

JOB REPORT

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Project Name: Studies of the Blue Crab Populations of the Texas Coast.
Period Covered: January 1, 1964 - December 31, 1964 Job No.: 1

Coordination of the Blue Crab Studies of the Texas Coast

Abstract: Blue crab (*Callinectes sapidus*) landings in the Galveston area increased from 1,062,091 pounds (live weight) in 1963 to 1,506,300 pounds in 1964. Peak production occurred in May and June. In the Matagorda area 671,000 pounds were reported as compared to 864,451 pounds in 1963. Peak months of production occurred in May and June. The Aransas-Corpus Christi area produced 307,100 pounds. This was about two-thirds less than in 1963 when 1,019,289 pounds were produced.

Biological samples were collected with drag seines, bag seines, trammel nets, bar-seines and trawls. Trammel nets and drag seines appeared to be the least effective sampling device used. Sixty-foot bag seines appeared to be the most effective.

The numbers of crabs caught in samples indicated that crab abundance decreased (in the Texas bays) from north to south. This was probably the result of a severe drought or the lack of flowing rivers on the southern part of the coast.

The sample catches indicated recruitment of juvenile crabs to the population in the Galveston and Matagorda-San Antonio Bay areas occurred three times (about March, July, and November or December), while the Aransas-Corpus Christi Bay area had only one recruitment period from March to May. The Laguna Madre had juvenile recruitment in January and May.

In Galveston Bay 819 tagged crabs were released. There were 77 returns; the greatest distance traveled was 16 miles.

Objectives: To coordinate all coastal crab jobs and to summarize and interpret coastwide crab data received from area biologists.

Procedures: Field biologists from the seven Texas bay areas sampled crab populations twice monthly with a standard 6-foot bar seine (1/2-inch stretch mesh) and a 10-foot shrimp trawl (1 1/4-inch stretch mesh). A 20-foot shrimp trawl (1 1/2-inch stretch mesh) was used each month in bay areas where commercial shrimp fishermen were working. Varying numbers of collections were made each month with a standard 60-foot seine (3/4-inch stretch mesh), and a 2400-foot trammel net (3-inch stretch mesh), or a 3600-foot drag seine (2-inch stretch mesh). The trawling time interval to collect a standard sample was 15 minutes. The catch per unit effort at all other stations was calculated as catch per area of bay bottom covered. In some areas, crab traps were used to catch crabs for tagging. Blue crabs were also sampled in the shallow gulf off the lower coast with a 42-foot shrimp trawl (2-inch stretch mesh). All crabs collected were measured in carapace width in millimeters and sexed.

Table 1 presents the total number of blue crabs for each sex by area and month for the period 1962 through 1964.

Figure 1 shows blue crab commercial landings by area from September 1961 through December 1964.

The Galveston area includes Sabine Lake, Galveston Bay, and the area around Freeport. The Matagorda area includes East Matagorda, Matagorda, Lavaca, Espiritu Santo, and San Antonio Bays. The Aransas-Corpus Christi Bay area includes all of these two bay systems.

Figure 2a through 2d shows a comparison of blue crabs contained in samples by gear in each bay area.

Figure 3a through 3e, is a "catch per unit effort" comparison of blue crab samples for 1961 through 1964, and a comparison of the sex ratios.

Findings: Commercial production of blue crabs, Callinectes sapidus, was reported from three areas: Galveston, Matagorda, and the Aransas-Corpus Christi area. In previous years of study no commercial production was reported from the Laguna Madre. This year 400 pounds were reported.

The Galveston Bay area produced 1,506,300 pounds (live weight) of blue crabs in 1964 (Figure 1). This is approximately 30 per cent more than the 1963 total of 1,062,091 pounds. Only 377,296 pounds were reported from the Galveston area in 1962.* Peak months of production (1964) were May and June.

The Matagorda area had a reported production of 671,000 pounds in 1964 (Figure 1). This is about 22.2 per cent less than in 1963 when 864,451 pounds were harvested commercially. Both 1963 and 1964 are much higher than the 1962 reported production of 252,411 pounds. Peak months of production (1964) were May and June. The Aransas-Corpus Christi area reported 307,100 pounds of blue crabs. This is less than one-third of the 1,019,289 pounds reported in 1963. Peak months of production were August and October.

Sampling and Catch Data: Data obtained from blue crab samples were combined according to gear type. These were trawls (10-foot and 20-foot), nets (trammel, gill, and drag seine), and seines (6-foot bar seine and 60-foot seine). Sampling intensity has increased in some areas since 1963, while decreasing in others.

Nets (Figure 2a through 2d) appeared to be an ineffective crab sampling device. Trammel nets were more effective than drag seines while gill nets were not used enough to be considered. In the trammel nets crabs were usually caught in conjunction with a large fish catch, which would indicate that most crabs were caught while feeding on the trapped fish. The drag seines are ineffective because crabs crawl over the sides or under the lead line and do not become entangled.

The intensity of sampling has increased about one-fourth from the 1,307 samples taken in 1963 to the present 1,876 samples. In 1964, 654 trawl samples, 208 net samples, and 1,014 seine samples were taken. During 1963, 734 trawl, 188 net, and 385 seine samples were collected.

Catch by gear varied between areas and between bays but more crabs were caught with seines than with trawls or nets in every area except Corpus Christi Bay. (Figure 2a through 2d).

* Production was not reported from Sabine Lake until 1963, when 104,496 pounds were landed. In 1964 293,100 pounds were reported.

The sex ratio based on sample results has remained fairly constant (1 to 1 ratio) since 1961.

Sampling indicated that blue crabs were more abundant on the upper Texas coast (Galveston and Matagorda areas) than on the lower coast. Commercial production continued to increase in the Galveston and Matagorda areas while sample data showed population increases. During this same period fishing pressure was at a minimum in the Aransas-Corpus Christi Bay area and the Laguna Madre area. Population density remained low there throughout 1964. During 1963 and 1964 a severe drought was experienced on the lower Texas coast (Aransas Bay southward). It appears that environmental conditions, as associated with spawning and survival, rather than fishing pressure at current levels, determines population density.

Few crabs were taken in Gulf Area 20 (Table 1).

