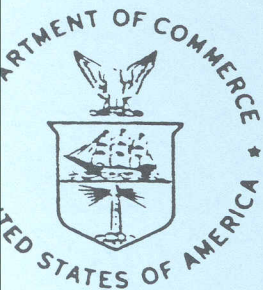
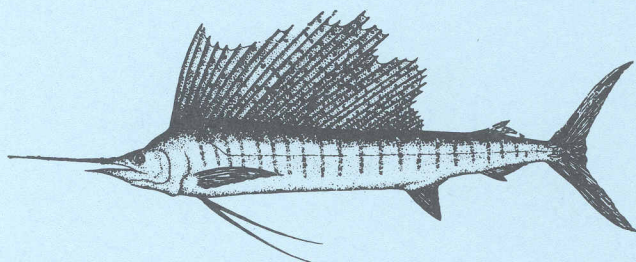
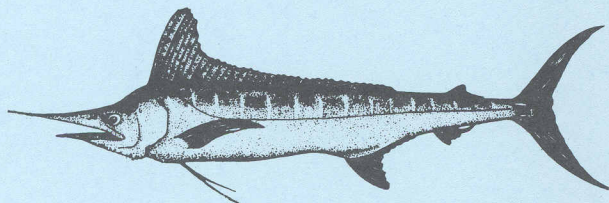
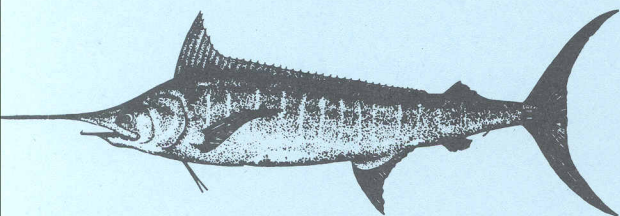


Library

NOAA Technical Memorandum NMFS-SEFC-77



BIG GAME FISHING IN THE NORTHERN
GULF OF MEXICO DURING 1980



Paul J. Pristas

June, 1981

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
Panama City Laboratory
3500 Delwood Beach Road
Panama City, Florida 32407

Technical Memorandums are used for documentation and timely communication of preliminary results, interim reports, or special-purpose information, and have not received complete formal review, editorial control, or detailed editing.



BIG GAME FISHING IN THE NORTHERN
GULF OF MEXICO DURING 1980.

Paul J. Pristas

June, 1981

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
National Oceanic and Atmospheric Administration
John V. Byrne, Administrator
National Marine Fisheries Service
William H. Stevenson, Acting Assistant Administrator
for Fisheries

INTRODUCTION

In 1970, the Panama City Laboratory of the National Marine Fisheries Service (NMFS) began a study on big game fishes (blue marlin, Makaira nigricans; white marlin, Tetrapturus albidus; and sailfish, Istiophorus platypterus) in the northern Gulf of Mexico. This study subsequently became part of the Southeast Fisheries Center's Oceanic Pelagics Program, the statistics for which are collected by the Fishery Survey Task of the Office of Technical and Information Management Services. Data have been collected through the cooperation of recreational fishermen who wished to learn more about big game fishes. This annual report, the tenth, is furnished to: (1) answer general questions such as: where was the best fishing? what was the best bait? how was the fishing season? etc.; and (2) provide scientific data about the distribution, abundance, and biology of marlins and sailfish in the Gulf of Mexico.

SURVEY DATA

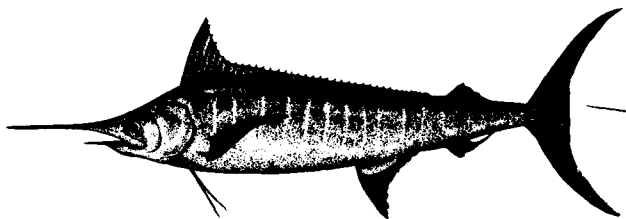
Port samplers for the NMFS were stationed during the 1980 billfishing season at: Port Aransas, Texas; Grand Isle, Louisiana; South Pass, Louisiana; Mobile, Alabama/Pensacola, Florida; Destin, Florida; and Panama City, Florida. Within their respective areas, these port samplers interviewed sport fishermen, charter boat captains, and others in order to collect such billfishing data as: catch; effort (hours fished); weather conditions; fishing activities related to time of day; species raised, hooked, boated, tagged, and released; length, weight, and sex; and fishing area (latitude and longitude). When fishing occurred in more than one 10-minute latitude and longitude square with no indication of amount of time fished per square, total fishing time was divided by the number of squares and the quotient allotted to each square.

This report is based primarily upon trolling effort directed toward marlins and sailfish. Data on spearfish (T. pflugeri) and swordfish (Xiphias gladius) are included in Tables 1 to 3, but are not included in computations for billfishes in Tables 4 to 6. Time spent fighting fishes is not included in the computations. The driftfishing activity listed in Table 1a began to increase in popularity three years ago and was thereafter recorded by our port samplers.

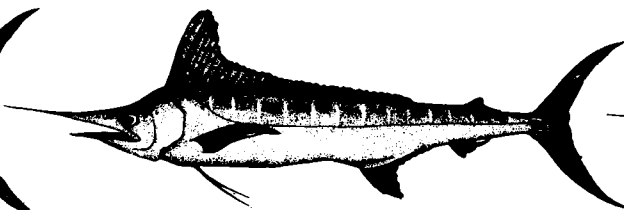
CATCH AND EFFORT

For the 1980 season, the number of hours fished, the number of fish caught (including releases), the catch-per-hour (CPH) and its reciprocal (hours trolled to catch a fish) are shown in Table 1. The 27,176 hr of trolling activity was a 14% (3,238 hr) increase over the number of hours recorded in 1979, and was 13% (4,167 hr) below the record high observed in 1978. In contrast to the 1979 season, when five of the seven ports reflected a decrease in fishing effort, only one port, Panama City, had a decrease (3%) in recorded effort. In 1980, recorded increases in fishing effort over the 1979 season were 41% at Destin, 8% at Pensacola, 24% at Mobile, 3% at South Pass, 6% at Grand Isle, and 13% in Texas. Recorded

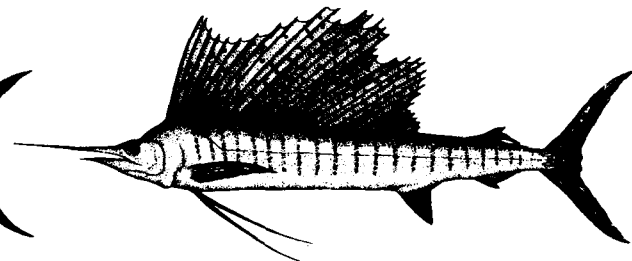
1980 SUMMARY FOR THE NORTHERN GULF OF MEXICO



BLUE MARLIN



WHITE MARLIN



SAILFISH

Hours
trolled to
catch a --

93.4

26.0

135.2

Percentage
hooked on
artificial
baits

79

60

51

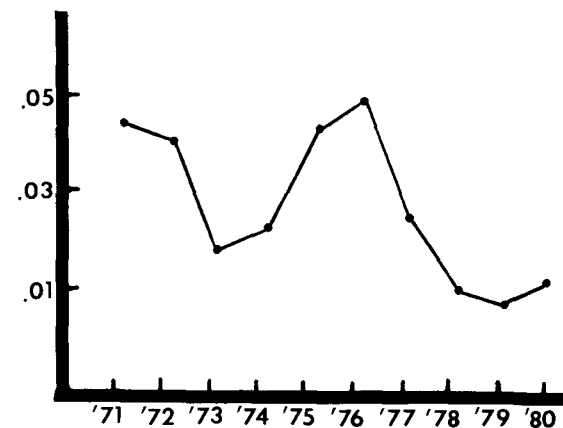
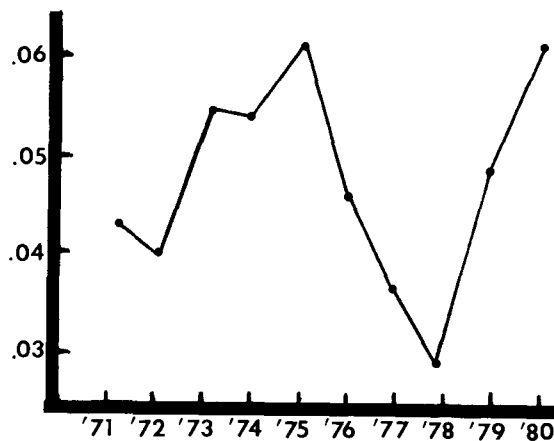
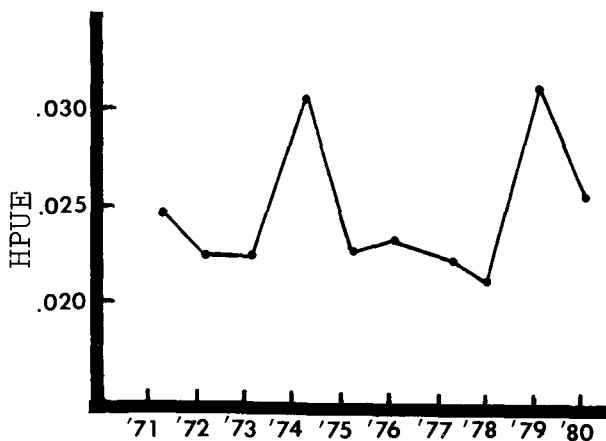
Peak feed-
ing period

5-6A.M.

10-11A.M.

10-11A.M.

Relative
abundance



Y E A R

fishing effort increased 11% (1,242 hr) in the northeastern area (Panama City, Destin, and Mobile/Pensacola), 4% (400 hr) in the northcentral area (South Pass and Grand Isle), and 13% (584 hr) in the northwestern area (Texas).

During the 1980 season, there was an increase in the number of recorded catches over that of the previous season at all ports except Pensacola (Table 1). These increases were reflected in increased CPH at all ports except Pensacola which had a slight decrease (7%) from 1979. Increases in the CPH over the 1979 rates were: 133% at Panama City, 41% at Destin, 29% at Mobile, 17% at South Pass, 19% at Grand Isle, and 29% in Texas. Compared to 1979, fishing success, as measured by CPH increased 33% in the entire northern Gulf; in areas of the Gulf, CPH increased 35% in the northeastern Gulf, 17% in the northcentral Gulf, and 29% in the northwestern Gulf.

Yearly fluctuations in the CPH of billfishes in the northern Gulf are shown in Figure 1. Most notable in 1980 was the high catch of white marlin. More white marlin (1,048 fish) were reported caught in 1980 than all three species together (1,029 fishes) reported in 1979. The CPH of white marlin (0.039) increased 62% over the previous season in the northern Gulf, with increases recorded at each port. For blue marlin, the total 1980 CPH (0.011) decreased 15% compared to 1979, as decreases in the CPH were reported at five (Panama City, Destin, South Pass, Grand Isle, and Texas) of the seven ports. During the season, sailfish were scarce in the billfish landings in the northeastern Gulf, where the recorded CPH decreased 23% from the 1979 level. However, the CPH (0.002) for sailfish in the northcentral Gulf doubled, and increased 87% in the northwestern Gulf over the previous season. For the entire northern Gulf the CPH of sailfish (0.007) increased 17% over the 1979 rate. For all three species combined, the CPH (0.057) increased for the second consecutive year.

The 953 hrs of driftfishing, primarily for swordfish, recorded in 1980 was 17% greater than the previous season (Table 1a). Ports where increased driftfishing effort were recorded were: Panama City (39%), Pensacola (200%), Mobile (95%), and Texas (231%). The ports of Destin, South Pass, and Grand Isle, had recorded decreases in effort of 52%, 27%, and 79%, respectively. Only South Pass had an increase (318%) in recorded CPH compared to 1979. For the northern Gulf, the recorded CPH for all billfishes (0.025) decreased 65% from the 1979 driftfishing rate.

SIZE COMPOSITION

Size data were summarized by weight as in previous years (Table 2). The largest blue marlin (738.0 lb) was again reported from South Pass. A 39.0-lb blue marlin, the smallest for this species, was landed at Mobile and was 7.0 lb heavier than the smallest blue marlin ever recorded (32.0-lb blue marlin reported from Pensacola in 1971). The largest white marlin (97.0 lb) was measured in Mobile; the smallest (20.0 lb) was reported from Texas. Both the largest (83.0 lb) and smallest (8.5 lb) sailfish were recorded in Texas. No spearfish was observed in the catches this season. The heaviest swordfish (310.0 lb) reported this season was landed at South

Pass and was 7.0 lb less than the heaviest one on record (317.0-lb swordfish, Texas, 1979) for the northern Gulf.

The fluctuations in yearly average weights during the ten-year study period are shown in Figure 2 for blue marlin, white marlin, and sailfish. In 1980, the average weight of blue marlin (263 lb) decreased 12 lb from the high of 275 lb in 1979 and was 9 lb above the previous 9-year average. As in most preceding years, the average weight of blue marlin in 1980 in the northcentral Gulf (303 lb) was greater than the average in the northeastern Gulf (240 lb) and in the northwestern Gulf (234 lb). The average weight of white marlin (52 lb) remained the same as in 1979 and was 2 lb below the average for the previous nine years. By area, the average weights were: 52 lb in the northeastern Gulf, 55 lb in the northcentral Gulf, and 45 lb in the northwestern Gulf. Sailfish decreased slightly in average weight from 45 lb in 1979 to 44 lb in 1980: a weight equal to the previous 9-yr average. In general, the average weights of the three species for 1980 were not especially noteworthy.

SEX COMPOSITION

During the 1980 season, 168 blue marlin, 378 white marlin, 101 sailfish, and 6 swordfish were examined for sex determination (Table 3). Female (F) blue marlin outnumbered males (M) by 3.4:1, the lowest F:M ratio in four years. The 2:1 ratio for white marlin was the highest we have recorded for this species since 1976. Almost equal numbers of female and male sailfish (51:50) were observed this season. Last year I commented that when the CPH of sailfish was low, females outnumbered males by at least 2:1. Conversely, when the CPH of sailfish was high the F:M ratio was less than 2:1. This was not the case in 1980, as the CPH of sailfish was quite low, yet the F:M ratio (1:1) was equal. No spearfish was available for sex determination, and only six swordfish were examined, only one of which was a male. Of interest is the fact that, of the four swordfish examined in 1979, males outnumbered females 3:1.

