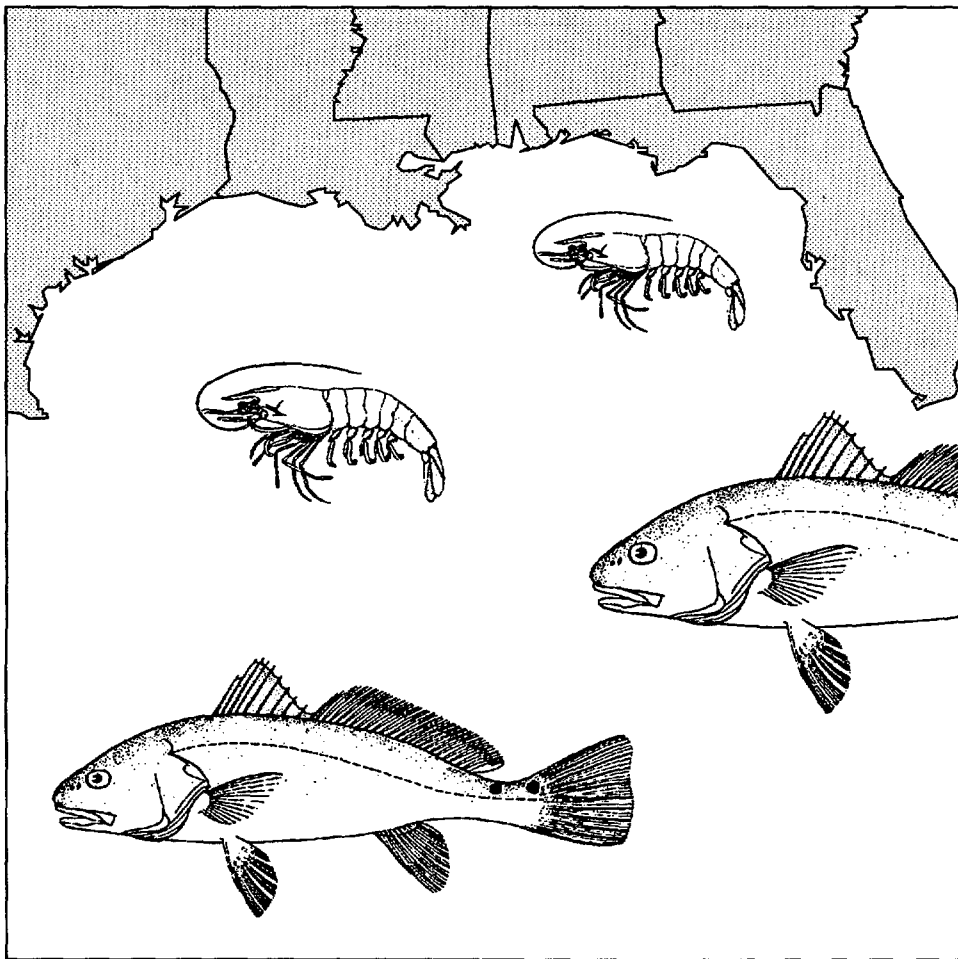


*Distribution and Abundance of Fishes and
Invertebrates in Gulf of Mexico Estuaries
Volume I: Data Summaries*



September 1992

*U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service*

NOAA's Estuarine Living Marine Resources Program

The Strategic Environmental Assessments (SEA) Division of NOAA's Office of Ocean Resources Conservation and Assessment (ORCA) was created in response to the need for comprehensive information on the effects of human activities on the Nation's coastal ocean. The SEA Division performs assessments of the estuarine and coastal environments and of the resources of the U.S. Exclusive Economic Zone (EEZ).

In June 1985, NOAA began a program to develop a comprehensive information base on the life history, relative abundance and distribution of fishes and invertebrates in estuaries throughout the Nation (Monaco 1986). The Estuarine Living Marine Resources (ELMR) program is conducted jointly by the SEA Division and laboratories of the National Marine Fisheries Service (NMFS). The Pt. Adams (Hammond), OR; Galveston, TX; and Beaufort, NC laboratories have compiled information for the contiguous West Coast, Gulf of Mexico, and Southeast regions. Data for the Northeast are being compiled by NOAA's SEA Division, NMFS (Annapolis, MD), the Virginia Institute of Marine Sciences, and the University of Massachusetts. To date, the program has compiled data for 115 species found in 83 estuaries. Six reports are now available free upon request (see below). This report, *Distribution and Abundance of Fishes and Invertebrates in Gulf of Mexico Estuaries, Volume I: Data Summaries*, revises and replaces earlier reports for Texas (Monaco et al. 1989), the Eastern Gulf of Mexico (Williams et al. 1990), and Central Gulf of Mexico (Czapla et al. 1991).

Three salinity zones as defined in Volume 1 of NOAA's *National Estuarine Inventory Data Atlas* (NOAA 1985) provided the spatial framework for organizing information on species distribution and abundance within each estuary. These salinity zones are tidal fresh (0.0 to 0.5 ppt), mixing (0.5 to 25 ppt), and seawater (>25 ppt). The primary data developed for each species include spatial distribution by salinity zone, temporal distribution by month, and relative abundance by life stage, e.g., adult, spawning, juvenile, larva, and egg. In addition, a detailed estuarine life history summary is written for each species.

Additional information on this or other programs of NOAA's Strategic Environmental Assessments Division is available from:

Strategic Environmental Assessments Division
Office of Ocean Resources Conservation and Assessment
National Oceanic and Atmospheric Administration
6001 Executive Blvd., Rm. 220
Rockville, Maryland 20852
FTS/Comm. (301) 443-0453/8921

Reports and reprints available from NOAA's Estuarine Living Marine Resources program include:

Monaco, M.E., et al. 1990. Distribution and abundance of fishes and invertebrates in west coast estuaries, Vol. I: data summaries. ELMR Rep. No. 4. Strategic Assessment Branch, NOS/NOAA, Rockville, MD. 240 p.

Bulger, A.J., et al. 1990. A proposed estuarine classification: analysis of species salinity ranges. ELMR Rep. No. 5. Strategic Assessment Branch, NOS/NOAA, Rockville, MD. 28 p.

Emmett, R.L., et al. 1991. Distribution and abundance of fishes and invertebrates in west coast estuaries, Vol. II: species life history summaries. ELMR Rep. No. 8. NOAA/NOS Strategic Environmental Assessments Division, Rockville, MD. 329 p.

Nelson, D.M., et al. 1991. Distribution and abundance of fishes and invertebrates in southeast estuaries. ELMR Rep. No. 9. NOAA/NOS Strategic Environmental Assessments Division, Rockville, MD. 177 p.

Monaco, M.E., et al. 1992. Assemblages of U.S. west coast estuaries based on the distribution of fishes. *Journal of Biogeography* 19: 251-267.

Nelson, D.M. (editor). 1992. Distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries, Vol. I: data summaries. ELMR Rep. No. 10. NOAA/NOS Strategic Environmental Assessments Division, Rockville, MD. 273 p.

Pattillo, M.E., et al. In prep. Distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries, Vol. II: species life history summaries. ELMR Rep. No. 11. NOAA/NOS Strategic Environmental Assessments Division, Rockville, MD.

*Distribution and Abundance of Fishes and
Invertebrates in Gulf of Mexico Estuaries
Volume I: Data Summaries*

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Distribution and Abundance of Fishes and Invertebrates in Gulf of Mexico Estuaries

Volume I: Data Summaries

Introduction

This report presents information on the spatial and temporal distribution, and relative abundance of 44 fish and invertebrate species in 31 estuaries along the Gulf of Mexico coast of Florida, Alabama, Mississippi, Louisiana, and Texas. Its purpose is to disseminate data developed in the National Oceanic and Atmospheric Administration's (NOAA) Estuarine Living Marine Resources (ELMR) program (see inside front cover). The ELMR program is conducted through a series of joint regional studies by the National Ocean Service (NOS) and National Marine Fisheries Service (NMFS). The presence, distribution, and relative abundance of each species and the time period it utilizes each estuary are the primary data compiled. The data and framework presented are illustrative of the nationwide ELMR program.

This report, *Volume I*, combines information presented in earlier reports for nine estuaries in Texas (Monaco et al. 1989), 13 estuaries in Florida and Alabama (Williams et al. 1990), and nine estuaries in Louisiana and Mississippi (Czapla et al. 1991). However, several species have been added, and the graphic depiction of relative abundance has been improved. *Volume II* (Pattillo et al., in prep.), to be published in 1993, will present life history summaries for 44 fish and invertebrate species, and focus on how these individual species utilize Gulf of Mexico estuaries.

The objective of the ELMR program is to develop a consistent data base on the distribution, abundance, and life history characteristics of important fishes and invertebrates in the Nation's estuaries. The Nation-wide data base is divided into four study regions (Figure 1). The data base contains the relative abundance and monthly occurrence of each species' life stage by estuary for three salinity zones (seawater, mixing, and tidal fresh) identified in NOAA's National Estuarine Inventory (NEI) Data Atlas-Volume I (NOAA 1985). When completed, the entire data base will contain information for 135 fish and invertebrate species found in 118 U.S. estuaries.

Rationale

Estuaries are among the most productive natural systems and are important nursery areas that provide food, refuge from predation, and valuable habitat for many species (Gunter 1967, Joseph 1973, Weinstein 1979, Mann 1982). Estuarine organisms that support important commercial and recreational fisheries include shrimp, crabs, and sciaenids. In spite of the well-documented importance of estuaries to fishes and invertebrates, few consistent and comprehensive data bases exist which allow examinations of the relationships between estuarine species found in or among groups of estuaries. Furthermore, much of the distribution and abundance information for estuarine-dependent species (i.e., species that require estuaries during

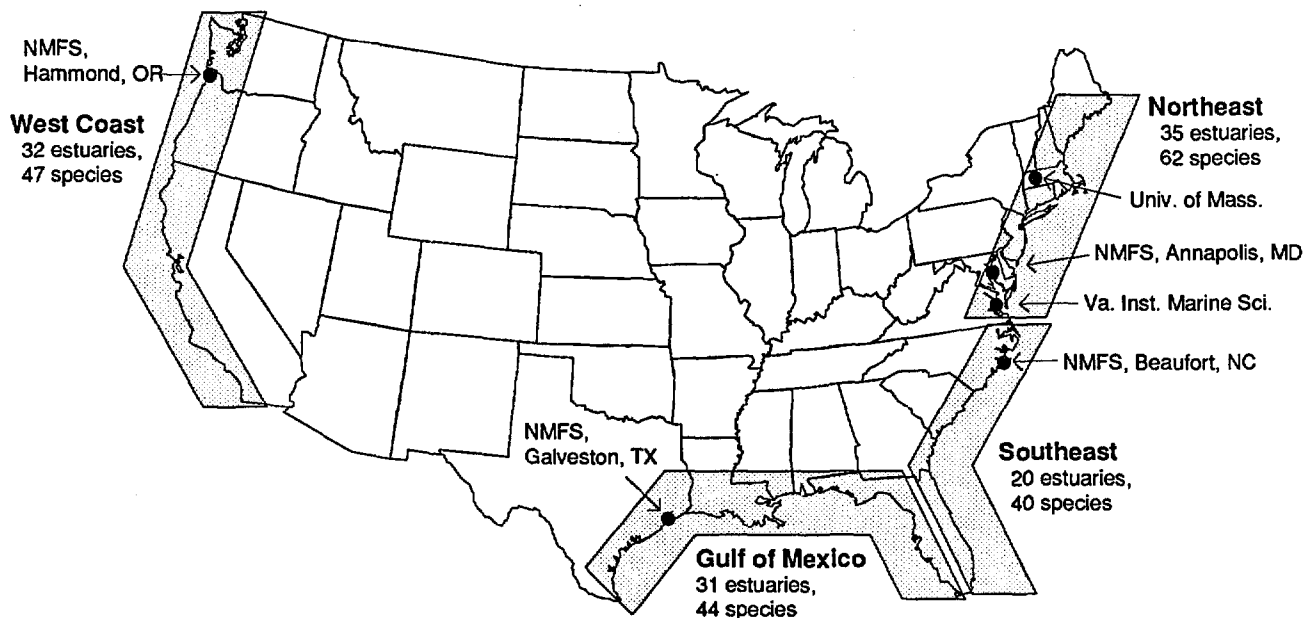


Figure 1. ELMR study regions and regional research laboratories.

their life cycle) is for offshore life stages and does not adequately describe estuarine distributions (Darnell et al. 1983, NOAA 1988).

Only a few comprehensive sampling programs (e.g., states of Louisiana and Texas) collect fishes and invertebrates with identical methods across groups of estuaries within a region (Barrett et al. 1978, Hammerschmidt and McEachron 1986). Therefore, most existing estuarine fisheries data cannot be compared among estuaries because of the variable sampling strategies. In addition, existing research programs do not focus on how groups of estuaries may be important for regional fishery management, and few compile information for species having little or no economic value.

Because life stages of many species use both estuarine and marine habitats, information on distribution, abundance, temporal utilization, and life history characteristics are needed to understand the coupling of estuarine, nearshore, and offshore habitats. To date, a national, comprehensive, and consistent data base of this type does not exist. Consequently, there is a need to develop a program that integrates fragments of information on marine and estuarine species and their associated habitats into a useful, comprehensive, and consistent format. The ELMR program was designed to help fulfill this need by developing a uniform nationwide data base on selected estuarine species. Results will complement NOAA efforts to develop a national estuarine assessment capability (NOAA 1985), identify information gaps, and assess the content and quality of existing estuarine fisheries data. In addition, the ELMR program provides the estuarine distribution data for NOAA's recently initiated East Coast of North America Strategic Assessment project (NOAA 1991).

An objective of this project is to map species distributions from the head-of-tide in estuaries to the far reaches of the continental shelf.

Data Collection and Organization

Figure 2 summarizes the major steps taken to collect and organize information on the distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries. The initial steps were selecting the estuaries and the species to be studied.

Selection of estuaries. Gulf of Mexico estuaries were selected from the National Estuarine Inventory (NEI) Data Atlas-Volume I (NOAA 1985) and NEI Supplement 3 (Shirzad et al. 1989). The 31 estuaries selected are listed in Table 1, and their locations shown in Figure 3.

Data on spatial and temporal distributions of species were developed and organized by the tidal fresh (0.0 to 0.5 parts per thousand (ppt)), mixing (0.5 to 25.0 ppt), and seawater (>25.0 ppt) zones delineated for each estuary in the NEI. Each salinity zone is represented in 17 of the Gulf of Mexico estuaries, but 14 estuaries are missing at least one zone (Table 1). A representative map and data table for Mobile Bay from the NEI Data Atlas is shown in Appendix 1.

Compiling consistent data nationwide limits the amount of information that may be compiled for each species and estuary. Also, it would be time- and cost-prohibitive to map each species by life stage for each estuary (Monaco 1986). The NOAA framework allows for a consistent compilation and organization of available information on the distribution of fishes and invertebrates in estuaries.

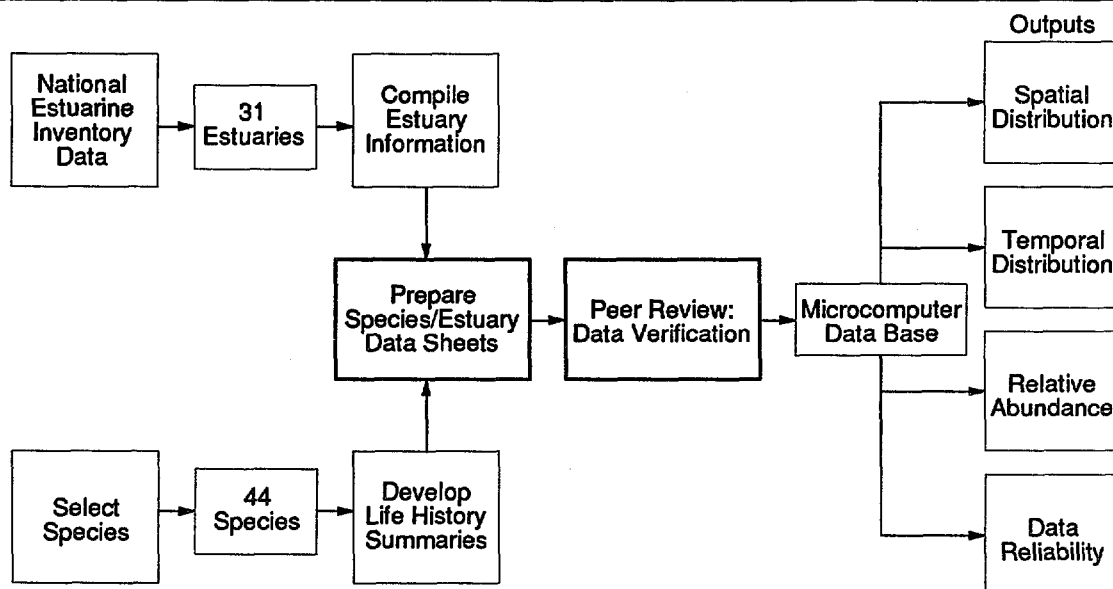


Figure 2. Major steps to complete the Gulf of Mexico ELMR study.

Table 1. ELMR Gulf of Mexico estuaries (n=31) and associated salinity zones.

Estuary, State	Zones present
Florida Bay, FL	T M S
Ten Thousand Islands, FL	T M S
Caloosahatchee River, FL	T M *
Charlotte Harbor, FL	T M S
Tampa Bay, FL	T M S
Suwannee River, FL	T M S
Apalachee Bay, FL	T M S
Apalachicola Bay, FL	T M S
St. Andrew Bay, FL	T M S
Choctawhatchee Bay, FL	T M S
Pensacola Bay, FL	T M S
Perdido Bay, FL/AL	T M S
Mobile Bay, AL	T M S
Mississippi Sound, MS/AL/LA	T M S
Lake Borgne, LA	T M *
Lake Pontchartrain, LA	* M *
Breton/Chandeleur Sounds, LA	* M S
Mississippi River, LA	T M *
Barataria Bay, LA	T M S
Terrebonne/Timbalier Bays, LA	T M S
Atchafalaya/Vermilion Bays, LA	T M *
Calcasieu Lake, LA	T M *
Sabine Lake, LA/TX	T M *
Galveston Bay, TX	T M S
Brazos River, TX	T M *
Matagorda Bay, TX	T M S
San Antonio Bay, TX	* M S
Aransas Bay, TX	* M S
Corpus Christi Bay, TX	T M S
Laguna Madre, TX	* * S
Baffin Bay, TX	* * S

T - Tidal fresh zone

M - Mixing zone

S - Seawater zone

* - salinity zone not present

Table 2. ELMR Gulf of Mexico species (n=44).

Common Name	Scientific Name
Bay scallop	<i>Argopecten irradians</i>
American oyster	<i>Crassostrea virginica</i> *
Common rangia	<i>Rangia cuneata</i> *
Hard clam	<i>Mercenaria species</i> *
Bay squid	<i>Lolliguncula brevis</i> *
Brown shrimp	<i>Penaeus aztecus</i>
Pink shrimp	<i>Penaeus duorarum</i>
White shrimp	<i>Penaeus setiferus</i>
Grass shrimp	<i>Palaemonetes pugio</i> *
Spiny lobster	<i>Panulirus argus</i> *
Blue crab	<i>Callinectes sapidus</i>
Gulf stone crab	<i>Menippe adina</i>
Stone crab	<i>Menippe mercenaria</i> *
Bull shark	<i>Carcharhinus leucas</i>
Tarpon	<i>Megalops atlanticus</i>
Alabama shad	<i>Alosa alabamiae</i>
Gulf menhaden	<i>Brevoortia patronus</i>
Yellowfin menhaden	<i>Brevoortia smithi</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Bay anchovy	<i>Anchoa mitchilli</i>
Hardhead catfish	<i>Arius felis</i>
Sheepshead minnow	<i>Cyprinodon variegatus</i>
Gulf killifish	<i>Fundulus grandis</i>
Silversides	<i>Menidia species</i> *
Snook	<i>Centropomus undecimalis</i> *
Bluefish	<i>Pomatomus saltatrix</i>
Blue runner	<i>Caranx crysos</i>
Crevalle jack	<i>Caranx hippos</i>
Florida pompano	<i>Trachinotus carolinus</i>
Gray snapper	<i>Lutjanus griseus</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Pinfish	<i>Lagodon rhomboides</i>
Silver perch	<i>Bairdiella chrysoura</i>
Sand seatrout	<i>Cynoscion arenarius</i>
Spotted seatrout	<i>Cynoscion nebulosus</i>
Spot	<i>Leiostomus xanthurus</i>
Atlantic croaker	<i>Micropogonias undulatus</i>
Black drum	<i>Pogonias cromis</i>
Red drum	<i>Sciaenops ocellatus</i>
Striped mullet	<i>Mugil cephalus</i>
Code goby	<i>Gobiosoma robustum</i>
Spanish mackerel	<i>Scomberomorus maculatus</i>
Gulf flounder	<i>Paralichthys albigutta</i>
Southern flounder	<i>Paralichthys lethostigma</i>

*See Life History Notes, pp. 8-10.

Selection of species. Four criteria were used to identify 44 species that had sufficient available information for inclusion in the ELMR data base (Table 2). The four criteria were:

1) Commercial value - determined by review of catch data and value statistics from NMFS and state agencies, e.g., Gulf menhaden (*Brevoortia patronus*) and penaeid shrimp (*Penaeus* sp.).

2) Recreational value - defined as a species that recreational fishermen specifically try to catch, that may or may not be of commercial importance. Recreational species were determined by consulting regional experts and NMFS reports, e.g., spotted seatrout (*Cynoscion nebulosus*) and red drum (*Sciaenops ocellatus*).

3) Indicator species of environmental stress - identified from the literature, discussions with fisheries experts, and from monitoring programs such as NOAA's National Status and Trends Program (O'Connor 1990). These species (e.g., American oyster, *Crassostrea virginica*, and Atlantic croaker, *Micropogonias undulatus*) are molluscs or demersal fishes that consume benthic invertebrates or have a strong association with bottom sediments. Their physiological disorders, morphological abnormalities, and bioaccumulation of contaminants, such as heavy metals, indicate episodes of environmental pollution and/or stress.

4) Ecological value - based on several attributes, including trophic level, relative abundance and importance as a key predator or prey species, e.g., bay anchovy, *Anchoa mitchilli*.

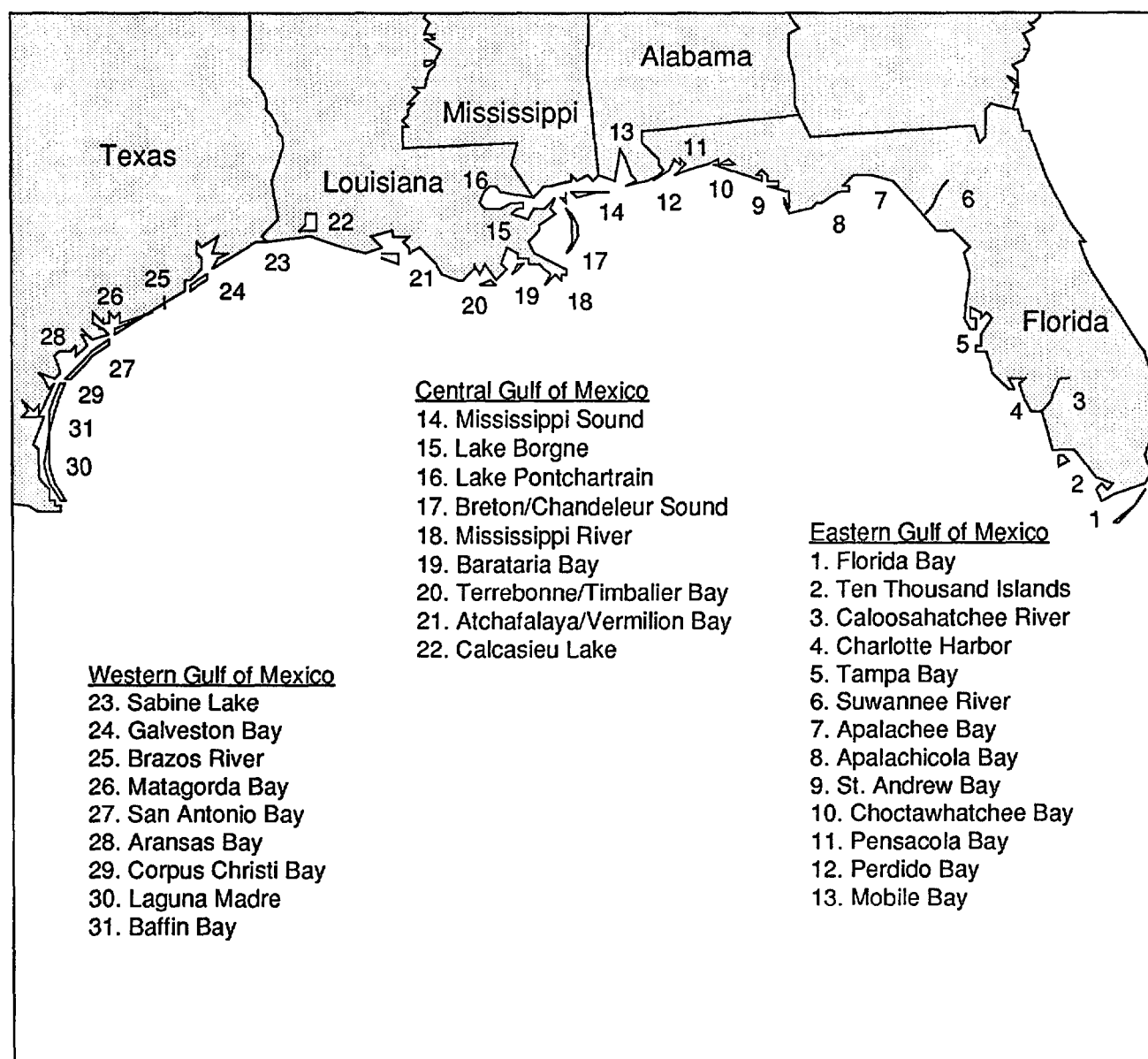


Figure 3. ELMR Gulf of Mexico estuaries.

Data sheets. A data sheet was developed for each species in each estuary to enable quick data compilation and presentation. Figure 4 depicts the data sheet for spotted seatrout (*Cynoscion nebulosus*) in Mobile Bay. Data sheets were developed by project staff and reviewed by local experts. Data compiled for each species/life stage included: 1) the salinity zone it occupies (seawater, mixing, tidal fresh), 2) its monthly distribution in those zones, and 3) its relative abundance in the zones. The ELMR data sheets were entered into a microcomputer data base management system.

The relative abundance of a species was classified using the following categories:

- Not present: species or life history stage not found, questionable data as to identification of species, and/or recent loss of habitat or environmental degradation suggests absence.

- No information available: no existing data available, and after expert review it was determined that not even an educated guess would be appropriate.

- Rare: species is definitely present but not frequently encountered.

- Common: species is frequently encountered but not in large numbers; does not imply a uniform distribution over a specific salinity zone.

- Abundant: species is often encountered in substantial numbers relative to other species.

- Highly abundant: species is numerically dominant relative to other species.

Adults were defined as reproductively mature individuals, juveniles as immature but otherwise similar to adults, and spawning adults as those releasing eggs and sperm. There were a few exceptions to these defined life stages, such as mating in crabs.

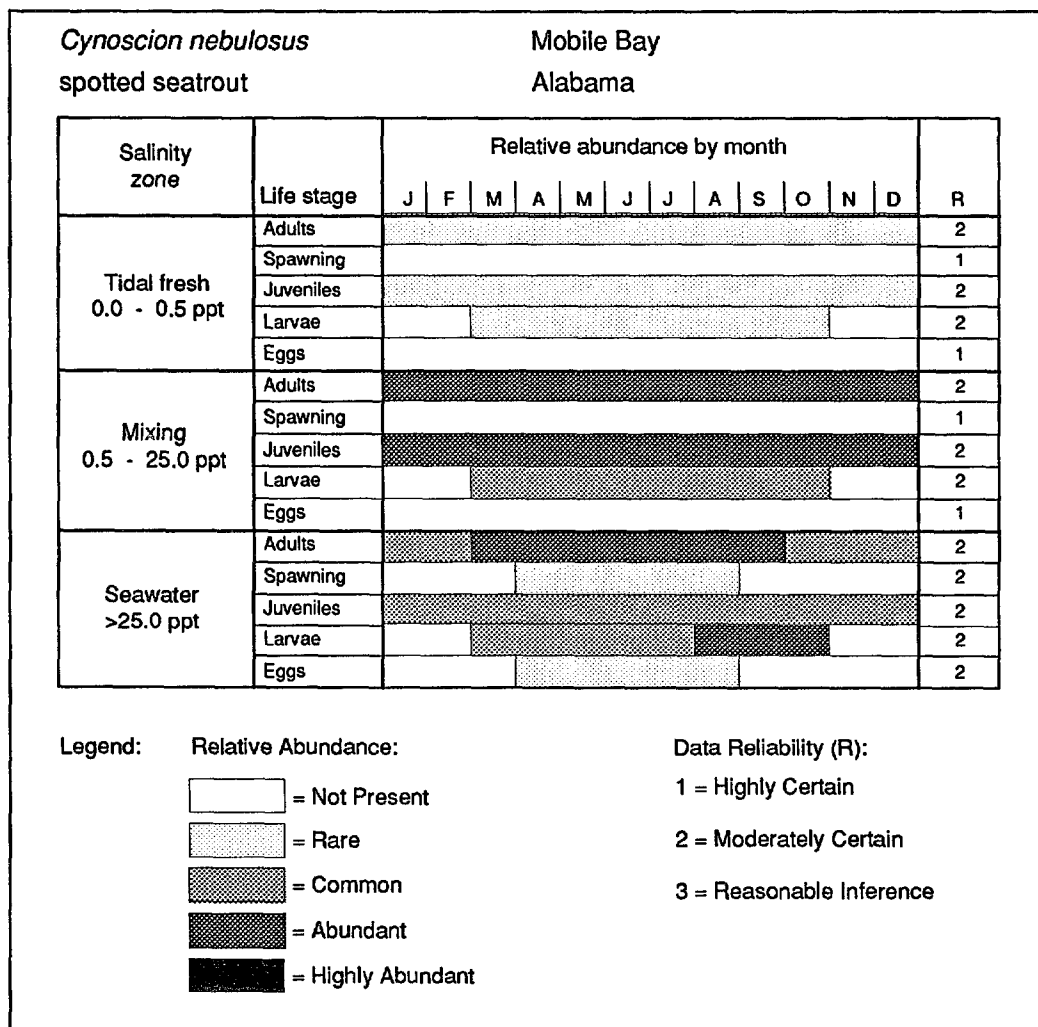


Figure 4. Example of a species/estuary data sheet: spotted seatrout in Mobile Bay.

For well-studied species such as penaeid shrimp, quantitative data were used to estimate abundance levels. For many species, however, reliable quantitative data were limited. Therefore, regional and local experts were consulted to estimate relative abundances based on the above criteria. Several reference or "guide" species with abundance levels corresponding to the above criteria were identified for each estuary. These guide species typified fishes and invertebrates belonging to a particular life mode (e.g., pelagic, demersal) or occupying similar habitats. Once guide species were selected, other species were then placed into the appropriate abundance categories relative to them. These data represent relative abundance levels within a specific estuary only; relative abundance levels across Gulf of Mexico estuaries could not be determined.

The final level of abundance assigned to a species was determined by asking regional and local biologists for expert opinions based on their knowledge of individual species within an estuary. This effort complemented quantitative studies, the ELMR relative abundance categories, and greatly increased reliability of abundance information. The quality of relative abundance information varied between estuaries as well as species. As a result, temporal resolution was greater in well-studied estuaries. Nevertheless, the relative abundance data shown in the data summaries are the best that could be synthesized from agency reports, academic studies, and expert reviews.

