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National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
P. O. Drawer 1207
Pascagoula, MS 39568-1207

NOAA Ship OREGON II 87-04 (167)
6/11-7/15/87

INTRODUCTION

The NOAA Ship OREGON II departed Pascagoula, MS on 11 June 1987 to conduct a 35-day Southeast Area Monitoring and Assessment Program (SEAMAP) survey in the northern and western Gulf of Mexico. The survey included additional sampling by the states of Florida, Alabama, Mississippi, Louisiana and Texas. The major objective was to monitor size and distribution of penaeid shrimp and provide information on shrimp and groundfish stocks across the northern Gulf of Mexico in 5 to 60 fathoms (fm).

All predefined stations were completed and the NOAA Ship OREGON II returned to Pascagoula, MS 15 July 1987.

OBJECTIVES

- 1) Determine size distribution of penaeid shrimp by depth across the U. S. northern and western Gulf of Mexico.
- 2) Obtain samples of brown, pink and white shrimp to determine length-weight relationships.
- 3) Obtain data to compare catch rates between cooperating NOAA and state research vessels.
- 4) Collect finfish catch data.
- 5) Collect associated hydrographic and environmental data at each station.
- 6) Collect ichthyoplankton samples throughout the survey area.
- 7) Compare catch rates between a 65-ft. fish trawl and a 40-ft. shrimp trawl.

SURVEY METHODOLOGY

Two hundred and twelve randomly selected trawl sites from Perdido Bay to the Texas-Mexico border in 5 to 60 fathoms were identified for day and night sampling. Sample trawls used were a 40-ft. shrimp trawl with mud rollers and 8'x40" wooden chain doors and a 65-ft. 2 seam fish trawl with ten 10-in. floats and 9.2 ft.² steel vee doors. Sample sites encompassed a 1 or 2 fm depth strata between 5 and 30 fm and 5 fm depth strata between 30 and 60 fm. Tows were made perpendicular to depth contours with tow times ranging from 10 to 60 minutes. Several stations required consecutive tows to cover the entire depth strata.

Total weight of each catch was recorded. All Penaeus and other predefined finfish and invertebrate species were then separated from the catch. Weight and count of each species was recorded from each sample site. A random selection of 200 shrimp of each species (when available) was removed for sex, maturation, and total length data. The remainder of the catch was then sampled for finfish information.

All OREGON II stations were double rigged (65 ft. fish trawl vs 40 ft. shrimp trawl) with each catch worked separately.

COMPARATIVE TRAWLS

The NOAA Ship OREGON II conducted comparative fishing tows at preselected day stations east of the Mississippi River with a research vessel from Alabama and the TOMMY MUNRO from Mississippi. West of the Mississippi River, comparative tows were made throughout the day along the Louisiana coast with the PELICAN. All vessels towed parallel to each other and nets were deployed and retrieved at the same time.

HYDROGRAPHIC AND ENVIRONMENTAL DATA

Selected hydrographic data were taken before the start of each station. A conductivity, temperature and depth (CTD) unit was used to collect salinity and temperature data. An XBT was shot once a day (more when the CTD was inoperable) and water samples from surface, mid and maximum depths were saved for analysis in the Pascagoula lab. These data will be used to validate the CTD readings. Water for dissolved oxygen was also collected from surface, mid and maximum depths. All day stations included secchi disk and water color readings. Chlorophyll samples were taken at each station and filtered with a GF/C filter. All samples were from surface waters except for those stations less than 20 fm off Louisiana, which included samples from the bottom. Chlorophyll samples were frozen in petri dishes and included information on station number, date and the amount of water filtered. Analysis of chlorophyll samples will be completed at the Pascagoula facility.

ICHTHYOPLANKTON

Bongo and neuston samples were taken from preselected stations integrated into the cruise track. Samples were initially held in cold water, then in buffered formalin for 24 hours. After 24 hours, the formalin was removed and samples were preserved in 95% ethanol.

VESSEL SATELLITE COMMUNICATION SYSTEM

A data communication terminal aboard the NOAA Ship OREGON II was used to transmit environmental data and daily catch rates of shrimp and finfish to the Mississippi Laboratories. The terminal operated through the ATS-3 satellite system located in a geostationary orbit over the Pacific Ocean. The satellite data allowed personnel in Pascagoula to provide a weekly report (on shrimp and finfish catch rates expressed in pounds per hour and location of capture) to interested parties. Six weekly reports and one summary report were prepared and distributed.

OBSERVATION AND RESULTS

A total of 460 shrimp and bottomfish tows were completed with dominant faunal components listed in Tables 1-4 for east Delta, Tables 5-8 for west Delta and Tables 9-12 for Texas. Longspine porgy (Stenotomus caprinus) was the most abundant species east of the Delta both day and night with both trawl types (40-ft. shrimp trawl and 65-ft. fish trawl). West of the Delta butterfish (Peprilus burti) were dominant in the 40-ft. trawl day catches (Table 5) and bumpers (Chlorosomus chrysurus) in the 65-ft. trawl day catches (Table 6). At night, Atlantic croakers (Micropogonias undulatus) were most abundant in both the 40-ft. and 65-ft. trawls (Tables 7 and 8). Along the Texas coast in day time catches arrow squid (Doryteuthis plei) was most abundant in the 40-ft. trawl and bumpers in the 65-ft. trawl (Tables 9-10). During night time catches, brown shrimp were most abundant in the 40-ft. trawl and croakers in the 65-ft. trawl (Tables 11-12).

Density summaries expressed as pounds per hour for total finfish and penaeid shrimp for the 40-ft. shrimp and the 65-ft. fish trawls are shown on Figures 1-4 east of the Delta, Figures 5-8 west of the Delta and Figures 9-12, along the northwestern Gulf of Mexico. The largest concentration of finfish (734 lbs. for 40-ft. trawl and 1,061 lbs. for 65-ft. trawl) was found off Louisiana in 8 fm of water (Figures 5 and 6). Croakers constituted 67% of the finfish catch in the 40-ft. trawl and 70% in the 65-ft. trawl.

Shrimp catches were light to medium across the entire Gulf with the highest concentration appearing off Port Mansfield, Texas in 17 fm of water (Figures 11 and 12).

MACKEREL

There was a total of 88 mackerel caught of which 48 were spanish (Scomberomorus maculatus) and 40 were king (Scomberomorus cavalla). East of the Delta only spanish mackerel were caught, five in the 65-ft. trawl and one in the 40-ft. trawl. West of the Delta off Louisiana, a mixture of both spanish and kings were caught, 31 spanish (22 caught in one haul) and 6 kings. All the spanish were caught by the 65-ft. trawl and the kings were divided equally between the 65-ft. trawl and the 40-ft. trawl. Most mackerel caught during the cruise were off Texas, 45 total. In the 65-ft. trawl 22 kings and 10 spanish were caught compared to 12 kings and 1 spanish in the 40-ft. trawl.

COMPARATIVE TRAWLS

The NOAA Ship OREGON II conducted three comparative fishing tows with the TOMMY MUNRO and fourteen with the PELICAN. The vessel from Alabama had mechanical problems on the first station and returned to port. Ten of the comparative tows were made during the day and seven at night.

ICHTHYOPLANKTON

Forty-six bongo and neuston samples were obtained during the cruise. The right bongo tows were sent to the NMFS, Miami Laboratory, for processing. The left bongo tows and the neuston samples were sent to the Gulf Coast Research Laboratory for housing. Ichthyoplankton stations are shown on Figure 13.


SCIENTIFIC PERSONNEL

Nathaniel Sanders, Jr., Field Party Chief, Pascagoula, MS	6/11-7/15/87
Freeman Richmond, Student Trainee, Pascagoula, MS	6/11-6/19/87
	7/02-7/15/87
Alonzo Hamilton, Fishery Biologist, Pascagoula, MS	6/11-7/15/87
Jim Benton, Fishery Biologist, Pascagoula, MS	6/11-6/19/87
Karen Lecke, Fishery Biologist, Pascagoula, MS	6/11-7/01/87
Jim Barrett, Fishing Gear & Dev. Manager, Pascagoula, MS	6/11-6/19/87
Bennie Rohr, Fishery Biologist, Pascagoula, MS	6/11-7/01/87
Gilmore Pellegrin, Jr., Fishery Biologist, Pascagoula, MS	7/02-7/15/87
Warren Stuntz, Fishery Biologist, Pascagoula, MS	7/02-7/15/87
Cecil Paris, Biological Aide, Pascagoula, MS	6/20-7/15/87
Danny Thomasson, Co-Op Student, Pascagoula, MS	6/20-7/15/87
Michael King, Biological Aide, Pascagoula, MS	7/02-7/15/87
Judy Gordon, Fishery Biologist, Pascagoula, MS	7/02-7/15/87
Robert Jenkins, Gear & Dev. Manager, Miami, FL	6/11-7/15/87
Elizabeth Scott, Biological Technician, Galveston, TX	7/02-7/15/87
Rick Reeves, Biological Aide, Galveston, TX	6/11-6/19/87

COOPERATORS


Wang Xialong, Researcher, Beijing, China	6/11-6/19/87
Li Jilong, Researcher, Beijing, China	6/20-7/01/87
Christina Canadell, Student, University of So. Alabama	6/11-7/01/87
Mary Penton, Bay St. Louis, MS	6/20-7/01/87
David Lee, Student, Texas A&M University	6/20-7/01/87
Abdon Reynaldo Cruz, Mexican Institute Nacional de la pesca	6/20-7/01/87
Margarita Medellia Avila, Mexican Inst. Nacional de la pesca	6/20-7/01/87

SUBMITTED BY:


Nathaniel Sanders, Jr.
Field Party Chief

APPROVED BY:


Andrew J. Kemmerer, Director
Mississippi Laboratories


Richard J. Berry
Center Director

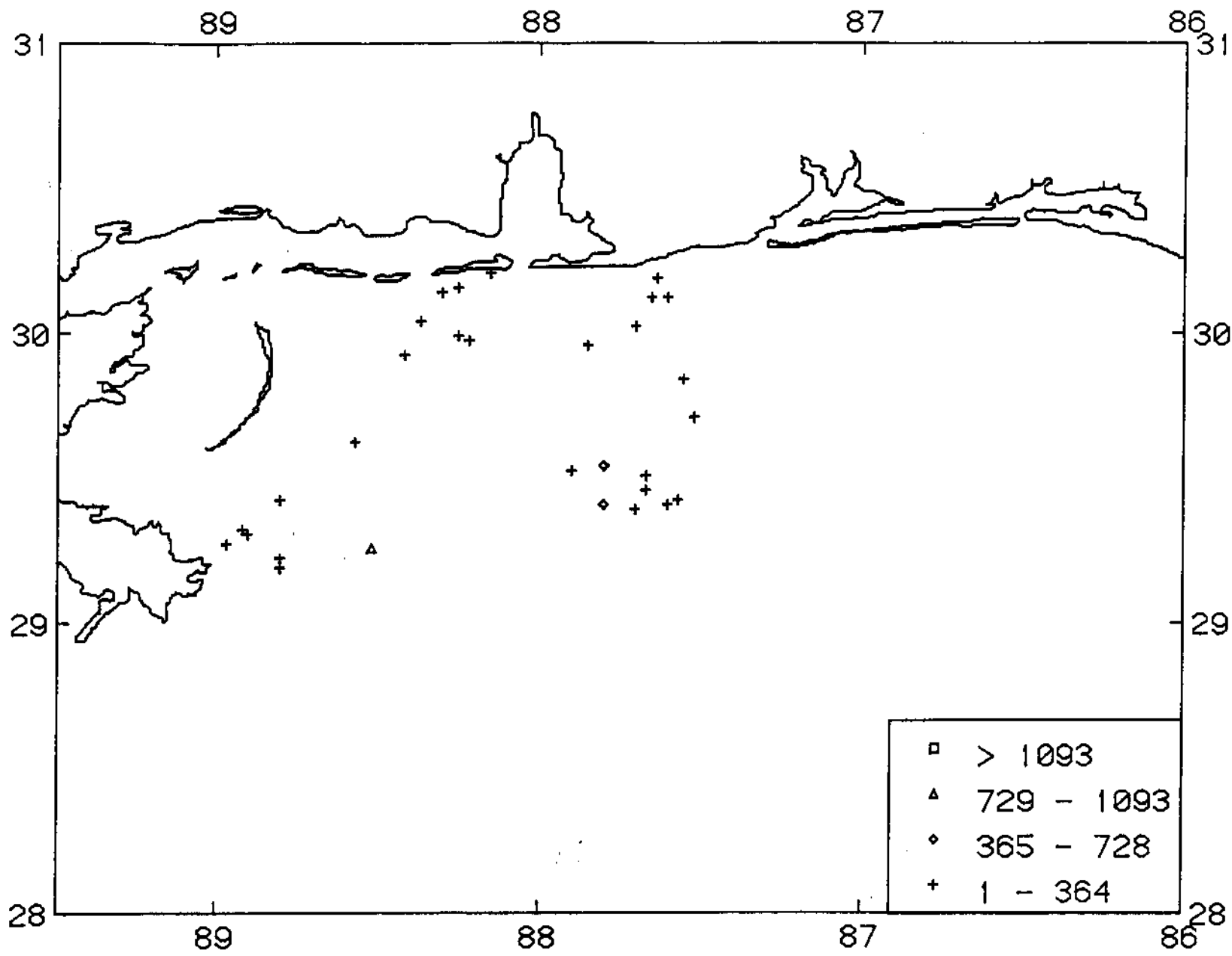


Figure 1. Finfish concentrations in the Gulf of Mexico, east of the Mississippi River. Symbols represent pounds per hour for a 40 ft. shrimp trawl.

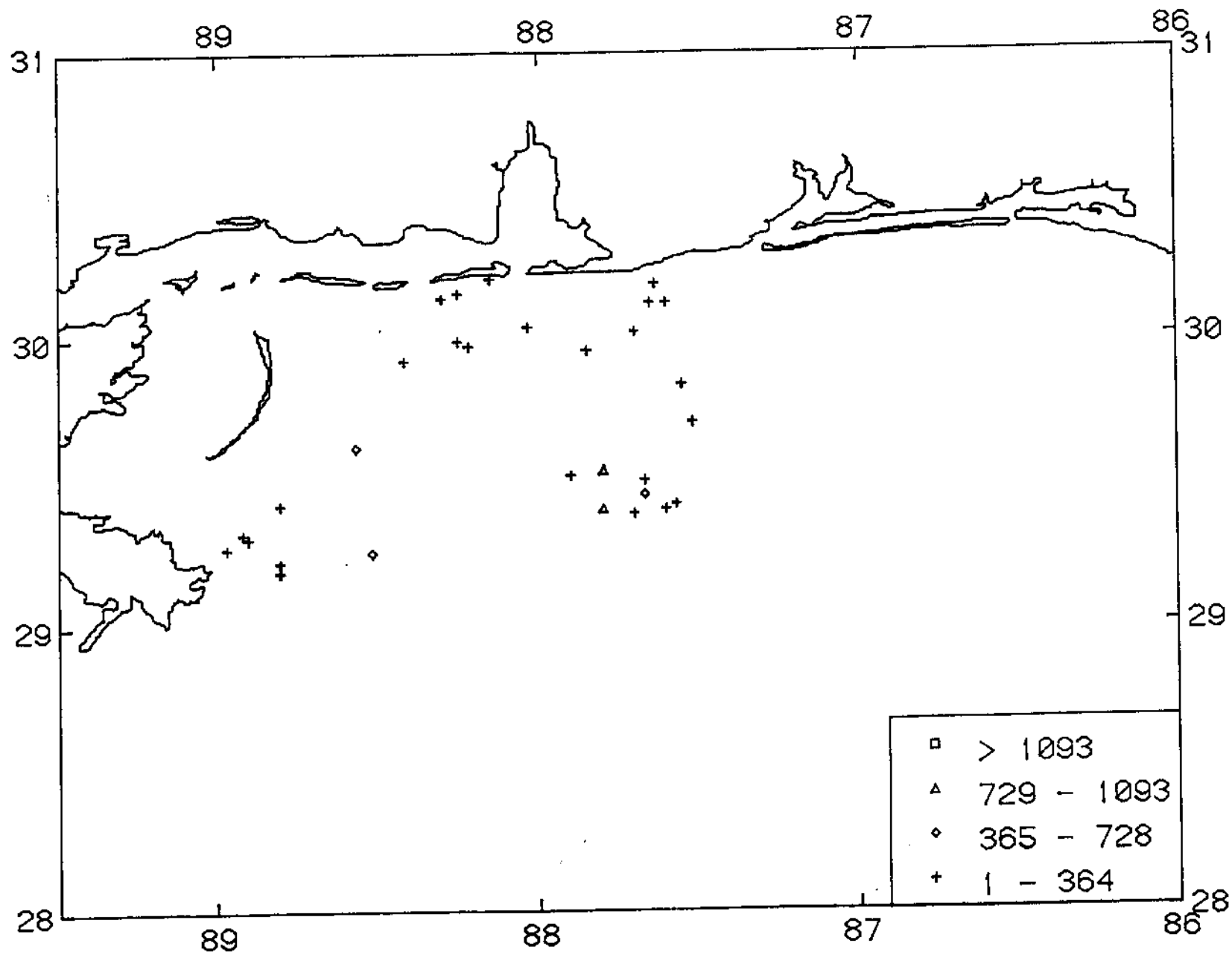


Figure 2. Finfish concentrations in the Gulf of Mexico, east of the Mississippi River. Symbols represent pounds per hour for a 65 ft. fish trawl.

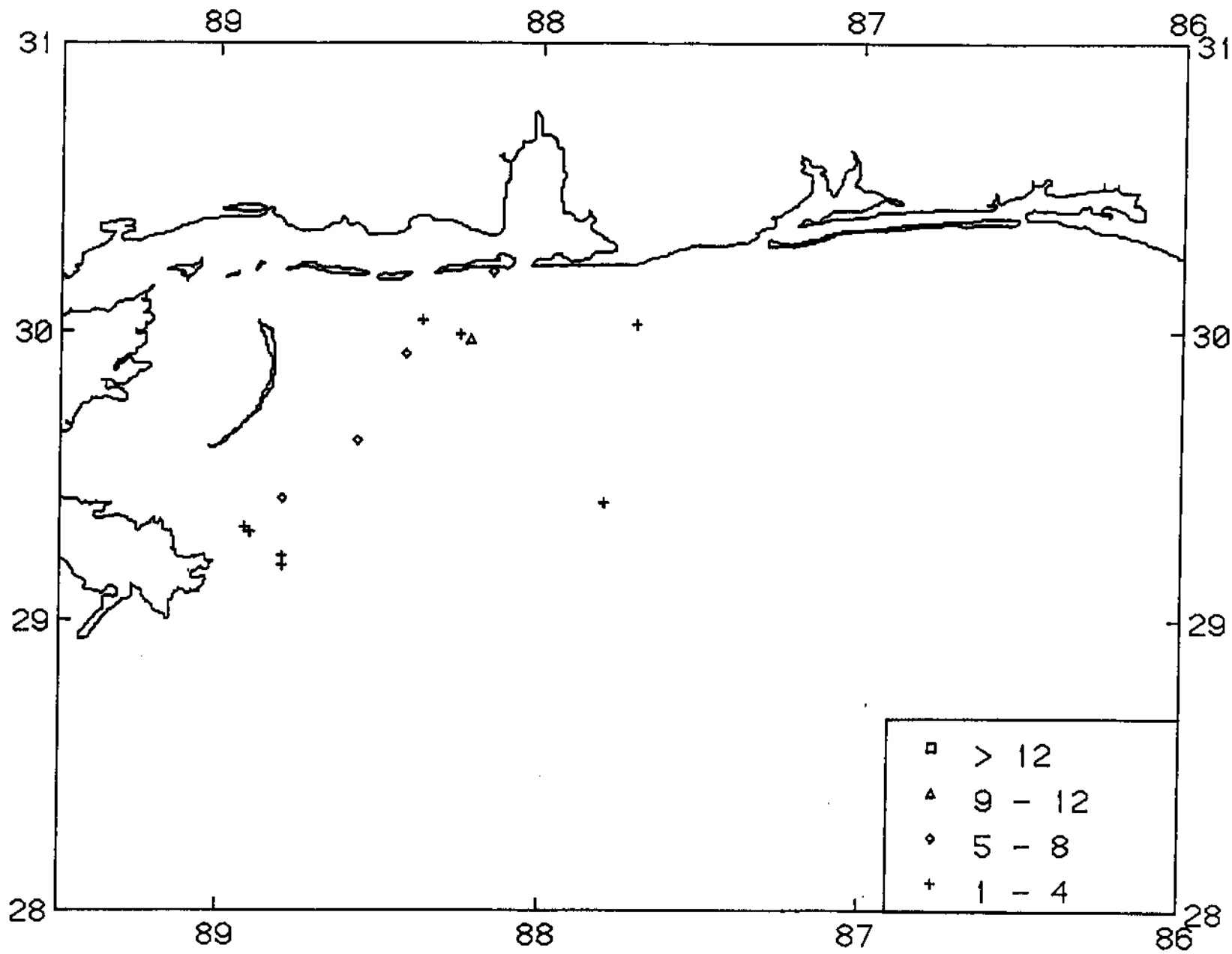


Figure 3. Penaeid shrimp concentrations in the Gulf of Mexico, east of the Mississippi River. Symbols represent pounds per hour for a 40-ft. shrimp trawl.