RELATIVE ABUNDANCE

The number of fish hooked-per-unit-of-effort (HPUE), i.e., hooked-per-hour-of-trolling, is used as an index of apparent relative abundance and is shown in Table 4 for each of the three species, as well as for all three combined species. The HPUE for blue marlin decreased 19% from 1979 in the northern Gulf, reflecting decreases of 7% in the northwestern Gulf, 17% in the northcentral Gulf, and 21% in the northeastern Gulf. The highest HPUE (0.034) in 1980 occurred at South Pass in the northcentral Gulf, where blue marlin appeared to be most abundant. The relative abundance of white marlin increased in all three areas of the northern Gulf, but not at all ports. For all areas combined, the HPUE (0.061) in 1980 increased 27% over 1979. The ports of Pensacola and Mobile, however, reported decreases, 9% and 34%, respectively. The relative abundance of sailfish in 1980 increased 22% for the entire northern Gulf over the previous season. However, this increase was not shown in all areas. Sailfish were noticeably scarce in the sport fishery in the northeastern Gulf. In this area, the HPUE (0.006)

decreased 45% from 1979; decreased HPUEs were recorded at all four ports. In the northcentral Gulf, where sailfish had not been generally abundant in the past, the HPUE (0.002) increased 100% over 1979 and was comparable to the rates in the northeastern Gulf. In Texas, the HPUE for sailfish (0.045) increased 114% over 1979. For all three combined species, the index of relative abundance increased 1% in the northeastern Gulf, 7% in the northcentral Gulf, 32% in the northwestern Gulf, and 10% for the entire northern Gulf.

The apparent relative abundance of billfishes in the northern Gulf in 1980 increased for two of the three species (Fig. 3). Although the HPUE (0.026) for blue marlin decreased 19% from 1979, the 1980 rate for this species remained 8% above the previous 9-yr average HPUE (0.024). For white marlin, this second continuing increase in HPUE was 39% above the 9-yr average and was only 3% below the record high HPUE recorded in 1975. The HPUE (0.011) for sailfish was 61% below the average for the previous nine years; a slight improvement over last year's relative abundance index which was 70% below the preceding 8-yr average. This season, the HPUE (0.097) for the three combined species was 2% above the average HPUE (0.095) from 1971 to 1979.

The relative abundances of billfishes determined yearly from 1972 to 1980 from tournament and nontournament data (dock data) and both combined are shown in Figure 4. From 1975 to 1980, over 40% of each year's data consisted of data collected during tournaments. In 1980, tournament data comprised 71% of all data collected in the Gulf; this was the greatest proportion of tournament data ever collected. Since 1975, the relative abundances of white marlin and sailfish have shown similar trends when calculated from either tournament or dock data. These similar year-to-year trends, also, occurred when data were combined for all three species. The HPUE for blue marlin as measured by both types of data have shown similar trends since 1978. From 1977 to 1980, over 60% of each year's data were derived from sampling tournaments. Fluctuations in the relative abundance of white marlin and sailfish, and all three species combined appear to coincide whenever tournament sampling constitutes at least 40% of the data. For blue marlin, fluctuations appear to coincide when tournament data constitutes 60% or more of the data.

The HPUE was calculated for each of the three areas for months during which 50 hr or more of trolling effort were recorded (Fig. 5). In the northeastern Gulf, the HPUE for the combined species continuously increased from May to August, then decreased each month until the season ended in November. Monthly HPUEs for the combined species were strongly influenced by the HPUE for white marlin each month. In the northcentral Gulf, the HPUE by monthly periods was generally the same as in the northeast. The HPUE for the marlins reflected the changes in HPUE from month to month, as sailfish were never abundant. In the northwestern Gulf, the HPUE for the combined species was highest in October, strongly influenced by the HPUE for sailfish and for white marlin. The HPUE for blue marlin continued to decrease from a high in April to lows in September and October.

FISHING SUCCESS

Fishing success as determined by the numbers of fishes that were hooked after being raised, or boated/released after being hooked is shown for all three species in Table 5. Blue marlin continued to be the hardest of the three species to boat after either being raised or hooked. For this species, 38% of the hooked fish were boated and 4% were released. The combined success rate of 42% (38% boated plus 4% released) has not varied more than 5% for five years. For white marlin, the combined success rate for hooked fish was 64% (53% boated and 11% released). The 64% success rate was an increase of 14% over the previous season. Fishermen were successful with 70% of the hooked sailfish (64% boated and 6% released). The combined fishing success for sailfish increased 5% over 1979. For combined species, 50% of the hooked fish were boated and 8% of those hooked were released.

BAIT PREFERENCE

Prior to 1977, the use of artificial lures (i.e., no natural bait attached) in trolling for billfishes was minimal, with some exceptions in certain areas (e.g., Grand Isle). Since then, the use of artificial lures has increased to the extent that fishermen frequently inquire as to the number of fish hooked on natural baits (or parts thereof) and artificial baits (lures).

The numbers of hours trolled while using either natural baits, artificial baits, or both simultaneously, and the HPUE rates for each of the three categories are shown in Table 6. In the northeastern Gulf, most trolling (5,063 hr) was done with only artificial baits. This resulted in the lowest HPUE (0.111). The highest HPUE (0.142) and the least number of hours trolled (3,146 hr) was recorded when only natural baits were used. When natural and artificial baits were trolled at the same time, 56% and 44% of the fishes were hooked on natural and artificial baits, respectively. When both types of baits were trolled simultaneously, most blue marlin (52%) were hooked on lures, while most white marlin (57%) and sailfish (80%) were hooked on natural baits. In the northcentral Gulf, artificial baits were trolled 97% of the fishing time and resulted in the highest HPUE (0.058). Natural baits only were used during 1% of the fishing, resulting in the lowest HPUE (0.012). All blue marlin and sailfish, and 99% of the white marlin were hooked on artificial baits. In the northwestern Gulf, the majority (55%) of the trolling was with artificial baits only, but the highest HPUE (0.118) occurred when natural baits only were fished. Percentages of the three species hooked on artificial baits were 78% of the blue marlin, 64% of the white marlin and 55% of the sailfish. For all three combined areas, the results showed most trolling (64%) for billfishes was with artificial baits only, but when dead baits only were used, the highest HPUE (0.135) occurred. In the study of bait preference, 79% of 692 blue marlin, 60% of 1,648 white marlin, and 51% of 287 sailfish were hooked on artificial baits.

FEEDING PERIODS

As an indicator of feeding activity, the HPUE rate by hourly periods was used with the realization that a billfish might strike for reasons other than hunger. In the 1978 Gulf billfishing report, it was acknowledged that a shift in fishing effort related to time periods or locations could affect the HPUE. Subsequently time-of-day and total effort data from 1971 to 1978 were analyzed with no apparent correlation.

For hourly periods during which there was at least 25 hr of trolling, the HPUE is shown in Figure 6 for the three species separately and combined. The rise in morning feeding activities of billfishes to a peak around the 1000 hr period is in general agreement with data from previous years. Through the years, peak morning feeding has occurred most consistently during the 1000 hr and 1100 hr period, with greatest activity fluctuating between these two periods from year to year. This season, the highest HPUE for while marlin and sailfish occurred during the 1000 hr period. The highest HPUE for blue marlin was during the 0500 hr period, a period with low effort as compared to most other hourly periods.

FISHING AREA

As stated in last year's report, data from previous years were examined to determine whether shifts in areas of high numbers of fish raised-per-hour-of-trolling could be related to shifts in areas of high fishing effort. No correlation was detected. For 1980, fishing areas (10-min latitude and longitude squares) in which 10 hr or more of trolling activity occurred are shown in Charts 1-12 along with the number of fish-raised-per-hour-of-trolling.

Northeastern Gulf

In 1980, the fished area (Charts 1-4) decreased about 25% compared to 1979 and 1978 (66 and 65 squares, respectively). Some fishing south of 29°N latitude has occurred since 1978, when it was first reported to us. Blue marlin were raised in 36 (72%) of the 50 fished squares in 1980 (Chart 1), compared to 44 (76%) of the 66 fished squares the previous season. Of interest is that blue marlin, the species that is generally reported as most abundant offshore, is the only species not reported to have been raised south of 29°N latitude during the three years for which we have data for this area. The increase in the apparent relative abundance of white marlin (Fig. 3) was reflected by the raising of these fish in 88% (44 squares) of the fished area (Chart 2). Sailfish were reported to have been raised in 46% (23 squares) of the fishing area (Chart 3), with the higher concentrations generally inshore of the 100-fath curve. Billfishes were apparently more widely dispersed in 1980 (Chart 4) than they were in 1979. As their index of relative abundance increased (Fig. 3), they were reported to have been raised in 96% (48 squares) of the fishing area compared to 74% (49 of 66 squares) of the 1979 fishing area.

Northcentral Gulf

In this region of the Gulf, billfishing occurred over a 22% larger area (Charts 5-8) in 1980 than in 1979 (50 and 41 squares, respectively). Blue marlin were reported to have been raised in 37 (74%) of the 50 fished squares (Chart 5), and, in contrast to last year, were generally more abundant offshore. High concentrations of white marlin occurred throughout the fishing area (Chart 6), as fish were reported to have been raised in 66% (33 squares) of the fished squares. Eighty-eight percent (7 squares) of the squares in which sailfish were reported to have been raised were inshore areas (Chart 7). The high concentration of sailfish in the offshore square resulted when 2 of 17 fish were raised in a square of comparatively low fishing effort. Billfishes were raised in 78% of 39 squares (Chart 8) of the fishing area, compared to 93% (38 squares) of the fished area in 1979. In contrast to last season, when higher concentrations were generally inshore, high abundances of billfishes were scattered throughout the fishing area.

Northwestern Gulf

Trolling for billfishes was confined to a 48% smaller area (48 vs. 101 squares) off the Texas coast in 1980 (Charts 9-12) than in 1979. Chart 9 shows blue marlin were raised in 56% (27 squares) of the fishing area. Their distribution was similar to last year, when higher concentrations were generally inshore of the 100-fath curve. Previously, higher concentrations of this species usually occurred between the 100 and 300-fath curve. White marlin were reported to have been raised in 58% (28 squares) of the fished area (Chart 10). With one exception off Port Isabel, this species was reported to have been raised more often from the area of the 100-fath curve and beyond. In contrast to last year, when sailfish were least widely distributed (30 squares) of the three species, these fish were most widely distributed (Chart 11) of all billfishes in 1980. Fishermen reported raising sailfish in 35 squares (73%) off the Texas coast. High concentrations of sailfishes were reported widely distributed throughout the fishing area. In 1980, billfishes were reported to have been raised in 42 squares (Chart 12), as compared to 61 squares in 1979. However, this season the three combined species were raised in 88% of the fished area compared to 61% the previous year.

RELATED OBSERVATIONS

1. The 738.0-lb blue marlin brought into South Pass aboard the *Invader* by angler Archie Lowery, Capt. Roger Green, and Mate Jack Roberts is the largest blue marlin caught in the Gulf of Mexico by a male angler. This is the second largest blue marlin caught with rod and reel in the Gulf. The largest of this species caught with rod and reel in the Gulf was the 1,018.5-lb blue marlin caught by Linda Koerner off South Pass in 1977.

2. Three "Grand Slams" (i.e., catches of blue marlin, white marlin, and sailfish on one trip) were recorded by NMFS port samplers this year. In Florida, a Grand Slam was made aboard the *South Bound* owned by John Boggs. In Texas, Phillip Zeale brought in a Grand Slam aboard the *Bottom Line*. During the Poco Bueno Tournament, a Grand Slam was landed from the *Mary Jane*.

ACKNOWLEDGMENTS

I am grateful for the cooperation given by 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, Freeport; Russ Wilhour, Key Allegro; Walter Fondren, Port O'Conner; organizers of the Texas International Fishing Tournament, Port Isabel; the Port Mansfield Chamber of Commerce, Port Mansfield; Marco Piccola, II, 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; Riley Smith and the Mobile Big Game Fishing Club; Bobby Snellgrove and the Pensacola Big Game Fishing Club; Al Clark, Roy Gonzales and the Fort Walton Beach Sailfish Club; Malcolm Patterson, Joy Dunlap and the Destin Charter Boat Association; and the Panama City Fishing Association.

I am especially grateful to Betty Tubbs, San Benito, Texas who reported over 600 hr of fishing effort from the south Texas Gulf coast.

The port samplers made about 3,590 interviews to collect these data. I thank Ron Ilg, Port Aransas; Myron Fischer, Grand Isle; Joe Yurt, South Pass; John Penn, Pensacola; and Kevin Fitzsimmons, Destin, for their outstanding work throughout the season.

I express my gratitude to Conner Davis, Gulf of Mexico Fishery Management Council, for constructive comments about data analyses; and Rita Bloechel, and Carl Saloman, Panama City Laboratory, for the preparation of text and figures, respectively.

