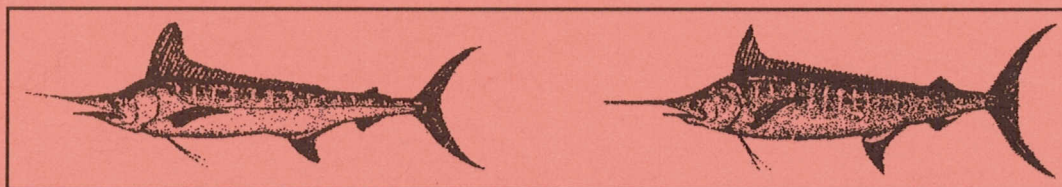




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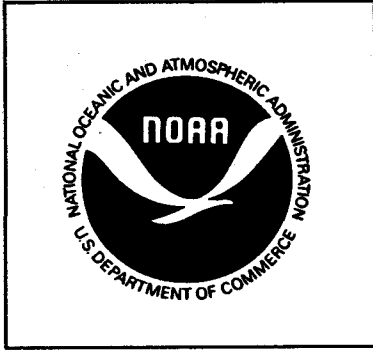
BIG GAME FISHING IN THE NORTHERN GULF OF MEXICO DURING 1991



Paul J. Pristas, Anna M. Avrigian, and Mark I. Farber

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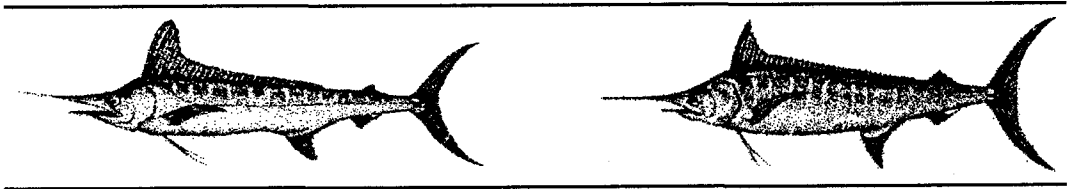


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U.S. DEPARTMENT OF COMMERCE
Barbara Hackman Franklin, Secretary

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National Marine Fisheries Service
William W. Fox, Jr., Assistant Administrator for Fisheries

November 1992

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INTRODUCTION

In 1991, the National Marine Fisheries Service (NMFS) began the 21st season of its Recreational Billfishing Survey in the northern Gulf of Mexico. The primary species involved are blue marlin, Makaira nigricans; white marlin, Tetrapturus albidus; sailfish, Istiophorus platypterus; swordfish, Xiphias gladius; and longbill spearfish, Tetrapturus pfluegeri. The Panama City, Florida, NMFS Laboratory has had jurisdiction over the billfish surveys in the northern Gulf of Mexico since 1971, providing information to develop indices of abundance and collecting biological and ecological data on this species group.

Data are acquired primarily by port samplers

conducting on-site interviews with recreational anglers fishing for billfishes at major ports from St. Petersburg, Florida to Port Isabel, Texas. Some anglers also provide data by voluntarily phoning or mailing information regarding their big game fishing trips (Appendix 1). Information derived from this study has been important to management decisions concerning this fishery resource. Our data analyses are generally summarized for three primary regions of the northern Gulf: northwestern, north-central, and northeastern (Fig. 1). For continuity with historical data analyses, the northwestern Gulf (Texas) is divided into three sections: eastern (Freeport, TX to the Texas-Louisiana border), central (Port O'Connor to Corpus Christi), and southern (Port Mansfield to the Texas-Mexico border).

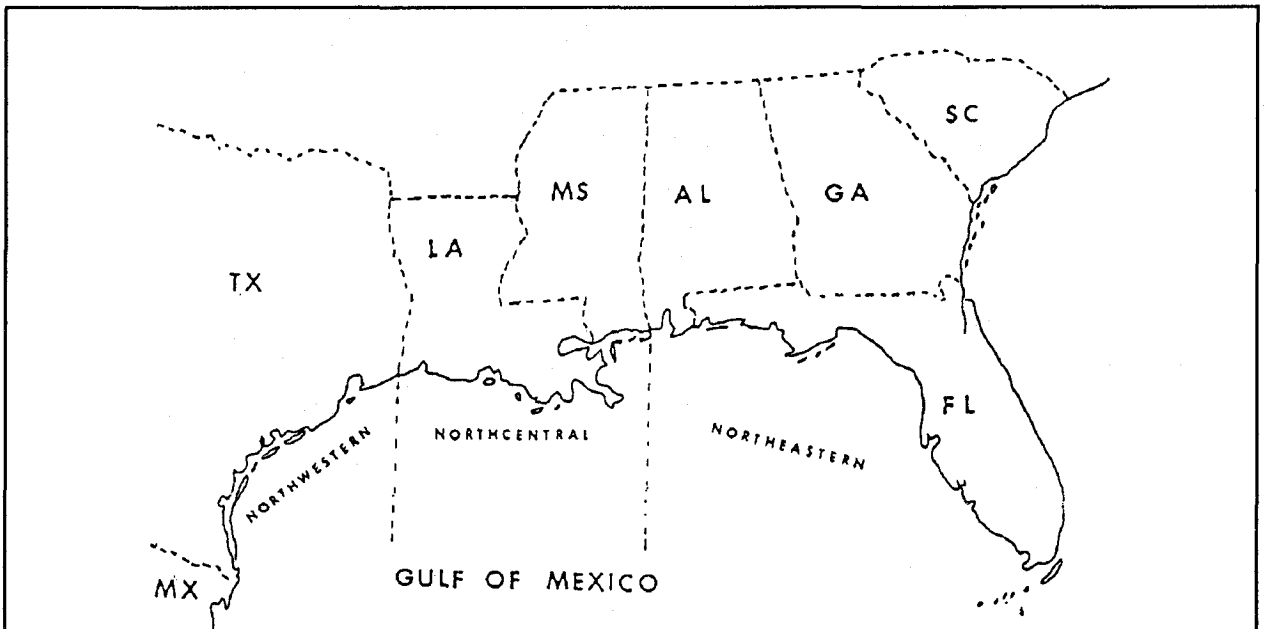


Figure 1. Primary sampling ports of the Recreational Billfishing Survey in the northern Gulf of Mexico.

