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Evaluation of Natural, Leaf, Vegetable, Worm and Cork Baits used on Trotlines in Upper and Lower Laguna Madre, Texas (September 1977 - August 1978)

by Lawrence W. McEachron, Gary C. Matlock,
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Management Data Series Number 8
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Government Documents



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MADRE, TEXAS (SEPTEMBER 1977-AUGUST 1978)

EXECUTIVE SUMMARY

Surface and bottom trotlines, 600 ft long with 100 hooks each, were fished in upper and lower Laguna Madre to determine the catch of commercially important finfishes using natural, leaf, vegetable, colored plastic worm and colored cork baits. Two day and two night sets were made each month; one each between the 1st and 15th of the month and one each between the 16th and the end of the month.

Spotted seatrout, red drum and black drum accounted for 36% of all fish caught and sea catfish, a scrap fish, accounted for 56%. Generally, fishes caught in lower Laguna Madre were larger than those caught in upper Laguna Madre.

Red drum catches were affected by type of set (top or bottom trotline), time of set (night or day) and bait type. None of the factors alone affected catch rates. More red drum were caught during the night on top trotlines than on bottom trotlines, regardless of bait type. Apparently, red drum did not appear to select one bait over another bait.

Spotted seatrout catch rates were affected by type of set, time of set and bait type. None of the factors alone affected the catch. Night trotlines had higher catch rates than trotlines fished during the day.

Black drum catch rates appeared to be affected the most by bait type. More black drum were caught on natural baits than on any other bait type. Bottom catches were higher at night than during the day in upper Laguna Madre but not in lower Laguna Madre.

The large sea catfish catches indicate that the relative abundance of these fishes may be high compared with other fishes.

EVALUATION OF NATURAL, LEAF, VEGETABLE, WORM AND CORK
BAITS USED ON TROTTLINES IN UPPER AND LOWER LAGUNA
MADRE, TEXAS (SEPTEMBER 1977-AUGUST 1978)

ABSTRACT

Surface and bottom trotlines were fished in upper and lower Laguna Madre to determine the catch of commercially important finfishes using natural, leaf, vegetable, worm and cork baits. Trotlines were set twice a month during the day and night from September 1977 to August 1978.

Spotted seatrout (Cynoscion nebulosus), red drum (Sciaenops ocellata) and black drum (Pogonias cromis) were the major commercial fishes caught in upper and lower Laguna Madre. Sea catfish (Arius felis), a scrap fish, was the most numerous fish caught.

Catch rates for red drum, black drum and spotted seatrout in both upper and lower Laguna Madre were all affected by type of set (bottom or top), time of set (day or night) and bait type. Interaction between these factors masked the effects of any one factor.

It appears that red drum catches were significantly higher on top-night trotlines than on bottom-night trotlines. Red drum were caught on all bait types but did not appear to select one bait over another bait. Black drum appeared to select natural baits over leaf, vegetable, worm or cork baits. Spotted seatrout catch rates were so affected by interaction between type of set, time of set and bait type that no specific generalization could be made concerning the effects of those factors on catch rates.

ACKNOWLEDGEMENTS

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INTRODUCTION

Trotlines in upper and lower Laguna Madre account for the majority of red drum (Sciaenops ocellata), spotted seatrout (Cynoscion nebulosus) and black drum (Pogonias cromis) landed by commercial fishermen. Matlock (1978) reported that trotlines have caught 50%, by weight, of the Texas commercial red drum landings since 1959. Breuer (1973, 1974, 1975) reported that red drum, spotted seatrout and black drum constituted 99.6%, by number, of the total lower Laguna Madre commercial fish landings in 1973, 98.6% of the landings in 1974 and 94.6% of the landings in 1975. Harrington (1970) stated that red drum, spotted seatrout and black drum are the preferred fishes of trotliners in upper Laguna Madre.

Harrington (1970) indicated that natural baits were preferred over artificial baits by spotted seatrout. In September 1974 the Texas Parks and Wildlife Department Commission banned the use of artificial baits on trotlines since Breuer (1973) reported that artificial baits (mainly plastic strips) were "highly selective for small red drum."

In summer 1977 commercial fishermen from the Corpus Christi Bay and upper Laguna Madre areas requested that the Texas Parks and Wildlife Department (TPWD) permit the use of plastic worms on trotlines. In response to this request the Commission approved a study to determine the catch of commercially important fishes on trotlines. The objective of the study was to compare the catches of selected species on both surface and bottom trotlines fished during day and night and baited with natural, leaf, vegetable, worm and colored cork baits in upper and lower Laguna Madre, Texas.

MATERIALS AND METHODS

Trotlines, 182.9 m long with 100 hooks each, were used from September 1977 through August 1978 in both upper and lower Laguna Madre (Figures 1 and 2). Trotlines were set in similar habitats, 0.8 to 1.6 km apart, in areas where commercial trotline fishermen usually fished; lines were set in water < 0.9 m deep with one trotline fishing the bottom and the other fishing just under the surface (top). Each trotline contained 10 panels with 10 hooks each. Hooks were approximately 1.8 m apart. On top lines, hook drops were 61 cm long and were hung so that the hooks were suspended just below the water surface (Figure 1). Wooden poles, used to support the lines, were placed on each end and between each panel. Bottom lines were stretched taut and the entire line was laid along the bottom with poles anchored on each end and in the middle; hook drops on these lines were 20 cm long (Figure 2). There were two day and two night sets each month; one each between the 1st and 15th of the month and one each between the 16th and the end of the month. Day and night trotlines were set on consecutive days. The night set was baited to fish no earlier than one hour before sunset. The night set was run and the daytime set baited simultaneously no later than one hour after sunrise. The day set was run no earlier than one hour before sunset.

Bait categories consisted of colored plastic worms, colored corks, leaves, vegetables and natural baits (Appendix A). The kind of bait within each category was randomly assigned to the 10 panels in the following frequency: 3 plastic worm panels, 3 natural bait panels, 2 leaf panels, 1 cork panel and 1 vegetable panel. Surface and bottom lines were baited identically each week. Natural baits tested during the year included dead shrimp (Penaeus spp.), live pinfish (Lagodon rhomboides), cut mullet (Mugil cephalus), squid (Lolliguncula sp.), crab (Callinectes sapidus), menhaden (Brevoortia patronus), live mullet, live killifish (Cyprinodon variegatus), leaves (primarily oleander) and vegetables (cranberries, carrots, potatoes, beets, cactus, citrus peel, bell pepper, cabbage). These baits were not all used at the same time but were tested at various times during the year depending on their availability.

Total lengths (mm) of commercially important fishes were recorded along with date, location, top or bottom line, panel and bait type. For this study commercially important fishes included red drum, black drum, spotted seatrout, southern flounder (Paralichthys lethostigma), sheepshead (Archosargus probatocephalus), Atlantic croaker (Micropogon undulatus), sand seatrout (Cynoscion arenarius) and gafftopsail catfish (Bagre marinus) (McEachron 1979). All other fishes were considered to be scrap fish.

Hydrological samples were taken just before fish were removed from the trotlines. Water temperature (C) was determined using a hand-held thermometer and salinity (o/oo) using an American Optical refractometer. Wind velocity and wind direction information was obtained from a local radio station. For trotlines fished during the day, hydrological samples were collected in the afternoon. For trotlines fished during the night, hydrological samples were collected in the morning following the set. Afternoon samples were considered day and morning samples night in Appendix B.

A three-way analysis of variance (Overall and Spiegel 1969) was used to determine the effects of type of set (top and bottom), time of set (day and night) and bait type (natural, leaf, vegetable, worms, colored corks) on the mean catch rates of red drum, spotted seatrout and black drum in both upper and lower Laguna Madre. In addition, night mean catch rates were combined for each species from both areas and a two-way analysis of variance (Overall and Spiegel 1969) was used to test the effects of type of set and bait type on those mean catch rates. The P-value for these analyses was < 0.05 .

RESULTS

Each of the hydrological and meteorological factors measured were similar in both bay systems except water depth (Appendix B). The mean water depth in lower Laguna Madre was approximately 0.3 m less than the water depth in upper Laguna Madre except during summer when the depth was about 0.6 m in each area.

During September 1977-August 1978 trotlines fished in upper and lower Laguna Madre caught 926 fish with an approximately equal number caught in each system (Table 1). Species composition in both systems was similar

with sea catfish (Arius felis) accounting for about 56% and spotted seatrout about 18% of the total catch.

Red drum (98) and black drum (65) were the only other commercially important species caught in sufficient numbers for analysis. One southern flounder and 10 Atlantic croaker were also caught.

Mean total lengths for each species were generally greater in lower Laguna Madre than in upper Laguna Madre (Appendix C).

The catch of red drum in upper Laguna Madre was significantly affected by the interaction of type of set, time of set and bait type (Appendix D). None of the three factors alone significantly affected catch rates. The catch of red drum in lower Laguna Madre was significantly affected by the interaction of type of set and time of set (Appendix D). Bait type did not appear to affect the catch rates of red drum on trotlines significantly.

Examination of the mean catch rates (Tables 2 and 3) for red drum indicated that trotlines fished at night had consistently higher mean catch rates than those fished during the day in both bay systems. Results of a two-way analysis of variance, for night sets only and both bay systems combined, indicated that top trotlines had significantly higher catch rates than bottom trotlines. Bait type did not appear to affect the catch rate of red drum significantly (Appendix D).

Spotted seatrout catch rates in upper and lower Laguna Madre were significantly affected by the interaction of type of set, time of set and bait type (Appendix D). None of these factors alone significantly affected catch rates.

Mean catch rates (Tables 2 and 3) for spotted seatrout indicated that night trotlines had higher catch rates than those fished during the day in both bay systems. A two-way analysis of variance, for night sets and both bays combined, indicated that the catch rates were significantly affected by interactions of the type of set and bait used (Appendix D).