Recruitment of juvenile crabs to the Galveston Bay area occurred in March, July, and December (Figure 3A). In the Matagorda area (Figure 3b) recruitment occurred in March, July, and November. The recruitment of small blue crabs in March was the largest in both bays. In the Aransas-Corpus Christi Bay area (Figure 3c) only one recruitment period was evident. This occurred from March through May, with the peak being in May. In the Laguna Madre area juvenile recruitment occurred in January and May (Figure 3d) and possibly in November.

Tagging: Crab tagging was conducted in two bay systems. In the Galveston Bay area (1963-64) 819 crabs were tagged and released. Of these 402 were female crabs (180 were sponge crabs). The recovery rate was 9.4 per cent. Males were returned at a rate of 15.1 per cent while females were returned at a rate of 6.3 per cent. Two tagged sponge crabs were returned. One moved from the bay to the Gulf of Mexico and was recovered after spawning. In Matagorda Bay eight crabs were tagged and released, but none were returned.

The greatest distance traveled by a tagged crab before re-capture in the Galveston Bay area was 16 miles (More and Moffett 1965). They reported that 84 per cent of the males and 77 per cent of the females were recaptured within five miles of the release site. Tagged crabs released in areas of commercial harvest have resulted in a better percentage of returns.

Comments: Improvements could be made in the sampling routine.

1. Larval crab samples should be taken in all passes to the Gulf of Mexico to determine peak periods of larval ingress and time of spawning.
2. Juvenile crabs should be sampled by bar seine, seine and in some cases trawl. Data on abundance of juvenile crabs should be correlated with the larval samples.
3. Commercial type crab traps should be used to sample larger crabs instead of trammel nets and drag seines. The catches may provide information on the seasonal abundance of market size crabs.
4. All sampling that does not produce useful information could be discontinued.

Literature Cited:

More, W. R. & A. W. Moffett 1965 Population Studies of Blue Crabs of the
Galveston Bay System. Coastal Fisheries Reports, Parks & Wildlife Dept.

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Table 1: Numbers and Sex of Blue Crabs Taken in Samples

	Area M-2, M-3			Area M-4, M-5			Area M-6, M-7			Area M-8, M-9			Area - Gulf 20		
1964	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Jan.	0	0	0	5	2	3	3	0	3	38	25	13	9	0	9
Feb.	27	18	9	2	0	2	8	3	5	30	18	12	0	0	0
Mar.	1,360	643	717	1,372	700	672	158	57	101	92	60	32	1	1	0
Apr.	990	504	486	386	202	184	307	144	163	53	38	15	0	0	0
May	349	154	195	360	187	173	327	152	175	83	58	25	0	0	0
June	262	121	141	273	144	129	201	99	102	127	67	60	13	0	13
July	842	434	408	496	279	217	146	46	100	113	48	65	1	0	1
Aug.	326	159	167	205	135	70	167	74	93	44	21	23	0	0	0
Sept.	137	59	78	214	100	114	99	34	65	15	9	6	3	0	3
Oct.	318	146	172	130	64	66	48	19	29	11	8	3	0	0	0
Nov.	373	174	199	422	186	236	78	43	35	96	53	43	0	0	0
Dec.	723	299	424	102	60	42	41	22	19	46	20	26	4	0	4
TOTAL	5,707	2,711	2,996	3,967	2,059	1,908	1,583	693	890	748	425	323	31	1	30
Total															
1963	1,263	650	613	2,580	1,293	1,287	703	276	427	317	247	70	183	11	172
Total															
1962	2,085	1,066	1,019	3,525	1,881	1,644	1,789	754	1,035	844	399	445	85	27	58