Data verification. Approximately two years were required to develop the 1,364 data sheets (Figure 4) and consult with regional and local experts for the 31 estuaries studied. Nearly all of the data sheets were carefully reviewed during consultations or by mail. These consultations complemented the literature and published data sets compiled by NOAA. Ninety-four scientists and managers at 44 institutions were consulted. Local experts were especially helpful in providing estuary/species-specific information. They also provided additional references and contacts, and identified additional species to be included in the ELMR data base. The names and affiliations of these experts are listed in Appendix 3.

Results

Presence/absence. Table 3 (pp. 16-17) was developed to readily convey the occurrence of each of the 44 ELMR species in each of the 31 Gulf of Mexico estuaries. The highest level of abundance during the year for the adult or juvenile life stages is depicted. The spawning, egg, and larval categories are not considered. This table suggests the zoogeographic distribution of species between Gulf of Mexico estuaries.

Data summary tables. The information compiled for each species and estuary (1,364 data sheets) was organized in three data summaries (pp. 19-191). Tables 4 and 5 provide graphic presentations of the spatial and temporal distribution and relative abundance by life stage for each species and estuary. The information shown represents the usual spatial and temporal distribution of a species in a particular estuary. Table 6 ranks the relative reliability of the information presented for each species and estuary.

Spatial distribution and relative abundance. Table 4 (pp. 19-59) summarizes the distribution and relative abundance for each species by life stage, in each estuary by salinity zone. The highest level of abundance during the year in each estuary is depicted.

Temporal distribution. Table 5 (pp. 61-149) summarizes the temporal distribution of each species by month and life stage for each estuary. This table combines data over the three salinity zones, showing the highest level of abundance for a particular life stage by month.

Data Content and Quality

An important aspect of the ELMR program, especially since it is based primarily on published and unpublished literature and consultations, is to determine the quality of available data. For many species, gear selectivity, difficulty in identifying larvae, and difficulty in sampling various habitats has limited the amount of reliable information. Therefore, a deliberate effort was made to assess the overall reliability of the data base so that it could be used appropriately.

Estimates of the reliability of the distribution and abundance information organized by species, life stage, and estuary are presented in Table 6 (pp. 151-190) of the *Data Summary Tables* section. Data reliability was classified using the following categories:

- Highly certain: Considerable sampling data available. Distribution, behavior, and preferred habitats well documented within an estuary.
- Moderately certain: Some sampling data available for an estuary. Distribution, preferred habitat, and behavior well documented in similar estuaries.
- Reasonable inference: Little or no sampling data available. Information on distributions, ecology, and preferred habitats documented in similar estuaries.

The quality and quantity of available data vary by species, life stage, and estuary. For example, a large amount of information is available on the blue crab

because it is highly valued both commercially and recreationally. The least amount of information available and poorest quality of data occur for the spawning, egg, and larval life stages. Except for a few species (e.g., blue crab), very little data has been generated on specific habitat preferences and *in situ* environmental ranges. This is particularly true for the smaller forage and/or non-commercial fishes and invertebrates. Gear selectivity, inability to correctly identify larval stages, and difficulty of sampling various habitats limits the development and reliability of this information. In addition, life history data are lacking on some of the commercially important sciaenid and pelagic species.

Data reliability was also based on experimental design and whether the studies were relatively recent. In the case of limited studies, information was occasionally inferred. An opportunity exists to refine the data presented based on additional reviews.

Given that the amount and quality of available information vary by species, by life stage, between estuaries, and even within an estuary, considerable scientific judgment is required to derive or infer spatial and temporal distributions from existing data and available literature. Unfortunately, even the most informed judgment is far from perfect due to the complexity of estuarine systems. Consequently, information on the level of certainty associated with each data element must be presented when synthesizing multiple data sets (Table 6). Appendices 2, 3, and 4 provide a complete summary of the personal communications and primary references used so that readers can track and obtain additional information efficiently.

Analysis of data content and quality. To assess the overall certainty of the ELMR Gulf of Mexico data, mean data reliability was calculated by estuary, salinity zone, species, and life stage. In this analysis, "highly certain" = 3, "moderately certain" = 2, and "reasonable inference" = 1. Mean data reliability was calculated using values for only those species and life stages known to occur within an estuary, i.e., those with a relative abundance of at least "rare" during some part of the year. This was because species and life stages known to be absent were typically scored as highly certain.

This analysis identified estuaries, species, and life stages that have the most reliable information, and those with the least. This information suggests species, life stages, and estuaries that could be the focus of research efforts. Future research should include a comprehensive and consistent sampling program to quantify species distributions and abundances within and across estuaries. In addition, life history requirements need to be determined, especially for those

species that may not have economic value, but are ecologically important.

Mean data reliability of fish and invertebrate data ranged from a high of 2.08 for Florida Bay to a low of 1.00 for Brazos River, with an overall average of 1.86 (Figure 5). In general, the reliability scores reflect the amount of fisheries research that has been conducted within an estuary. Reliability scores were especially high for Florida Bay, Tampa Bay, Barataria Bay, and Galveston Bay, all of which are fairly large coastal embayments. They were especially low for the Suwannee and Brazos Rivers, both of which are fairly small tidal rivers.

When averaged across estuaries and analyzed by salinity zone, data reliability scores were lower in the tidal fresh zone than in the mixing and seawater zones (Figure 6). This may occur because the selected species are primarily estuarine, not freshwater, and may also be indicative of fewer studies of tidal fresh waters.

When averaged across estuaries and analyzed by species, mean data reliability scores ranged from a high of 2.49 for brown shrimp to a low of 1.46 for gulf stone crab (Figure 7). Of the invertebrate species, reliability scores were highest for penaeid shrimp and blue crab. They were fairly low for gulf stone crab, spiny lobster, bay squid, and hard clam. Of the fish species, reliability scores were fairly high for gulf and yellowfin menhaden, bay anchovy, pinfish, spotted seatrout, and Atlantic croaker. They were fairly low for bull shark, sheepshead minnow, silversides, and code goby. In general, the reliability scores reflect the amount of fisheries research directed towards different species. Reliabilities were especially high for species with high commercial value (e.g., penaeid shrimp, menhaden), recreational value (e.g., spotted seatrout), or ecological value (e.g., bay anchovy). Reliabilities tended to be lower for species with low commercial and recreational value (e.g., bay squid, silversides, sheepshead minnow, code goby), even though these species are ecologically important and fairly abundant. Low data reliability scores for gulf stone crab may also be because of its relatively recent recognition as a separate species (Williams and Felder 1986).

When analyzed by life stage, data for juvenile and adult life stages were most reliable, while data for spawning, larvae, and eggs were less certain (Figure 8). This reflects the number of research studies that have focused on adult and juvenile life stages. Species-specific studies of spawning, eggs, and larvae have not been conducted in most estuaries. Thus, some of the information for these life stages was inferred from life history studies and data from similar estuaries.

Variability in space and time. Species data were organized according to the salinity zone boundaries developed for each estuary in the NEI data atlas-Volume 1 (NOAA 1985). However, division of an estuary on the basis of salinity is highly variable due to the many interacting factors that affect salinity, such as variations in freshwater inflow, wind, and tides. To compile information on species distribution according to these zones, it is assumed that if a particular salinity zone expands or contracts, the distribution of a mobile species in that zone will correspond to the shift. For example, if increased freshwater inflow shifts the tidal fresh zone further down the estuary, the distribution of a species confined to that zone increases to include the new area. If a species exhibits a wide range of salinity tolerance, a shift may or may not occur. The placement of species in a salinity zone was ultimately determined by where they have been observed or captured.

Species temporal distributions are often dependent on annual climatic conditions and water currents. Monthly distributional patterns were derived based on the consistent presence of a life stage within a particular month. If a species is only present in an estuary in unusual years (e.g., drought), this was not portrayed as part of that species' spatial or temporal distribution. However, if a species usually occurs, even during a restricted time period, it was considered present for the specific month(s). Greater temporal resolution, such as on a biweekly rather than on a monthly basis, was not possible.

Life history notes. Because of the complex life histories of some species, the following comments are provided below to clarify and supplement information presented in the data summary tables.

Invertebrates. Sessile invertebrates, such as clams and oysters, usually have a patchy rather than a uniform distribution. Therefore, the ELMR framework may overestimate the areal distribution of these organisms, but identify the salinity zones of colonization. Specific areas may contain acceptable salinity regimes, but suitable bottom habitat for colonization may not exist. Specific habitat requirements and life history characteristics of a number of invertebrate species are provided below:

- Bay scallop: Usually associated with seagrass beds and salinities greater than 25 ppt.
- American oyster: Also known as eastern oyster (Turgeon et al. 1988). Prefers hard substrate in intertidal and subtidal estuarine waters.
- Common rangia: Also known as Atlantic rangia (Turgeon et al. 1988). All life stages occur in salinities below 25 ppt. Not common in the south Florida and south Texas estuaries, which have relatively high salinities.
- Hard clam: Also known as quahog (Turgeon et al. 1988). Most life stages occur in salinities above 20 ppt. Two species occur in the Gulf of Mexico, and hybridization may occur. The northern quahog (*Mercenaria mercenaria*) is generally found in intertidal and subtidal waters to 15 m, and the southern quahog (*Mercenaria campechiensis*) in deeper, more saline waters. The two species are considered together in this report because most fisheries data do not distinguish between them.
- Baysquid: Also known as Atlantic brief squid (Turgeon et al. 1988). The lower lethal salinity limit is approximately 17 ppt, and bay squid actively avoid salinities that are lower than this. Therefore, the distribution of juveniles and adults will only be from the lower mixing zone to the seawater zone, and out to the nearshore waters of the Gulf of Mexico.
- Penaeid shrimp: Postlarvae and juveniles are the main life stages utilizing the estuaries. Adults generally move to nearshore spawning grounds, where spawning, egg development, and most of the larval development occur. Brown and white shrimp are generally more abundant in the central and western Gulf of Mexico, whereas pink shrimp are generally more abundant in the eastern Gulf of Mexico.
- Grass shrimp: Also known as daggerblade grass shrimp (Williams et al. 1989). Most abundant in vegetated or oyster reef habitat. Fertilized eggs are held on the female's pleopods until hatching. In higher salinities, *Palaemonetes pugio* is often replaced by brackish grass shrimp (*P. intermedius*) and/or marsh grass shrimp (*P. vulgaris*).
- Spiny lobster: Also known as Caribbean spiny lobster (Williams et al. 1989). Found in the Gulf of Mexico estuaries of southern Florida and southern Texas. Juveniles do not mature into adults until 6-8 years of age. Life stages considered in this report are adults, mating (instead of spawning), juveniles, larvae, and eggs.
- Blue crab: Mating usually takes place in the low salinities of the tidal fresh to the upper region of the mixing zone. After mating, females move to the seawater zone, while males often remain in the upper reaches of the estuary. Females brood the eggs (sponge females), and larvae are released in higher salinities. Development through the late zoeal stages occurs offshore. Megalopae are transported back into the estuary and disperse throughout the salinity zones. As

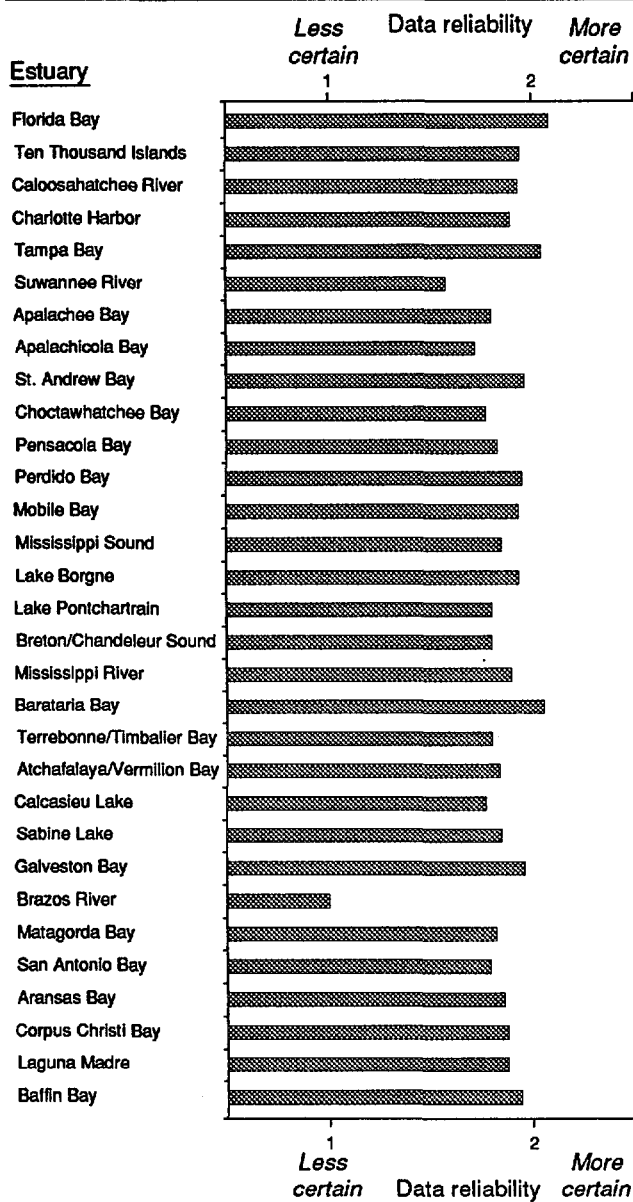


Figure 5. Mean data reliability by estuary.

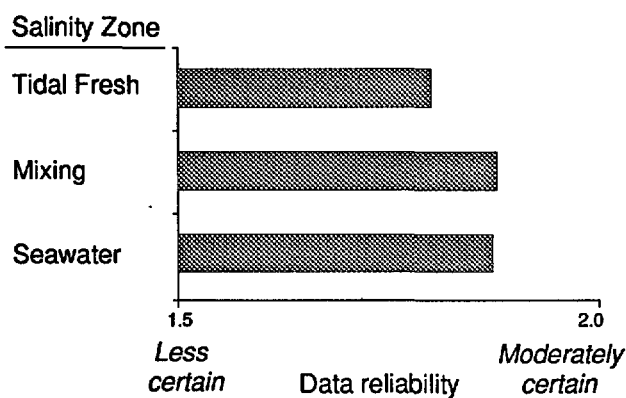


Figure 6. Mean data reliability by salinity zone.

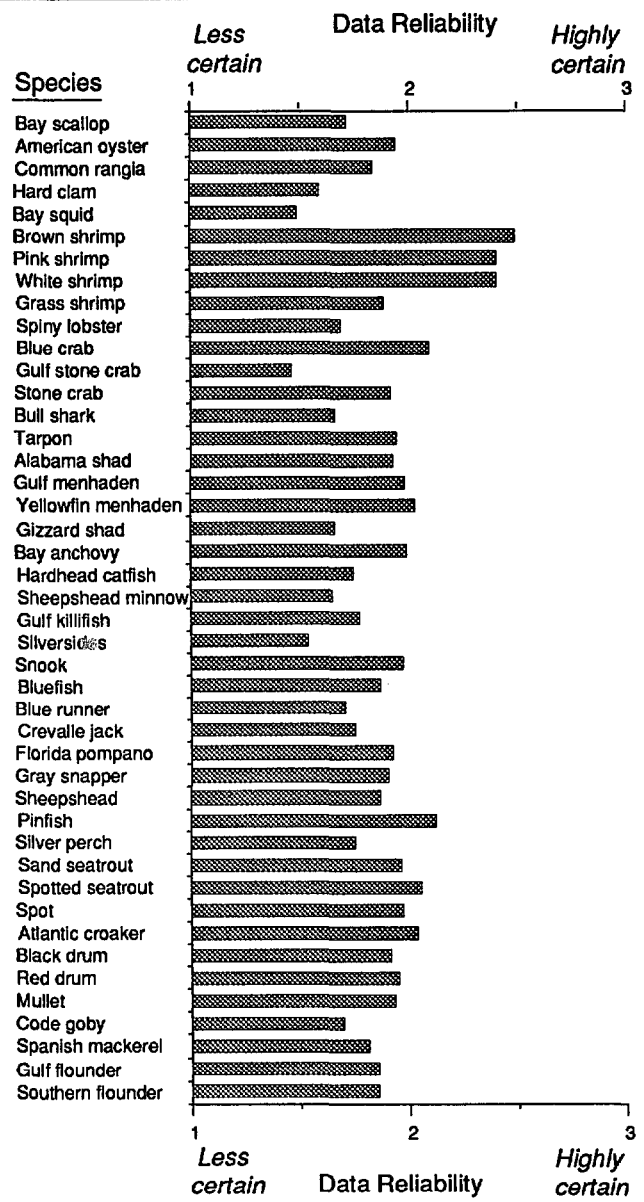


Figure 7. Mean data reliability by species.

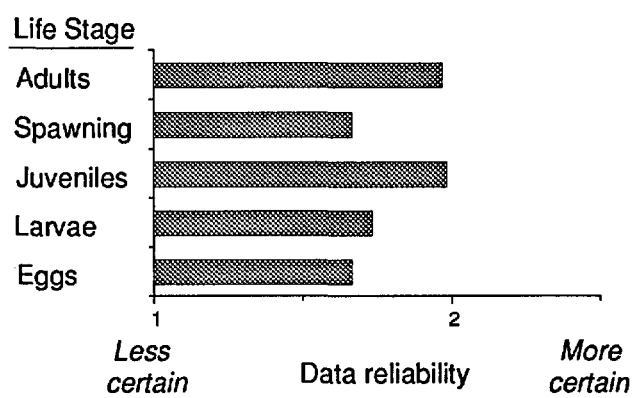


Figure 8. Mean data reliability by life stage.

they approach maturity, blue crabs seek lower salinities. Life stages considered in this report are adults, mating (instead of spawning), juveniles, larvae, and eggs.

- **Stone crabs:** Usually found in salinities greater than 20 ppt. Males are typically in nearshore waters, but migrate into the estuaries for mating. Life stages considered in this report are adults, mating, juveniles, larvae, and eggs. Williams and Felder (1986) have distinguished two separate species in the Gulf of Mexico. The stone crab (*Menippe mercenaria*) occurs from Florida Bay to Apalachicola Bay, and the Gulf stone crab (*M. adina*) is found from Suwannee River to the Yucatan peninsula. *M. mercenaria* is also known as Florida stone crab (Williams et al. 1989).

Fishes. Aggregating species by salinity zone uses a single fundamental habitat parameter. However, a combination of habitat characteristics, such as bottom type, water temperature, and bathymetry, would more accurately indicate species' spatial and temporal distributions. Specific habitat requirements and life history characteristics of a number of fishes are presented here:

- **Bull shark:** Development of eggs and larvae are internal, and parturition results in pups of juvenile size (75 cm TL). Therefore, only juveniles and adults are found in the estuaries. Fishing gear usually limits the ability to take large sharks. Based on the sizes of sharks captured, it may be inferred that parturition is occurring within the estuaries. Life stages considered in this report are adults, mating, juveniles, and parturition.

- **Tarpon:** Spawning, egg, and larval stages occur well off shore. Juveniles use the estuaries as a nursery ground, often seeking waters of low dissolved oxygen and low salinity.

- **Alabama shad:** Not found west of the Barataria Bay barrier islands in Louisiana, nor in south Florida.

- **Menhaden:** Juveniles are the predominant life stage utilizing the estuaries. Spawning generally occurs from the coastline to six miles offshore. Gulf menhaden (*Brevoortia patronus*) are generally not common south of Tampa Bay, and yellowfin menhaden (*Brevoortia smithi*) are generally not common north and west of Tampa Bay. The two species may hybridize where their ranges overlap.

- **Gizzard shad:** Large juveniles and adults are found in estuaries, but adults must return to freshwater to spawn. In large rivers there is an upstream migration or "spring run." Juveniles that are washed into bays

with floods can mature to adulthood, but their upstream migration may be impeded by dams, weirs, and other waterway restrictions. Not common in south Florida estuaries.

- **Bay anchovy:** All life stages occur in estuaries, although adults may move offshore. This is a key forage species that is one of the most abundant fishes in Gulf of Mexico estuarine waters.

- **Hardhead catfish:** Eggs and larvae are brooded in the mouths of adult males; therefore, their distribution is determined by the adult population.

- **Sheepshead minnow:** The entire life cycle is completed within the estuary, and all life stages are euryhaline and eurythermal. This species tends to prefer open bottom to heavily vegetated areas.

- **Gulf killifish:** All life stages are estuarine, euryhaline, and eurythermal. This species occurs in shallow estuarine waters, including mangrove and flooded marsh habitat.

- **Silversides:** Two species commonly occur in Gulf of Mexico estuaries: the tidewater silverside, *Menidia peninsulae*, and inland silverside, *M. beryllina* (Chernoff et al. 1981, Robins et al. 1991). The two were formerly considered to be a single species (Robins et al. 1980). Although they do occur together and occasionally hybridize, the tidewater silverside is generally found in moderate to high salinity estuarine waters, and the inland silverside in low salinity estuarine waters and inland freshwater (Johnson 1975). These species are considered together in this report because most fisheries data do not distinguish between them. All life stages are estuarine, euryhaline, and eurythermal. Adults and juveniles form schools, primarily in shallow waters near the surface, and are often abundant.

- **Snook:** Also known as common snook (Robins et al. 1991). The snook is most common in the southern Florida estuaries, but also occurs in Texas. Adults and juveniles are euryhaline, but are quite sensitive to cold temperatures.

- **Bluefish:** Spawning, egg and larval development occur offshore. Juveniles and adults are the principal life stages found in estuaries. The bluefish is a primarily visual predator, and often schools. In the Gulf of Mexico, they are generally most common from Mississippi Sound eastward.

- **Blue runner and crevalle jack:** Juveniles and adults enter estuaries, but other life stages are usually offshore.

- **Florida pompano:** Typically found in nearshore surf and inlet waters, but juveniles and adults do enter the bays. Spawning, eggs, and larvae are typically offshore.

- **Gray snapper:** Juveniles are typically associated with vegetation in estuaries, particularly seagrass beds and mangroves. Adults, spawning, eggs, and larvae are usually offshore.

- **Sheepshead:** Spawning occurs in nearshore and inlet waters. Larvae are transported towards the estuaries, but typically enter as juveniles.

- **Pinfish:** Juveniles are the predominant life stage within estuaries. Adults, spawning and eggs are typically offshore. Larvae are transported to inlets, but usually attain juvenile size before they enter bays. Subadults and adults may remain in some bays before migrating offshore for spawning.

- **Sciaenids:** Most sciaenids move to nearshore or offshore waters for spawning, although some may spawn in passes. Larvae may be transported toward estuaries, but typically attain juvenile size before they enter. Juveniles develop in the nursery habitats of the bays, then migrate out as subadults. Since some of these species have rather long life spans, several years may be spent in the estuaries as juveniles. As temperatures drop in the winter, they move into deeper waters.

- **Striped mullet:** Estuarine habitat is primarily used by juveniles and adults. They spawn offshore or near passes, and larvae move inshore and into estuaries.

- **Code goby:** This species is usually associated with seagrasses and higher salinities.

- **Spanish mackerel:** Juveniles and adults enter estuaries, but other life stages are pelagic and primarily offshore.

- **Flounders:** Spawning, eggs, and larvae are in nearshore waters. Juveniles and larvae migrate into bays for growth and development. Juveniles and adults migrate according to temperature, creating "fall runs" to the offshore waters. Gulf flounder (*Paralichthys albigutta*) appear to be more restricted in their ascent into fresher water, typically remaining in salinities greater than 20 ppt, whereas southern flounder (*P. lethostigma*) often occur in tidal fresh water. Gulf flounder are most common from Mississippi Sound eastward to Florida, whereas southern flounder occur primarily from the Florida panhandle westward to Texas.

Life history summaries. The life history notes above assist in interpreting the data summary tables. However, because of the complex life histories of estuarine-dependent species, a concise life history summary was written for each species. Each summary provides an overview of how and when a species uses estuaries and what specific habitats it uses. The 44 life history summaries will be published as *Volume II of Distribution and Abundance of Fishes and Invertebrates in Gulf of Mexico Estuaries* (Pattillo et al., in prep.). They emphasize species-specific life history characteristics that relate directly to estuarine spatial and temporal distribution and abundance. Information for the species life history summaries was gathered primarily from published and unpublished literature, and individuals with species-specific knowledge were consulted. Examples of draft summaries for three Gulf of Mexico species are included in Monaco et al. (1989).

Life history tables. While the species life history summaries provide concise accounts of important life history attributes, they do not permit a direct and simple assessment of characteristics that a species shares with others. Furthermore, many life history attributes are categorical and more readily conveyed in a tabular rather than a textual format. Therefore, information from the species life history summaries has been augmented with additional physical and biological parameters and condensed into three life history tables. Major table headings are: Habitat Associations, Biological Attributes, and Reproduction. These tables present life history characteristics for each species along with behavioral traits and preferred habitats. They reflect the most current information about a species as compiled from published and unpublished literature, and can be used to quickly identify species with similar characteristics. The life history tables will be presented along with the summaries in *Volume II* (Pattillo et al., in prep.).

Use of ELMR Data

Classifying and comparing estuaries. Although the qualitative nature of the distribution data precludes statistical comparisons of species abundances among estuaries, comparisons can be made using data on the presence/absence of species in salinity zones. This information, combined with the spatial and temporal distribution data, is the strength of the data base. Estuaries can be loosely categorized by their physical and chemical characteristics and their associated species assemblages (Monaco et al. 1992). The relative importance of individual estuaries to specific species may also be determined.

The species found in an estuary are sensitive indicators of both the mean and extreme environmental

conditions within that estuary. Estuaries can be classified by the number of species present and by whether the fauna are primarily marine, estuarine, or freshwater. Species assemblages may correlate with physical characteristics, such as bottom substrate, vegetation, and areal and temporal characteristics of salinity zones. The information on species presence/absence or other attributes can be used to determine the faunal similarities and differences among estuaries.

A comparison of estuaries and associated species can identify differing factors among those estuaries that might account for shifts in species distribution and relative abundance, helping to define ecological variables controlling species distributions. For example, a species may show differing salinity tolerances among estuaries, suggesting that some other factor, such as temperature, competition, or predation may be regulating its distribution.

Linkages to marine ecosystems. Estuaries are home to many aquatic species year-round, however, a large number of species only use estuaries for specific parts of their life histories and spend the rest offshore. Most of these latter species fall into four general categories: 1) diadromous species, which use estuaries as migration corridors and, in some instances, nursery areas; 2) species that use estuaries for spawning, often at specific salinities; 3) species that spawn in marine waters near the mouths of estuaries and depend on tidal- and wind-driven currents to carry eggs, larvae, or early juveniles into estuarine nursery areas; and 4) species that enter estuaries during certain times of year to feed on abundant prey. The importance of an estuary can be assessed by the intensity with which species use estuarine habitats. Importance can be estimated both by the number of species present as well as the density of specific life stages in estuaries relative to offshore habitats. These data may assist in identifying adverse effects of estuarine degradation on offshore populations.

East Coast Strategic Assessment. Development of a capability to define and interpret the effects of anthropogenic and natural phenomena on living marine resources will be a component of the Strategic Environmental Assessments Division's *East Coast of North America Strategic Assessment Project* begun in FY 92 (NOAA 1991). This project will characterize the biological, physical, chemical, and economic characteristics of the east coast of North America to address multiple resource use conflicts. The data compiled for the ELMR southeast and northeast study regions will be major components of this project. The new initiative will include electronic mapping of the distribution and relative abundance of living marine resources. The study area begins at the head-of-tide in estuaries and

encompasses the continental shelf as defined by the 200-m isobath. Beyond the shelf, the study area contains epipelagic waters. The areal coverage will extend from the Straits of Belle Isle, Newfoundland, to Tampa Bay, Florida. The ELMR distribution and abundance data will be the primary source of fish and invertebrate information for east coast estuaries. These data will be integrated with the coastal and offshore living resource information to develop a consistent data base on species found from the head-of-tide to past the continental shelf. This will enhance NOAA's capability to define and understand the coupling of estuarine and marine habitats based on species' spatial and temporal distributions and life history characteristics.

Additional data sets developed or under development (e.g., National Status and Trends, O'Connor 1990) in NOAA programs will enable regional environmental assessments of anthropogenic effects on living marine resources. The integration of biological and physical data will significantly improve our ability to identify and define the biological linkages and physical interchanges between estuarine and shelf habitats. As it becomes apparent that the cumulative effects of small alterations in many estuaries have a total systemic impact on coastal ocean resources, it is more important than ever to compile consistent information on the Nation's estuarine fishes and invertebrates. Although the knowledge available to effectively conserve and manage living resources is limited, the ELMR data base provides an important tool for assessing the status of estuarine fauna and examining their relationships with other species and their environment. The ELMR data base provides baseline information on the zoogeography and ecology of estuarine fishes and invertebrates, and identifies gaps in our knowledge of these resources. When combined with data sets under development in the *East Coast of North America Strategic Assessment Project*, our ability to conduct interdisciplinary assessments that identify strategies to balance resource development and conservation efforts will be significantly enhanced.

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Literature Cited

- Barrett, B.B., J.L. Merrell, T.P. Morrison, M.C. Gillespie, E.J. Ralph and J.F. Burdon. 1978. A study of Louisiana's major estuaries and adjacent offshore waters. Louis. Dept. Wildl. Fish. New Orleans, LA. 197 p.
- Chernoff, B., J.V. Conner, and C.F. Bryan. 1981. Systematics of the *Menidia beryllina* complex from the Gulf of Mexico and its tributaries. *Copeia* 1981(2):319-336.
- Czapla, T.E., M.E. Pattillo, D.M. Nelson, and M.E. Monaco. 1991. Distribution and abundance of fishes and invertebrates in central Gulf of Mexico estuaries. ELMR Rep. No. 7. NOAA/NOS Strategic Environmental Assessments Division. Rockville, MD. 82 p.
- Darnell, R.M., R.E. Defenbaugh, and D. Moore. 1983. Northwestern Gulf shelf bio-atlas. Open File Rep. No. 82-04. Minerals Management Service, Gulf of Mexico OCS Regional Office. Metairie, LA. 438 p.
- Gunter, G. 1967. Some relationships of estuaries to the fisheries of the Gulf of Mexico. In G.H. Lauff (ed.), *Estuaries*, pp. 621-638. Amer. Assoc. Adv. Sci. Spec. Publ. No. 83. Washington, DC. 757 p.
- Hammerschmidt, P.C., and L.W. McEachron. 1986. Trends in relative abundance of selected shellfishes along the Texas coast: January 1977 - March 1986. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgmt. Data Ser., No. 108: 149 p.
- Johnson, M.S. 1975. Biochemical systematics of the Atherinid genus *Menidia*. *Copeia* 1975(4): 662-691.
- Joseph, E.B. 1973. Analysis of a nursery ground. In A.L. Pacheco (ed.), *Proceedings of a Workshop on Egg, Larval, and Juvenile Stages of Fish in Atlantic Coast Estuaries*. NOAA/NMFS Middle Atlantic Coastal Fisheries Center, Tech. Pub. No. 1, pp. 118-121.
- Mann, K.H. 1982. *Ecology of coastal waters*. Univ. of California Press. Los Angeles, CA. 322 p.
- Monaco, M.E. 1986. National Estuarine Inventory: Living marine resources component, preliminary West Coast study. ELMR Rep. No. 1. Ocean Assessments Division, NOS/NOAA. Rockville, MD. 33 p.
- Monaco, M.E., T.E. Czapla, D.M. Nelson, and M.E. Pattillo. 1989. Distribution and abundance of fishes and invertebrates in Texas estuaries. ELMR Rep. No. 3. Strategic Assessment Branch, NOS/NOAA. Rockville, MD. 107 p.
- Monaco, M.E., T.A. Lowery, and R.L. Emmett. 1992. Assemblages of U.S. west coast estuaries based on the distribution of fishes. *J. Biogeogr.* 19: 251-267.
- NOAA (National Oceanic and Atmospheric Administration). 1985. National Estuarine Inventory: Data Atlas. Volume 1. Physical and Hydrologic Characteristics. Strategic Assessment Branch, NOS/NOAA. Rockville, MD. 103 p.
- NOAA (National Oceanic and Atmospheric Administration). 1988. Bering, Chukchi, and Beaufort Seas Strategic Assessment: Data Atlas. Strategic Assessment Branch, NOS/NOAA. Rockville, MD. 135 p.
- NOAA (National Oceanic and Atmospheric Administration). 1991. Prospectus for the East Coast of North America Strategic Assessment Project: Biogeographic Characterization Component. Strategic Environmental Assessments Division, NOS/NOAA. Rockville, MD. 17 p.
- O'Connor, T.P. 1990. Coastal Environmental Quality in the United States, 1990: Chemical Contamination in Sediment and Tissues. Ocean Assessments Division, NOS/NOAA. Rockville, MD. 34 p.
- Pattillo, M.E., T.E. Czapla, D.M. Nelson, and M.E. Monaco. In preparation. Distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries, Vol. II: species life history summaries. ELMR Rept. No. 11. Strategic Environmental Assessments Division, NOS/NOAA. Rockville, MD.
- Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1980. A list of common and scientific names of fishes from the United States and Canada, Fourth Edition. Am. Fish. Soc. Spec. Publ. 12. 174 p.
- Robins, C.R., R.M. Bailey, C.E. Bond, J.R. Brooker, E.A. Lachner, R.N. Lea, and W.B. Scott. 1991. Common and scientific names of fishes from the United States and Canada, Fifth Edition. Am. Fish. Soc. Spec. Publ. 20. 183 p.
- Shirzad, F.F., C.J. Klein III, and S.P. Orlando. 1989. Revised physical and hydrologic characteristics for the Mississippi delta region estuaries. NEI Supplement 3. NOAA/NOS Strategic Assessment Branch. Rockville, MD.

