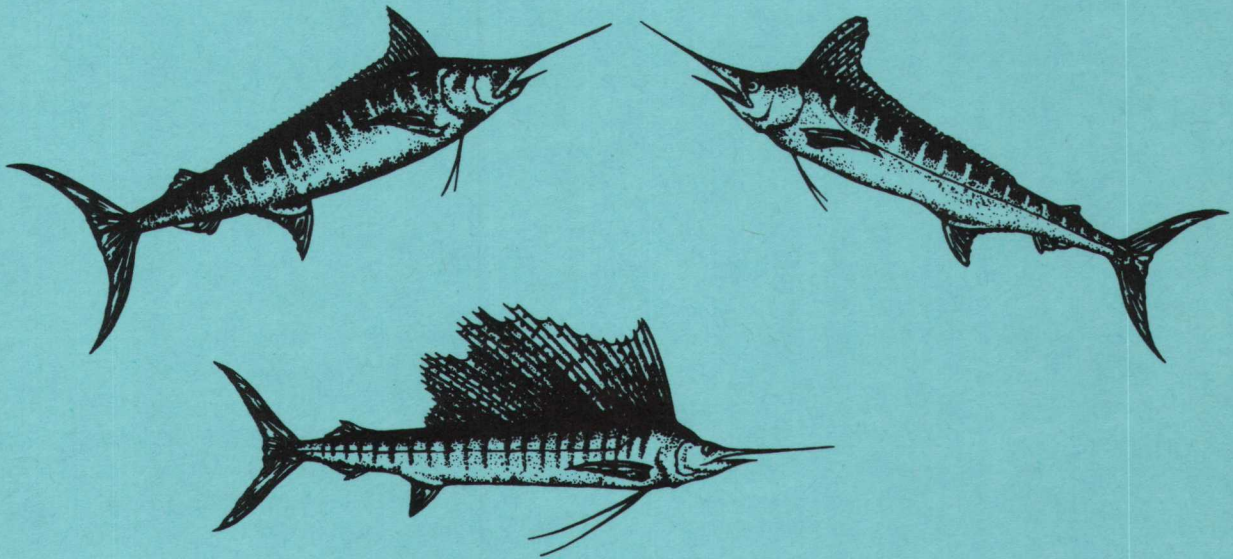




BIG GAME FISHING IN THE NORTHERN
GULF OF MEXICO DURING 1981

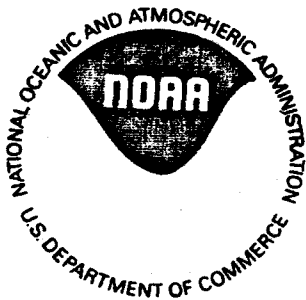


PAUL J. PRISTAS

JUNE 1982

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
PANAMA CITY LABORATORY
3500 DELWOOD BEACH ROAD
PANAMA CITY, FLORIDA 32407-7499

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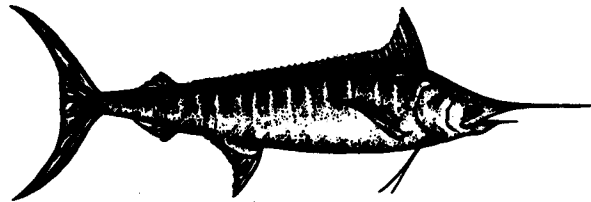
BIG GAME FISHING IN THE NORTHERN
GULF OF MEXICO DURING 1981

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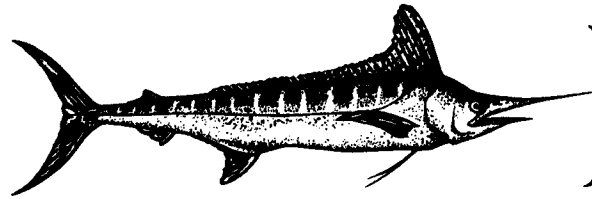
JUNE 1982

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
John V. Byrne, Administrator
NATIONAL MARINE FISHERIES SERVICE
William G. Gordon, Assistant Administrator for
Fisheries

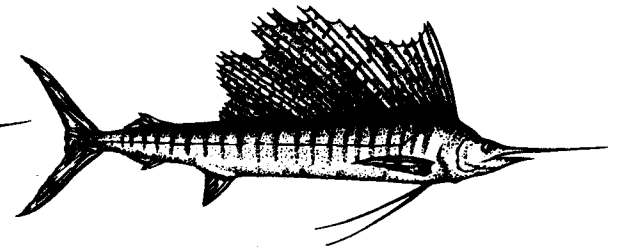
1981 SUMMARY FOR THE NORTHERN GULF OF MEXICO



BLUE MARLIN



WHITE MARLIN



SAILFISH

Hours
trolled to
catch a --

68

44

94

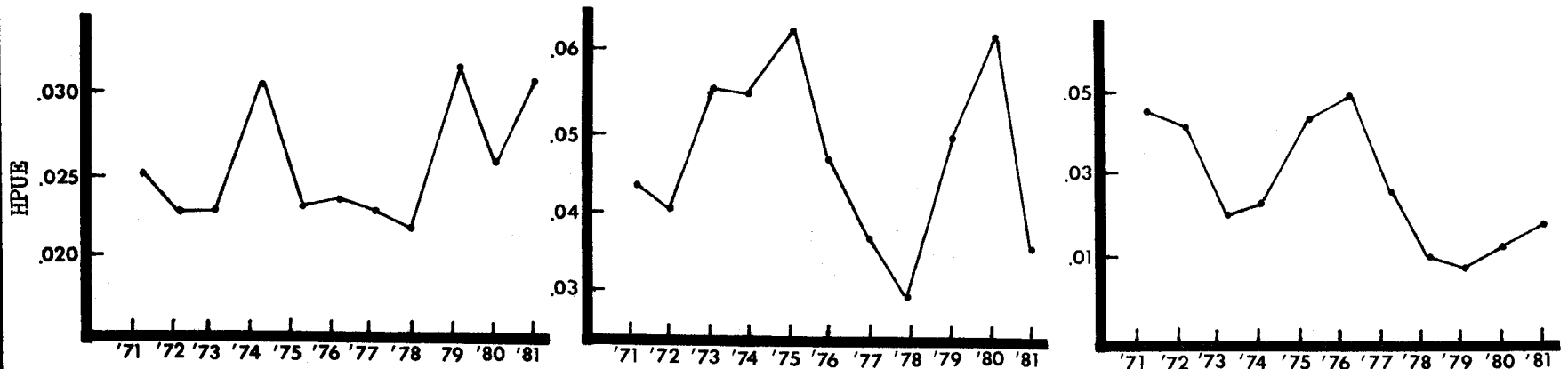
Bait
preference

Artificial

Artificial

Natural

Relative
abundance



Y E A R

INTRODUCTION

Big game fishing for oceanic pelagic fishes (i.e., marlins, sailfish, swordfish, tunas, etc.) was a relatively infrequent event in the northern Gulf of Mexico prior to the mid-1950s. Research by the federal government contributed to the increase in popularity of this activity. The U.S. Fish and Wildlife Service conducted exploratory longline fishing off the Louisiana coast in the mid-1950s to determine the abundance of tuna stocks. The longline catches included impressive numbers of blue marlin, Makaira nigricans, and white marlin, Tetrapturus albidus, which intensified the interest in recreational big game fishing. This new recreational fishery continued to expand throughout the northern gulf coast area in the 1960s and 1970s.

In the late 1960s, the federal government began preliminary investigations from their Panama City, Florida laboratory to gather information about this oceanic pelagic fishery resource in the northern gulf. In 1970-71, the National Marine Fisheries Service (NMFS) began a study of the distribution, abundance, biology, and ecology of billfishes (i.e., marlins and sailfish, Istiophorus platypterus). In 1972, responsibility for this study was transferred to the Miami Laboratory, Southeast Fisheries Center (SEFC). In 1977, responsibility for data collection was assigned to the Fishery Surveys Task of the SEFC's Office of Technical and Information Management Services.

The best (i.e., cost per data unit) means of data collection was determined to be a public-contact survey. Since 1970, port samplers have interviewed big game fishing participants to obtain data concerning catch and effort (i.e., hours fished); weather conditions; types of bait; fishing area (latitude and longitude); fish weight, length, and sex. In return for the cooperation given by charter boat captains, members of big game fishing clubs, and individual sport fishermen, the investigators promised to analyze the data and present the results in a report to them. Analyses in this report are to answer some of the most frequently asked questions.

SURVEY AREA, METHODS, AND DATA

Historically, port samplers have been located at Port Aransas, Texas, in the northwestern gulf; Grand Isle and South Pass, Louisiana, in the northcentral gulf; and Mobile, Alabama, and Pensacola, Destin, and Panama City, Florida, in the northeastern gulf. In 1981, the survey area was expanded to cover the fishery from Port Isabel, Texas, to St. Petersburg, Florida. Supplemental funding from the Gulf of Mexico Fishery Management Council (GMFMC) supported additional personnel for sampling throughout the season at Port Isabel and Galveston, Texas; Biloxi, Mississippi; and St. Petersburg, Florida. This expansion was in response to a request by the GMFMC to the NMFS in an attempt to determine the total numbers of marlins landed (i.e., brought into port) in the recreational fishery for billfishes in the northern gulf.

In 1981, both interview and non-interview methods were used to obtain the necessary data. From established state and federal publications as well

as information provided by state, federal, and private personnel, a list of coastal marinas, fish camps, and launch sites was developed. A preseason telephone survey determined those establishments at which landings of billfishes had ever been reported. Operators of these establishments were provided with a log book and were asked to record the landings of any billfishes. The port samplers periodically checked by phone and by on-site visits for reported landings. In addition to interview and log book records, reports of marlin landings were obtained from newspaper reports, club records, and correspondence from individuals. These sources provided additional landings that had not already been recorded by one of our port samplers. This led to the intuitive feeling that those landings which were not recorded at all in 1981 comprised 5% or less of the total marlin landings for the year.

Two "Intensive Surveys" were conducted, one in Pensacola and another in Panama City, to determine the landing of billfishes at public boat ramps not normally surveyed by the regular port samplers. Experience along with reports from people familiar with an area, indicated that offshore fishing in small trailerable boats would be conducted from launches most adjacent to the gulf. These sites would be used in lieu of sites farther inland to conserve the fuel of small boats. Examination of potential launch sites before the surveys determined those sites from which billfishing might occur. Within each of the two areas, five additional port samplers were hired to record marlin landings during a 14-consecutive-day period. The two marlins recorded during these Intensive Surveys (Appendix Table 2) were also reported by the regular port sampler and were not duplicated for total recorded catches.

Survey data were divided into two categories: catch and catch/effort. Catch data were those reported landings of billfishes for which no fishing effort was recorded. These data (Appendix Table 1) came from logbook landings, fishing club records, tournament records, and those on-site landings which consisted of catches from two or more boats. In the latter instances, port samplers were unable to determine fishing effort from those vessels that sent their catches into port on other boats. Catch/effort data were from those reports for which we could verify effort for billfishes. Comparative analyses in this report are based upon the number of hours spent trolling for billfishes. Driftfishing for swordfish, Xiphias gladius, began about four years ago and has been recorded (Table 1a) for historical purposes. Swordfish and spearfish T. pfluegeri, data are shown only in Tables 1, 1a, 2, and 3. Data from ports where we have previously sampled throughout the season (i.e., Port Aransas, Grand Isle, South Pass, Mobile, Pensacola, Destin, and Panama City) are called "historical." Data from the additional seasonal sampling sites of Port Isabel, Galveston, Biloxi, and St. Petersburg are called "expansion." Analyses are based on trolling effort minus fighting time.

CATCH AND EFFORT

The total recorded trolling effort for big game fishes in the Gulf of Mexico for 1981 amounted to 34,881 hr (Table 1). Of this, 29,741 hr (85% of total) were recorded at the "historical" ports (HP) of Panama City, Destin, Pensacola, Mobile, South Pass, Grand Isle, and Port Aransas, while 5,140 hr

(15%) were recorded at the "expansion" ports (EP) of St. Petersburg, Biloxi, Galveston, and Port Isabel. Effort at the HP increased 9% over 1980 and was 5% less than the 31,343 hr recorded in 1978, the highest annual effort ever recorded at the HP. Effort at five of the HP increased over the 1980 season, while it decreased at two (Panama City +66%, Destin +14%, Mobile +20%, South Pass +43%, Port Aransas +14%, Pensacola -23%, Grand Isle -52%).

The total recorded billfish catches in the Gulf of Mexico for 1981 was 1,774 of which 1,680 had accompanying data on fishing effort (Table 1 and Appendix Table 1). For the catch and effort data, 1,408 were recorded at HP and 272 at EP (Table 1). The combined catch for the seven HP was 69% lower than in 1980 due to fewer white marlin recorded at Panama City, Destin, Pensacola, Mobile, and Port Aransas. White marlin catches increased 66% at South Pass and 18% at Grand Isle. Of the 513 blue marlin caught in 1981, 440 were recorded at the HP, an increase of 51% over 1980. Of the 371 sailfish, 240 were at HP and 131 at EP. The combined catch of sailfish at the HP increased 19% over that of the previous season.

Fluctuations of annual catch-per-hour (CPH) for the northern Gulf of Mexico from 1971 to 1981 are shown in Figure 1. The CPH of billfishes at the seven HP was 0.47 in 1981, an 18% decline from 1980. The decline was attributed to the decreased catch of white marlin. CPH for both blue marlin and sailfish rose in 1981. Inclusion of data from the EP increased the CPH for all billfishes by only .001.