Table 1.--Summary of recorded trolling for big game fishes in the northern Gulf of Mexico, 1980.

| | Panama City | Destin | Pensacola | Mobile | South Pass | Grand Isle | Texas | All areas Combined |
|-----------------------------|----------------|---------|-----------|---------|---------------|---------------|---------|-----------------------|
| Total hrs. trolled | 1,188.2 | 4,428.8 | 2,454.9 | 4,260.0 | 5,594.4 | 4,302.9 | 4,946.6 | 27,175.8 |
| Number of recorded catches* | | | | | | | | |
| Blue marlin | 11 | 52 | 17 | 37 | 75 | 45 | 54 | 291 |
| White marlin | 118 | 283 | 112 | 239 | 146 | 56 | 93 | 1,047 |
| Sailfish | 6 | 32 | 1 | 9 | 8 | 7 | 138 | 201 |
| Spearfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Swordfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All billfishes | 135 | 367 | 130 | 285 | 229 | 108 | 285 | 1,539 |
| Catch-per-hour | | | | | | | | |
| Blue marlin | 0.009 | 0.012 | 0.007 | 0.009 | 0.013 | 0.010 | 0.011 | 0.011 |
| White marlin | 0.099 | 0.064 | 0.046 | 0.056 | 0.026 | 0.013 | 0.019 | 0.039 |
| Sailfish | 0.005 | 0.007 | 0.000 | 0.002 | 0.001 | 0.002 | 0.028 | 0.007 |
| Spearfish | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Swordfish | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| All billfishes | 0.114 | 0.083 | 0.053 | 0.067 | 0.041 | 0.025 | 0.058 | 0.057 |
| Hours trolled to catch a | | | | | | | | |
| Blue marlin | 108.0 | 85.2 | 144.4 | 115.1 | 74.6 | 95.6 | 91.6 | 93.4 |
| White marlin | 10.1 | 15.6 | 21.9 | 17.8 | 38.3 | 76.8 | 53.2 | 26.0 |
| Sailfish | 198.0 | 138.4 | 2,454.9 | 473.3 | 699.3 | 614.7 | 35.8 | 135.2 |
| Spearfish | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Swordfish | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| All billfishes | 8.8 | 12.1 | 18.9 | 14.9 | 24.4 | 39.8 | 17.4 | 17.7 |

*Includes releases

Table 1a.--Summary of recorded driftfishing for big game fishes in the northern Gulf of Mexico, 1980.

| | Panama City | Destin | Pensacola | Mobile | South Pass | Grand Isle | Texas | All Areas Combined |
|---|----------------|---------|-----------|---------|---------------|---------------|---------|-----------------------|
| Total hrs. fished | 160.8 | 173.4 | 236.9 | 69.2 | 31.4 | 66.6 | 214.9 | 953.2 |
| Number of recorded catches* and catch- per hour () | | | | | | | | |
| Swordfish | 2(.012) | 5(.029) | 1(.004) | 3(.043) | 3(.096) | 4(.060) | 1(.005) | 19(.020) |
| Blue marlin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| White marlin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sailfish | 0 | 0 | 0 | 0 | 0 | 0 | 5(.023) | 5(.005) |
| All billfishes | 2(.012) | 5(.029) | 1(.004) | 3(.043) | 3(.096) | 4(.060) | 6(.028) | 24(.025) |

11 *Includes releases

Table 2.--Weights (pounds) of billfishes recorded in the northern Gulf of Mexico, 1980.

| | Panama City | Destin | Pensacola | Mobile | South Pass | Grand Isle | Texas | All Areas Combined |
|--------------|----------------|--------|-----------|--------|---------------|---------------|-------|-----------------------|
| Blue marlin | | | | | | | | |
| Largest | 504.5 | 565.3 | 529.0 | 477.0 | 738.0 | 695.5 | 667.0 | 738.0 |
| Smallest | 149.0 | 111.0 | 146.0 | 39.0 | 91.2 | 100.3 | 50.0 | 39.0 |
| Average | 287.8 | 243.3 | 222.5 | 233.9 | 308.9 | 291.8 | 233.6 | 263.2 |
| White marlin | | | | | | | | |
| Largest | 80.3 | 83.3 | 81.0 | 97.0 | 89.5 | 89.3 | 85.0 | 97.0 |
| Smallest | 36.5 | 34.0 | 30.0 | 32.0 | 35.8 | 38.8 | 20.0 | 20.0 |
| Average | 52.7 | 51.2 | 51.7 | 51.8 | 56.6 | 52.6 | 45.2 | 51.9 |
| Sailfish | | | | | | | | |
| Largest | 74.5 | 61.0 | 33.0 | 56.5 | 68.3 | 71.0 | 83.0 | 83.0 |
| Smallest | 44.0 | 9.5 | 33.0 | 30.0 | 26.5 | 29.0 | 8.5 | 8.5 |
| Average | 57.3 | 37.2 | 33.0 | 40.2 | 43.7 | 50.2 | 44.8 | 43.6 |
| Spearfish | | | | | | | | |
| Largest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smallest | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Swordfish | | | | | | | | |
| Largest | 58.0 | 90.0 | 45.0 | 198.4 | 310.0 | 133.0 | 176.3 | 310.0 |
| Smallest | 44.3 | 29.0 | 45.0 | 57.8 | 138.5 | 68.8 | 176.3 | 29.0 |
| Average | 51.2 | 45.6 | 45.0 | 113.7 | 205.1 | 92.6 | 176.3 | 98.9 |

Table 3.--Sex ratios of examined billfishes caught in the northern Gulf of Mexico, 1980. (M = males; F = females).

| | Panama City | Destin | Pensacola | Mobile | South Pass | Grand Isle | Texas | All Areas Combined |
|--------------------|----------------|--------|-----------|--------|---------------|---------------|-------|-----------------------|
| Blue marlin | | | | | | | | |
| No. of M: no. of F | 0:4 | 6:13 | 1:7 | 1:7 | 6:54 | 11:21 | 13:24 | 38:130 |
| One M per no. of F | 0:4 | 1:2.2 | 1:7.0 | 1:7.0 | 1:9.0 | 1:1.9 | 1:1.8 | 1:3.4 |
| White marlin | | | | | | | | |
| No. of M:no. of F | 8:16 | 23:59 | 12:15 | 12:18 | 33:75 | 12:36 | 28:31 | 128:250 |
| One M per no. of F | 1:2.0 | 1:2.6 | 1:1.2 | 1:1.5 | 1:2.3 | 1:3.0 | 1:1.1 | 1:2.0 |
| Sailfish | | | | | | | | |
| No. of M:no. of F | 0 | 3:6 | 0 | 1:1 | 2:5 | 0:6 | 44:33 | 50:51 |
| One M per no. of F | 0 | 1:2.0 | 0 | 1:1.0 | 1:2.5 | 0 | 1:0.7 | 1:1.0 |
| Spearfish | | | | | | | | |
| No. of M:no. of F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| One M per no. of F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Swordfish | | | | | | | | |
| No. of M:no. of F | 1:0 | 0 | 0 | 0 | 0:3 | 0:1 | 0:1 | 1:5 |
| One M per no. of F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1:5.0 |

Table 4.--Billfishes hooked-per-hour-of-trolling and hours trolled to hook a fish in the northern Gulf of Mexico, 1980.

| | 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 | 12,331.9 | 0.023 (44.2) | 0.009 (10.1) | 0.006 (181.4) | 0.127 (7.9) |
| Panama City | 1,188.2 | 0.024 (41.0) | 0.144 (6.9) | 0.006 (169.7) | 0.174 (5.7) |
| Destin | 4,428.8 | 0.027 (37.2) | 0.124 (8.1) | 0.010 (98.4) | 0.161 (6.2) |
| Pensacola | 2,454.9 | 0.021 (48.1) | 0.072 (13.9) | 0.000 (2,454.9) | 0.093 (10.7) |
| Mobile | 4,260.0 | 0.019 (53.3) | 0.075 (13.4) | 0.004 (284.0) | 0.097 (10.3) |
| Northcentral Gulf | 9,897.3 | 0.029 (34.6) | 0.028 (35.3) | 0.002 (582.2) | 0.059 (17.0) |
| South Pass | 5,594.4 | 0.034 (29.4) | 0.036 (27.7) | 0.002 (621.6) | 0.072 (13.6) |
| Grand Isle | 4,302.9 | 0.022 (44.8) | 0.018 (55.2) | 0.002 (537.9) | 0.042 (23.6) |
| Northwestern Gulf | | | | | |
| Texas | 4,946.6 | 0.026 (38.3) | 0.032 (31.3) | 0.045 (24.2) | 0.099 (10.1) |
| All three areas | 27,175.8 | 0.026 (39.2) | 0.061 (16.4) | 0.011 (94.0) | 0.097 (10.3) |

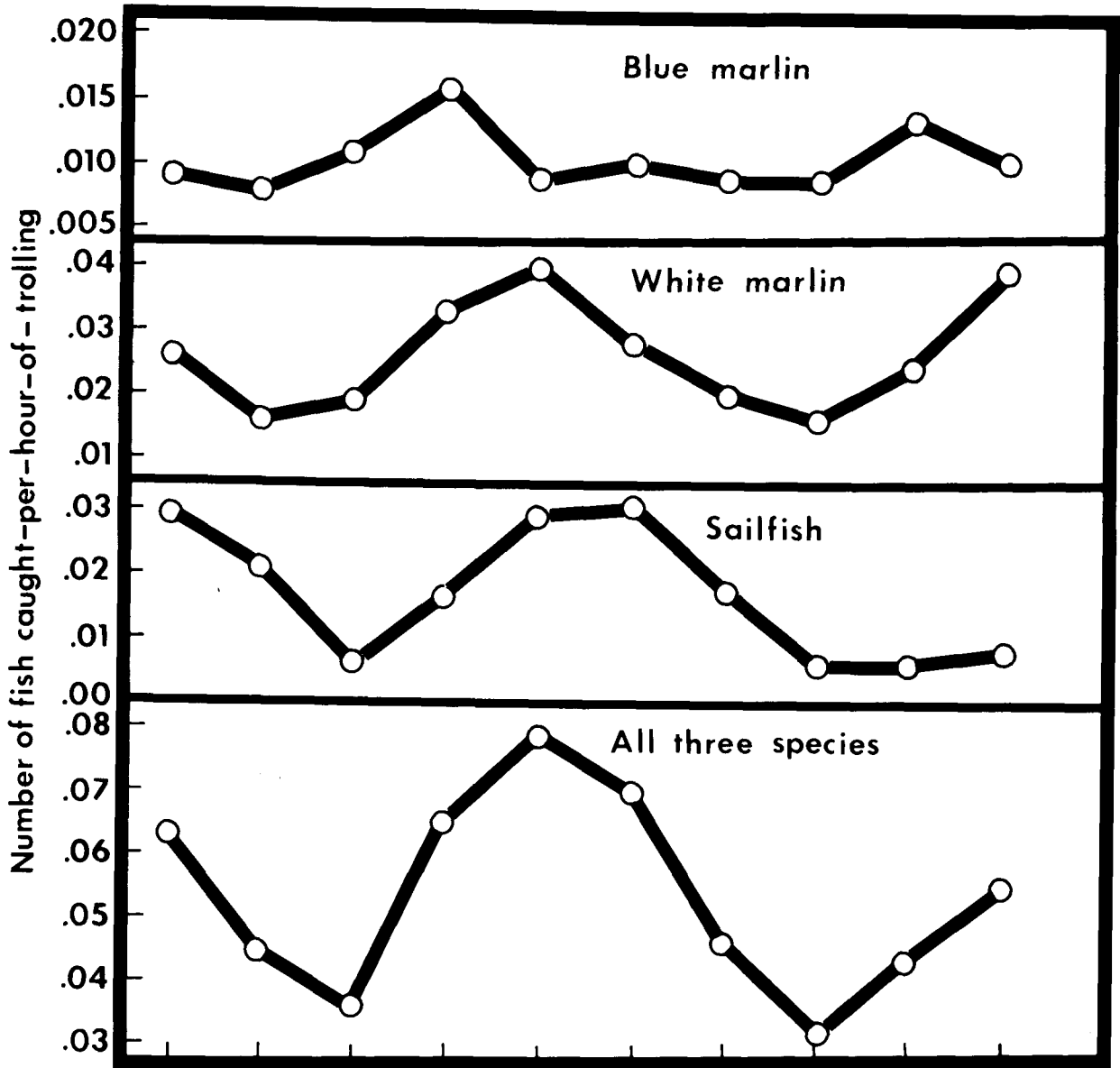
Table 5.--Hours trolled and billfishes raised, hooked, and boated/released () in the northern Gulf of Mexico, 1980.

| | 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 | 12,331.9 | 420 | 279 | 111(6) | 2,119 | 1,216 | 619(133) | 97 | 68 | 46(2) | 2,636 | 1,563 | 776(141) |
| Panama City | 1,188.2 | 42 | 29 | 11(0) | 315 | 171 | 110(8) | 7 | 7 | 5(1) | 364 | 207 | 126(9) |
| Destin | 4,428.8 | 193 | 119 | 48(4) | 938 | 550 | 212(71) | 69 | 45 | 31(1) | 1,200 | 714 | 291(76) |
| Pensacola | 2,454.9 | 65 | 51 | 15(2) | 273 | 177 | 91(21) | 3 | 1 | 1(0) | 341 | 229 | 107(23) |
| Mobile | 4,260.0 | 120 | 80 | 37(0) | 593 | 318 | 206(33) | 18 | 15 | 9(0) | 731 | 413 | 252(33) |
| Northcentral Gulf | 9,897.3 | 432 | 286 | 97(23) | 439 | 280 | 161(41) | 17 | 17 | 14(1) | 888 | 583 | 272(65) |
| South Pass | 5,594.4 | 320 | 190 | 62(13) | 348 | 202 | 113(33) | 9 | 9 | 8(0) | 677 | 401 | 183(46) |
| Grand Isle | 4,302.9 | 112 | 96 | 35(10) | 91 | 78 | 48(8) | 8 | 8 | 6(1) | 211 | 182 | 89(19) |
| Northwestern Gulf | | | | | | | | | | | | | |
| Texas | 4,946.6 | 186 | 129 | 53(1) | 217 | 158 | 91(2) | 275 | 204 | 125(13) | 678 | 491 | 269(16) |
| All three areas | 27,175.8 | 1,038 | 694 | 261(30) | 2,775 | 1,654 | 871(176) | 389 | 289 | 185(16) | 4,202 | 2,637 | 1,316(222) |
| % of raised | | | 67 | 25(3) | | 60 | 31(6) | | 74 | 48(4) | | 63 | 31(5) |
| % of hooked | | | | 38(4) | | | 53(11) | | | 64(6) | | | 50(8) |