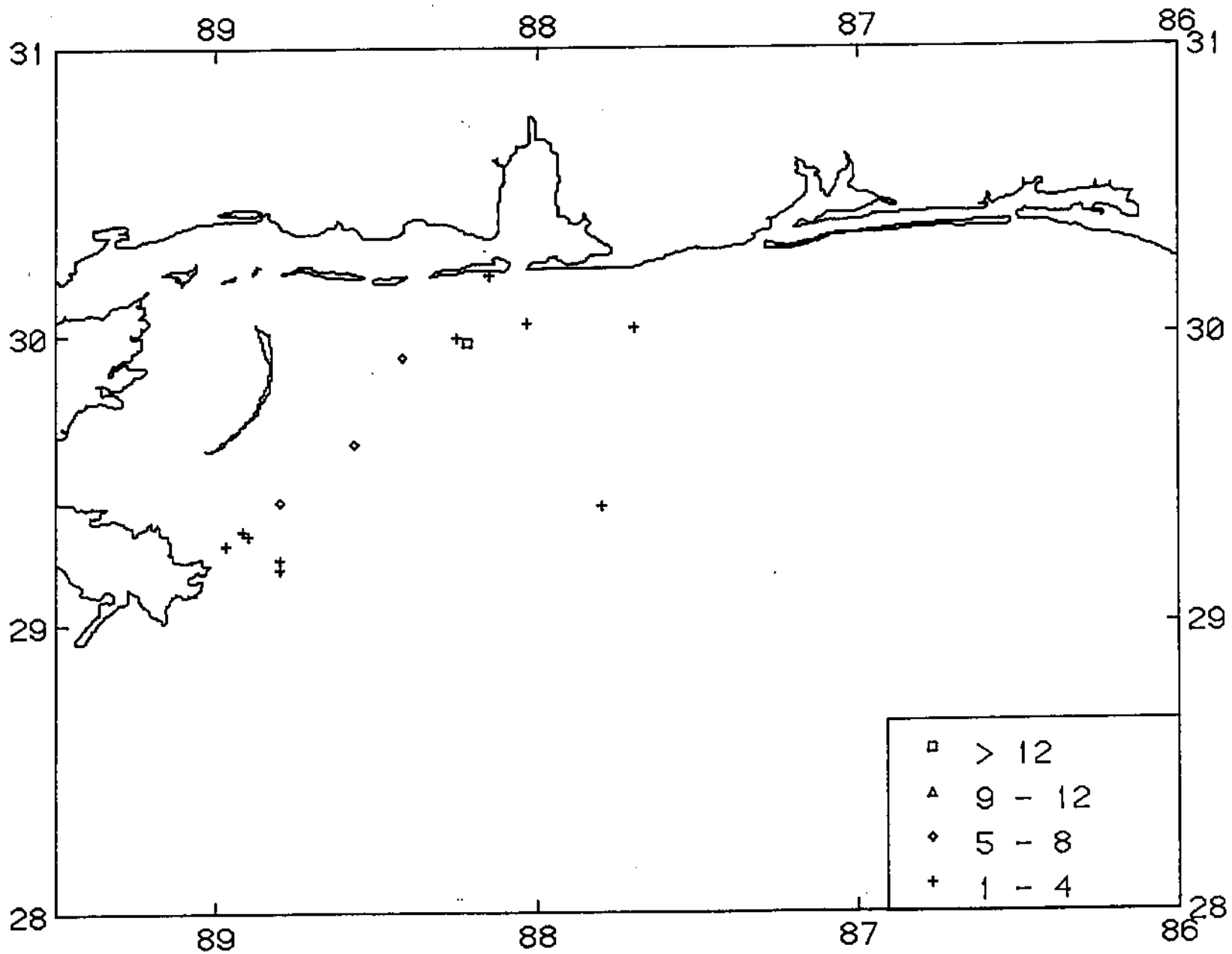


Figure 4. Penaeid shrimp concentrations in the Gulf of Mexico, east of the Mississippi River. Symbols represent pounds per hour for a 65-ft. shrimp trawl.

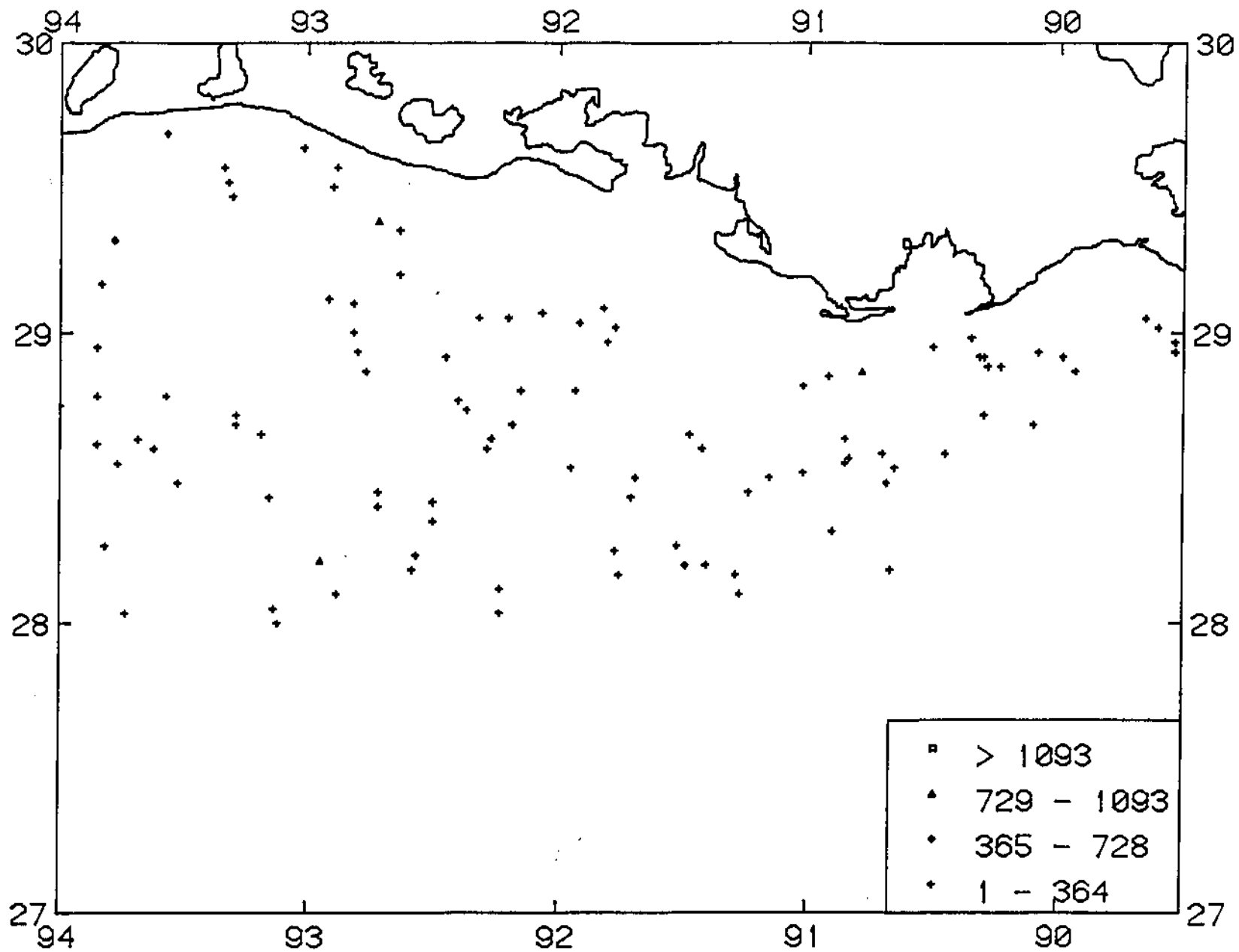


Figure 5. Finfish concentrations in the Gulf of Mexico, west of the Mississippi River. Symbols represent pounds per hour for a 40-ft. shrimp trawl.