The recorded driftfishing effort (780 hr) for the entire gulf in 1981 (Table 1a) was less than that (953 hr) for the seven HP in 1980. Decreases occurred at five of the HP, while increases occurred at two: Panama City -40%, Destin -42%, Pensacola -99%, South Pass -68%, Port Aransas -74%, Mobile +28%, Grand Isle +43%.

SIZE COMPOSITION

Largest, smallest, and average weights of billfishes taken while trolling or driftfishing are shown in Table 2. The largest fish, a 679.0-lb blue marlin, was landed at Destin (Table 2). It was 9.5 lb less than the largest we had ever recorded in the northeastern gulf. The smallest (48.0 lb, Mobile) blue marlin was 16.0 lb larger than the smallest on our records. The 88.0-lb white marlin measured at Galveston was the largest of this species for 1981, while the 20.0-lb white marlin recorded at Port Isabel tied last season's "smallest of species." Records from St. Petersburg accounted for the largest (88.0 lb) sailfish, with sailfish less than 10 lb recorded at Panama City and Destin. Four spearfish (largest, 55.0 lb; smallest, 17.9 lb) were measured during the season; none were measured in 1980. The season's heaviest (230.0 lb) swordfish was landed at Port Isabel and the smallest (15.0 lb), at Mobile; the latter was more than twice the weight of the smallest (6.3-lb swordfish, Pensacola 1979) of this species that we have recorded.

The average weights of blue marlin, white marlin, and sailfish in the northern gulf have fluctuated from 1971 to 1981 (Figure 2). Blue marlin averaged 258 lb, 3 lb heavier than the previous 10-yr average. In accord with most years, the average weight (274 lb) of blue marlin in the northcentral gulf was highest. Blue marlin averaged 268 lb in the northeastern gulf and 224 lb

in the northwestern gulf. In 1981, the average weights of white marlin (51 lb) and sailfish (43 lb) were slightly below their respective 10-yr averages. Over the 11 years of study, a declining trend appears in the average size (weight) of white marlin but not for the other two species.

SEX COMPOSITION

Sex composition of the catch was determined by examining 689 billfishes during the season (Table 3). Of the 243 examined blue marlin, 196 were females (F) and 47 were males (M): A F:M ratio of 4.2:1. Over the 11-yr study, the F:M ratio has ranged from 1.5:1 to 4.6:1. For white marlin the F:M ratio was 2.8:1 (212F:77M). This was the highest F:M ratio since 1974, and the third highest F:M ratio during the 11-yr study. The F:M ratio of the 150 examined sailfish was 1.2:1, and did not support an observation made in 1979. At that time, our records had shown that females outnumbered males at least 2:1 when the CPH was low. Even though the CPH of sailfish this year was below the 11-yr average (.014), the F:M ratio remained low. Of the four spearfish that were recorded this season, two were examined for sex: both were males. Three males were found among five examined swordfish.

RELATIVE ABUNDANCE

The number of fish hooked-per-hour-of-trolling (HPUE) has been used as an index of apparent relative abundance since 1976. Prior to 1976, number of fish raised-per-hour-of-trolling was used. The change was made because a hooked fish could be more easily identified than a raised fish. Catch-per-hour has not been used, because this measure would be biased by the anglers' skills.

The HPUE for all billfishes in the Gulf of Mexico was .084 (Table 4), which was 13% less than that (.097) for 1980. The HPUE (.095) in the northwestern gulf was higher than the HPUEs (.082, .078) in both the northcentral and the northeastern gulf, respectively. The northcentral gulf had the highest HPUE (.036) for blue marlin, the northeastern and northwestern HPUEs (.043) were highest for white marlin, and the northwestern gulf had the highest HPUE (.049) for sailfish.

The indexes of relative abundance by species within an area were similar to those in the past six years. From 1976 to 1981, the northcentral gulf has shown the highest HPUE for blue marlin in five of the six years, the northeastern gulf the highest (or tied for the highest) for white marlin in five of the six years, and the northwestern gulf the highest for sailfish in five of the six years. If this pattern continues, then the chances of hooking a blue marlin are best if one goes fishing in the northcentral gulf, a white marlin in the northeastern gulf, and a sailfish in the northwestern gulf.

The annual fluctuations in the indexes of relative abundance showed an increase for blue marlin and sailfish and a decrease for white marlin in 1981 (Figure 3). The HPUE (.031) for blue marlin was 29% higher than the 10-yr average (.024). Comparison of the HPUE (.032) for the HP with the 10-yr average

showed an increase of 33%. For white marlin, the HPUEs (.035, .038) for the gulf and HP decreased 20% and 14%, respectively, from the 10-yr average. Although in 1981 the HPUE (.018) for sailfish in the northern gulf increased over the HPUE (.011) in 1980, the 1981 and the HP rates were 22% and 35%, respectively, below the 10-yr average. The indexes of relative abundance for all billfishes for the entire area and the HP were .084 or 8% below the 10-yr average.

Relative abundance indexes were calculated for each species and for the three combined species during months when, at least 50 hr of billfishing activity occurred in each of the three areas (Fig. 4). In the northeastern gulf, HPUE rates for blue marlin were higher early (April) and late (September, October) in the season than during midseason. The high number of white marlin hooked during a relatively few hours of fishing in November resulted in the highest monthly HPUE (.147) for this species and for the three combined species. Sailfish appeared slightly more abundant during the first half of the season than during the last half. In the northcentral gulf, the apparent relative abundance of blue marlin was higher during the first half of the season than during the second half. The HPUE for white marlin was highest during midseason. Sailfish appeared to be slightly more abundant in July than during any other month in which they were caught. The HPUE rate for the three combined species followed a general "bell-curve" distribution for the season. In the northwestern gulf, the monthly HPUE for blue marlin declined continually from April through August, then increased in September and October. The HPUE for white marlin fluctuated throughout the season. The HPUE for sailfish was lowest in the spring, increased to a nearly constant level from June through August, peaked in September and declined in October. For the three combined species, the HPUE rate fluctuated throughout the season, not appearing to be strongly associated with the relative abundance of any one species.

FISHING SUCCESS

The numbers and percentages of billfishes that were hooked, boated or released after being raised, or that were boated or released after being hooked were examined as indicators of fishing success (Table 5). For hooked blue marlin, the percent boated (40%) was about the same as the previous season (38%). Both the numbers of boated and released blue marlin increased compared to 1980 (261 boated, 30 released). Although the number of boated white marlin (550 fish) decreased from the previous season (871 fish), the number of releases increased, nearly doubling the released percentage from 11% to 20%. The success rate (65%) of boating and/or releasing a hooked white marlin this season was almost identical to that in 1980 (63%). Even though more sailfish were boated (319) and released (52) this season (371 total) compared to 1980 (201 total), the success rate of boating and/or releasing a hooked fish decreased from 70% to 60%. The percent of hooked sailfish that were boated decreased 13% from 1980, while the released percentage increased 2%. For the three combined species, 13 fewer fish were boated and 149 more fish were released than in 1980. This resulted in the percentage of hooked fishes that were boated decreasing from 50% to 45%, while the percentage of released fishes increased from 8% to 13%.

In addition to the numbers of billfishes that were recorded in conjunction with hours fished, 94 marlins were landed for which we were unable to determine fishing effort (Appendix Table 1). Of the 94 marlins, 35 were blue marlin, 12 of which were reported from the EP. The combined numbers of boated fish (Table 5), fish caught while driftfishing (Table 1a), and those recorded without effort (Appendix Table 1), brought the total number of blue marlin landed by recreational fishermen to 472 fish. Of this total number of landed fish, 396 blue marlin (84%) were recorded at the HP and 76 blue marlin (16%) were reported from the EP. The 59 white marlin that were recorded without fishing effort brought the season's total for this species to 610 landed fish (Table 5, 550 fish; Table 1a, 1 fish; Appendix Table 1, 59 fish). The 610 landed white marlin consisted of 552 fish (90%) recorded at the HP and 58 fish (10%) recorded at the EP.

BAIT PREFERENCE

Bait preference as defined by the number of billfishes HPUE while trolling natural baits, artificial baits, or both simultaneously is shown in Table 6. In all three areas artificial baits only were fished most often. Artificial baits only were fished 73% of the total recorded hours, natural baits only 8%, and both simultaneously 19%. For the three combined areas, the highest HPUE (.099) occurred when natural baits only were trolled. These results for the entire northern gulf are similar to the 1980 results: artificial baits were trolled most often but the highest HPUE was for natural bait only. When both bait types were fished at the same time the HPUE (.038) for artificial bait was slightly higher than the other (.035). In each area, the highest HPUE for each of the marlins occurred when artificial baits only were trolled. When both bait types were fished simultaneously the highest HPUE for the marlins occurred, almost exclusively, on artificial bait. In contrast to the marlins, the highest HPUE for sailfish in each area occurred when natural baits only were used. Likewise, when both bait types were fished at the same time, the highest HPUE for sailfish occurred on natural bait.

FISHING AREA

Except for the area off St. Petersburg, fishing areas, by 10-min latitude and longitude squares, are shown in Charts 1-12 for squares where 10 hr or more trolling effort occurred. In addition to fishing areas, the number of billfishes raised-per-hour-of-trolling and indices of low, mid, and high abundances are shown.

Northeastern Gulf

Charts (1-4) for the northeastern gulf do not extend to the areas fished out of St. Petersburg. However, the 688 hr of recorded fishing effort from this port showed that billfishing activity was confined to an area between 26°40' to 27°40'N latitude and 83°10' to 84°30'W longitude. In the northern portion of the northeastern gulf (Charts 1-4), the 60 squares that composed the fished area represent a 20% increase in fishing area over 1980 (50 squares). The 1981 season was the fourth consecutive year in which we had fishing effort

reported south of 29°N, and the first year blue marlin were reported as raised in this area. Chart 1 shows blue marlin were reported as raised in 70% (42 squares) of the fished area compared to 72% (36 squares) in 1980. Generally, the higher abundances of blue marlin occurred south of Orange Beach, Alabama/Pensacola, Florida area. White marlin were raised in 48 (80%) of the 60 fished squares (Chart 2) compared to 44 (88%) squares in 1980. The higher abundances for this species were concentrated south of Panama City beyond the 50-fath curve. The highest concentration of sailfish (Chart 3), which were raised in 45% (27 squares) of the fishing area, occurred inshore of the 20-fath curve south of Destin. Chart 4 shows billfishes were raised in 88% (53 squares) of the fished area compared to 96% (48 squares) of the 1980 fishing area. This season, billfishes appeared to be less widely dispersed than in 1980, as their apparent relative abundance decreased (Table 4) along with a decrease in their distribution percentage.

Northcentral Gulf

Data from this region of the gulf showed billfishing occurred in a 14% (43 squares) smaller area (Charts 5-8) during the season than in 1980 (50 squares). Similar to 1979 and in contrast with 1980, higher concentrations of blue marlin reportedly occurred inshore (Chart 5). Their percent distributions within the fished area in 1981 (77%) and 1980 (74%) were less than in 1979 (83%). White marlin appeared to be more concentrated within the fishing area this season (Chart 6) than in 1980. The apparent relative abundance of white marlin (Table 4) increased 54% over 1980, yet they were reportedly raised in only 16% (36 squares) of the fished area compared to 66% (33 squares) of the area in 1980. Sailfish were reported as raised in 26% (11 squares) of the fished area (Chart 7). The single high concentration area offshore was similar to the 1980 results, when a few fish (12% in 1980, 17% in 1981) were raised in an area of low fishing effort. The season's increase in the apparent relative abundances of billfishes in the northcentral gulf (Table 4) was reflected in their wider distribution within the fishing area (Chart 8). During the season, billfishes were reported as raised in 93% (40 squares) of the fished area compared to 78% (39 squares) in 1980. The offshore high concentration area resulted from six billfishes (1 blue marlin, 5 sailfish) raised during a comparatively few hours of trolling.

Northwestern Gulf

The area in which billfishing was reported to have occurred in 1981 (Charts 9-12) more than doubled from the previous season (103 squares compared to 48 squares). This primarily resulted from: an increase in the number of fished inshore areas, reported fishing north of 28°N latitude, and reported fishing in offshore areas around 27°N latitude. Data showed blue marlin were raised in 63% (65 squares) of the fished area (Chart 9), with high concentrations occurring generally farther offshore than during the past two years. Although there was a severe decline (53%) in the apparent relative abundance of white marlin (Table 4) compared to last year, the percent of fished area in which they were reported as raised (Chart 10) only decreased 8% between 1980 and 1981. Higher concentrations generally occurred closer inshore this season than last year, when white marlin were usually raised most often from the 100-fath curve and beyond. Sailfish were reported as raised in 78 (76%) of 103 fished squares (Chart 11). Last year, they were reported as raised in 35 squares

which constituted nearly the same percent (73%) of fished area as this season. High concentrations of this species were scattered both inshore and offshore and were generally more prevalent in the northern half of the area. Fishermen reported raising billfishes in 93 squares during the season (Chart 12). Although this is more than twice the number of squares in which billfishes were reported as raised during 1980 (42 squares), the percent of fishing area in which they occurred during this season (90%) was nearly the same as in 1980 (88%). In contrast to 1980, when higher concentrations generally occurred offshore, high concentrations of billfishes occurred both inshore and offshore this season.