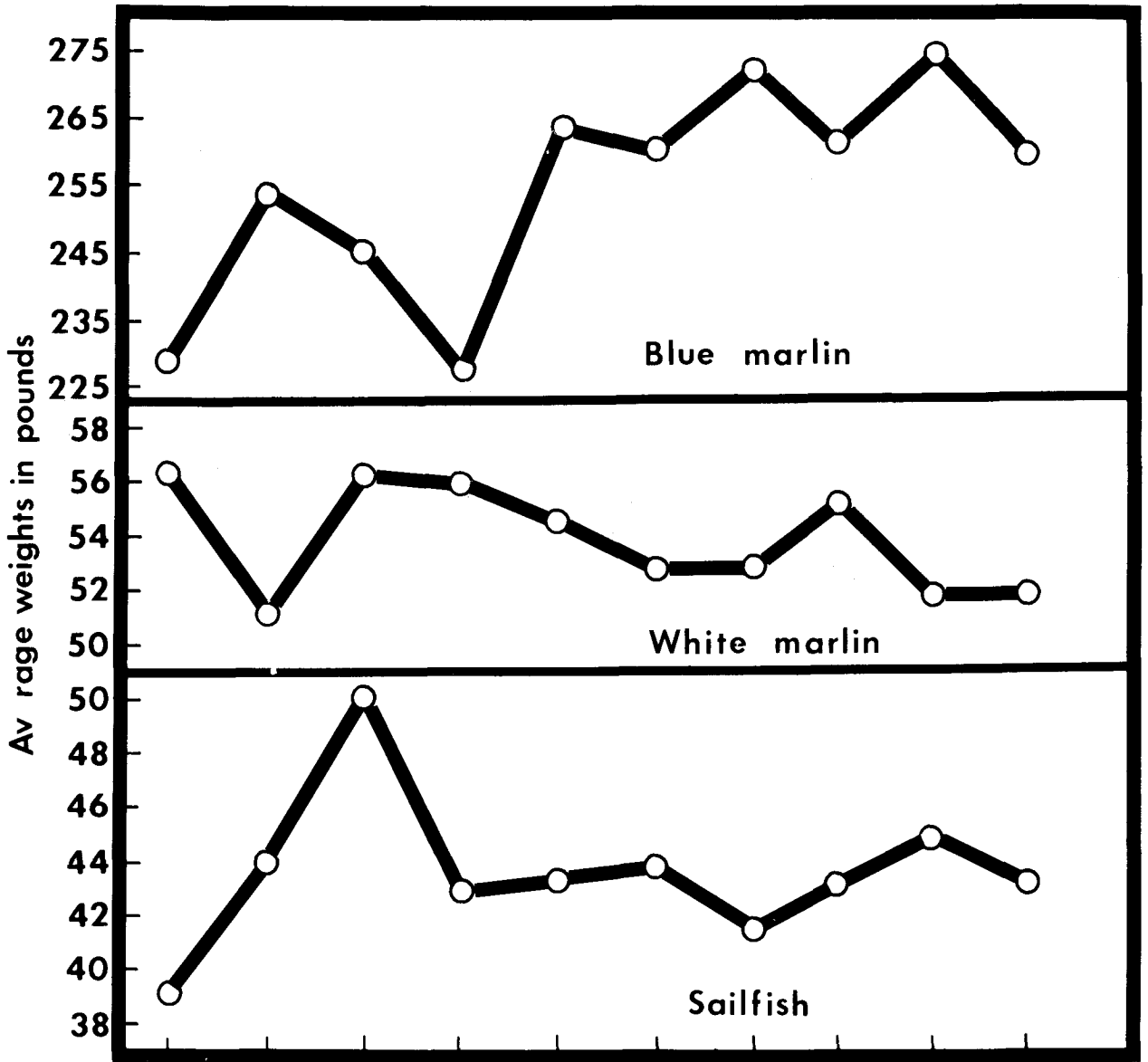
R = Raised
H = Hooked
B(R) = Boated (Released)

Table 6.--Hours trolled and number of billfishes hooked-per-hour-of-trolling with various baits fished in the northern Gulf of Mexico, 1980.

| | Natural bait only | | Artificial bait only | | Both simultaneously | |
|-------------------|-------------------|-------|----------------------|-------|---------------------|-------|
| | Hours trolled | HPUE | Hours trolled | HPUE | Hours trolled | HPUE |
| Northeastern Gulf | 3,146 | 0.142 | 5,063 | 0.111 | 4,421 | 0.123 |
| Panama City | 389 | 0.170 | 109 | 0.257 | 748 | 0.150 |
| Destin | 1,913 | 0.160 | 844 | 0.161 | 1,819 | 0.149 |
| Pensacola | 373 | 0.056 | 1,096 | 0.104 | 1,003 | 0.089 |
| Mobile | 471 | 0.110 | 3,014 | 0.095 | 851 | 0.086 |
| Northcentral Gulf | 86 | 0.012 | 9,970 | 0.058 | 197 | 0.036 |
| South Pass | 56 | 0.018 | 5,603 | 0.071 | 197 | 0.036 |
| Grand Isle | 30 | 0 | 4,367 | 0.042 | 0 | 0 |
| Northwestern Gulf | | | | | | |
| Texas | 730 | 0.118 | 2,680 | 0.091 | 1,506 | 0.103 |
| All three areas | 3,962 | 0.135 | 17,713 | 0.078 | 6,124 | 0.115 |



1971 1972 1973 1974 1975 1976 1977 1978 1979 1980
 Figure 1.-- Number of billfishes caught-per-hour-of-trolling in the northern Gulf of Mexico, 1971-80.



1971 1972 1973 1974 1975 1976 1977 1978 1979 1980
 Figure 2.-- Average weights (pounds) of billfishes in the northern Gulf of Mexico, 1971-80.

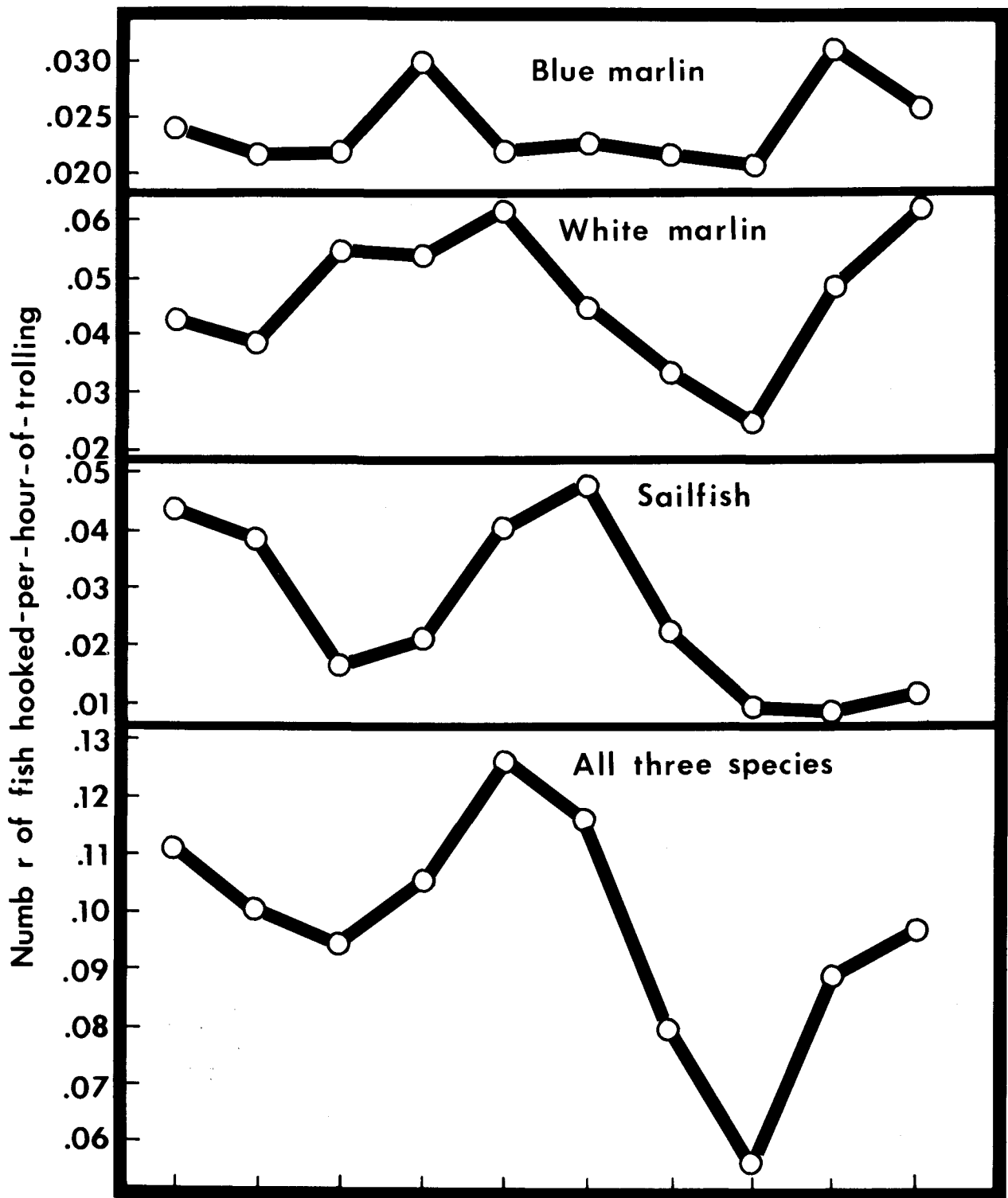


Figure 3.-- Number of billfishes hooked-per-hour-of-trolling in the northern Gulf of Mexico, 1971-80.

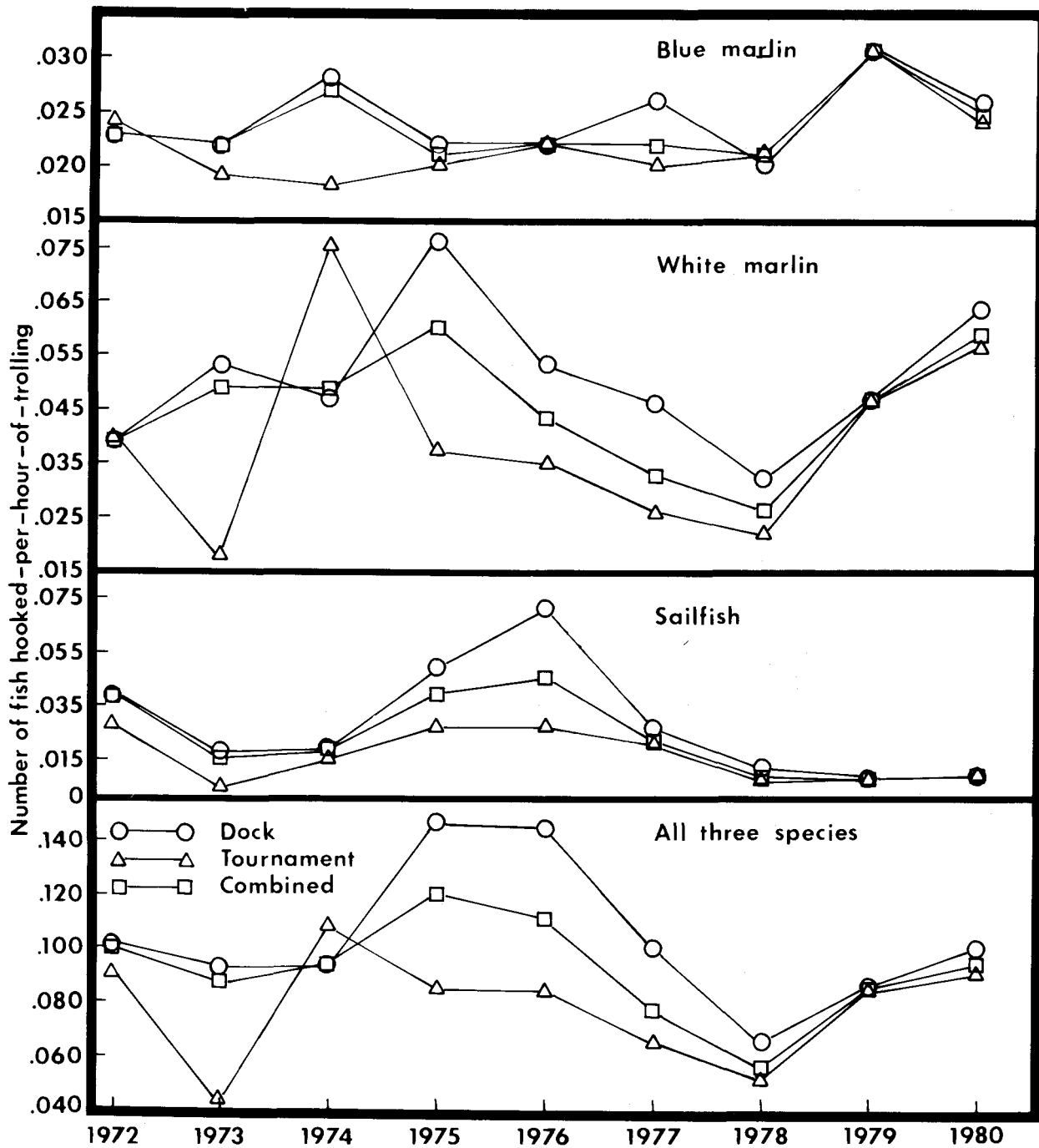


Figure 4.-- Number of billfishes hooked-per-hour-of-trolling determined from nontournament (dock) and tournament sampling in the northern Gulf of Mexico, 1972-1980.