Catch rates of black drum in upper Laguna Madre were significantly affected by the interaction of type of set and bait type and by the interaction of time of set and bait type (Appendix D). Therefore, bait type is probably the factor most affecting the catch rates of black drum in upper Laguna Madre. Catch rates of black drum in lower Laguna Madre were significantly affected by the interaction of time of set and bait type (Appendix D). Type of set did not significantly affect the catch rates of black drum on trotlines.

Analysis of mean catch rates (Tables 2 and 3) indicated that bottom catches of black drum were higher at night than during the day in upper Laguna Madre but not in lower Laguna Madre. Results of the two-way analysis of variance indicated that the interaction of the type of set and bait type significantly affected the catch of black drum on trotlines (Appendix D). It appears that bait type was the primary factor affecting nighttime catches.

DISCUSSION

Red drum, spotted seatrout, black drum, southern flounder and sheepshead are commercially important species that are available in upper and lower Laguna Madre (Matlock and Weaver 1979). Since red drum, spotted seatrout and black drum were the only commercially important species caught in high numbers it appears that trotlines are selective for these fishes. The mean catches for these three fishes were generally higher in lower Laguna Madre than in upper Laguna Madre and probably reflected the higher availability of these species in lower Laguna Madre (Matlock and Weaver 1979) as compared with upper Laguna Madre.

No generalization can be made about the individual effects of type of set, time of day or bait type on the catches of commercially important fishes in upper and lower Laguna Madre. However, each of the factors interacting with the others did have a significant effect on the catches. The shallowness (avg. depth = 0.4-0.9 m) of the water may have contributed to the interaction because baits fished on both top and bottom trotlines may have fished the same portion of the water column. In shallow water, live fish (pinfish, mullet, killifish) or corks fished on the bottom would either swim or float to the same area as a bait suspended near the surface. Also, trotlines fished on consecutive day and night periods may have affected the catches on top and bottom trotlines. A trotline fished during a second time period may have lower catch rates than the immediately preceding period because fish availability may have been reduced by the initial trotline catches.

More red drum were caught in the upper and lower Laguna during the night with top trotlines than with bottom trotlines, regardless of bait type. Apparently, none of the five bait types were selective for red drum. Red drum were caught with each of the bait types including plastic worms. Darnell (1958) reported that red drum feed on a wide variety of food (saltwater organisms, algae and plant material). Red drum may have been attracted to baits suspended near the surface because of greater movement due to current and wind than baits fished on the bottom.

The high catches of black drum in upper and lower Laguna Madre with natural baits are probably due to the selective feeding of these fish. Simmons and Breuer (1962) and Darnell (1958) reported that marine organisms predominated in the stomachs of black drum in Texas and Louisiana.

Type of set, time of set and bait type appeared to affect the catches of spotted seatrout; however, no specific generalization could be made on the effects of these factors on catch rates. The interaction of these factors could be due to the high availability of spotted seatrout (Matlock and Weaver 1979) in both areas. Since spotted seatrout are voracious predators relying primarily on sight for the capture of prey (Vetter 1977) any movement of baits by wind and current action may trigger a feeding reaction.

Landings of commercially caught sheepshead during September 1977-August 1978 ranged from 9090 kg in upper Laguna Madre to 18,181 kg in lower Laguna Madre (McEachron 1980). Since no sheepshead were caught on trotlines in the present study the commercial landings are probably

a result of "illegal" netting activities in both areas. Sheepshead were predominantly caught in upper and lower Laguna Madre in 12.7- and 15.2-cm gill net webbing during TPWD sampling in 1975-76 (Matlock and Weaver 1979).

The large sea catfish catches in the present study indicate that the relative abundance of this fish may be high compared with other fishes. Sea catfish were the predominant non-commercial fish in TPWD sampling studies in 1975-76 (Matlock and Weaver 1979). Sea catfish are not landed by commercial fishermen in either upper or lower Laguna Madre since no market for them exists (Gillespie and Gregory 1971).

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Table 1. Total number of fishes caught on top and bottom trotlines fished during the day and night in upper and lower Laguna Madre (Sept. 1977-Aug. 1978).

Species	Upper Laguna Madre	Lower Laguna Madre	Total
COMMERCIAL FISH			
Red drum	24	74	98
Spotted seatrout	91	81	172
Black drum	35	30	65
Southern flounder	0	1	1
Atlantic croaker	9	1	10
SCRAP FISH			
Sea catfish	267	256	523
Stingray	9	24	33
Toadfish	9	2	11
Mullet	1	1	2
Silver perch	1	0	1
Seabrobin	8	0	8
Ladyfish	0	1	1
Shark	0	1	1
TOTAL	454	472	926

Table 2. Average annual catches (no/100 hook-h) of fishes caught on trotlines, by bait type, in upper Laguna Madre (Sept. 1977-Aug. 1978).

Species	Bait	Top		Bottom	
		Day	Night	Day	Night
Red drum	Natural	0.024	0.097	0.012	0.010
	Leaves	0.017	0.047	0.016	0.000
	Vegetable	0.000	0.000	0.000	0.000
	Worms	0.037	0.011	0.000	0.022
	Colored corks	0.000	0.000	0.000	0.000
	Average	0.022	0.044	0.007	0.010
Spotted seatrout	Natural	0.072	0.140	0.000	0.020
	Leaves	0.000	0.031	0.000	0.000
	Vegetable	0.000	0.047	0.000	0.000
	Worms	0.185	0.572	0.000	0.011
	Colored corks	0.000	0.000	0.000	0.000
	Average	0.078	0.225	0.000	0.010
Black drum	Natural	0.024	0.075	0.058	0.194
	Leaves	0.000	0.000	0.016	0.000
	Vegetable	0.000	0.000	0.000	0.000
	Worms	0.000	0.000	0.000	0.011
	Colored corks	0.000	0.000	0.000	0.000
	Average	0.007	0.024	0.021	0.065
Scrap fish	Natural	0.708	0.851	0.486	0.806
	Leaves	0.050	0.125	0.000	0.000
	Vegetable	0.000	0.000	0.048	0.000
	Worms	0.099	0.112	0.000	0.043
	Colored corks	0.000	0.034	0.000	0.037
	Average	0.259	0.343	0.153	0.278

Table 3. Average annual catches (no/100 hook-h) of fishes caught on trotlines, by bait type, in lower Laguna Madre (Sept. 1977-Aug. 1978).

Species	Bait	Top		Bottom	
		Day	Night	Day	Night
Red drum	Natural	0.054	0.154	0.000	0.008
	Leaves	0.000	0.148	0.000	0.022
	Vegetables	0.023	0.219	0.000	0.022
	Worms	0.027	0.109	0.000	0.000
	Colored corks	0.041	0.251	0.000	0.000
	Average	0.033	0.161	0.000	0.005
Spotted seatrout	Natural	0.107	0.239	0.054	0.042
	Leaves	0.000	0.000	0.000	0.000
	Vegetable	0.000	0.000	0.000	0.000
	Worms	0.014	0.276	0.000	0.008
	Colored corks	0.000	0.025	0.000	0.000
	Average	0.037	0.125	0.016	0.015
Black drum	Natural	0.000	0.111	0.000	0.075
	Leaves	0.000	0.042	0.000	0.000
	Vegetable	0.000	0.027	0.000	0.000
	Worms	0.000	0.025	0.000	0.000
	Colored corks	0.000	0.025	0.000	0.000
	Average	0.000	0.053	0.000	0.023
Scrap fish	Natural	0.469	0.949	0.352	0.729
	Leaves	0.000	0.148	0.000	0.022
	Vegetables	0.023	0.014	0.000	0.000
	Worms	0.000	0.050	0.014	0.017
	Colored corks	0.000	0.151	0.000	0.025
	Average	0.147	0.320	0.110	0.229