RELATED OBSERVATIONS

1. A blue marlin that set a new state record was landed in Alabama during the season. Jeff Friedman, aboard the *Ms. Mindy* fought the fish for over 3 hr during the Gulf Coast Master's Tournament. The fish was certified at 587 1/4 lb and beat a 505 lb blue marlin brought in one week earlier aboard the *Honky Tonk* for the state record.
2. A bluefin tuna (Thunnus thynnus) was landed for a new state record at Grand Isle, Louisiana. Darlene Fischer, fishing aboard the *La Lunette* fought the 891.0 lb bluefin for 45 minutes before bringing it to gaff on May 31, 1981.
3. NMFS personnel recorded two Grand Slams (i.e., catches of blue marlin, white marlin, and sailfish on one trip) during the season. After 12 hr of fishing the *All Right* returned with one of each species during the 11th Annual Pensacola International Billfish Tournament. Approximately one month later the *Slingshot* returned to Orange Beach, Alabama from a 10-hr trip with a Grand Slam aboard the boat.
4. A billfish's stamina was demonstrated when a blue marlin was tagged and released off South Pass in June. The fish, estimated to weigh 200-225 lb, floated belly-up for several minutes after release before "righting" itself and slowly sounding. Nearly one month later the fish was caught in the northeastern gulf and weighed 242 lb when brought into Orange Beach, Alabama.

ACKNOWLEDGMENTS

In appreciation for their cooperation, I thank the following anglers, charter boatmen, and officers of sport fishing groups: organizers of the Texas Championship Billfish Tournament, and Boatman's Association, Port Aransas; Jessie Edmundson, Houston; Russ Wilhour, Key Allegro; Walter Fondren, Port O'Conner; Jim Haley, Betty Tubbs, and Mary Lou Campbell, Port Isabel; the Port Mansfield Chamber of Commerce, Port Mansfield; Marco Picciola, II, Myron Fischer and the Golden Meadow Big Game Fishing Club; Herman "Dutch" Prager, Jr., Maumus F. Claverie, Jr. and the New Orleans Big Game Fishing Club; William Myers and the Baton Rouge Big Game Fishing Club; Bobby Johnson and the Mobile Big Game Fishing Club; Bobby Snellgrove, George Ballard and the Pensacola Big Game Fishing Club; Al Clark and the Fort Walton Beach

Sailfish Club; Malcolm Patterson, Joy Dunlap and the Destin Charter Boat Association; and John Boggs and the Panama City Big Game Fishing Club.

The port samplers made about 4,405 interviews to collect these data. I thank Speros Doulos, Port Isabel; Julie Kinney, Port Aransas; Jody Gruber, Galveston; Paul Phillips, Grand Isle, Joe Yurt, South Pass; Maxie Gordon, Biloxi; Steve Eberly, Mobile; Rick Doria, Pensacola; Don Rozycke, Destin; and Debbie Fable, Panama City for their outstanding work throughout the season.

I am especially grateful to Lucius Johnson (NMFS), and Mark Godcharles and Lewis Bullock (Fla. DNR) for data collections at St. Petersburg.

Table 1. Summary of recorded trolling for big game fishes in the northern Gulf of Mexico, 1981.

	St. Pete.	Panama City	Destin	Pensacola	Mobile	Biloxi	South Pass	Grand Isle	Galveston	Port Aransas	Port Isabel	All areas combined
Total hours trolled	688	1,975	5,029	1,889	5,115	279	8,004	2,084	1,309	5,645	2,864	34,881
Number of recorded catches*												
Blue marlin	2	14	91	23	64	4	143	35	36	70	31	513
White marlin	3	32	145	82	128	6	242	66	31	29	27	791
Sailfish	19	6	30	12	15	0	19	10	61	148	51	371
Spearfish	0	1	1	0	0	0	0	2	0	0	0	4
Swordfish	0	0	0	0	0	0	0	0	0	0	1	1
All billfishes	24	53	267	117	207	10	404	113	128	247	110	1,680
Catch-per-hour												
Blue marlin	.003	.007	.018	.012	.013	.014	.018	.017	.027	.012	.011	.015
White marlin	.004	.016	.029	.043	.025	.002	.030	.032	.024	.005	.009	.023
Sailfish	.028	.003	.006	.006	.003	.000	.002	.005	.047	.026	.018	.011
Spearfish	.000	.001	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000
Swordfish	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
All billfishes	.035	.027	.053	.062	.040	.036	.050	.054	.098	.044	.038	.048
Hours trolled to catch a												
Blue marlin	344	141	55	82	180	70	56	60	36	81	92	68
White marlin	229	62	35	23	40	46	33	32	42	195	106	44
Sailfish	36	329	168	157	341	0	421	208	21	38	56	94
Spearfish	0	1,975	5,029	0	0	0	0	1,042	0	0	0	8,720
Swordfish	0	0	0	0	0	0	0	0	0	0	2,864	34,881
All billfishes	29	37	19	16	25	28	20	18	10	23	26	21

*Includes releases

Table 1a. Summary of recorded driftfishing for big game fishes in the northern Gulf of Mexico, 1981.

	St. Pete.	Panama City	Destin	Pensacola	Mobile	Biloxi	South Pass	Grand Isle	Galveston	Port Aransas	Port Isabel	All areas combined
Total hours fished	0	97	101	3	265	0	10	96	152	56	0	780
Number of recorded catches* and catch-per-hour ()												
Swordfish	0	3 (.031)	4 (.040)	0	11 (.042)	0	0	0	1 (.007)	0	0	19 (.024)
Blue marlin	0	0	0	0	0	0	0	0	2 (.013)	0	0	2 (.003)
White marlin	0	0	1 (.010)	0	0	0	0	0	0	0	0	1 (.001)
Sailfish	0	0	0	0	0	0	0	0	15 (.099)	1 (.018)	0	16 (.021)
All billfishes	0	3 (.031)	5 (.050)	0	11 (.042)	0	0	0	18 (.118)	1 (.018)	0	38 (.049)

*Includes releases

Table 2. Weights (pounds) of billfishes recorded in the northern Gulf of Mexico, 1981.

	St. Pete.	Panama City	Destin	Pensacola	Mobile	Biloxi	South Pass	Grand Isle	Galveston	Port Aransas	Port Isabel	All areas combined
Blue marlin												
Largest	351.8	344.5	679.0	672.2	578.5	350.0	601.5	403.0	575.5	610.0	620.0	679.0
Smallest	270.0	105.0	83.0	125.0	76.5	157.0	68.0	48.0	72.0	48.5	61.0	48.0
Average	310.9	198.5	266.6	346.6	257.7	236.9	284.0	240.2	310.8	200.6	209.5	258.3
White marlin												
Largest	47.5	85.0	76.0	86.8	74.5	62.0	79.5	82.9	88.0	74.5	68.8	88.0
Smallest	38.5	40.8	30.0	33.5	33.5	60.0	31.5	26.5	34.5	36.0	20.0	20.0
Average	44.2	50.0	49.1	52.1	49.0	61.0	51.9	53.6	59.4	52.0	41.8	50.8
Sailfish												
Largest	82.0	49.8	58.8	52.8	55.8	0	53.8	66.0	79.0	73.0	67.0	82.0
Smallest	28.0	5.2	7.0	33.0	15.0	0	30.0	17.7	19.5	20.5	27.8	5.2
Average	47.3	32.1	37.1	42.4	40.8	0	38.6	39.0	48.4	44.4	42.5	42.8
Spearfish												
Largest	0	55.0	42.8	0	0	0	0	21.9	0	0	0	55.0
Smallest	0	55.0	42.8	0	0	0	0	17.9	0	0	0	17.9
Average	0	55.0	42.8	0	0	0	0	19.9	0	0	0	34.4
Swordfish												
Largest	0	53.2	85.5	0	139.5	0	0	0	45.5	0	230.0	230.0
Smallest	0	34.0	20.0	0	15.0	0	0	0	45.5	0	230.0	15.0
Average	0	43.6	45.4	0	58.9	0	0	0	45.5	0	230.0	62.8

Table 3. Sex ratios of examined billfishes caught in the northern Gulf of Mexico, 1981. (M = males; F = females).

	St. Pete.	Panama City	Destin	Pensacola	Mobile	Biloxi	South Pass	Grand Isle	Galveston	Port Aransas	Port Isabel	All areas combined
Blue marlin												
No. M:No. F	0:1	4:8	10:42	0:6	3:17	0	16:71	5:8	1:2	3:34	5:7	47:196
1 M:No. F	0	1:2	1:4.2	0	1:5.7	0	1:4.4	1:1.6	1:2.0	1:11.3	1:1.4	1:4.2
White marlin												
No. M:No. F	0	12:9	16:67	1:7	4:4	0	35:87	3:13	0:4	0:17	6:4	77:212
1 M:No. F	0	1:0.8	1:4.2	1:7.0	1:1.0	0	1:2.5	1:4.3	0	0	1:0.7	1:2.8
Sailfish												
No. M:No. F	1:1	0:3	7:15	0:3	1:1	0	7:6	0:2	3:2	36:44	14:4	69:81
1 M:No. F	1:1	0	1:2.1	0	1:1.0	0	1:0.9	0	1:0.7	1:1.2	1:0.3	1:1.2
Spearfish												
No. M:No. F	0	1:0	1:0	0	0	0	0	0	0	0	0	2:0
1 M:No. F	0	0	0	0	0	0	0	0	0	0	0	0
Swordfish												
No. M:No. F	0	1:0	2:1	0	0:1	0	0	0	0	0	0	3:2
1 M:No. F	0	0	1:0.5	0	0	0	0	0	0	0	0	1:0.7

Table 4. Billfishes hooked-per-hour-of-trolling and hours trolled to hook a fish in the northern Gulf of Mexico, 1981.

	Total hours trolled	Fish hooked-per-hour-of-trolling and hours trolled to hook one fish ()			
		Blue marlin	White marlin	Sailfish	All three species
Northeastern Gulf	14,975	.028 (35)	.043 (23)	.007 (140)	.078 (13)
St. Petersburg	688	.009 (115)	.007 (138)	.031 (33)	.047 (22)
Panama City	1,975	.028 (35)	.042 (24)	.004 (247)	.074 (14)
Destin	5,029	.028 (36)	.039 (26)	.007 (144)	.074 (14)
Pensacola	1,889	.028 (36)	.082 (12)	.010 (99)	.120 (8)
Mobile	5,115	.031 (33)	.038 (26)	.005 (213)	.074 (14)
Biloxi	279	.003 (25)	.021 (47)	0 0	.061 (16)
Northcentral Gulf	10,088	.036 (28)	.043 (23)	.003 (306)	.082 (12)
South Pass	8,004	.036 (28)	.041 (25)	.003 (364)	.079 (13)
Grand Isle	2,084	.038 (26)	.050 (20)	.005 (189)	.094 (11)
Northwestern Gulf	9,818	.030 (33)	.015 (65)	.049 (20)	.095 (11)
Galveston	1,309	.041 (24)	.037 (27)	.063 (16)	.141 (7)
Port Aransas	5,645	.030 (33)	.012 (87)	.056 (18)	.098 (10)
Port Isabel	2,864	.025 (40)	.013 (75)	.028 (35)	.067 (15)
All three areas	34,881	.031 (32)	.035 (29)	.018 (56)	.084 (12)

Table 5. Hours trolled and billfishes raised, hooked, and boated/released () in the northern Gulf of Mexico, 1981.

	Total hours trolled	Blue marlin			White marlin			Sailfish			All three species		
		R	H	B(R)	R	H	B(R)	R	H	B(R)	R	H	B(R)
		----- Number -----											
Northeastern Gulf	14,975	559	424	180(18)	961	639	290(106)	139	107	77 (5)	1,659	1,170	547(129)
St. Petersburg	688	9	6	2 (0)	6	5	3 (0)	32	21	18 (1)	47	32	23 (1)
Panama City	1,975	78	56	14 (0)	111	82	30 (2)	8	8	6 (0)	197	146	50 (2)
Destin	5,029	187	141	80(11)	312	195	111 (34)	47	35	28 (2)	546	371	219 (47)
Pensacola	1,889	55	53	22 (1)	157	155	64 (18)	21	19	12 (0)	233	227	98 (19)
Mobile	5,115	216	157	58 (6)	368	196	80 (48)	31	24	13 (2)	615	377	151 (56)
Biloxi	279	14	11	4 (0)	7	6	2 (4)	0	0	0 (0)	21	17	6 (4)
Northcentral Gulf	10,088	511	365	138(40)	591	431	189(119)	36	33	27 (2)	1,138	829	354(161)
South Pass	8,004	423	286	105(38)	457	326	140(102)	23	22	17 (2)	903	634	262(142)
Grand Isle	2,084	88	79	33 (2)	134	105	49 (17)	13	11	10 (0)	235	195	92 (19)
Northwestern Gulf	9,818	345	296	117(20)	186	151	71 (16)	562	482	215(45)	1,093	929	403 (81)
Galveston	1,309	68	54	26(10)	56	48	22 (9)	94	83	40(21)	218	185	88 (40)
Port Aransas	5,645	205	170	61 (9)	86	65	27 (2)	385	318	129(19)	676	553	217 (30)
Port Isabel	2,864	72	72	30 (1)	44	38	22 (5)	83	81	46 (5)	199	191	98 (11)
All three areas	34,881	1,415	1,085	435(78)	1,738	1,221	550(241)	737	622	319(52)	3,890	2,928	1,304(371)
% of raised			77	31 (6)		70	32 (14)		84	43 (7)		75	34 (10)
% of hooked				40 (7)			45 (20)			51 (8)			45 (13)

R = Raised

H = Hooked

B(R)= Boated (Released)

Table 6. Hours trolled and number of billfishes hooked-per-hour-of-trolling (HPUE) with various baits fished in the northern Gulf of Mexico, 1981.

