years (Texas Game, Fish and Oyster Commission 1929). After netting was prohibited in the five counties encompassing the Laguna Madre during 1931-1953 (State of Texas 1957), trotlines became a major legal gear in that area. In 1981-1982 recreational saltwater fishermen were prohibited from using nets and seines (except cast nets, dip nets and 6.1-m minnow seines) to catch fish in an effort to protect red drum (Sciaenops ocellatus) and spotted seatrout (Cynoscion nebulosus) (Texas Parks and Wildlife Department 1983). On 1 September 1988 commercial saltwater finfish fishermen were prohibited from using nets and seines (except dip nets for landing fish caught on other legal gear, cast nets and 6.1-m minnow seines for taking bait, and purse seines for taking menhaden) to catch fish in an effort to reduce the harvest of black drum (Pogonias cromis), flounder (Paralichthys sp.) and sheepshead (Archosargus probatocephalus), and to prevent the incidental capture of red drum (Texas Parks and Wildlife Department 1988).

Because nets and trotlines effectively catch fish, their use in Texas saltwaters has been regulated for many years. In addition to restrictions on where, when and how these gear could be used (Table 1), there were requirements that fishermen be licensed and gear be tagged (Table 2). All commercial saltwater finfish fishermen are currently required to obtain a General Commercial Fisherman's License and a Commercial Finfish Fisherman's License (State of Texas 1987). Prior to the 1988 ban on use of nets and seines to catch fish, seine tags were required for commercial fishermen. One seine tag was to be firmly attached to each 30.5 m of net or seine. Nets and seines could be no longer than 548.6 m. Seine tags are currently purchased by commercial fishermen for use in Texas freshwaters and on menhaden vessels operating in the Texas Territorial Sea. Regulations currently require commercial and recreational fishermen to purchase trotline tags for use on trotlines, including sail lines (State of Texas 1987). One trotline tag must be firmly attached to each 91.4 m of trotline. Trotlines and sail lines can be no longer than 182.9 and 548.6 m, respectively.

The impact of commercial netting on saltwater finfish increased substantially after 1984 because of a major fish kill in December 1983 and January 1984. Populations of black drum, flounder and sheepshead were declining, and their ability to withstand historic fishing mortality levels was greatly reduced. Netting was a primary source of their mortality, and in 1988 consideration was given to prohibiting the use of nets and seines in saltwater. As part of this consideration, the Administrative Procedures Act required an estimate of the economic impact of possible regulations.

The objective of this study was to determine the maximum number of commercial fishermen who could be directly affected by a prohibition on the use of nets and seines in Texas saltwaters. Commercial trotline fishermen could be affected by a net prohibition if net fishermen became trotline fishermen. So, a second objective was to provide base line information on the number of commercial trotline fishermen.

MATERIALS AND METHODS

When seine and trotline tags were sold, a copy of the sales receipt was retained by Texas Parks and Wildlife Department (TPWD). Information recorded on the receipt was limited to the fisherman's name and address, the date of purchase, and the number and type of tags purchased. Nothing was recorded to indicate whether the purchaser of a seine tag would fish in fresh or saltwaters or whether the purchaser of a trotline tag was a commercial or recreational fisherman.

To determine the number of seine and trotline tags purchased by licensed commercial saltwater finfish fishermen for use in Texas saltwaters, individual sales receipts from each of three fiscal years (1985, 1986 and 1987) (1 September 1984-31 August 1987) were compared with lists of resident and non-resident commercial saltwater finfish fishermen licensed for each corresponding fiscal year. Seine and trotline tags purchased by a licensed commercial saltwater finfish fisherman on more than one date during a fiscal year were summed. All receipts could not be located; so, the total number of licensed commercial saltwater finfish fishermen buying seine and trotline tags and the total number of seine and trotline tags purchased were estimated by adjusting observed totals (Appendix A) for each fiscal year as follows:

$$a = b(c/d)$$

where:

- a - adjusted total number of licensed commercial saltwater finfish fishermen buying seine or trotline tags, or adjusted total number of seine or trotline tags purchased by licensed commercial saltwater finfish fishermen;
- b - observed total number of licensed commercial saltwater finfish fishermen buying seine or trotline tags, or observed total number of seine or trotline tags purchased by licensed commercial saltwater finfish fishermen;
- c - total number of seine or trotline tags sold to all fishermen as reported by TPWD License Accounting Section (Table 3); and
- d - total number of seine or trotline tags sold to all fishermen as verified through examination of receipts (Table 3).