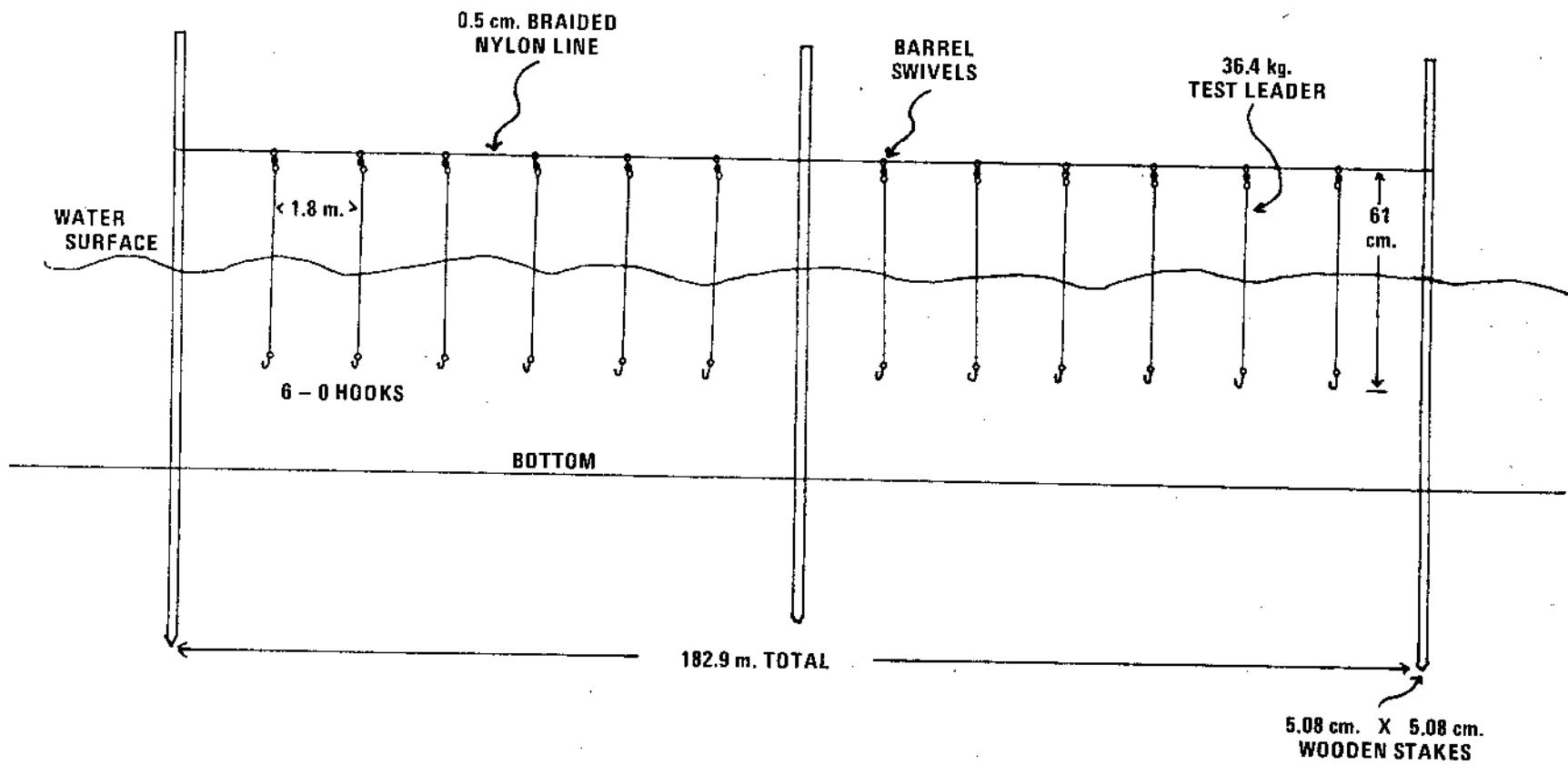


Figure 1. Top trotline

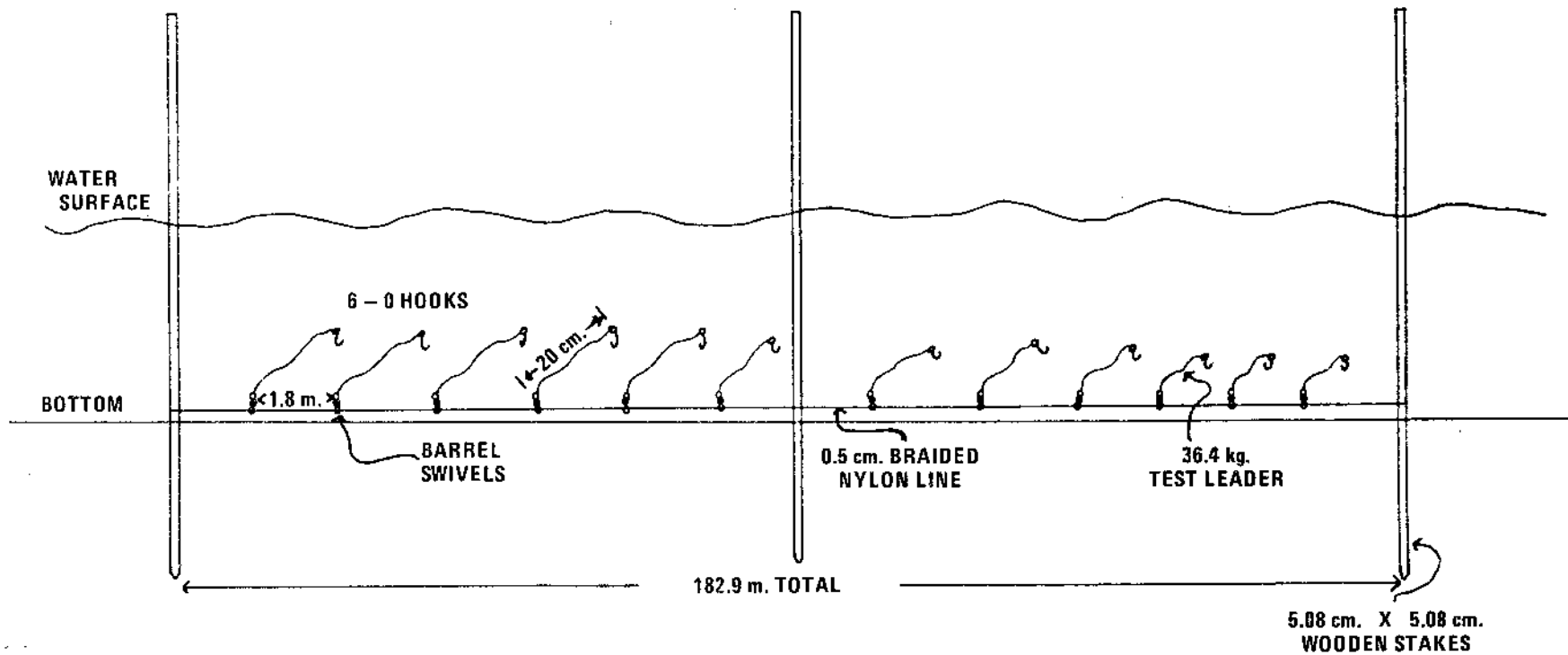


Figure 2. Bottom trotline

Appendix A. Summary of trotline catch data.

Table 1. Total number of hooks and hook-hours of top and bottom trotlines, by bait type, during day and night sets in upper Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Fall (Sept.-Nov.)								
Natural	200	2400	200	2400	200	2400	200	2400
Dead shrimp	90	1080	100	1200	90	1080	100	1200
Live pinfish	40	480	40	480	50	600	40	480
Crabs	70	840	60	720	60	720	60	720
Leaves	150	1800	150	1800	150	1800	150	1800
Oleander	150	1800	150	1800	150	1800	150	1800
Vegetables	10	120	10	120	10	120	10	120
Carrots	10	120	10	120	NS	0	NS	0
Potatoes	NS	0	NS	0	10	120	10	120
Worms	180	2160	180	2160	180	2160	180	2160
Colored corks	60	720	60	720	60	720	60	720
Winter (Dec.-Feb.)								
Natural	150	1800	160	1920	180	2160	180	2160
Dead shrimp	70	840	70	840	100	1200	100	1200
Live pinfish	50	600	60	720	30	360	20	240
Cut mullet	30	360	30	360	50	600	60	720
Leaves	120	1440	110	1320	130	1560	130	1560
Oleander	120	1440	110	1320	130	1560	130	1560
Vegetables	30	360	30	360	50	600	50	600
Potatoes	20	240	20	240	40	480	40	480
Other ^a	10	120	10	120	10	120	10	120
Worms	150	1800	150	1800	180	2160	180	2160
Colored corks	50	600	50	600	60	720	60	720

Table 1. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Spring (March-May)								
Natural	180	1958	210	2775	180	1944	230	3041
Dead shrimp	120	1313	150	1935	120	1343	150	1928
Cut mullet	30	345	30	405	30	293	30	405
Squid	30	300	30	435	30	308	50	708
Leaves	120	1305	140	1850	120	1295	140	1840
Oleander	120	1305	140	1850	120	1295	140	1840
Vegetables	60	653	70	925	60	649	70	921
Carrots	10	120	20	245	10	123	20	243
Potatoes	40	420	40	555	40	406	40	550
Beets	10	113	10	125	10	120	10	128
Worms	180	1958	210	2775	180	1944	210	2760
Colored corks	60	653	70	925	50	549	40	505
Corks w/shrimp	NS	0	NS	0	10	150	10	135
Summer (June-Aug.)								
Natural	180	2176	180	2184	180	2145	180	2198
Dead shrimp	150	1778	150	1816	150	1785	150	1823
Live pinfish	30	398	30	368	30	360	30	375
Leaves	120	1450	120	1455	120	1430	120	1465
Oleander	120	1450	120	1455	120	1430	120	1465
Vegetables	60	727	60	729	60	715	60	734
Potatoes	30	366	30	353	30	365	30	356
Beets	20	246	20	256	20	235	20	258
Other ^a	10	115	10	120	10	115	10	120
Worms	180	2176	180	2184	180	2145	180	2198
Colored corks	60	726	60	729	60	715	60	733

Table 1. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Annual total								
Natural	710	8334	750	9279	740	8649	790	9799
Dead shrimp	430	5011	460	5671	470	5528	500	6151
Live pinfish	120	1478	140	1688	100	1200	90	1095
Cut mullet	60	705	60	765	80	893	90	1125
Squid	30	300	30	435	30	308	50	708
Crabs	70	840	60	720	60	720	60	720
Leaves	510	5995	520	6425	520	6085	540	6665
Oleander	510	5995	520	6425	520	6085	540	6665
Vegetables	160	1860	170	2124	180	2084	190	2375
Carrots	20	240	20	245	20	243	20	243
Potatoes	90	1026	100	1268	110	1251	120	1506
Beets	30	359	30	381	30	355	30	386
Other ^a	20	235	20	240	20	235	20	240
Worms	690	8094	720	8919	720	8409	750	9278
Colored corks	230	2699	240	2974	230	2704	220	2678
Corks w/shrimp	NS	0	NS	0	10	100	10	135

^aOthers included cabbage and bell peppers.