	Natural bait only		Artificial bait only		Both simultaneously		
	Hours trolled	HPUE	Hours trolled	HPUE	Hours trolled	Nat. HPUE	Art. HPUE
Northeastern Gulf	1,822		9,113		3,687		
Blue marlin		.029		.032		.009	.011
White marlin		.042		.043		.020	.022
Sailfish		.021		.004		.005	.002
All three species		.091		.079		.035	.035
Northcentral Gulf	142		9,818		84		
Blue marlin		0		.037		.012	.012
White marlin		0		.043		0	0
Sailfish		.007		.003		0	0
All three species		.007		.084		.012	.012
Northwestern Gulf	993		6,077		2,669		
Blue marlin		.021		.036		.008	.011
White marlin		.010		.020		.002	.007
Sailfish		.097		.041		.026	.024
All three species		.128		.097		.036	.042
All three areas	2,957		25,008		6,440		
Blue marlin		.025		.035		.009	.011
White marlin		.029		.038		.012	.015
Sailfish		.046		.013		.014	.011
All three species		.099		.085		.035	.038

Appendix Table 1. Numbers of marlins brought into port with no accompanying data on fishing hours in the northern Gulf of Mexico, 1981.

	Number		Total marlins
	Blue marlin	White marlin	
Northeastern Gulf	6	31	37
St. Petersburg	0	0	0
Panama City	0	0	0
Destin	1	3	4
Pensacola	5	26	31
Mobile	0	2	2
Biloxi	0	0	0
Northcentral Gulf	15	18	33
South Pass	1	1	2
Grand Isle	14	17	31
Northwestern Gulf	14	10	24
Galveston	3	4	7
Port Aransas	2	1	3
Port Isabel	9	5	14
All three areas	35	59	94

Appendix Table 2. Numbers of marlins brought into port during Intensive Surveys at small boat launch sites in the northern Gulf of Mexico, 1981.

	Number		
	Blue marlin	White marlin	Total marlins
Panama City			
Tyndall AFB	0	0	0
Lynn Haven Park	0	0	0
St. Andrews	0	0	0
Panama City Marina/ Ethridge	0	0	0
Carl Grey Park/ Holiday Lodge	0	0	0
Pensacola			
Capt. Red's	0	0	0
Pier One Marina	1	1	2
Shoreline Park	0	0	0
NAS Sherman Cove Marina	0	0	0
Big Lagoon State Park	0	0	0
Both areas combined	1	1	2

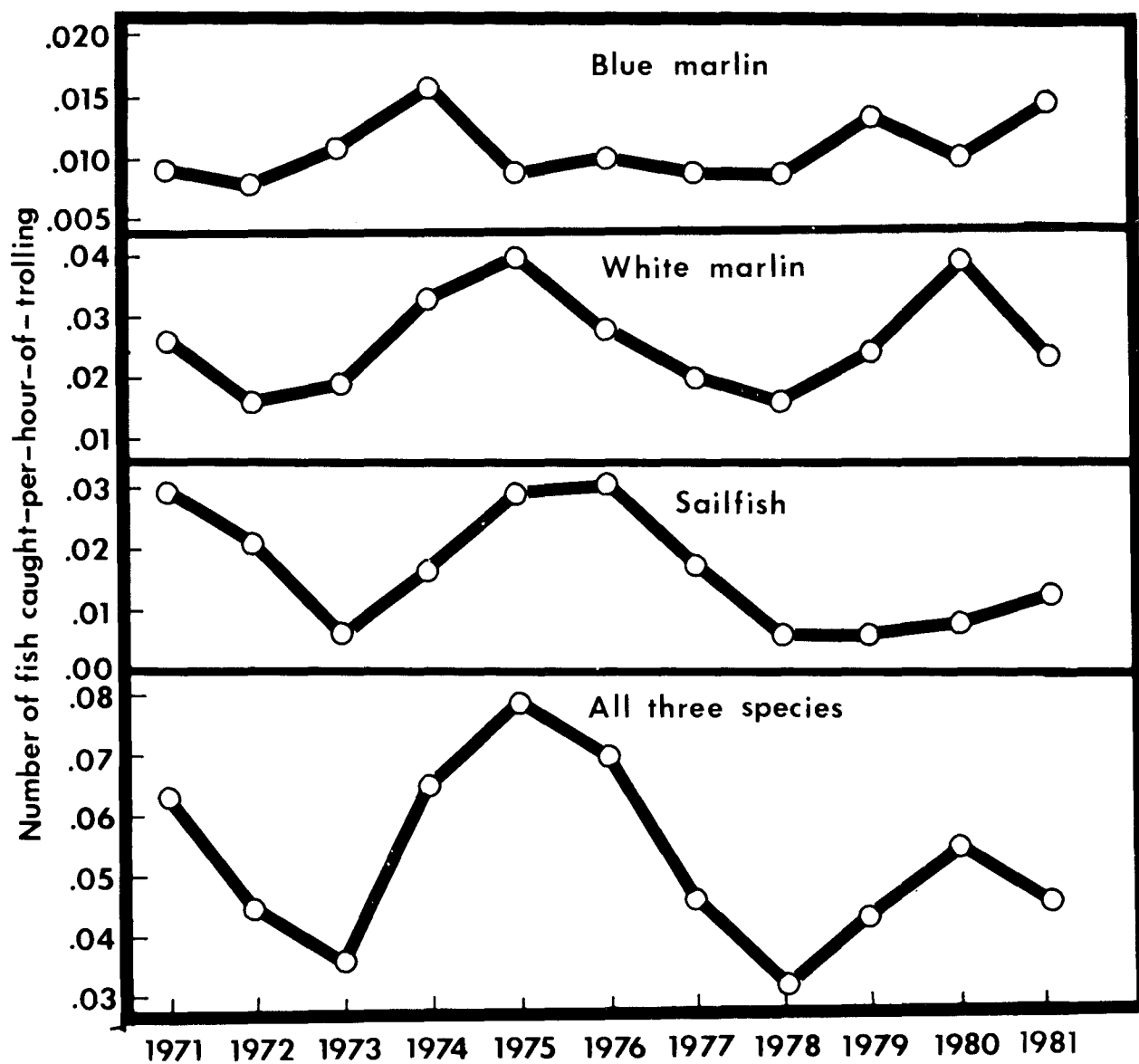


Figure 1.-- Number of billfishes caught-per-hour-of-trolling in the northern Gulf of Mexico, 1971-81.

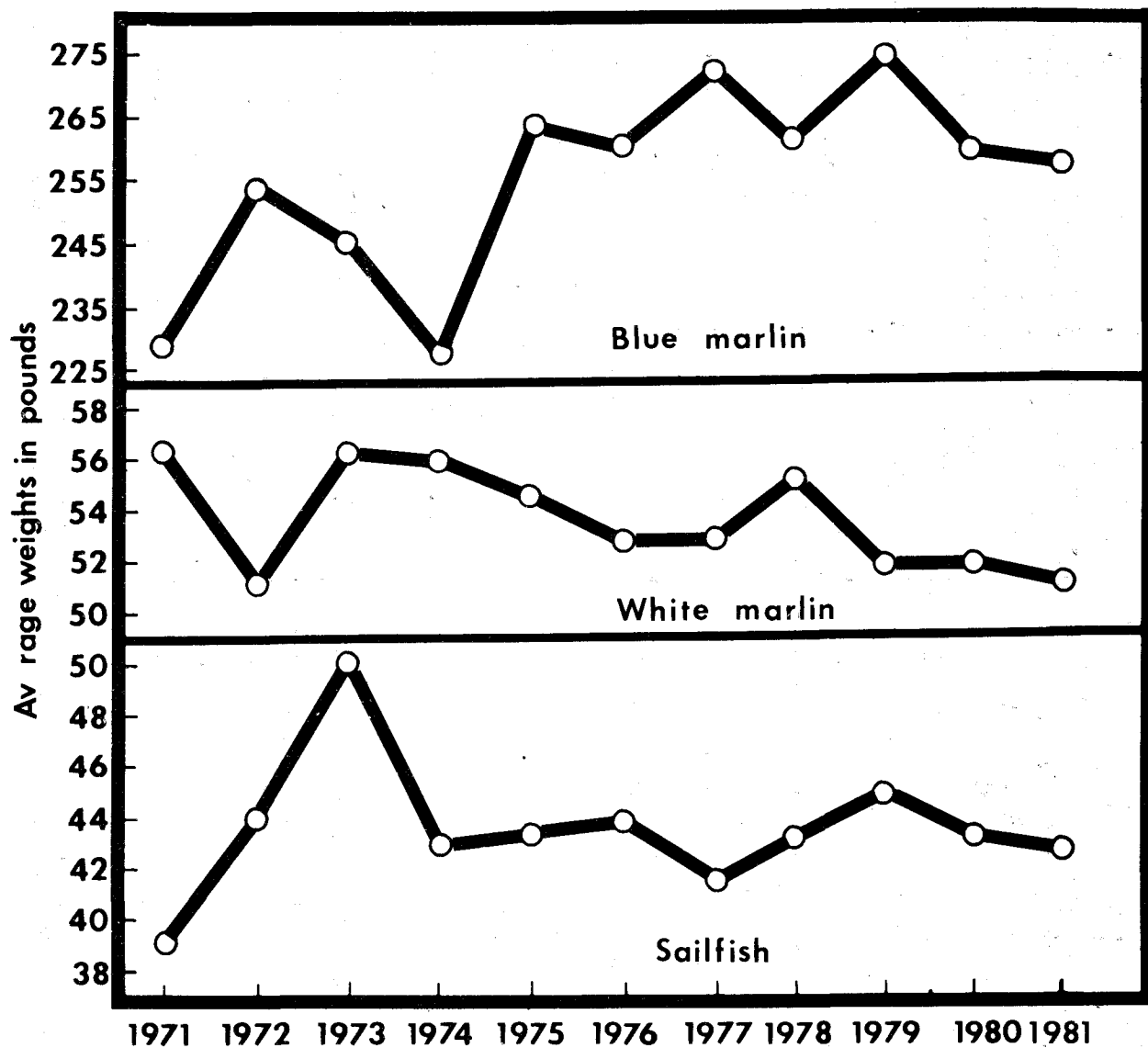


Figure 2.-- Average weights (pounds) of billfishes in the northern Gulf of Mexico, 1971-81.

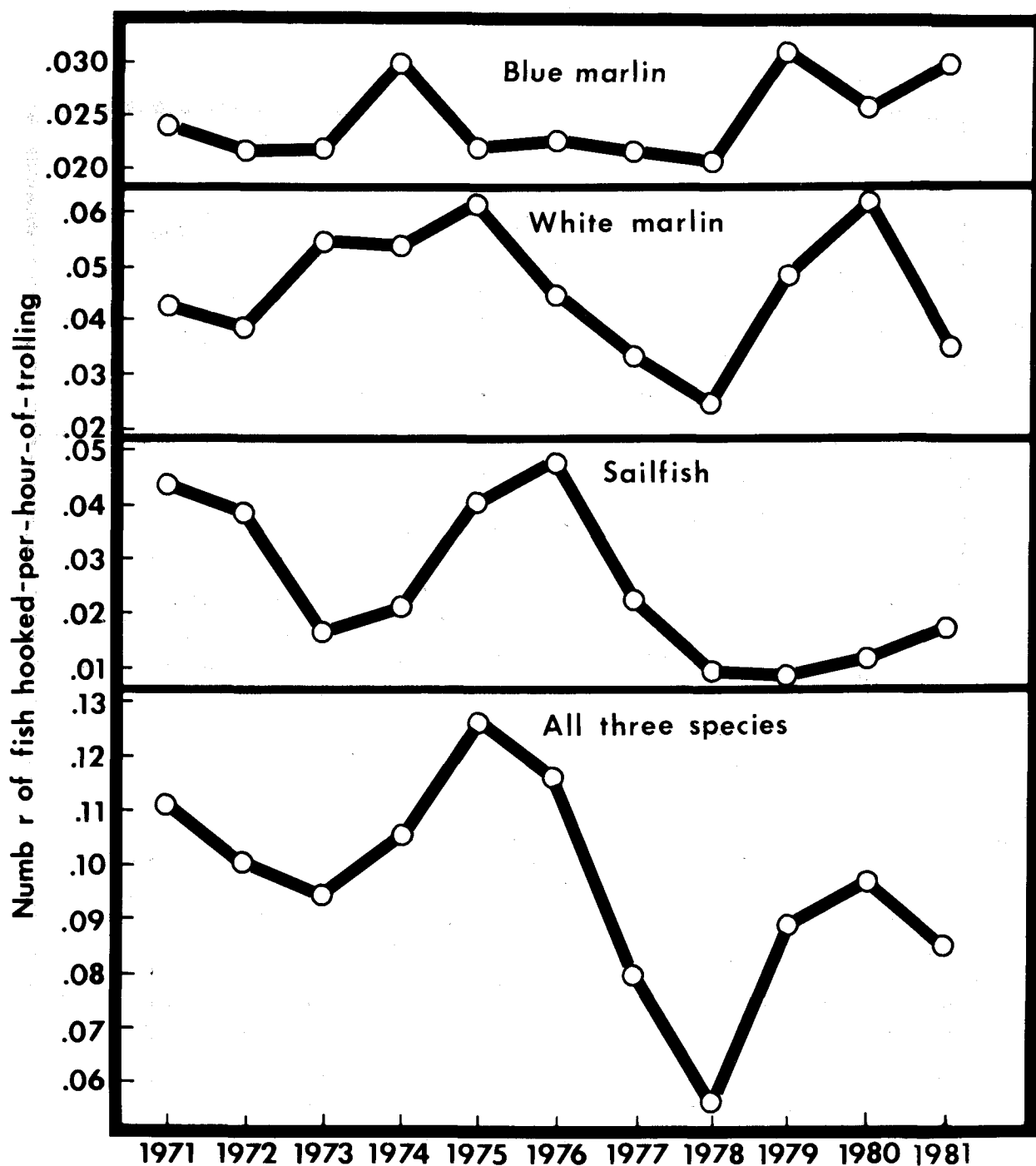


Figure 3.-- Number of billfishes hooked-per-hour-of-trolling in the northern Gulf of Mexico, 1971-81.