Turgeon, D.D., A.E. Bogan, E.V. Coan, W.K. Emerson, W.G. Lynons, W.L. Pratt, C.F.E. Roper, A. Scheltema, F.G. Thompson, and J.D. Williams. 1988. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks. Am. Fish. Soc. Spec. Publ. 16. 277 p.

Weinstein, M.P. 1979. Shallow marsh habitats as primary nurseries for fishes and shellfish. Cape Fear River, North Carolina. Fish. Bull., U.S. 77: 339-357.

Williams, A.B., and D.L. Felder. 1986. Analysis of stone crabs: *Menippe mercenaria* (Say), restricted, and a previously unrecognized species described (Decapoda: Xanthidae). Proc. Biol. Soc. Wash. 99: 517-543.

Williams, A.B., L.G. Abele, D.L. Felder, H.H. Hobbs, Jr., R.B. Manning, P.A. McLaughlin, and I. Pérez Farfante. 1989. Common and scientific names of aquatic invertebrates from the United States and Canada: decapod crustaceans. Am. Fish. Soc. Spec. Publ. 17. 77 p.

Williams, C.D., D.M. Nelson, L.C. Clements, M.E. Monaco, S.L. Stone, C. Iancu, and E.A. Irlandi. 1990. Distribution and abundance of fishes and invertebrates in eastern Gulf of Mexico estuaries. ELMR Rep. No. 6. Strategic Assessment Branch, NOS/NOAA. Rockville, MD. 105 p.

Data Summary Tables

Table 3. Presence/absence of ELMR species in Gulf of Mexico estuaries

Table 4. Spatial distribution and relative abundance

Table 5. Temporal distribution

Table 6. Data reliability

In each data summary table, species are listed in a phylogenetic order, as in Table 2, p. 3. Estuaries are listed in an east to west order, as in Table 1, p. 3. At the beginning of each data summary is an index table showing the page location of each species and estuary within the data summary.

Table 3. Presence/absence* of ELMR species in Gulf of Mexico estuaries

*highest relative abundance of adults or juveniles in any salinity zone, in any month.

Species	Estuary																													
	Florida Bay	Ten Thousand Islands	Caloosahatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachicola Bay	St. Andrew Bay	Choctawhatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound	Lake Borgne	Lake Pontchartrain	Mississippi River	Barataria Bay	Terrebonne Bay	Atchafalaya/Timbalier Bay	Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Anansas Bay	Corpus Bay	Laguna Madre	Baffin Bay	
Bay scallop	✓	✓	○	✓	✓		○	✓	○		○			✓							✓		✓	✓	✓	✓	✓			
American oyster		○	⊗	○	○	⊗	⊗	○	○	○	✓	○	○	○	⊗	✓	⊗	⊗	⊗	○	○	●	na	○	⊗	○	○	○	✓	
Common rangia			●	●	●	⊗	⊗	○	○	○	⊗	⊗	○	⊗	○	○	⊗	⊗	○	○	●	⊗	na	○	✓	✓	✓			
Hard clam				○	⊗	○	○		○	○		○	✓	○		○		○	✓			○	na	○	○	○	○			
Bay squid	✓	✓	○	○	⊗	○	○	⊗	⊗	○	○	○	○	●	⊗	○	○		○	○	○	○	✓	○	○	⊗	⊗	○	○	○
Brown shrimp	✓	✓	✓	✓			⊗	⊗	⊗	●	●	●	●	●	⊗	⊗	○	●	●	●	●	⊗	●	⊗	●	●	●	●	⊗	●
Pink shrimp	●	●	⊗	⊗	●	●	⊗	⊗	⊗	○	○	○	○	✓	✓	⊗		○	✓	✓		✓	○	○	○	○	○	⊗	○	○
White shrimp					✓	●	●	○	⊗	⊗	○	●	●	●	●	○	○	●	⊗	●	●	●	●	●	●	⊗	⊗	⊗	✓	
Grass shrimp	●	○	●	●	●	●	●	⊗	⊗	●		●	⊗	●	○	⊗	○	⊗	⊗	●	●	●	⊗	●	⊗	⊗	●	●	●	●
Spiny lobster	○	✓		✓	✓			○				✓																✓		
Blue crab	⊗	⊗	●	⊗	⊗	●	●	●	⊗	⊗	⊗	●	●	●	⊗	⊗	○	⊗	⊗	⊗	●	●	⊗	○	⊗	●	●	●	⊗	⊗
Gulf stone crab					✓	○	○	✓	✓	✓	✓	○	○	✓	✓	○	○	○	○	✓	○	✓	○	na	○	○	○	○	✓	○
Stone crab	○	○	✓	○	○	○	○	✓																						
Bull shark	○	○	○	○	○	○	○	○	○	○	✓	○	○	○	○	⊗	✓	○	○	○	✓	✓	○	na	○	○	○	○	✓	✓
Tarpon	○	○	⊗	⊗	⊗	○	○	○	○	○	✓	○	○	○	○		○	✓	✓	✓		✓	✓	na	○	○	✓	✓	✓	✓
Alabama shad						○		○	○			✓	⊗	○	✓	✓														
Gulf menhaden	✓	✓	✓	✓	●	○	⊗	⊗	●	●	●	⊗	●	●	●	●	⊗	●	⊗	●	●	●	●	⊗	●	⊗	⊗	⊗	⊗	●
Yellowfin menhaden	⊗	●	○	○	⊗		✓						✓	✓	✓															
Gizzard shad						○	○	○		○	○	✓	○	⊗	●	○	○	⊗	○	○	○	○	○	○	○	✓	○	✓	⊗	
Bay anchovy	●	●	●	●	●	●	●	⊗	●	●	⊗	●	●	●	⊗	●	●	●	●	●	●	⊗	●	●	●	●	●	●	●	●
Hardhead catfish	⊗	○	⊗	●	○	●	⊗	●	●	⊗	⊗	○	●	●	⊗	⊗	●	●	⊗	⊗	○	⊗	○	⊗	●	⊗	⊗	●	●	●
Sheepshead minnow	⊗	○	○	○	●	●	●	⊗	⊗	⊗	⊗	○	⊗	⊗	○	○	○	⊗	●	○	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	●	●

Relative abundance:

● - Highly Abundant

⊙ - Abundant

○ - Common

√ - Rare

Blank - Not present

na - No data available

Table 3, continued.

Species	Estuary																															
	Florida Bay	Ten Thousand Islands	Caloosahatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee River	Apalachicola Bay	St. Andrew Bay	Choctawhatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound	Lake Borgne	Lake Pontchartrain	Mississippi River	Barataria Bay	Terrebonne Sound	Atchafalaya/Timbalier Bay	Calcasieu/Vermilion Bay	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay	Corpus Christi Bay	Laguna Madre	Baffin Bay		
Gulf killifish	○	●	○	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Silversides	●	○	●	●	●	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Snook	○	○	○	○	○	○	○										√				√		√		√	√	○					
Bluefish	○	○		○	○	○	○	○	○	○	○	○	○			√	√	○	√	√	√	√	○	○	√	√	√	√				
Blue runner	√	○		○	○	○	○	○	○	○	○	○	○				○	√			√											
Crevalle jack	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Florida pompano	●	○		○	○	√	○		○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Gray snapper	○	○	√	○	○	○	○	√	○	○	○	○			○		○	√		√		√		√	√	√	√	○	√			
Sheepshead	○	○	√	√	○	○	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Pinfish	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Silver perch	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Sand seatrout	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Spotted seatrout	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Spot	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Atlantic croaker	√	√	√	○	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Black drum	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Red drum	○	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Striped mullet	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Code goby	●	●	○	○	○	○	○	○	○	○	○	○	○	○		√					√	na	○	√	○	○	○	○	○	○		
Spanish mackerel	○	○	√	○	○	○	√	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Gulf flounder	○	○	√	○	○	○	○	○	○	○	○	○	○								√		√	√	√	√	√	√	√	√		
Southern flounder	√	√		√	√	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

Relative abundance:

● - Highly Abundant

○ - Abundant

○ - Common

√ - Rare

Blank - Not present

na - No data available

Table 4. Spatial distribution and relative abundance

Index to Table 4. Page location of spatial distribution table for each species and estuary.

Common and Scientific Name	Estuary				
	Florida Bay Ten Thousand Islands Caloosahatchee River Charlotte Harbor Tampa Bay Suwannee River Apalachee Bay	Apalachicola Bay St. Andrew Bay Choctawhatchee Bay Pensacola Bay Perdido Bay Mobile Bay Mississippi Sound	Lake Bortne Baton/Chandeleur Sound Lake Pontchartrain Mississippi River Barataria Bay Tereborter Sound	Calcasieu Lake Sabine Lake Gulf of Mexico Gulf of Mexico Gulf of Mexico Gulf of Mexico Gulf of Mexico	Galveston Bay Brazos River Matagorda Bay San Antonio Bay Corpus Christi Bay Laguna Madre Baffin Bay
Bay scallop (<i>Argopecten irradians</i>) American oyster (<i>Crassostrea virginica</i>) Common rangia (<i>Rangia cuneata</i>) Hard clam (<i>Mercenaria</i> species) Bay squid (<i>Lolliguncula brevis</i>) Brown shrimp (<i>Penaeus aztecus</i>)	20	21	22	23	24
Pink shrimp (<i>Penaeus duorarum</i>) White shrimp (<i>Penaeus setiferus</i>) Grass shrimp (<i>Palaemonetes pugio</i>) Spiny lobster (<i>Panulirus argus</i>) Blue crab (<i>Callinectes sapidus</i>) Gulf stone crab (<i>Menippe adina</i>)	25	26	27	28	29
Stone crab (<i>Menippe mercenaria</i>) Bull shark (<i>Carcharhinus leucas</i>) Tarpon (<i>Megalops atlanticus</i>) Alabama shad (<i>Alosa alabamae</i>) Gulf menhaden (<i>Brevoortia patronus</i>) Yellowfin menhaden (<i>Brevoortia smithi</i>)	30	31	32	33	34
Gizzard shad (<i>Dorosoma cepedianum</i>) Bay anchovy (<i>Anchoa mitchilli</i>) Hardhead catfish (<i>Arius felis</i>) Sheepshead minnow (<i>Cyprinodon variegatus</i>) Gulf killifish (<i>Fundulus grandis</i>) Siversides (<i>Menidia</i> species)	35	36	37	38	39
Snook (<i>Centropomus undecimalis</i>) Bluefish (<i>Pomatomus saltatrix</i>) Blue runner (<i>Caranx crysos</i>) Crevalle jack (<i>Caranx hippos</i>) Florida pompano (<i>Trachinotus carolinus</i>) Gray snapper (<i>Lutjanus griseus</i>)	40	41	42	43	44
Sheepshead (<i>Archosargus probatocephalus</i>) Pinfish (<i>Lagodon rhomboides</i>) Silver perch (<i>Bairdiella chrysoura</i>) Sand seatrout (<i>Cynoscion arenarius</i>) Spotted seatrout (<i>Cynoscion nebulosus</i>) Spot (<i>Leiostomus xanthurus</i>)	45	46	47	48	49
Atlantic croaker (<i>Micropogonias undulatus</i>) Black drum (<i>Pogonias cromis</i>) Red drum (<i>Sciaenops ocellatus</i>) Striped mullet (<i>Mugil cephalus</i>) Code goby (<i>Gobiosoma robustum</i>) Spanish mackerel (<i>Scomberomorus maculatus</i>)	50	51	52	53	54
Gulf flounder (<i>Paralichthys albigutta</i>) Southern flounder (<i>Paralichthys lethostigma</i>)	55	56	57	58	59

Table 4. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Bay scallop <i>Argopecten irradians</i>	A		√	√		√	√		○			√	√		√	√					√	○			
	S		√	√		√	√		○			√	√		√	√					√	○			
	J		√	√		√	√		○			√	√		√	√					√	○			
	L		√	√		√	√		○			√	√		√	√					√	○			
	E		√	√		√	√		○			√	√		√	√					√	○			
American oyster <i>Crassostrea virginica</i>	A					○	○	√	●			○	○		○	○		●	●		●	●		●	●
	S					○	○	√	○			○	○		○	○		●	●		●	●		●	●
	J					○	○	√	○			○	○		○	○		●	●		●	●		●	●
	L					○	○		○			○	○		○	○		●	●		●	●		●	●
	E					○	○		○			○	○		○	○		●	●		●	●		●	●
Common rangia <i>Rangia cuneata</i>	A							●	●		●	●		●	●		○	●		○	○				
	S							●	●		●	●		●	●			●			○	○			
	J							●	●		●	●		●	●			●			○	○			
	L							●	●		●	●		●	●			●			○	○			
	E							●	●		●	●		●	●			●			○	○			
Hard clam <i>Mercenaria</i> species	A												○			○			○				○		
	S												○			○							○		
	J												○			○							○		
	L												○			○							○		
	E												○			○							○		
Bay squid <i>Lolliguncula brevis</i>	A		√	√		√	√		○			○	○		●	●		○	○		○	○			
	S		√	√		√	√		○			○	○		●	●		○	○		○	○			
	J		√	√		√	√		○			○	○		●	●		○	○		○	○			
	L		√	√		√	√		○			○	○		●	●		○	○		○	○			
	E		√	√		√	√		○			○	○		●	●		○	○		○	○			
Brown shrimp <i>Penaeus aztecus</i>	A		√	√		√	√					√	√												
	S		√	√		√	√					√	√												
	J		√	√		√	√	√				√	√												
	L		√	√		√	√					√	√												
	E		√	√		√	√					√	√												
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																								
		Apalachicola Bay			St. Andrew Bay			Choctaw-hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound						
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
Bay scallop <i>Argopecten irradians</i>	A		√	√		○	○					○	○									○	○			
	S		√	√		○	○					○	○									○	○			
	J		√	√		○	○					○										○	○			
	L		√	√		○	○															○	○			
	E		√	√		○	○															○	○			
American oyster <i>Crassostrea virginica</i>	A		●	●		○	√		○	√		○	√			√		○	○			○	√			
	S		●	●		○	√		○	√		○	√			√		○	○			●	●			
	J		●	●		○	√		○	√		○	√			√		○	○			○	√			
	L		●	●		○	√		○	√		○	√			√		○	○			●	√			
	E		●	●		○	√		○	√		○	√			√		○	○			●	○			
Common rangia <i>Rangia cuneata</i>	A	○	●		○	○		√	○		○	○		○	●		●	●			○					
	S		●			○			○			○			●			●			○					
	J	○	●		○	○		√	○		○	○		○	●		√	●			○					
	L	○	●		○	○		√	○		○	○			●		√	●			○					
	E		●		○	○		○	○		○	○			●			●			○					
Hard clam <i>Mercenaria</i> species	A						○			○					○	○		√	√			√	○			
	S						○			○					√	√		√	√			√	○			
	J						○			○					√	√		√	√			√	○			
	L						○			○					√	√		√	√			√	○			
	E						○			○					√	√		√	√			√	○			
Bay squid <i>Lolliguncula brevis</i>	A		●	●		○	●		○	○		○	○		○	○		○	○			●	●			
	S		●	●		○	○		○	○		○	○		○	○		○	○			○	●			
	J		●	●		○	○		○	○		○	○		○	○		○	○			○	●			
	L		●	●		○	○		○	○		○	○		○	○		○	○			○	○			
	E		●	●		○	○		○	○		○	○		○	○		○	○			○	○			
Brown shrimp <i>Penaeus aztecus</i>	A		●	●		●	●		●	●		●	●		●	●		●	●			●	●	√	●	●
	S		●	●		●	●		●	●		●	●		●	●		●	●			●	●		○	
	J	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	○	
	L		●	●		●	●		●	●		●	●		●	●	√	√			●	●	●	●	○	
	E		●	●		●	●		●	●		●	●		●	●		●	●			●	●	○	○	
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
		Apalachicola Bay			St. Andrew Bay			Choctaw-hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound						
		Gulf of Mexico Estuaries																								

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
Bay scallop	A									√															
	S									√															
<i>Argopecten irradians</i>	J									√															
	L									√															
	E									√															
American oyster	A		○			○			●	●		√		√	●	○	√	●	○		●				
	S		○			○			●	●		√		√	●	○	√	●	○		●				
<i>Crassostrea virginica</i>	J		○			○			●	●		√		√	●	○	√	●	○		●				
	L		○			○			●	●		√		√	●	○	√	●	○		●				
	E		○			○			●	●		√		√	●	○	√	●	○		●				
Common rangia	A	●	●			●			○		○	○		●	●		●	○			○				
	S	●	●			●			○		○	○		●	○		●	○			○				
<i>Rangia cuneata</i>	J	●	●			●			○		○	○		●	○		●	○			○				
	L	●	●			●			○		○	○		●	○		●	○			○				
	E	●	●			●			○		○	○		●	○		●	○			○				
Hard clam	A								○	○					○	○		√	√						
	S								○	○					○	○		√	√						
<i>Mercenaria species</i>	J								○	○					○	○		√	√						
	L								○	○					○	○		√	√						
	E								○	○					○	○		√	√						
Bay squid	A		●			○			○	○					○	○		○	○		○				
	S		●			○			○	○					○	○		○	○		○				
<i>Lolliguncula brevis</i>	J		●			○			○	○					○	○		○	○		○				
	L																								
	E																								
Brown shrimp	A		●			○																			
	S	√	●			●			●	○		○		○	●	●	○	●	●		√	●			
<i>Penaeus aztecus</i>	J		●			○			●	○		○		○	●	●		○	●		○				
	L		●			○									●	●					○				
	E																								
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
Bay scallop	A									√					√	√		√	√		√	√
	S									√					√	√		√	√		√	√
<i>Argopecten irradians</i>	J									√					√	√		√	√		√	√
	L									√					√	√		√	√		√	√
	E									√					√	√		√	√		√	√
American oyster	A		○		√	○		√	●	√	na	na		√	○	√		●	√		○	√
	S		○			○			●	√	na	na			○	√		●	√		○	√
<i>Crassostrea virginica</i>	J		○		√	○		√	●	√	na	na		√	○	√		●	√		○	√
	L		○		√	○		√	●	√	na	na		√	○	√		●	√		○	√
	E		○			○			●	√	na	na			○	√		●	√		○	√
Common rangia	A	√	○		√	●		●	○		na	na		○	○			√			√	
	S	√	○		√	●		●	○		na	na		○	○			√			√	
<i>Rangia cuneata</i>	J	√	○		√	●		●	○		na	na		○	○			√			√	
	L	√	○		√	●		●	○		na	na		○	○			√			√	
	E	√	○		√	●			○		na	na		○	○			√			√	
Hard clam	A								√	○		na			√	○		√	○		○	○
	S								√	○		na			√	○		√	○		○	○
<i>Mercenaria species</i>	J								√	○		na			√	○		√	○		○	○
	L								√	○		na			√	○		√	○		○	○
	E								√	○		na			√	○		√	○		○	○
Bay squid	A		○			√			○	○		○			○	●		○	●		○	○
	S					√			○	○		na			○	●		○	●		○	○
<i>Lolliguncula brevis</i>	J		○			√			○	○		○			○	●		○	●		○	○
	L								○	○		○			○	●		○	●		○	○
	E								○	○		na			○	●		○	●		○	○
Brown shrimp	A				√	√									○	●		○	●			
	S														○	●		○	●			
<i>Penaeus aztecus</i>	J	○	●		○	●		●	●	○	na	●		○	●	○	●	○		●	●	
	L		●			●			○	●	na	●		○	●	●	●	○		●	●	
	E																					
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Bay scallop	A		√	√			√			
	S		√	√			√			
<i>Argopecten irradians</i>	J		√	√			√			
	L		√	√			√			
	E		√	√			√			
American oyster	A		O	√			√			
	S		O	√			√			
<i>Crassostrea virginica</i>	J		O	√			√			
	L		O	√			√			
	E		O	√			√			
Common rangia	A		√							
	S		√							
<i>Rangia cuneata</i>	J		√							
	L		√							
	E		√							
Hard clam	A		O	O						
	S		O	O						
<i>Mercenaria</i> species	J		O	O						
	L		O	O						
	E		O	O						
Bay squid	A		O	O			O			O
	S		O	O			O			
<i>Lolliguncula brevis</i>	J		O	O			O			O
	L		O	O			O			
	E		O	O			O			
Brown shrimp	A						O			
	S									
<i>Penaeus aztecus</i>	J		●	O			●			●
	L		O	O			√			
	E									
		* <td>M<td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td></td>	M <td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td>	S <td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td>	* <td>*<td>S<td>*<td>*<td>S</td></td></td></td></td>	* <td>S<td>*<td>*<td>S</td></td></td></td>	S <td>*<td>*<td>S</td></td></td>	* <td>*<td>S</td></td>	* <td>S</td>	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- Abundant
- O Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Pink shrimp <i>Penaeus duorarum</i>	A															√									
	S																								
	J		●	●		⊙	●		⊙			⊙	⊙		●	●		●	⊙		⊙	⊙		⊙	⊙
	L		●	●		⊙	●								●	●			○					○	○
	E																								
White shrimp <i>Penaeus setiferus</i>	A																	√	√		√	⊙		⊙	⊙
	S																								
	J																	√	√		○	●	⊙		
	L																		√						
	E																								
Grass shrimp <i>Palaemonetes pugio</i>	A	√	●	⊙	√	○	○	○	●		√	●	⊙		●	⊙	√	●	⊙	√	●	⊙	√	●	⊙
	S		●	⊙		○	○		●			●	⊙		●	⊙		●	⊙		●	⊙		●	⊙
	J	√	●	⊙	√	○	○		●		√	●	⊙		●	⊙	√	●	⊙	√	●	⊙	√	●	⊙
	L		●	⊙		○	○		●			●	⊙		●	⊙		●	⊙		●	⊙		●	⊙
	E		●	⊙		○	○		●			●	⊙		●	⊙		●	⊙		●	⊙		●	⊙
Spiny lobster <i>Panulirus argus</i>	A			√									√			√									
	M																								
	J						√						√			√									
	L			○																					
	E																								
Blue crab <i>Callinectes sapidus</i>	A	○	⊙	⊙	√	⊙	⊙	√	⊙			⊙	○		⊙	○	○	●	●	○	●	●		●	●
	M	○	⊙		√	⊙	⊙		⊙			⊙			⊙		○	●	●	○	○	●	○	○	○
	J	○	⊙	○	√	⊙	○	⊙	●			⊙	√		⊙	√	○	○	○	○	○	○	○	○	○
	L		√	⊙		⊙	⊙					√	⊙		√	⊙		○	○		○	○	○	○	○
	E			√			√					○	⊙		○	⊙		⊙	⊙		⊙	⊙		⊙	⊙
Gulf stone crab <i>Menippe adina</i>	A																	√	√		○	○	○	○	○
	M																	√	√		○	○	○	○	○
	J																	√	√		○	○	○	○	○
	L																	√	√		○	○	○	○	○
	E																	√	√		○	○	○	○	○
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Pink shrimp	A			√	√	√	⊙	⊙		√	√		√	√		○	○		√	√			○	○	
<i>Penaeus duorarum</i>	S			⊙	⊙	√	⊙	⊙	√	⊙	⊙		○	○		○	○		○	○			○	○	
	J						√	√		√	√		√	○		√	○		√	√			○	○	
	L																						○	○	
	E																						○	○	
White shrimp	A			√	⊙	√	○	○	√	○	○	√	○	○		√	○	√	○	○	√	⊙	⊙		
<i>Penaeus setiferus</i>	S			○	⊙	√	○	○	√	⊙	⊙	√	⊙	○		○	○	⊙	⊙	⊙	√	⊙	⊙		
	J																				√	⊙	⊙		
	L																				√	⊙	⊙		
	E																				√	⊙	⊙		
Grass shrimp	A	√	⊙	⊙	√	⊙	⊙	√	⊙	⊙	√	⊙	⊙				√	⊙	⊙	○	⊙	○			
<i>Palaemonetes pugio</i>	S		⊙	⊙		⊙	⊙		⊙	⊙		⊙	⊙					⊙	⊙	√	⊙	○			
	J	√	⊙	⊙	√	⊙	⊙	√	⊙	⊙	√	⊙	⊙				√	⊙	⊙	√	⊙	○			
	L		⊙	⊙		⊙	⊙		⊙	⊙		⊙	⊙					⊙	⊙	√	⊙	○			
	E		⊙	⊙		⊙	⊙		⊙	⊙		⊙	⊙					⊙	⊙	√	⊙	○			
Spiny lobster	A						○																		
<i>Panulirus argus</i>	M																								
	J																								
	L																								
	E																								
Blue crab	A	○	⊙	⊙	○	⊙	⊙	√	⊙	○	√	⊙	○	√	⊙	⊙	√	⊙	⊙	√	⊙	⊙			
<i>Callinectes sapidus</i>	M	○	⊙	⊙	○	⊙	⊙		⊙	○		⊙	○	√	○	○	√	⊙	⊙	○	⊙	⊙			
	J	○	⊙	○	○	⊙	⊙	√	⊙	○	√	⊙	○	○	⊙	○	○	⊙	⊙	○	⊙	⊙			
	L		√	⊙		√	⊙	√	⊙	⊙	√	⊙	⊙		√	○	√	⊙	⊙	○	⊙	⊙			
	E		⊙	⊙		○			√			√			√			√		○	⊙	⊙			
Gulf stone crab	A		○	○		√	√		√	√		√	√		√	√		○	○			○	○		
<i>Menippe adina</i>	M		○	○		√	√		√	√		√	√		√	√		○	○			○	○		
	J		○	○		√	√		√	√		√	√		√	√		○	○			○	○		
	L		○	○		√	√		√	√		√	√		√	√		○	○			○	○		
	E		○	○		√	√		√	√		√	√		√	√		○	○			○	○		
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- ⊙ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchar-train			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
Pink shrimp	A								○	○															
<i>Penaeus duorarum</i>	S								○	●															
	J		√			√			○	●								○	○		√	√			
	L																								
	E																								
White shrimp	A		●			●				○								●	○		○	○			
<i>Penaeus setiferus</i>	S	●	●			●			○			○	○				○	●	●		○	●			
	J									○		○	○				○	●	●		○	●			
	L									○		○	○					○	○			○			
	E									○		○	○					○	○			○			
Grass shrimp	A	√	●			○			○	●	○	○		○	○		○	○	○	○	○	○			
<i>Palaemonetes pugio</i>	S		●			○			○	○	○	○		○	○		○	○	○	○	○	○			
	J	√	●			○			○	○	○	○		○	○		○	○	○	○	○	○			
	L		●			○			○	○	○	○		○	○		○	○	○	○	○	○			
	E		●			○			○	○	○	○		○	○		○	○	○	○	○	○			
Spiny lobster	A																								
<i>Panulirus argus</i>	M																								
	J																								
	L																								
	E																								
Blue crab	A	●	●			○			○	○	○	○		○	○	○	○	○	○	○	○	○			
<i>Callinectes sapidus</i>	M	○	●			○			○	○	○	○		○	○	○	○	○	○	○	○	○			
	J	√	●			○			○	○	○	○		○	○	○	○	○	○	○	○	○			
	L		●			○	√		○	○	○	○		○	○	○	○	○	○	○	○	○			
	E		●						○	○	○	○		○	○	○	○	○	○	○	○	○			
Gulf stone crab	A		√			√			○	○		○			√	√		√	○			√			
<i>Menippe adina</i>	M								○	○		○													
	J		√			√			○	○		○			○	○		√	○			√			
	L								○	○															
	E								○	○															
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
		Lake Borgne			Lake Pontchar-train			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
Pink shrimp	A								√	√					○	○		○	○		○	
<i>Penaeus duorarum</i>	S								√	√	na	○			√	√		○	○		○	○
	J																					
	L																					
	E																					
White shrimp	A	○	○		●	●			○	○	na	○		√	●	○		●	●		○	○
<i>Penaeus setiferus</i>	S	○	●		●	●		●	●	●	●	●		●	●	○		●	○		●	○
	J		●			●		○	●	●	○	○		●	●	○		●	○		○	○
	L		●			●		○	●	●	○	○		●	●	○		●	○		○	○
	E		●			●		○	●	●	○	○		●	●	○		●	○		○	○
Grass shrimp	A	●	●		●	●		○	●	●	na	●		●	●	●		●	○		●	●
<i>Palaemonetes pugio</i>	S	●	●		●	●		○	●	●	na	●		●	●	●		●	○		●	●
	J	●	●		●	●		○	●	●	na	●		●	●	●		●	○		●	●
	L	●	●		●	●		○	●	●	na	●		●	●	●		●	○		●	●
	E	●	●		●	●		○	●	●	na	●		●	●	●		●	○		●	●
Spiny lobster	A																					
<i>Panulirus argus</i>	M																					
	J																					
	L																					
	E																					
Blue crab	A	○	●		●	●		●	●	●	na	○		○	●	○		●	○		●	○
<i>Callinectes sapidus</i>	M	○	○		●	●		○	○	○	na	○		○	○	○		○			○	○
	J	○	●		●	●		○	●	●	na	○		○	●	○		●	√		○	●
	L		○			○			○	○		○		○	○	○			○		○	○
	E							○	○	○		○		○	○	○			○		○	○
Gulf stone crab	A		√			√			√	○		na			○	○		○	○		○	○
<i>Menippe adina</i>	M									○		na			○	○		○	○		○	○
	J		○			√			√	○		na			○	○		○	○		○	○
	L									○					○	○			○		○	○
	E									○					○	○			○		○	○
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
		Calcasieu Lake	Sabine Lake			Galveston Bay	Brazos River			Matagorda Bay	San Antonio Bay			Aransas Bay								
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Pink shrimp	A						○			√
	S									
<i>Penaeus duorarum</i>	J	○	○				●			○
	L									
	E									
White shrimp	A	○	●				○			√
	S									
<i>Penaeus setiferus</i>	J	●	●				●			√
	L						√			
	E									
Grass shrimp	A	●	●				●			●
	S	●	●				●			●
<i>Palaemonetes pugio</i>	J	●	●				●			●
	L	●	●				●			●
	E	●	●				●			●
Spiny lobster	A						√			
	M									
<i>Panulirus argus</i>	J						√			
	L									
	E									
Blue crab	A	○	●				●			●
	M	○					○			
<i>Callinectes sapidus</i>	J	○	●				●			●
	L	○	●				●			○
	E		●				●			○
Gulf stone crab	A	○	○				√			○
	M		○				√			○
<i>Menippe adina</i>	J	○	○				√			○
	L		○				√			○
	E		○				√			○
		*	M	S	*	*	S	*	*	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Stone crab <i>Menippe mercenaria</i>	A		√	○		○	○					○	○		√	○		√	○		√	○		√	○
	M		√	○		○	○					○	○		√	○		√	○		√	○		√	○
	J		√	√		√	○		√			○	○		√	○		√	○		√	○		√	○
	L		√	√		√	○		√			○	○		√	○		√	○		√	○		√	○
	E		√	○		○	○					○	○		√	○		√	○		√	○		√	○
Bull shark <i>Carcharhinus leucas</i>	A	√	√	√	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	M			√			√						√			√			√					√	
	J	√	○	√	○	○	√	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	P	√	√	√	○	○	○	√	○		√	○	○	√	○	○	○	○	○	○	○	○	○	○	○
Tarpon <i>Megalops atlanticus</i>	A	√	○	○	√	○	○	●	●		○	●	●	√	○	●	√	√	○	○				○	
	S																								
	J	○	○	○	○	○	○	●	●		●	●	●	√	○	○	○	○	○	○	○	○	○	○	○
	L							√	√				○			√			○						○
Alabama shad <i>Alosa alabamae</i>	A																○	○	○						
	S																○	○	○						
	J																○	○	○						
	L																○	○	○						
Gulf menhaden <i>Brevoortia patronus</i>	A														●	●		√	√		●	●			
	S																								
	J			√		√	√		√			√	√		●	●	√	○	○	○	○	○	○	○	○
	L															√									○
Yellowfin menhaden <i>Brevoortia smithi</i>	A											○	○		○	○					√	√			
	S																								
	J	○	●	●		●	●	○	○		○	○	○	○	○	○					√	√			
	L		○	○		○	○		√			√	○												√
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating
- P - Parturition