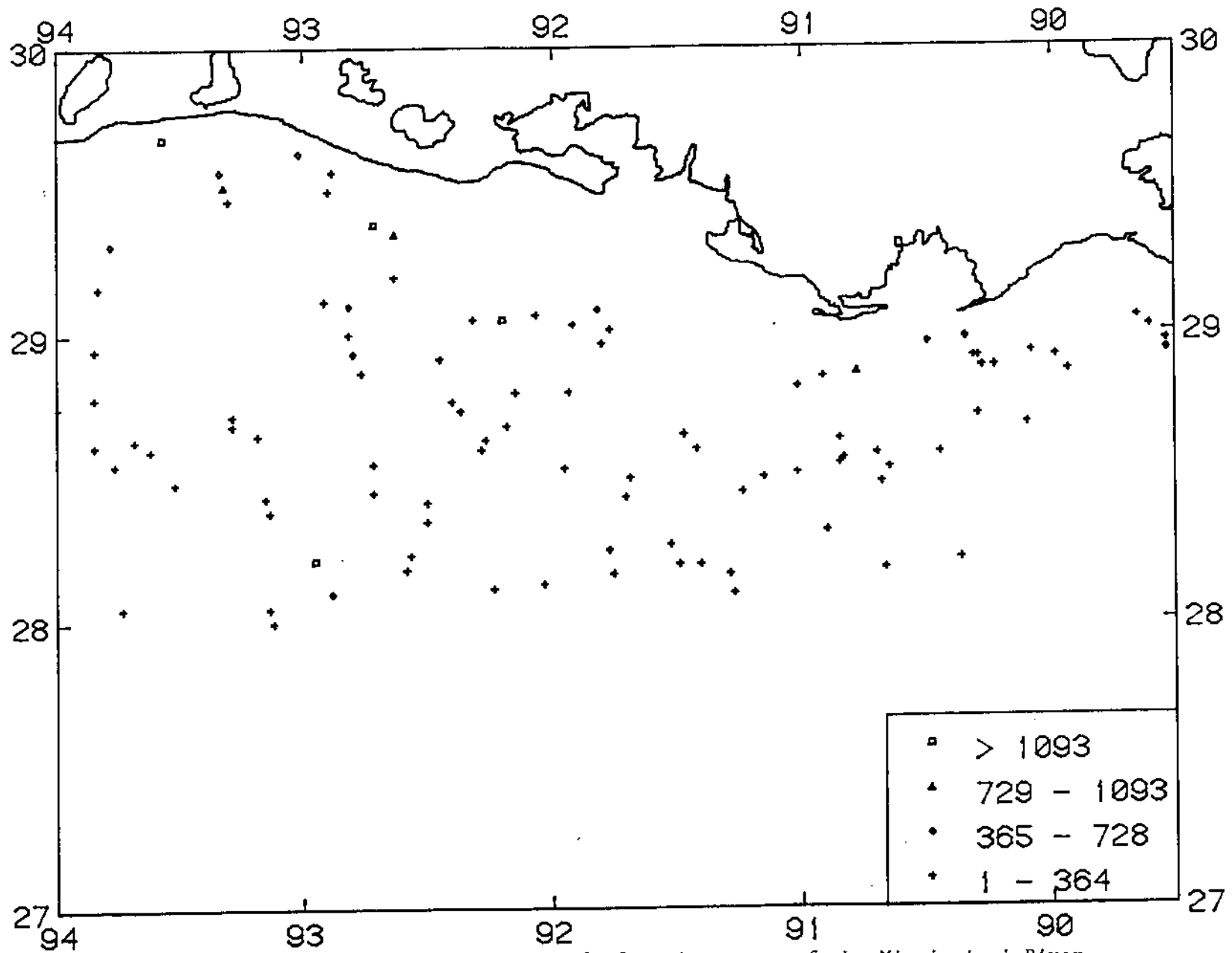


Figure 6. Finfish concentrations in the Gulf of Mexico, west of the Mississippi River. Symbols represent pounds per hour for a 65-ft. shrimp trawl.

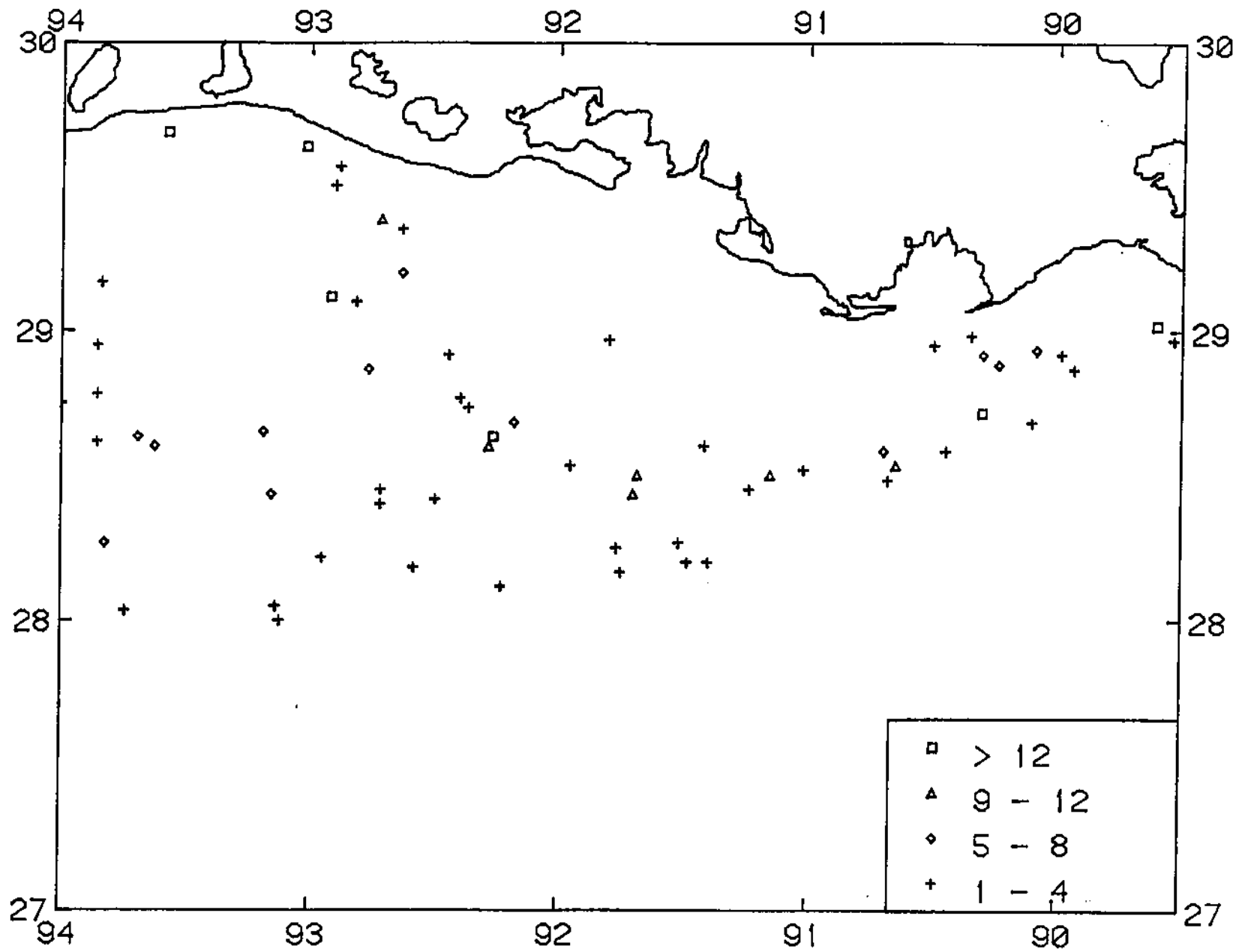


Figure 7. Penaeid shrimp concentrations in the Gulf of Mexico, west of the Mississippi River. Symbols represent pounds per hour for a 40-ft. shrimp trawl.

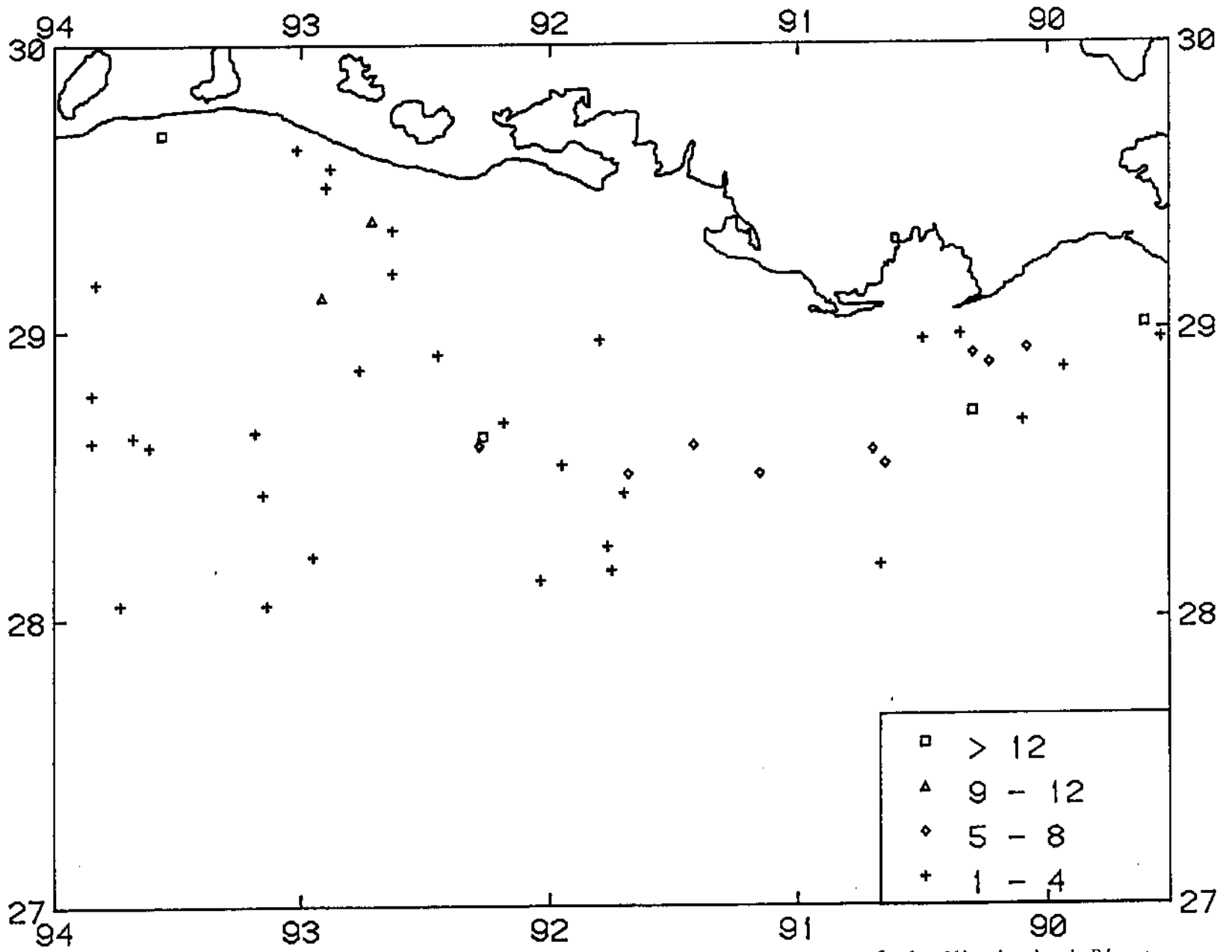


Figure 8. Penaeid shrimp concentrations in the Gulf of Mexico, west of the Mississippi River. Symbols represent pounds per hour for a 65-ft. fish trawl.