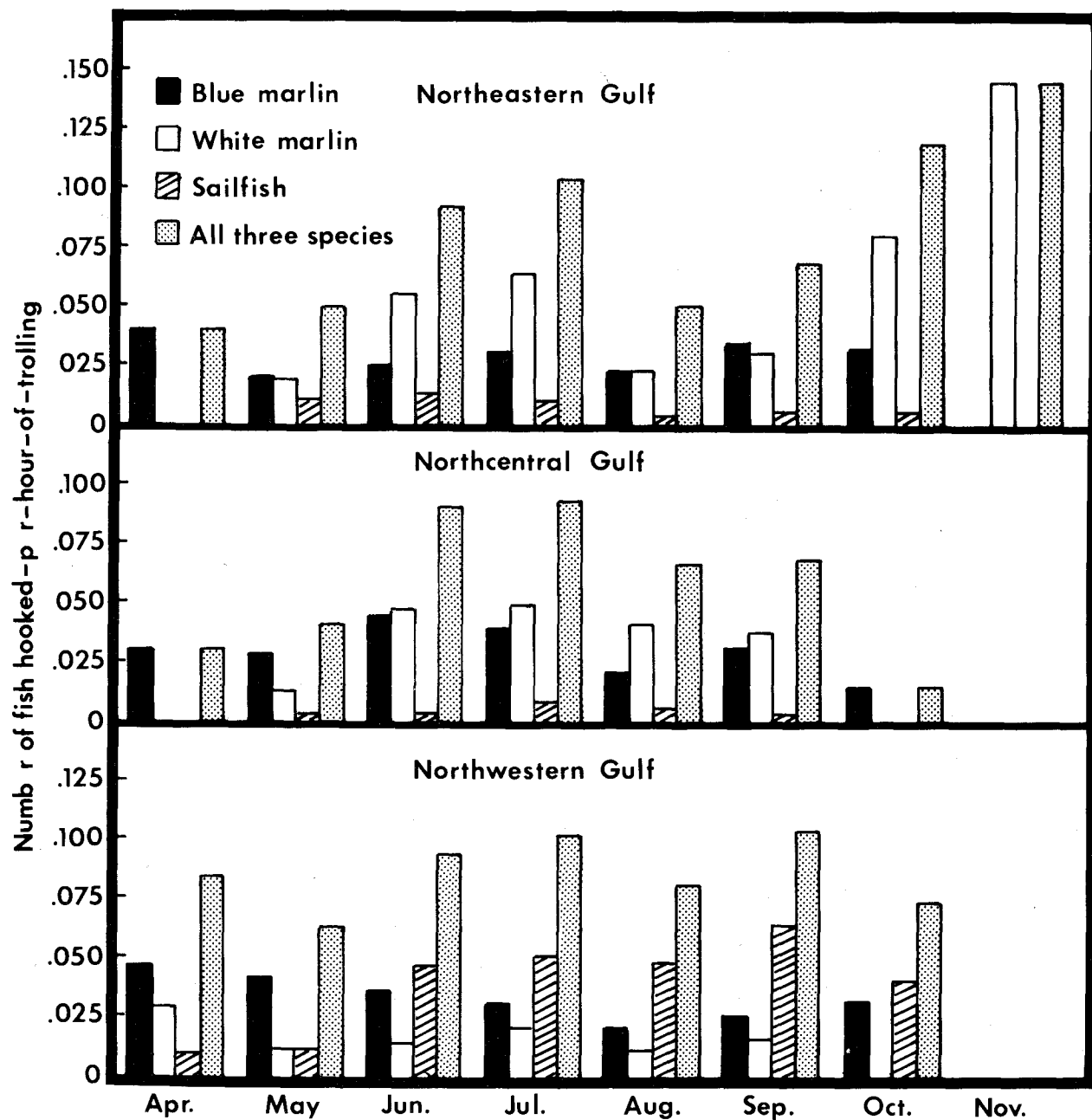




Figure 4.-- Number of billfishes hooked-per-hour-of-trolling by monthly periods in the northern Gulf of Mexico, 1981.


LEGEND

Fishing area
bound by
heavy black
lines.

Number of
fish raised-
per-hour-of-
trolling:

.001-.050 

.051-.100 

> .101 

No fish
raised in
squares
without
symbols.

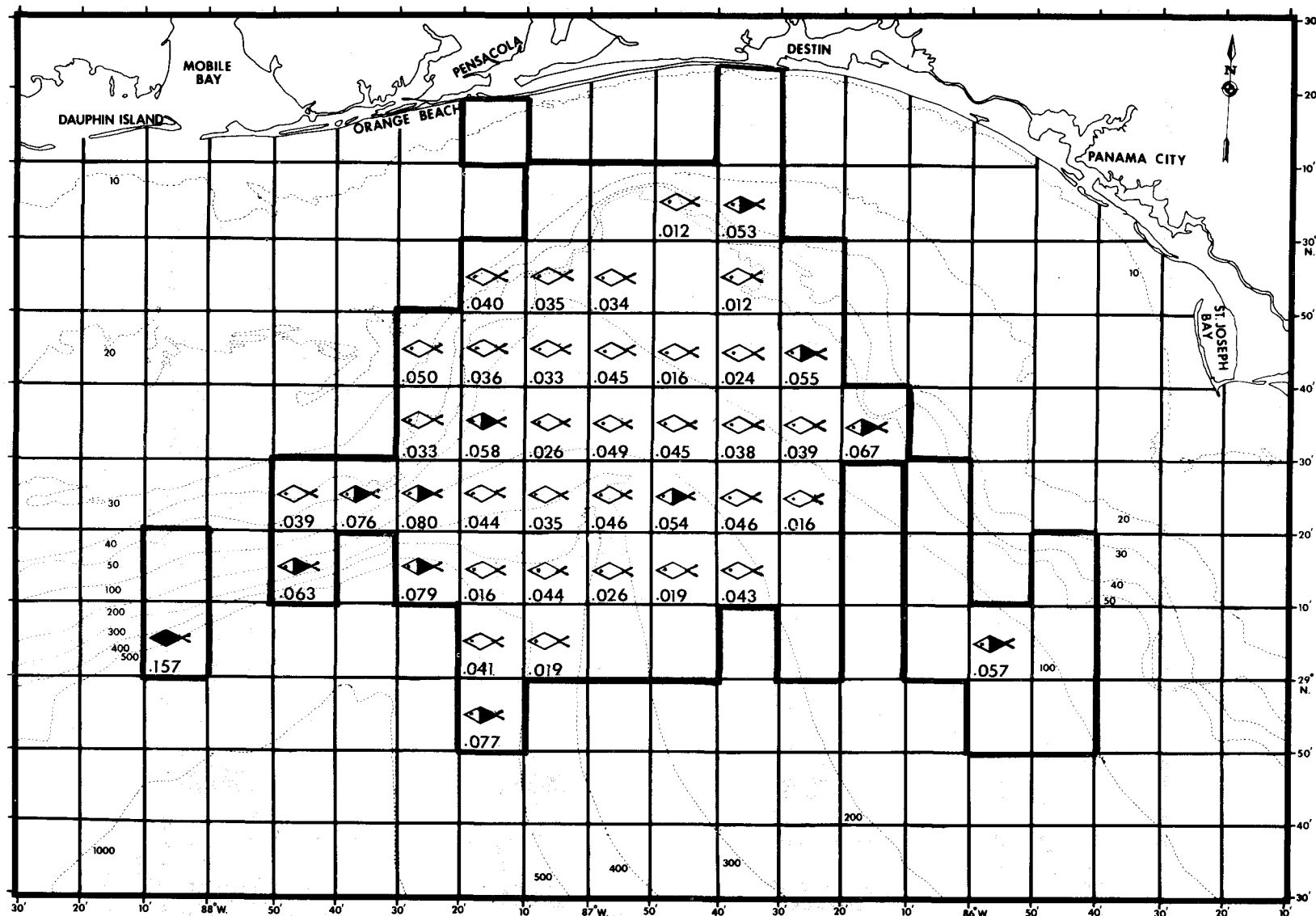
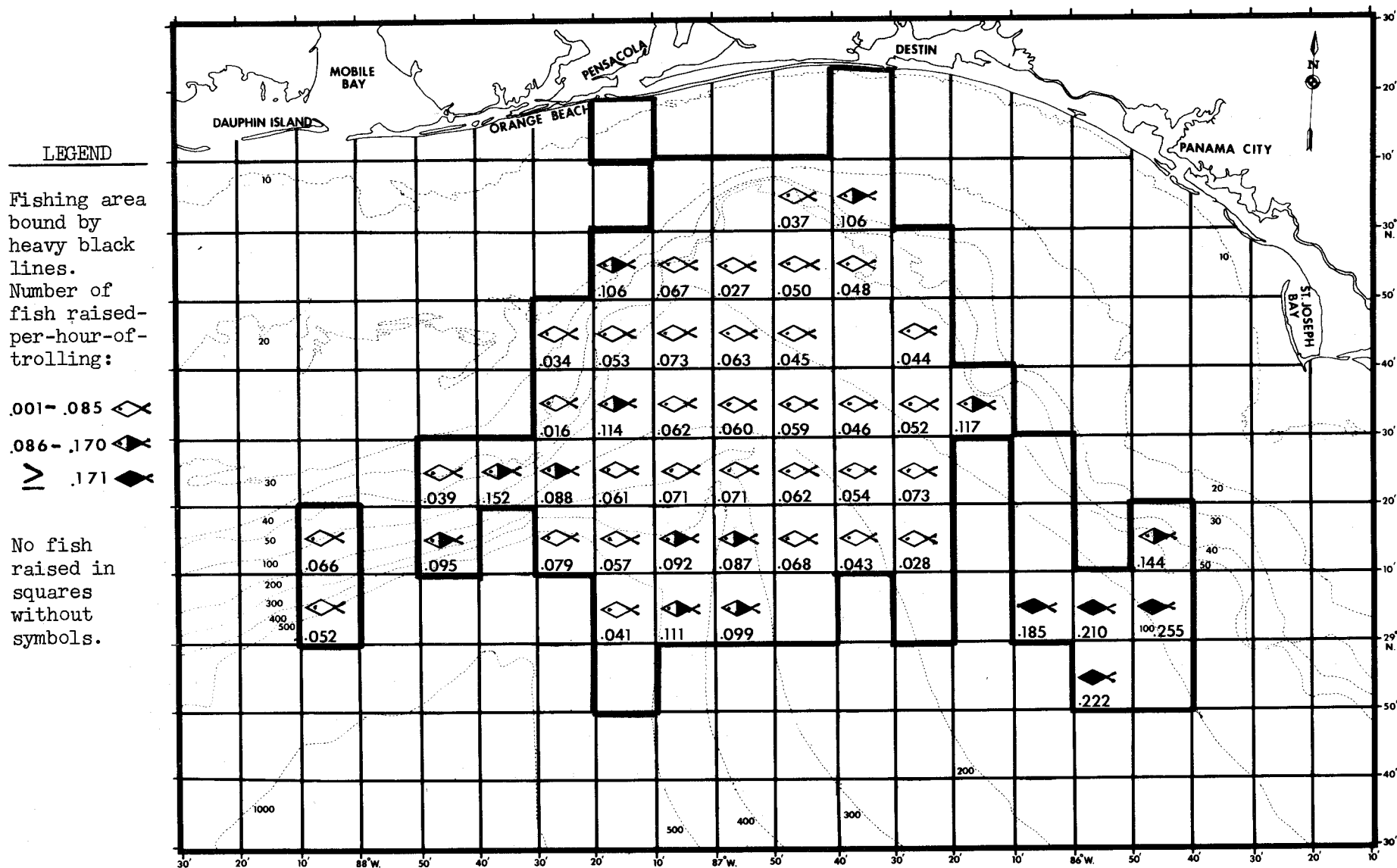



CHART 1.--Number of blue marlin raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1981.





LEGEND

Fishing area
bound by
heavy black
lines.

Number of
fish raised-
per-hour-of-
trolling:

.001-.035 

.036-.070 

\geq .071 

No fish
raised in
squares
without
symbols.