Table 2. Total number of hooks and hook-hours of top and bottom trotlines, by bait type, during day and night sets in lower Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Fall (Sept.-Nov.)								
Natural	210	1800	240	2880	210	1800	240	2880
Dead shrimp	50	440	20	240	40	360	20	240
Live pinfish	51	408	50	600	NS	0	NS	0
Live mullet	NS	0	10	120	20	160	20	240
Dead menhaden	NS	0	30	360	NS	0	20	240
Cut mullet	80	720	130	1560	140	1200	180	2160
Crabs	29	232	NS	0	10	80	NS	0
Leaves	130	1120	150	1800	110	1800	150	1800
Oleander	80	680	90	1080	70	600	90	1080
Other ^a	50	440	60	720	40	360	60	720
Vegetables	70	600	80	960	90	760	80	960
Carrots	30	280	30	360	40	360	30	360
Potatoes	20	160	20	240	30	240	20	240
Beets	NS	0	10	120	NS	0	10	120
Citrus peel	20	160	20	240	20	160	20	240
Worms	210	1800	240	2880	210	1800	240	2880
Colored corks	70	600	80	960	70	600	80	960
Styrofoam	10	80	10	120	10	80	10	120
Winter (Dec.-Feb.)								
Natural	210	1800	270	3240	210	1800	270	3240
Dead shrimp	140	1200	180	2160	140	1200	180	2160
Cut mullet	40	320	50	600	40	320	50	600
Squid	30	280	40	480	30	280	40	480
Leaves	80	680	100	1200	80	680	100	1200
Oleander	70	600	90	1080	70	600	90	1080
Other ^a	10	80	10	120	10	80	10	120

Table 2. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Winter (cont'd).								
Vegetables	130	1120	170	2040	130	1120	170	2040
Cranberries	50	440	70	840	50	440	70	840
Carrots	30	240	40	480	30	240	40	480
Beets	10	80	10	120	10	80	10	120
Citrus peel	40	360	50	600	40	360	50	600
Worms	210	1800	270	3240	210	1800	270	3240
Colored corks	70	600	90	1080	70	600	90	1080
Spring (Mar.-May)								
Natural	220	2010	270	3180	210	1920	300	3420
Dead shrimp	60	540	50	720	60	540	70	840
Live pinfish	105	960	85	900	NS	0	NS	0
Live mullet	NS	0	30	340	NS	0	NS	0
Live killifish	NS	0	10	120	NS	0	NS	0
Cut mullet	45	430	85	980	110	1060	130	1500
Squid	10	80	10	120	40	320	100	1080
Leaves	40	380	80	940	40	380	60	700
Oleander	40	380	80	940	40	380	60	700
Vegetables	160	1450	240	2720	170	1540	240	2720
Cranberries	20	180	20	240	20	180	20	240
Carrots	60	550	100	1140	70	640	100	1140
Potatoes	10	80	20	240	10	80	20	240
Cactus	40	380	60	660	40	380	60	660
Citrus peel	30	260	40	440	30	260	40	440
Worms	210	1920	300	3420	210	1920	300	3420
Colored corks	70	640	100	1140	70	640	100	1140

Table 2. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Summer (June-Aug.)								
Natural	180	1860	180	2400	180	1860	180	2400
Live pinfish	180	1860	180	2400	180	1860	180	2400
Leaves	60	620	60	800	60	620	60	800
Oleander	60	620	60	800	60	620	60	800
Vegetables	120	1210	120	1600	120	1240	120	1600
Carrots	40	400	40	500	40	430	40	500
Potatoes	20	190	20	300	20	190	20	300
Cactus	60	620	60	800	60	620	60	800
Worms	180	1860	180	2400	180	1860	180	2400
Colored corks	60	620	60	800	60	620	60	800
Annual total								
Natural	820	7470	970	11700	810	7380	990	11940
Dead shrimp	250	2180	260	3120	240	2100	270	3240
Live pinfish	336	3228	315	3900	180	1860	180	2400
Live mullet	NS	0	40	460	20	160	20	240
Live killifish	NS	0	10	120	NS	0	NS	0
Dead menhaden	NS	0	30	360	NS	0	20	240
Cut mullet	165	1470	265	3140	290	2580	360	4260
Squid	40	360	50	600	70	600	140	1560
Crabs	29	232	NS	0	10	80	NS	0
Leaves	310	2800	390	4740	290	2640	370	4500
Oleander	250	2280	320	3900	240	2200	300	3660
Other ^a	60	520	70	840	50	440	70	840

Table 2. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h	Hooks (No.)	Hook-h
Annual total (cont'd).								
Vegetables	480	4380	610	7320	510	4660	610	7320
Cranberries	70	620	90	1080	70	620	90	1080
Carrots	160	1470	210	2480	180	1670	210	2480
Potatoes	50	430	60	780	60	510	60	780
Beets	10	80	20	240	10	80	20	240
Cactus	100	1000	120	1460	100	1000	120	1460
Citrus peel	90	780	110	1280	90	780	110	1280
Worms	810	7380	990	11940	810	7380	990	11940
Colored corks	270	2460	330	3980	270	2460	330	3980
Styrofoam	10	80	10	120	10	80	10	120

^aOthers included fiddle and pittisporum leaves.

Table 3. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of red drum (*Sciaenops ocellata*), by bait type, during day and night sets in upper Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.000		0.000		0.000		0.000	
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.000		0.000		0.000		0.000	
Crabs	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		NS		0.000		NS	
Potatoes	NS		0.000		NS		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Winter (Dec.-Feb.)								
Natural	0.056	0.060	0.156	0.180	0.000		0.046	0.053
Dead shrimp	0.119	0.130	0.357	0.411	0.000		0.083	0.095
Live pinfish	0.000		0.000		0.000		0.000	
Cut mullet	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.046	0.038
Colored corks	0.000		0.000		0.000		0.000	

Table 3. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (March-May)								
Natural	0.051	0.033	0.108	0.070	0.051	0.039	0.000	
Dead shrimp	0.000		0.103	0.060	0.075	0.056	0.000	
Cut mullet	0.290	0.189	0.000		0.000		0.000	
Squid	0.000		0.230	0.183	0.000		0.000	
Leaves	0.077	0.057	0.054	0.035	0.077	0.056	0.000	
Oleander	0.077	0.057	0.054	0.035	0.077	0.056	0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Worms	0.051	0.037	0.036	0.016	0.000		0.501	0.016
Colored corks	0.000		0.000		0.000		0.000	
Corks w/shrimp	0.000		0.000		0.000		0.000	
Summer (June-Aug.)								
Natural	0.000		0.137	0.160	0.000		0.000	
Dead shrimp	0.000		0.055	0.037	0.000		0.000	
Live pinfish	0.000		0.533	0.751	0.000		0.000	
Leaves	0.000		0.138	0.092	0.000		0.000	
Oleander	0.000		0.138	0.092	0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.092	0.057	0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 3. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.024		0.097	0.096	0.012	0.009	0.010	0.012
Dead shrimp	0.020	0.022	0.109	0.093	0.018	0.014	0.016	0.019
Live pinfish	0.000		0.119	0.167	0.000		0.000	
Cut mullet	0.142	0.092	0.000		0.000		0.000	
Squid	0.000		0.230	0.183	0.000		0.000	
Crabs	0.000		0.000		0.000		0.000	
Leaves	0.017	0.013	0.047	0.031	0.016	0.012	0.000	
Oleander	0.017	0.013	0.047	0.031	0.016	0.012	0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.037	0.025	0.011	0.005	0.000		0.022	0.013
Colored corks	0.000		0.000		0.000		0.000	
Corks w/shrimp	0.000		0.000		0.000		0.000	

^aOthers included cabbage and bell pepper.

Table 4. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of spotted seatrout (*Cynoscion nebulosus*), by bait type, during day and night sets in upper Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.045	0.024	0.083	0.031	0.000		0.000	
Dead shrimp	0.093	0.054	0.000		0.000		0.000	
Live pinfish	0.000		0.333	0.125	0.000		0.000	
Crabs	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		NS		0.000		NS	
Potatoes	NS		0.000		NS		0.000	
Worms	0.232	0.108	0.324	0.121	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Winter (Dec.-Feb.)								
Natural	0.111	0.055	0.260	0.188	0.000		0.000	
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.333	0.165	0.694	0.500	0.000		0.000	
Cut mullet	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.000		0.278	0.098	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 4. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (March-May)								
Natural	0.051	0.015	0.072	0.035	0.000		0.066	0.051
Dead shrimp	0.076	0.023	0.103	0.050	0.000		0.052	0.035
Cut mullet	0.000		0.000		0.000		0.247	0.217
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.108	0.037	0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.800	0.273	0.000		0.000	
Worms	0.255	0.153	0.864	0.625	0.000		0.036	0.017
Colored corks	0.000		0.000		0.000		0.000	
Corks w/shrimp	0.000		0.000		0.000		0.000	
Summer (June-Aug.)								
Natural	0.092	0.092	0.183	0.206	0.000		0.000	
Dead shrimp	0.000		0.055	0.030	0.000		0.000	
Live pinfish	0.503	0.502	0.815	1.075	0.000		0.000	
Leaves	0.000		0.138	0.064	0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.230	0.090	0.687	0.430	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 4. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.072	0.046	0.140	0.100	0.000		0.020	0.016
Dead shrimp	0.040	0.017	0.053	0.027	0.000		0.016	0.010
Live pinfish	0.271	0.202	0.176	0.438	0.000		0.000	
Cut mullet	0.000		0.000		0.000		0.016	0.078
Squid	0.000		0.000		0.000		0.000	
Crabs	0.000		0.000		0.000		0.000	
Leaves	0.000		0.031	0.015	0.000		0.000	
Oleander	0.000		0.031	0.015	0.000		0.000	
Vegetables	0.000		0.047	0.016	0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.263	0.090	0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.185	0.090	0.572	0.345	0.000		0.011	0.005
Colored corks	0.000		0.000		0.000		0.000	
Corks w/shrinp	0.000		0.000		0.000		0.000	

^aOthers included cabbage and bell peppers.