Total Number = 12,036

Males = 5,889

Females = 6,147

1963 = 5,046

2,477

2,569

1962 = 8,328

4,127

4,201

Percent Males = 48.92%

49.0%

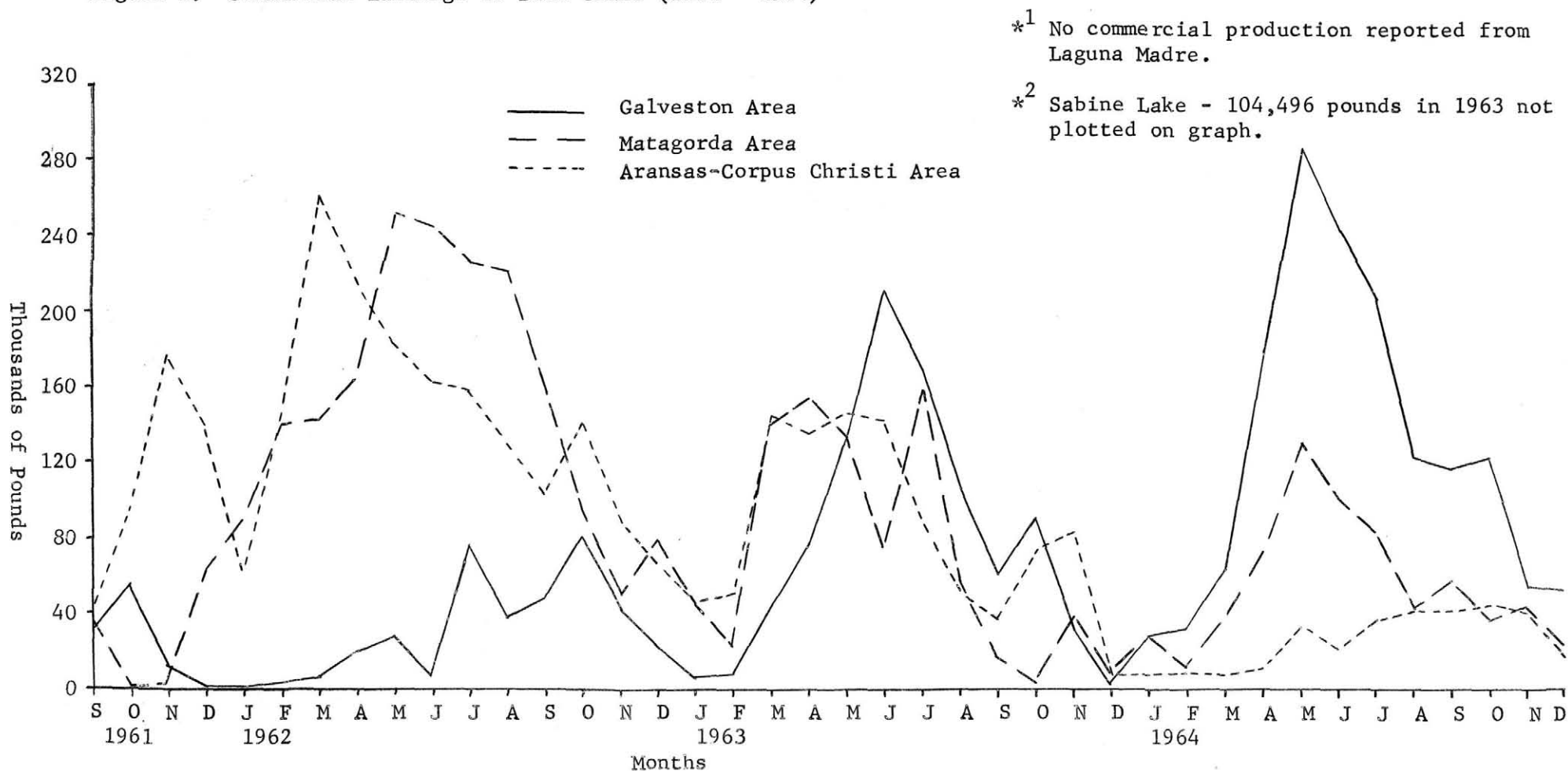
49.6%

Percent Females = 51.08%

50.9%

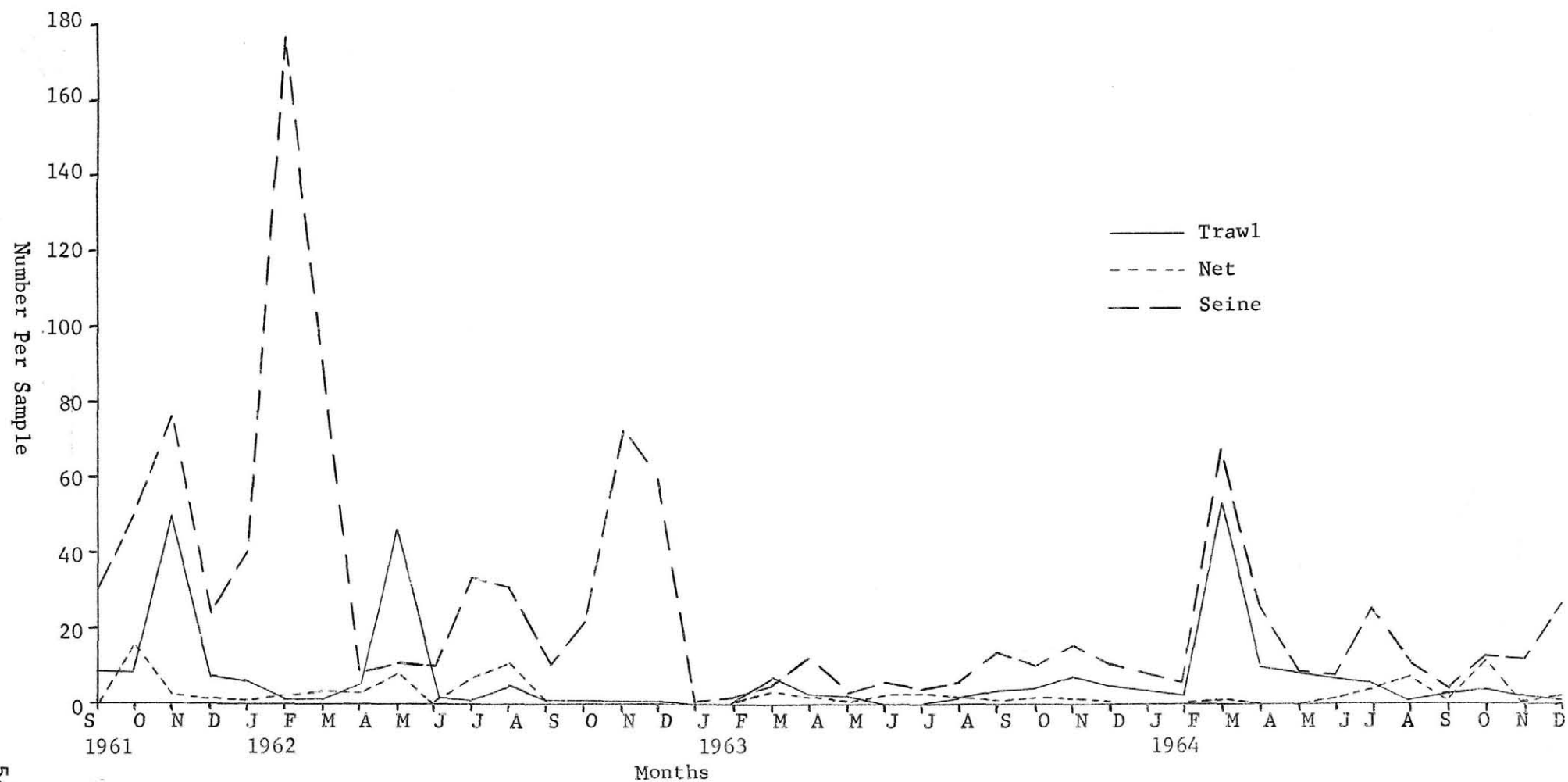
50.4%

Figure 1: Commercial Landings of Blue Crabs (1961 - 1964)



Note: Sources: Mr. O. Farley, Statistics Branch - Bureau of Commercial Fisheries, Galveston, Texas and Mr. Tom Scott, Parks & Wildlife Dept., Rockport, Texas

Figure 2a: Galveston Bay Area - Comparison of catch by gear - number per sample (1961-1964).
Blue Crab