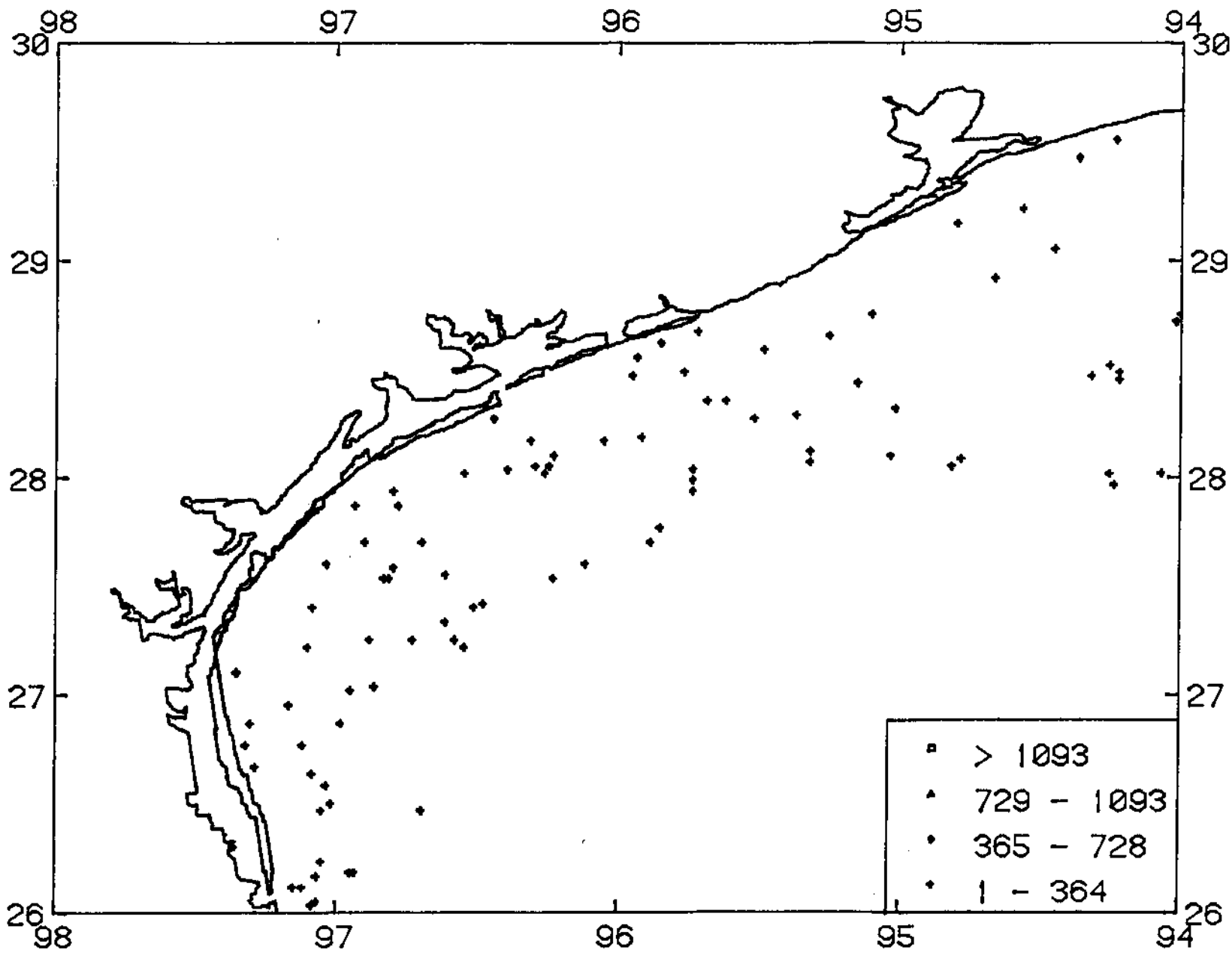


Figure 9. Finfish concentrations in the northwestern Gulf of Mexico. Symbols represent pounds per hour for a 40-ft. shrimp trawl.

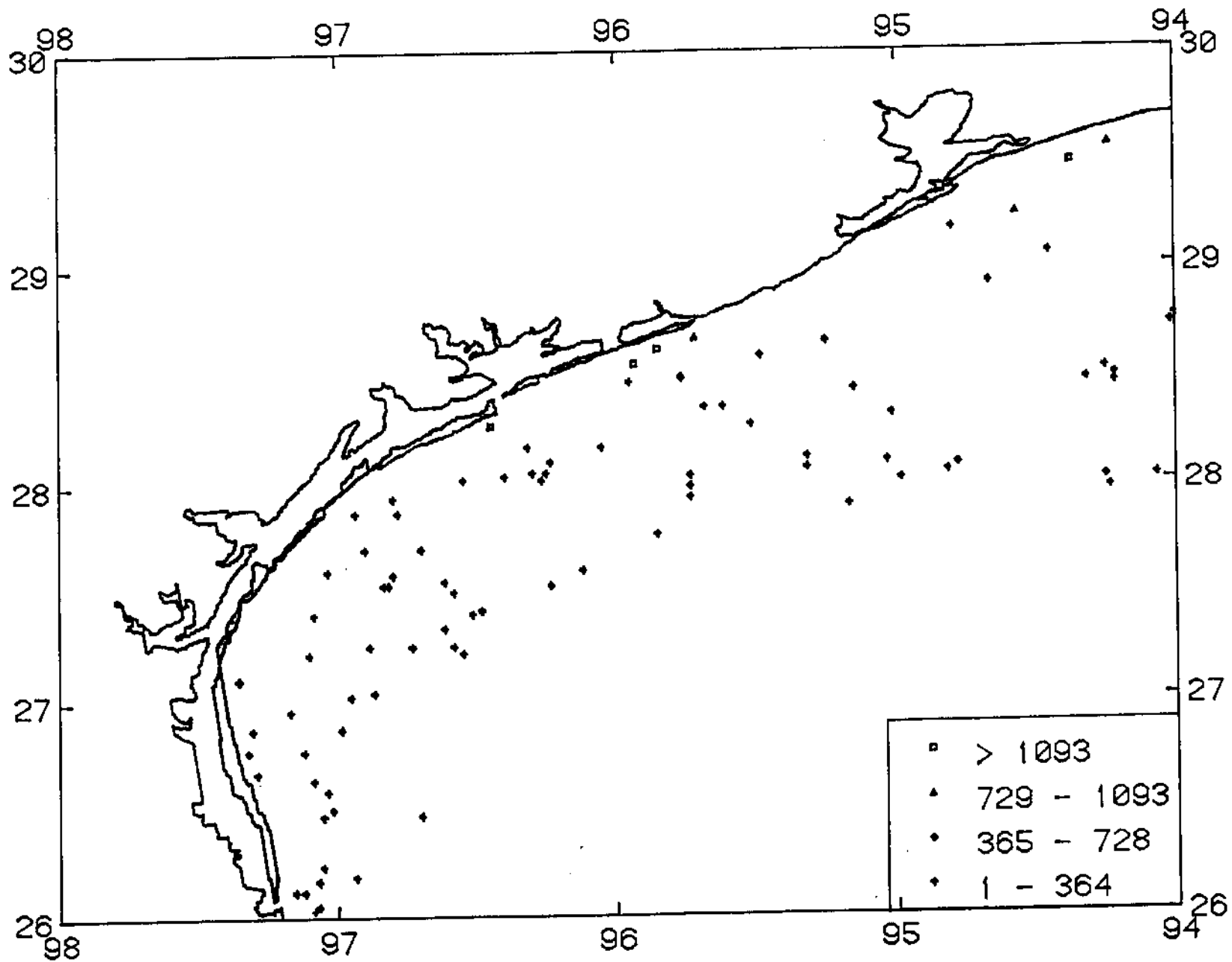


Figure 10. Finfish concentrations in the northwestern Gulf of Mexico. Symbols represent pounds per hour for a 65-ft. fish trawl.