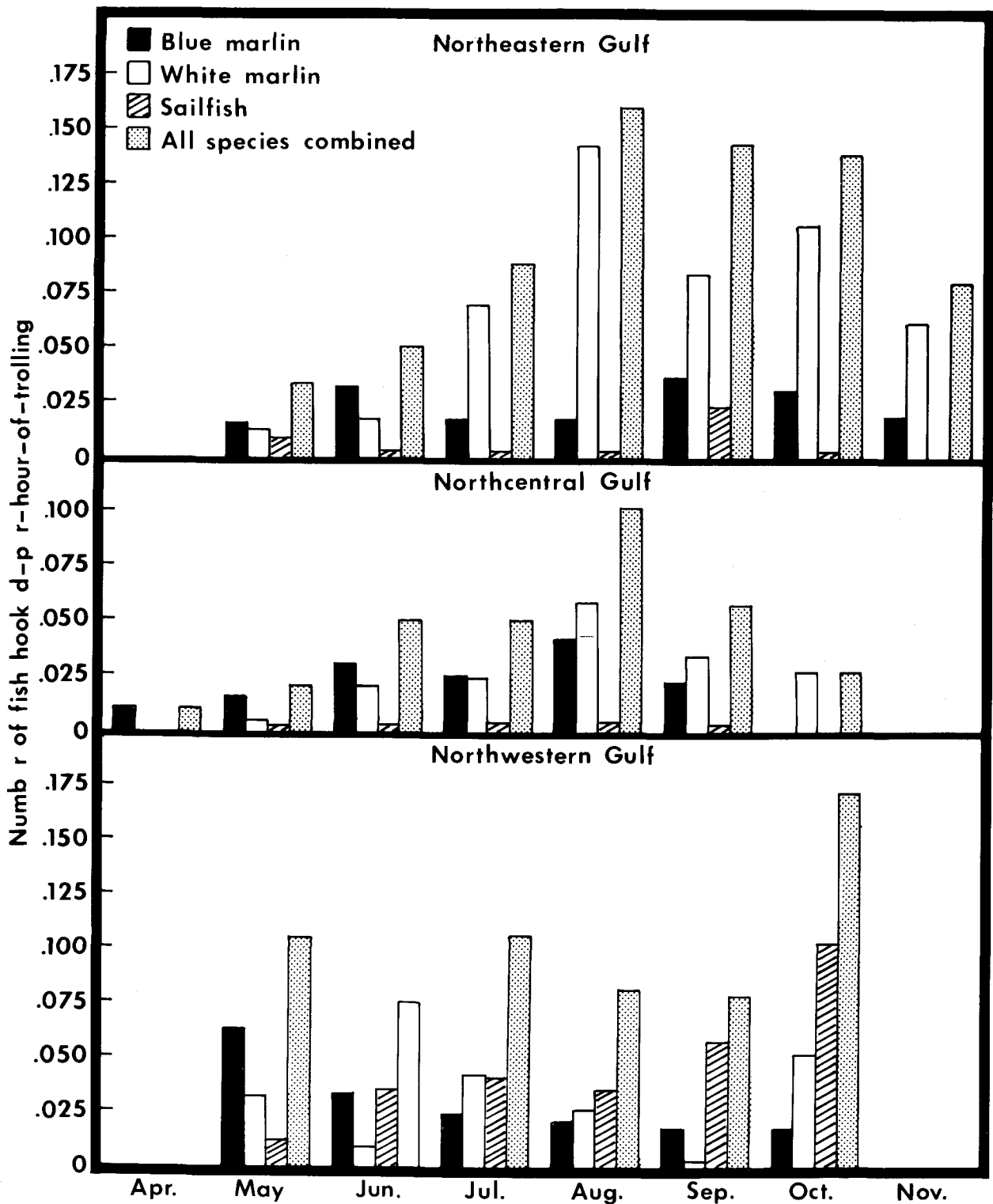


Figure 5.--Number of billfishes hooked-per-hour-of-trolling by monthly periods in the northern Gulf of Mexico, 1980.

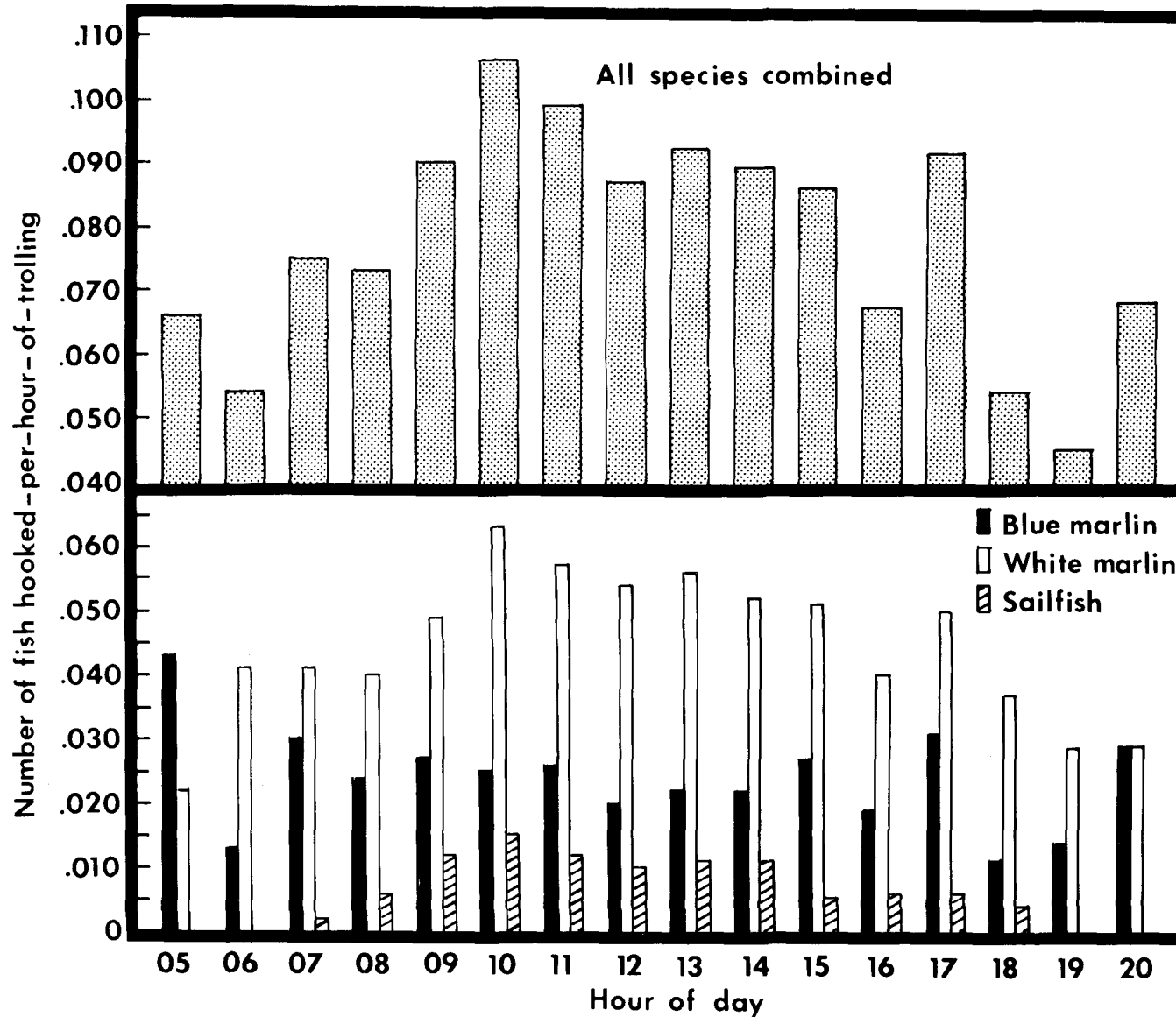


Figure 6.-- Number of billfishes hooked-per-hour-of-trolling by time of day in the northern Gulf of Mexico, 1980.

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.

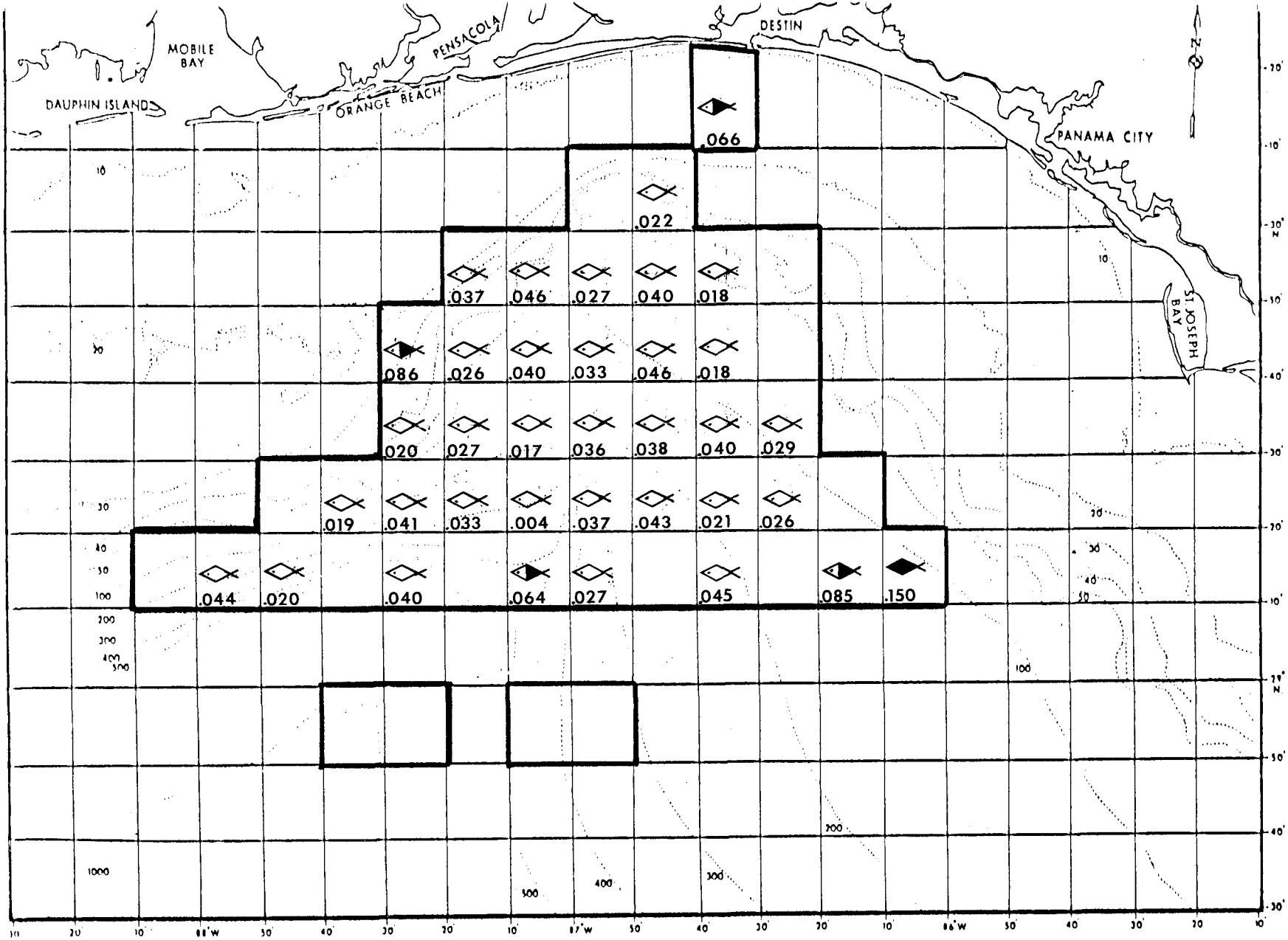


CHART 1.--Number of blue marlin raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001-.235
- .236-470
- ≥ 471

No fish raised in squares without symbols.

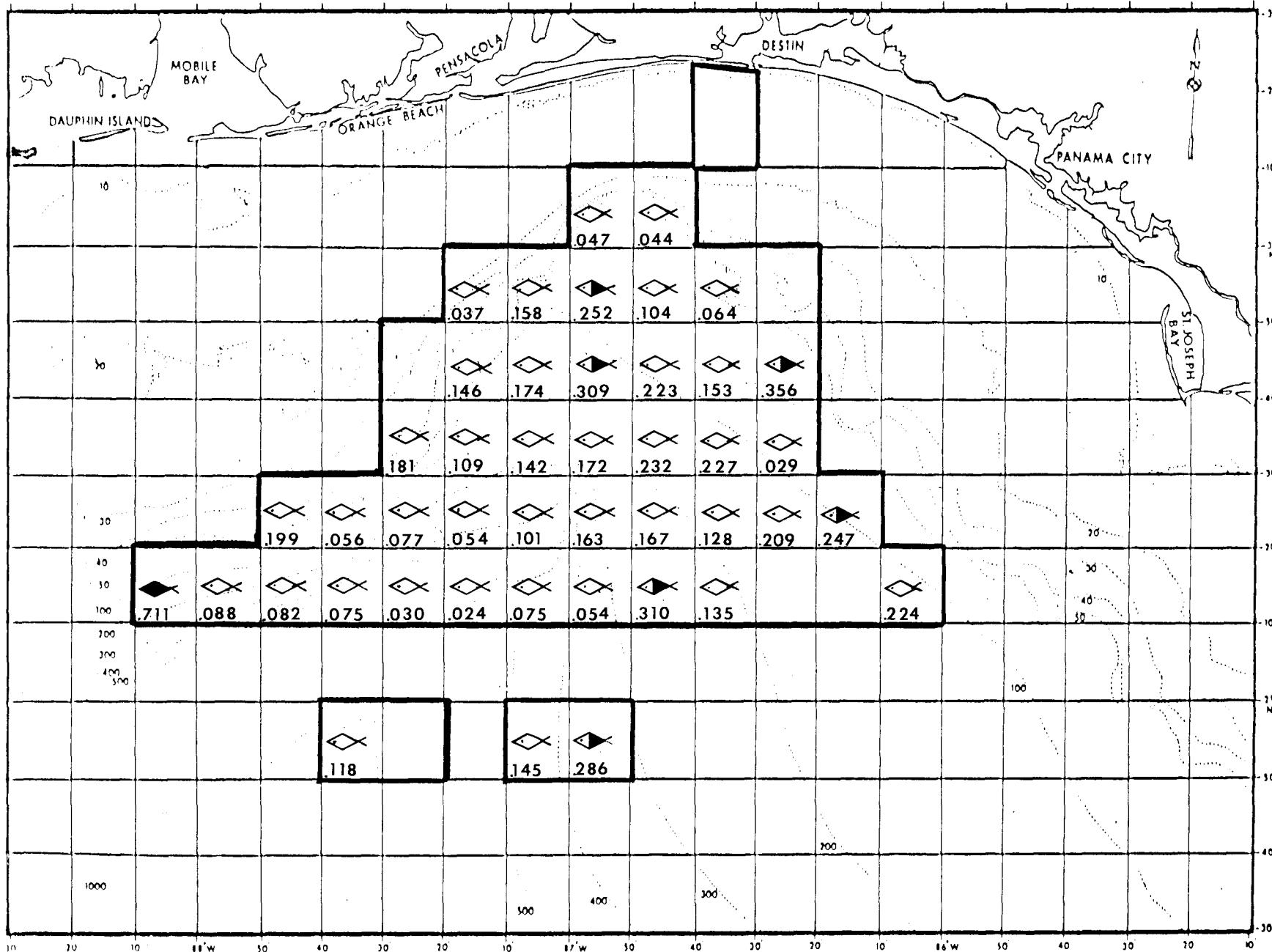


CHART 2.--Number of white marlin raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001-.070
- .071-.140
- ≥ .141

No fish raised in squares without symbols.