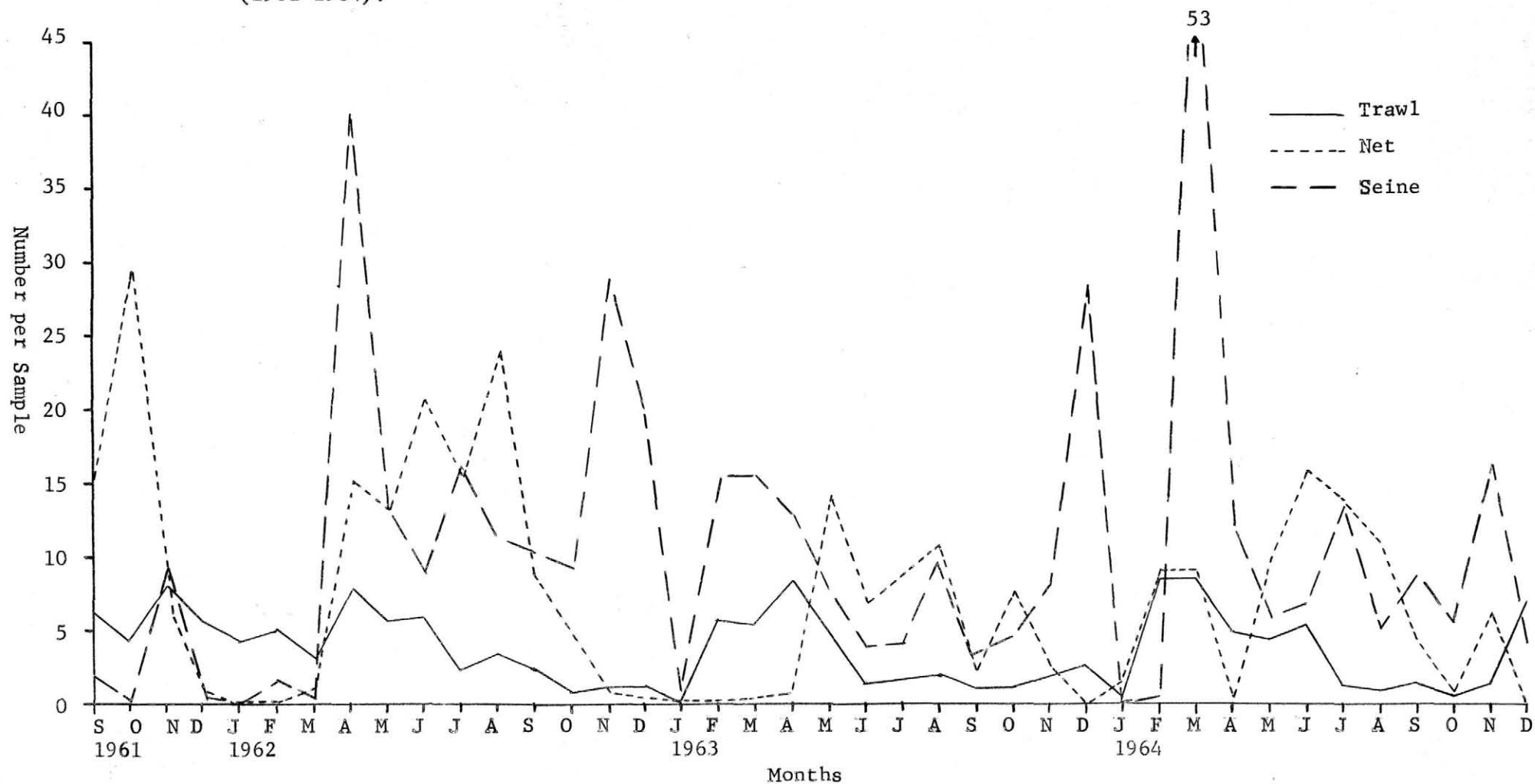


Figure 2c: Aransas-Corpus Christi Bay Area - Comparison of Catch by Gear - Number Per Sample (1961-1964)
Blue Crab

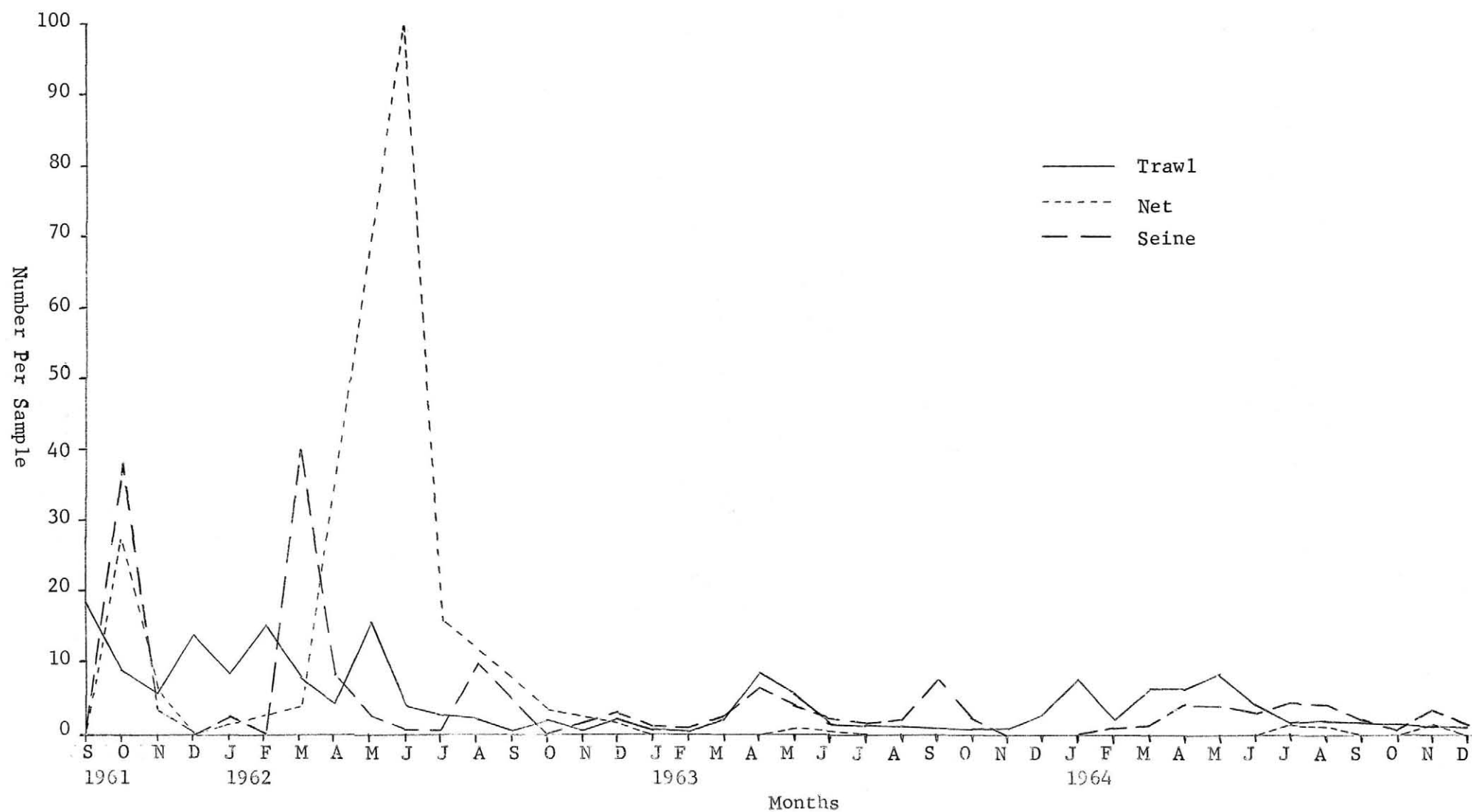


Figure 2d: Laguna Madre Area - Comparison of Blue Crab Catch by Gear - Number Per Sample (1961-1964).