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Stone crab	A			√	√																				
<i>Menippe mercenaria</i>	M			√	√																				
	J			√	√																				
	L			√	√																				
	E			√	√																				
Bull shark	A	○	○	○	○	○	○	○	○	○	○	○	○	√	√	√	○	○	○	○	○	○	○	○	○
<i>Carcharhinus leucas</i>	M			√			√			√			√			√			√			√			
	J	○	○	○	○	○	○	○	○	○	○	○	○	√	√	√	○	○	○	○	○	○	○	○	○
	P	○	○	○	○	○	○	○	○	○	○	○	○	√	√	√	○	○	○	○	○	○	○	○	○
Tarpon	A	○	○	○		○	○	○	○	○		○	○			√		○	○			√	○	○	○
<i>Megalops atlanticus</i>	S															√							√	○	○
	J	○	○	○	√	√	√	○	○	○	√	○	○			√		○	○		√	√	○	○	○
	L			○			○			○		○	○					○	○			√	○	○	○
	E																		○					○	○
Alabama shad	A	○	○	○	○	○	○	○	○	○							√	√		●	○	√			
<i>Alosa alabamae</i>	S	○																		●	○				
	J	○	○	○	○	○	○	○	○	○							√	√	●	○	√				
	L	○																	●	○					
	E	○																	●	○					
Gulf menhaden	A		●	●	√	●	●		●	●	√	●	●	√	○	○	√	●	●		●	●		●	●
<i>Brevoortia patronus</i>	S		●	●		●	●		●	●		●	●		○	○		●	●		●	●		●	●
	J	○	●	○	○	●	●	○	●	○	○	●	●	○	○	○	○	●	●	●	●	●	●	●	●
	L			●		○	○		●	●		○	○		○	○		●	●	●	●	●	●	●	●
	E															√		●						○	○
Yellowfin menhaden	A																							√	
<i>Brevoortia smithi</i>	S																								
	J																								
	L																								
	E																								
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating
- P - Parturition

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
Stone crab	A																								
<i>Menippe mercenaria</i>	M																								
	J																								
	L																								
	E																								
Bull shark	A	○	○			○			○	●	√	√		√	√	○	√	○	○						
<i>Carcharhinus leucas</i>	M								○	○	√	√		√	√	√	√	○	○	√	○				
	J	○	○			○			○	○	√	√		√	√	√	√	○	○		√	○			
	P								○	○				√	√	√	√	√	√						
Tarpon	A	√	○			○						○				√		√	√		√				
<i>Megalops atlanticus</i>	S																								
	J	√	○			○										√									
	L	√	√																						
	E																								
Alabama shad	A	○	○						√																
<i>Alosa alabamae</i>	S																								
	J	○	○			√																			
	L																								
	E																								
Gulf menhaden	A	●	●															●	●						
<i>Brevoortia patronus</i>	S																								
	J	●	●			●			●	○		○		○	○	●	○	○	○	●	●				
	L		●			○															○	○			
	E																								
Yellowfin menhaden	A		√			√																			
<i>Brevoortia smithi</i>	S																								
	J		√			√																			
	L																								
	E																								
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
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Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating
- P - Parturition

		Gulf of Mexico Estuaries																				
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
Stone crab	A M J L E																					
<i>Menippe mercenaria</i>																						
Bull shark	A M J P	√	√							√												
<i>Carcharhinus leucas</i>		√	√		√	√		√	○	√	na	na		○	○	○		○	○		○	○
		√	√																			
Tarpon	A S J L E								√	√						○		√	○		√	√
<i>Megalops atlanticus</i>						√			√	√	na	na		√	√	○		√	○		√	√ √
Alabama shad	A S J L E																					
<i>Alosa alabamae</i>																						
Gulf menhaden	A S J L E				○	○									⊙	●		○	○			
<i>Brevoortia patronus</i>		○	●		●	●		○	●	⊙	na	⊙		●	●	●		⊙	○		⊙	⊙ ⊙
		○	⊙																			
Yellowfin menhaden	A S J L E																					
<i>Brevoortia smithi</i>																						
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
		Gulf of Mexico Estuaries																				

Relative Abundance

● Highly Abundant
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 ○ Common
 √ Rare
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Salinity Zone

T - Tidal Fresh
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Life Stage

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J - Juveniles
L - Larvae
E - Eggs
M - Mating
P - Parturition

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Stone crab	A									
<i>Menippe mercenaria</i>	M J L E									
Bull shark	A									
<i>Carcharhinus leucas</i>	M J P		○	○			√			√
Tarpon	A		√	√			√			
<i>Megalops atlanticus</i>	S J L E		√	√ √			√			√
Alabama shad	A									
<i>Alosa alabamae</i>	S J L E									
Gulf menhaden	A		○	○			○			√
<i>Brevoortia patronus</i>	S J L E		●	● ○			●			● √
Yellowfin menhaden	A									
<i>Brevoortia smithi</i>	S J L E									
		* <td>M<td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td></td>	M <td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td>	S <td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td>	* <td>*<td>S<td>*<td>*<td>S</td></td></td></td></td>	* <td>S<td>*<td>*<td>S</td></td></td></td>	S <td>*<td>*<td>S</td></td></td>	* <td>*<td>S</td></td>	* <td>S</td>	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
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Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S			
Gizzard shad	A																○	√		○	√				
	S																○			○					
<i>Dorosoma cepedianum</i>	J																○	√		○	√				
	L																○			○					
	E																○			○					
Bay anchovy	A	⊙	●	●	○	●	●	⊙	●		⊙	●	●	⊙	●	●	○	⊙	●	○	●	⊙			
	S		●	●		●	●		●			●	●		●	●		⊙	●		●	⊙			
<i>Anchoa mitchilli</i>	J	⊙	●	●	○	●	●	⊙	●		⊙	●	●	⊙	●	●	○	⊙	●	○	●	⊙			
	L		●	●		●	●	√	●			●	●		●	●		⊙	●		●	⊙			
	E		●	●		●	●	●	●			●	●		●	●		⊙	●		●	⊙			
Hardhead catfish	A	○	○	⊙	○	○	○	○	⊙		○	⊙	⊙	○	○	○	●	●	○	○	⊙	⊙			
	S		○	⊙		○	○		⊙			⊙	⊙		○	○		○	○		⊙	⊙			
<i>Arius felis</i>	J	○	○	⊙	○	○	○	○	⊙		○	●	⊙	○	○	○	⊙	⊙	○	○	⊙	⊙			
	L		○	⊙		○	○		⊙			⊙	⊙		○	○		○	○		⊙	⊙			
	E		⊙	⊙		○	○		⊙			⊙	⊙		○	○		○	○		⊙	⊙			
Sheepshead minnow	A	⊙	○	○	○	○	○	○	○		○	○	○	○	●	⊙	○	●	⊙	○	●	⊙			
	S		○	○		○	○	√	○		√	○	○	√	○	⊙	√	●	⊙	○	●	⊙			
<i>Cyprinodon variegatus</i>	J	⊙	○	○	○	○	○	○	○		○	○	○	○	●	⊙	○	●	⊙	○	●	⊙			
	L		○	○		○	○	√	○		√	○	○	√	○	⊙	√	●	⊙		●	⊙			
	E		○	○		○	○	√	○		√	○	○	√	○	⊙	√	●	⊙		●	⊙			
Gulf killifish	A	○	○	○	○	○	○	○	○		⊙	⊙	⊙	√	○	○	√	⊙	○	√	⊙	○			
	S	○	○	○	○	⊙	○	○	○		⊙	⊙	⊙	√	○	○	√	⊙	○	√	⊙	○			
<i>Fundulus grandis</i>	J	○	○	○	○	⊙	○	○	○		⊙	⊙	⊙	√	○	○	√	⊙	○	√	⊙	○			
	L	○	○	○	○	⊙	○	○	○		⊙	⊙	⊙	√	○	○	√	⊙	○	√	⊙	○			
	E	○	○	○	○	⊙	○	○	○		⊙	⊙	⊙	√	○	○	√	⊙	○	√	⊙	○			
Silversides	A	●	●	⊙	⊙	⊙	○	⊙	●		⊙	●	●	⊙	●	⊙	⊙	⊙	⊙	⊙	●	●			
	S	⊙	●	○	⊙	⊙	○	⊙	●		⊙	●	●	⊙	●	⊙	⊙	⊙	⊙	⊙	●	●			
<i>Menidia species</i>	J	●	●	○	⊙	⊙	○	⊙	●		⊙	●	●	⊙	●	⊙	⊙	⊙	⊙	⊙	●	●			
	L	⊙	●	○	⊙	⊙	○	⊙	●		⊙	●	●	⊙	●	⊙	⊙	⊙	⊙	⊙	●	●			
	E	⊙	●	○	⊙	⊙	○	⊙	●		⊙	●	●	⊙	●	⊙	⊙	⊙	⊙	⊙	●	●			
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S			
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- ⊙ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Gizzard shad <i>Dorosoma cepedianum</i>	A	○	√					○	√		○	○		√	√		○	√		●	○	√			
	S	○						○			○	○		√	√		○			●					
	J	○	√					○	√		○	○		√	√		○	√		○	○	√			
	L	○						○			○			√			○			○					
	E	○						○			○			√			○			○					
Bay anchovy <i>Anchoa mitchilli</i>	A	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	●	●	●	○	●	●
	S		●	●		●	●		●	●		●	●		○	○		●	●	●	●	●	○	●	●
	J	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	●	○	○	○	○	○
	L		●	●		●	●		●	●		○	○		○	○		●	●	●	○	○	○	○	○
	E		●	●		●	●		●	●		○	○		○	○		●	●	●	○	○	○	○	○
Hardhead catfish <i>Arius felis</i>	A	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	●	●	●	○	●	○
	S		●	●		●	●		●	●		○	○		○	○		○	○	○	○	○	○	○	○
	J	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	●	○	○	○	○	○
	L		●	●		●	●		●	●		○	○		○	○		○	○	○	○	○	○	○	○
	E		●	●		●	●		●	●		○	○		○	○		○	○	○	○	○	○	○	○
Sheepshead minnow <i>Cyprinodon variegatus</i>	A	○	●	●	○	●	●	○	●	●	○	●	●	○	○	○	○	●	●	●	○	○	○	○	○
	S	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	○	√	○	○	○	○
	J	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	√	○	○	○	○
	L	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	○	√	○	○	○	○
	E	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	○	√	○	○	○	○
Gulf killifish <i>Fundulus grandis</i>	A	○	○	○	○	○	○	○	○	○	○	○	○				○	○	○	○	○	○	○	○	○
	S		○	○	√	○	○	√	○	○	√	○	○				○	○	○	○	○	○	○	○	○
	J	○	○	○	√	○	○	○	○	○	○	○	○				○	○	○	○	○	○	○	○	○
	L		○	○	√	○	○	√	○	○	√	○	○				○	○	○	○	○	○	○	○	○
	E		○	○	√	○	○	√	○	○	√	○	○				○	○	○	○	○	○	○	○	○
Silversides <i>Menidia species</i>	A	●	●	●	○	●	●	○	●	●	○	●	●	○	●	●	○	●	●	●	○	○	○	○	○
	S	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	J	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	L	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	E	○	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
 ○ Abundant
 ○ Common
 √ Rare
 Blank Not Present

Salinity Zone

- T - Tidal Fresh
 M - Mixing
 S - Seawater

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*	T	M	*
Gizzard shad	A	●	○			○			○	○	○	○		○	○	○	○	○	○	○	○		○	○	
	S	○																							
<i>Dorosoma cepedianum</i>	J	●	●			○					○	●		○	○		○	○			○	○		○	○
	L	○									○														
	E	○																							
Bay anchovy	A	●	●			●			●	○	○	●		○	●	●	○	●	●	○	●	●	●	●	
	S		●			●			●	○		●			●	●		●	●		●	●	●	●	
<i>Anchoa mitchilli</i>	J	●	●			●			●	○	○	●		○	●	●	○	●	●		●	●	○	●	
	L	●	●			●			●	○		●			●	●		●	●			●	○	●	
	E		●			●			●	○		●			●	●		●	●			●	●	●	
Hardhead catfish	A	○	●			○			○	○		●			●	●	○	○	○	○	○	○	○	○	
	S		○			○			○	○		○			○	○		○	○		○	○		○	
<i>Arius felis</i>	J	○	○			○			○	○		○			○	○	○	○	○	○	○	○	○	○	
	L		○			○			○	○		○			○	○		○	○		○	○		○	
	E		○			○			○	○		○			○	○		○	○		○	○		○	
Sheepshead minnow	A	○	○			○			○	○	○	○		○	○	○	○	○	○	○	○	○	○		
	S	○	○			○			○	○	○	○			○	○	○	○	○	○	○	○	○		
<i>Cyprinodon variegatus</i>	J	○	○			○			○	○	○	○		○	○	○	○	○	○	○	○	○	○		
	L	○	○			○			○	○	○	○			○	○	○	○	○	○	○	○	○		
	E	○	○			○			○	○	○	○			○	○	○	○	○	○	○	○	○		
Gulf killifish	A	○	○			○			○		√	○		○	○	○	○	○	○	○	○	○	○		
	S		○			○			○			○			○	○		○	○		○	○	○		
<i>Fundulus grandis</i>	J	○	○			○			○		√	○		○	○	○	○	○	○	○	○	○	○		
	L		○			○			○			○			○	○		○	○		○	○	○		
	E		○			○			○			○			○	○		○	○		○	○	○		
Silversides	A	○	○			○			○	○	√	○			○	○	○	○	○	○	○	○	○		
	S	○	○			○			○	○		○			○	○	○	○	○	○	○	○			
<i>Menidia species</i>	J	○	○			○			○	○	√	○			○	○	○	○	○	○	○	○			
	L	○	○			○			○	○		○			○	○	○	○	○	○	○	○			
	E	○	○			○			○	○		○			○	○	○	○	○	○	○	○			
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*	T	M	*
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
Gizzard shad <i>Dorosoma cepedianum</i>	A	○	○		○	○		○	○	○	○	○		●	○	√		○	√		√	√
	S																					
	J	○	○								na	na		●	○	√		○			√	
	L																					
Bay anchovy <i>Anchoa mitchilli</i>	A	○	●		●	●		●	●	●	na	●		●	●	○		●	○		●	○
	S		●						●	●		●		○	●	○		●	○		●	○
	J	○	●		●	●		●	●	●	na	●		●	●	○		●	○		●	○
	L	○	●		○	○		○	●	●		●		●	○	○		●	○		●	○
Hardhead catfish <i>Arius felis</i>	A	○	●		√	○		○	●	●	○	○			●	●		●	●		●	○
	S		○			○			●	●		na			●	●		●	●		●	○
	J	○	●		√	○		√	●	●	○	na			●	●		●	●		●	○
	L		○			○			●	●		na			●	●		●	●		●	○
Sheepshead minnow <i>Cyprinodon variegatus</i>	A	○	○		●	●		○	●	●	●	○		●	●	●		●	●		●	●
	S	○	○		●	●		○	●	●	●	○		●	●	●		●	●		●	●
	J	○	●		●	●		○	●	●	●	○		●	●	●		●	●		●	●
	L	○	○		●	●		○	●	●	●	○		●	●	●		●	●		●	●
Gulf killifish <i>Fundulus grandis</i>	A	○	○		○	●		○	●	●	●	○		●	●	●		●	●		●	○
	S		○			●			●	●		○			●	●		●	●		●	○
	J	○	●		○	●		○	●	●	●	●		○	●	●		●	●		●	○
	L	√	○		√	●		√	●	●	√	○			●	●		●	●		●	○
Silversides <i>Menidia</i> species	A	○	●		○	●		●	●	○	●	●		●	●	√		●	√		●	○
	S	○	●		○	●		●	●		●	●		●	●			●			●	√
	J	○	●		○	●		●	●	○	●	●		●	●	√		●	√		●	○
	L	○	●		○	●		●	●		●	●		●	●			●			●	√
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Gizzard shad	A		○	√			√			⊙
<i>Dorosoma cepedianum</i>	S									
	J		○							⊙
	L									
	E									
Bay anchovy	A		●	○			●			●
<i>Anchoa mitchilli</i>	S		●	○			●			●
	J		●	○			●			●
	L		●	○			●			●
	E		●	○			●			●
Hardhead catfish	A		⊙	○			⊙			●
<i>Arius felis</i>	S		⊙	○			⊙			●
	J		⊙	○			●			●
	L		⊙	○			⊙			●
	E		⊙	○			⊙			●
Sheepshead minnow	A		⊙	⊙			●			⊙
<i>Cyprinodon variegatus</i>	S		⊙	⊙			●			⊙
	J		⊙	⊙			●			●
	L		⊙	⊙			●			⊙
	E		⊙	⊙			●			⊙
Gulf killifish	A		○	○			⊙			⊙
<i>Fundulus grandis</i>	S		○	○			⊙			⊙
	J		○	○			⊙			⊙
	L		○	○			⊙			⊙
	E		○	○			⊙			⊙
Silversides	A		⊙	○			●			●
<i>Menidia</i> species	S		⊙	○			●			●
	J		⊙	○			●			●
	L		⊙	○			●			●
	E		⊙	○			●			●
		* <td>M<td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td></td>	M <td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td>	S <td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td>	* <td>*<td>S<td>*<td>*<td>S</td></td></td></td></td>	* <td>S<td>*<td>*<td>S</td></td></td></td>	S <td>*<td>*<td>S</td></td></td>	* <td>*<td>S</td></td>	* <td>S</td>	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- ⊙ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																										
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay								
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
Snook	A	√	○	○	○	●	●	○	○		○	●	●	○	○	○	○	○	○	○	○	○	○	○	○			
<i>Centropomus undecimalis</i>	S					●	●					√				●												
	J	○	○	○	●	●	○	●	●		●	●	●	○		○	○	○										
	L				○	○	●	○	○		○	√	○			●	●											
	E						●					√	○			●	●											
Bluefish	A		○	○		○	○					√	○			○		○	○			○	○					
<i>Pomatomus saltatrix</i>	S																											
	J		√	√		√	√					○	○			√		○	○			○	○					
	L																											
	E																											
Blue runner	A			√			○					√	○			○			○					○				
<i>Caranx crysos</i>	S																											
	J			√			○					√	○			○			○					○				
	L																											
	E																											
Creville jack	A		●	●		○	○	√	○			●	●		√	●	√	○	○			○	○					
<i>Caranx hippos</i>	S																											
	J	√	●	●	√	○	○	√	○			○	○		○	●	√	○	○			○	○					
	L																											
	E																											
Florida pompano	A			●			○						●			○			√					○				
<i>Trachinotus carolinus</i>	S																											
	J			●			○						●			○	○		√					○				
	L																											
	E																											
Gray snapper	A												○				√	○	○	√	○	○	√	○	○			
<i>Lutjanus griseus</i>	S																											
	J	√	●	●	○	○	○		√		√	√	○		√	○	√	○	○	√	○	○	√	○	○			
	L																											
	E																											
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay								
		Gulf of Mexico Estuaries																										

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																										
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound								
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
Snook	A	○	○	○																								
<i>Centropomus undecimalis</i>	S																											
	J																											
	L																											
	E																											
Bluefish	A		○	○		●	●		●	●		○	○		○	○		○	○						○			
<i>Pomatomus saltatrix</i>	S		○	○		○	○		○	○		○	○		○	○		○	○						○			
	J																											
	L																											
	E																											
Blue runner	A			○		●			○			○			○				○			○		○	○			
<i>Caranx crysos</i>	S			○		○			○			○			○				○			○		○	○			
	J																							○				
	L																							○				
	E																							○				
Creville jack	A		○	○		○	○		○	○		○	○		○	○			○			√	○	○	○			
<i>Caranx hippos</i>	S		○	○		○	○		○	○		○	○	√	○	○		○	○	√	○		√	○	○			
	J																							○				
	L																							○				
	E																							○				
Florida pompano	A						○			○		√	√					√	○			√		○	○			
<i>Trachinotus carolinus</i>	S						○					√	○		○	○		√	○	√		√		○	○			
	J																							○				
	L																							○				
	E																							○				
Gray snapper	A		√	√		√	○	√	○	○	●	○					√	√	√									
<i>Lutjanus griseus</i>	S		√	√	√	○	○	○	○	○	○	○	√	○	○		√	○	○									
	J																											
	L																											
	E																											
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound								
		Gulf of Mexico Estuaries																										

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays		
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*
Snook	A															√						
<i>Centropomus undecimalis</i>	S																					
	J																					
	L																					
	E																					
Bluefish	A											√										
<i>Pomatomus saltatrix</i>	S											√	√		√	○		√	√		√	
	J											√										
	L																					
	E																					
Blue runner	A																					
<i>Caranx crysos</i>	S																					
	J																					
	L																					
	E																					
Creville jack	A																					
<i>Caranx hippos</i>	S																					
	J	○	○			○					○											
	L																					
	E																					
Florida pompano	A																					
<i>Trachinotus carolinus</i>	S																					
	J																					
	L																					
	E																					
Gray snapper	A																					
<i>Lutjanus griseus</i>	S																					
	J																					
	L																					
	E																					
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays		
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- ◎ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																										
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay								
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S						
Snook	A									√				√	√	√					√	√	√					
<i>Centropomus undecimalis</i>	S									√				√	√	√					√	√	√					
	J																						√	√	√	√		
	L																											
	E																											
Bluefish	A																		√		√	√						
<i>Pomatomus saltatrix</i>	S		√			√		√	√	○	na	○			√	√					√	√						
	J																						√	√				
	L																											
	E																											
Blue runner	A									√																		
<i>Caranx crysos</i>	S									√																		
	J																											
	L																											
	E																											
Crevalle jack	A				√	√		√	√	√					○	○		○	○		○	○		○	○			
<i>Caranx hippos</i>	S		○			√			○	○		○			○	○		○	○		○	○		○	○			
	J																											
	L																											
	E																											
Florida pompano	A																		○		√	√						
<i>Trachinotus carolinus</i>	S		○							○						○		○			√	○						
	J																											
	L																											
	E																											
Gray snapper	A															√					√	√						
<i>Lutjanus griseus</i>	S		√							√						√		√			√	√						
	J																											
	L																											
	E																											
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S						
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay								
		Gulf of Mexico Estuaries																										

Relative Abundance

- Highly Abundant
- ⊙ Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Snook	A		√	√			√			
	S			√			√			
<i>Centropomus undecimalis</i>	J		√	√			○			
	L			√			√			
	E			√			√			
Bluefish	A		√	√						
	S									
<i>Pomatomus saltatrix</i>	J		√	√						
	L									
	E									
Blue runner	A									
	S									
<i>Caranx crysos</i>	J									
	L									
	E									
Creville jack	A		○	○			○			○
	S									
<i>Caranx hippos</i>	J		○	○			●			○
	L									
	E									
Florida pompano	A		√	√			○			√
	S									
<i>Trachinotus carolinus</i>	J		√	○			●			√
	L									
	E									
Gray snapper	A		√	√			√			√
	S									
<i>Lutjanus griseus</i>	J		√	√			○			√
	L									
	E									
		* <td>M<td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td></td>	M <td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td>	S <td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td>	* <td>*<td>S<td>*<td>*<td>S</td></td></td></td></td>	* <td>S<td>*<td>*<td>S</td></td></td></td>	S <td>*<td>*<td>S</td></td></td>	* <td>*<td>S</td></td>	* <td>S</td>	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- ⊙ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Sheepshead	A	√	○	○	√	○	○		√			√	√		○	○		○	○		√	√		√	√
<i>Archosargus probatocephalus</i>	S														√										
	J	√	○	○	○	○	○	√	√		√	√	√	○	○	○	○	○	○	√	√	√	√	√	
	L		√	○		√	○		√			√	√		○	○	○		○		√	√		√	
Pinfish	A	√	●	●		●	●	√	○		√	⊙	●		●	●	√	●	●		⊙	⊙		⊙	⊙
	S																								
	J	√	⊙	●	○	⊙	○	○	●		√	●	●		●	●	√	●	●	○	⊙	⊙		⊙	⊙
Silver perch	A	√	○	○	√	○	○	√	⊙		√	⊙	⊙	√	⊙	⊙	√	⊙	⊙	√	○	○		○	○
	S					⊙	⊙		⊙			●	●		●	●		⊙	⊙		○	○		○	○
	J	√	○	⊙	√	○	⊙	√	⊙		√	⊙	⊙	√	⊙	⊙	√	○	○	√	○	○		○	○
Sand seatrout	A					○	○	√	√		○	⊙	●	√	⊙	⊙	√	○	⊙	√	○	⊙		○	⊙
	S								√			√	⊙		⊙	⊙									
	J			√		⊙	○	⊙	●		○	⊙	●	√	⊙	⊙	√	●	●	√	●	●		○	○
Spotted seatrout	A		⊙	⊙		○	○		○			⊙	⊙		○	○	√	⊙	⊙	√	○	○		○	○
	S		⊙	⊙		○	○		○			⊙	⊙		○	○		⊙	⊙		○	○		○	○
	J		⊙	⊙		○	○	√	○			⊙	⊙		○	○	√	⊙	⊙	√	○	○		○	○
Spot	A							√	√			√	√		⊙	⊙	√	○	○	√	⊙	⊙		○	○
	S																								
	J			○		○	○	○	○		○	○	○	⊙	●	●	○	⊙	○	○	●	●		○	○
	L						⊙						√		○	○									
	E																								
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																										
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound								
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
Sheepshead	A		○	○		○	○		○	○		○	○	√	○	●		○	●	○	○	○		○	○	○		
<i>Archosargus probatocephalus</i>	S																											
	J	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	L		○	○		○	○		○	○		○	○		○	○		○	○		○	○		○	○			
Pinfish	E						√																					
	A		●	●	√	●	●		○	○	●	●	●	√	○	○	√	●	●	√	●	●	√	●	○			
	S																											
<i>Lagodon rhomboides</i>	J	○	●	●	√	●	●	○	●	●	√	●	●	√	●	●	√	●	●	√	●	●	√	●	○			
	L			○		○	○		○	○		○	○		○	○		○	○		○	○		○	○			
	E								●	●					√	○									○			
Silver perch	A	√	●	●	√	●	●	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	●	√			
<i>Bairdiella chrysoura</i>	S		●	●		●	●		○	○		○	○		○	○		○	○		○	○		○	○			
	J	√	●	●	√	●	●	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	○	●	√			
	L		●	●		●	●		○	○		○	○		○	○		○	○		○	○		○	○			
Sand seatrout	E		●	●		●	●		○	○		○	○		○	○		○	○		○	○		○	○			
	A		●	●	√	○	○	○	●	●	√	○	○	√	○	○	√	○	○	○	○	○	○	○	○			
	S								●	●		○	○		○	○		○	○		○	○		○	○			
<i>Cynoscion arenarius</i>	J		●	●	○	●	●	○	●	●	○	○	○	√	○	○	√	○	○	○	○	○	○	○	○			
	L			○		○	○	○	○	○		○	○		○	○		○	○		○	○		○	○			
	E			○		○	○		○	○		○	○		○	○		○	○		○	○		○	○			
Spotted seatrout	A	√	○	○	√	●	●	√	●	●	√	○	○	√	○	○	√	○	○	√	○	○		○	○			
	S		○	○		√			○	○		○	○		○	○		○	○		○	○		○	○			
	J		○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○	√	○	○		○	○			
<i>Cynoscion nebulosus</i>	L		○	○		○	○		○	○		○	○	√	○	○	√	○	○	√	○	○		○	○			
	E		○	○		√	○			√		○	○		○	○		○	○		○	○		○	○			
Spot	A		○	○	√	●	●	√	○	○	√	√	√	√	○	○	√	○	○	○	○	○	○	○	○			
	S																											
	J	○	○	○	○	○	○	√	●	●	√	●	●	√	○	○	√	○	○	√	○	○	○	○	○			
<i>Leiostomus xanthurus</i>	L								○	○																		
	E								○	○																		
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound								
		Gulf of Mexico Estuaries																										