CATCH AND EFFORT

Primary data collected during on-site dockside interviews and from contributed data reports, consist of catches (includes "boated", released, and tagged and released billfishes) by species, as well as the number of hours trolled (i.e., fishing effort). Also presented in this report for documentation purposes are related data on driftfishing (i.e., drifting dead bait down-rigged for swordfish). Because of the difference in fishing method and target species, however, these data are not included in the analyses of trolling effort.

A total of 23,798 hours of trolling effort were recorded

during the 1991 season (Table 1) by the port samplers and voluntary reporting. This amount of effort recorded in 1991 was slightly less (3%) than the 24,602 hours recorded in 1990. Compared to 1990, only the northcentral region showed a slight increase (7%) in effort. The northeastern and northwestern Gulf regions decreased 6% and 10%, respectively. The amount of recorded effort in 1991 was slightly (2%) above the previous 20-year average (23,366 hours) for the northern Gulf.

Compared to the previous season, the decrease in reported catches during 1991 may have reflected the decrease in recorded fishing effort. Compared to the 566 billfishes

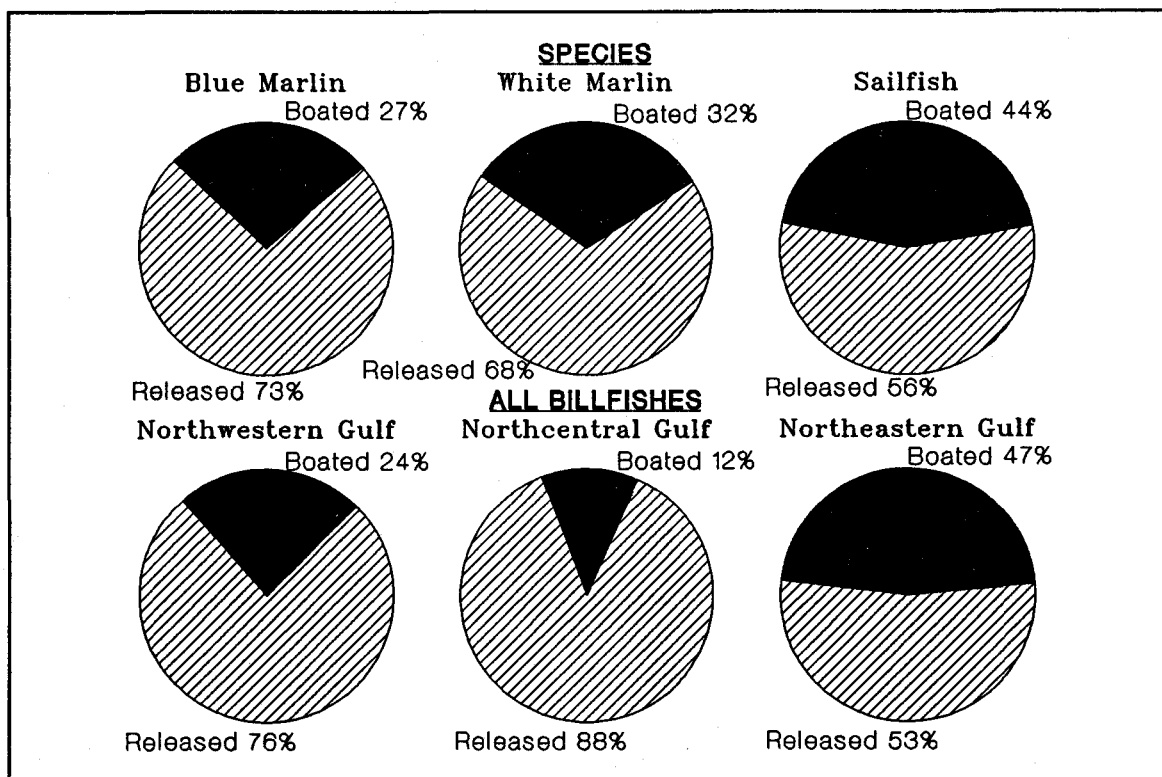


Figure 2. Percentage of billfishes boated vs. released in the northern Gulf of Mexico, 1991.

reportedly caught in 1990, the reported catch of 507 billfishes in 1991 (Tables 1 and 2) represents a decrease of 10%. Blue marlin accounted for 54% (273 fish), white marlin 29% (146 fish), and sailfish 17% (84 fish) of the catches. Four spearfish were also reported caught this season. An increasing number of billfishes are being released in recent years by sport anglers due to a genuine concern for conserving the resource and enactment of various federal and state fishing laws. On October 28, 1988, the Fishery Management Plan (FMP) for the Atlantic Billfishes went into effect.

Between 1988 and 1991 the percentage of released catches has continually increased from 51% to 60% to 66% to 69%, respectively. The 1991 percentage of releases increased from 65% to 73% for blue marlin, and from 49% to 56% for sailfish compared to 1990; while the percentage of releases for white marlin decreased from 75% to 68% (Fig. 2). For all billfishes combined, the 1991 percentage of releases increased from 72% to 76% in the northwestern Gulf and from 75% to 88% in the northcentral Gulf compared to 1990. The percentage of releases in the northeastern Gulf decreased from 61% in 1990 to 53% in 1991 (Fig. 2).

For documentation purposes, 831 hours of driftfishing activity were recorded in 1991. This was an increase of 29% over the 646 hours recorded the previous year. One blue marlin, one sailfish, and six swordfish were reported caught

in conjunction with this fishing effort. All were reportedly released except for four swordfish.