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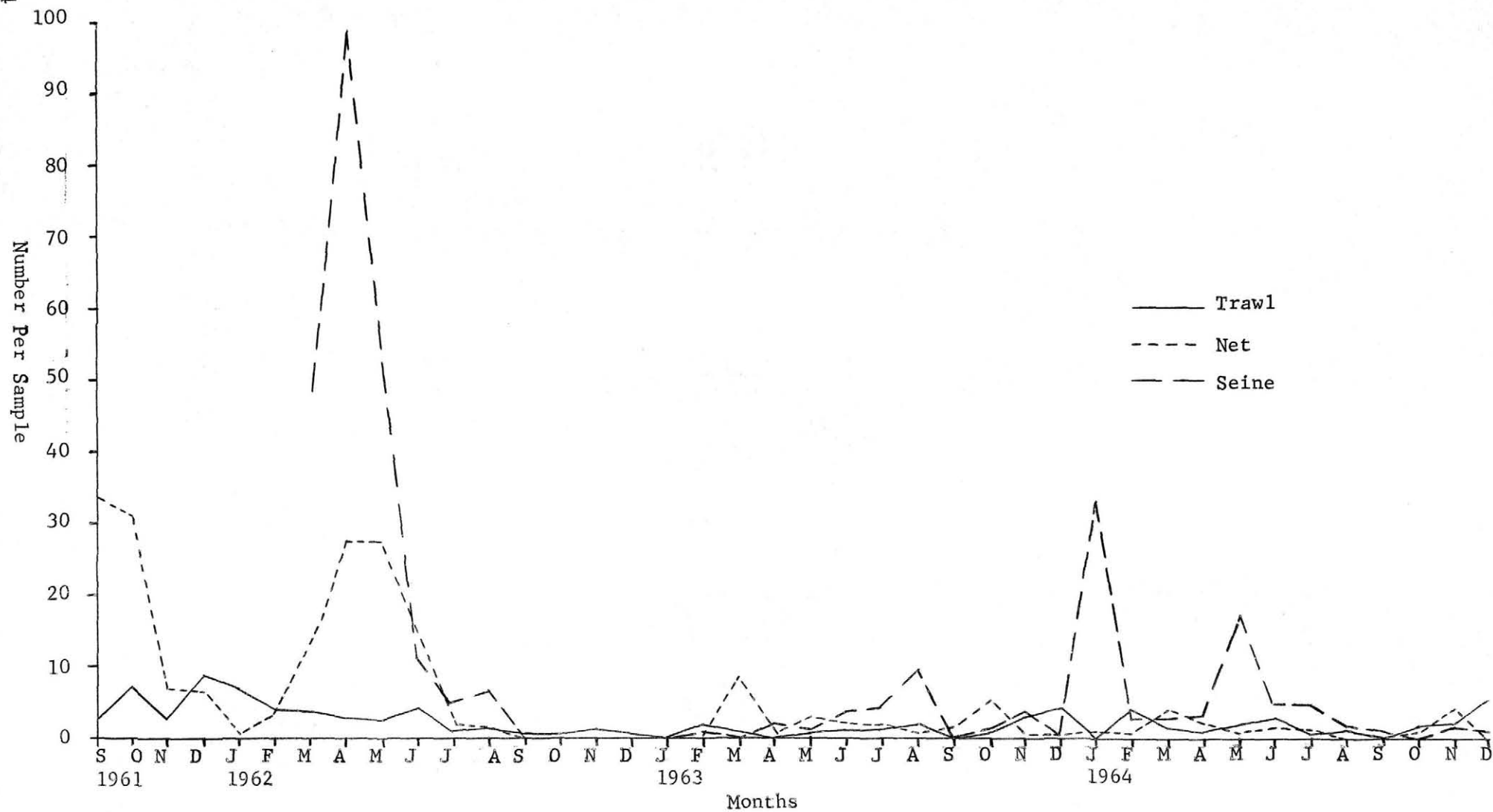
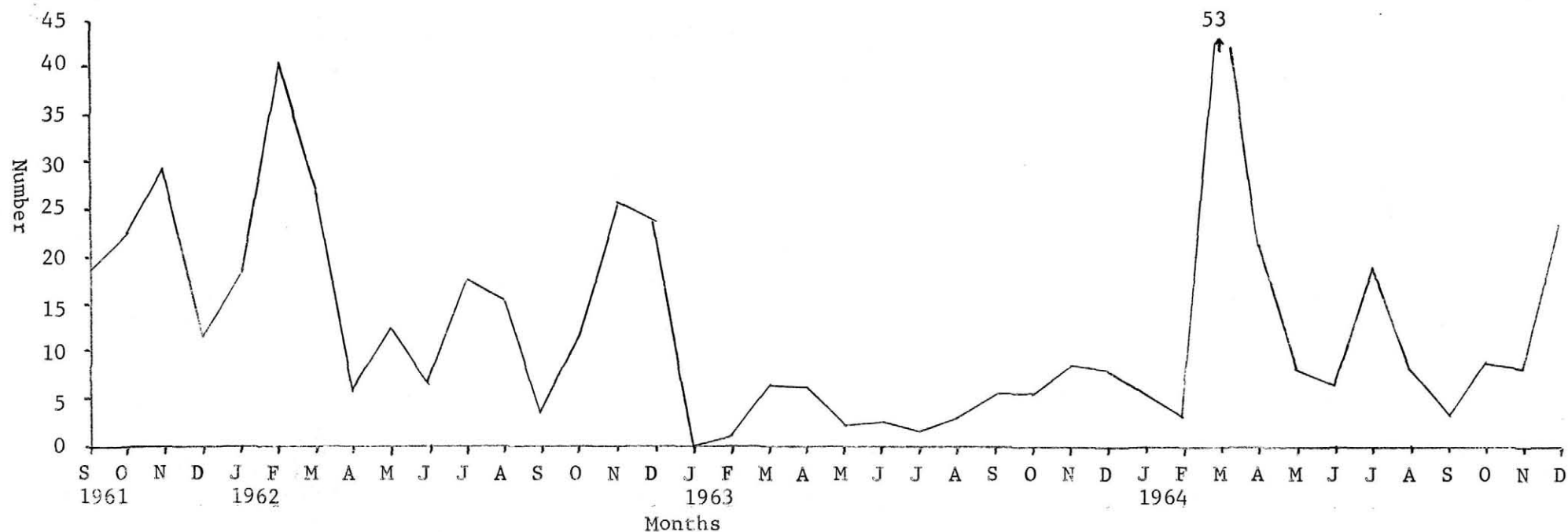