Geographic distribution of seine and trotline tags purchased by licensed commercial saltwater finfish fishermen was determined by county of residence (Figure 1) based on addresses provided by fishermen when fishing licenses were purchased.

RESULTS

About 167 licensed commercial saltwater finfish fishermen purchased an estimated 3,676 seine tags annually during fiscal years 1985-1987 (Table 4). This number of seine tags represents about 112 km of net. About 70% of these

fishermen purchased ≤ 20 seine tags each year (Figure 2). Of the fishermen buying seine tags in 1985, only 55% and 39% also bought seine tags in 1986 and 1987, respectively. Of the fishermen buying seine tags in 1986, only 41% also bought seine tags in 1987. Purchases of seine tags by licensed commercial saltwater finfish fishermen were concentrated in counties bordering the Galveston, Aransas and Corpus Christi Bay systems (Table 5).

About 98 licensed commercial saltwater finfish fishermen purchased an estimated 1,099 trotline tags annually during fiscal years 1985-1987 (Table 4). This number of trotline tags represents about 100 km of trotline. About 61% of these fishermen purchased ≤ 10 trotline tags each year (Figure 2). Of the fishermen buying trotline tags in 1985, only 37% and 32% also bought trotline tags in 1986 and 1987, respectively. Of the fishermen buying trotline tags in 1986, only 37% also bought trotline tags in 1987. Purchases of trotline tags by licensed commercial saltwater finfish fishermen were concentrated in counties bordering the Corpus Christi, upper Laguna Madre and lower Laguna Madre Bay systems (Table 6).

Of the estimated 241 licensed commercial saltwater finfish fishermen purchasing seine and trotline tags each fiscal year during 1985-1987, about 59% purchased only seine tags, about 31% purchased only trotline tags and about 10% purchased both seine and trotline tags (Table 7). The number of fishermen purchasing only trotline or seine tags decreased each succeeding fiscal year; whereas, the number purchasing both tags increased. About half (256) of the commercial saltwater finfish fishermen licensed each year bought neither tag.

DISCUSSION

The September 1988 ban on use of nets and seines to catch fish in Texas saltwaters will affect about 167 licensed commercial saltwater finfish fishermen annually. There were about 497 licensed commercial saltwater finfish fishermen in Texas each year during fiscal years 1985-1987. The majority (67%) did not use nets to catch finfish. Of the remainder, 5% used both nets and trotlines, leaving 29% that relied solely on nets to catch finfish. If all of these net fishermen left the fishery the following impacts could be expected:

1. A reduction of about 167 participants in the fishery per year or a loss of revenue to TPWD of about \$22,466 based on license and tag sales;
2. A reduction in the harvest of black drum, flounder, sheepshead and other species resulting in decreased availability of these species to fish markets and restaurants; and
3. Increases in unemployment and in the number of participants in other saltwater fisheries.

The effects of a net ban are expected to be less than the maximum because the net fishery is characterized by high turnover and low profit, and

fishermen can shift to another fishery or use other legal gear (i.e., rod and reel, trotline, and gig) to catch fish. During fiscal years 1979-1981, most commercial saltwater finfish fishermen in Texas did not fish commercially every year, and finfish were not a substantial source of income for most fishermen (Ferguson 1986). Using personal interviews of randomly selected commercial fishermen from coastal Louisiana, Pesson (1974) found that fishing was not the main source of income for many and that many fished only part-time. Ferguson (1986) concluded that commercial fishermen leaving the Texas saltwater finfish fishery could be expected to switch to other fisheries such as shrimp or crabs, or become guides for recreational fishermen. Based on responses to a mailed questionnaire, Prochaska and Cato (1977) determined that most commercial fishermen in Florida used several types of gear. The authors concluded that ownership of several types of gear is beneficial because it allows fishermen more flexibility to adjust to changing economic and production conditions whether these changes be induced by the market place, the marine environment or public management authorities through season, area or gear restrictions.

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Table 1. Restrictions on the commercial use of nets (gill nets, trammel nets and drag seines) and trotlines in Texas saltwaters (Texas Parks and Wildlife Department 1986).