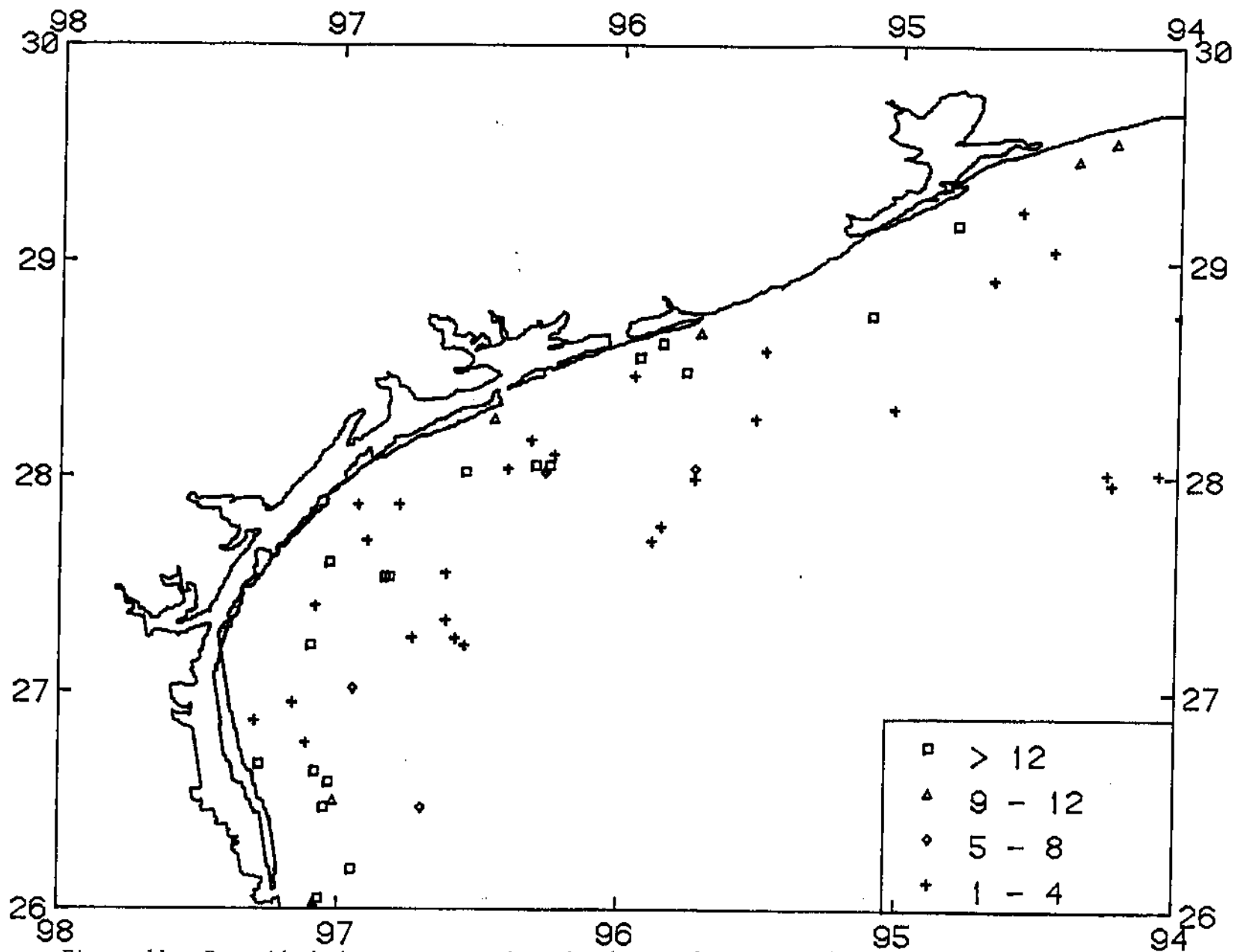


Figure 11. Penaeid shrimp concentrations in the northwestern Gulf of Mexico. Symbols represent pounds per hour for a 40-ft. shrimp trawl.

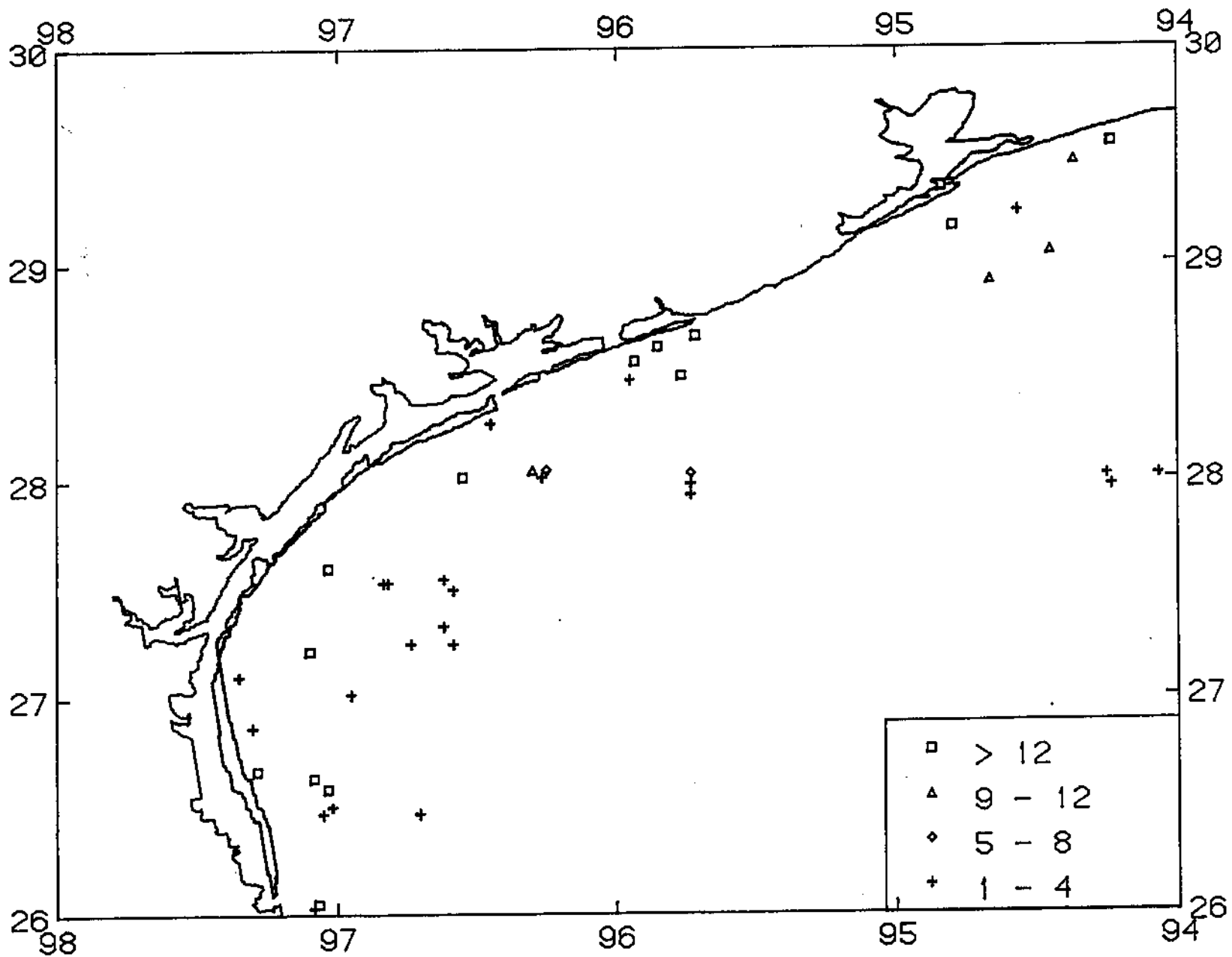


Figure 12. Penaeid shrimp concentrations in the northwestern Gulf of Mexico. Symbols represent pounds per hour for a 65-ft. fish trawl.

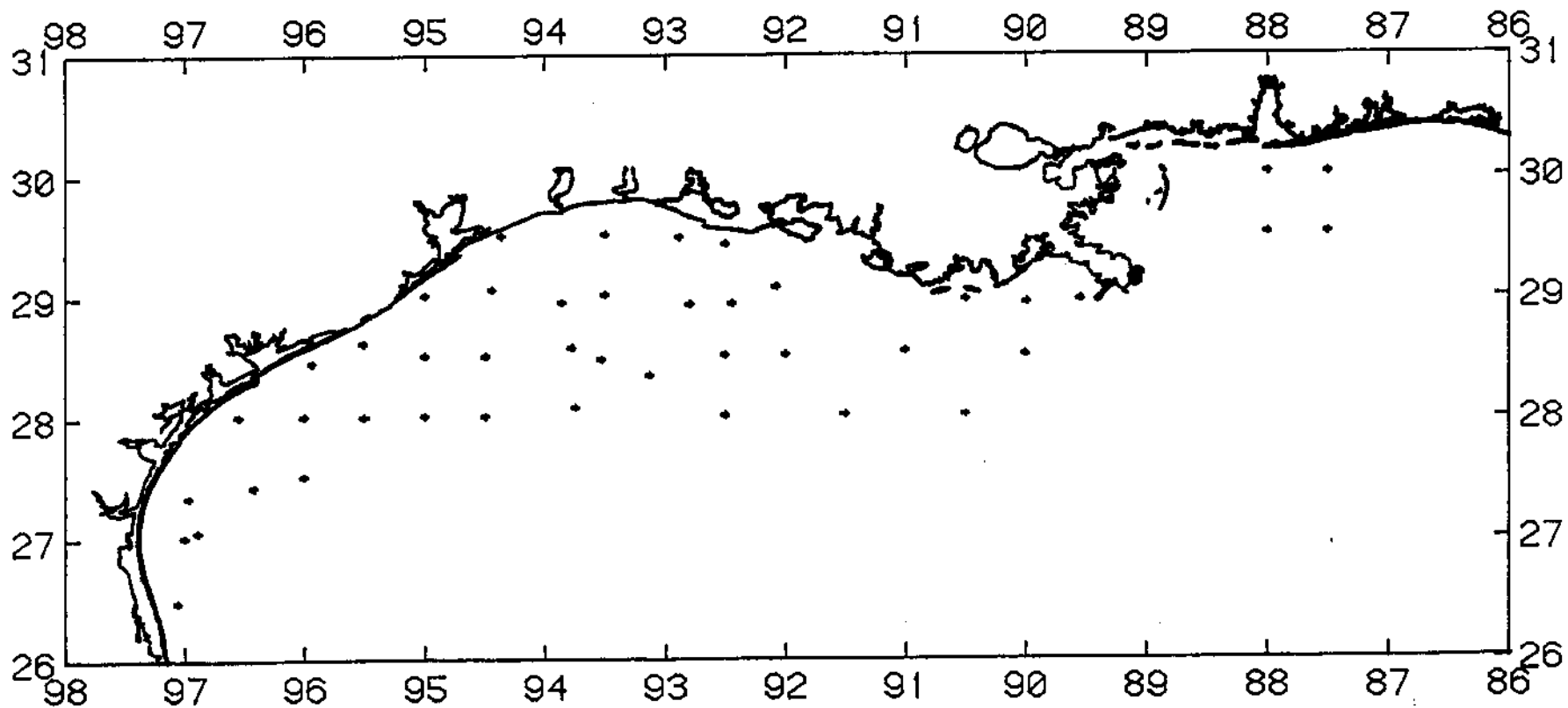


Figure 13. Ichthyoplankton sample sites.