Figure 3a: Galveston Bay Area - Average Number of Blue Crabs per Sample, by Months (1961 - 1964).



Galveston Bay Area - Comparison of Male and Female Blue Crab Catches - (1961 - 1964).

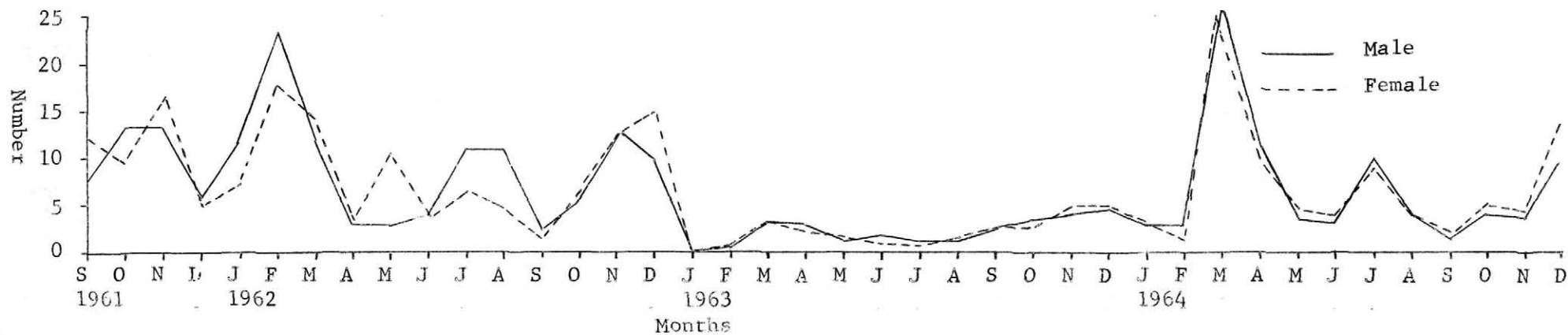
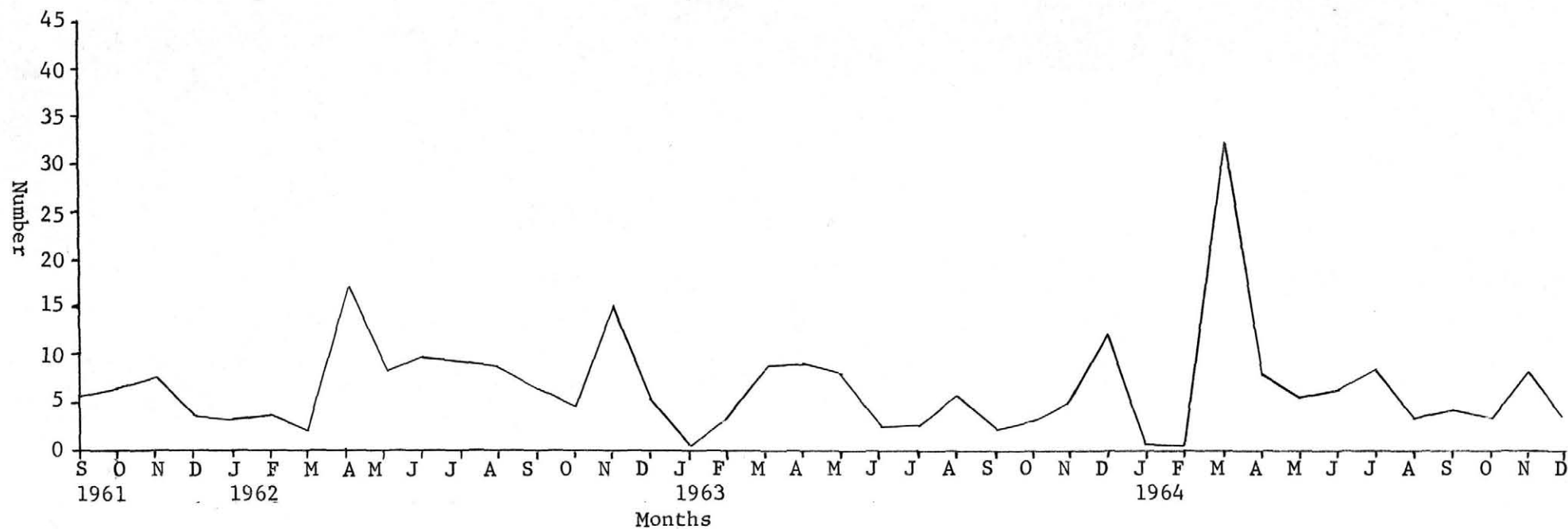


Figure 3 b: Matagorda - San Antonio Bay Area - Average number of Blue Crabs per Sample, by Month (1961 - 1964).



Matagorda - San Antonio Bay Area - Comparison of Male and Female Blue Crab Catches (1961 - 1964).