Gear type	Composition restrictions	Area and time restrictions	Other restrictions
Nets ^a	Nets longer than 548.6 m or with mesh less than 38 mm from knot to knot are prohibited. Nets must be equipped with floats at intervals of 1.8 m or less, buoyant enough to keep the device in an upright position in the water. Nets with meshes constructed of four or less monofilaments twisted or bound together are prohibited.	Nets may not be used between the hours of 1:00 p.m. on Friday through 1:00 p.m. on Sunday of each week. The use of nets is prohibited within 1.6 km of any pass connecting with the Gulf of Mexico. Netting is permitted in defined portions of Trinity, Galveston, East Matagorda, Tres Palacios, Turtle, Matagorda, San Antonio, Hynes, Guadalupe, Ayres, Mesquite, Carlos, Dunham, Aransas, and Corpus Christi Bays, and the Gulf of Mexico; however, additional gear and seasonal restrictions exist in several of these areas.	No person may retain or possess red drum or spotted seatrout caught in any net.
Trotlines	Trotlines may not exceed 182.9 m in length. Trotline ends shall be marked with burlap or flagging attached to stakes or with a yellow floating buoy not less than 254 mm above the water and 254 mm in width, or with a yellow plastic bottle of not less than 3.8 l size attached to end fixtures. Metallic stakes are prohibited. The minimum hook interval is 0.9 horizontal meters. All hooks used shall be a tuna circle-type hook with point curved in and having a gap of no less than 13 mm distance from point to shank.	No trotline or trotline component, including lines and hooks, but excluding poles, may be left in or on coastal waters between the hours of 1:00 p.m. on Friday through 1:00 p.m. on Sunday of each week, except in Chambers County where this restriction is in effect only from the Saturday of Memorial Day weekend through sunset on Labor Day in that portion of Galveston or Trinity Bays where trotlines are permitted. All trotlines must be at least 15.2 m apart and at least 61.0 m from the Gulf Intracoastal Waterway. Trotlines are prohibited in the saltwater bays or lakes of Harris County from the Saturday of Memorial Day weekend through sunset on Labor Day. Trotlines are prohibited within 0.8 km of the north and west shoreline of Aransas Bay.	The main fishing line, staging and attached hooks must be fished below the water's surface. Trotlines must be baited with natural baits only, including whole or cut-up portions of fish, shrimp, crab, squid or plant material in its natural state. No person may retain or possess red drum or spotted seatrout caught on a trotline. In addition to the tags purchased for each 91.4 m, or fraction thereof, of trotline, each trotline must be identified by a legible tag bearing the name and address of the fisherman and the date it was set out.

^aEffective 1 September 1988 the use of nets and seines to catch fish was prohibited in Texas saltwaters.

Table 2. License and tag requirements for the commercial use of nets (gill nets, trammel nets and drag seines) and trotlines in Texas saltwaters (State of Texas 1987).

License or tag type	Requirements	Fee
General commercial fisherman's license	Required for any person who catches fish, oysters or other edible aquatic products from the waters of this state for pay or for the purpose of sale, barter or exchange.	\$ 15 for residents \$100 for non-residents
Commercial finfish fisherman's license	Required for any person who catches finfish from the tidal waters of this state for pay or for the purpose of sale, barter or exchange. Issued only to those persons that file with the department, at the time of application for the license, an affidavit stating that not less than 50% of the applicant's gainful employment is devoted to commercial fishing, that the applicant is not employed at any full-time occupation other than commercial fishing, and that during the period of validity of the commercial finfish fisherman's license the applicant does not intend to engage in any full-time occupation other than commercial fishing.	\$ 65 for residents \$125 for non-residents
Saltwater commercial fishing boat license	Required of each boat that is subject to state and federal registration laws and is used in taking fish, oysters or other edible aquatic life except shrimp from the tidal waters of this state for pay or for the purpose of sale, barter or exchange.	\$ 10.50 for residents \$ 60 for non-residents
Seine tag ^a	Required for, and must be firmly attached to, each 30.5 m of length, or fraction thereof, of each net or seine used to catch edible aquatic life in the waters of this state for pay or for the purpose of sale, barter or exchange.	\$ 2
Trotline tag	Required for, and must be firmly attached to, each 91.4 m of length, or fraction thereof, of each trotline placed in the saltwater of this state, whether used for commercial or non-commercial purposes.	\$ 2

^aRequired only for purse seines used in the Texas Territorial Sea beginning 1 September 1988.