Table 1. East Delta - dominant day time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows:	1	7	1	2	2	1	14
Depth Range (Fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Stenotomus caprinus</u>	-	6	1	1	3	5	1
<u>Peprilus burti</u>	2	4	2	-	1	-	2
<u>Micropogonias undulatus</u>	1	10	7	-	2	-	3
<u>Doryteuthis plei</u>	-	1	-	2	10	-	4
<u>Chloroscombrus chrysurus</u>	9	2	-	-	-	-	5
<u>Synodus foetens</u>	4	8	9	3	6	2	6
<u>Trichiurus lepturus</u>	3	12	-	-	9	-	7
<u>Loligo pealei</u>	-	-	3	-	5	4	8
<u>Anchoa hepsetus</u>	10	3	-	-	-	-	9
<u>Leiostomus xanthurus</u>	-	-	-	-	4	-	10
<u>Squatina dumerili</u>	-	-	-	-	-	1	11
<u>Syacium papillosum</u>	-	7	8	4	7	-	12
<u>Cynoscion nothus</u>	5	-	-	-	-	-	13
<u>Harengula jaguana</u>	7	9	-	-	-	-	14
<u>Pristipomoides aquilonaris</u>	-	-	-	-	8	3	15
<u>Lutjanus campechanus</u>	-	5	-	-	-	-	16
<u>Penaeus setiferus</u>	8	14	-	-	-	-	17
<u>Cynoscion arenarius</u>	6	-	-	-	-	-	18
<u>Lagodon rhomboides</u>	-	11	6	-	-	-	19
<u>Etrumeus teres</u>	-	-	4	-	-	-	20
<u>Balistes capricus</u>	-	-	5	-	-	-	21
<u>Penaeus aztecus</u>	11	13	-	-	-	-	22

Table 2. East Delta - dominant day time species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows	1	7	1	2	2	1	14	
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60	
<u>Stenotomus caprinus</u>	-	8	1	2	1	4	1	
<u>Chloroscombrus chrysuru</u>	9	1	-	-	-	-	2	
<u>Peprilus burti</u>	2	6	4	6	2	-	3	
<u>Micropogonais undulatus</u>	1	15	6	3	11	-	4	
<u>Trichiurus lepturus</u>	3	17	-	1	3	-	5	
<u>Doryteuthis plei</u>	-	2	-	4	9	-	6	
<u>Anchoa hepsetus</u>	7	3	-	9	-	-	7	
<u>Synodus foeten</u>	4	7	-	5	10	2	8	
<u>Harengula jaguana</u>	-	5	-	7	6	-	9	
<u>Loligo pealei</u>	-	20	2	-	5	3	10	
<u>Balistes capriscus</u>	-	4	-	-	-	-	11	
<u>Scomberomorus maculatus</u>	6	11	-	-	-	-	12	
<u>Pristipomoides aquilonaris</u>	-	-	-	10	4	1	13	
<u>Cynoscion nothus</u>	5	19	-	-	-	-	14	
<u>Trachurus lathami</u>	-	16	-	-	7	-	15	
<u>Aurelia</u>	-	10	-	8	-	-	16	
<u>Lutjanus campechanus</u>	-	9	-	-	-	-	17	
<u>Echeneis naucrates</u>	-	12	-	-	-	-	18	
<u>Opisthonema oglinum</u>	-	13	-	-	-	-	19	
<u>Rhomboplites aurorubens</u>	-	18	3	-	-	-	20	
<u>Lagodon rhomboides</u>	-	-	5	-	8	-	21	
<u>Syacium papillosum</u>	-	14	-	-	-	-	22	

Table 3. East Delta - dominant night time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows	1	9	2	2	2	1	17
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Stenotomus caprinus</u>	4	1	1	1	1	1	1
<u>Centropristis philadelphica</u> -		4	8	2	10	3	2
<u>Micropogonias undulatus</u>	-	17	3	5	5	4	3
<u>Synodus foetens</u>	3	14	4	3	6	6	4
<u>Syacium papillosum</u>	2	15	2	8	3	8	5
<u>Diplectrum bivittatum</u>	5	2	-	-	-	-	6
<u>Cynoscion arenarius</u>	-	5	-	6	-	-	7
<u>Trachypeneus sp</u>	-	3	-	-	-	-	8
<u>Mullus auratus</u>	-	-	-	-	2	-	9
<u>Prionotus roseus</u>	-	-	-	4	12	9	10
<u>Mustelus canis</u>	-	-	-	-	4	-	11
<u>Loligo pealei</u>	-	6	-	11	13	-	12
<u>Urophycis regia</u>	-	-	6	-	9	5	13
<u>Doryteuthis plei</u>	1	7	7	-	11	-	14
<u>Prionotus salmonicolor</u>	-	16	5	-	8	-	15
<u>Lepophidium graellsii</u>	-	9	-	7	-	-	16
<u>Pristipomoides aquilonaris</u>	-	-	-	-	7	2	17
<u>Penaeus aztecus</u>	-	13	-	9	14	-	18
<u>Peprilus burti</u>	-	11	-	10	-	7	19
<u>Leiostomus xanthurus</u>	-	8	-	-	15	-	20
<u>Penaeus duorarum</u>	-	10	-	-	-	-	21
<u>Callinectes similis</u>	-	12	-	12	-	-	22

Table 4. East Delta -- dominant night time species ranked by weight within depth strata, using a 65-ft. fish trawl.

<u>Number of Tows</u>	1	9	2	2	2	1	17
<u>Depth Range (fathoms)</u>	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Stenotomus caprinus</u>	3	2	1	1	1	1	1
<u>Lutjanus campechanus</u>	-	1	9	-	-	-	2
<u>Cynoscion arenarius</u>	-	5	-	2	-	-	3
<u>Peprilus burti</u>	-	7	2	7	7	7	4
<u>Trachypeneus sp</u>	-	3	-	-	-	-	5
<u>Synodus foeten</u>	4	14	8	4	4	6	6
<u>Centropristis philadelphica</u>	-	11	-	3	9	4	7
<u>Doryteuthis plei</u>	1	10	3	-	-	-	8
<u>Micropogonais undulatus</u>	-	15	-	5	3	3	9
<u>Diplectrum bivittatum</u>	-	4	-	-	-	-	10
<u>Anchoa hepsetus</u>	-	6	-	-	-	-	11
<u>Mullus auratus</u>	-	17	-	-	2	-	12
<u>Prionotus salmonicolor</u>	-	16	4	-	10	-	13
<u>Syacium papillosum</u>	-	-	5	-	6	8	14
<u>Loligo pealei</u>	-	8	-	-	8	9	15
<u>Pristipomoides aquilonaris</u>	-	-	-	-	5	2	16
<u>Harengula jaguana</u>	-	9	-	-	-	-	17
<u>Urophycis regia</u>	-	-	7	-	11	5	18
<u>Aequipecten gibbus</u>	-	-	6	-	-	-	19
<u>Decapterus punctatus</u>	2	13	-	-	-	-	20
<u>Prionotus roseus</u>	-	-	10	6	-	-	21
<u>Aluterus heudeloti</u>	-	12	-	-	-	-	22

Table 5. West Delta - dominant day time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows	12	20	5	7	5	3	52
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Peprilus burti</u>	1	3	1	2	1	1	1
<u>Stenotomus caprinus</u>	13	10	4	1	2	2	2
<u>Chloroscombrus chrysuru</u>	4	1	-	-	-	-	3
<u>Micropogonais undulatus</u>	2	15	-	14	3	8	4
<u>Loligo pealei</u>	10	4	2	3	4	7	5
<u>Synodus foeten</u>	16	9	5	5	5	4	6
<u>Trachurus latham</u>	17	5	3	13	6	3	7
<u>Aurelia</u>	6	2	15	17	13	-	8
<u>Arius felis</u>	3	-	-	-	-	-	9
<u>Trichiurus lepturus</u>	7	14	13	4	11	-	10
<u>Doryteuthis plei</u>	14	7	6	6	-	-	11
<u>Cynoscion nothus</u>	5	16	-	16	-	-	12
<u>Pristipomoides aquilonaris</u>	-	-	8	7	7	5	13
<u>Lutjanus campechanus</u>	9	12	9	-	-	-	14
<u>Amusium papyraceum</u>	-	-	7	9	9	9	15
<u>Anchoa hepsetus</u>	15	6	-	18	-	-	16
<u>Penaeus aztecus</u>	11	13	11	10	10	10	17
<u>Leiostomus xanthurus</u>	8	17	16	-	12	-	18
<u>Etrumeus teres</u>	-	8	10	15	-	-	19
<u>Carcharhinus falciformis</u>	-	-	-	8	-	-	20
<u>Callinectes similis</u>	12	11	12	11	-	-	21
<u>Upeneus parvus</u>	-	18	14	12	8	6	22

Table 6. West Delta - dominant day time species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows	9	21	8	5	4	4	51
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Chloroscombrus chrysuru</u>	1	1	-	15	-	-	1
<u>Peprilus burti</u>	2	2	1	3	1	1	2
<u>Stenotomus caprinus</u>	19	11	3	1	2	2	3
<u>Trichiurus lepturus</u>	10	9	10	2	3	5	4
<u>Loligo pealei</u>	14	4	2	4	4	6	5
<u>Micropogonais undulatus</u>	3	-	11	14	8	-	6
<u>Arius felis</u>	4	-	-	-	-	-	7
<u>Doryteuthis plei</u>	17	3	5	5	-	-	8
<u>Trachurus lathami</u>	18	5	4	6	5	3	9
<u>Opisthonema oglinum</u>	5	-	-	-	-	-	10
<u>Pogonias cromis</u>	6	-	-	-	-	-	11
<u>Cynoscion nothus</u>	7	14	-	-	10	-	12
<u>Pristipomoides aquilonaris</u>	-	-	6	9	6	4	13
<u>Leiostomus xanthurus</u>	8	-	-	-	-	-	14
<u>Synodus foetens</u>	-	15	8	7	9	7	15
<u>Cynoscion arenarius</u>	12	13	12	8	-	-	16
<u>Harengula jaguana</u>	9	12	-	-	-	-	17
<u>Balistes capriscus</u>	16	6	-	10	-	-	18
<u>Callinectes similis</u>	13	8	9	13	-	-	19
<u>Sphyræna guachancho</u>	-	7	-	11	-	-	20
<u>Aurelia</u>	11	10	-	16	11	-	21
<u>Rhizoprionodon terraenovae</u>	15	-	7	12	7	-	22