INDICES OF RELATIVE ABUNDANCE

The number of fish Hooked Per Unit of Effort (HPUE), where effort represents hours of trolling, is considered as our best estimate of apparent relative abundance. The reported numbers of fishes hooked divided by the number of hours trolled (i.e., fishing effort) is used for our HPUE indices. Figure 3 shows HPUE measurements for yearly relative abundances of marlins and sailfish and the overall average for the 21-year period of this study (1971-1991).

For blue marlin, the 1991 HPUE (0.021 fish/hour trolling), remained the same as in 1990, equalling the 1978 historic low (Fig. 3). Consequently, the 1991 value remained 19% below the 21-year average rate (0.026). Compared to 1990, HPUE's for blue marlin in the northeastern and northwestern Gulf regions had decreased from 0.017 to 0.016, and from 0.033 to 0.024, respectively. Conversely, in the northcentral Gulf the HPUE increased from 0.021 to 0.031. The low HPUE rate for blue marlin has continued since 1987.

In 1991, the HPUE (0.010) for white marlin was the lowest recorded during the 21 years of this study (Fig. 3). This resulted in a 21-year average HPUE of 0.035. Compared to 1990 by region, the HPUE's for

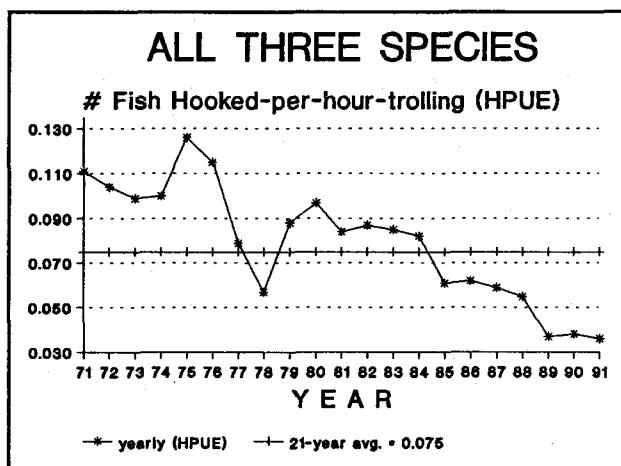
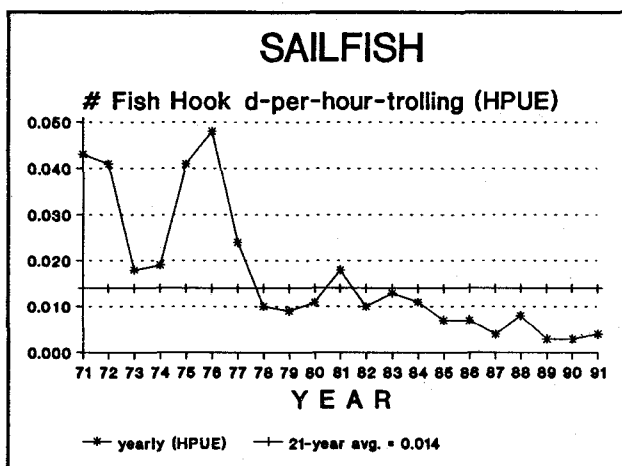
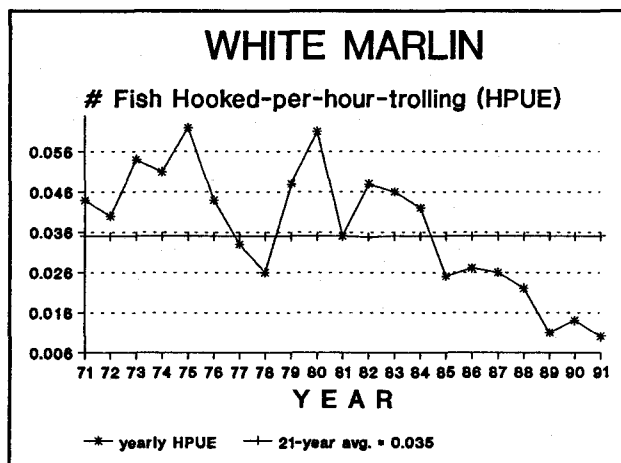
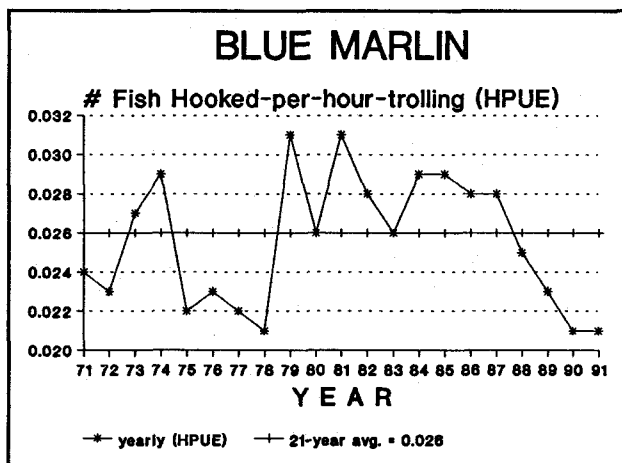


Figure 3. Numbers of billfishes hooked-per-hour-trolling (HPUE) in northern Gulf of Mexico, 1971-1991. Straight line indicates 21-year average of each category.

white marlin decreased in the northeaster Gulf from 0.018 to 0.011, increased in the northwestern Gulf from 0.013 to 0.014, and remained the same (0.006) in the northcentral Gulf. The decrease in the 1991 HPUE for white marlin continued the general trend occurring since 1983.

The HPUE of 0.004 for sailfish increased slightly from the historic low of 0.003 in 1989 and 1990 (Fig.3). The comparatively low HPUE has decreased the 21-year average to 0.014. Compared to 1990, the northeastern region's HPUE

for sailfish remained the same (0.004), the northcentral region's decreased from 0.001 to 0.000, and the northwestern region's HPUE increased substantially from 0.008 to 0.014.