Table 3. Number of seine and trotline tags sold in Texas, and number and percent of seine and trotline tags verified for fiscal years 1985-1987.

Gear tag type	1985	1986	1987	Mean of 1985-1987
Seine				
Number sold ^a	7,006	7,180	6,462	6,883
Number verified ^b	5,154	6,071	6,020	5,748
Percent verified	73.6	84.6	93.2	83.5
Trotline				
Number sold ^a	7,648	8,318	8,840	8,269
Number verified ^b	6,830	7,440	8,397	7,556
Percent verified	89.3	89.4	95.0	91.4

^aObtained from TPWD License Accounting Section.

^bObtained through examination of individual sales receipts.

Table 4. Estimated^a total number and percent (%) of licensed commercial saltwater finfish fishermen (LCSFF) and other fishermen purchasing seine and trotline tags, and estimated^a total number and percent (%) of seine and trotline tags purchased in Texas during fiscal years 1985-1987.

Gear tag type Fisherman type	1985		1986		1987		Mean of 1985-1987	
	Fishermen	Tags	Fishermen	Tags	Fishermen	Tags	Fishermen	Tags
Seine								
LCSFF	164 (40)	3,931 (56)	174 (34)	3,780 (57)	163 (34)	3,318 (51)	167 (36)	3,676 (55)
Other ^{b,c}	242 (60)	3,075 (44)	345 (66)	2,875 (43)	313 (66)	3,144 (49)	300 (64)	3,031 (45)
Trotline								
LCSFF	91 (5)	1,065 (14)	102 (6)	1,201 (14)	101 (5)	1,030 (12)	98 (5)	1,099 (13)
Other ^{b,d}	1,676 (95)	6,583 (86)	1,732 (94)	7,117 (86)	2,041 (95)	7,810 (88)	1,817 (95)	7,170 (87)

^aEstimates were obtained by adjusting observed totals in proportion to the ratio of total tags sold and total tags verified for each tag type and year.

^bIndividuals in this category were not checked for multiple purchases during a fiscal year; therefore, the number of fishermen tallied may be higher than actual number of individuals purchasing tags.

^cCommercial fishermen using nets in freshwater and on board menhaden vessels in the Texas Territorial Sea.

^dRecreational fishermen using trotlines and sail lines.

Table 5. Number^a of licensed commercial saltwater finfish fishermen purchasing seine tags and number^a of seine tags purchased in Texas by county or state of residence^b during fiscal years 1985-1987.

County or state	1985		1986		1987	
	No. of fishermen	No. of tags	No. of fishermen	No. of tags	No. of fishermen	No. of tags
Coastal						
Aransas	6	142	9	193	21	441
Calhoun	3	25	5	42	7	91
Chambers	15	726	15	869	24	749
Galveston	39	602	54	805	34	624
Harris	4	54	11	83	13	179
Jefferson	0	0	0	0	1	6
Matagorda	2	30	7	101	4	55
Nueces	18	482	21	395	19	330
Refugio	0	0	1	5	0	0
San Patricio	18	424	13	436	15	400
Victoria	0	0	1	9	0	0
Willacy	1	12	0	0	1	10
Non-coastal						
Angelina	1	50	0	0	0	0
Bell	1	20	0	0	0	0
Bexar	1	3	0	0	1	4
Colorado	0	0	1	7	0	0
Fort Bend	0	0	0	0	1	2
Liberty	4	232	4	192	2	90
Tyler	0	0	1	6	0	0
Wharton	8	90	4	53	8	104
Louisiana	0	0	0	0	1	6
Total	121	2,892	147	3,196	152	3,091

^aObtained by comparing individual sales receipts with lists of licensed commercial saltwater finfish fishermen. Tags purchased by the same fisherman on more than one date during a fiscal year were summed. Numbers represent actual counts.

^bBased on addresses provided by fishermen when fishing licenses were issued.

Table 6. Number^a of licensed commercial saltwater finfish fishermen purchasing trotline tags and number^a of trotline tags purchased in Texas by county of residence^b during fiscal years 1985-1987.