Table 7. West Delta - dominant night time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows	12	20	5	7	5	3	52
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Microgogonais undulatus</u>	1	3	16	1	10	10	1
<u>Stenotomus caprinus</u>	12	1	1	2	1	1	2
<u>Arius felis</u>	2	-	-	-	-	-	3
<u>Leiostomus xanthurus</u>	3	21	2	3	-	11	4
<u>Sicyonia brevirostris</u>	-	2	3	10	12	-	5
<u>Penaeus aztecus</u>	13	4	4	6	5	7	6
<u>Callinectes similis</u>	4	5	8	12	13	-	7
<u>Peprilus burti</u>	5	11	17	14	7	2	8
<u>Synodus foeten</u>	16	13	7	4	2	5	9
<u>Centropristis philadelphica</u>	17	16	5	5	3	8	10
<u>Squilla sp</u>	11	10	6	11	8	-	11
<u>Cynoscion arenarius</u>	6	9	14	-	11	9	12
<u>Pristipomoides aquilonaris</u>	-	20	10	9	4	3	13
<u>Aurelia</u>	10	6	18	-	-	-	14
<u>Prionotus rubio</u>	8	17	12	8	9	6	15
<u>Prionotus paralatus</u>	-	19	9	7	-	4	16
<u>Lutjanus campechanus</u>	-	7	15	-	-	-	17
<u>Cynoscion nothus</u>	7	15	-	13	-	-	18
<u>Trachypeneus sp</u>	14	14	11	-	-	-	19
<u>Chloroscombrus chrysuru</u>	9	12	-	-	-	-	20
<u>Diplectrum bivittatum</u>	-	8	-	-	-	-	21
<u>Loligo pealei</u>	15	18	13	15	6	12	22

Table 8. West Delta - dominant night species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows	9	21	8	5	4	4	51
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Micropogonais undulatus</u>	1	3	15	1	11	7	1
<u>Stenotomus caprinus</u>	12	2	1	3	1	1	2
<u>Leiostomus xanthurus</u>	4	18	2	2	10	-	3
<u>Arius felis</u>	2	-	-	-	-	-	4
<u>Brevoortia patronus</u>	3	-	-	-	-	-	5
<u>Chloroscombrus chrysuru</u>	6	1	17	-	-	-	6
<u>Peprilus burti</u>	5	6	11	12	5	2	7
<u>Cynoscion arenarius</u>	7	4	14	7	9	8	8
<u>Cynoscion nothus</u>	9	7	16	6	-	-	9
<u>Pristipomoides aquilonaris</u>	-	14	4	5	2	3	10
<u>Centropristis philadelphica</u>	16	17	3	4	4	4	11
<u>Aurelia</u>	11	8	18	-	-	11	12
<u>Loligo pealei</u>	15	15	5	10	6	5	13
<u>Carcharhinus limbatus</u>	-	5	-	-	-	-	14
<u>Penaeus aztecus</u>	13	12	6	11	8	10	15
<u>Callinectes similis</u>	10	11	10	-	-	-	16
<u>Lutjanus campechanus</u>	-	9	13	-	-	-	17
<u>Synodus foeten</u>	17	16	7	9	7	9	18
<u>Prionotus paralatus</u>	-	19	8	8	3	6	19
<u>Pogonias cromis</u>	8	-	-	-	-	-	20
<u>Trachypeneus</u>	14	10	12	14	-	-	21
<u>Sicyonia brevirostris</u>	-	13	9	13	-	-	22

Table 9. Texas Coast - dominant day time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows	9	20	7	5	4	1	46
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Doryteuthis plei</u>	4	1	1	4	1	9	1
<u>Peprilus burti</u>	2	3	4	1	7	10	2
<u>Trachurus lathami</u>	10	2	2	3	5	6	3
<u>Chloroscombrus chrysuru</u>	1	4	16	-	-	-	4
<u>Stenotomus caprinus</u>	11	5	8	2	2	1	5
<u>Micropogonais undulatus</u>	3	-	-	-	-	-	6
<u>Synodus foeten</u>	17	11	3	5	4	5	7
<u>Cynoscion nothus</u>	5	14	-	-	-	-	8
<u>Pristipomoides aquilonaris</u>	-	-	6	8	6	2	9
<u>Upeneus parvus</u>	14	12	17	12	3	3	10
<u>Rhizoprionodon terraenovae</u>	7	-	15	7	-	-	11
<u>Etrumeus teres</u>	16	6	5	13	-	-	12
<u>Penaeus aztecus</u>	12	8	10	14	11	8	13
<u>Leiostomus xanthurus</u>	6	16	-	-	-	-	14
<u>Diplectrum bivittatum</u>	18	7	7	-	-	-	15
<u>Arius felis</u>	8	-	-	-	-	-	16
<u>Serranus atrobranchus</u>	-	18	13	9	9	4	17
<u>Lagodon rhomboides</u>	13	13	9	10	8	11	18
<u>Aurelia</u>	9	15	-	-	-	-	19
<u>Loligo pealei</u>	19	10	14	11	10	-	20
<u>Cyclopsetta chittendeni</u>	-	17	11	6	-	-	21
<u>Syacium gunteri</u>	15	9	12	-	-	7	22

Table 10. Texas coast - dominant day time species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows	9	20	7	5	4	1	46
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Chloroscombrus chrysuru</u>	1	3	9	-	-	-	1
<u>Peprilus burti</u>	3	2	3	2	2	2	2
<u>Doryteuthis plei</u>	6	1	1	4	3	7	3
<u>Stenotomus caprinus</u>	18	10	8	1	1	1	4
<u>Trachurus lathami</u>	17	4	2	3	4	3	5
<u>Micropogonais undulatus</u>	2	14	12	-	-	-	6
<u>Etrumeus teres</u>	20	6	4	5	6	5	7
<u>Cynoscion nothus</u>	4	16	-	-	-	-	8
<u>Opisthonema oglinum</u>	5	12	-	-	-	-	9
<u>Rhizoprionodon terraenovae</u>	8	9	-	12	-	-	10
<u>Sphyrna tiburo</u>	9	8	-	-	-	-	11
<u>Trichiurus lepturus</u>	7	13	13	13	8	-	12
<u>Pristipomoides aquilonaris</u>	-	-	6	9	5	4	13
<u>Synodus foeten</u>	15	15	5	6	9	6	14
<u>Scomber japonicus</u>	19	7	7	10	10	-	15
<u>Mustelus norrisi</u>	-	5	10	11	-	-	16
<u>Leiostomus xanthurus</u>	10	-	-	-	-	-	17
<u>Arius felis</u>	11	-	-	-	-	-	18
<u>Lagodon rhomboides</u>	16	17	11	7	7	8	19
<u>Peprilus paru</u>	12	-	-	-	-	-	20
<u>Anchoa hepsetus</u>	13	11	-	-	-	-	21
<u>Scomberomorus maculatus</u>	14	-	-	8	-	-	22

Table 11. Texas coast - dominant night time species ranked by weight within depth strata, using a 40-ft. shrimp trawl.

Number of Tows	10	21	9	4	4	2	50
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Penaeus aztecus</u>	3	1	5	8	10	12	1
<u>Stenotomus caprinus</u>	6	2	8	3	1	3	2
<u>Micropogonais undulatus</u>	1	12	-	17	13	-	3
<u>Doryteuthis plei</u>	5	3	4	1	9	4	4
<u>Pristipomoides aquilonaris</u>	-	16	2	5	2	2	5
<u>Peprilus burti</u>	-	18	19	10	-	1	6
<u>Trachypeneus sp</u>	13	5	1	4	18	-	7
<u>Lagodon rhomboides</u>	7	15	9	14	4	6	8
<u>Synodus foeten</u>	11	13	6	2	8	10	9
<u>Callinectes similis</u>	9	4	14	18	-	-	10
<u>Trachurus lathami</u>	8	7	15	-	-	5	11
<u>Serranus atrobranchus</u>	-	19	11	6	3	9	12
<u>Portunus spinicarpus</u>	17	20	3	7	14	13	13
<u>Centropristis philadelphica</u>	16	10	10	9	7	14	14
<u>Sauilla sp</u>	12	6	12	15	17	15	15
<u>Prionotus paralatus</u>	-	-	13	11	6	8	16
<u>Sicyonia brevirostris</u>	15	9	7	12	15	16	17
<u>Lefostomus xanthurus</u>	2	-	-	-	16	-	18
<u>Upeneus parvus</u>	10	11	18	16	11	7	19
<u>Syacium gunteri</u>	18	8	17	13	12	11	20
<u>Chloroscombrus chrysuru</u>	4	14	-	-	-	-	21
<u>Lutjanus campechanus</u>	14	17	16	-	5	-	22

Table 12. Texas coast - dominant night time species ranked by weight within depth strata, using a 65-ft. fish trawl.

Number of Tows	10	21	9	4	4	2	50
Depth Range (fathoms)	5-9	10-19	20-29	30-39	40-49	50-60	5-60
<u>Micropogonais undulatus</u>	1	10	-	13	-	-	1
<u>Stenotomus caprinus</u>	15	2	5	3	1	3	2
<u>Penaeus aztecus</u>	7	1	8	11	12	9	3
<u>Chloroscombrus chrysuru</u>	2	9	-	-	-	-	4
<u>Doryteuthis plei</u>	12	4	1	1	11	7	5
<u>Pristipomoides aquilonaris</u>	-	18	2	2	2	2	6
<u>Peprilus burti</u>	9	8	14	7	8	1	7
<u>Brevoortia patronus</u>	4	3	-	-	-	-	8
<u>Cynoscion nothus</u>	3	14	16	-	-	-	9
<u>Lagodon rhomboides</u>	11	15	6	10	3	6	10
<u>Trachypeneus sp</u>	10	6	3	5	15	-	11
<u>Trachurus lathamii</u>	13	7	7	15	13	5	12
<u>Upeneus parvus</u>	-	11	13	12	5	4	13
<u>Leiostomus xanthurus</u>	5	20	12	-	-	-	14
<u>Synodus foetens</u>	16	12	4	6	9	-	15
<u>Trichiurus lepturus</u>	6	16	17	-	14	-	16
<u>Centropristis philadelphica</u>	17	13	11	9	6	8	17
<u>Mullus auratus</u>	-	21	-	14	4	11	18
<u>Callinectes similis</u>	14	5	15	16	-	-	19
<u>Opisthonema oglinum</u>	8	-	-	-	-	-	20
<u>Serranus atrobranchus</u>	-	19	10	8	7	10	21
<u>Prionotus stearnsi</u>	-	17	9	4	10	12	22