Table 5. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of black drum (*Pogonias cromis*), by bait type, during day and night sets in upper Laguna Madre (Sept. 1977-Aug. 1978).
 NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.000		0.042	0.036	0.000		0.083	0.110
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.000		0.000		0.000		0.000	
Crabs	0.000		0.139	0.120	0.000		0.278	0.331
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		NS		0.000		NS	
Potatoes	NS		0.000		NS		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Winter (Dec.-Feb.)								
Natural	0.000		0.000		0.042	0.092	0.139	0.244
Dead shrimp	0.000		0.000		0.083	0.019	0.250	0.440
Live pinfish	0.000		0.000		0.000		0.000	
Cut mullet	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.046	0.046
Colored corks	0.000		0.000		0.000		0.000	

Table 5. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (March-May)								
Natural	0.102	0.100	0.180	0.375	0.103	0.122	0.230	0.535
Dead shrimp	0.076	0.087	0.000		0.149	0.177	0.311	0.679
Cut mullet	0.290	0.230	0.741	2.072	0.000		0.000	
Squid	0.000		0.460	0.467	0.000		0.141	0.398
Leaves	0.000		0.000		0.077	0.078	0.000	
Oleander	0.000		0.000		0.077	0.078	0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Corks w/shrimp	0.000		0.000		0.000		0.000	
Summer (June-Aug.)								
Natural	0.000		0.046	0.044	0.093	0.133	0.319	0.568
Dead shrimp	0.000		0.055	0.053	0.056	0.048	0.329	0.622
Live pinfish	0.000		0.000		0.278	0.455	0.267	0.303
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 5. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.024	0.023	0.075	0.061	0.058	0.040	0.194	0.372
Dead shrimp	0.020	0.023	0.018	0.015	0.724	0.063	0.243	0.489
Live pinfish	0.000		0.000		0.083	0.136	0.091	0.104
Cut mullet	0.142	0.113	0.392	0.247	0.000		0.000	
Squid	0.000		0.460	0.467	0.000		0.141	0.398
Crabs	0.000		0.139	0.120	0.000		0.278	0.331
Leaves	0.000		0.000		0.016	0.017	0.000	
Oleander	0.000		0.000		0.016	0.017	0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.011	0.011
Colored corks	0.000		0.000		0.000		0.000	
Cork w/shrimp	0.000		0.000		0.000		0.000	

^aOthers included cabbage and bell pepper.

Table 6. Seasonal top and bottom trotline catches (no/100 hook-h) of scrap fish, by bait type, during day and night sets in upper Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample.

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Fall (Sept.-Nov.)				
Natural	0.458	0.833	0.333	0.667
Dead shrimp	0.648	1.111	0.667	1.250
Live pinfish	0.833	1.333	0.000	0.208
Crabs	0.000	0.000	0.000	0.000
Leaves	0.056	0.056	0.000	0.000
Oleander	0.056	0.056	0.000	0.000
Vegetables	0.000	0.000	0.000	0.000
Carrots	0.000	NS	0.000	NS
Potatoes	NS	0.000	NS	0.000
Worms	0.000	0.093	0.000	0.093
Colored corks	0.000	0.139	0.000	0.000
Winter (Dec.-Feb.)				
Natural	0.056	0.208	0.000	0.139
Dead shrimp	0.167	0.000	0.000	0.000
Live pinfish	0.000	0.417	0.000	0.000
Cut mullet	0.000	0.278	0.000	0.417
Leaves	0.000	0.076	0.000	0.000
Oleander	0.000	0.076	0.000	0.000
Vegetables	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.000	0.000
Worms	0.000	0.000	0.000	0.000
Colored corks	0.000	0.000	0.000	0.000

Table 6. (Cont'd).

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Spring (March-May)				
Natural	1.379	1.333	0.720	1.410
Dead shrimp	1.142	1.034	0.670	0.986
Cut mullet	0.580	0.988	0.341	0.741
Squid	3.333	2.989	1.299	1.271
Leaves	0.153	0.324	0.000	0.000
Oleander	0.153	0.324	0.000	0.000
Vegetables	0.000	0.000	0.154	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.246	0.000
Beets	0.000	0.000	0.000	0.000
Worms	0.255	0.180	0.000	0.073
Colored corks	0.000	0.000	0.000	0.198
Corks w/shrimp	0.000	0.000	0.000	0.000
Summer (June-Aug.)				
Natural	0.919	0.824	0.932	1.319
Dead shrimp	0.844	0.991	1.001	1.426
Live pinfish	1.256	0.000	0.556	0.800
Leaves	0.000	0.000	0.000	0.000
Oleander	0.000	0.000	0.000	0.000
Vegetables	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.000	0.000
Beets	0.000	0.000	0.000	0.000
Other ^a	0.000	0.000	0.000	0.000
Worms	0.138	0.137	0.000	0.000
Colored corks	0.000	0.000	0.000	0.000

Table 6. (Cont'd).

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Annual total				
Natural	0.708	0.851	0.486	0.806
Dead shrimp	0.738	0.882	0.633	0.976
Live pinfish	0.677	0.652	0.167	0.365
Cut mullet	0.284	0.654	0.112	0.533
Squid	3.333	2.989	1.299	1.271
Crabs	0.000	0.000	0.000	0.000
Leaves	0.050	0.125	0.000	0.000
Oleander	0.050	0.125	0.000	0.000
Vegetables	0.000	0.000	0.048	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.080	0.000
Beets	0.000	0.000	0.000	0.000
Other ^a	0.000	0.000	0.000	0.000
Worms	0.099	0.112	0.000	0.043
Colored corks	0.000	0.034	0.000	0.037
Corks w/shrimp	0.000	0.000	0.000	0.000

^aOthers included cabbage and bell pepper

Table 7. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of red drum (*Sciaenops ocellata*), by bait type, during day and night sets in lower Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.000		0.241	0.401	0.000		0.035	0.102
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.000		0.333	0.529	NS		NS	
Live mullet	NS		0.000		0.000		0.417	1.220
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.000		0.321	0.538	0.000		0.000	
Crabs	0.000		NS		0.000		NS	
Leaves	0.000		0.000		0.000		0.056	0.024
Oleander	0.000		0.000		0.000		0.093	0.039
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.208	0.135	0.000		0.000	
Carrots	0.000		0.278	0.170	0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	NS		0.000		NS		0.000	
Citrus peel	0.000		0.417	0.283	0.000		0.000	
Worms	0.000		0.174	0.283	0.000		0.000	
Colored corks	0.000		0.208	0.080	0.000		0.000	
Styrofoam	0.000		0.000		0.000		0.000	

Table 7. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Winter (Dec.-Feb.)								
Natural	0.000		0.216	0.454	0.000		0.000	
Dead shrimp	0.000		0.324	0.681	0.000		0.000	
Cut mullet	0.000		0.000		0.000		0.000	
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.083	0.163	0.000		0.000	
Oleander	0.000		0.093	0.180	0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.098	0.416	0.000		0.000	
Cranberries	0.000		0.119	0.070	0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.167	0.204	0.000		0.000	
Worms	0.000		0.154	0.232	0.000		0.000	
Colored corks	0.000		0.093	0.139	0.000		0.000	
Spring (March-May)								
Natural	0.050	0.097	0.063	0.185	0.000		0.000	
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.000		0.111	0.285	NS		NS	
Live mullet	NS		0.000		NS		NS	
Live killifish	NS		0.000		NS		NS	
Cut mullet	0.233	0.454	0.102	0.340	0.000		0.000	
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.532	0.735	0.000		0.000	
Oleander	0.000		0.532	0.735	0.000		0.000	
Vegetables	0.069	0.121	0.368	0.783	0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.439	0.990	0.000		0.000	
Potatoes	0.000		0.417	1.220	0.000		0.000	
Cactus	0.263	0.460	0.303	0.504	0.000		0.000	
Citrus peel	0.000		0.455	0.865	0.000		0.000	

Table 7. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (Cont'd).								
Worms	0.052	0.136	0.059	0.088	0.000		0.000	
Colored corks	0.156	0.166	0.263	0.559	0.000		0.000	
Summer (June-Aug.)								
Natural	0.161	0.256	0.083	0.177	0.000		0.000	
Live pinfish	0.161	0.256	0.083	0.177	0.000		0.000	
Leaves	0.000		0.125	0.267	0.000		0.000	
Oleander	0.000		0.125	0.267	0.000		0.000	
Vegetables	0.000		0.125	0.193	0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.667	1.030	0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Worms	0.054	0.064	0.042	0.104	0.000		0.000	
Colored corks	0.000		0.500	1.205	0.000		0.000	

Table 7. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.054	0.009	0.154	0.311	0.000		0.008	0.025
Dead shrimp	0.000		0.224	0.472	0.000		0.000	
Live pinfish	0.093	0.147	0.128	0.256	0.000		0.000	
Live mullet	NS		0.000		0.000		0.417	1.220
Live killifish	NS		0.000		NS		NS	
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.068	0.133	0.191	0.373	0.000		0.000	
Squid	0.000		0.000		0.000		0.000	
Crabs	0.000		NS		0.000		NS	
Leaves	0.000		0.148	0.232	0.000		0.022	0.010
Oleander	0.000		0.180	0.282	0.000		0.027	0.011
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.023	0.040	0.219	0.376	0.000		0.000	
Cranberries	0.000		0.093	0.055	0.000		0.000	
Carrots	0.000		0.242	0.480	0.000		0.000	
Potatoes	0.000		0.385	0.765	0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Cactus	0.100	0.175	0.137	0.228	0.000		0.000	
Citrus peel	0.000		0.313	0.446	0.000		0.000	
Worms	0.027	0.051	0.109	0.177	0.000		0.000	
Colored corks	0.041	0.043	0.251	0.498	0.000		0.000	
Styrofoam	0.000				0.000		0.000	

^aOthers included fiddle and pittosporum leaves.