County of	1985		1986		1987	
	No. of fishermen	No. of tags	No. of fishermen	No. of tags	No. of fishermen	No. of tags
Coastal						
Aransas	1	12	2	9	3	21
Calhoun	0	0	2	13	3	8
Cameron	24	366	25	440	15	231
Chambers	10	72	13	99	19	216
Galveston	1	5	2	7	5	18
Harris	1	3	2	19	4	14
Kleberg	11	128	7	44	6	76
Matagorda	0	0	1	2	1	6
Nueces	11	146	9	116	14	107
Refugio	1	5	0	0	2	20
San Patricio	6	33	8	77	7	57
Victoria	0	0	1	18	0	0
Willacy	12	146	17	223	13	168
Non-coastal						
Bastrop	0	0	1	4	0	0
Colorado	0	0	0	0	1	1
Fort Bend	1	1	0	0	0	0
Hidalgo	2	34	1	3	3	35
Total	81	951	91	1,074	96	978

^aObtained by comparing individual sales receipts with lists of licensed commercial saltwater finfish fishermen. Tags purchased by the same fisherman on more than one date during a fiscal year were summed. Numbers represent actual counts.

^bBased on addresses provided by fishermen when licenses were issued.

Table 7. Estimated^a number and percent of licensed commercial saltwater finfish fishermen purchasing seine and trotline tags in Texas during fiscal years 1985-1987.

Gear tag type	1985		1986		1987		Mean of 1985-1987	
	No.	%	No.	%	No.	%	No.	%
Seine only	152	62	149	59	128	56	143	59
Trotline only	81	33	78	31	66	29	75	31
Seine and trotline	11	5	24	10	35	15	23	10
Total	244		251		229		241	

^aEstimates were obtained by adjusting observed totals in proportion to the ratio of total tags sold and total tags verified for each tag type and year.

Figure 1. Coastal counties and bay systems of Texas.