The low HPUE's for marlins with only a slight increase for sailfish resulted in the lowest combined annual HPUE (0.036) during the 21-year period of this study (Fig.3). The last several season's low HPUE's for all billfishes combined decreased the 21-year average to 0.075. With few exceptions, the average annual HPUE value has decreased since 1980. Be-

tween 1971 and 1980, the 10-year overall annual average HPUE was 0.092. It appears that factors other than recreational fishing mortality may be adversely affecting these resources (i.e., billfishes), as the percentage of released billfishes has been increasing in the recreational fishery in the northern Gulf for the past several years.

WEIGHTS

Size data, along with the other data analyses, can provide information about the health or general status of a fishery and may be used in fishery management decisions. Federal and state size regulations, as well as size limits imposed by many tournaments have influenced the size of fishes brought to the docks, which biased actual size composition estimates of the landings. However, length and weight data, as recorded from actual landings, do provide information about the size composition of the catches. Table 3 includes weight data recorded from all fishing methods (i.e., trolling, drifting, and live baiting). Figure 4 presents the 21-year average weight, the range (i.e., minimum and maximum weights), and the 50% grouping (i.e., size range for 50% of the fishes) for marlins and sailfish.

Of the 68 blue marlin weights recorded during the season, two exceeded 600 lbs, the heaviest landed at South Pass, Louisiana (Table 3). The

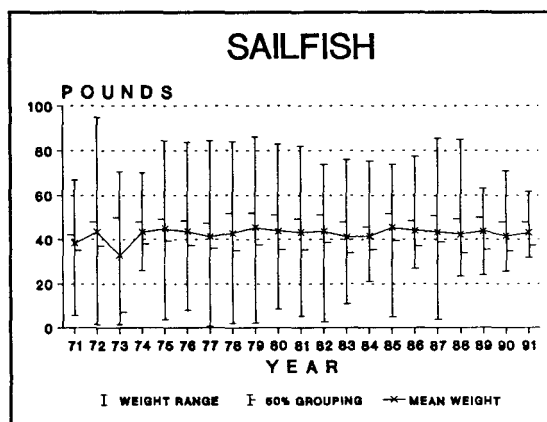
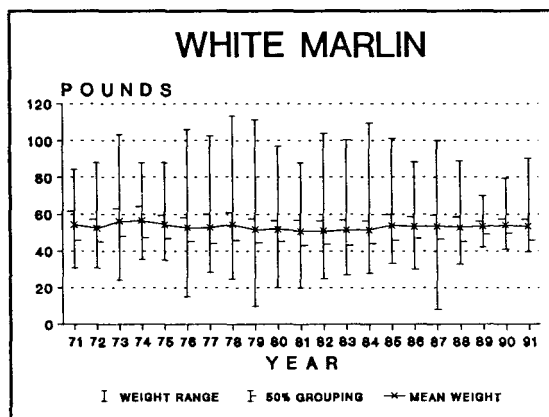
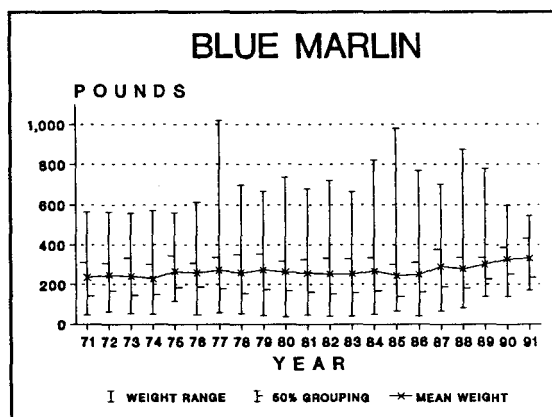


Figure 4. Yearly weights (lbs) with range (vertical line), 50 percentile grouping indicate that 50% of billfishes caught fell into range (between marks), and yearly average (horizontal line).

334.5 lb. average weight for this species in 1991 continued an increasing trend existing over the past several seasons, increasing the 21-year overall average weight to a record 263.2 lbs (Fig. 4). These data reflect the minimum size limits imposed by tournaments, as well as federal and state size regulations. Mandatory releasing of small billfishes allows landings and measurements of only larger fishes, thus increasing the corresponding average weight.

The weights of 42 white marlin were recorded during the season, with the largest (90.2 lbs) being reported from Mobile, Alabama (Table 3). Though this fish was more than 10 lbs heavier than the largest in 1990, the average weight decreased from 54.5 lbs in 1990 to 53.3 lbs. in 1991 (Fig. 4).

The 53.3 lb average weight for white marlin in 1991 was 1.0 lb heavier than the 21-year overall average weight.

The weights of 33 sailfish were recorded during 1991 season (Table 3). The largest weighed in 1991 (69.6 lbs) was about 10 lbs less than the largest reported sailfish in 1990 (71.0 lbs). No sailfish weights were recorded at four ports: Mobile, AL; Grand Isle and South Pass, LA; and East Texas. The 1990 average weight (43.8 lbs) was slightly more than the 21-year overall average weight of 42.6 lbs (Fig. 4). The yearly overall average has varied from 38.3 to 42.6 lbs, remaining at 42.6 lbs since 1986.

BAITS

Information about various types of fishing baits and methods which may influence hook-up and catch rates can be important to fisheries managers. Changes in baits and methods could affect apparent relative abundance estimates. Prior to the late 1970's, slower trolling with natural baits was the predominant fishing method in the northern Gulf. Since then, fast trolling with artificial baits (i.e., lures) has become the prevalent style of fishing for billfishes. The number of hours trolled and the HPUE for various baits fished in the Gulf of Mexico and its three