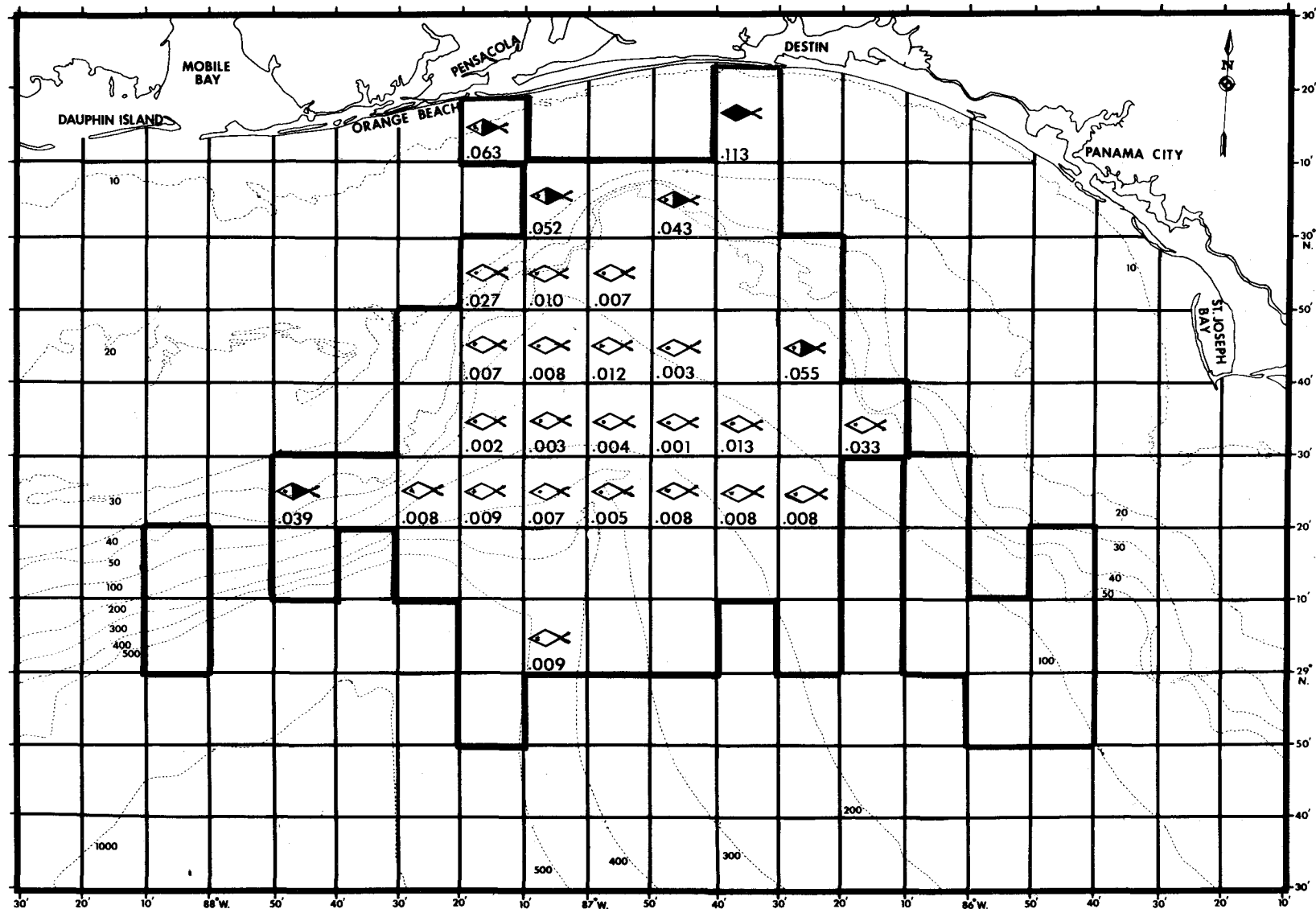


CHART 3.--Number of sailfish raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1981.

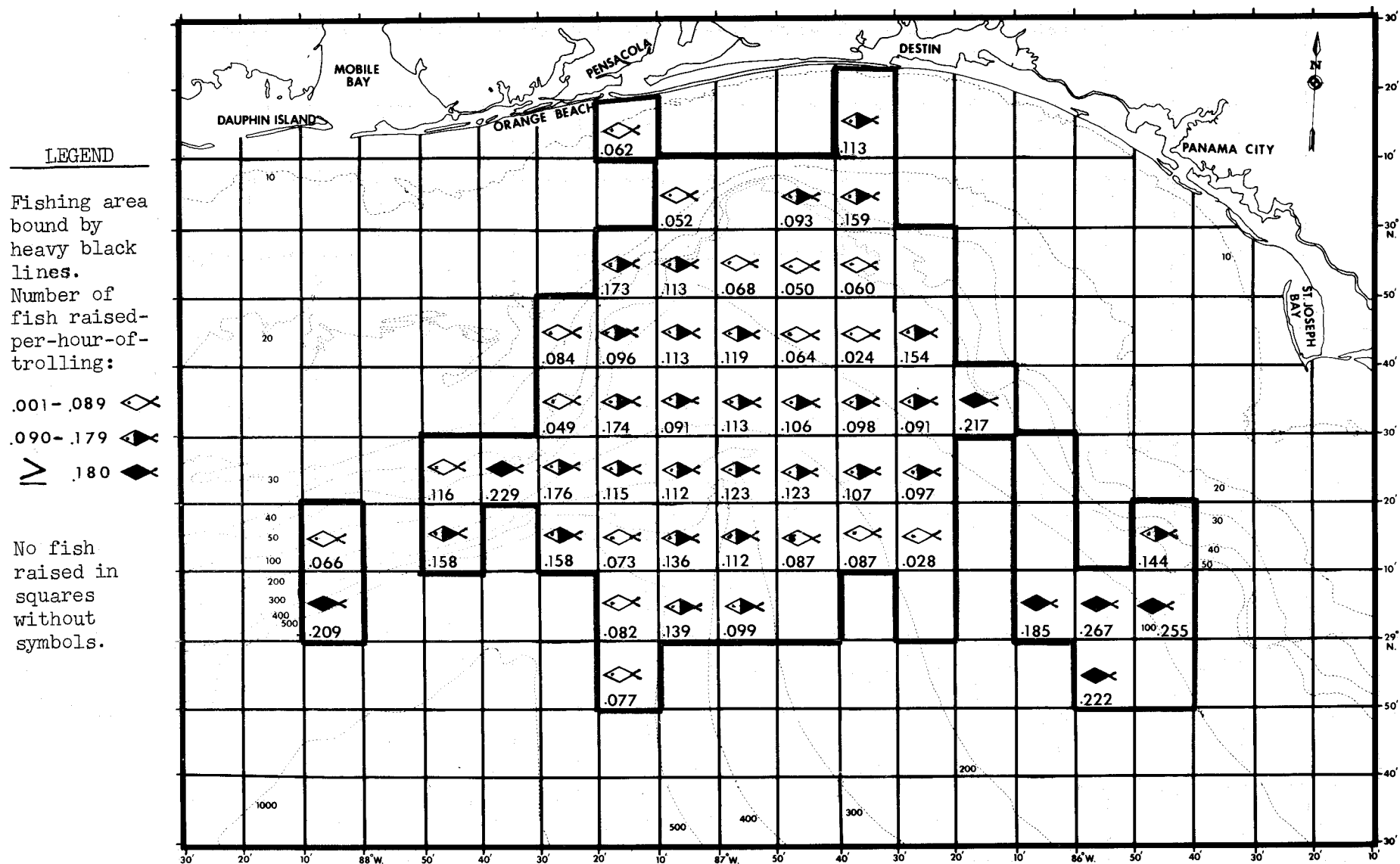


CHART 4.--Numbers of billfishes raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1981.

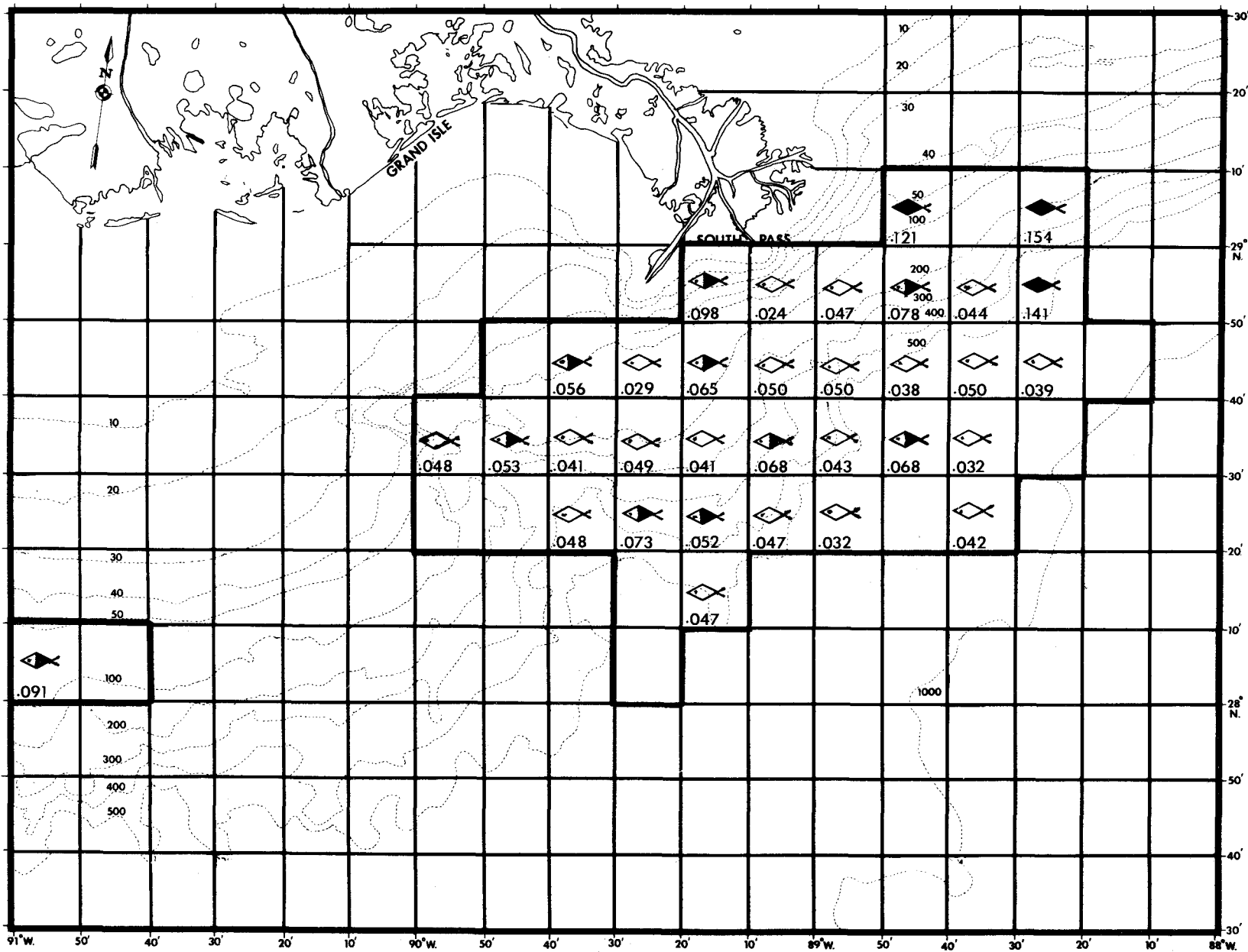


CHART 5.--Number of blue marlin raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1981.