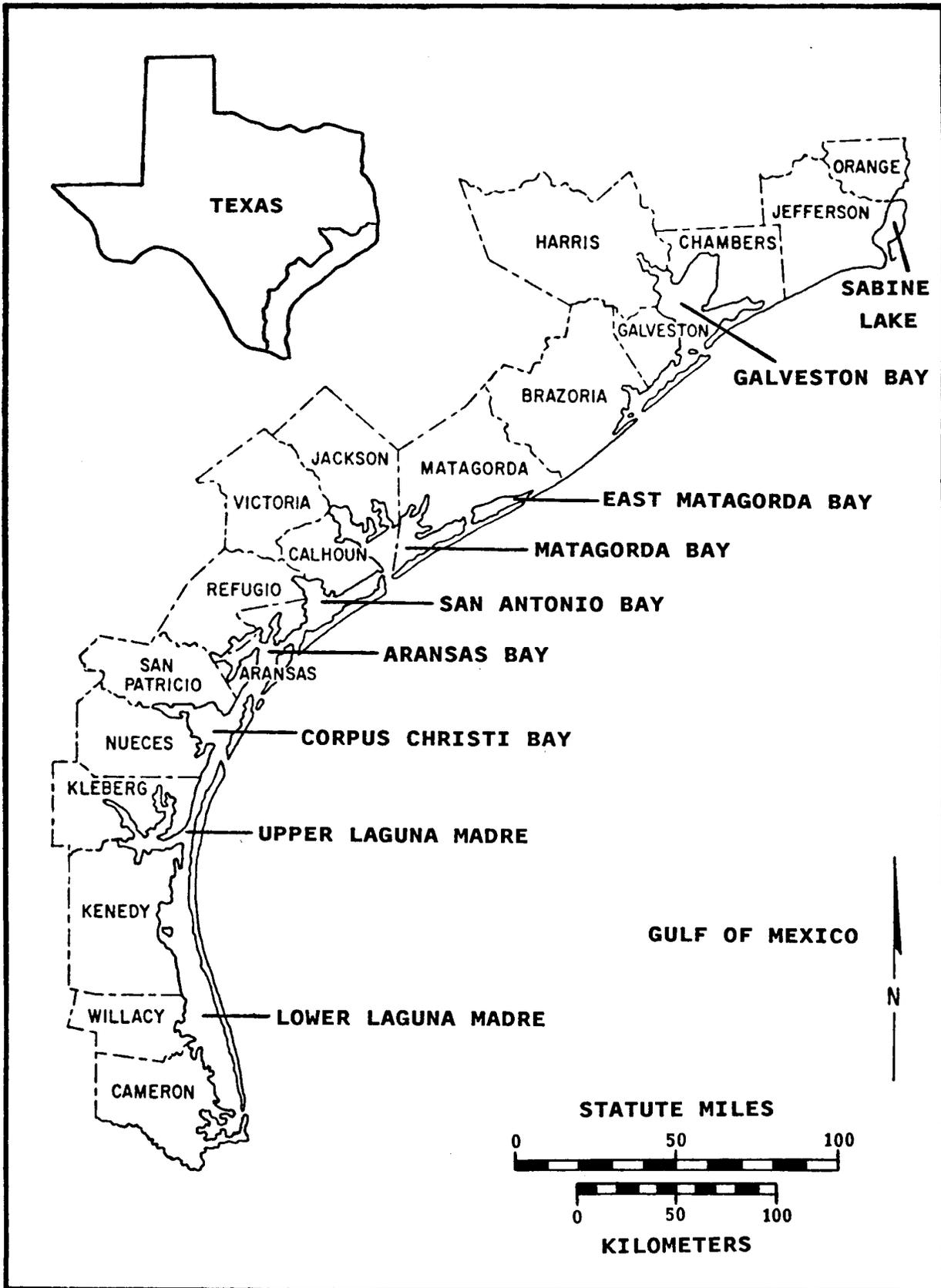
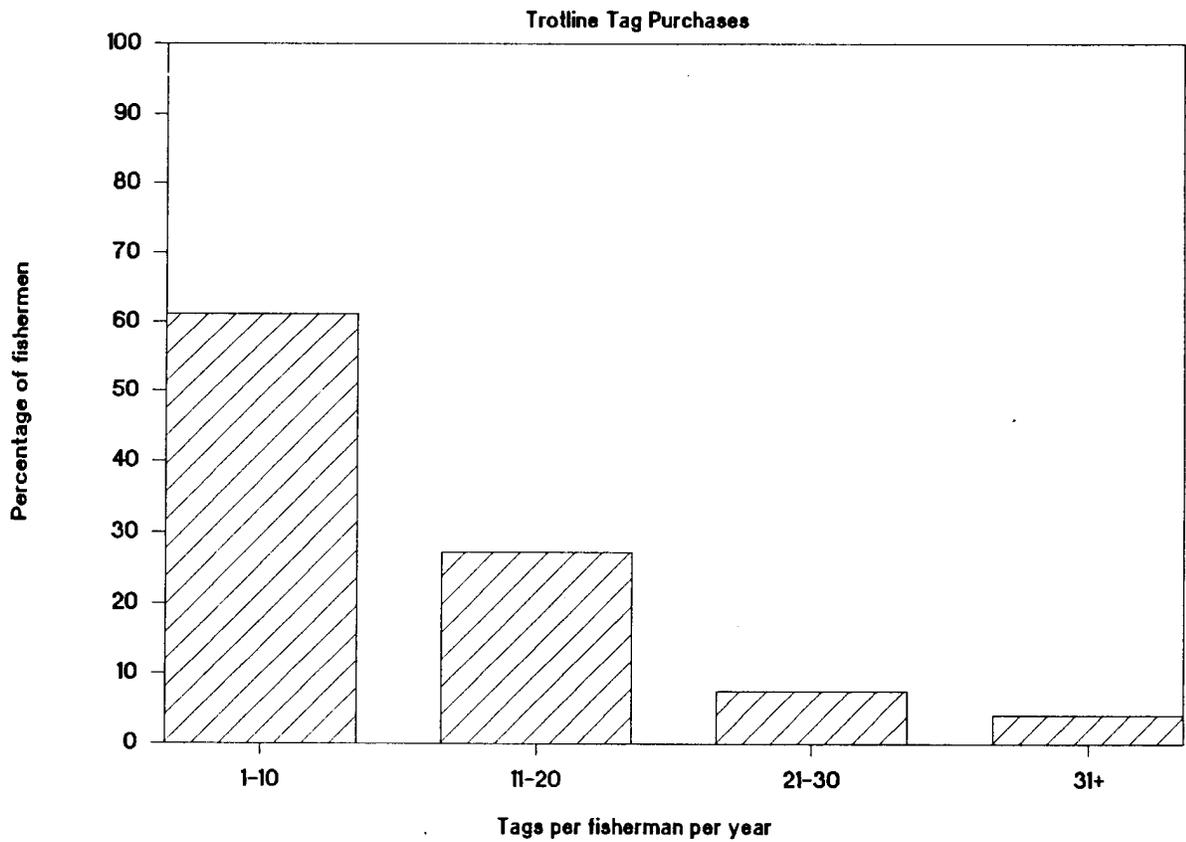