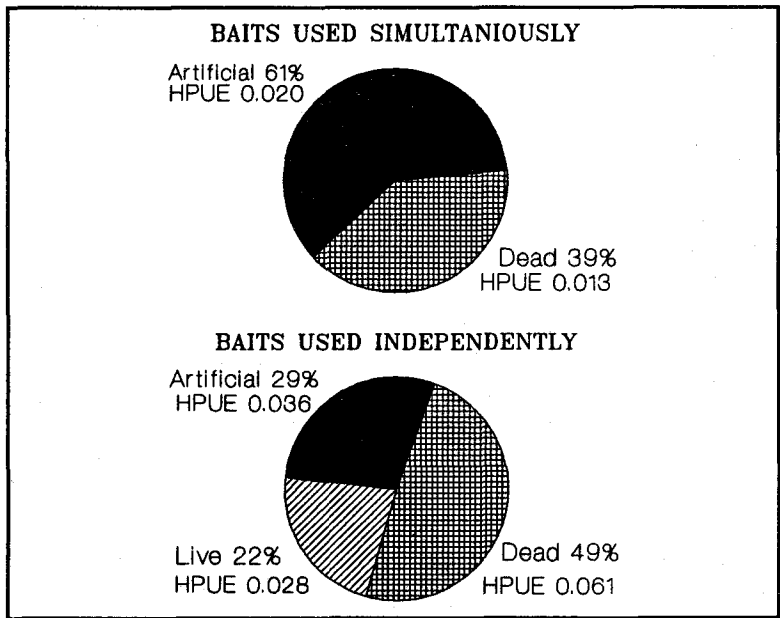


Figure 5. Number of billfishes hooked-per-hour-trolling (HPUE) and percent HPUE for various baits in Gulf of Mexico, 1991.

regions are presented in Table 4. The majority (85%) of the reported fishing effort resulted from trolling only artificial baits. In descending frequency, the percentages of trolling effort were: both bait types simultaneously, 12%; dead baits only, 3%; and live baits only, less than 1%. Since 1989, trolling only with dead baits accounted for the highest HPUE in the northern Gulf. However, when both baits were trolled simultaneously, artificial baits had the highest HPUE (0.019) in the northeastern region, the northcentral region (0.041) and for the overall northern Gulf (0.020). When fished independently of each other, dead baits accounted for 49% of the HPUE in the northern Gulf (Fig. 5). When fished in conjunction with dead baits, artificial baits produced 61% of the HPUE in the northern Gulf of Mexico.

FISHING AREAS

In order to provide information to participants in the recreational fishery for billfishes, "fishing charts" showing indices of low, mid, and high activity by 10' latitudinal and longitudinal blocks are presented in Figures 6-8 to depict this reported activity and its success. For consistency with previous reports, the indices are compiled by computing the numbers of billfishes raised-per-hour-of-trolling. Data are given for blocks in which 10 hours or more of trolling effort was reported throughout the season.

In the northeastern Gulf (Fig.6), fishing effort was reported over a slightly larger area in 1991 than in 1990 (108 vs. 105 blocks). A minor number of reports indicated some fishing occurred off the chart south of latitude $28^{\circ}30'N$. This activity generally occurred during periods in which "good" blue water could not be located closer to shore. All three of the high value blocks were offshore of the 100-fathom curve. No billfishes were reported raised in 27% (29 blocks) of the fished blocks.

Fishermen in the northcentral Gulf (Fig. 7) expanded their fishing area in 1991 by 18% to 71 blocks compared to the 60 blocks reportedly fished in 1990. The percentage of blank (i.e., no billfishes raised) blocks increased from 27% (16 blocks) in 1990 to 31% (22 blocks) in 1991, while the percentage of high-value blocks decreased from 15% in 1990 to 4% in 1991. These data tend to support the decrease in catches reported earlier in this report.

In the northwestern Gulf (Fig.8), the reported fishing area decreased from 73 blocks in 1990 to 58 blocks in 1991. Reportedly high catches of sailfish near the inshore areas off Port Isabel, Texas, resulted in the high-value indices shown in that region of the northern Gulf. The area south of $27^{\circ}N$ latitude had 24% (8) blank blocks and 6% (2) high-value blocks, while the area north of this latitude had 36% (9) blank blocks and 4% (1) high-value blocks.

RELATED OBSERVATIONS

1. The first reported billfish catch of the season came from Destin, Florida. On May 1st, the crew of the boat "Destiny" reported tagging and releasing a blue marlin.

2. For three consecutive years now, no "Grand Slams" (i.e., catches of a blue marlin, white marlin, and sailfish on a 1-day trip) were reported during the season. The last reports of "Grand Slams" were in 1988 when two were recorded.

ACKNOWLEDGMENTS

The National Marine Fisheries Service's billfishing survey has received considerable support from the recreational fishing community. Recreational fishery constituents have provided both indirect and direct assistance to assure a successful outcome of this study. This support is gratefully appreciated, and we thank those who helped (Appendix 1).

Survey efforts resulted in approximately 2,709 interviews during the 1991 season. For a job WELL DONE, we thank: Julie Callais, Grand Isle, LA; Wm. "Hank" Geier, Jr., South Padre Island, TX; Pam Heard, Port Aransas, TX; Richard Kersten, Destin, FL; Craig Martin, Pensacola, FL/Mobile, AL; and Joe Yurt, South Pass, LA.

Appendix 1. Persons and tournament organizations that actively assisted the NMFS Recreational Billfishing Survey in the northern Gulf of Mexico during the 1991 fishing season.

Name	Location
George Ballard	Pensacola, FL
Bay Point Invitational Tournament	Panama City, FL
Blue Marlin Classic Tournament	P rdido K y, FL
East Pass Towers Tournament	Destin, FL
Florida West Coast Championship Tournaments	Madeira Beach, FL
Fort Walton Beach Sailfish Club	Ft. Walton Beach, FL
Nancy Hanna	Pensacola, FL
Jim Hubbard	Houston, TX
Mobile Big Game Fishing Club/Ladies	Mobile, AL
New Orleans Big Game Fishing Club/Ladies	New Orleans, LA
Pensacola Big Game Fishing Club/Ladies	Pensacola, FL
Poco Bueno Tournament	Port O'Connor, TX
Donnie Rozier	Pensacola, FL
Sportsman's Blue Marlin Tournament	Orange Beach, AL
Bonnie Yaste	Pensacola, FL

Table 1. Hours trolled and billfishes RAised (RAI), Hooked (H), Boated (B) and Released (R) in the northern Gulf of Mexico during 1991. Reported catch is considered to be boated plus released. All swordfish numbers were zero.