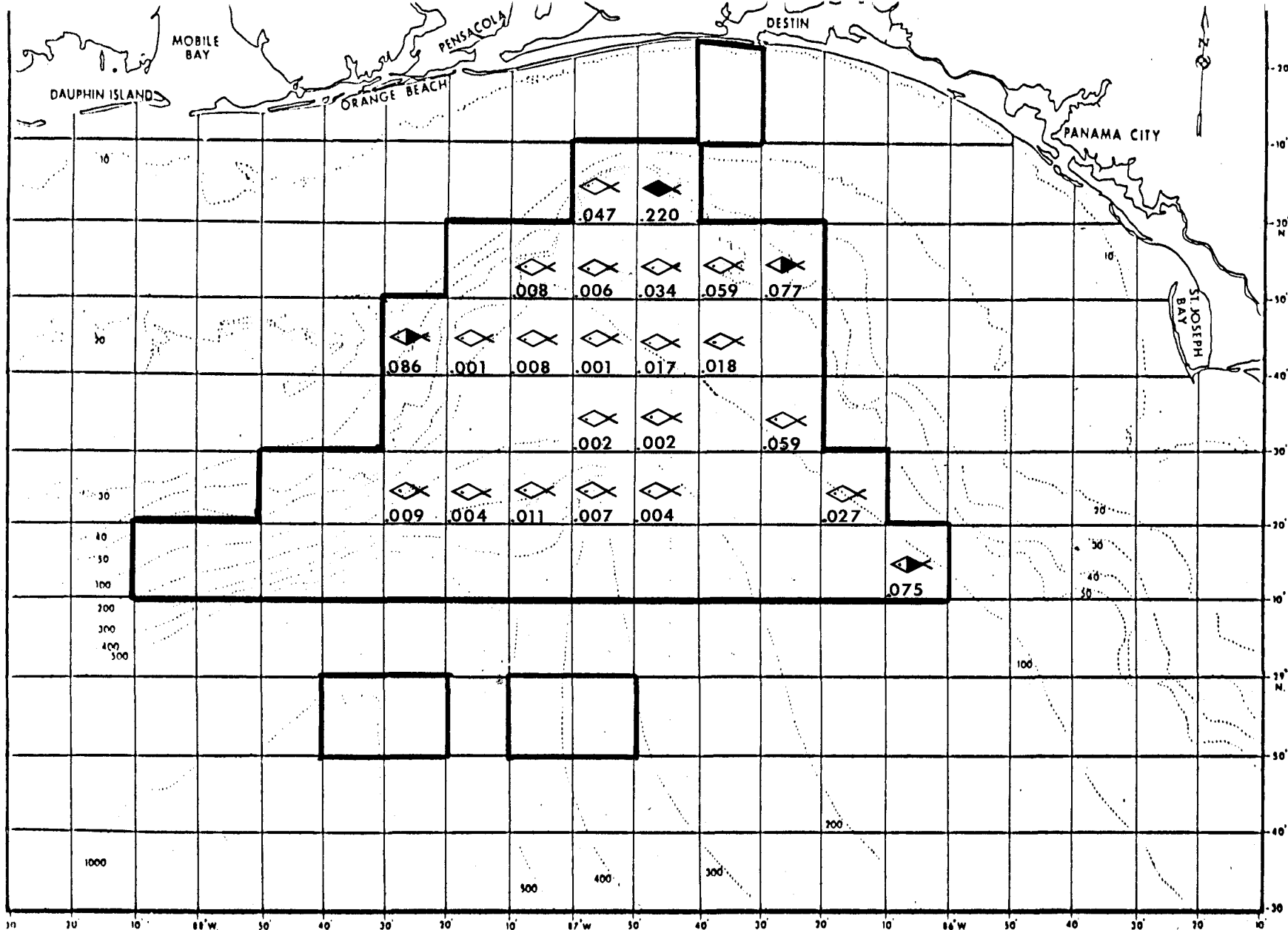


CHART 3.--Number of sailfish raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001 - .235
- .236 - .470
- > .471

No fish raised in squares without symbols.

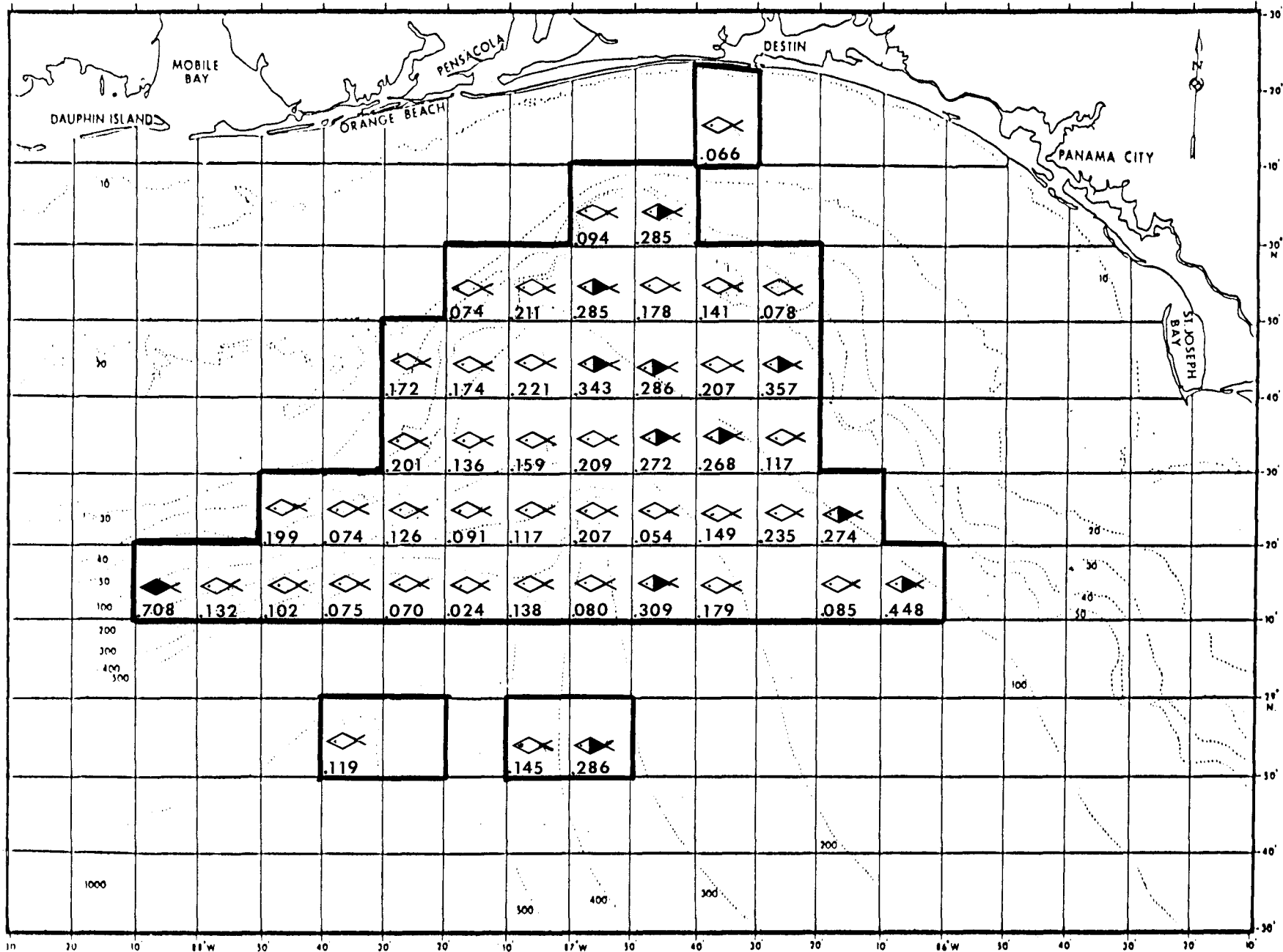


CHART 4.--Number of billfishes raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001-.049
- .050-.099
- ≥ .100

No fish raised in squares without symbols.

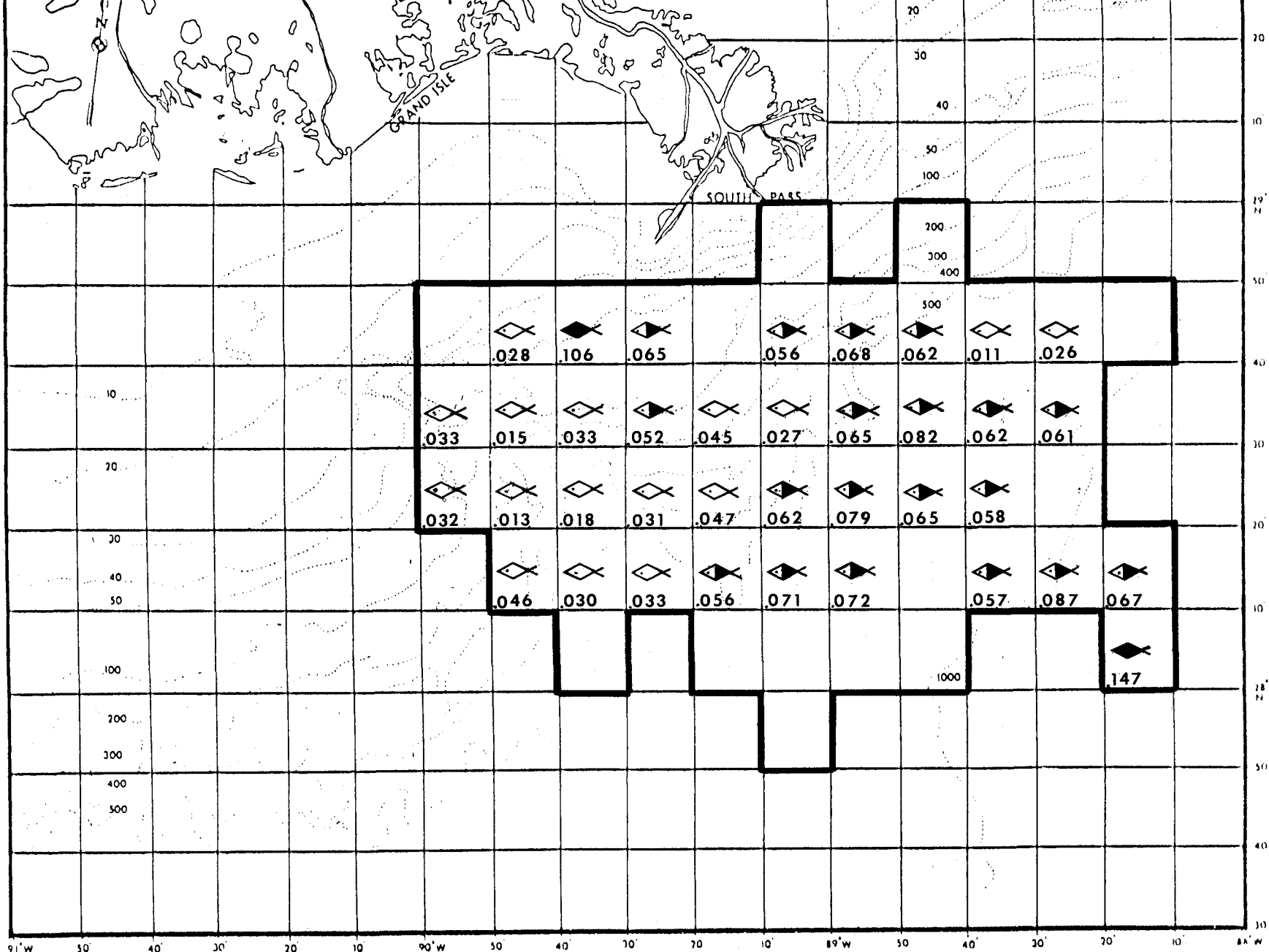


CHART 5.--Number of blue marlin raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001 - .035
- .036 - .070
- ≥ .071

No fish raised in squares without symbols.