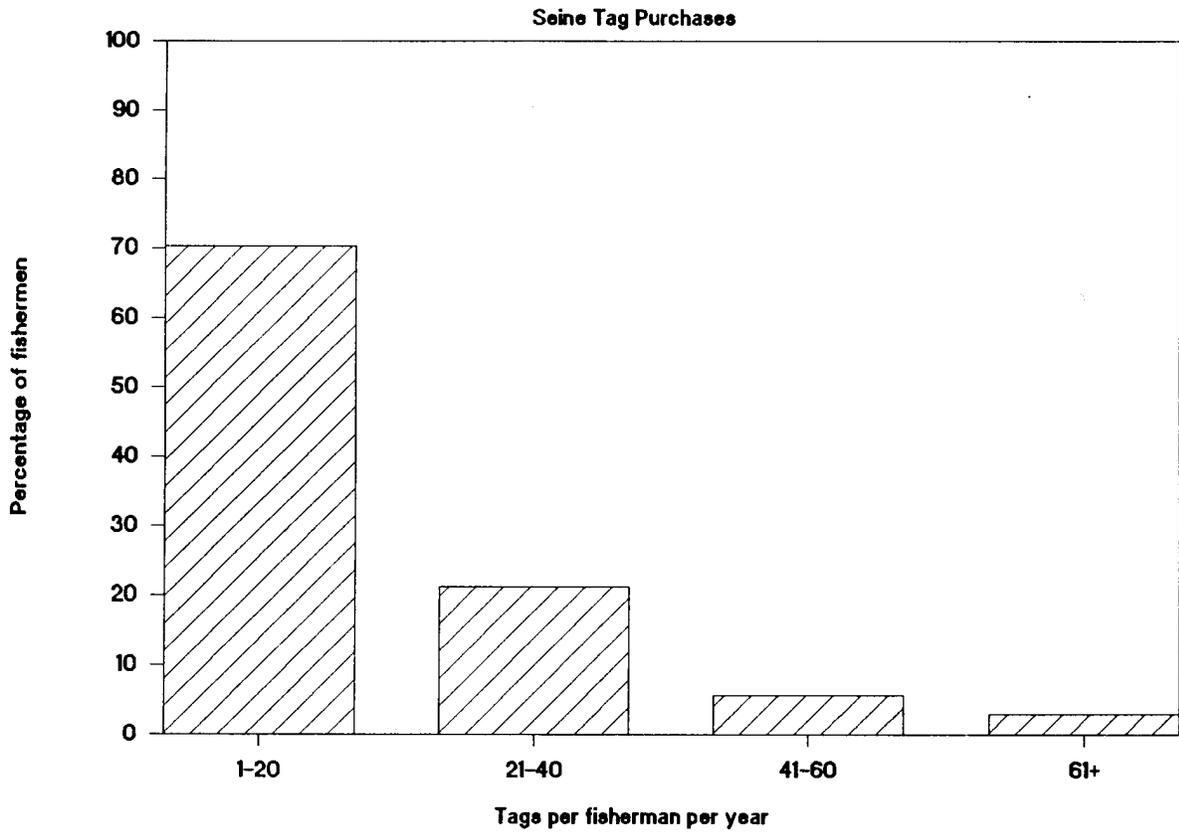