Table 8. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of spotted seatrout (*Cynoscion nebulosus*), by bait type, during day and night sets in lower Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.056	0.026	0.278	0.294	0.056	0.040	0.035	0.073
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.245	0.113	0.833	0.525	NS		NS	
Live mullet	NS		0.833	1.000	0.000		0.000	
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.000		0.128	0.264	0.083	0.059	0.046	0.097
Crabs	0.000		NS		0.000		NS	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Poatoes	0.000		0.000		0.000		0.000	
Beets	NS		0.000		NS		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.000		0.313	0.128	0.000		0.035	0.017
Colored corks	0.000		0.000		0.000		0.000	
Styrofoam	0.000		0.000		0.000		0.000	

Table 8. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Winter (Dec.-Feb.)								
Natural	0.000		0.031	0.075	0.000		0.031	0.065
Dead shrimp	0.000		0.000		0.000		0.000	
Cut mullet	0.000		0.167	0.401	0.000		0.167	0.350
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.000		0.031	0.008	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Spring (March-May)								
Natural	0.100	0.105	0.377	0.322	0.000		0.029	0.031
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.208	0.220	0.556	0.597	NS		NS	
Live mullet	NS		1.471	1.116	NS		NS	
Live killifish	NS		0.833	0.330	NS		NS	
Cut mullet	0.000		0.102	0.070	0.000		0.067	0.070
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	

Table 8. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (Cont'd).								
Vegetables	0.000		0.000		0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.052	0.044	0.439	0.251	0.000		0.000	
Colored corks	0.000		0.088	0.050	0.000		0.000	
Summer (June-Aug.)								
Natural	0.269	0.409	0.292	0.278	0.161	0.208	0.083	0.112
Live pinfish	0.269	0.409	0.292	0.278	0.161	0.208	0.083	0.112
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Worms	0.000		0.333	0.103	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 8. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.107	0.136	0.239	0.238	0.054	0.062	0.042	0.066
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.248	0.315	0.436	0.390	0.054	0.038	0.083	0.112
Live mullet	NS		1.304	1.086	0.000		0.000	
Live killifish	NS		0.833	0.330	NS		NS	
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.000		0.127	0.230	0.116	0.150	0.070	0.123
Squid	0.000		0.000		0.000		0.000	
Crabs	0.000		NS		0.000		NS	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.014	0.011	0.276	0.126	0.000		0.008	0.004
Colored corks	0.000		0.025	0.015	0.000		0.000	
Styrofoam	0.000		0.000		0.000		0.000	

^aOthers included fiddle and pittsorum leaves

Table 9. Seasonal top and bottom trotline catches (no/100 hook-h and kg/100 hook-h) of black drum (Pogonias cromis), by bait type, during day and night sets in lower Laguna Madre (Sept. 1977-Aug. 1978).
 NS = no sample; blank = 0.000 kg/100 hook-h.

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Fall (Sept.-Nov.)								
Natural	0.000		0.694	0.152	0.000		0.069	0.151
Dead shrimp	0.000		0.000		0.000		0.000	
Live pinfish	0.000		0.000		NS		NS	
Live mullet	NS		0.833	1.174	0.000		0.000	
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.000		0.064	0.191	0.000		0.093	0.200
Crabs	0.000		NS		0.000		NS	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.208	0.521	0.000		0.000	
Carrots	0.000		0.278	0.695	0.000		0.000	
Potatoes	0.000		0.417	1.042	0.000		0.000	
Beets	NS		0.000		0.000		0.000	
Citrus peel	0.000		0.000		NS		0.000	
Worms	0.000		0.035	0.047	0.000		0.000	
Colored corks	0.000		0.104	0.170	0.000		0.000	
Styrofoam	0.000		0.000		0.000		0.000	

Table 9. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Winter (Dec.-Feb.)								
Natural	0.000		0.309	0.668	0.000		0.216	0.386
Dead shrimp	0.000		0.417	0.864	0.000		0.232	0.377
Cut mullet	0.000		0.167	0.496	0.000		0.333	0.722
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.056	0.139	0.000		0.000	
Oleander	0.000		0.093	0.231	0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.000		0.062	0.080	0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Spring (March-May)								
Natural	0.000		0.031	0.350	0.000		0.000	
Dead shrimp	0.000		0.139	0.155	0.000		0.000	
Live pinfish	0.000		0.000		NS		NS	
Live mullet	NS		0.000		NS		NS	
Live killifish	NS		0.000		NS		NS	
Cut mullet	0.000		0.000		0.000		0.000	
Squid	0.000		0.000		0.000		0.000	
Leaves	0.000		0.106	0.215	0.000		0.000	
Oleander	0.000		0.106	0.215	0.000		0.000	

Table 9. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Spring (Cont'd).								
Vegetables	0.000		0.000		0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	
Summer (June-Aug.)								
Natural								
Live pinfish	0.000		0.000		0.000		0.000	
Leaves	0.000		0.000		0.000		0.000	
Oleander	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.000		0.000		0.000	
Carrots	0.000		0.000		0.000		0.000	
Potatoes	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Worms	0.000		0.000		0.000		0.000	
Colored corks	0.000		0.000		0.000		0.000	

Table 9. (Cont'd).

Bait type	Top				Bottom			
	Day		Night		Day		Night	
	No.	kg	No.	kg	No.	kg	No.	kg
Annual total								
Natural	0.000		0.111	0.232	0.000		0.075	0.141
Dead shrimp	0.000		0.321	0.634	0.000		0.154	0.252
Live pinfish	0.000		0.000		0.000		0.000	
Live mullet	NS		0.217	0.306	0.000		0.000	
Live killifish	NS		0.000		NS		NS	
Dead menhaden	NS		0.000		NS		0.000	
Cut mullet	0.000		0.064	0.190	0.000		0.094	0.204
Squid	0.000		0.000		0.000		0.000	
Crabs	0.000		NS		0.000		0.000	
Leaves	0.000		0.042	0.095	0.000		0.000	
Oleander	0.000		0.051	0.116	0.000		0.000	
Other ^a	0.000		0.000		0.000		0.000	
Vegetables	0.000		0.027	0.068	0.000		0.000	
Cranberries	0.000		0.000		0.000		0.000	
Carrots	0.000		0.040	0.101	0.000		0.000	
Potatoes	0.000		0.128	0.320	0.000		0.000	
Beets	0.000		0.000		0.000		0.000	
Cactus	0.000		0.000		0.000		0.000	
Citrus peel	0.000		0.000		0.000		0.000	
Worms	0.000		0.025	0.033	0.000		0.000	
Colored corks	0.000		0.025	0.041	0.000		0.000	
Styrofoam	0.000		0.000		0.000		0.000	

^aOthers included fiddle and pittisporum leaves.

Table 10. Seasonal top and bottom trotline catches (no/100 hook-h) of scrap fish, by bait type, during day and night sets in lower Laguna Madre (Sept. 1977-Aug. 1978). NS = no sample.

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Fall (Sept.-Nov.)				
Natural	0.222	1.181	0.222	0.694
Dead shrimp	0.227	0.833	0.000	0.417
Live pinfish	0.490	1.167	NS	NS
Live mullet	NS	0.000	1.250	0.417
Dead menhaden	NS	0.833	NS	0.417
Cut mullet	0.000	1.410	0.167	0.787
Crabs	0.431	NS	0.000	NS
Leaves	0.000	0.222	0.000	0.000
Oleander	0.000	0.093	0.000	0.000
Other ^a	0.000	0.417	0.000	0.000
Vegetables	0.000	0.000	0.000	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.000	0.000
Beets	NS	0.000	NS	0.000
Citrus peel	0.000	0.000	0.000	0.000
Worms	0.000	0.069	0.056	0.000
Colored corks	0.000	0.104	0.000	0.000
Styrofoam	0.000	0.000	0.000	0.000
Winter (Dec.-Feb.)				
Natural	0.111	0.216	0.111	0.216
Dead shrimp	0.167	0.139	0.167	0.185
Cut mullet	0.000	0.000	0.000	0.000
Squid	0.000	0.833	0.000	0.625
Leaves	0.000	0.000	0.000	0.000
Oleander	0.000	0.000	0.000	0.000
Other ^a	0.000	0.000	0.000	0.000

Table 10. (Cont'd).

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Winter (Cont'd).				
Vegetables	0.000	0.000	0.000	0.000
Cranberries	0.000	0.000	0.000	0.000
Carrots	0.000	0.000	0.000	0.000
Beets	0.000	0.000	0.000	0.000
Citrus peel	0.000	0.000	0.000	0.000
Worms	0.000	0.000	0.000	0.000
Colored corks	0.000	0.000	0.000	0.000
Spring (March-May)				
Natural	1.244	1.415	0.521	1.140
Dead shrimp	0.000	0.000	0.000	0.119
Live pinfish	1.250	1.667	NS	NS
Live mullet	NS	0.588	NS	NS
Live killifish	NS	2.500	NS	NS
Cut mullet	1.861	2.041	0.849	1.667
Squid	6.250	4.167	0.313	1.204
Leaves	0.000	0.790	0.000	0.000
Oleander	0.000	0.790	0.000	0.000
Vegetables	0.069	0.037	0.000	0.000
Cranberries	0.000	0.000	0.000	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.417	0.000	0.000
Cactus	0.263	0.000	0.000	0.000
Citrus peel	0.000	0.000	0.000	0.000
Worms	0.000	0.117	0.000	0.059
Colored corks	0.000	0.263	0.000	0.088

Table 10. (Cont'd).