	Hours trolled	Blue marlin				White marlin				Sailfish				Spearfish				Total all species			
		RAI	H	B	R	RAI	H	B	R	RAI	H	B	R	RAI	H	B	R	RAI	H	B	R
Northeast Gulf	13,089	264	207	44	50	232	145	38	48	70	52	22	20	2	1	1	0	568	405	105	118
St. Petersburg	2,049	34	13	5	1	45	17	8	3	32	22	11	4	1	1	1	0	112	53	25	8
Panama City	2,121	38	25	7	5	56	24	7	7	13	8	4	4	1	0	0	0	108	57	18	16
Destin	1,458	54	37	9	8	57	35	10	16	17	14	4	9	0	0	0	0	128	86	23	33
Pensacola	4,036	52	50	11	12	41	39	8	6	7	7	3	2	0	0	0	0	100	96	22	20
Mobile	3,425	86	82	12	24	33	30	5	16	1	1	0	1	0	0	0	0	120	113	17	41
Northcentral Gulf	7,113	302	219	17	99	64	46	1	22	5	3	0	3	3	3	0	3	374	271	18	127
Grand Isle	773	32	25	2	9	7	7	0	4	1	0	0	0	0	0	0	0	40	32	2	13
South Pass	6,340	270	194	15	90	57	39	1	18	4	3	0	3	3	3	0	3	334	239	16	114
Northwest Gulf	3,596	117	85	7	46	76	49	6	27	109	50	15	18	0	0	0	0	302	184	28	91
East Texas	48	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Central Texas	1,088	38	34	2	19	18	14	1	4	22	17	5	3	0	0	0	0	78	65	8	26
South Texas	2,460	78	50	5	27	58	35	5	23	87	33	10	15	0	0	0	0	223	118	20	65
Total all areas	23,798	683	511	68	195	372	240	45	97	184	105	37	41	5	4	1	3	1,244	860	151	336

Table 2. Numbers of billfishes reported as Boated (Boat) or Released (Rel) without related effort in the northern Gulf of Mexico during 1991. All swordfish numbers were zero.

Gulf of Mexico Area	Blue Marlin		White Marlin		Sailfish		Total All species	
	Boat	Rel	Boat	Rel	Boat	Rel	Boat	Rel
Northeast Gulf	1	0	1	0	0	4	2	4
St. Petersburg	0	0	0	0	0	0	0	0
Panama City	0	0	0	0	0	1	0	1
Destin	1	0	1	0	0	1	2	1
Pensacola	0	0	0	0	0	2	0	2
Mobile	0	0	0	0	0	0	0	0
Northcentral Gulf	0	0	0	0	0	0	0	0
Grand Isle	0	0	0	0	0	0	0	0
South Pass	0	0	0	0	0	0	0	0
Northwest Gulf	4	5	0	3	0	2	4	10
East Texas	3	2	0	0	0	0	3	2
Central Texas	0	0	0	0	0	0	0	0
South Texas	1	3	0	3	0	2	1	8
Total all areas	5	5	1	3	0	6	6	14

Table 3. Number of billfishes and weights (pounds) recorded in the northern Gulf of Mexico during 1991. Data includes trolling, drifting and live baiting methods.

	St. Petersburg	Panama City	Destin	Pensacola	Mobile	Grand Isle	South Pass	East Texas	Central Texas	South Texas	All Areas Combined
Blue Marlin # Weighed	5	6	12	10	12	2	14	0	2	5	68
Largest	539.5	530.0	544.7	485.3	618.0	249.4	627.8	0	534.0	351.0	627.8
Smallest	238.0	248.0	191.8	187.0	194.8	209.8	201.8	0	173.6	164.0	164.0
Average	382.5	364.1	307.0	325.8	329.9	229.6	373.4	0	353.8	270.0	334.5
White Marlin # weighed	8	6	8	8	5	0	1	0	1	5	42
Largest	67.0	74.5	60.2	65.3	90.2	0	50.5	0	49.6	58.0	90.2
Smallest	44.0	46.0	39.6	41.8	46.8	0	50.5	0	49.6	49.5	39.6
Average	52.8	56.9	49.7	51.1	60.7	0	50.5	0	49.6	53.3	53.3
Sailfish #weighed	10	4	3	3	0	0	0	0	5	8	33
Largest	53.0	59.5	59.5	46.7	0	0	0	0	58.1	61.6	61.6
Smallest	32.0	31.8	31.8	34.8	0	0	0	0	45.3	33.0	31.8
Average	43.8	43.8	43.8	39.4	0	0	0	0	49.7	42.7	43.8
Spearfish # weighed	1	0	0	0	0	0	0	0	0	0	1
Largest	48.0	0	0	0	0	0	0	0	0	0	48.0
Smallest	48.0	0	0	0	0	0	0	0	0	0	48.0
Average	48.0	0	0	0	0	0	0	0	0	0	48.0

Table 4. Hours trolled and number of billfishes hooked-per-hour-of-trolling (HPUE) with various baits fished in the northern Gulf of Mexico, 1991.

Gulf of Mexico Area	Dead bait only		Live bait only		Artificial bait only		Both simultaneously		
	Hours trolled	HPUE	Hours trolled	HPUE	Hours trolled	HPUE	Hours trolled	Natural ¹ HPUE	Artificial HPUE
Northeastern	595	.045	69	.043	9,979	.030	2,446	.011	.019
Northcentral	32	.125	10	.000	6,998	.038	73	.000	.041
Northwestern	60	.183	28	.000	3,134	.049	374	.032	.021
All three combined	687	.061	107	.028	2,111	.036	2,893	.013	.020

¹Natural bait includes both dead and live baits.