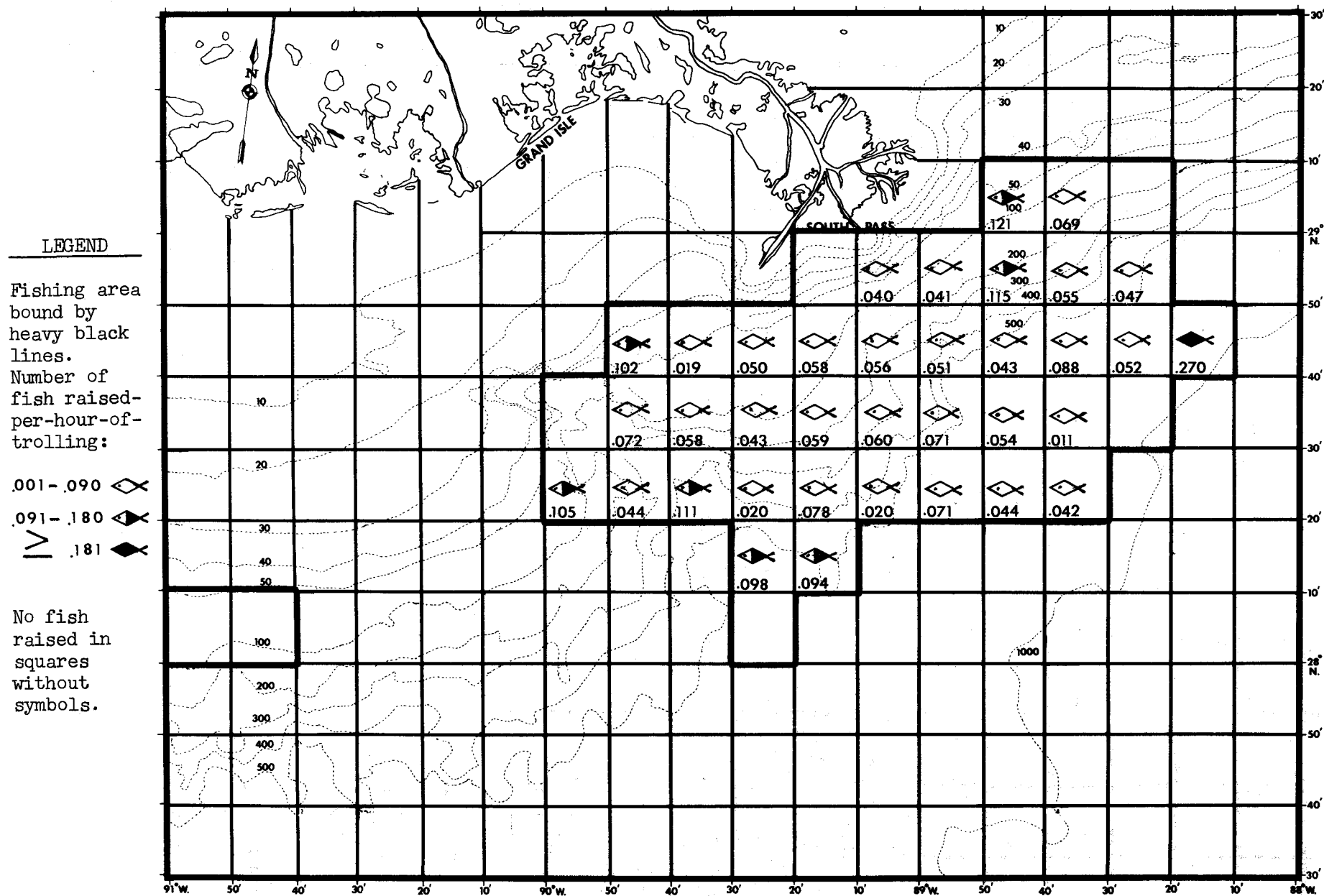


CHART 6.--Number of white marlin raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1981.

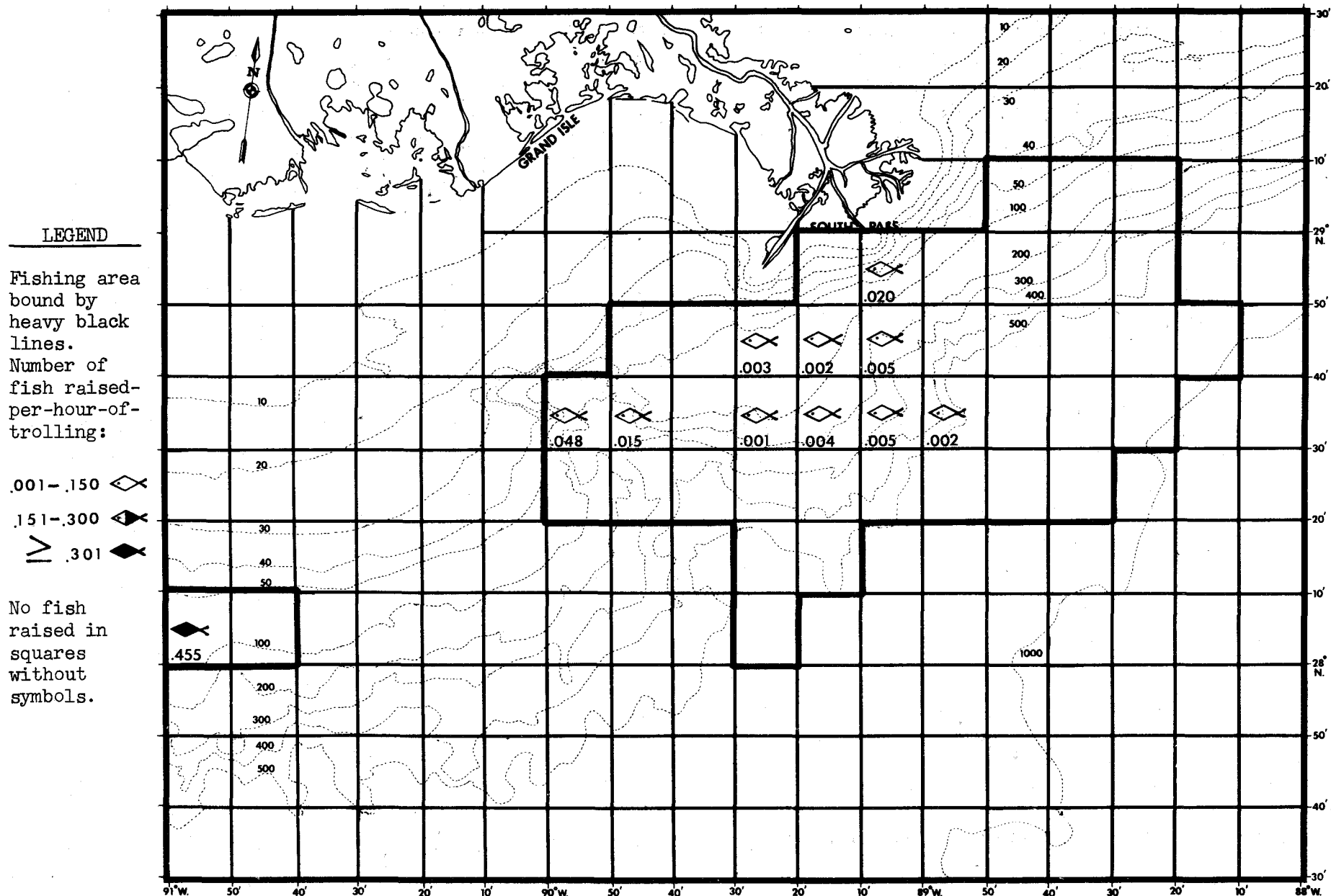


CHART 7.--Number of sailfish raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1981.

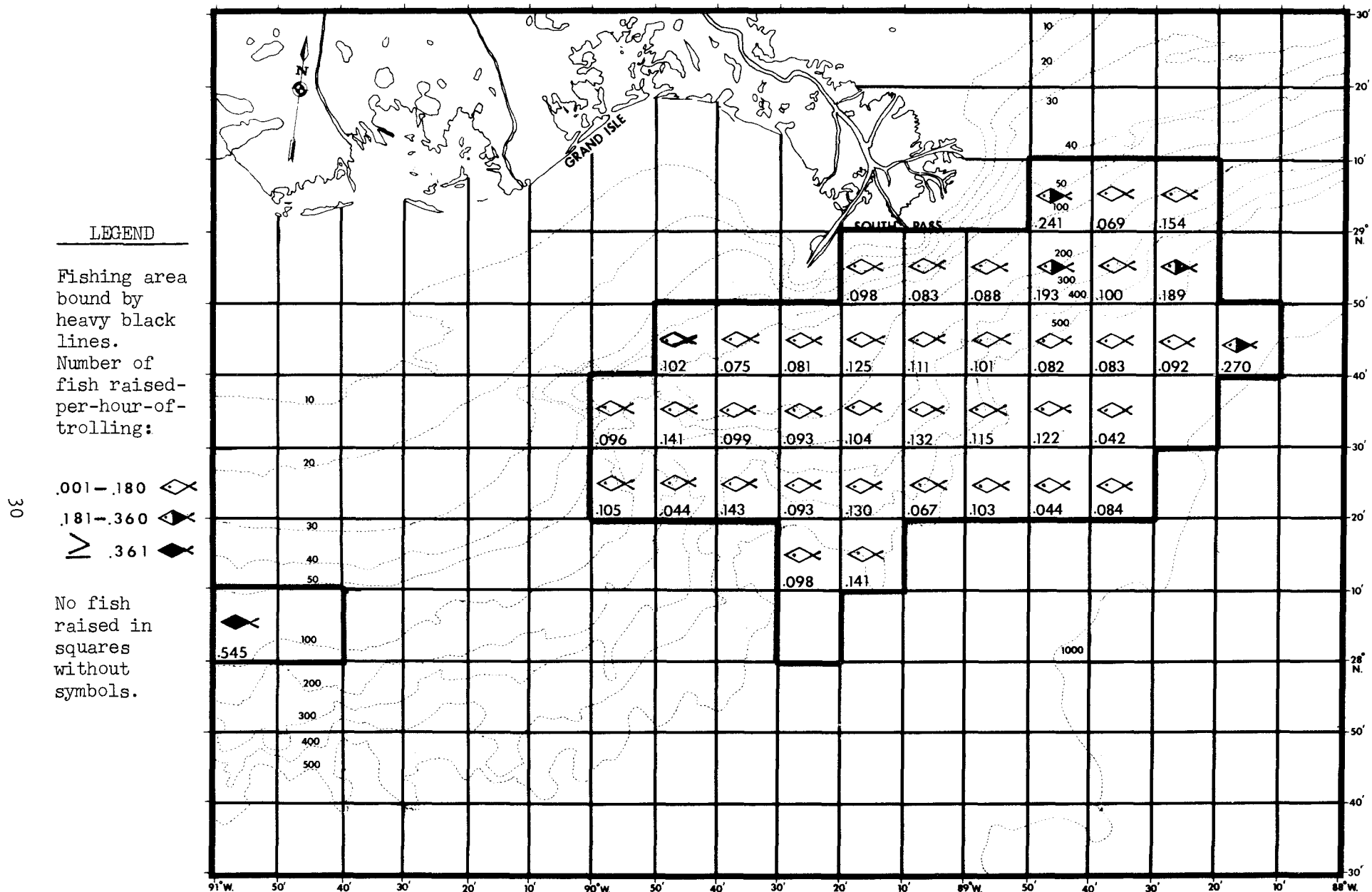
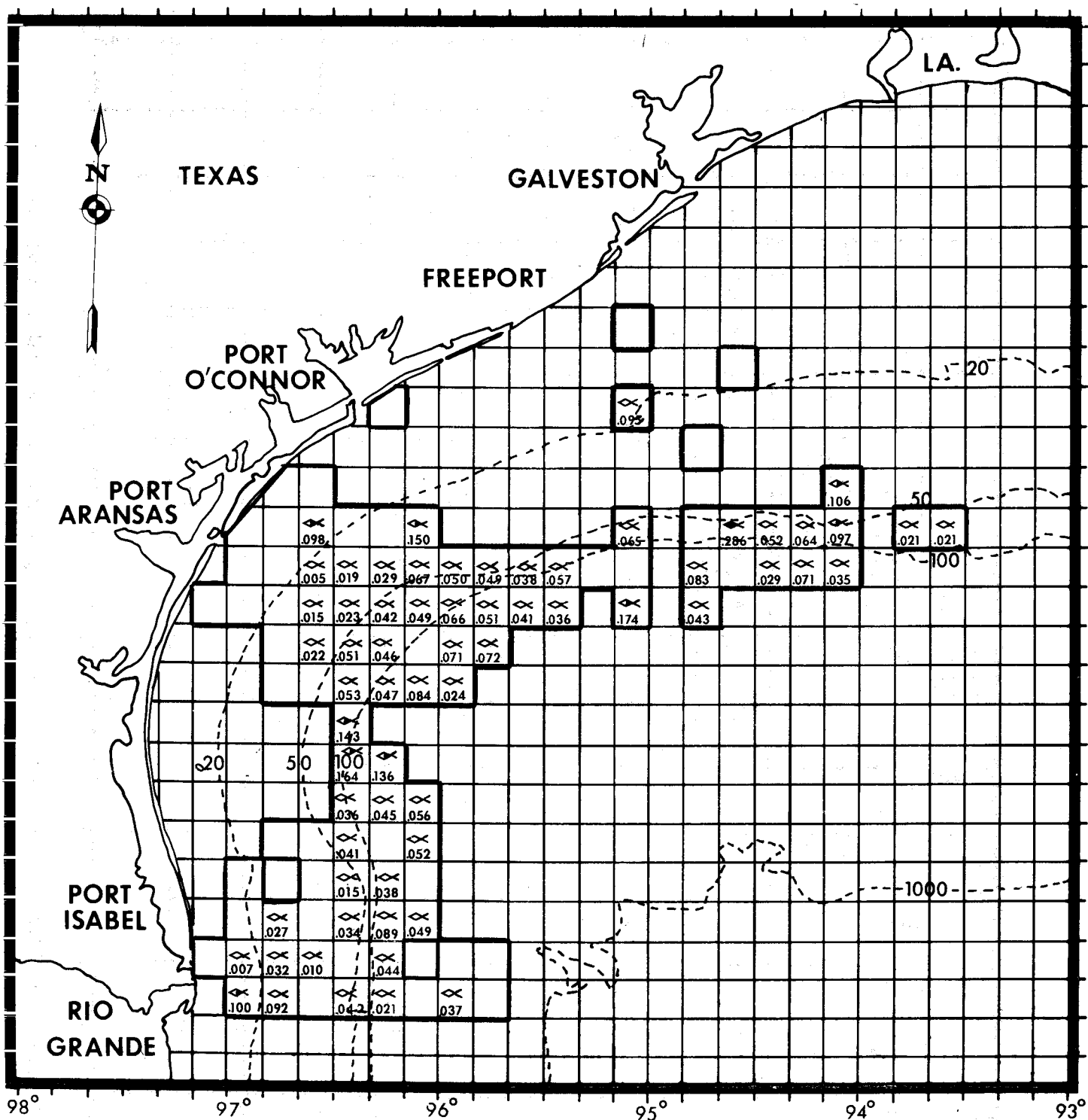