Figure 2. Number of seine and trotline tags purchased per year by individual licensed commercial saltwater finfish fishermen during fiscal years 1985-1987 combined.



Appendix A. Actual counts obtained through examination of individual sales receipts.

Table A.1. Number^a of licensed commercial saltwater finfish fishermen purchasing seine tags and number^a of seine tags purchased in Texas during fiscal years 1985-1987.

No. of tags per fisherman	1985		1986		1987	
	No. of fishermen	No. of tags	No. of fishermen	No. of tags	No. of fishermen	No. of tags
1	0	0	1	1	0	0
2	1	2	5	10	2	4
3	4	12	5	15	4	12
4	2	8	7	28	5	20
5	2	10	5	25	1	5
6	5	30	13	78	15	90
7	1	7	4	28	5	35
8	5	40	1	8	1	8
9	9	81	5	45	6	54
10	9	90	13	130	16	160
11	3	33	2	22	2	22
12	15	180	12	144	11	132
13	0	0	2	26	2	26
14	1	14	1	14	2	28
15	6	90	8	120	8	120
16	0	0	3	48	3	48
17	0	0	0	0	1	17
18	9	162	8	144	14	252
19	0	0	0	0	2	38
20	7	140	12	240	9	180
21	3	63	3	63	2	42
22	1	22	1	22	0	0
23	1	23	1	23	1	23
24	1	24	2	48	4	96
25	3	75	1	25	6	150
26	1	26	0	0	1	26
27	1	27	2	54	2	54
28	1	28	1	28	0	0
30	5	150	8	240	3	90
31	0	0	0	0	1	31
32	0	0	2	64	2	64
33	1	33	0	0	0	0
35	1	35	1	35	1	35
36	2	72	1	36	2	72
37	1	37	0	0	0	0
39	0	0	1	39	1	39
40	7	280	3	120	7	280
41	0	0	1	41	0	0
42	0	0	1	42	1	42
43	1	43	0	0	0	0
44	0	0	2	88	0	0
45	1	45	1	45	1	45
47	0	0	2	94	0	0
48	1	48	0	0	0	0
50	2	100	1	50	2	100

Table A.1. (Cont'd.).

No. of tags per fisherman	1985		1986		1987	
	No. of fishermen	No. of tags	No. of fishermen	No. of tags	No. of fishermen	No. of tags
54	0	0	0	0	1	54
55	1	55	1	55	1	55
60	2	120	0	0	1	60
62	1	62	0	0	0	0
65	1	65	0	0	0	0
75	0	0	0	0	1	75
81	0	0	0	0	1	81
93	0	0	1	93	0	0
100	1	100	0	0	0	0
120	0	0	1	120	0	0
145	0	0	1	145	0	0
160	1	160	0	0	0	0
300	1	300	0	0	0	0
326	0	0	0	0	1	326
500	0	0	1	500	0	0
Total	121	2,892	147	3,196	152	3,091

^aObtained by comparing individual sales receipts with lists of licensed commercial saltwater finfish fishermen. Tags purchased by the same fisherman on more than one date during a fiscal year were summed. Numbers represent actual counts.

Table A.2. Number^a of licensed commercial saltwater finfish fishermen purchasing trotline tags and number^a of trotline tags purchased in Texas during fiscal years 1985-1987.

No. of tags per fisherman	1985		1986		1987	
	No. of fishermen	No. of tags	No. of fishermen	No. of tags	No. of fishermen	No. of tags
1	2	2	2	2	4	4
2	3	6	5	10	9	18
3	5	15	3	9	4	12
4	4	16	6	24	11	44
5	5	25	5	25	7	35
6	10	60	7	42	6	36
7	1	7	2	14	1	7
8	5	40	6	48	9	72
9	1	9	2	18	0	0
10	11	110	19	190	9	90
11	4	44	1	11	1	11
12	7	84	5	60	5	60
13	0	0	0	0	1	13
14	1	14	5	70	8	112
15	2	30	0	0	2	30
16	2	32	3	48	2	32
17	1	17	0	0	0	0
18	3	54	5	90	1	18
20	1	20	5	100	8	160
21	0	0	1	21	0	0
22	0	0	1	22	1	22
23	2	46	0	0	1	23
24	3	72	2	48	1	24
26	1	26	0	0	1	26
28	2	56	0	0	0	0
29	0	0	0	0	1	29
30	2	60	0	0	1	30
31	0	0	1	31	0	0
32	1	32	0	0	0	0
34	1	34	1	34	1	34
35	0	0	1	35	0	0
36	0	0	0	0	1	36
40	1	40	2	80	0	0
42	0	0	1	42	0	0
Total	81	951	91	1,074	96	978

^aObtained by comparing individual sales receipts with lists of licensed commercial saltwater finfish fishermen. Tags purchased by the same fisherman on more than one date during a fiscal year were summed. Numbers represent actual counts.

Table A.3. Number^a of licensed commercial saltwater finfish fishermen purchasing seine and trotline tags in Texas during fiscal years 1985-1987.

Gear tag type	1985	1986	1987
Seine only	112	126	119
Trotline only	72	70	63
Seine and trotline	9	21	33
Total	193	217	215

^aObtained by comparing individual sales receipts with lists of licensed commercial saltwater finfish fishermen. Tags purchased by the same fisherman on more than one date during a fiscal year were summed. Numbers represent actual counts.

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