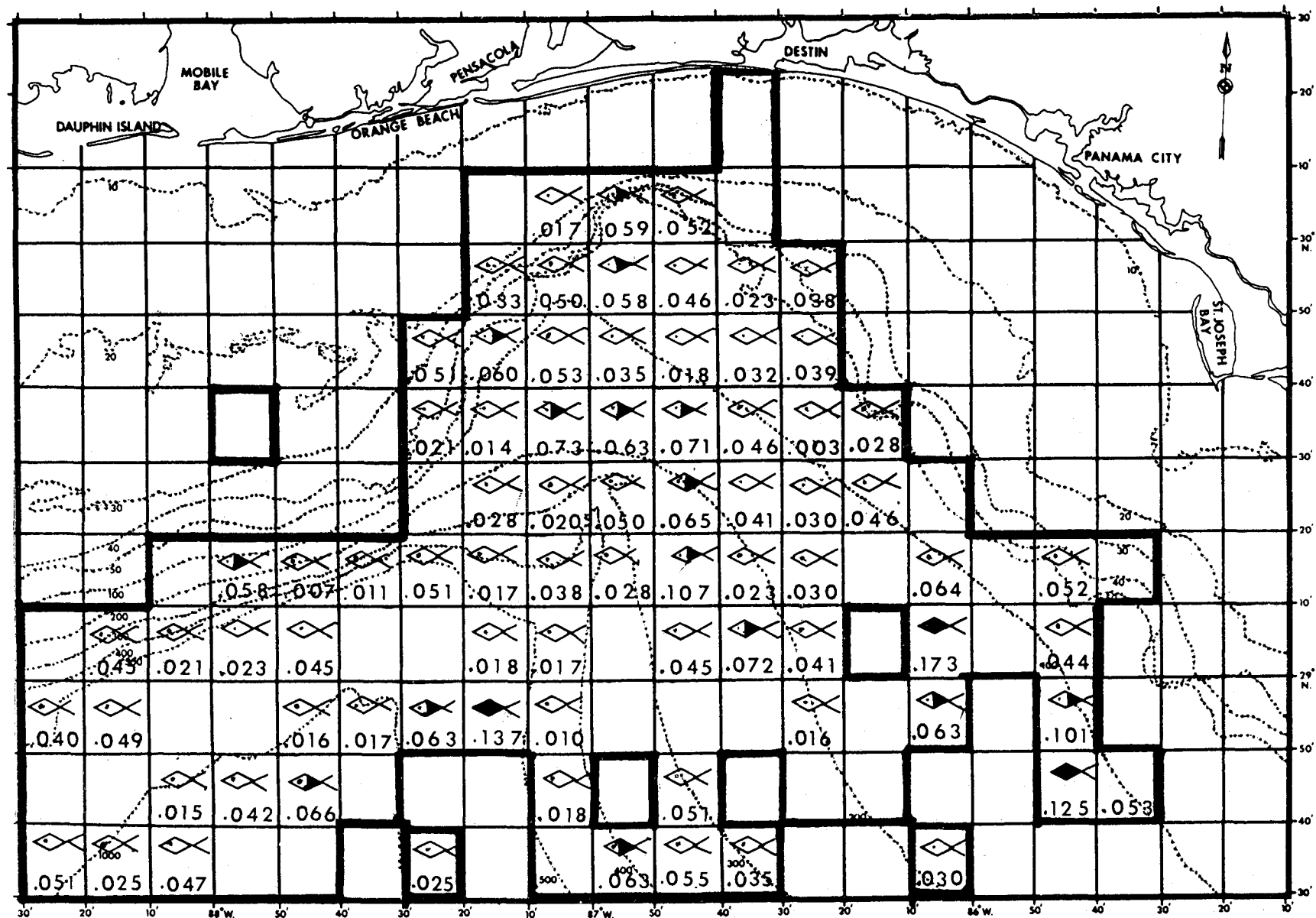


Figure 6. Numbers of billfishes raised-per-hour-of-trolling in the northeastern Gulf of Mexico by 10-min. blocks, 1991.

LEGEND

Fishing area bound by heavy black lines.

Numbers of fishes raised-per-hour-trolling:

.001-.095 

.096-.190 

≥ .191 

No fishes raised in blocks without symbols.