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Summer (June-Aug.)				
Natural	0.215	1.042	0.538	0.875
Live pinfish	0.215	1.042	0.538	0.875
Leaves	0.000	0.000	0.000	0.125
Oleander	0.000	0.000	0.000	0.125
Vegetables	0.000	0.000	0.000	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.000	0.000	0.000
Cactus	0.000	0.000	0.000	0.000
Worms	0.000	0.000	0.000	0.000
Colored corks	0.000	0.000	0.000	0.000
Annual total				
Natural	0.469	0.949	0.352	0.729
Dead shrimp	0.138	0.160	0.095	0.185
Live pinfish	0.558	1.205	0.538	0.875
Live mullet	NS	0.435	1.250	0.417
Live killifish	NS	2.500	NS	NS
Dead menhaden	NS	0.833	NS	0.417
Cut mullet	0.544	1.338	0.426	0.986
Squid	1.389	1.500	0.167	1.026
Crabs	0.431	NS	0.000	NS
Leaves	0.000	0.148	0.000	0.022
Oleander	0.000	0.103	0.000	0.027
Other ^a	0.000	0.357	0.000	0.000

Table 10. (Cont'd).

Bait type	Top		Bottom	
	Day (No.)	Night (No.)	Day (No.)	Night (No.)
Annual total (Cont'd).				
Vegetables	0.023	0.014	0.000	0.000
Cranberries	0.000	0.000	0.000	0.000
Carrots	0.000	0.000	0.000	0.000
Potatoes	0.000	0.196	0.000	0.000
Beets	0.000	0.000	0.000	0.000
Cactus	0.100	0.000	0.000	0.000
Citrus peel	0.000	0.000	0.000	0.000
Worms	0.000	0.050	0.014	0.017
Colored corks	0.000	0.151	0.000	0.025
Styrofoam	0.000	0.000	0.000	0.000

^aOthers included fiddle and pittosporum leaves.

Appendix B. Summary of hydrological and meteorological data.

Table 1. Mean seasonal water temperature (C) for day and night trotline sets in upper and lower Laguna Madre, Sept. 1977-Aug. 1978 (number in parenthesis = number of samples).

Season	Day		Night	
	$\bar{x} \pm 1SE$	Range	$\bar{x} \pm 1SE$	Range
Upper Laguna Madre				
Fall	26.2 \pm 0.8 (6)	23.0 - 28.5	23.8 \pm 1.25 (6)	20.0 - 26.5
Winter	15.6 \pm 2.3 (5)	10.0 - 22.5	13.9 \pm 1.8 (5)	8.0 - 19.0
Spring	23.7 \pm 2.1 (6)	16.0 - 29.5	22.0 \pm 2.3 (5)	14.0 - 27.0
Summer	31.4 \pm 0.4 (6)	29.5 - 33.0	28.5 \pm 0.4 (6)	27.0 - 30.0
Lower Laguna Madre				
Fall	27.5 \pm 0.8 (6)	24.0 - 30.5	26.9 \pm 1.1 (8)	20.0 - 30.0
Winter	13.0 \pm 1.9 (7)	4.0 \pm 19.0	13.5 \pm 1.7 (9)	6.5 - 20.0
Spring	20.1 \pm 1.1 (7)	14.0 - 25.0	20.4 \pm 1.3 (10)	14.0 - 27.5
Summer	28.2 \pm 0.4 (6)	25.0 - 30.0	29.2 \pm 0.4 (6)	28.0 - 30.0

Table 2. Mean seasonal water salinity (0/00) for day and night trotline sets in upper and lower Laguna Madre, Sept. 1977-Aug. 1978 (numbers in parenthesis indicate number of samples).

Season	Day		Night	
	$\bar{x} \pm 1SE$	Range	$\bar{x} \pm 1SE$	Range
Upper Laguna Madre				
Fall	35.9 ± 0.8 (6)	32.2 - 38.3	35.7 ± 0.8 (6)	32.8 - 37.8
Winter	36.4 ± 2.3 (5)	35.0 - 43.9	36.6 ± 2.3 (5)	29.4 - 44.4
Spring	41.9 ± 1.3 (6)	38.9 - 41.6	41.5 ± 1.3 (6)	37.8 - 47.2
Summer	43.7 ± 0.8 (6)	40.5 - 46.0	43.6 ± 0.4 (6)	41.1 - 45.5
Lower Laguna Madre				
Fall	36.0 ± 0.91 (5)	32.0 - 38.0	34.5 ± 1.4 (8)	24.0 - 38.0
Winter	30.7 ± 1.5 (7)	24.0 - 34.0	30.8 ± 1.3 (9)	24.0 - 36.0
Spring	32.8 ± 1.5 (7)	23.0 - 36.0	32.0 ± 1.3 (10)	23.0 - 36.0
Summer	35.0 ± 1.3 (6)	32.0 - 39.0	35.6 ± 1.4 (5)	32.0 - 39.0

Table 3. Seasonal mean^a wind speed (km/h) at day and night trotline stations in upper and lower Laguna Madre, Sept. 1977-Aug. 1978.

Quarter	Day	Night
Upper Laguna Madre		
Fall	18	10
Winter	18	16
Spring	27	32
Summer	26	16
Lower Laguna Madre		
Fall	6	14
Winter	10	11
Spring	23	26
Summer	27	29

^aData collected at time the trotline was set.

Table 4. Number of times^a during the day and night when wind direction was from the north (N), south (S), east (E), west (W), northeast (NE), northwest (NW), southeast (SE), southwest (SW) or no wind in upper and lower Laguna Madre, Sept. 1977-Aug. 1978.

Season	Wind direction	Upper Laguna Madre		Lower Laguna Madre		Total
		Day	Night	Day	Night	
Fall	N	0	0	1	1	2
	S	3	1	0	0	4
	E	1	1	0	1	3
	W	0	0	0	2	2
	NE	0	1	1	1	3
	NW	0	0	0	0	0
	SE	2	2	3	0	7
	SW	0	0	0	2	2
	No wind	0	1	1	1	3
Winter	N	0	1	1	1	3
	S	0	0	1	0	1
	E	1	2	1	0	4
	W	0	0	0	0	0
	NE	2	2	2	4	10
	NW	0	0	1	0	1
	SE	2	0	0	3	5
	SW	0	0	1	0	1
	No wind	0	0	0	1	1
Spring	N	0	1	1	2	4
	S	0	0	1	0	1
	E	3	0	0	3	6
	W	0	0	0	0	0
	NE	0	0	0	3	3
	NW	1	0	0	0	1
	SE	2	5	3	2	10
	SW	0	0	0	0	0
	No wind	0	0	0	0	0
Summer	N	0	0	0	0	0
	S	0	0	0	0	0
	E	3	3	0	0	6
	W	0	0	0	0	0
	NE	0	0	0	0	0
	NW	0	0	0	0	0
	SE	4	3	6	6	19
	SW	0	0	0	0	0
	No wind	0	0	0	0	0

^aData collected at time the trotline was set.

Table 5. Seasonal mean^a water depth (m) at the shallow and deep ends of trotlines set during the day and night in upper and lower Laguna Madre, Sept. 1977-Aug. 1978.

	Day		Night	
	Shallow	Deep	Shallow	Deep
Upper Laguna Madre				
Fall	0.7	0.9	0.7	0.9
Winter	0.8	0.9	0.8	0.8
Spring	0.7	0.7	0.6	0.6
Summer	0.6	0.6	0.6	0.6
Lower Laguna Madre				
Fall	0.4	0.5	0.4	0.5
Winter	0.4	0.4	0.4	0.4
Spring	0.5	0.5	0.5	0.5
Summer	0.6	0.6	0.6	0.6

^aData collected at time the trotline was set.

Appendix C. Average size of selected fishes caught with trotlines in upper and lower Laguna Madre.

Table 1. Average total length (mm) \pm 1SE of selected fishes caught with top and bottom trotlines, by bait type, for day and night sets in upper Laguna Madre, Sept. 1977-Aug. 1978 (number in parenthesis = number of fish measured).

Species	Bait type	Top		Bottom	
		Day	Night	Day	Night
Red drum	Natural	409 \pm 56 (2)	445 \pm 20 (9)	404 \pm 0 (1)	475 \pm 0 (1)
	Leaves	404 \pm 0 (1)	376 \pm 0 (3)	399 \pm 0 (1)	(0)
	Vegetables	(0)	(0)	(0)	(0)
	Worms	396 \pm 10 (3)	338 \pm 0 (1)	(0)	384 \pm 48 (2)
	Corks	(0)	(0)	(0)	(0)
Spotted seatrout	Natural	353 \pm 69 (6)	427 \pm 20 (13)	(0)	442 \pm 23 (2)
	Leaves	(0)	368 \pm 28 (2)	(0)	(0)
	Vegetables	(0)	338 \pm 0 (1)	(0)	(0)
	Worms	371 \pm 18 (15)	394 \pm 10 (51)	(0)	384 \pm 0 (1)
	Corks	(0)	(0)	(0)	(0)

Table 1. (Cont'd).

Species	Bait type	Top		Bottom	
		Day	Night	Day	Night
Black drum	Natural	404 ± 23 (2)	452 ± 48 (7)	401 ± 41 (5)	460 ± 33 (19)
	Leaves	(0)	(0)	409 ± 0 (1)	(0)
	Vegetables	(0)	(0)	(0)	(0)
	Worms	(0)	(0)	(0)	409 ± 0 (1)
	Corks	(0)	(0)	(0)	(0)

Table 2. Average total length (mm) \pm 1SE of selected fishes caught on top and bottom trotlines, by bait type, for day and night sets in lower Laguna Madre, Sept. 1977-Aug. 1978 (number in parenthesis = number of fish measured).