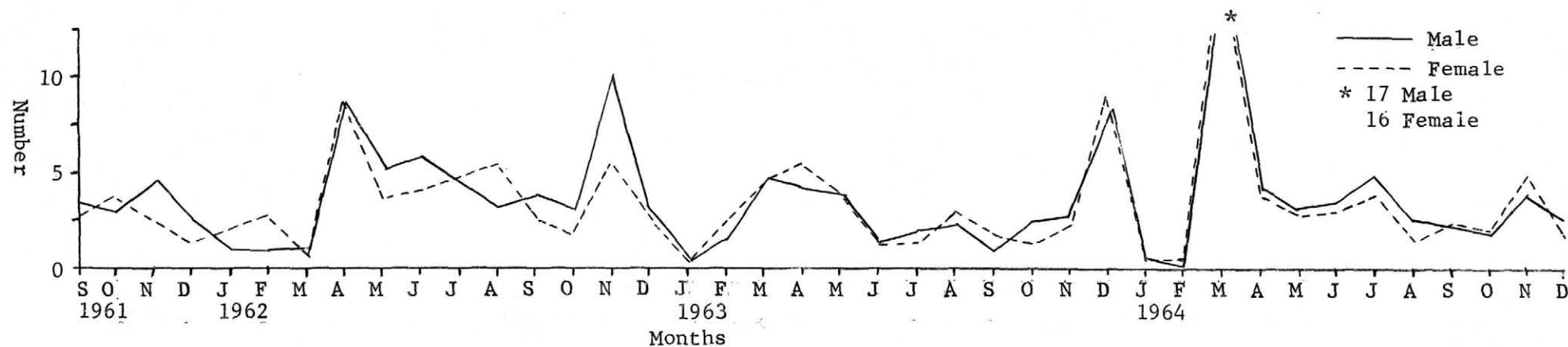
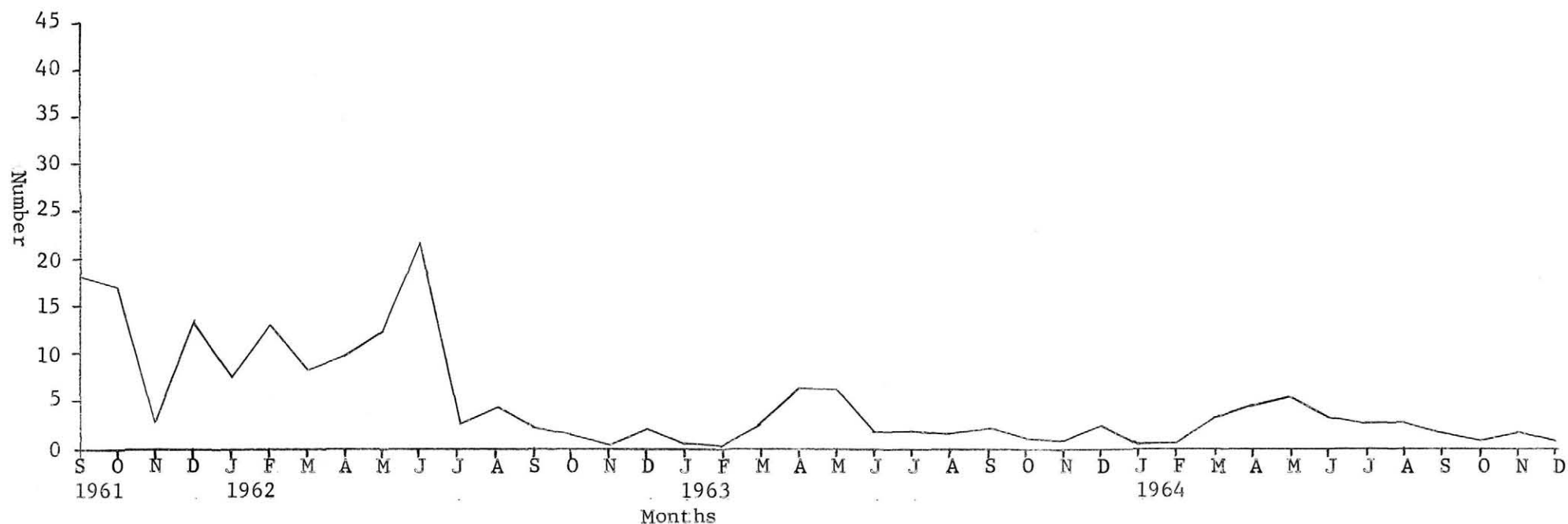


Figure 3c: Aransas - Corpus Christi Bay Area - Average Number of Blue Crabs per Sample, by Month (1961 - 1964).



Aransas - Corpus Christi Bay Area - Comparison of Male and Female Blue Crab Catches (1961 - 1964).

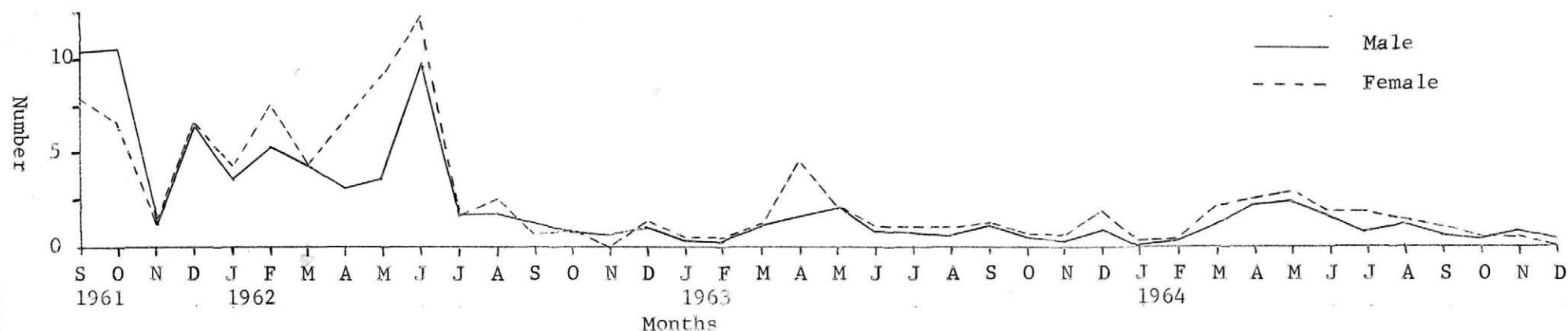
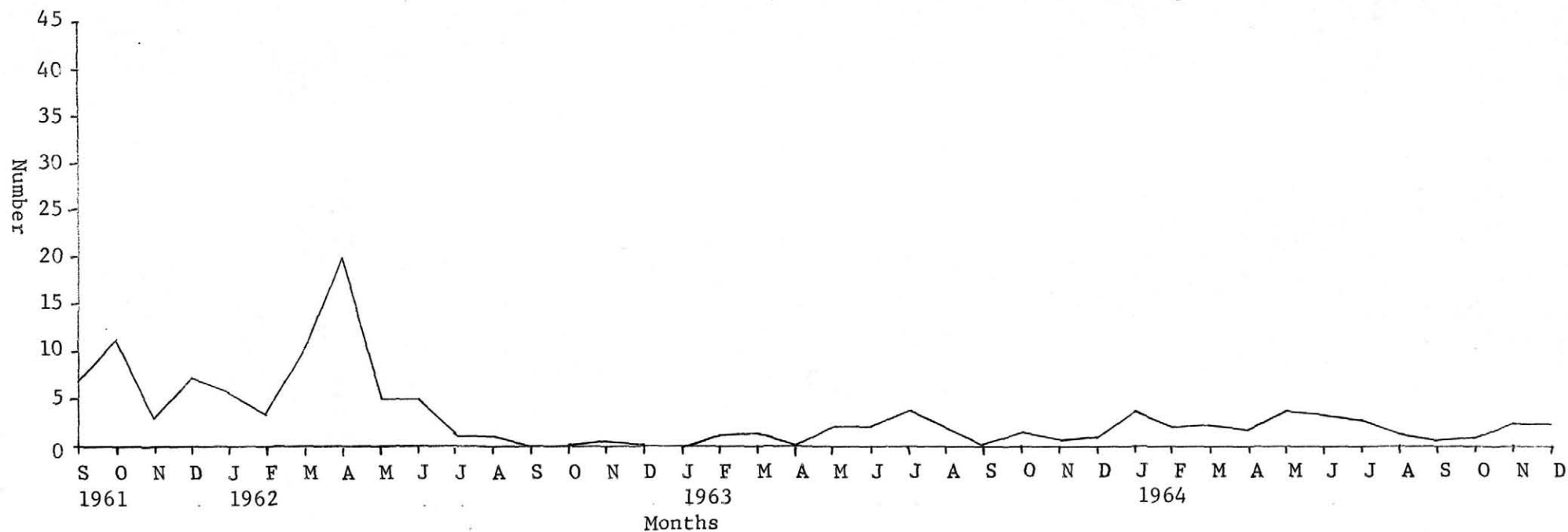