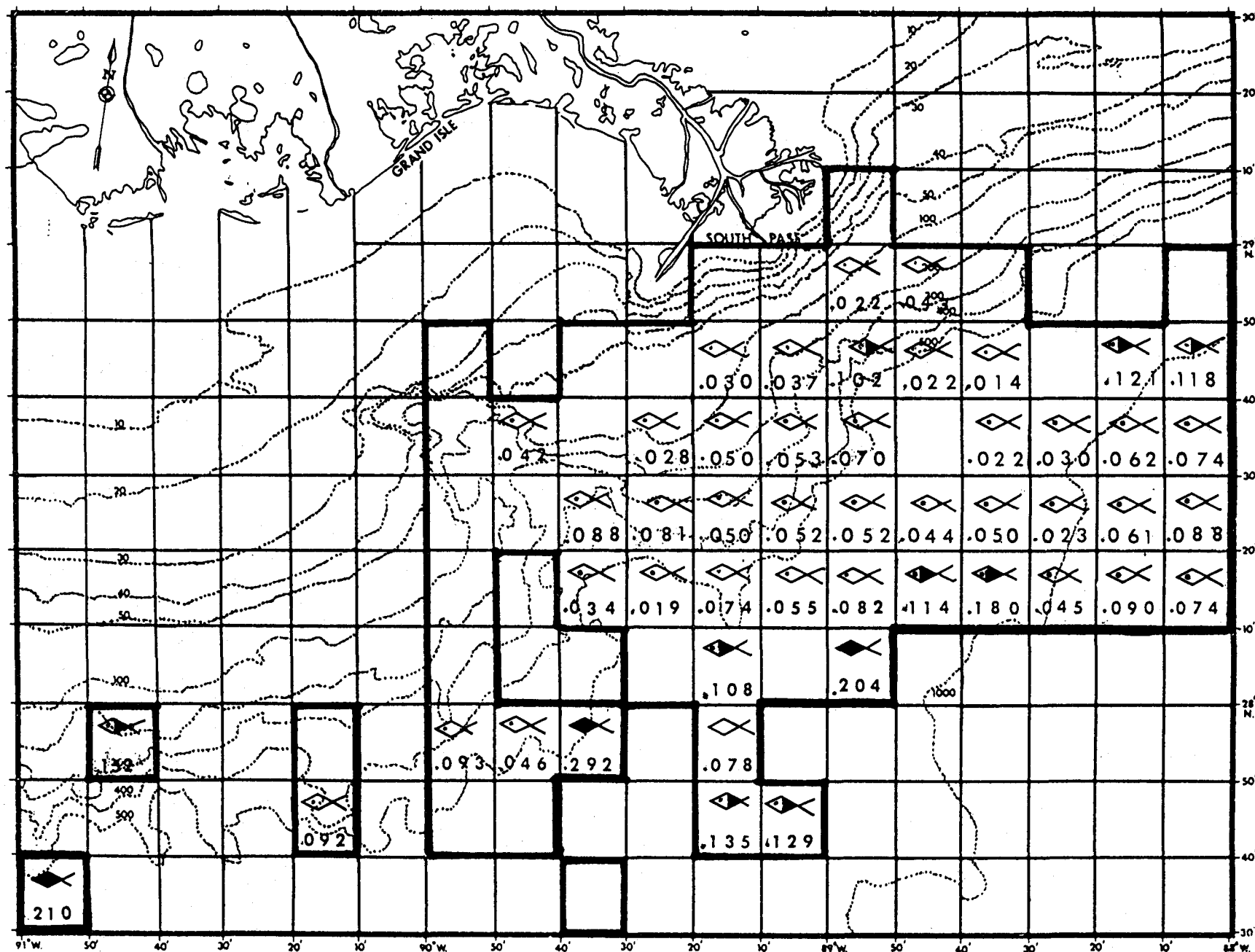


Figure 7. Numbers of billfishes raised-per-hour-of-trolling in the northcentral Gulf of Mexico by 10-min. blocks, 1991.

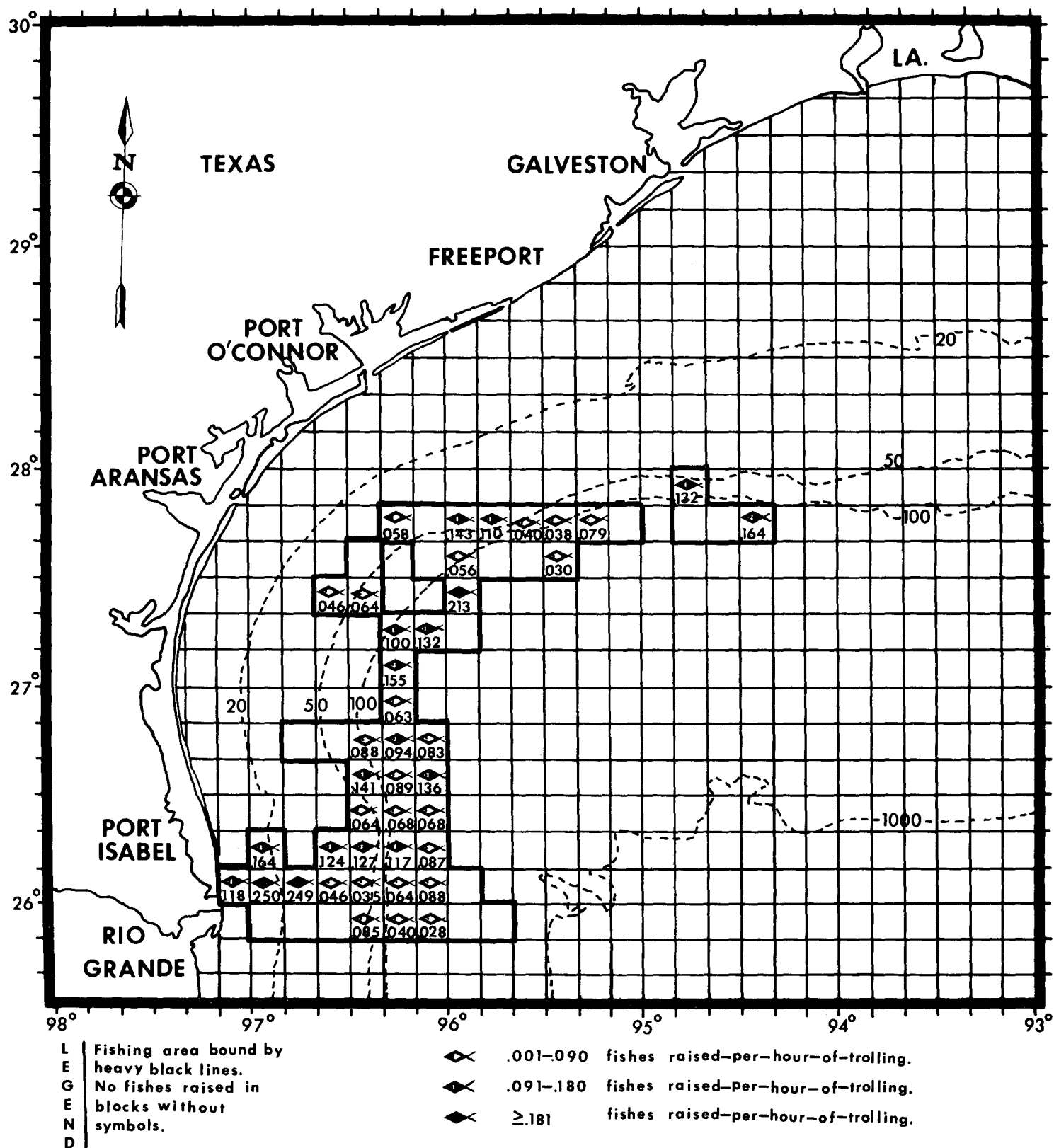


Figure 8. Numbers of billfishes raised-per-hour-of-trolling in the northwestern Gulf of Mexico by 10-min. blocks, 1991.