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
Sheepshead	A	○	○			○			○	○	√	○		○	●	●	○	●	●	○	○				
<i>Archosargus probatocephalus</i>	S		●			○			○	○	○	○		○	○	○	○	●	●	○	○				
	J																								
	L																								
	E																								
Pinfish	A	○	●			○																√			
<i>Lagodon rhomboides</i>	S																								
	J	○	●			●			○	○		○		√	○	●		●	●		○				
	L																								
	E																								
Silver perch	A	√	●			○			○	○		○			○	●		○	○						
<i>Bairdiella chrysoura</i>	S		○						○	○		○			○	●									
	J	√	●			○			○	○		○			○	●		●	●	○	○				
	L		○													●									
	E		○													●									
Sand seatrout	A	●	●			○			○	○					○	○		○	○	√	○				
<i>Cynoscion arenarius</i>	S		○																						
	J	○	●			●			○	○	●				●	●		●	●	●	●				
	L		○																						
	E		○																						
Spotted seatrout	A	○	●			○			●	●	●			√	○	○	√	○	●		●				
<i>Cynoscion nebulosus</i>	S		●			○			○						○	○		○	○		○				
	J	○	●			○			○	○	●			√	○	○	√	○	○		○				
	L		●			○			○						○	○		○	○		○				
	E		○			○			○						○	○		○	○		○				
Spot	A	√	○			○			○	○	●							○	○						
<i>Leiostomus xanthurus</i>	S																								
	J	○	●			○			●	●	●			○	●	●	○	●	●	●	●				
	L	√	●			○									●	●									
	E					○																			
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*			
		Lake Borgne			Lake Pontchartrain			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
Sheepshead	A	√	√		○	○			○	○	na	○		○	●	●		●	○		○	○
<i>Archosargus probatocephalus</i>	S																					
	J	√	○		○	○		○	○	○	na	○		○	●	○		○	○		○	○
	L																				○	○
	E																				○	○
Pinfish	A		○											○	○	●		√	○		●	●
<i>Lagodon rhomboides</i>	S																					
	J	√	○		○	○		○	●	●	na	●		○	●	●		●	●		●	●
	L																					
	E																					
Silver perch	A				○	○		√	○	○	na	○		○	○	○		○	√		○	○
<i>Bairdiella chrysoura</i>	S								○	○		○			○	○		○	√		○	○
	J		○		√	√		√	○	○	na	○			○	○		○	√		○	○
	L								○	○		○			○	○		○	√		○	○
	E								○	○		○			○	○		○	√		○	○
Sand seatrout	A		○						●	●					○	○					○	○
<i>Cynoscion arenarius</i>	S																				○	○
	J		○					√	○	○	na	○		○	○	○		○	○		○	○
	L		●			√		√	○	○		○		○	○	○		○	○		○	○
	E																				○	○
Spotted seatrout	A	√	○		√	√		√	○	○	na	○		√	○	○		○	○		○	○
<i>Cynoscion nebulosus</i>	S		○						○	○		○			○	○		○	○		○	○
	J	√	○		○	○		√	○	○	na	○		√	○	○		○	○		○	○
	L		○		○	√			○	○		○			○	○		○	○		○	○
	E		○			√			○	○		○			○	○		○	○		○	○
Spot	A				●	●		√	○	○	na	na		○	○	○		○	○		●	●
<i>Leiostomus xanthurus</i>	S																					
	J	√	○		○	○		○	●	○	○	●		○	●	○		●	○		●	●
	L																					
	E																					
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Sheepshead	A		○	○			○			○
	S		○	○						√
<i>Archosargus probatocephalus</i>	J		○	○			●			○
	L		○	○						√
	E		○	○						√
Pinfish	A		●	●			●			○
	S									
<i>Lagodon rhomboides</i>	J		●	●			●			●
	L									
	E									
Silver perch	A		○	○			○			●
	S		○	○			○			●
<i>Bairdiella chrysoura</i>	J		○	○			●			●
	L		○	○			○			●
	E		○	○			○			●
Sand seatrout	A		●	●			√			○
	S			○						
<i>Cynoscion arenarius</i>	J		●	○			√			○
	L			○						
	E			○						
Spotted seatrout	A		○	○			○			○
	S		○	○			○			○
<i>Cynoscion nebulosus</i>	J		○	○			○			○
	L		○	○			○			○
	E		○	○			○			○
Spot	A		●	●			●			○
	S									
<i>Leiostomus xanthurus</i>	J		●	●			●			●
	L									
	E									
		*	M	S	*	*	S	*	*	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																								
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay						
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
Atlantic croaker	A																○	○	○		○	○				
<i>Micropogonias undulatus</i>	S							√	√		○	○	√		√	√	○	○	○	○	○	○				
	J			√			√	√	√										○							
	L																		○							
	E																									
Black drum	A		○	○		○	○		○			○	○		○	○		○	○		○	○				
<i>Pogonias cromis</i>	S	√	√	√	√	√	√	√	○		√	○	○	√	○	○	√	○	○	○	√	○	○			
	J		√	○		○	○		○			○	○		○	○		○	○		○	○				
	L		√	○		○	○		○			○	○		○	○		○	○		○	○				
	E			√		√	√								√	√										
Red drum	A		√	√		√	√	√	√			√	○	√	○	○		○	○	√	○	○				
<i>Sciaenops ocellatus</i>	S	√	○	○	√	√	√	○	⊗		○	⊗	⊗	○	⊗	⊗		○	○	○	√	○	○	√	○	○
	J			○		√	√		○			○	○		○	○			○		○	○		○	○	
	L			√		√	√		○			○	○		○	○			○		○	○		○	○	
	E											√	√		√	√								√	√	
Striped mullet	A	○	⊗	⊗	○	⊗	⊗	○	○		○	⊗	⊗	○	○	○	○	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
<i>Mugil cephalus</i>	S	○	⊗	⊗	○	⊗	⊗	⊗	⊗		⊗	⊗	⊗	⊗	⊗	⊗	○	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
	J		⊗	⊗	○	⊗	⊗	⊗	⊗		⊗	⊗	⊗	⊗	⊗	⊗	○	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	
	L			○									√					○	○						○	
	E																									
Code goby	A	√	⊗	⊗	√	⊗	⊗	√	⊗		√	⊗	⊗	√	⊗	⊗	√	○	○		○	○				
<i>Gobiosoma robustum</i>	S		⊗	⊗		⊗	⊗		⊗			⊗	⊗		○	⊗		○	○		○	○				
	J	√	⊗	⊗	√	⊗	⊗	√	⊗		√	⊗	⊗	√	⊗	⊗	√	○	○		○	○				
	L		⊗	⊗		⊗	⊗		⊗			⊗	⊗		⊗	⊗		○	○		○	○				
	E		⊗	⊗		⊗	⊗		⊗			⊗	⊗		⊗	⊗		○	○		○	○				
Spanish mackerel	A		○	○		○	○		√			√	○			○		√	√		√	√				
<i>Scomberomorus maculatus</i>	S																									
	J		○	○	√	○	○		√			○	○		√	√		√	○		√	√				
	L																									
	E																									
		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay						
		Gulf of Mexico Estuaries																								

Relative Abundance

- Highly Abundant
- ⊗ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																								
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound						
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
Atlantic croaker	A		●	●		●	●		●	●		●	●		○	○		●	●	○	●	●		○	●	●
<i>Micropogonias undulatus</i>	S																									
	J	●	●	●	√	●	●	○	●	●	●	●	●	○	○	○	●	●	●	●	●	○	●	●	○	
	L		●	●		○	○		●	●		○	●		√	○		√	●	○	●	●	○	●	○	
Black drum	E																									
	A		○	○		○	○		○	○		○	○		√	○	√	○	○		○	○		○	○	
	S																									
<i>Pogonias cromis</i>	J	√	○		√	○	○	√	○	○	√	○	○	√	○	○	√	○	○		○	○		○	○	
	L		○	○		○	○		○	○		○	○		○	○		○	○		○	○		○	○	
	E					√	√																			
Red drum	A	√	○	○		○	●	√	○	○		○	○			√	√	○	√		○	○		○	○	
<i>Sciaenops ocellatus</i>	S			√						√						√										
	J	√	○	○	√	○	○	√	○	○	√	○	○		○	○	√	○	○	√	○		○	○		
	L		√	○		√	○		○	○		√	○			√		○	○		○	○		○	○	
Striped mullet	E			√		√	√			√			√			√			√		○	○		○	○	
	A	●	●	●	○	●	●	○	●	●	●	●	●	√	○	○	●	●	●	○	●	●		○	○	
	S																									
<i>Mugil cephalus</i>	J	●	●	○	○	●	●	○	●	●	●	●	●	√	●	●	●	●	●	○	●	●		○	○	
	L			○		○	○		○	○		○	○		○	○		○	○		○	○		○	○	
	E																									
Code goby	A	√	○	○	√	●	●	√	○	○	√	○	○		√	√					○	○		○	○	
<i>Gobiosoma robustum</i>	S		○	○		○	○		○	○		○	○		√	√					○	○		○	○	
	J	√	○	○	√	○	○	√	○	○	√	○	○		√	√					○	○		○	○	
	L		○	○		○	○		○	○		○	○		√	√					○	○		○	○	
Spanish mackerel	E		○	○		○	○		○	○		○	○		√	√					○	○		○	○	
	A		√	√		√	●		○	○		○	○		○	○		○	○					○	○	
	S																									
<i>Scomberomorus maculatus</i>	J		√	√		√	○		○	○		○	○													
	L																									
	E																									
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound						
		Gulf of Mexico Estuaries																								

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Lake Borgne			Lake Pontchar-train			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*	T	M	*
Atlantic croaker	A	○	○			○			○	○															
<i>Micropogonias undulatus</i>	S	●	●			●			●	●		●		○	●	●	○	●	●	●	●	●		○	
	J	√	○																						
	L	○	○																						
	E																								
Black drum	A	√	○			○			○	○	√	○		√	○	○		○	○	○		○		○	
<i>Pogonias cromis</i>	S	√	○			○			○	○	√	○		√	○	○		○	○	○	√	○			
	J		○																						
	L		○																						
	E																								
Red drum	A		○						○	○				√	√	○		√	√			√			
<i>Sciaenops ocellatus</i>	S		○						○	○				○	○	○	√	○	○	○		○		○	
	J	○	○			○			○	○	○	○		○	○	○		○	○	○	○	○	○	○	
	L		○																						
	E																								
Striped mullet	A	○	●			○			○	○	○	○		√	○	○	○	○	○	○	○	○		○	
<i>Mugil cephalus</i>	S	○	○			○			○	○	○	○		√	○	○	○	○	○	○	○	○	○	○	
	J		○			○																			
	L		○																						
	E																								
Code goby	A		○			○										√									
<i>Gobiosoma robustum</i>	S		○			○																			
	J		○			○																			
	L		○			○																			
	E		○			○																			
Spanish mackerel	A									○						○		√	√						
<i>Scomberomorus maculatus</i>	S									○						○									
	J		√			√			○	○	√				○	○		○	○	○	○	○	○	○	
	L																								
	E																								
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*	T	M	*
		Lake Borgne			Lake Pontchar-train			Breton/Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/Timbalier Bays			Atchafalaya/Vermilion Bays					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
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Salinity Zone

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Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																					
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay			
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S	
Atlantic croaker <i>Micropogonias undulatus</i>		A S J L E	○	●		●	●		√	○	○	na	na		●	●	●		●	●		●	○
Black drum <i>Pogonias cromis</i>		A S J L E		○			√			○	○		○			○	○		○	○		○	○
Red drum <i>Sciaenops ocellatus</i>		A S J L E				√	√		√	○	○	na	na		√	√	○		√	√		√	√
Striped mullet <i>Mugil cephalus</i>		A S J L E				○	○		○	○	○	na	○		○	●	●		○	○		○	○
Code goby <i>Gobiosoma robustum</i>		A S J L E									√		na			○	○		√	√		○	○
Spanish mackerel <i>Scomberomorus maculatus</i>		A S J L E					○												√			√	
			T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S
			Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay		
			Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present
- na No Data Available

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Atlantic croaker	A		●	○			●			●
<i>Micropogonias undulatus</i>	S									
	J		●	●			●			●
	L		○	●			●			
	E									
Black drum	A		○	○			○			●
<i>Pogonias cromis</i>	S			○			○			●
	J		○	○			○			●
	L			○			○			●
	E			○			○			●
Red drum	A		√	√			√			√
<i>Sciaenops ocellatus</i>	S									
	J		○	○			○			○
	L									
	E									
Striped mullet	A		○	○			○			●
<i>Mugil cephalus</i>	S						○			
	J		●	●			●			●
	L						○			
	E						○			
Code goby	A		○	○			●			●
<i>Gobiosoma robustum</i>	S		○	○			●			●
	J		○	○			●			●
	L		○	○			●			●
	E		○	○			●			●
Spanish mackerel	A		√	√						
<i>Scomberomorus maculatus</i>	S									
	J		√	√			√			
	L									
	E									
		* <th>M</th> <th>S</th> <td>*<th>*</th><th>S</th><td>*<th>*</th><th>S</th></td></td>	M	S	* <th>*</th> <th>S</th> <td>*<th>*</th><th>S</th></td>	*	S	* <th>*</th> <th>S</th>	*	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
 ◎ Abundant
 ○ Common
 √ Rare
 Blank Not Present

Salinity Zone

- T - Tidal Fresh
 M - Mixing
 S - Seawater
 * - Salinity zone not present

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																								
		Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay						
Species/Life Stage		T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	
Gulf flounder <i>Paralichthys albigutta</i>	A		○	○		○	○		√			○	○		○	○		○	○		○	○		○	○	
	S								√			○	○		○	○		○	○		○	○		○	○	
	J		○	○		○	○		√			○	○		○	○		○	○		○	○		○	○	
	L		○	○								√	○					√	○		√	○		○	○	
Southern flounder <i>Paralichthys lethostigma</i>	A			√			√				√	√	√	√	√	√	○	○	○	○	○	○		○	○	
	S										√	√	√	√	√	√	○	○	○	○	○	○		○	○	
	J			√			√				√	√	√	√	√	√	○	○	√	○	○	○		○	√	
	L											√	√	√			√		○		○	○		○	○	
	E																									
			T	M	S	T	M	S	T	M	*	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
			Florida Bay			Ten Thousand Islands			Caloosa-hatchee River			Charlotte Harbor			Tampa Bay			Suwannee River			Apalachee Bay					
		Gulf of Mexico Estuaries																								

Relative Abundance

- Highly Abundant
- ◎ Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																							
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
Species/Life Stage		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
Gulf flounder <i>Paralichthys albigutta</i>	A		√	○		○	●		○	○		○	○		√	○		√	√		√	○			
	S																								
	J		√	○		○	●		○	○		○	○		○	○		√	○		√	○			
	L		√	○			○			○			○			○			○		√	○			
Southern flounder <i>Paralichthys lethostigma</i>	A	○	○	○	○	○	○	√	○	○	○	○	○	√	○	○	○	○	○	√	●	●			
	S																								
	J	○	○	√	○	○	○	○	○	○	○	○	√	○	○	○	○	○	○	√	●	○			
	L		○	○		○	○		○	○		○	○		○	○		○	○		●	○			
		T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S			
		Apalachi- cola Bay			St. Andrew Bay			Choctaw- hatchee Bay			Pensacola Bay			Perdido Bay			Mobile Bay			Mississippi Sound					
		Gulf of Mexico Estuaries																							

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																				
		Lake Borgne			Lake Pontchar-train			Breton/ Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/ Timbalier Bays			Atchafalaya/ Vermilion Bays		
Species/Life Stage		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*
Gulf flounder	A																					
<i>Paralichthys albigutta</i>	S																					
	J																					
	L																					
	E																					
Southern flounder	A	√	○			○			●	●		●			○	●		○	●	○	○	
<i>Paralichthys lethostigma</i>	S														○	●						
	J	√	○			○			○	○		●			○	●		○	○	○	○	
	L															○						
	E																					
		T	M	*	*	M	*	*	M	S	T	M	*	T	M	S	T	M	S	T	M	*
		Lake Borgne			Lake Pontchar-train			Breton/ Chandeleur Sounds			Mississippi River			Barataria Bay			Terrebonne/ Timbalier Bays			Atchafalaya/ Vermilion Bays		
		Gulf of Mexico Estuaries																				

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries																					
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay			
Species/Life Stage		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S	
Gulf flounder <i>Paralichthys albigutta</i>	A									√					√	√				√		√	√
	S																						
	J									√					√	√		√	√		√	√	
	L																						
Southern flounder <i>Paralichthys lethostigma</i>	A		○		●	●		○	⊙	●	na	○		○	⊙	○		○	⊙		○	○	
	S																						
	J		⊙		○	○		○	○	○	na	○		○	○	○		○	○		○	○	
	L																						
		T	M	*	T	M	*	T	M	S	T	M	*	T	M	S	*	M	S	*	M	S	
		Calcasieu Lake			Sabine Lake			Galveston Bay			Brazos River			Matagorda Bay			San Antonio Bay			Aransas Bay			
		Gulf of Mexico Estuaries																					

Relative Abundance

●	Highly Abundant
●	Abundant
○	Common
√	Rare
Blank	Not Present
na	No Data Available

Salinity Zone

T	Tidal Fresh
M	Mixing
S	Seawater
*	Salinity zone not present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 4, continued. Spatial distribution and relative abundance

		Gulf of Mexico Estuaries								
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
Species/Life Stage		*	M	S	*	*	S	*	*	S
Gulf flounder <i>Paralichthys albigutta</i>	A		√	√			√			
	S									
	J		√	√			√			√
	L E									
Southern flounder <i>Paralichthys lethostigma</i>	A		○	○			○			○
	S									
	J		○	○			●			○
	L E									
		* <td>M<td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td></td>	M <td>S<td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td></td>	S <td>*<td>*<td>S<td>*<td>*<td>S</td></td></td></td></td></td>	* <td>*<td>S<td>*<td>*<td>S</td></td></td></td></td>	* <td>S<td>*<td>*<td>S</td></td></td></td>	S <td>*<td>*<td>S</td></td></td>	* <td>*<td>S</td></td>	* <td>S</td>	S
		Corpus Christi Bay			Laguna Madre			Baffin Bay		
		Gulf of Mexico Estuaries								

Relative Abundance

- Highly Abundant
- Abundant
- Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 5. Temporal distribution

Index to Table 5. Page location of temporal distribution table for each species and estuary.

Common and Scientific Name	Estuary											
	Florida Bay	Ter. Thousand Islands	Charlotte Harbor	Caloosahatchee River	Tampa Bay	Suwannee River	Apalachicola Bay	Apalachicola Bay	St. Andrew Bay	Chocowatchee Bay	Pensacola Bay	Panola Bay
Bay scallop (<i>Argopecten irradians</i>)												
American oyster (<i>Crassostrea virginica</i>)												
Common rangia (<i>Rangia cuneata</i>)												
Hard clam (<i>Mercenaria species</i>)	62	63	64	65	66	67	68	69	70	71	72	
Bay squid (<i>Lolliguncula brevis</i>)												
Brown shrimp (<i>Penaeus aztecus</i>)												
Pink shrimp (<i>Penaeus duorarum</i>)												
White shrimp (<i>Penaeus setiferus</i>)												
Grass shrimp (<i>Palaemonetes pugio</i>)												
Spiny lobster (<i>Panulirus argus</i>)	73	74	75	76	77	78	79	80	81	82	83	
Blue crab (<i>Callinectes sapidus</i>)												
Gulf stone crab (<i>Menippe adina</i>)												
Stone crab (<i>Menippe mercenaria</i>)												
Bull shark (<i>Carcharhinus leucas</i>)												
Tarpon (<i>Megalops atlanticus</i>)												
Alabama shad (<i>Alosa alabamae</i>)	84	85	86	87	88	89	90	91	92	93	94	
Gulf menhaden (<i>Brevoortia patronus</i>)												
Yellowfin menhaden (<i>Brevoortia smithi</i>)												
Gizzard shad (<i>Dorosoma cepedianum</i>)												
Bay anchovy (<i>Anchoa mitchilli</i>)												
Hardhead catfish (<i>Arius felis</i>)	95	96	97	98	99	100	101	102	103	104	105	
Sheepshead minnow (<i>Cyprinodon variegatus</i>)												
Gulf killifish (<i>Fundulus grandis</i>)												
Silversides (<i>Menidia species</i>)												
Snook (<i>Centropomus undecimalis</i>)												
Bluefish (<i>Pomatomus saltatrix</i>)												
Blue runner (<i>Caranx crysos</i>)	106	107	108	109	110	111	112	113	114	115	116	
Crevalle jack (<i>Caranx hippos</i>)												
Florida pompano (<i>Trachinotus carolinus</i>)												
Gray snapper (<i>Lutjanus griseus</i>)												
Sheepshead (<i>Archosargus probatocephalus</i>)												
Pinfish (<i>Lagodon rhomboides</i>)												
Silver perch (<i>Bairdiella chrysoura</i>)	117	118	119	120	121	122	123	124	125	126	127	
Sand seatrout (<i>Cynoscion arenarius</i>)												
Spotted seatrout (<i>Cynoscion nebulosus</i>)												
Spot (<i>Leiostomus xanthurus</i>)												
Atlantic croaker (<i>Micropogonias undulatus</i>)												
Black drum (<i>Pogonias cromis</i>)												
Red drum (<i>Sciaenops ocellatus</i>)	128	129	130	131	132	133	134	135	136	137	138	
Striped mullet (<i>Mugil cephalus</i>)												
Code goby (<i>Gobiosoma robustum</i>)												
Spanish mackerel (<i>Scomberomorus maculatus</i>)												
Gulf flounder (<i>Paralichthys albigutta</i>)	139	140	141	142	143	144	145	146	147	148	149	
Southern flounder (<i>Paralichthys lethostigma</i>)												

Table 5. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Florida Bay				Ten Thousand Islands				Caloosahatchee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria</i> species	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay				Ten Thousand Islands				Caloosahatchee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Charlotte Harbor					Tampa Bay					Suwannee River													
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A																								
	S																								
	J																								
	L																								
	E																								
American oyster <i>Crassostrea virginica</i>	A																								
	S																								
	J																								
	L																								
	E																								
Common rangia <i>Rangia cuneata</i>	A																								
	S																								
	J																								
	L																								
	E																								
Hard clam <i>Mercenaria</i> species	A																								
	S																								
	J																								
	L																								
	E																								
Bay squid <i>Lolliguncula brevis</i>	A																								
	S																								
	J																								
	L																								
	E																								
Brown shrimp <i>Penaeus aztecus</i>	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor					Tampa Bay					Suwannee River													

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria</i> species	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria species</i>	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria species</i>	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria species</i>	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Common rangia <i>Rangia cuneata</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Hard clam <i>Mercenaria</i> species	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Bay squid <i>Lolliguncula brevis</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brown shrimp <i>Penaeus aztecus</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
		J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			

Relative Abundance

■	Highly Abundant
■	Abundant
■	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A									.....			
	S									.....			
	J									.....			
	L									.....			
	E									.....			
American oyster <i>Crassostrea virginica</i>	A	=====								=====			
	S		=====							=====			
	J	=====								=====			
	L		=====							=====			
	E		=====							=====			
Common rangia <i>Rangia cuneata</i>	A	=====								=====			
	S		=====							=====			
	J	=====								=====			
	L		=====							=====			
	E		=====							=====			
Hard clam <i>Mercenaria species</i>	A									=====			
	S									=====			
	J									=====			
	L									=====			
	E									=====			
Bay squid <i>Lolliguncula brevis</i>	A									=====			
	S									=====			
	J									=====			
	L									=====			
	E									=====			
Brown shrimp <i>Penaeus aztecus</i>	A									=====			
	S									=====			
	J									=====			
	L									=====			
	E									=====			
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

Relative Abundance

=====	Highly Abundant
=====	Abundant
=====	Common
.....	Rare
Blank	Not Present

Life Stage

A	- Adults
S	- Spawning adults
J	- Juveniles
L	- Larvae
E	- Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A	na											
	S	na											
	J	na											
	L	na											
	E	na											
Common rangia <i>Rangia cuneata</i>	A	na											
	S	na											
	J	na											
	L	na											
	E	na											
Hard clam <i>Mercenaria species</i>	A	na											
	S	na											
	J	na											
	L	na											
	E	na											
Bay squid <i>Lolliguncula brevis</i>	A												
	S	na											
	J												
	L	na											
	E	na											
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present
na	No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria</i> species	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Bay scallop <i>Argopecten irradians</i>	A												
	S												
	J												
	L												
	E												
American oyster <i>Crassostrea virginica</i>	A												
	S												
	J												
	L												
	E												
Common rangia <i>Rangia cuneata</i>	A												
	S												
	J												
	L												
	E												
Hard clam <i>Mercenaria</i> species	A												
	S												
	J												
	L												
	E												
Bay squid <i>Lolliguncula brevis</i>	A												
	S												
	J												
	L												
	E												
Brown shrimp <i>Penaeus aztecus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Florida Bay				Ten Thousand Islands				Caloosahatchee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A												
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Spiny lobster <i>Panulirus argus</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue crab <i>Callinectes sapidus</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay				Ten Thousand Islands				Caloosahatchee River			

Relative Abundance

■	Highly Abundant
■	Abundant
□	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Charlotte Harbor				Tampa Bay				Suwannee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A												
	S												
	J												
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor				Tampa Bay				Suwannee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A									.....			
	S												
	J												
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
White shrimp <i>Penaeus setiferus</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grass shrimp <i>Palaemonetes pugio</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spiny lobster <i>Panulirus argus</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue crab <i>Callinectes sapidus</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf stone crab <i>Menippe adina</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	E	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

■	Highly Abundant
▨	Abundant
□	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A																								
	S																								
	J	■																							
	L																								
	E																								
White shrimp <i>Penaeus setiferus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Grass shrimp <i>Palaemonetes pugio</i>	A																								
	S																								
	J																								
	L																								
	E																								
Spiny lobster <i>Panulirus argus</i>	A																								
	M																								
	J																								
	L																								
	E																								
Blue crab <i>Callinectes sapidus</i>	A																								
	M																								
	J																								
	L																								
	E																								
Gulf stone crab <i>Menippe adina</i>	A																								
	M																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne															

Relative Abundance

■	Highly Abundant
▤	Abundant
□	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A												
	S												
	J	.....											
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Barataria Bay												Terrebonne/Timbalier Bay												Atchafalaya/Vermilion Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A																																				
	S																																				
	J									.....												.....															
	L																																				
	E																																				
White shrimp <i>Penaeus setiferus</i>	A									.....																											
	S																																				
	J																																				
	L																																				
	E	.....																																			
Grass shrimp <i>Palaemonetes pugio</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spiny lobster <i>Panulirus argus</i>	A																																				
	M																																				
	J																																				
	L																																				
	E																																				
Blue crab <i>Callinectes sapidus</i>	A																																				
	M																																				
	J																																				
	L																																				
	E																																				
Gulf stone crab <i>Menippe adina</i>	A	.....												...												.....											
	M																									.....											
	J																																				
	L																																				
	E																																				
		J	F	M	A	M	J <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th>	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay												Terrebonne/Timbalier Bay												Atchafalaya/Vermilion Bay											

Relative Abundance

 Highly Abundant
 Abundant
 Common
 Rare
Blank Not Present

Life Stage

A - Adults
S - Spawning adults
J - Juveniles
L - Larvae
E - Eggs
M - Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A									.....			
	S												
	J									.....			
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A	■					■	.....	■	■	■	■	■
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■	■	■	■	■	■
Gulf stone crab <i>Menippe adina</i>	A	.....								.....			
	M									.....			
	J	.....								.....			
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

Relative Abundance

■	Highly Abundant
■	Abundant
■	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A												
	S												
	J												
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present
na	No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A												
	S												
	J												
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L												
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

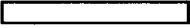
Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Pink shrimp <i>Penaeus duorarum</i>	A	.....											
	S												
	J	... 											
	L												
	E												
White shrimp <i>Penaeus setiferus</i>	A												
	S												
	J												
	L	.....											
	E												
Grass shrimp <i>Palaemonetes pugio</i>	A												
	S												
	J												
	L												
	E												
Spiny lobster <i>Panulirus argus</i>	A												
	M												
	J												
	L												
	E												
Blue crab <i>Callinectes sapidus</i>	A												
	M												
	J												
	L												
	E												
Gulf stone crab <i>Menippe adina</i>	A												
	M	 											
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																					
Estuary / Month		Florida Bay												Ten Thousand Islands												Caloosahatchee River													
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
Stone crab <i>Menippe mercenaria</i>	A																																						
	M	 												 																									
	J																																						
	L																																						
	E																																						
Bull shark <i>Carcharhinus leucas</i>	A													 												 													
	M																																						
	J													 																									
	P																									 													
Tarpon <i>Megalops atlanticus</i>	A	 																																					
	S																																						
	J																																						
	L																																						
Alabama shad <i>Alosa alabamiae</i>	A																																						
	S																																						
	J																																						
	L																																						
Gulf menhaden <i>Brevoortia patronus</i>	A																																						
	S																																						
	J																																						
	L																																						
Yellowfin menhaden <i>Brevoortia smithi</i>	A																																						
	S																																						
	J	 												 																									
	L	 												 																									
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
		Florida Bay														Ten Thousand Islands												Caloosahatchee River											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Charlotte Harbor				Tampa Bay				Suwannee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
	E												
Alabama shad <i>Alosa alabamiae</i>	A												
	S												
	J												
	L												
	E												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
	E												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor				Tampa Bay				Suwannee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
Alabama shad <i>Alosa alabamiae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	P	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alabama shad <i>Alosa alabamae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

.....	Highly Abundant
.....	Abundant
.....	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A	.....											
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
Alabama shad <i>Alosa alabamiae</i>	A	.....											
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
Alabama shad <i>Alosa alabamae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
Alabama shad <i>Alosa alabamae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Calcasieu Lake												Sabine Lake												Galveston Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Stone crab	A																																				
	M																																				
<i>Menippe</i>	J																																				
<i>mercenaria</i>	L																																				
	E																																				
Bull shark	A	.....																								.....											
	M																																				
<i>Carcharhinus</i>	J	.....												.....												..... .....											
<i>leucas</i>	P	.....																																			
Tarpon	A																									.....											
	S																																				
<i>Megalops</i>	J													.....												.....											
<i>atlanticus</i>	L																																				
	E																																				
Alabama shad	A																																				
	S																																				
<i>Alosa</i>	J																																				
<i>alabamae</i>	L																																				
	E																																				
Gulf menhaden	A																																				
	S																																				
<i>Brevoortia</i>	J																																				
<i>patronus</i>	L																																				
	E																																				
Yellowfin menhaden	A																																				
	S																																				
<i>Brevoortia</i>	J																																				
<i>smithi</i>	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake												Sabine Lake												Galveston Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J				na								
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J				na								
	L												
Alabama shad <i>Alosa alabamae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present
na	No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab <i>Menippe mercenaria</i>	A												
	M												
	J												
	L												
	E												
Bull shark <i>Carcharhinus leucas</i>	A												
	M												
	J												
	P												
Tarpon <i>Megalops atlanticus</i>	A												
	S												
	J												
	L												
Alabama shad <i>Alosa alabamiae</i>	A												
	S												
	J												
	L												
Gulf menhaden <i>Brevoortia patronus</i>	A												
	S												
	J												
	L												
Yellowfin menhaden <i>Brevoortia smithi</i>	A												
	S												
	J												
	L												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Stone crab	A												
	M												
<i>Menippe</i>	J												
<i>mercenaria</i>	L												
	E												
Bull shark	A												
	M												
<i>Carcharhinus</i>	J												
<i>leucas</i>	P												
Tarpon	A												
	S												
<i>Megalops</i>	J												
<i>atlanticus</i>	L												
	E												
Alabama shad	A												
	S												
<i>Alosa</i>	J												
<i>alabamae</i>	L												
	E												
Gulf menhaden	A												
	S												
<i>Brevoortia</i>	J												
<i>patronus</i>	L												
	E												
Yellowfin menhaden	A												
	S												
<i>Brevoortia</i>	J												
<i>smithi</i>	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs
M	Mating
P	Parturition

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Florida Bay					Ten Thousand Islands					Caloosahatchee River													
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad	A																								
	S																								
<i>Dorosoma</i>	J																								
<i>cepedianum</i>	L																								
	E																								
Bay anchovy	A																								
	S																								
<i>Anchoa</i>	J																								
<i>mitchilli</i>	L																								
	E																								
Hardhead catfish	A																								
	S																								
<i>Arius</i>	J																								
<i>felis</i>	L																								
	E																								
Sheepshead minnow	A																								
	S																								
<i>Cyprinodon</i>	J																								
<i>variegatus</i>	L																								
	E																								
Gulf killifish	A																								
	S																								
<i>Fundulus</i>	J																								
<i>grandis</i>	L																								
	E																								
Silversides	A																								
	S																								
<i>Menidia</i>	J																								
species	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay					Ten Thousand Islands					Caloosahatchee River													