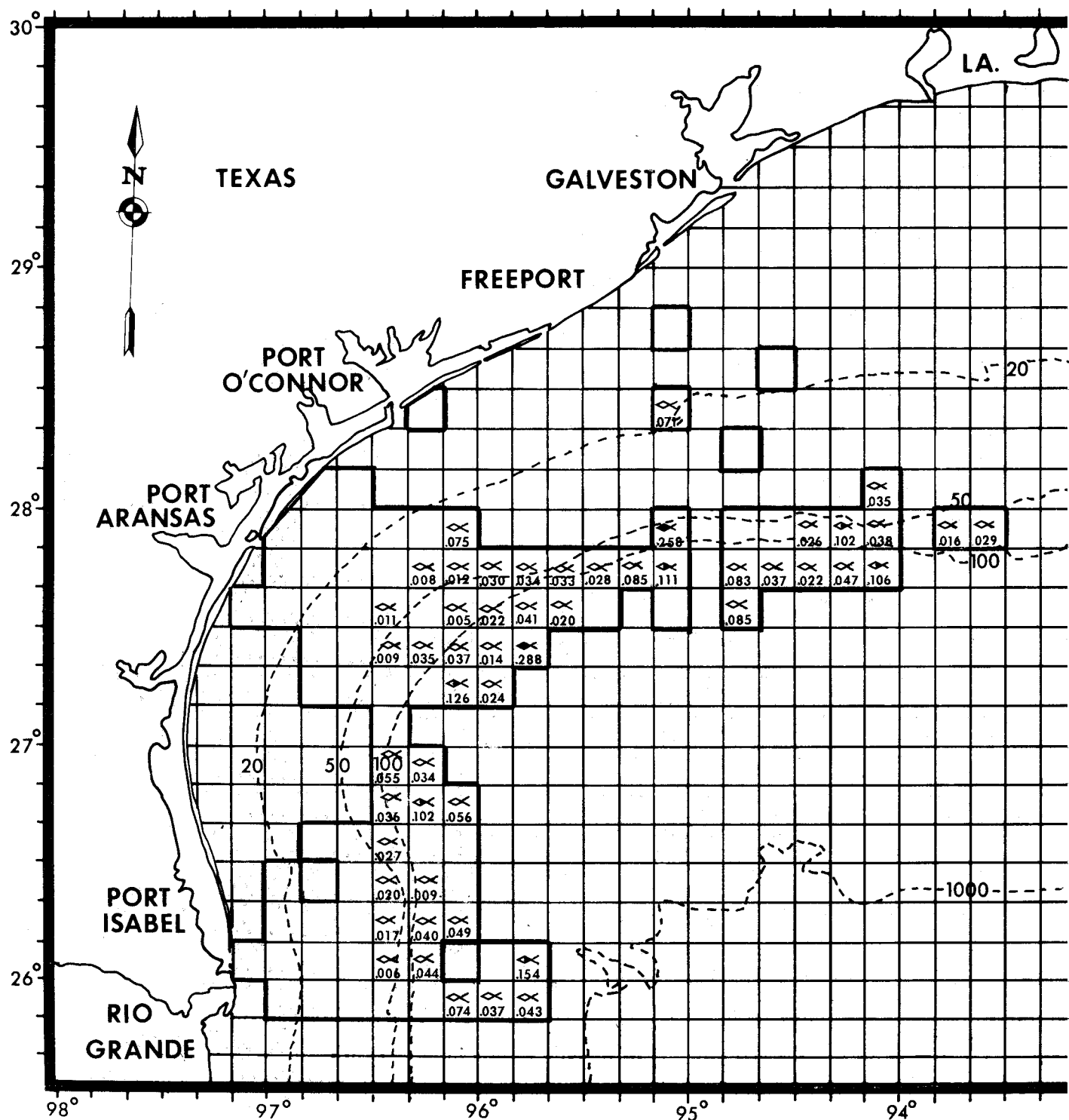
CHART 8.--Numbers of billfishes raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1981.



L Fishing areas
 E bound by heavy
 G black lines.
 E No fish raised
 N in squares
 D without symbols.

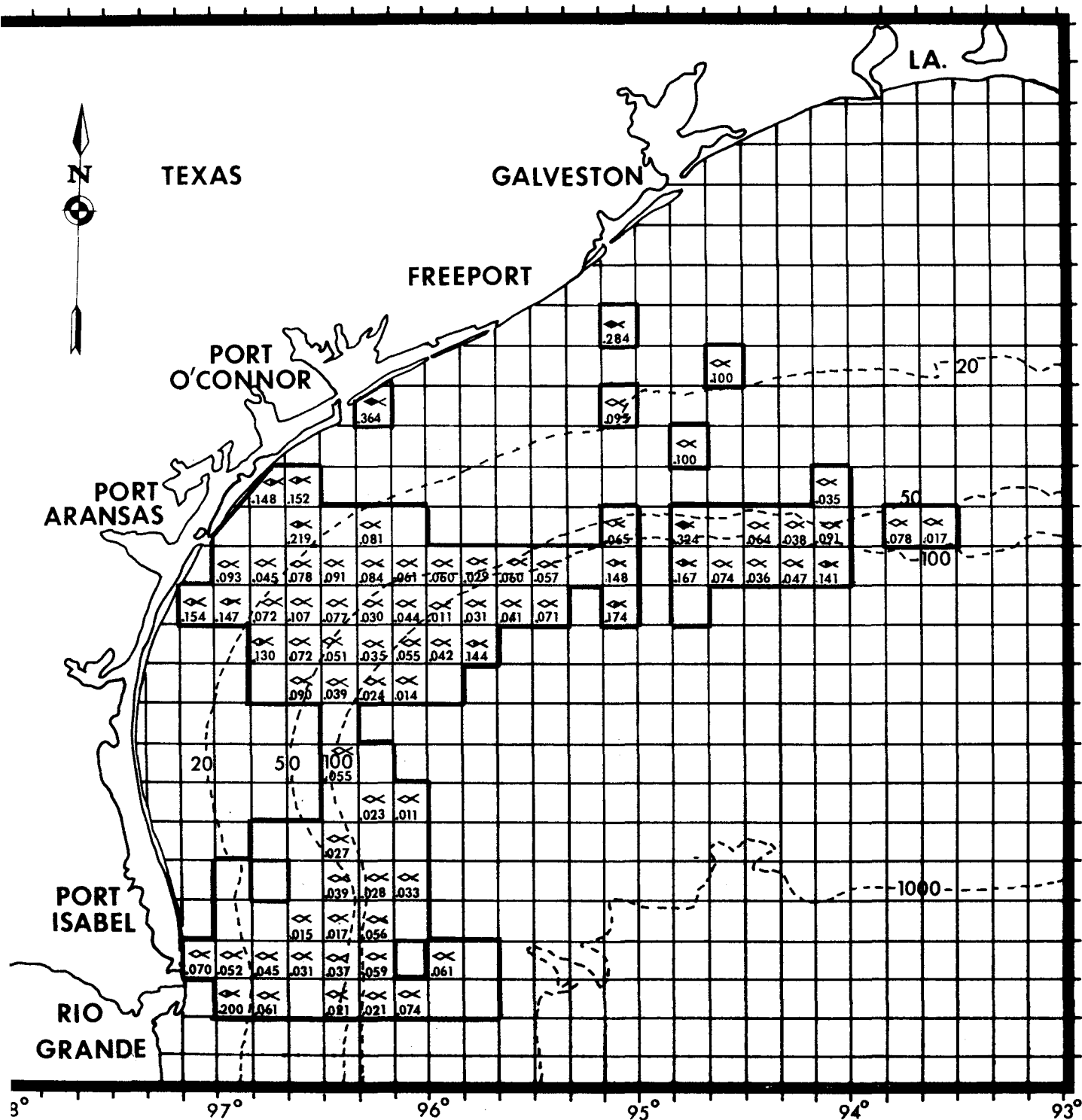
.001-.095 ⌘ fishes raised-per-hour-of-trolling.
 .096-.190 ⌘ fishes raised-per-hour-of-trolling.
 ≥ .191 ⌘ fishes raised-per-hour-of-trolling.

CHART 9.--Number of blue marlin raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1981.



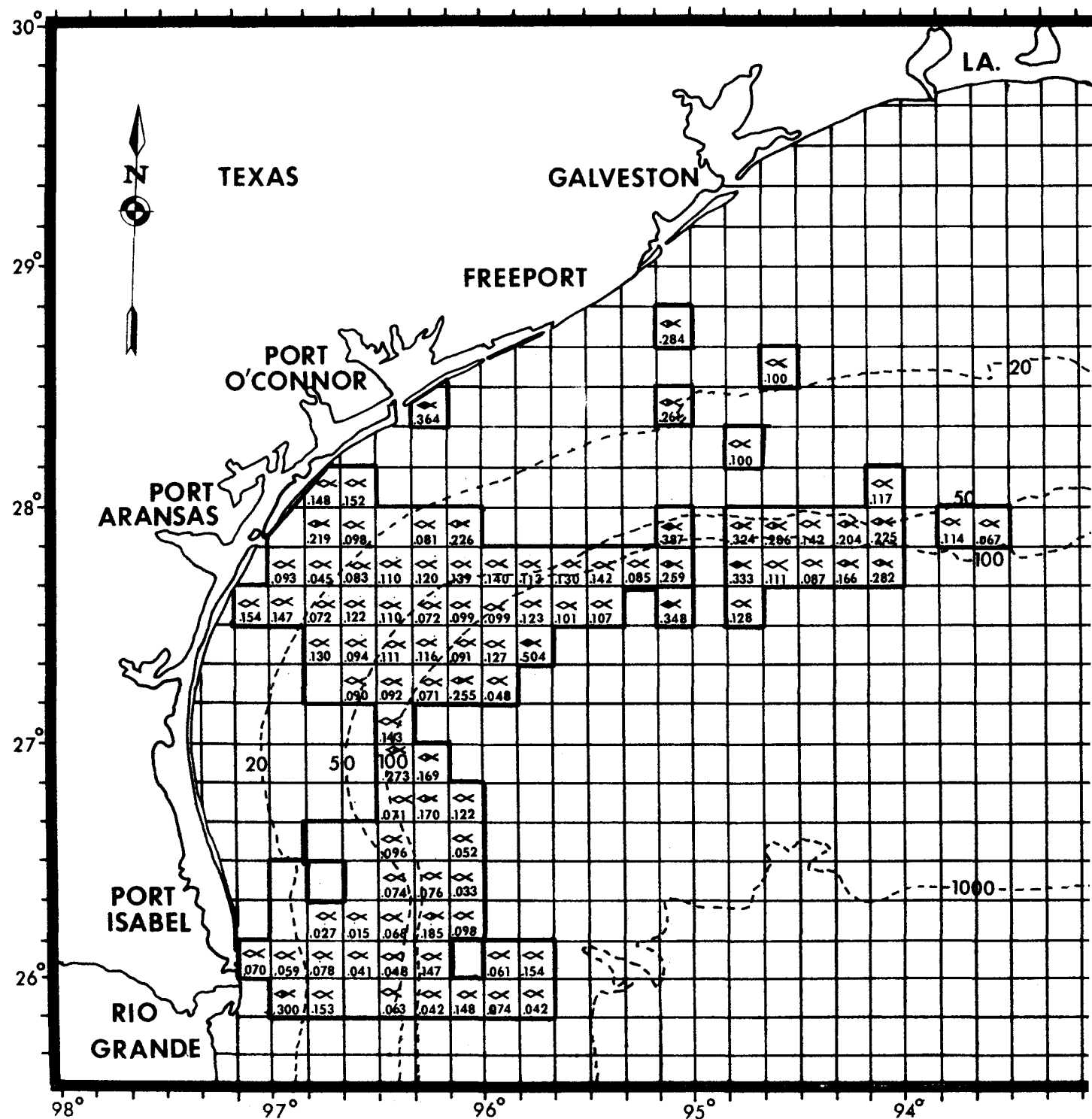
- | | | | | |
|---|------------------|-----------|---|-------------------------------------|
| L | Fishing areas | .001-.095 | X | fishes raised-per-hour-of-trolling. |
| E | bound by heavy | | | |
| G | black lines. | .096-.190 | ⊗ | fishes raised-per-hour-of-trolling. |
| E | No fish raised | | | |
| N | in squares | .191 | ⊗ | fishes raised-per-hour-of-trolling. |
| D | without symbols. | | | |

CHART 10.--Number of white marlin raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1981.



L	Fishing areas	.001-.120	⋈ fishes raised-per-hour-of-trolling.
E	bound by heavy	.121-.240	⋈ fishes raised-per-hour-of-trolling.
G	black lines.	≥ .241	⋈ fishes raised-per-hour-of-trolling.
E	No fish raised		
N	in squares		
D	without symbols.		

CHART 11.--Number of sailfish raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1981.



- | | | | |
|---|------------------|---------|---------------------------------------|
| L | Fishing areas | 001-165 | ♠ fishes raised-per-hour-of-trolling. |
| E | bound by heavy | 166-330 | ♠ fishes raised-per-hour-of-trolling. |
| G | black lines. | ≥ 331 | ♠ fishes raised-per-hour-of-trolling. |
| E | No fish raised | | |
| N | in squares | | |
| D | without symbols. | | |

CHART 12.--Numbers of billfishes raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1981.