Figure 3d: Laguna Madre Bay Area - Average Number of Blue Crabs per Sample, by Month (1961 - 1964).



Laguna Madre Bay Area - Comparison of Male and Female Blue Crab Catches (1961 - 1964).

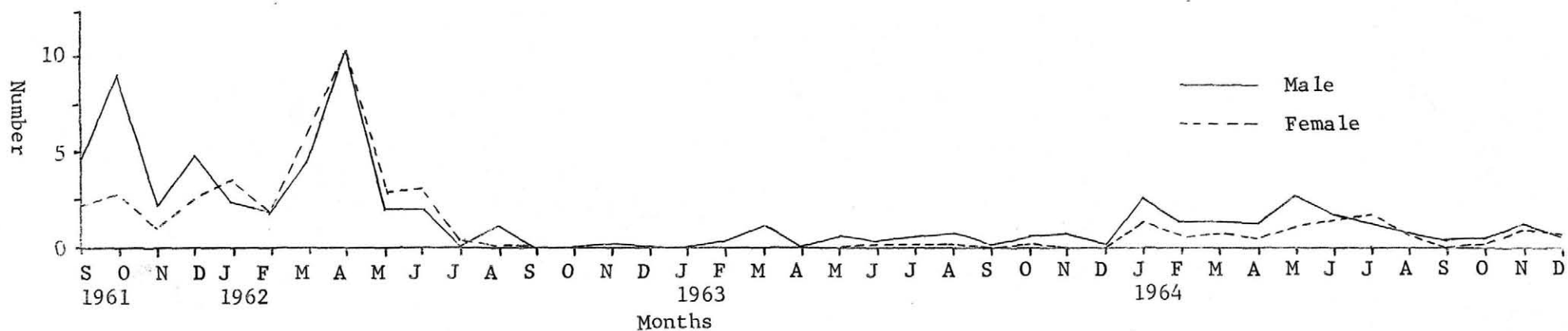
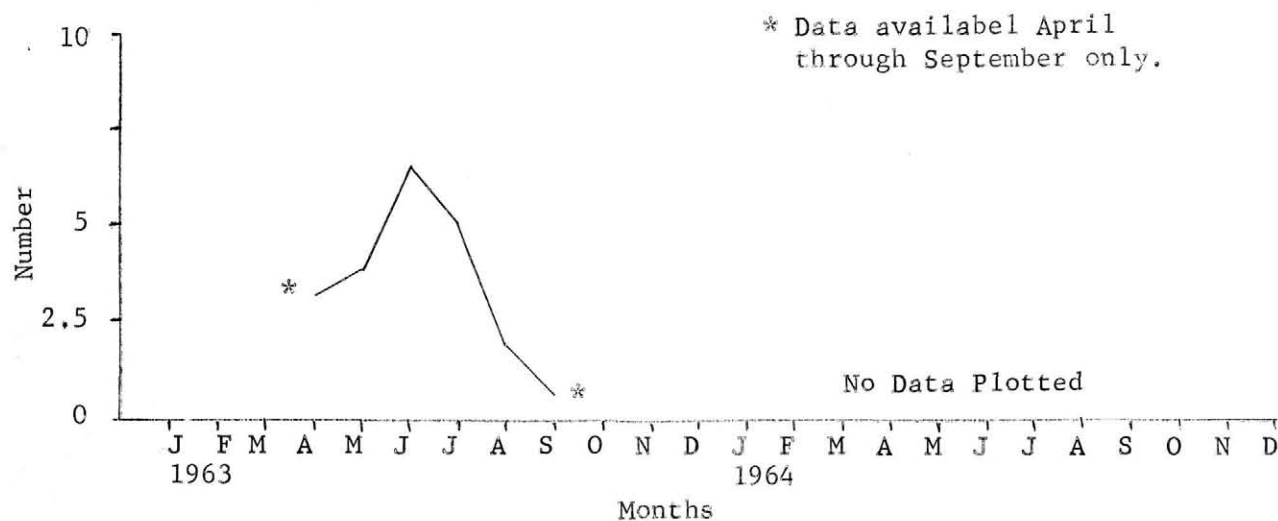


Figure 3e: Gulf Area 20 - Average Number of Blue Crabs per Sample, by Month



Gulf Area 20 - Comparison of Male and Female Blue Crab Catches