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Charlotte Harbor				Tampa Bay				Suwannee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia species</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor				Tampa Bay				Suwannee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia</i> species	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia species</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia species</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia</i> species	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Barataria Bay												Terrebonne/Timbalier Bay												Atchafalaya/Vermilion Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Bay anchovy <i>Anchoa mitchilli</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Hardhead catfish <i>Arius felis</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Sheepshead minnow <i>Cyprinodon variegatus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Gulf killifish <i>Fundulus grandis</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Silversides <i>Menidia species</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay												Terrebonne/Timbalier Bay												Atchafalaya/Vermilion Bay											

Relative Abundance

Highly Abundant

 Abundant

☐ Common

..... Rare

Blank Not Present

Life Stage

A - Adults

S - Spawning adults

J - Juveniles

L - Larvae

E - Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia species</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J	na											
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S	na											
	J												
	L	na											
	E	na											
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia</i> species	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present
na	No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Aransas Bay					Corpus Christi Bay					Laguna Madre													
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A																								
	S																								
	J																								
	L																								
	E																								
Bay anchovy <i>Anchoa mitchilli</i>	A																								
	S																								
	J																								
	L																								
	E																								
Hardhead catfish <i>Arius felis</i>	A																								
	S																								
	J																								
	L																								
	E																								
Sheepshead minnow <i>Cyprinodon variegatus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Gulf killifish <i>Fundulus grandis</i>	A																								
	S																								
	J																								
	L																								
	E																								
Silversides <i>Menidia</i> species	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay					Corpus Christi Bay					Laguna Madre													

Relative Abundance

Highly Abundant

 Abundant

☐ Common

..... Rare

Blank Not Present

Life Stage

A - Adults

S - Spawning adults

J - Juveniles

L - Larvae

E - Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gizzard shad <i>Dorosoma cepedianum</i>	A												
	S												
	J												
	L												
	E												
Bay anchovy <i>Anchoa mitchilli</i>	A												
	S												
	J												
	L												
	E												
Hardhead catfish <i>Arius felis</i>	A												
	S												
	J												
	L												
	E												
Sheepshead minnow <i>Cyprinodon variegatus</i>	A												
	S												
	J												
	L												
	E												
Gulf killifish <i>Fundulus grandis</i>	A												
	S												
	J												
	L												
	E												
Silversides <i>Menidia species</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Florida Bay				Ten Thousand Islands				Caloosahatchee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Creville jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay				Ten Thousand Islands				Caloosahatchee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Charlotte Harbor				Tampa Bay				Suwannee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevale jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor				Tampa Bay				Suwannee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Creville jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevalle jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevalle jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												.....
	S												
	J								.....				.....
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevalle jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

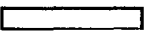
Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A	.....											
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J	...							.....				
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J								....				
	L												
	E												
Crevalle jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A												
	S												
	J												
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Creville jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A								.....				
	S												
	J								.....				
	L												
	E												
Bluefish <i>Pomatomus saltatrix</i>	A									.....			
	S												
	J								.....				
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevale jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A												
	S												
	J												
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A								.....				
	S												
	J								.....				
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook <i>Centropomus undecimalis</i>	A	.....											
	S												
	J	.....											
	L	.....											
	E	.....											
Bluefish <i>Pomatomus saltatrix</i>	A												
	S												
	J												
	L												
	E												
Blue runner <i>Caranx crysos</i>	A												
	S												
	J												
	L												
	E												
Crevalle jack <i>Caranx hippos</i>	A												
	S												
	J												
	L												
	E												
Florida pompano <i>Trachinotus carolinus</i>	A	.....											
	S												
	J	.....											
	L												
	E												
Gray snapper <i>Lutjanus griseus</i>	A	.....											
	S												
	J	.....											
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Snook	A												
	S												
<i>Centropomus undecimalis</i>	J												
	L												
	E												
Bluefish	A												
	S												
<i>Pomatomus saltatrix</i>	J												
	L												
	E												
Blue runner	A												
	S												
<i>Caranx crysos</i>	J												
	L												
	E												
Crevalle jack	A												
	S												
<i>Caranx hippos</i>	J												
	L												
	E												
Florida pompano	A												
	S												
<i>Trachinotus carolinus</i>	J												
	L												
	E												
Gray snapper	A												
	S												
<i>Lutjanus griseus</i>	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Florida Bay				Ten Thousand Islands				Caloosahatchee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay				Ten Thousand Islands				Caloosahatchee River			

Relative Abundance



Highly Abundant



Abundant



Common



Rare

Blank Not Present

Life Stage

A - Adults

S - Spawning adults

J - Juveniles

L - Larvae

E - Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Charlotte Harbor												Tampa Bay												Suwannee River											
Species / Life Stage		J F M A M J J A S O N D												J F M A M J J A S O N D												J F M A M J J A S O N D											
Sheepshead <i>Archosargus probatocephalus</i>	A	.....																																			
	S													.....																							
	J	.....																																			
	L	.....																																			
	E													.....																							
Pinfish <i>Lagodon rhomboides</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Silver perch <i>Bairdiella chrysoura</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Sand seatrout <i>Cynoscion arenarius</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spotted seatrout <i>Cynoscion nebulosus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spot <i>Leiostomus xanthurus</i>	A	.....																																			
	S																																				
	J																																				
	L	.....																																			
	E																																				
		J F M A M J J A S O N D												J F M A M J J A S O N D												J F M A M J J A S O N D											
		Charlotte Harbor												Tampa Bay												Suwannee River											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A	.....											
	S									.....			
	J	.....											
	L	.....											
	E									.....			
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay				Apalachicola Bay				St. Andrew Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A																								
	S																								
	J																								
	L									... ..															
	E																								
Pinfish <i>Lagodon rhomboides</i>	A																								
	S																								
	J																								
	L																								
	E																								
Silver perch <i>Bairdiella chrysoura</i>	A																								
	S																								
	J																								
	L																								
	E																								
Sand seatrout <i>Cynoscion arenarius</i>	A																								
	S																								
	J																								
	L																								
	E																								
Spotted seatrout <i>Cynoscion nebulosus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Spot <i>Leiostomus xanthurus</i>	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay															

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A									.....			
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A	.....											
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J	.....											
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J	.....											
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare

Blank Not Present

na No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Sheepshead <i>Archosargus probatocephalus</i>	A												
	S												
	J												
	L												
	E												
Pinfish <i>Lagodon rhomboides</i>	A												
	S												
	J												
	L												
	E												
Silver perch <i>Bairdiella chrysoura</i>	A												
	S												
	J												
	L												
	E												
Sand seatrout <i>Cynoscion arenarius</i>	A												
	S												
	J												
	L												
	E												
Spotted seatrout <i>Cynoscion nebulosus</i>	A												
	S												
	J												
	L												
	E												
Spot <i>Leiostomus xanthurus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Florida Bay												Ten Thousand Islands												Caloosahatchee River											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A																																				
	S																																				
	J	.....																								.....											
	L																																				
	E																																				
Black drum <i>Pogonias cromis</i>	A	.....												.....																							
	S	.....												.....																							
	J	.....												.....																							
	L	.....												.....																							
	E	.....												.....																							
Red drum <i>Sciaenops ocellatus</i>	A	.....																								.....											
	S																																				
	J													.....																							
	L	.....												.....																							
	E													e																							
Striped mullet <i>Mugil cephalus</i>	A	..... .....												..... .....																							
	S																																				
	J																																				
	L																																				
	E																																				
Code goby <i>Gobiosoma robustum</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spanish mackerel <i>Scomberomorus maculatus</i>	A																									.....											
	S																																				
	J																									.....											
	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay												Ten Thousand Islands												Caloosahatchee River											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Charlotte Harbor				Tampa Bay				Suwannee River			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A												
	S												
	J												
	L												
	E												
Black drum <i>Pogonias cromis</i>	A												
	S												
	J												
	L												
	E												
Red drum <i>Sciaenops ocellatus</i>	A												
	S												
	J												
	L												
	E												
Striped mullet <i>Mugil cephalus</i>	A												
	S												
	J												
	L												
	E												
Code goby <i>Gobiosoma robustum</i>	A												
	S												
	J												
	L												
	E												
Spanish mackerel <i>Scomberomorus maculatus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor				Tampa Bay				Suwannee River			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Apalachee Bay												Apalachicola Bay												St. Andrew Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Black drum <i>Pogonias cromis</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																									.....											
Red drum <i>Sciaenops ocellatus</i>	A																																				
	S	.....												.....																							
	J																																				
	L																																				
	E	.....												.....												.... ..											
Striped mullet <i>Mugil cephalus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Code goby <i>Gobiosoma robustum</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spanish mackerel <i>Scomberomorus maculatus</i>	A	.....												.....																							
	S	.....												.....																							
	J	.....												.....																							
	L																																				
	E																																				
		J <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th>	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Apalachee Bay												Apalachicola Bay												St. Andrew Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay																											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D												
Atlantic croaker <i>Micropogonias undulatus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Black drum <i>Pogonias cromis</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Red drum <i>Sciaenops ocellatus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Striped mullet <i>Mugil cephalus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Code goby <i>Gobiosoma robustum</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Spanish mackerel <i>Scomberomorus maculatus</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay																											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Mobile Bay				Mississippi Sound				Lake Borgne															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Black drum <i>Pogonias cromis</i>	A																								
	S																								
	J																								
	L																								
	E																								
Red drum <i>Sciaenops ocellatus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Striped mullet <i>Mugil cephalus</i>	A																								
	S																								
	J																								
	L																								
	E																								
Code goby <i>Gobiosoma robustum</i>	A																								
	S																								
	J																								
	L																								
	E																								
Spanish mackerel <i>Scomberomorus maculatus</i>	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay				Mississippi Sound				Lake Borgne															

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																				
Estuary / Month		Lake Pontchartrain												Breton/Chandeleur Sound												Mississippi River												
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Atlantic croaker <i>Micropogonias undulatus</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
Black drum <i>Pogonias cromis</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
Red drum <i>Sciaenops ocellatus</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
Striped mullet <i>Mugil cephalus</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
Code goby <i>Gobiosoma robustum</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
Spanish mackerel <i>Scomberomorus maculatus</i>	A																																					
	S																																					
	J																																					
	L																																					
	E																																					
		J	F	M	A	M	J <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <td>J</td> <td>F</td> <td>M</td> <td>A</td> <td>M</td> <td>J<th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th><td>J</td><td>F</td><td>M</td><td>A</td><td>M</td><td>J<th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th></td></td>	J	A	S	O	N	D	J	F	M	A	M	J <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <td>J</td> <td>F</td> <td>M</td> <td>A</td> <td>M</td> <td>J<th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th></td>	J	A	S	O	N	D	J	F	M	A	M	J <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th>	J	A	S	O	N	D	
		Lake Pontchartrain												Breton/Chandeleur Sound												Mississippi River												

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A												
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■				■							
	E												
Black drum <i>Pogonias cromis</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L												
	E												
Red drum <i>Sciaenops ocellatus</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L												
	E												
Striped mullet <i>Mugil cephalus</i>	A	■	■	■	■	■	■	■	■	■	■	■	■
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L	■											
	E												
Code goby <i>Gobiosoma robustum</i>	A	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	S												
	J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	L												
	E												
Spanish mackerel <i>Scomberomorus maculatus</i>	A												
	S												
	J	■	■	■	■	■	■	■	■	■	■	■	■
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay			

Relative Abundance

■	Highly Abundant
■	Abundant
■	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A												
	S												
	J												
	L												
	E												
Black drum <i>Pogonias cromis</i>	A												
	S												
	J												
	L												
	E												
Red drum <i>Sciaenops ocellatus</i>	A												
	S												
	J												
	L												
	E												
Striped mullet <i>Mugil cephalus</i>	A												
	S												
	J												
	L												
	E												
Code goby <i>Gobiosoma robustum</i>	A												
	S												
	J												
	L												
	E												
Spanish mackerel <i>Scomberomorus maculatus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay			

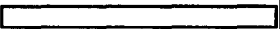
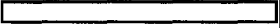
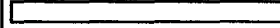
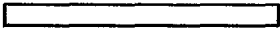
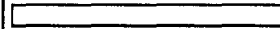
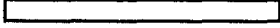
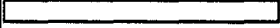
Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker	A	na											
	S												
<i>Micropogonias undulatus</i>	J												
	L												
	E												
Black drum	A												
	S												
<i>Pogonias cromis</i>	J												
	L												
	E												
Red drum	A	na											
	S												
<i>Sciaenops ocellatus</i>	J												
	L												
	E												
Striped mullet	A												
	S												
<i>Mugil cephalus</i>	J												
	L												
	E												
Code goby	A	na											
	S	na											
<i>Gobiosoma robustum</i>	J	na											
	L	na											
	E	na											
Spanish mackerel	A												
	S												
<i>Scomberomorus maculatus</i>	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present
na	No Data Available

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A												
	S												
	J	.....											
	L												
	E												
Black drum <i>Pogonias cromis</i>	A												
	S												
	J												
	L												
	E												
Red drum <i>Sciaenops ocellatus</i>	A												
	S												
	J												
	L												
	E												
Striped mullet <i>Mugil cephalus</i>	A												
	S												
	J												
	L												
	E												
Code goby <i>Gobiosoma robustum</i>	A												
	S												
	J												
	L												
	E												
Spanish mackerel <i>Scomberomorus maculatus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

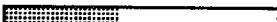
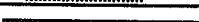
Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Atlantic croaker <i>Micropogonias undulatus</i>	A												
	S												
	J												
	L												
	E												
Black drum <i>Pogonias cromis</i>	A												
	S												
	J												
	L												
	E												
Red drum <i>Sciaenops ocellatus</i>	A	.....											
	S												
	J												
	L												
	E												
Striped mullet <i>Mugil cephalus</i>	A												
	S												
	J												
	L												
	E												
Code goby <i>Gobiosoma robustum</i>	A												
	S												
	J												
	L												
	E												
Spanish mackerel <i>Scomberomorus maculatus</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Florida Bay					Ten Thousand Islands					Caloosahatchee River													
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A											.....													
	S																								
	J											.....													
	L																								
	E																								
Southern flounder <i>Paralichthys lethostigma</i>	A	.....					.....																		
	S																								
	J	.....					.....																		
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Florida Bay					Ten Thousand Islands					Caloosahatchee River													

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Charlotte Harbor												Tampa Bay												Suwannee River											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Southern flounder <i>Paralichthys lethostigma</i>	A	.....												.....																							
	S																																				
	J	.....												.....																							
	L	.....												.....																							
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Charlotte Harbor												Tampa Bay												Suwannee River											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Estuary / Month		Apalachee Bay												Apalachicola Bay												St. Andrew Bay																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Gulf flounder <i>Paralichthys albigutta</i>	A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A												
	S												
	J												
	L												
	E												
Southern flounder <i>Paralichthys lethostigma</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Choctawhatchee Bay				Pensacola Bay				Perdido Bay			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Mobile Bay												Mississippi Sound												Lake Borgne											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A	.....																																			
	S																																				
	J																																				
	L																																				
	E																																				
Southern flounder <i>Paralichthys lethostigma</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Mobile Bay												Mississippi Sound												Lake Borgne											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																																			
Estuary / Month		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River																											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D												
Gulf flounder <i>Paralichthys albigutta</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
Southern flounder <i>Paralichthys lethostigma</i>	A																																				
	S																																				
	J																																				
	L																																				
	E																																				
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Lake Pontchartrain				Breton/Chandeleur Sound				Mississippi River																											

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder	A																								
	S																								
	J																								
	L																								
	E																								
Southern flounder	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Barataria Bay				Terrebonne/Timbalier Bay				Atchafalaya/Vermilion Bay															

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Calcasieu Lake				Sabine Lake				Galveston Bay															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A									.....															
	S									.....															
	J																								
	L																								
	E																								
Southern flounder <i>Paralichthys lethostigma</i>	A																								
	S																								
	J																								
	L																								
	E																								
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Calcasieu Lake				Sabine Lake				Galveston Bay															

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries																							
Estuary / Month		Brazos River				Matagorda Bay				San Antonio Bay															
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A																								
	S																								
	J																								
	L																								
	E																								
Southern flounder <i>Paralichthys lethostigma</i>	A																								
	S																								
	J																								
	L																								
	E																								
		J <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th> <th>J</th> <th>F</th> <th>M</th> <th>A</th> <th>M</th> <th>J</th> <th>J</th> <th>A</th> <th>S</th> <th>O</th> <th>N</th> <th>D</th>	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
		Brazos River				Matagorda Bay				San Antonio Bay															

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Aransas Bay				Corpus Christi Bay				Laguna Madre			
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder <i>Paralichthys albigutta</i>	A												
	S												
	J												
	L												
	E												
Southern flounder <i>Paralichthys lethostigma</i>	A												
	S												
	J												
	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Aransas Bay				Corpus Christi Bay				Laguna Madre			

Relative Abundance

	Highly Abundant
	Abundant
	Common
	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 5, continued. Temporal distribution

		Gulf of Mexico Estuaries											
Estuary / Month		Baffin Bay											
Species / Life Stage		J	F	M	A	M	J	J	A	S	O	N	D
Gulf flounder	A												
	S												
<i>Paralichthys</i>	J												
<i>albigutta</i>	L												
	E												
Southern flounder	A												
	S												
<i>Paralichthys</i>	J												
<i>lethostigma</i>	L												
	E												
		J	F	M	A	M	J	J	A	S	O	N	D
		Baffin Bay											

Relative Abundance

	Highly Abundant
	Abundant
	Common
.....	Rare
Blank	Not Present

Life Stage

A	Adults
S	Spawning adults
J	Juveniles
L	Larvae
E	Eggs

Table 6. Data reliability

Index to Table 6. Page location of data reliability table for each species and estuary.

Common and Scientific Name	Estuary					
	Florida Bay Ten Thousand Islands Charlotte Harbor Tampa Bay Suwannee River Apalachicola Bay	Apalachicola Bay St. Andrew Bay Choctawhatchee Bay Pensacola Bay Perdido Bay Mobile Bay	Mississippi Sound Lake Borgne Breton/Chantrelour Sound Lake Pontchartrain Mississippi River Barataria Bay Terrebonne Bay Atchafalaya/Timbalier Bay	Calcasieu Lake Sabine Lake Gulf of Mexico Brazos River Matagorda Bay San Antonio Bay Aransas Bay	Corpus Christi Bay Laguna Madre Baffin Bay	
Bay scallop (<i>Argopecten irradians</i>)						
American oyster (<i>Crassostrea virginica</i>)						
Common rangia (<i>Rangia cuneata</i>)						
Hard clam (<i>Mercenaria</i> species)	152	153	154	155	156	
Bay squid (<i>Lolliguncula brevis</i>)						
Brown shrimp (<i>Penaeus aztecus</i>)						
Pink shrimp (<i>Penaeus duorarum</i>)						
White shrimp (<i>Penaeus setiferus</i>)						
Grass shrimp (<i>Palaemonetes pugio</i>)						
Spiny lobster (<i>Panulirus argus</i>)	157	158	159	160	161	
Blue crab (<i>Callinectes sapidus</i>)						
Gulf stone crab (<i>Menippe adina</i>)						
Stone crab (<i>Menippe mercenaria</i>)						
Bull shark (<i>Carcharhinus leucas</i>)						
Tarpon (<i>Megalops atlanticus</i>)						
Alabama shad (<i>Alosa alabamae</i>)	162	163	164	165	166	
Gulf menhaden (<i>Brevoortia patronus</i>)						
Yellowfin menhaden (<i>Brevoortia smithi</i>)						
Gizzard shad (<i>Dorosoma cepedianum</i>)						
Bay anchovy (<i>Anchoa mitchilli</i>)						
Hardhead catfish (<i>Arius felis</i>)	167	168	169	170	171	
Sheepshead minnow (<i>Cyprinodon variegatus</i>)						
Gulf killifish (<i>Fundulus grandis</i>)						
Silversides (<i>Menidia</i> species)						
Snook (<i>Centropomus undecimalis</i>)						
Bluefish (<i>Pomatomus saltatrix</i>)						
Blue runner (<i>Caranx crysos</i>)						
Crevalle jack (<i>Caranx hippos</i>)	172	173	174	175	176	
Florida pompano (<i>Trachinotus carolinus</i>)						
Gray snapper (<i>Lutjanus griseus</i>)						
Sheepshead (<i>Archosargus probatocephalus</i>)						
Pinfish (<i>Lagodon rhomboides</i>)						
Silver perch (<i>Bairdiella chrysoura</i>)	177	178	179	180	181	
Sand seatrout (<i>Cynoscion arenarius</i>)						
Spotted seatrout (<i>Cynoscion nebulosus</i>)						
Spot (<i>Leiostomus xanthurus</i>)						
Atlantic croaker (<i>Micropogonias undulatus</i>)						
Black drum (<i>Pogonias cromis</i>)						
Red drum (<i>Sciaenops ocellatus</i>)	182	183	184	185	186	
Striped mullet (<i>Mugil cephalus</i>)						
Code goby (<i>Gobiosoma robustum</i>)						
Spanish mackerel (<i>Scomberomorus maculatus</i>)						
Gulf flounder (<i>Paralichthys albigutta</i>)	187	188	189	190	191	
Southern flounder (<i>Paralichthys lethostigma</i>)						

Table 6. Data reliability

		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Species/Life Stage								
Bay scallop <i>Argopecten irradians</i>	A	■	▣	▣	□	▣	■	▣
	S	■	▣	▣	□	▣	■	▣
	J	■	▣	▣	□	▣	■	▣
	L	■	▣	▣	□	▣	■	▣
	E	■	▣	▣	□	▣	■	▣
American oyster <i>Crassostrea virginica</i>	A	■	■	■	■	■	▣	▣
	S	■	▣	□	▣	▣	▣	▣
	J	■	▣	■	■	■	▣	▣
	L	■	▣	□	▣	▣	▣	▣
	E	■	▣	□	▣	▣	▣	▣
Common rangia <i>Rangia cuneata</i>	A	■	■	▣	▣	▣	▣	▣
	S	■	■	▣	▣	▣	▣	▣
	J	■	■	▣	▣	▣	▣	▣
	L	■	■	▣	▣	▣	▣	▣
	E	■	■	▣	▣	▣	▣	▣
Hard clam <i>Mercenaria</i> species	A	■	■	■	▣	▣	■	□
	S	■	■	■	□	▣	▣	□
	J	■	■	■	▣	▣	■	□
	L	■	■	■	□	▣	▣	□
	E	■	■	■	□	▣	▣	□
Bay squid <i>Lolliguncula brevis</i>	A	▣	▣	▣	▣	▣	▣	▣
	S	▣	□	□	□	□	□	□
	J	▣	▣	▣	▣	▣	▣	▣
	L	▣	□	□	□	□	□	□
	E	▣	□	□	□	□	□	□
Brown shrimp <i>Penaeus aztecus</i>	A	▣	▣	□	▣	▣	■	■
	S	□	■	■	■	■	■	■
	J	▣	▣	□	▣	▣	■	■
	L	□	▣	▣	▣	▣	■	■
	E	□	■	■	■	■	■	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- ▣ Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Bay scallop <i>Argopecten irradians</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
American oyster <i>Crassostrea virginica</i>	A	■	■	■	■	■	■	■
	S	■	■	■	□	■	■	□
	J	■	■	■	■	■	■	■
	L	■	■	■	□	■	■	□
	E	■	■	■	□	■	■	□
Common rangia <i>Rangia cuneata</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
Hard clam <i>Mercenaria species</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
Bay squid <i>Lolliguncula brevis</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	□	□	□
	J	■	■	■	■	■	■	□
	L	□	□	□	□	□	□	□
	E	□	□	□	□	□	□	□
Brown shrimp <i>Penaeus aztecus</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	■
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Bay scallop <i>Argopecten irradians</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
American oyster <i>Crassostrea virginica</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Common rangia <i>Rangia cuneata</i>	A	■	■	■	■	■	■	□
	S	■	■	■	□	■	■	□
	J	■	■	■	■	■	■	□
	L	■	■	■	□	■	■	□
	E	■	■	■	□	■	■	□
Hard clam <i>Mercenaria</i> species	A	■	■	■	■	□	□	□
	S	■	■	■	■	□	□	□
	J	■	■	■	■	□	□	□
	L	■	■	■	■	□	□	□
	E	■	■	■	■	□	□	□
Bay squid <i>Lolliguncula brevis</i>	A	■	□	■	□	□	■	■
	S	□	■	□	■	□	□	■
	J	■	□	■	□	□	■	■
	L	□	■	□	■	□	□	■
	E	□	■	□	■	□	□	■
Brown shrimp <i>Penaeus aztecus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	■
	L	□	□	■	■	□	□	■
	E	■	■	■	■	■	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Bay scallop <i>Argopecten irradians</i>	A	■	■	■	■	□	□	□
	S	■	■	■	■	□	□	□
	J	■	■	■	■	□	□	□
	L	■	■	■	■	□	□	□
	E	■	■	■	■	□	□	□
American oyster <i>Crassostrea virginica</i>	A	■	■	■	□	□	■	■
	S	■	□	□	□	□	□	□
	J	■	■	■	□	□	■	■
	L	■	□	□	□	□	□	□
	E	■	□	□	□	□	□	□
Common rangia <i>Rangia cuneata</i>	A	■	■	■	□	■	■	■
	S	■	□	□	□	□	□	□
	J	■	■	■	□	■	■	■
	L	■	□	□	□	□	□	□
	E	■	□	□	□	□	□	□
Hard clam <i>Mercenaria</i> species	A	■	■	■	□	■	□	■
	S	■	■	□	□	□	□	□
	J	■	■	■	□	■	□	■
	L	■	■	□	□	□	□	□
	E	■	■	□	□	□	□	□
Bay squid <i>Lolliguncula brevis</i>	A	■	■	■	□	■	□	■
	S	■	□	□	□	□	□	□
	J	■	■	■	□	■	□	■
	L	■	□	□	□	□	□	□
	E	■	□	□	□	□	□	□
Brown shrimp <i>Penaeus aztecus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	□	■	■	□	■	■	■
	L	□	■	■	□	■	■	■
	E	■	■	■	■	■	■	■
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Bay scallop <i>Argopecten irradians</i>	A	☐	☒	☒
	S	☐	☐	☒
	J	☐	☒	☒
	L	☐	☐	☒
	E	☐	☐	☒
American oyster <i>Crassostrea virginica</i>	A	☒	☒	☒
	S	☐	☐	☒
	J	☒	☒	☒
	L	☐	☐	☒
	E	☐	☐	☒
Common rangia <i>Rangia cuneata</i>	A	☐	☒	☒
	S	☐	☒	☒
	J	☐	☒	☒
	L	☐	☒	☒
	E	☐	☒	☒
Hard clam <i>Mercenaria</i> species	A	☒	☒	☒
	S	☐	☒	☒
	J	☒	☒	☒
	L	☐	☒	☒
	E	☐	☒	☒
Bay squid <i>Lolliguncula brevis</i>	A	☒	☒	☒
	S	☐	☐	☐
	J	☒	☒	☒
	L	☐	☐	☐
	E	☐	☐	☐
Brown shrimp <i>Penaeus aztecus</i>	A	☒	☒	☒
	S	☒	☒	☒
	J	☒	☒	☒
	L	☒	☒	☒
	E	☒	☒	☒
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- ☒ Highly Certain
☒ Moderately Certain
☐ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Pink shrimp	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Penaeus duorarum</i>	J	■	■	□	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
White shrimp	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Penaeus setiferus</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Grass shrimp	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	□	■
<i>Palaemonetes pugio</i>	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	□	■
Spiny lobster	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
<i>Panulirus argus</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Blue crab	A	■	■	■	■	■	□	■
	M	■	■	■	■	■	■	■
<i>Callinectes sapidus</i>	J	■	■	□	■	■	■	■
	L	□	□	■	□	□	□	□
	E	■	■	■	■	■	■	■
Gulf stone crab	A	■	■	■	■	■	□	□
	M	■	■	■	■	■	□	□
<i>Menippe adina</i>	J	■	■	■	■	■	□	□
	L	■	■	■	■	■	□	□
	E	■	■	■	■	■	□	□
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Pink shrimp <i>Penaeus duorarum</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	□
White shrimp <i>Penaeus setiferus</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Grass shrimp <i>Palaemonetes pugio</i>	A	□	■	■	■	■	■	□
	S	□	■	■	■	■	■	□
	J	■	■	■	■	■	■	□
	L	□	■	■	■	■	■	□
	E	□	■	■	■	■	■	□
Spiny lobster <i>Panulirus argus</i>	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
Blue crab <i>Callinectes sapidus</i>	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	□	■	□	□	□	□	■
	E	■	■	■	■	■	■	■
Gulf stone crab <i>Menippe adina</i>	A	□	■	□	□	□	□	■
	M	□	■	□	□	□	□	■
	J	□	■	□	□	□	□	■
	L	□	■	□	□	□	□	■
	E	□	■	□	□	□	□	■
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Pink shrimp <i>Penaeus duorarum</i>	A	■	■	■	■	□	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	□	■	■
White shrimp <i>Penaeus setiferus</i>	A	■	■	□	■	□	■	■
	S	■	■	□	■	□	■	■
	J	■	■	□	■	■	■	■
	L	■	■	□	■	□	■	■
	E	■	■	□	■	□	■	■
Grass shrimp <i>Palaemonetes pugio</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Spiny lobster <i>Panulirus argus</i>	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Blue crab <i>Callinectes sapidus</i>	A	■	■	■	■	□	□	■
	M	□	■	■	□	□	□	■
	J	■	■	■	■	□	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	□	■	■	■
Gulf stone crab <i>Menippe adina</i>	A	■	■	■	■	□	□	□
	M	■	■	■	□	□	□	□
	J	■	■	■	■	□	□	□
	L	■	■	■	□	□	□	□
	E	■	■	■	□	□	□	□
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Pink shrimp	A	■	■	▣	■	▣	▣	▣
	S	■	■	■	■	■	■	■
<i>Penaeus duorarum</i>	J	■	■	▣	□	▣	▣	▣
	L	■	■	■	■	▣	▣	▣
	E	■	■	■	■	■	■	■
White shrimp	A	□	■	■	□	■	■	■
	S	■	■	■	■	■	■	■
<i>Penaeus setiferus</i>	J	□	■	■	□	■	■	■
	L	□	■	■	□	■	■	■
	E	■	■	■	■	■	■	■
Grass shrimp	A	▣	▣	▣	□	▣	▣	▣
	S	▣	□	▣	□	▣	▣	▣
<i>Palaemonetes pugio</i>	J	▣	▣	▣	□	▣	▣	▣
	L	▣	□	▣	□	▣	▣	▣
	E	▣	□	▣	□	▣	▣	▣
Spiny lobster	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
<i>Panulirus argus</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Blue crab	A	■	▣	■	□	▣	▣	▣
	M	■	▣	■	□	▣	□	▣
<i>Callinectes sapidus</i>	J	■	▣	■	□	▣	▣	▣
	L	■	▣	■	□	□	□	▣
	E	■	▣	■	□	□	□	▣
Gulf stone crab	A	□	▣	▣	□	▣	▣	▣
	M	□	□	▣	■	▣	□	▣
<i>Menippe adina</i>	J	□	▣	▣	□	▣	▣	▣
	L	□	□	▣	■	▣	▣	▣
	E	□	□	▣	■	▣	□	▣
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
		Gulf of Mexico Estuaries						