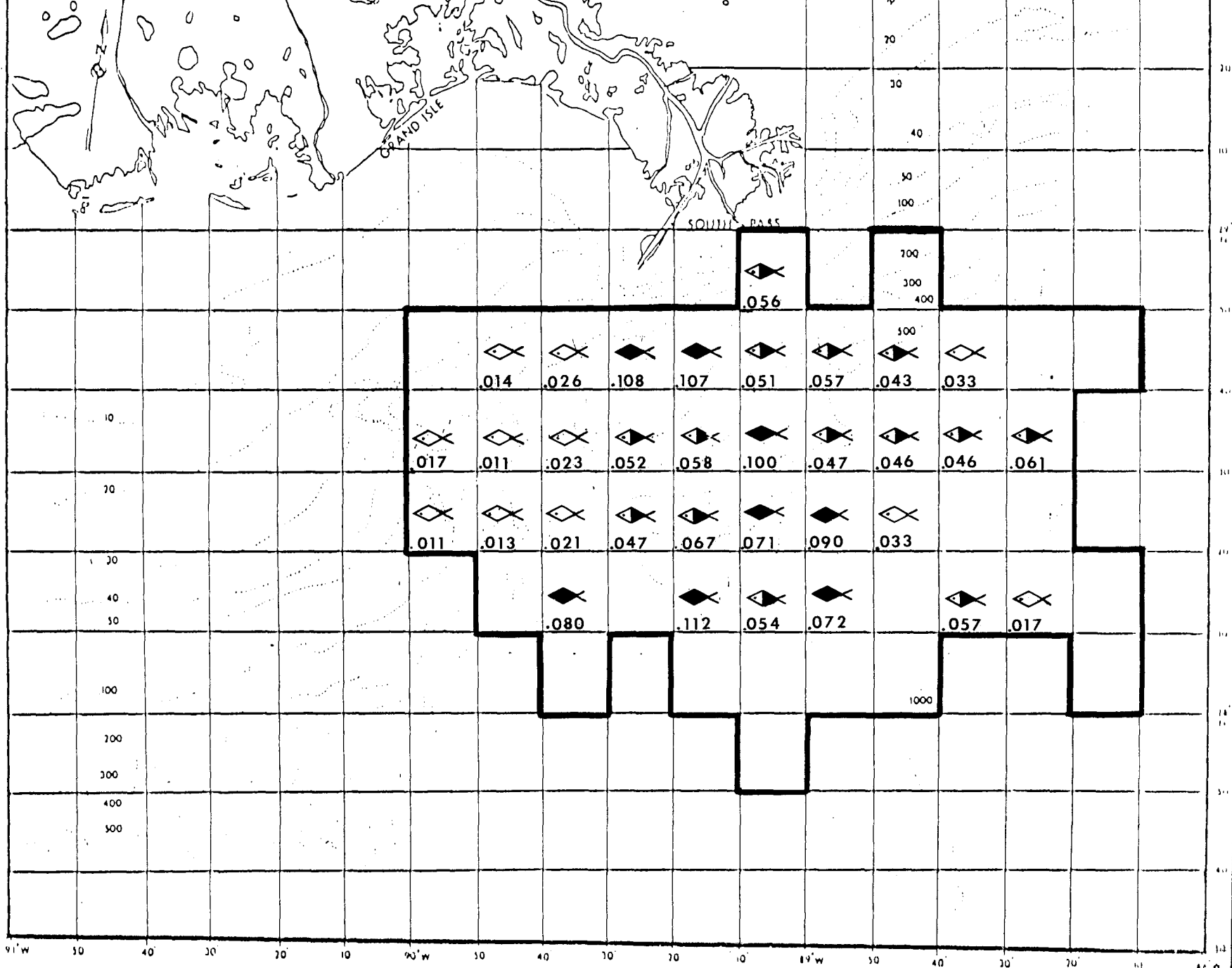


CHART 6.--Number of white marlin raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1980.

LEGEND

Fishing area bound by heavy black lines.
 Number of fish raised-per-hour-of-trolling:

- .001 - .030
- .031 - .060
- > .061

No fish raised in squares without symbols.

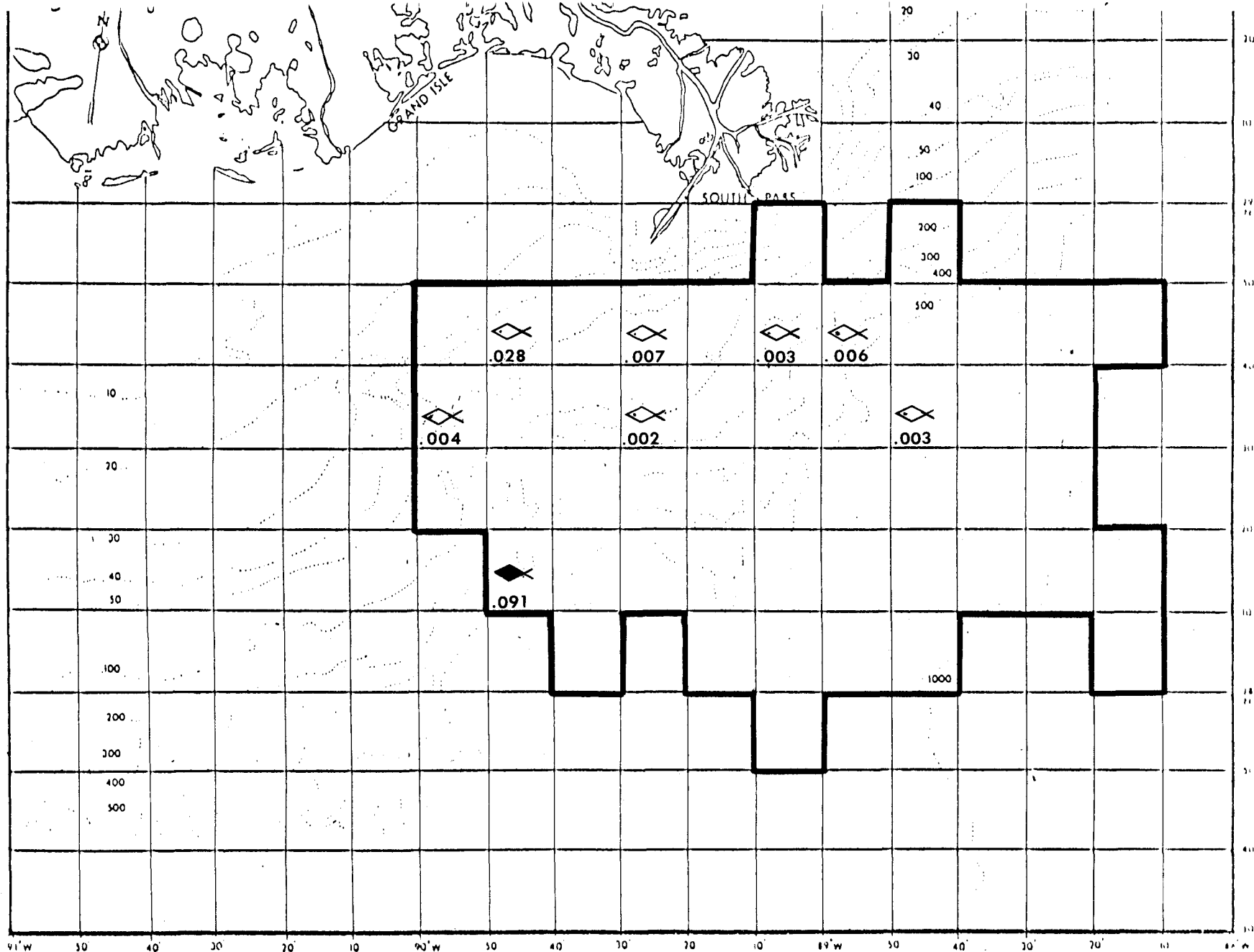
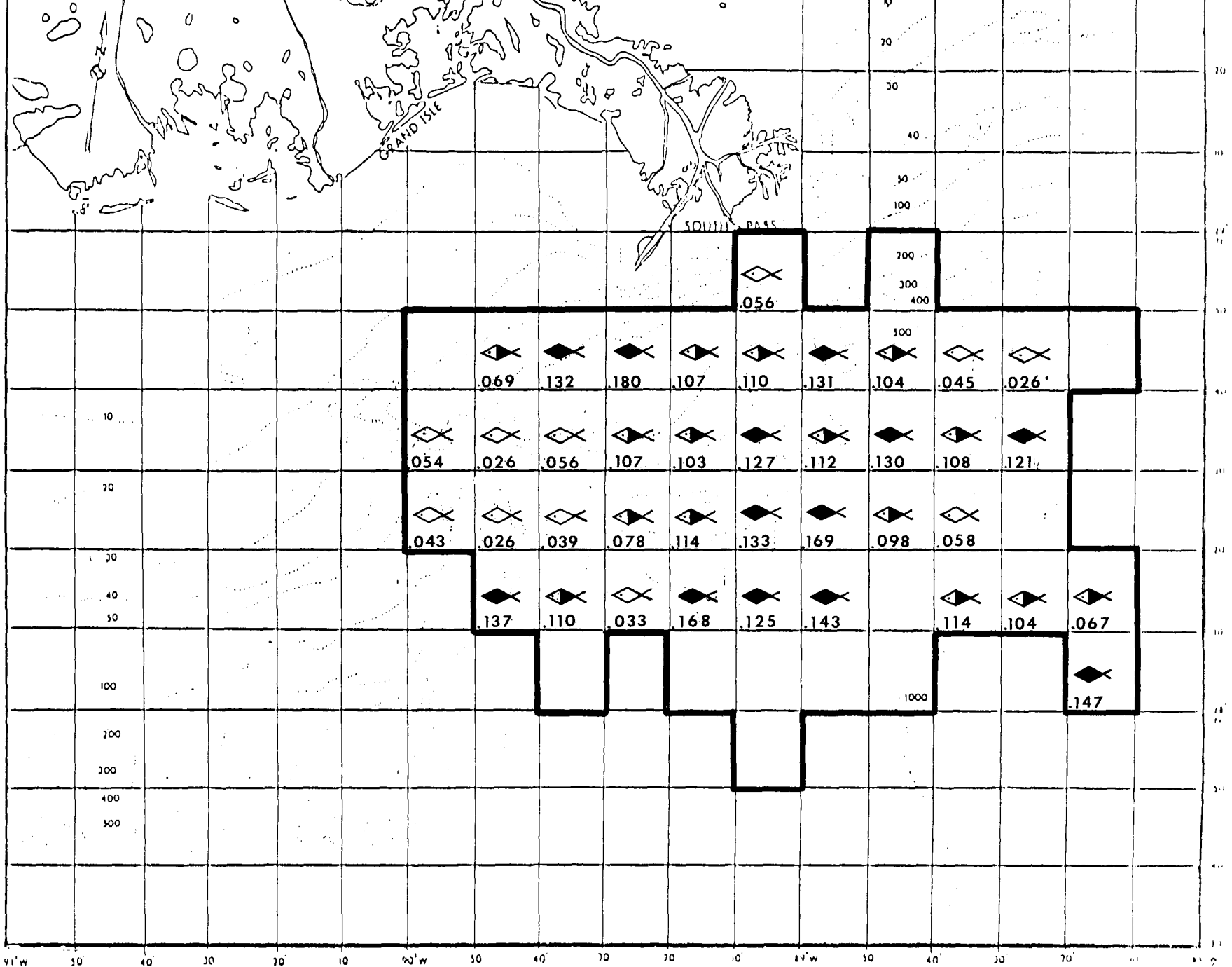


CHART 7.--Number of sailfish raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1980.



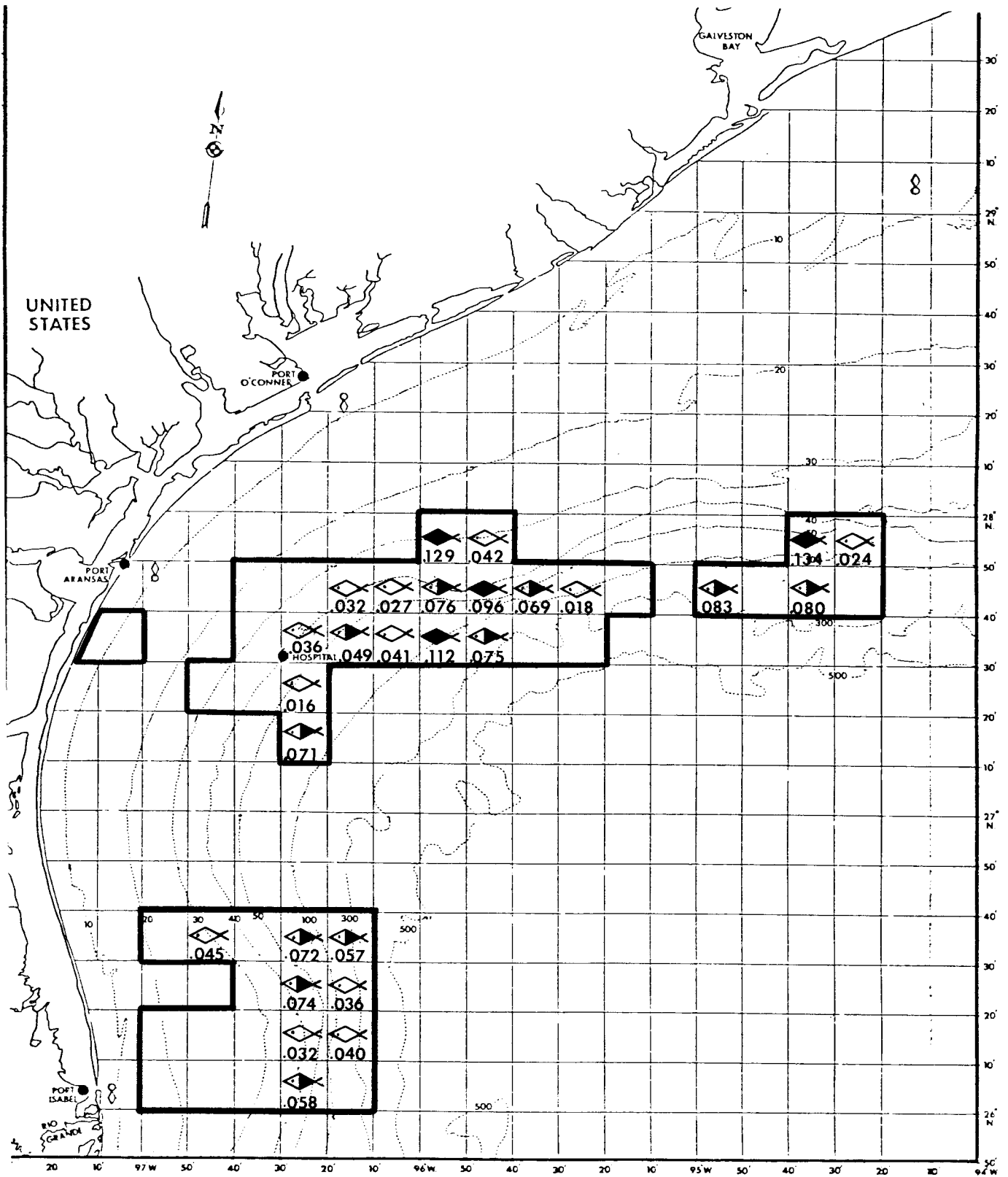
LEGEND

Fishing area bound by heavy black lines. Number of fish raised-per-hour-of-trolling:

- .001 - .060
- .061 - .120
- ≥ .121

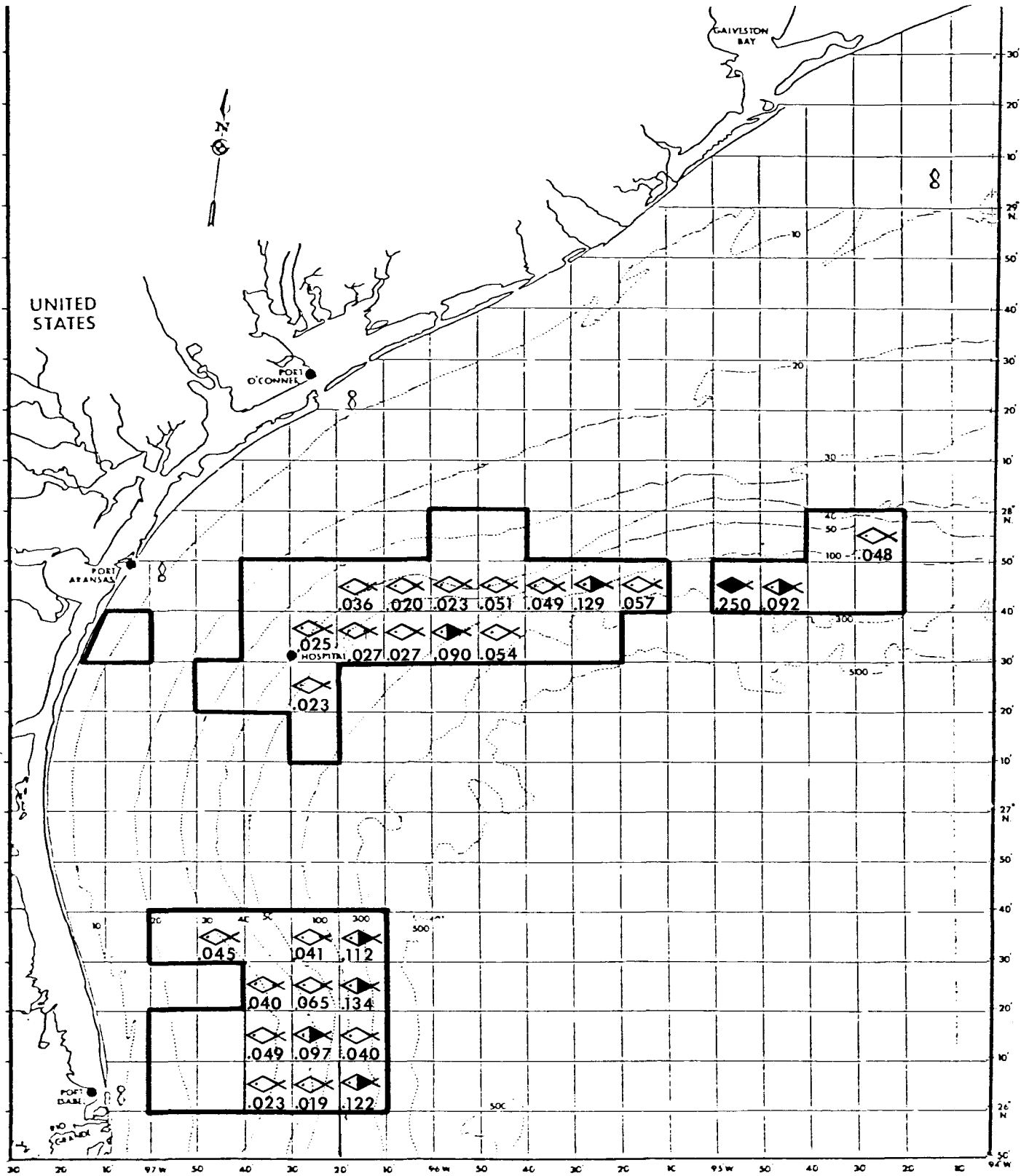
No fish raised in squares without symbols.

CHART 8.--Number of billfishes raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min squares, 1980.



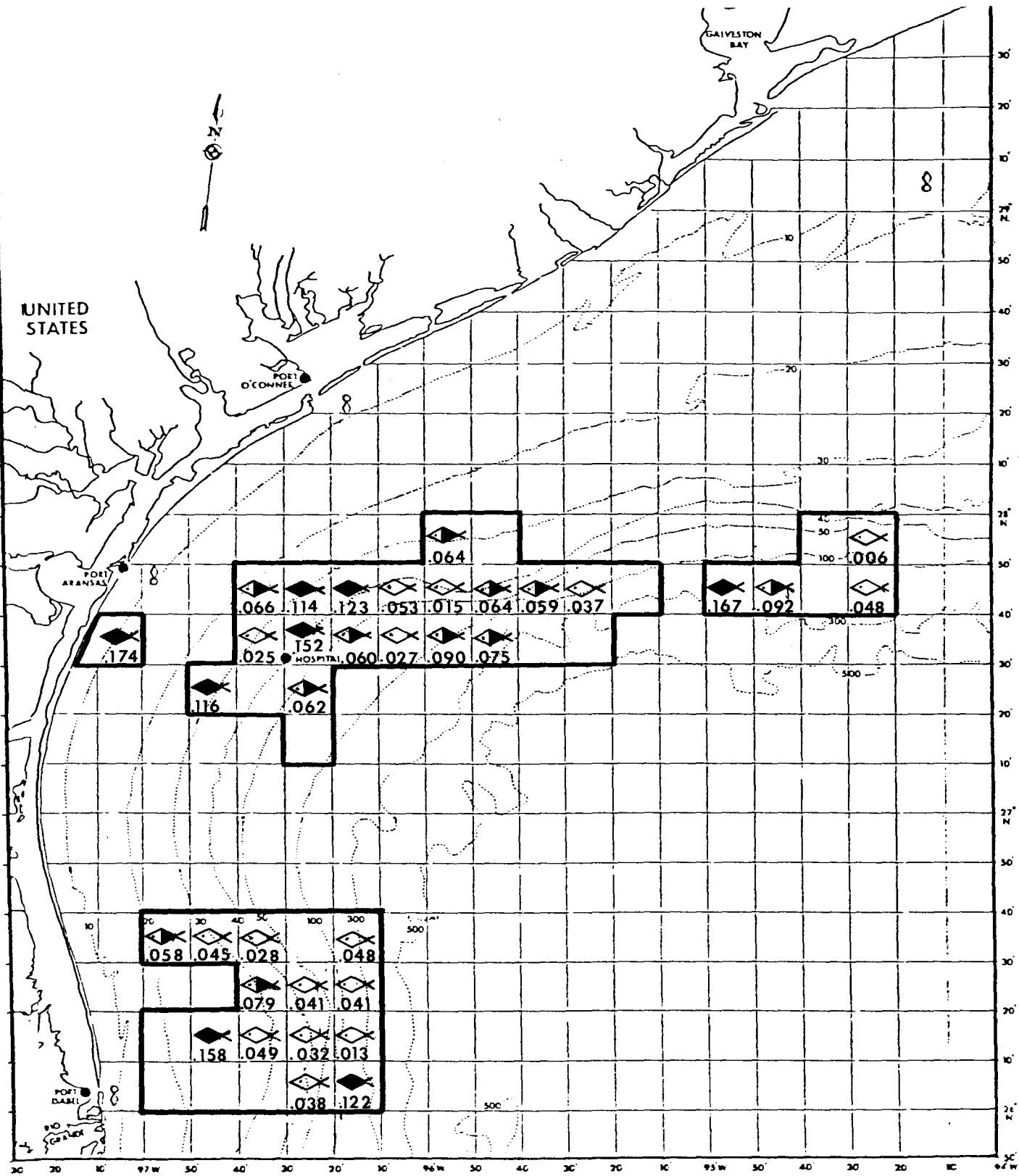
L Fishing areas .001-.045 fishes raised-per-hour-of-trolling.
 E bound by heavy .046-.090 fishes raised-per-hour-of-trolling.
 G No fish raised
 N in squares \geq .091 fishes raised-per-hour-of-trolling.
 D without symbols.

CHART 9.--Number of blue marlin raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1980.



| | | | |
|----------------------------|---|----------------------------------|---|
| L E G E N D | Fishing areas bound by heavy black lines. No fish raised in squares without symbols. | .001-.080 .081-.160 ≥ .161 | ◇ fishes raised-per-hour-of-trolling. ◐ fishes raised-per-hour-of-trolling. ◑ fishes raised-per-hour-of-trolling. |
|----------------------------|---|----------------------------------|---|

CHART 10.--Number of white marlin raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1980.






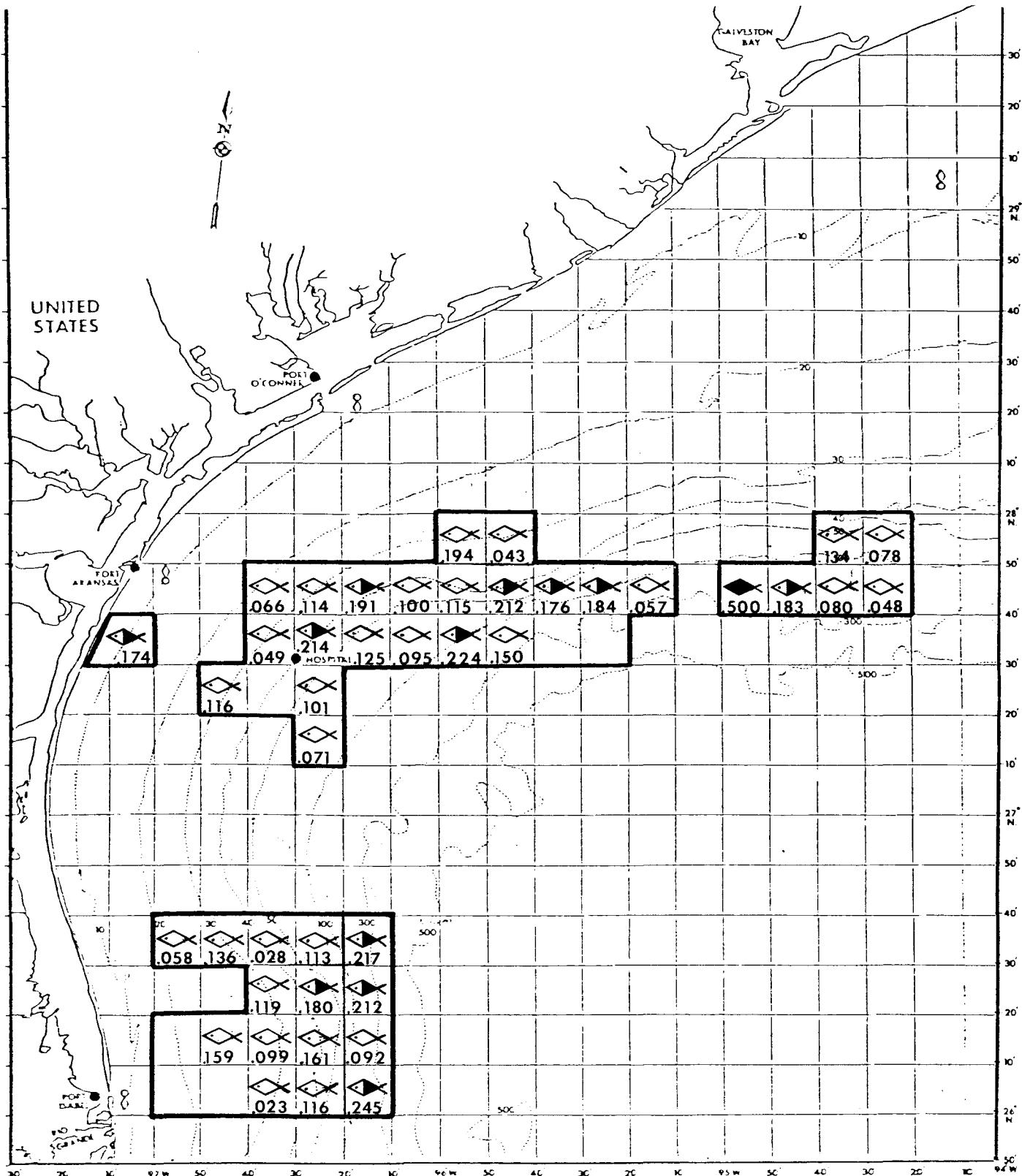
L Fishing areas .001-.055  fishes raised-per-hour-of-trolling.
 E bound by heavy .056-.110  fishes raised-per-hour-of-trolling.
 G No fish raised \geq .111  fishes raised-per-hour-of-trolling.
 E in squares
 N without symbols.
 D

CHART 11.--Number of sailfish raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1980.



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

CHART 12.--Number of billfishes raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min squares, 1980.