Species	Bait type	Top		Bottom	
		Day	Night	Day	Night
Red drum	Natural	536 \pm 20 (4)	561 \pm 20 (18)	(0)	650 \pm 0 (1)
	Leaves	(0)	508 \pm 33 (7)	(0)	328 \pm 0 (1)
	Vegetables	538 \pm 0 (1)	526 \pm 25 (16)	(0)	(0)
	Worms	549 \pm 69 (2)	511 \pm 25 (11)	(0)	(0)
	Corks	455 \pm 0 (1)	556 \pm 25 (10)	(0)	(0)
Spotted seatrout	Natural	475 \pm 51 (8)	462 \pm 15 (28)	465 \pm 61 (4)	533 \pm 26 (4)
	Leaves	(0)	(0)	(0)	(0)
	Vegetables	(0)	(0)	(0)	(0)
	Worms	460 \pm 0 (1)	353 \pm 74 (33)	(0)	389 \pm 0 (1)
	Corks	(0)	404 \pm 0 (1)	(0)	389 \pm 0 (1)

Table 2. (Cont'd).

Species	Bait type	Top		Bottom	
		Day	Night	Day	Night
Black drum	Natural	(0)	505 + 20 (13)	(0)	488 + 23 (7)
	Leaves	(0)	531 + 18 (2)	(0)	(0)
	Vegetables	(0)	549 + 0 (3)	(0)	(0)
	Worms	(0)	450 + 5 (3)	(0)	(0)
	Corks	(0)	478 + 0 (1)	(0)	(0)

Appendix D. Summary of three-way and two-way analyses of variances of mean catch rates.

Table 1. Results of three-way analysis of variance of mean catch rates of red drum (Sciaenops ocellata) in upper Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _S
Type of set (R)	1	0.038	0.038	6.578*
Time of day (C)	1	0.007	0.007	1.194 ns
Bait type (S)	4	0.097	0.024	4.206*
R X C	1	0.008	0.008	1.419 ns
R X S	4	0.041	0.010	1.788 ns
C X S	4	0.025	0.006	1.087 ns
R X C X S	4	0.060	0.015	2.611*
Error	460	2.649	0.006	
Total	480	2.925		

* P < 0.05

ns = not significant

Table 2. Results of three-way analysis of variance of mean catch rates of red drum (Sciaenops ocellata) in lower Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	1.720	1.720	36.859*
Time of set (C)	1	0.854	0.854	18.309*
Bait type (S)	4	0.095	0.024	0.509 ns
R X C	1	0.762	0.762	16.332*
R X S	4	0.093	0.023	0.499 ns
C X S	4	0.099	0.025	0.529 ns
R X C X S	4	0.103	0.026	0.550 ns
Error	580	27.067	0.047	
Total	600	30.809		

* P < 0.05

ns = not significant

Table 3. Results of three-way analysis of variance of mean catch rates of spotted seatrout (Cynoscion nebulosus) in upper Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	1.178	1.178	77.440*
Time of set (C)	1	0.317	0.317	20.818*
Bait type (S)	4	2.562	0.641	42.101*
R X C	1	0.256	0.256	16.849*
R X S	4	2.478	0.619	40.716*
C X S	4	0.660	0.165	10.847*
R X C X S	4	0.607	0.152	9.978*
Error	460	6.998	0.015	
Total	480	15.084		

* $P < 0.05$

Table 4. Results of three-way analysis of variance of mean catch rates of spotted seatrout (Cynoscion nebulosus) in lower Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	0.599	0.599	27.921*
Time of set (C)	1	0.287	0.287	13.392*
Bait type (S)	4	1.418	0.354	16.526*
R X C	1	0.299	0.299	13.942*
R X S	4	0.649	0.162	7.563*
C X S	4	0.424	0.106	4.943*
R X C X S	4	0.399	0.099	4.656*
Error	580	12.438	0.021	
Total	600	16.622		

* P < 0.05

Table 5. Results of three-way analysis of variance of mean catch rates of black drum (Pogonias cromis) in upper Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	0.040	0.039	6.236*
Time of set (C)	1	0.031	0.030	4.781*
Bait type (S)	4	0.558	0.139	21.850*
R X C	1	0.007	0.006	1.021 ns
R X S	4	0.098	0.024	3.819*
C X S	4	0.141	0.035	5.517*
R X C X S	4	0.038	0.009	1.486*
Error	460	2.937	0.006	
Total	480	3.853		

* $P < 0.05$

ns = not significant

Table 6. Results of three-way analysis of variance of mean catch rates of black drum (Pogonias cromis) in lower Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	0.027	0.027	2.968 ns
Time of set (C)	1	0.111	0.111	12.198*
Bait type (S)	4	0.200	0.050	5.489*
R X C	1	0.022	0.022	2.428 ns
R X S	4	0.006	0.002	0.176 ns
C X S	4	0.164	0.041	4.491*
R X C X S	4	0.006	0.002	0.176 ns
Error	580	5.288	0.009	
Total	600	5.826		

* $P < 0.05$

ns = not significant

Table 7. Results of two-way analysis of variance of night mean catch rates of red drum (Sciaenops ocellata) in upper and lower Laguna Madre (Sept. 1977–Au. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	1.428	1.428	15.548*
Bait (C)	4	0.173	0.043	0.471 ns
R X C	4	0.354	0.089	0.964 ns
Error	275	25.262	0.092	
Total	285	27.218		

* $P < 0.05$

ns = not significant

Table 8. Results of two-way analysis of variance of night mean catch rates of spotted seatrout (Cynoscion nebulosus) in upper and lower Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	0.097	0.097	1.810 ns
Bait (C)	4	7.151	1.788	33.413*
R X C	4	1.218	0.304	5.689*
Error	275	14.714	0.054	
Total	285	23.179		

* P < 0.05

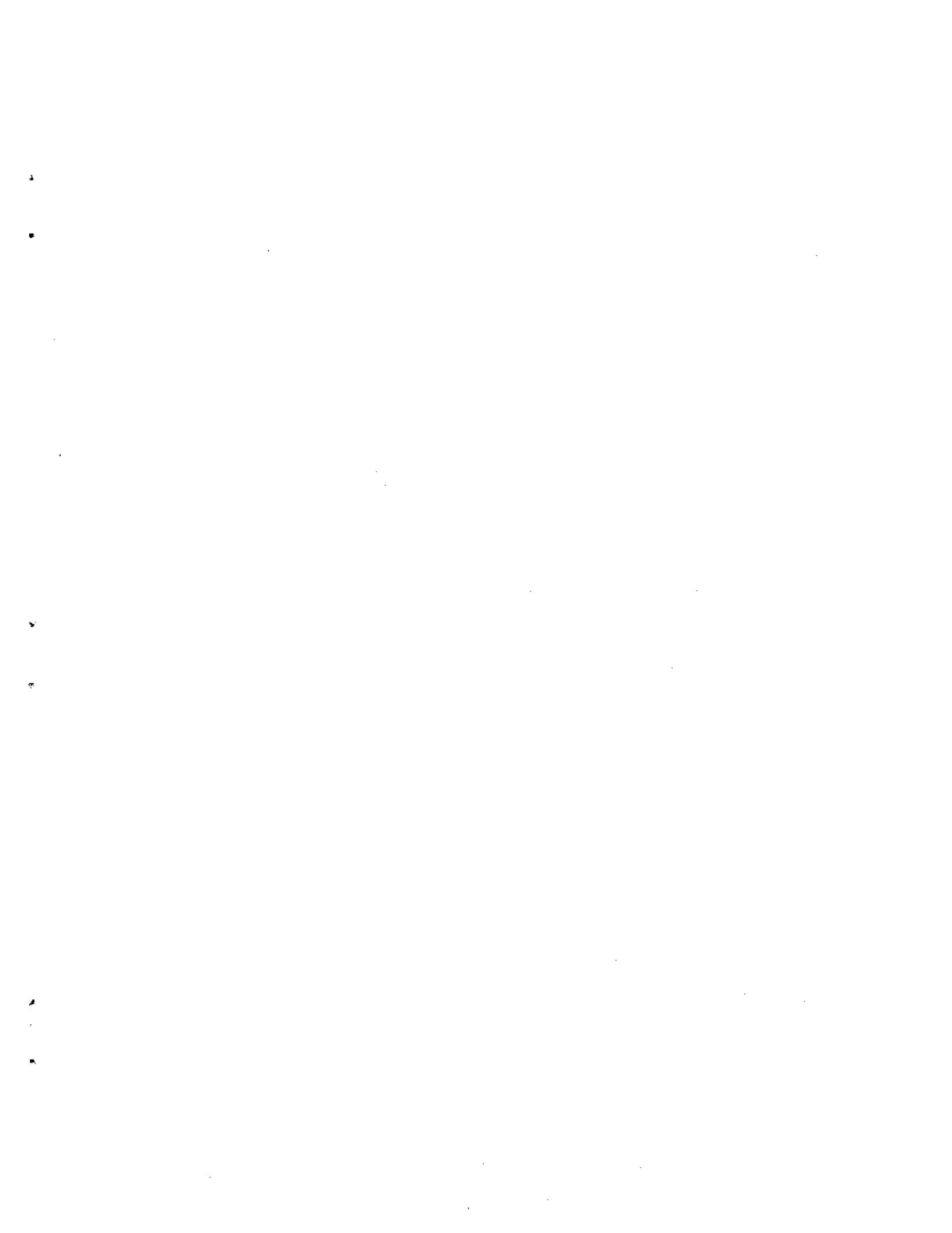
ns = not significant

Table 9. Results of two-way analysis of variance of night mean catch rates of black drum (Pogonias cromis) in upper and lower Laguna Madre (Sept. 1977-Aug. 1978).

Source of variation	df	SS	MS	F _s
Type of set (R)	1	0.041	0.041	3.638 ns
Bait (C)	4	0.689	0.172	15.147*
R X C	4	0.131	0.033	2.877*
Error	280	3.185	0.011	
Total	290	4.046		

* $P < 0.05$

ns = not significant



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