Data Reliability

- Highly Certain
 ▣ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Pink shrimp <i>Penaeus duorarum</i>	A	■	▣	▣
	S	■	■	□
	J	▣	▣	▣
	L	▣	■	□
	E	■	■	□
White shrimp <i>Penaeus setiferus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	▣	■	■
	E	■	■	■
Grass shrimp <i>Palaemonetes pugio</i>	A	▣	▣	■
	S	▣	▣	■
	J	▣	▣	■
	L	▣	▣	■
	E	▣	▣	■
Spiny lobster <i>Panulirus argus</i>	A	■	□	■
	M	■	□	■
	J	■	□	■
	L	■	□	■
	E	■	□	■
Blue crab <i>Callinectes sapidus</i>	A	■	▣	■
	M	▣	▣	□
	J	■	▣	■
	L	▣	▣	□
	E	▣	▣	□
Gulf stone crab <i>Menippe adina</i>	A	▣	▣	▣
	M	▣	▣	□
	J	▣	▣	▣
	L	▣	▣	□
	E	▣	▣	□
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Gulf of Mexico Estuaries				

Data Reliability

- Highly Certain
 ▣ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Stone crab <i>Menippe mercenaria</i>	A	■	■	▣	□	■	▣	□
	M	■	■	▣	□	■	▣	□
	J	■	■	▣	□	■	▣	□
	L	■	▣	▣	□	▣	▣	□
	E	■	■	▣	□	■	▣	□
Bull shark <i>Carcharhinus leucas</i>	A	▣	□	▣	▣	▣	▣	▣
	M	▣	□	□	□	□	□	□
	J	▣	▣	▣	▣	▣	▣	▣
	P	▣	□	□	□	□	□	□
Tarpon <i>Megalops atlanticus</i>	A	▣	▣	▣	▣	▣	■	□
	S	■	■	■	▣	■	■	■
	J	▣	▣	■	■	▣	■	□
	L	□	□	▣	□	▣	■	□
	E	■	■	■	■	■	■	■
Alabama shad <i>Alosa alabamiae</i>	A	■	■	■	■	■	▣	■
	S	■	■	■	■	■	▣	■
	J	■	■	■	■	■	▣	■
	L	■	■	■	■	■	▣	■
	E	■	■	■	■	■	▣	■
Gulf menhaden <i>Brevoortia patronus</i>	A	▣	▣	▣	□	■	□	▣
	S	▣	▣	■	■	■	□	■
	J	▣	▣	□	□	■	□	▣
	L	▣	▣	▣	□	▣	□	▣
	E	▣	▣	■	■	■	□	■
Yellowfin menhaden <i>Brevoortia smithi</i>	A	□	□	■	▣	■	□	▣
	S	□	■	■	■	■	□	■
	J	□	▣	▣	▣	■	□	▣
	L	□	▣	▣	□	■	□	▣
	E	□	■	■	■	■	□	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- ▣ Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs
- M - Mating
- P - Parturition

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Stone crab <i>Menippe mercenaria</i>	A	□	■	■	■	■	■	■
	M	□	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	□	■	■	■	■	■	■
	E	□	■	■	■	■	■	■
Bull shark <i>Carcharhinus leucas</i>	A	■	■	■	■	■	■	□
	M	□	□	□	□	□	□	■
	J	■	■	■	■	■	■	□
	P	□	□	□	□	□	□	■
Tarpon <i>Megalops atlanticus</i>	A	■	■	□	□	■	■	□
	S	■	■	■	■	■	■	□
	J	■	■	□	□	■	■	■
	L	■	■	□	□	■	■	□
	E	■	■	■	□	■	■	□
Alabama shad <i>Alosa alabamae</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Gulf menhaden <i>Brevoortia patronus</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	□	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	□	□
Yellowfin menhaden <i>Brevoortia smithi</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating
 P - Parturition

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Stone crab	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
<i>Menippe mercenaria</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Bull shark	A	■	■	■	■	□	□	□
	M	■	■	■	■	■	■	■
<i>Carcharhinus leucas</i>	J	■	■	■	■	□	□	□
	P	□	■	□	□	□	□	□
Tarpon	A	■	■	■	■	■	□	□
	S	■	■	■	■	□	■	■
<i>Megalops atlanticus</i>	J	■	■	■	■	■	□	■
	L	■	■	■	■	□	■	■
	E	■	■	■	■	□	■	■
Alabama shad	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Alosa alabamae</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Gulf menhaden	A	■	■	■	■	□	□	■
	S	■	■	■	■	■	■	■
<i>Brevoortia patronus</i>	J	■	■	■	■	□	□	■
	L	■	□	■	■	■	■	■
	E	■	■	■	■	■	■	■
Yellowfin menhaden	A	■	□	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Brevoortia smithi</i>	J	■	□	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating
 P - Parturition

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Stone crab	A	■	■	■	■	■	■	■
	M	■	■	■	■	■	■	■
<i>Menippe mercenaria</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Bull shark	A	□	▣	▣	□	▣	▣	▣
	M	□	▣	▣	□	▣	▣	▣
<i>Carcharhinus leucas</i>	J	□	▣	▣	□	▣	▣	▣
	P	□	■	■	■	■	■	■
Tarpon	A	■	□	▣	▣	▣	▣	▣
	S	■	□	▣	▣	▣	▣	▣
<i>Megalops atlanticus</i>	J	■	□	▣	□	▣	▣	▣
	L	■	□	▣	▣	▣	▣	▣
	E	■	□	▣	▣	▣	▣	▣
Alabama shad	A	■	■	■	□	■	■	■
	S	■	■	■	□	■	■	■
<i>Alosa alabamiae</i>	J	■	■	■	□	■	■	■
	L	■	■	■	□	■	■	■
	E	■	■	■	□	■	■	■
Gulf menhaden	A	■	▣	▣	▣	▣	▣	▣
	S	■	■	■	■	■	■	■
<i>Brevoortia patronus</i>	J	□	▣	▣	□	▣	▣	■
	L	□	▣	▣	▣	□	▣	▣
	E	■	■	■	■	■	■	■
Yellowfin menhaden	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Brevoortia smithi</i>	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
		Gulf of Mexico Estuaries						

Data Reliability

- Highly Certain
 ▣ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating
 P - Parturition

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Stone crab	A	■	■	■
<i>Menippe mercenaria</i>	M	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		■	■	■
Bull shark	A	■	■	■
<i>Carcharhinus leucas</i>	M	■	■	■
	J	■	■	□
	P	■	■	■
		■	■	■
Tarpon	A	■	■	■
<i>Megalops atlanticus</i>	S	■	□	■
	J	■	■	■
	L	■	□	■
	E	■	□	■
		■	■	■
Alabama shad	A	■	■	■
<i>Alosa alabamae</i>	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		■	■	■
Gulf menhaden	A	■	■	■
<i>Brevoortia patronus</i>	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		■	■	■
Yellowfin menhaden	A	■	■	■
<i>Brevoortia smithi</i>	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		■	■	■
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs
 M - Mating
 P - Parturition

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gizzard shad <i>Dorosoma cepedianum</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	□	□
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	□	□
	E	■	■	■	■	■	□	□
Bay anchovy <i>Anchoa mitchilli</i>	A	■	□	■	■	■	□	■
	S	■	■	■	■	■	□	■
	J	■	□	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	□	■
Hardhead catfish <i>Arius felis</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	□	□	□
	J	■	■	■	■	■	■	■
	L	□	□	□	□	■	□	□
	E	□	□	□	□	□	□	□
Sheepshead minnow <i>Cyprinodon variegatus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	□	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	□	■
Gulf killifish <i>Fundulus grandis</i>	A	■	□	■	■	■	□	■
	S	□	□	■	■	■	□	■
	J	■	□	■	■	■	□	■
	L	□	□	■	■	■	□	■
	E	□	□	■	■	■	□	■
Silversides <i>Menidia species</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	□	□	□
	J	■	■	■	■	■	■	■
	L	□	□	□	□	□	□	□
	E	□	□	□	□	□	□	□
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gizzard shad <i>Dorosoma cepedianum</i>	A	■	□	□	□	■	■	■
	S	□	□	□	□	□	□	■
	J	■	□	□	□	■	■	□
	L	□	□	□	□	□	□	□
	E	□	□	□	□	□	□	□
Bay anchovy <i>Anchoa mitchilli</i>	A	□	■	■	■	□	■	■
	S	■	■	■	■	□	■	■
	J	□	■	■	■	□	■	□
	L	■	■	■	■	□	■	□
	E	■	■	■	■	□	■	□
Hardhead catfish <i>Arius felis</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	■	□	□
	J	■	■	■	■	■	■	□
	L	□	□	□	□	■	□	□
	E	□	□	□	□	■	□	□
Sheepshead minnow <i>Cyprinodon variegatus</i>	A	□	■	■	■	■	■	■
	S	□	■	□	■	■	■	□
	J	□	■	□	■	■	■	□
	L	□	■	□	■	■	■	□
	E	□	■	□	■	■	■	□
Gulf killifish <i>Fundulus grandis</i>	A	□	■	□	■	□	■	□
	S	□	■	□	■	□	■	□
	J	□	■	□	■	□	■	□
	L	□	■	□	■	□	■	□
	E	□	■	□	■	□	■	□
Siversides <i>Menidia species</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	■	□	□
	J	■	■	■	■	■	■	□
	L	□	□	■	□	■	□	□
	E	□	□	□	□	■	□	□
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gizzard shad	A	■	■	■	□	□	□	■
<i>Dorosoma cepedianum</i>	S	■	■	■	■	■	■	■
	J	■	■	■	■	□	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Bay anchovy	A	■	■	■	■	■	■	■
<i>Anchoa mitchilli</i>	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Hardhead catfish	A	■	■	■	■	□	□	□
<i>Arius felis</i>	S	■	■	■	■	■	■	□
	J	■	■	■	■	□	□	□
	L	■	■	■	■	□	□	□
	E	■	■	■	■	□	□	□
Sheepshead minnow	A	■	■	□	■	□	□	□
<i>Cyprinodon variegatus</i>	S	■	■	□	■	□	□	□
	J	■	■	□	■	□	■	□
	L	■	■	□	■	□	□	□
	E	■	■	□	■	□	□	□
Gulf killifish	A	■	■	□	■	■	■	□
<i>Fundulus grandis</i>	S	□	■	□	■	□	■	■
	J	■	■	□	■	■	■	□
	L	□	■	□	■	□	■	□
	E	□	■	□	■	□	■	■
Silversides	A	■	■	□	■	□	□	□
<i>Menidia species</i>	S	■	■	□	■	■	□	□
	J	■	■	□	■	□	□	□
	L	■	■	□	■	■	□	□
	E	■	■	□	■	■	□	□
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gizzard shad	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☒	☒	☒	☒
<i>Dorosoma cepedianum</i>	J	☐	☐	☒	☐	☒	☒	☒
	L	☒	☒	☒	☒	☒	☒	☒
	E	☒	☒	☒	☒	☒	☒	☒
Bay anchovy	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☐	☒	☐	☐	☐	☒
<i>Anchoa mitchilli</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☐	☐	☒	☐	☐	☐	☒
	E	☒	☐	☒	☐	☐	☐	☒
Hardhead catfish	A	☐	☒	☒	☐	☒	☒	☒
	S	☐	☒	☒	☐	☒	☒	☒
<i>Arius felis</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☐	☒	☒	☐	☒	☒	☒
	E	☐	☒	☒	☐	☒	☒	☒
Sheepshead minnow	A	☐	☒	☒	☐	☒	☒	☒
	S	☐	☐	☐	☐	☐	☐	☐
<i>Cyprinodon variegatus</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☐	☐	☐	☐	☐	☐	☐
	E	☐	☐	☐	☐	☐	☐	☐
Gulf killifish	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☐	☒	☒	☒
<i>Fundulus grandis</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☐	☒	☒	☐	☒	☒	☒
	E	☒	☒	☒	☐	☒	☒	☒
Silversides	A	☐	☒	☒	☐	☒	☒	☒
	S	☐	☐	☐	☐	☐	☐	☐
<i>Menidia</i> species	J	☐	☒	☒	☐	☒	☒	☒
	L	☐	☐	☐	☐	☐	☐	☐
	E	☐	☐	☐	☐	☐	☐	☐
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf of Mexico Estuaries								

Data Reliability

- ☒ Highly Certain
☒ Moderately Certain
☐ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Gizzard shad	A	■	■	■
	S	■	■	■
<i>Dorosoma cepedianum</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
Bay anchovy	A	■	■	■
	S	■	■	■
<i>Anchoa mitchilli</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
Hardhead catfish	A	■	■	■
	S	■	■	■
<i>Arius felis</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
Sheepshead minnow	A	■	■	■
	S	□	□	□
<i>Cyprinodon variegatus</i>	J	■	■	■
	L	□	■	□
	E	□	□	□
Gulf killifish	A	■	■	■
	S	■	■	□
<i>Fundulus grandis</i>	J	■	■	■
	L	■	■	□
	E	■	■	□
Silversides	A	■	■	■
	S	□	□	□
<i>Menidia species</i>	J	■	■	■
	L	□	■	□
	E	□	□	□
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Snook <i>Centropomus undecimalis</i>	A	■	□	□	■	■	■	■
	S	■	■	□	■	■	□	■
	J	■	■	□	■	■	□	■
	L	■	□	□	□	■	□	■
	E	■	■	□	□	■	□	■
Bluefish <i>Pomatomus saltatrix</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	□	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Blue runner <i>Caranx crysos</i>	A	■	□	□	■	□	■	■
	S	■	■	□	■	■	□	■
	J	■	□	□	■	□	□	■
	L	■	■	□	■	□	□	■
	E	■	■	□	■	■	□	■
Creville jack <i>Caranx hippos</i>	A	■	□	□	■	■	□	■
	S	■	■	□	■	■	■	■
	J	■	□	□	■	■	□	■
	L	■	■	□	■	■	□	■
	E	■	■	□	■	■	□	■
Florida pompano <i>Trachinotus carolinus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	□	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Gray snapper <i>Lutjanus griseus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	□	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Snook <i>Centropomus undecimalis</i>	A	■	■	■	■	■	■	■
	S	□	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	□	■	■	■	■	■	■
	E	□	■	■	■	■	■	■
Bluefish <i>Pomatomus saltatrix</i>	A	□	■	■	■	■	■	□
	S	□	■	■	■	■	■	□
	J	□	■	■	■	■	■	□
	L	□	■	■	■	■	■	□
	E	□	■	■	■	■	■	□
Blue runner <i>Caranx crysos</i>	A	□	■	■	■	■	■	■
	S	□	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	□	■	■	■	■	■	□
	E	□	■	■	■	■	■	□
Creville jack <i>Caranx hippos</i>	A	□	■	□	■	■	■	□
	S	□	■	■	■	■	■	□
	J	□	■	□	■	■	■	■
	L	□	■	■	■	■	■	□
	E	□	■	■	■	■	■	□
Florida pompano <i>Trachinotus carolinus</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
Gray snapper <i>Lutjanus griseus</i>	A	□	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Snook <i>Centropomus undecimalis</i>	A	■	■	■	■	□	■	■
	S	■	■	■	■	□	■	■
	J	■	■	■	■	□	■	■
	L	■	■	■	■	□	■	■
	E	■	■	■	■	□	■	■
Bluefish <i>Pomatomus saltatrix</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	■	■	■	■	□	■	■
	E	■	■	■	■	■	■	■
Blue runner <i>Caranx crysos</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	□	■	■	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Creville jack <i>Caranx hippos</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Florida pompano <i>Trachinotus carolinus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	□	■	□	□
	L	■	■	■	■	□	■	■
	E	■	■	■	■	■	■	■
Gray snapper <i>Lutjanus griseus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Snook	A	■	▣	▣	□	▣	▣	▣
<i>Centropomus undecimalis</i>	S	■	■	■	■	▣	■	▣
	J	■	▣	▣	□	▣	▣	▣
	L	■	■	▣	□	▣	▣	▣
	E	■	■	■	■	▣	■	▣
Bluefish	A	■	▣	▣	□	▣	▣	▣
<i>Pomatomus saltatrix</i>	S	■	■	■	■	■	■	■
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Blue runner	A	■	■	□	□	■	■	■
<i>Caranx crysos</i>	S	■	■	■	□	■	■	■
	J	■	■	□	□	■	■	■
	L	■	■	■	□	■	■	■
	E	■	■	■	□	■	■	■
Crevalle jack	A	■	▣	▣	□	□	▣	▣
<i>Caranx hippos</i>	S	■	■	■	■	■	■	■
	J	□	▣	▣	□	□	▣	▣
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Florida pompano	A	■	▣	▣	□	□	▣	▣
<i>Trachinotus carolinus</i>	S	■	■	■	■	■	■	■
	J	□	▣	▣	□	□	▣	▣
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Gray snapper	A	■	▣	▣	□	□	▣	▣
<i>Lutjanus griseus</i>	S	■	■	■	■	■	■	■
	J	□	▣	▣	□	□	▣	▣
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ▣ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Snook <i>Centropomus undecimalis</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Bluefish <i>Pomatomus saltatrix</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Blue runner <i>Caranx crysos</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Crevalle jack <i>Caranx hippos</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Florida pompano <i>Trachinotus carolinus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Gray snapper <i>Lutjanus griseus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Species/Life Stage								
Sheepshead <i>Archosargus probatocephalus</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	□	□	□
	J	■	■	■	■	■	■	■
	L	□	□	■	■	■	□	□
	E	□	□	□	□	□	□	□
Pinfish <i>Lagodon rhomboides</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Silver perch <i>Bairdiella chrysoura</i>	A	■	■	■	■	■	■	■
	S	■	□	□	□	□	□	□
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	□	□
	E	■	□	□	□	□	□	□
Sand seatrout <i>Cynoscion arenarius</i>	A	■	■	■	■	■	□	■
	S	■	■	□	□	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	□	□	■	■	■
	E	■	■	□	□	■	■	■
Spotted seatrout <i>Cynoscion nebulosus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Spot <i>Leiostomus xanthurus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
		Gulf of Mexico Estuaries						

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Sheepshead <i>Archosargus probatocephalus</i>	A	■	■	■	■	■	■	■
	S	□	□	□	□	□	□	■
	J	■	■	■	■	■	■	□
	L	■	□	□	□	■	■	■
	E	□	□	□	□	□	□	□
Pinfish <i>Lagodon rhomboides</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Silver perch <i>Bairdiella chrysoura</i>	A	■	■	■	■	■	■	□
	S	□	□	□	□	■	□	■
	J	■	■	■	■	■	■	□
	L	□	□	□	□	■	■	□
	E	□	□	□	□	□	□	□
Sand seatrout <i>Cynoscion arenarius</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	□	■	■	■
Spotted seatrout <i>Cynoscion nebulosus</i>	A	□	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	□	■	■	■	■
	L	□	■	■	■	■	■	■
	E	□	■	■	■	■	■	■
Spot <i>Leiostomus xanthurus</i>	A	■	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	■
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Sheepshead <i>Archosargus probatocephalus</i>	A	■	■	■	■	■	□	□
	S	■	■	□	■	□	□	■
	J	■	■	■	■	■	□	□
	L	■	■	□	■	□	□	■
	E	■	■	□	■	□	□	■
Pinfish <i>Lagodon rhomboides</i>	A	■	□	■	■	□	■	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	□	■	■
	E	■	■	■	■	■	■	■
Silver perch <i>Bairdiella chrysoura</i>	A	■	□	■	■	■	■	□
	S	□	□	□	■	□	■	■
	J	■	□	■	■	■	■	□
	L	□	□	□	■	□	■	■
	E	□	□	□	■	□	■	■
Sand seatrout <i>Cynoscion arenarius</i>	A	■	□	■	■	■	□	□
	S	□	□	□	■	□	□	■
	J	■	□	■	■	■	□	□
	L	□	□	□	■	□	□	■
	E	□	□	□	■	□	□	■
Spotted seatrout <i>Cynoscion nebulosus</i>	A	■	■	■	■	□	■	□
	S	■	■	□	■	□	■	■
	J	■	■	■	■	□	■	□
	L	■	■	□	■	□	■	■
	E	■	■	□	■	□	■	■
Spot <i>Leiostomus xanthurus</i>	A	■	□	□	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	□	■	■	■	□
	L	■	□	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Sheepshead	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☒	☒	☒	☒
<i>Archosargus probatocephalus</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☒	☒	☒	☒	☒	☒
	E	☒	☒	☒	☒	☒	☒	☒
Pinfish	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☒	☒	☒	☒
<i>Lagodon rhomboides</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☒	☒	☒	☒	☒	☒
	E	☒	☒	☒	☒	☒	☒	☒
Silver perch	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☐	☒	☒	☒
<i>Bairdiella chrysoura</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☒	☒	☐	☒	☒	☒
	E	☒	☒	☒	☐	☒	☒	☒
Sand seatrout	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☐	☐	☐	☐	☐	☐
<i>Cynoscion arenarius</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☐	☐	☐	☐	☐	☐
	E	☒	☐	☐	☐	☐	☐	☐
Spotted seatrout	A	☐	☒	☒	☐	☒	☒	☒
	S	☒	☐	☒	☐	☐	☒	☒
<i>Cynoscion nebulosus</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☒	☒	☐	☐	☒	☒
	E	☒	☐	☒	☐	☐	☒	☒
Spot	A	☒	☒	☒	☐	☒	☒	☒
	S	☒	☒	☒	☒	☒	☒	☒
<i>Leiostomus xanthurus</i>	J	☐	☒	☒	☐	☒	☒	☒
	L	☒	☒	☒	☒	☒	☒	☒
	E	☒	☒	☒	☒	☒	☒	☒
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
		Gulf of Mexico Estuaries						

Data Reliability

- ☒ Highly Certain
☒ Moderately Certain
☐ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Sheepshead <i>Archosargus probatocephalus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Pinfish <i>Lagodon rhomboides</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Silver perch <i>Bairdiella chrysoura</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Sand seatrout <i>Cynoscion arenarius</i>	A	■	■	■
	S	□	□	□
	J	■	■	■
	L	□	□	□
	E	□	□	□
Spotted seatrout <i>Cynoscion nebulosus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Spot <i>Leiostomus xanthurus</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Atlantic croaker <i>Micropogonias undulatus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	□	■	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	■	■
Black drum <i>Pogonias cromis</i>	A	■	■	■	■	■	■	■
	S	■	□	□	□	■	□	□
	J	■	■	■	■	■	■	■
	L	□	■	■	■	■	□	□
	E	□	□	□	□	□	□	□
Red drum <i>Sciaenops ocellatus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	□	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	□	■
Striped mullet <i>Mugil cephalus</i>	A	■	■	■	■	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Code goby <i>Gobiosoma robustum</i>	A	□	■	■	□	■	□	■
	S	■	■	■	□	■	□	■
	J	■	■	■	□	■	□	■
	L	■	■	■	□	□	□	■
	E	■	■	■	□	■	□	■
Spanish mackerel <i>Scomberomorus maculatus</i>	A	■	■	■	□	■	□	■
	S	■	■	■	■	■	■	■
	J	■	■	■	□	■	□	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	□	■	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Atlantic croaker <i>Micropogonias undulatus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	□
	L	■	■	■	■	■	■	■
	E	■	□	■	■	■	■	□
Black drum <i>Pogonias cromis</i>	A	■	■	■	■	■	■	□
	S	□	□	□	□	□	□	■
	J	■	■	■	■	■	■	■
	L	□	□	□	□	■	■	■
	E	□	□	□	□	□	□	■
Red drum <i>Sciaenops ocellatus</i>	A	■	■	□	■	■	■	□
	S	■	■	□	■	■	■	■
	J	■	■	□	■	■	■	□
	L	■	■	□	■	■	■	■
	E	■	■	□	■	■	■	■
Striped mullet <i>Mugil cephalus</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Code goby <i>Gobiosoma robustum</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Spanish mackerel <i>Scomberomorus maculatus</i>	A	□	□	■	■	■	■	□
	S	■	■	■	■	■	■	□
	J	□	□	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Atlantic croaker	A	■	□	□	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Micropogonias undulatus</i>	J	■	■	□	□	■	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Black drum	A	■	■	■	■	■	■	□
	S	■	■	□	■	□	■	■
<i>Pogonias cromis</i>	J	■	■	□	■	■	■	□
	L	■	■	□	■	□	■	■
	E	■	■	□	■	□	■	■
Red drum	A	■	■	■	■	□	□	□
	S	■	■	□	■	□	■	■
<i>Sciaenops ocellatus</i>	J	■	■	■	■	□	■	□
	L	■	■	□	■	■	■	■
	E	■	■	□	■	□	■	■
Striped mullet	A	■	□	□	■	□	□	□
	S	■	■	■	■	■	■	■
<i>Mugil cephalus</i>	J	■	■	□	□	□	□	□
	L	■	■	■	■	□	■	■
	E	■	■	■	■	■	■	■
Code goby	A	■	□	□	■	□	■	□
	S	□	□	□	■	□	■	□
<i>Gobiosoma robustum</i>	J	■	□	□	■	□	■	□
	L	□	□	□	■	□	■	□
	E	□	□	□	■	□	■	□
Spanish mackerel	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
<i>Scomberomorus maculatus</i>	J	■	■	■	■	□	■	□
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ■ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Atlantic croaker <i>Micropogonias undulatus</i>	A	■	▣	▣	□	▣	▣	▣
	S	■	■	■	■	■	■	■
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	▣	▣	▣
	E	■	■	■	■	■	■	■
Black drum <i>Pogonias cromis</i>	A	□	□	▣	□	▣	▣	▣
	S	■	■	▣	■	▣	▣	▣
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	▣	▣	▣
	E	■	■	▣	■	▣	▣	▣
Red drum <i>Sciaenops ocellatus</i>	A	□	▣	▣	□	▣	▣	▣
	S	■	■	□	■	□	□	□
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	▣	▣	▣
	E	■	■	□	■	□	□	□
Striped mullet <i>Mugil cephalus</i>	A	□	▣	▣	□	▣	▣	▣
	S	■	■	▣	■	▣	▣	▣
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	▣	▣	▣
	E	■	■	▣	■	▣	▣	▣
Code goby <i>Gobiosoma robustum</i>	A	▣	▣	▣	□	□	□	▣
	S	▣	▣	▣	□	□	□	▣
	J	▣	▣	▣	□	□	□	▣
	L	▣	▣	▣	□	□	□	▣
	E	▣	▣	▣	□	□	□	▣
Spanish mackerel <i>Scomberomorus maculatus</i>	A	■	□	▣	□	□	▣	▣
	S	■	■	■	■	■	■	■
	J	□	□	▣	□	□	▣	▣
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
 ▣ Moderately Certain
 □ Reasonable Inference

Life Stage

- A - Adults
 S - Spawning adults
 J - Juveniles
 L - Larvae
 E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Atlantic croaker	A	■	■	■
	S	■	■	■
<i>Micropogonias undulatus</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
Black drum	A	■	■	■
	S	■	■	■
<i>Pogonias cromis</i>	J	■	■	■
	L	■	□	■
	E	■	□	■
Red drum	A	■	■	■
	S	□	□	■
<i>Sciaenops ocellatus</i>	J	■	■	■
	L	■	■	■
	E	□	□	■
Striped mullet	A	■	■	■
	S	■	■	■
<i>Mugil cephalus</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
Code goby	A	■	□	■
	S	■	□	□
<i>Gobiosoma robustum</i>	J	■	■	■
	L	■	□	□
	E	■	□	□
Spanish mackerel	A	■	□	■
	S	■	■	■
<i>Scomberomorus maculatus</i>	J	■	■	■
	L	■	■	■
	E	■	■	■
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf flounder <i>Paralichthys albigutta</i>	A	■	■	■	■	■	□	□
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	□	■
	L	■	■	■	■	■	□	■
	E	■	■	■	■	■	■	■
Southern flounder <i>Paralichthys lethostigma</i>	A	□	■	■	□	□	■	■
	S	■	■	■	■	■	■	■
	J	□	■	■	□	□	■	■
	L	■	■	■	□	□	■	■
	E	■	■	■	■	□	■	■
		Florida Bay	Ten Thousand Islands	Caloosa-hatchee River	Charlotte Harbor	Tampa Bay	Suwannee River	Apalachee Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf flounder <i>Paralichthys albigutta</i>	A	□	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	□	■	■	■	■	■	■
	L	□	■	■	■	■	■	□
	E	■	■	■	■	■	■	□
Southern flounder <i>Paralichthys lethostigma</i>	A	□	■	■	■	■	■	□
	S	■	■	■	■	■	■	■
	J	□	■	■	■	■	■	□
	L	■	■	■	■	■	■	□
	E	■	■	■	■	■	■	■
		Apalachi- cola Bay	St. Andrew Bay	Choctaw- hatchee Bay	Pensacola Bay	Perdido Bay	Mobile Bay	Mississippi Sound
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf flounder <i>Paralichthys albigutta</i>	A	■	■	■	■	■	■	■
	S	■	■	■	■	■	■	■
	J	■	■	■	■	■	■	■
	L	■	■	■	■	■	■	■
	E	■	■	■	■	■	■	■
Southern flounder <i>Parlichthys lethostigma</i>	A	▣	□	▣	▣	▣	□	□
	S	■	■	■	■	□	■	■
	J	▣	▣	▣	▣	▣	□	□
	L	■	■	■	■	□	■	■
	E	■	■	■	■	□	■	■
		Lake Borgne	Lake Pontchartrain	Breton/Chandeleur Sounds	Mississippi River	Barataria Bay	Terrebonne/Timbalier Bays	Atchafalaya/Vermilion Bays
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- ▣ Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries						
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf flounder <i>Paralichthys albigutta</i>	A	■	▣	▣	□	▣	▣	▣
	S	■	■	■	■	■	■	■
	J	■	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	■	▣	▣
	E	■	■	■	■	■	■	■
Southern flounder <i>Parlichthys lethostigma</i>	A	□	▣	▣	□	▣	▣	▣
	S	■	■	▣	■	▣	▣	▣
	J	□	▣	▣	□	▣	▣	▣
	L	■	■	▣	■	▣	▣	▣
	E	■	■	▣	■	▣	▣	▣
		Calcasieu Lake	Sabine Lake	Galveston Bay	Brazos River	Matagorda Bay	San Antonio Bay	Aransas Bay
Gulf of Mexico Estuaries								

Data Reliability

- Highly Certain
- ▣ Moderately Certain
- Reasonable Inference

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Table 6, continued. Data reliability

Species/Life Stage		Gulf of Mexico Estuaries		
		Corpus Christi Bay	Laguna Madre	Baffin Bay
Gulf flounder <i>Paralichthys albigutta</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
Southern flounder <i>Paralichthys lethostigma</i>	A	■	■	■
	S	■	■	■
	J	■	■	■
	L	■	■	■
	E	■	■	■
		Corpus Christi Bay	Laguna Madre	Baffin Bay
		Gulf of Mexico Estuaries		

Data Reliability

- Highly Certain
- Moderately Certain
- Reasonable Inference

Life Stage

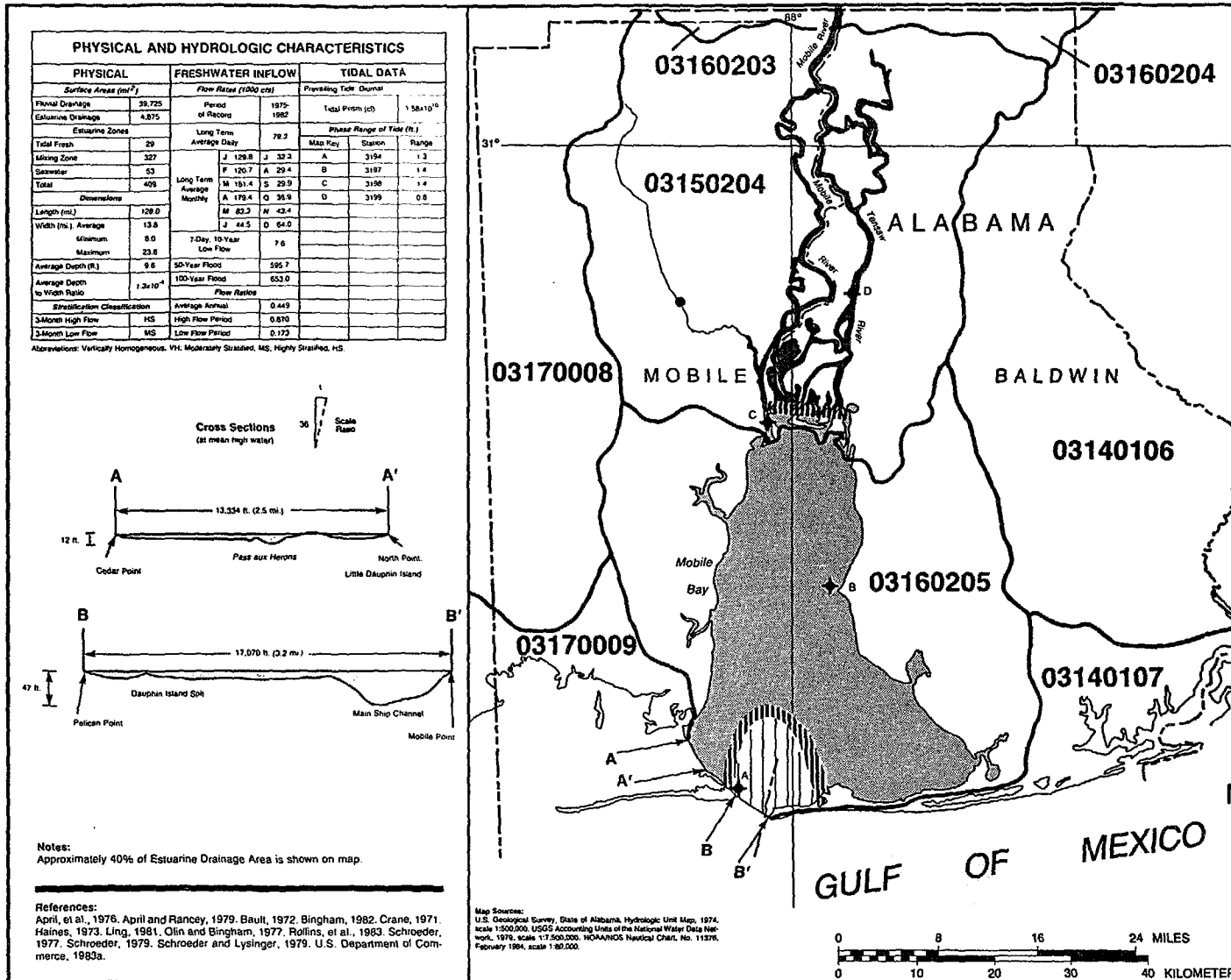
- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Appendices

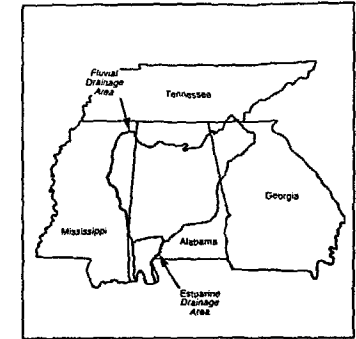
- Appendix 1. National Estuarine Inventory Map of Mobile Bay
- Appendix 2. Table of references and personal communications
- Appendix 3. Reviewers and personal communications
- Appendix 4. References

Appendix 1. National Estuarine Inventory Map of Mobile Bay

National Estuarine Atlas



Mobile Bay AL



- Tide Gage
- Flow Gage
- Head of Tide
- Estuarine Drainage Area (EDA)
- Tidal Fresh Zone
- Mixing Zone
- Seawater Zone
- Hydrologic Cataloging Unit Boundary
- County Boundary
- Salinity Zone Boundary - Low Variability
- Salinity Zone Boundary - Moderate Variability
- Salinity Zone Boundary - High Variability

Strategic Assessment Branch
 Ocean Assessment Division
 Office of Oceanography and Marine Assessment
 National Ocean Service/NOAA

Appendix 2. Table of references and personal communications

Species	Florida Bay, FL
Bay scallop	28
<i>Argopecten irradians</i>	Fonseca, LaCroix, Tilmant
American oyster	Tilmant
<i>Crassostrea virginica</i>	
Common rangia	491
<i>Rangia cuneata</i>	Marelli, Tilmant
Hard clam	296, 297, 429
<i>Mercenaria species</i>	Tilmant
Bay squid	56, 429, 630, 780, 878
<i>Loliguncula brevis</i>	Schmidt
Brown shrimp	11, 658, 692
<i>Peneaus aztecus</i>	
Pink shrimp	11, 64, 105, 295, 429, 458, 658, 692, 748, 749, 782, 878
<i>Peneaus duorarum</i>	Schmidt, Tilmant
White shrimp	658, 692
<i>Peneaus setiferus</i>	Tilmant
Grass shrimp	16, 782, 962
<i>Palaemonetes pugio</i>	Tilmant
Spiny lobster	200, 309, 429, 433, 438, 535, 560, 561, 547, 658, 868
<i>Panulirus argus</i>	Hunt, Tilmant
Blue crab	392, 429, 892, 898, 962
<i>Callinectes sapidus</i>	Steele, Tilmant
Gulf stone crab	947
<i>Menippe adina</i>	
Stone crab	61, 106, 226, 241, 242, 429, 511, 658, 898, 946, 947
<i>Menippe mercenaria</i>	Bert
Bull shark	429, 714, 780, 878
<i>Carcharhinus leucas</i>	Schmidt
Tarpon	460, 524, 780, 898
<i>Megalops atlanticus</i>	
Alabama shad	909
<i>Alosa alabamae</i>	Tilmant
Gulf menhaden	780, 879, 909
<i>Brevoortia patronus</i>	Schmidt, Tilmant
Yellowfin menhaden	152, 162, 524, 780, 892, 909
<i>Brevoortia smithii</i>	Tilmant
Gizzard shad	460, 504, 524
<i>Dorosoma cepedianum</i>	
Bay anchovy	460, 524, 750, 780, 832, 878, 879, 890, 892
<i>Anchoa mitchilli</i>	Tilmant
Hardhead catfish	56, 429, 524, 645, 714, 753, 780, 832, 833, 878, 879, 891, 898
<i>Arius felis</i>	Schmidt
Sheepshead minnow	524, 718, 780, 831, 832, 878, 879, 892
<i>Cyprinodon variegatus</i>	Tilmant
Gulf killifish	235, 306, 429, 524, 718, 831, 878, 891
<i>Fundulus grandis</i>	Tilmant
Silversides	524, 753, 780, 831, 878, 879, 891
<i>Menidia species</i>	Schmidt
Snook	429, 504, 524, 714, 715, 780, 897, 899, 898, 901
<i>Centropomus undecemalis</i>	
Bluefish	342, 539, 779, 780
<i>Pomatomus saltatrix</i>	
Blue runner	301, 302, 429, 753, 779, 780, 841, 877
<i>Caranx crysos</i>	Edwards, Tilmant
Crevalle jack	429, 524, 753, 779, 780, 832, 841, 877, 898
<i>Caranx hippos</i>	Edwards
Florida pompano	290, 658, 780, 892, 898
<i>Trachinotus carolinus</i>	Tilmant
Gray snapper	70, 114, 131, 312, 386, 429, 524, 714, 715, 773, 771, 772, 780, 832, 833, 879, 891, 892, 890, 898, 962
<i>Lutjanus griseus</i>	Powell, Thayer, Tilmant
Sheepshead	56, 114, 219, 429, 445, 524, 714, 753, 780, 831, 878, 877, 879, 891, 890, 898
<i>Archosargus probatocephalus</i>	Schmidt
Pinfish	429, 524, 780, 782, 832, 833, 879, 890, 962
<i>Lagodon rhomboides</i>	Hettler, Powell, Tilmant
Silver perch	219, 524, 714, 780, 831, 832, 833, 878, 879, 891, 890
<i>Bairdiella chysoura</i>	Schmidt
Sand seatrout	218, 443, 658, 782, 863, 879, 891
<i>Cynoscion arenarius</i>	Tilmant
Spotted seatrout	114, 131, 219, 386, 429, 446, 697, 714, 715, 773, 774, 780, 832, 879, 892, 890, 899, 898, 937
<i>Cynoscion nebulosus</i>	
Spot	443, 658, 782, 879, 891, 892, 962
<i>Leiostomus xanthurus</i>	Tilmant
Atlantic croaker	443, 780, 843
<i>Micropogonias undulatus</i>	Davis, Schmidt
Black drum	56, 114, 162, 443, 714, 753, 780, 878, 879, 891, 898
<i>Pogonias cromis</i>	Schmidt
Red drum	114, 429, 524, 658, 714, 715, 780, 831, 879, 899, 900, 898, 957
<i>Sciaenops ocellatus</i>	Schmidt, Tilmant
Striped mullet	278, 429, 524, 780, 832, 833, 878, 892, 898
<i>Mugil cephalus</i>	Hettler, Powell, Tilmant
Code goby	429, 524, 780, 782, 878, 879, 892, 962
<i>Gobiosoma robustum</i>	Tilmant
Spanish mackerel	263, 475, 483, 780, 898
<i>Scomberomorus maculatus</i>	
Gulf flounder	753, 780, 832, 879, 892
<i>Paralichthys albigutta</i>	Powell, Tilmant
Southern flounder	291, 658, 780
<i>Paralichthys lethostigma</i>	Tilmant

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Ten Thousand Islands, FL
Bay scallop <i>Argopecten irradians</i>	28
American oyster <i>Crassostrea virginica</i>	118, 123, 658, 782, 845 Browder, Thoemke
Common rangia <i>Rangia cuneata</i>	106, 491 Browder, Marelli, Tilmant
Hard clam <i>Mercenaria species</i>	106, 297, 936 Browder, Tashiro, Tilmant
Bay squid <i>Lolliguncula brevis</i>	56, 104, 106, 161, 199, 509, 878, 781 Schmidt
Brown shrimp <i>Peneaus aztecus</i>	332, 658, 692, 946
Pink shrimp <i>Peneaus duorarum</i>	64, 105, 123, 226, 295, 648, 658, 692, 754, 782, 876 Browder, Tilmant, Schmidt
White shrimp <i>Peneaus setiferus</i>	106, 658, 692 Browder, Tilmant
Grass shrimp <i>Palaemonetes pugio</i>	16, 106, 123, 161, 226, 946, 962 Browder, Tilmant
Spiny lobster <i>Panulirus argus</i>	106, 161, 547, 561, 658 Hunt
Blue crab <i>Callinectes sapidus</i>	106, 123, 161, 392, 602, 898 Browder, Steele
Gulf stone crab <i>Menippe adina</i>	947
Stone crab <i>Menippe mercenaria</i>	62, 63, 106, 123, 226, 511, 658, 898, 946, 947 Bert, Browder
Bull shark <i>Carcharhinus leucas</i>	77, 123, 157, 660, 781, 829 Schmidt
Tarpon <i>Megalops atlanticus</i>	103, 106, 123, 161, 524, 658, 898
Alabama shad <i>Alosa alabamae</i>	909
Gulf menhaden <i>Brevoortia patronus</i>	106, 123, 161, 879, 909 Schmidt
Yellowfin menhaden <i>Brevoortia smithii</i>	106, 107, 123, 152, 161, 162, 909 Browder
Gizzard shad <i>Dorosoma cepedianum</i>	460, 504, 524 Schmidt
Bay anchovy <i>Anchoa mitchilli</i>	106, 123, 161, 524, 750, 878, 879 Browder
Hardhead catfish <i>Arius felis</i>	56, 106, 123, 158, 199, 226, 509, 524, 645, 660, 781, 879, 898 Schmidt
Sheepshead minnow <i>Cyprinodon variegatus</i>	103, 106, 107, 123, 161, 524, 878, 879 Browder
Gulf killifish <i>Fundulus grandis</i>	103, 106, 107, 123, 161, 235, 524 Browder
Silversides <i>Menidia species</i>	103, 107, 123, 161, 509, 524, 660, 878, 879 Schmidt
Snook <i>Centropomus undecimalis</i>	103, 123, 269, 504, 524, 794, 897, 898, 899, 901, 903 Browder
Bluefish <i>Pomatomus saltatrix</i>	106, 269, 342, 539, 658
Blue runner <i>Caranx crysos</i>	106, 107, 301, 302, 509, 878 Edwards
Creville jack <i>Caranx hippos</i>	106, 107, 123, 161, 509, 524, 590, 878, 898 Browder
Florida pompano <i>Trachinotus carolinus</i>	106, 161, 658, 898
Gray snapper <i>Lutjanus griseus</i>	70, 123, 161, 312, 504, 524, 770, 771, 878, 879, 898 Browder, Tilmant
Sheepshead <i>Archosargus probatocephalus</i>	56, 106, 107, 123, 158, 161, 162, 219, 445, 509, 524, 660, 878, 879, 898 Schmidt
Pinfish <i>Lagodon rhomboides</i>	Bro86, 123, 162, 161, 524, 643, 782, 879
Silver perch <i>Bairdiella chysoura</i>	106, 108, 107, 123, 158, 161, 162, 219, 443, 509, 524, 660, 753, 781, 878, 879 Schmidt
Sand seatrout <i>Cynoscion arenarius</i>	106, 107, 123, 161, 218, 808, 863, 879 Browder
Spotted seatrout <i>Cynoscion nebulosus</i>	123, 161, 219, 690, 697, 774, 879, 898, 899 Browder
Spot <i>Leiostomus xanthurus</i>	106, 107, 123, 161, 443, 878, 879 Browder, Tilmant
Atlantic croaker <i>Micropogonias undulatus</i>	106, 161, 878 Browder, Tilmant
Black drum <i>Pogonias cromis</i>	56, 106, 123, 161, 162, 443, 509, 878, 879, 898 Schmidt
Red drum <i>Sciaenops ocellatus</i>	106, 123, 158, 162, 443, 524, 714, 770, 879, 898, 899, 900 Browder, Schmidt
Striped mullet <i>Mugil cephalus</i>	78, 103, 106, 123, 161, 278, 509, 524, 878, 898 Browder, Hettler, Tilmant
Code goby <i>Gobiosoma robustum</i>	106, 107, 123, 158, 161, 524, 878, 879 Browder
Spanish mackerel <i>Scomberomorus maculatus</i>	123, 263, 298, 475, 483, 694, 898 Browder
Gulf flounder <i>Paralichthys albigutta</i>	107, 123, 161, 879 Browder
Southern flounder <i>Paralichthys lethostigma</i>	106, 107, 123, 291, 658 Browder

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Caloosahatchee River, FL
Bay scallop	28
<i>Argopecten irradians</i>	Estevez
American oyster	118, 658
<i>Crassostrea virginica</i>	Chamberlain
Common rangia	297, 491
<i>Rangia cuneata</i>	Marelli
Hard clam	297, 491, 509, 525
<i>Mercenaria species</i>	Chamberlain
Bay squid	56, 224
<i>Lolliguncula brevis</i>	Fraser
Brown shrimp	658, 692, 946
<i>Peneaus aztecus</i>	
Pink shrimp	295, 333, 658, 692
<i>Peneaus duorarum</i>	
White shrimp	658, 692
<i>Penaeus setiferus</i>	
Grass shrimp	16, 333
<i>Palaemonetes pugio</i>	Chamberlain
Spiny lobster	547
<i>Panulirus argus</i>	Hunt
Blue crab	602, 910
<i>Callinectes sapidus</i>	Chamberlain, Steele
Gulf stone crab	947
<i>Menippe adina</i>	
Stone crab	62, 63, 226, 511, 658, 947
<i>Menippe mercenaria</i>	Bert
Bull shark	77, 157, 829
<i>Carcharhinus leucas</i>	Fraser, Heuter
Tarpon	
<i>Megalops atlanticus</i>	Fraser
Alabama shad	909
<i>Alosa alabamae</i>	
Gulf menhaden	909
<i>Brevoortia patronus</i>	
Yellowfin menhaden	152, 333, 909, 928
<i>Brevoortia smithii</i>	Chamberlain
Gizzard shad	460, 504
<i>Dorosoma cepedianum</i>	Fraser
Bay anchovy	226, 333
<i>Anchoa mitchilli</i>	Chamberlain, Fraser
Hardhead catfish	56, 226, 246, 333, 645, 709, 928
<i>Arius felis</i>	Fraser
Sheepshead minnow	333, 388, 709, 730
<i>Cyprinodon variegatus</i>	Chamberlain, Fraser
Gulf killifish	333
<i>Fundulus grandis</i>	Chamberlain
Silversides	226, 246, 333, 709, 928
<i>Menidia species</i>	Fraser
Snook	333, 504, 542, 923
<i>Centropomus undecemalis</i>	Chamberlain, Fraser
Bluefish	333, 342, 539, 658, 709, 928
<i>Pomatomus saltatrix</i>	Chamberlain
Blue runner	928
<i>Caranx crysos</i>	Chamberlain
Crevalle jack	333, 709
<i>Caranx hippos</i>	Chamberlain
Florida pompano	333, 709, 843, 928
<i>Trachinotus carolinus</i>	Chamberlain
Gray snapper	333, 928
<i>Lutjanus griseus</i>	Chamberlain, Fraser
Sheepshead	56, 219, 246, 333, 445
<i>Archosargus probatocephalus</i>	Fraser
Pinfish	333, 643, 843, 928
<i>Lagodon rhomboides</i>	Chamberlain
Silver perch	219, 226, 246, 333, 709, 928
<i>Bairdiella chysoura</i>	Fraser
Sand seatrout	218, 333
<i>Cynoscion arenarius</i>	Chamberlain, Fraser
Spotted seatrout	161, 219, 226, 246, 114, 697, 928
<i>Cynoscion nebulosus</i>	Fraser, Chamberlain
Spot	333, 928
<i>Leiostomus xanthurus</i>	Chamberlain, Fraser
Atlantic croaker	333, 928
<i>Micropogonias undulatus</i>	Chamberlain
Black drum	56, 333, 928
<i>Pogonias cromis</i>	Fraser
Red drum	333, 843
<i>Sciaenops ocellatus</i>	Chamberlain, Fraser
Striped mullet	78, 333, 658, 896, 928
<i>Mugil cephalus</i>	Chamberlain, Fraser
Code goby	79, 274, 333, 843, 928
<i>Gobiosoma robustum</i>	Chamberlain
Spanish mackerel	298, 694, 709
<i>Scomberomorus maculatus</i>	Chamberlain
Gulf flounder	333
<i>Paralichthys albigutta</i>	Chamberlain
Southern flounder	333
<i>Paralichthys lethostigma</i>	Chamberlain

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Charlotte Harbor, FL
Bay scallop	28
<i>Argopecten irradians</i>	Estevez
American oyster	118, 658
<i>Crassostrea virginica</i>	Fraser
Common rangia	297, 491
<i>Rangia cuneata</i>	Estevez, Marelli
Hard clam	297, 459, 491, 509, 525
<i>Mercenaria species</i>	Fraser
Bay squid	56, 224
<i>Lolliguncula brevis</i>	Fraser
Brown shrimp	658, 692, 946
<i>Peneaus aztecus</i>	
Pink shrimp	658, 692
<i>Peneaus duorarum</i>	Browder
White shrimp	658, 692
<i>Penaeus setiferus</i>	
Grass shrimp	16, 333
<i>Palaemonetes pugio</i>	
Spiny lobster	547, 658
<i>Panulirus argus</i>	Fraser, Hunt
Blue crab	226, 333, 392, 602, 910
<i>Callinectes sapidus</i>	Fraser, Steele
Gulf stone crab	947
<i>Menippe adina</i>	
Stone crab	62, 63, 226, 511, 658, 947
<i>Menippe mercenaria</i>	Bert
Bull shark	77, 157, 246, 829
<i>Carcharhinus leucas</i>	Fraser, Heuter
Tarpon	219, 460, 827
<i>Megalops atlanticus</i>	Fraser
Alabama shad	909
<i>Alosa alabamiae</i>	
Gulf menhaden	909
<i>Brevoortia patronus</i>	
Yellowfin menhaden	152, 333, 909, 928
<i>Brevoortia smithii</i>	Fraser
Gizzard shad	460, 504
<i>Dorosoma cepedianum</i>	Fraser
Bay anchovy	226, 246, 333, 928
<i>Anchoa mitchilli</i>	
Hardhead catfish	56, 226, 246, 333, 645, 709, 928
<i>Arius felis</i>	Fraser
Sheepshead minnow	333, 719, 928
<i>Cyprinodon variegatus</i>	Fraser
Gulf killifish	246, 928
<i>Fundulus grandis</i>	Fraser
Silversides	226, 246, 333, 709, 928
<i>Menidia species</i>	Fraser
Snook	504, 928
<i>Centropomus undecemalis</i>	Browder, Fraser
Bluefish	342, 539, 658, 928
<i>Pomatomus saltatrix</i>	
Blue runner	928
<i>Caranx crysos</i>	Fraser
Crevalle jack	333, 509, 928
<i>Caranx hippos</i>	Fraser
Florida pompano	333, 843, 928
<i>Trachinotus carolinus</i>	Fraser
Gray snapper	333, 928
<i>Lutjanus griseus</i>	Fraser
Sheepshead	56, 219, 246, 333, 445
<i>Archosargus probatocephalus</i>	Fraser
Pinfish	219, 226, 643, 928
<i>Lagodon rhomboides</i>	
Silver perch	219, 226, 246, 333, 709, 928
<i>Bairdiella chysoura</i>	Fraser
Sand seatrout	218, 219, 333, 658, 928
<i>Cynoscion arenarius</i>	Fraser
Spotted seatrout	161, 219, 226, 246, 446, 697, 928
<i>Cynoscion nebulosus</i>	Fraser
Spot	333, 658, 928
<i>Leiostomus xanthurus</i>	Fraser
Atlantic croaker	928
<i>Micropogonias undulatus</i>	
Black drum	56, 333, 928
<i>Pogonias cromis</i>	Fraser
Red drum	333, 928
<i>Sciaenops ocellatus</i>	Fraser
Striped mullet	78, 333, 658, 896, 928
<i>Mugil cephalus</i>	Fraser
Code goby	246, 274, 843, 928
<i>Gobiosoma robustum</i>	Fraser
Spanish mackerel	298, 475, 483, 928
<i>Scomberomorus maculatus</i>	
Gulf flounder	219, 928
<i>Paralichthys albigutta</i>	Fraser
Southern flounder	219, 928
<i>Paralichthys lethostigma</i>	Fraser

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Tampa Bay, FL
Bay scallop	28, 508
<i>Argopecten irradians</i>	Fonseca, Estevez
American oyster	118, 170, 260, 285, 658, 845
<i>Crassostrea virginica</i>	Edwards, Estevez, Phillips
Common rangia	658
<i>Rangia cuneata</i>	
Hard clam	297, 459, 825, 843
<i>Mercenaria species</i>	Edwards
Bay squid	56, 224, 510
<i>Loliguncula brevis</i>	Comp, Phillips
Brown shrimp	244, 510, 692, 875
<i>Peneaus aztecus</i>	Comp, Camp
Pink shrimp	658, 692
<i>Peneaus duorarum</i>	Comp, Edwards, Estevez
White shrimp	658, 692
<i>Penaeus setiferus</i>	
Grass shrimp	16, 225, 946
<i>Palaemonetes pugio</i>	Phillips
Spiny lobster	938
<i>Panulirus argus</i>	Hunt, Estevez
Blue crab	392, 602, 658, 875, 938, 946
<i>Callinectes sapidus</i>	Steele
Gulf stone crab	947
<i>Menippe adina</i>	
Stone crab	508, 511, 938, 947
<i>Menippe mercenaria</i>	Bert
Bull shark	77, 157, 829, 843
<i>Carcharhinus leucas</i>	Comp, Heuter
Tarpon	219, 719, 843
<i>Megalops atlanticus</i>	Edwards
Alabama shad	909
<i>Alosa alabamiae</i>	
Gulf menhaden	494, 909
<i>Brevoortia patronus</i>	Mahmoudi, Edwards, Phillips
Yellowfin menhaden	152, 843, 875
<i>Brevoortia smithii</i>	Mahmoudi, Phillips
Gizzard shad	460, 504, 839
<i>Dorosoma cepedianum</i>	Comp, Phillips
Bay anchovy	165, 750, 938
<i>Anchoa mitchilli</i>	Comp, Edwards, Estevez
Hardhead catfish	56, 508, 510, 645, 719, 733, 843
<i>Arius felis</i>	Comp, Phillips
Sheepshead minnow	165, 342, 719, 733
<i>Cyprinodon variegatus</i>	Comp, Phillips
Gulf killifish	235, 310, 469, 719, 843, 860
<i>Fundulus grandis</i>	Comp, Phillips
Silversides	165, 469, 508, 689, 710, 719, 733, 843, 875
<i>Menidia species</i>	Comp, Phillips
Snook	483, 504, 542, 588, 843, 923
<i>Centropomus undecemalis</i>	Edwards
Bluefish	342, 539, 658, 843
<i>Pomatomus saltatrix</i>	
Blue runner	447, 587, 776, 843, 875
<i>Caranx crysos</i>	Edwards
Crevalle jack	776, 843, 875
<i>Caranx hippos</i>	Edwards
Florida pompano	258, 843
<i>Trachinotus carolinus</i>	Phillips
Gray snapper	843
<i>Lutjanus griseus</i>	Edwards
Sheepshead	56, 219, 445, 469, 483, 508, 510, 687, 689, 733, 843, 875, 938
<i>Archosargus probatocephalus</i>	Comp, Phillips
Pinfish	165, 219, 643, 843
<i>Lagodon rhomboides</i>	Comp, Edwards, Estevez
Silver perch	165, 219, 469, 504, 508, 510, 689, 710, 719, 733, 843
<i>Bairdiella chysoura</i>	Comp, Phillips
Sand seatrout	218, 219, 843, 875
<i>Cynoscion arenarius</i>	Comp, Phillips
Spotted seatrout	219, 446, 504, 589, 658, 875, 928, 937
<i>Cynoscion nebulosus</i>	Comp, Phillips
Spot	165, 219, 509, 719, 843, 875
<i>Leiostomus xanthurus</i>	Comp, Phillips
Atlantic croaker	495, 509, 843, 875
<i>Micropogonias undulatus</i>	Phillips
Black drum	56, 443, 469, 483, 508, 510, 649, 689, 706, 719, 843
<i>Pogonias cromis</i>	Comp, Phillips
Red drum	650, 658, 705, 711, 719, 752, 875
<i>Sciaenops ocellatus</i>	Estevez, Phillips
Striped mullet	163, 165, 719, 752, 843, 875
<i>Mugil cephalus</i>	Edwards, Estevez, Phillips
Code goby	79, 274, 840, 843
<i>Gobiosoma robustum</i>	
Spanish mackerel	298, 475, 483, 694, 875
<i>Scoromorus maculatus</i>	Comp
Gulf flounder	165, 219, 719, 843, 875, 904
<i>Paralichthys albigutta</i>	Phillips
Southern flounder	165, 219, 719, 732, 733, 843, 875
<i>Paralichthys lethostigma</i>	

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Suwannee River, FL
Bay scallop <i>Argopecten irradians</i>	
American oyster <i>Crassostrea virginica</i>	360, 500, 845 Lindberg
Common rangia <i>Rangia cuneata</i>	491, 952 Gilbert, Marelli
Hard clam <i>Mercenaria species</i>	249, 459, 525, 825 Menzel, Nordlie
Bay squid <i>Lolliguncula brevis</i>	56 Clugston, Nordlie
Brown shrimp <i>Peneaus aztecus</i>	172, 331, 332, 500, 692 Sheridan
Pink shrimp <i>Peneaus duorarum</i>	64, 435, 500, 658, 692 Sheridan
White shrimp <i>Peneaus setiferus</i>	500, 644, 658, 692, 946 Sheridan
Grass shrimp <i>Palaemonetes pugio</i>	16, 361, 946 Sheridan
Spiny lobster <i>Panulirus argus</i>	658
Blue crab <i>Callinectes sapidus</i>	500, 699, 846, 910 Steele
Gulf stone crab <i>Menippe adina</i>	500, 947 Bert, Lindberg
Stone crab <i>Menippe mercenaria</i>	500, 947 Bert, Lindberg
Bull shark <i>Carcharhinus leucas</i>	77, 157, 829 Clugston, Nordlie
Tarpon <i>Megalops atlanticus</i>	219, 500, 658
Alabama shad <i>Alosa alabamae</i>	35, 265, 504, 909 Clugston, Gilbert
Gulf menhaden <i>Brevoortia patronus</i>	152, 217, 219, 493, 909, 913 Ahrenholz
Yellowfin menhaden <i>Brevoortia smithii</i>	909
Gizzard shad <i>Dorosoma cepedianum</i>	35, 188, 265, 460 Clugston, Nordlie, Gilbert
Bay anchovy <i>Anchoa mitchilli</i>	469, 733, 750
Hardhead catfish <i>Arius felis</i>	56, 645 Clugston, Nordlie
Sheepshead minnow <i>Cyprinodon variegatus</i>	469, 733
Gulf killifish <i>Fundulus grandis</i>	469
Silversides <i>Menidia species</i>	Clugston, Nordlie
Snook <i>Centropomus undecemalis</i>	658, 733, 747
Bluefish <i>Pomatomus saltatrix</i>	259, 500, 658, 733
Blue runner <i>Caranx crysos</i>	59, 60, 301, 302, 349, 447, 733
Crevalle jack <i>Caranx hippos</i>	59, 174, 324, 447, 666, 733, 921
Florida pompano <i>Trachinotus carolinus</i>	
Gray snapper <i>Lutjanus griseus</i>	35, 504, 658
Sheepshead <i>Archosargus probatocephalus</i>	35, 56, 219, 265, 445, 469, 500, 733 Clugston, Nordlie
Pinfish <i>Lagodon rhomboides</i>	217, 219, 469, 642, 643, 733
Silver perch <i>Bairdiella chysoura</i>	165, 219, 469, 510, 719, 733, 843 Clugston, Nordlie
Sand seatrout <i>Cynoscion arenarius</i>	218, 219, 658, 816 Lindberg
Spotted seatrout <i>Cynoscion nebulosus</i>	219, 500, 595, 673 Lindberg
Spot <i>Leiostomus xanthurus</i>	35, 217, 219, 275, 469, 733
Atlantic croaker <i>Micropogonias undulatus</i>	217, 219, 275, 500 Nordlie, Warlen
Black drum <i>Pogonias cromis</i>	56 Clugston, Nordlie
Red drum <i>Sciaenops ocellatus</i>	420, 500, 515, 596, 597, 658, 731
Striped mullet <i>Mugil cephalus</i>	219, 500 Clugston, Nordlie
Code goby <i>Gobiosoma robustum</i>	469, 733
Spanish mackerel <i>Scomberomorus maculatus</i>	217, 219, 261, 298, 463
Gulf flounder <i>Paralichthys albigutta</i>	35, 219, 265, 311, 313, 469, 642, 733
Southern flounder <i>Paralichthys lethostigma</i>	35, 219, 504, 904 Clugston, Nordlie

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Apalachee Bay, FL
Bay scallop	592, 778
<i>Argopecten irradians</i>	Menzel, Subrahmanyam
American oyster	360, 594, 592, 845
<i>Crassostrea virginica</i>	Subrahmanyam
Common rangia	491, 592
<i>Rangia cuneata</i>	Subrahmanyam
Hard clam	
<i>Mercenaria species</i>	Menzel, Subrahmanyam
Bay squid	56
<i>Loliguncula brevis</i>	Subrahmanyam
Brown shrimp	1, 151, 172, 234, 308, 331, 332, 425, 426, 692
<i>Peneaus aztecus</i>	Sheridan, Subrahmanyam
Pink shrimp	436, 592, 658, 692, 859, 946
<i>Peneaus duorarum</i>	Sheridan, Subrahmanyam
White shrimp	512, 513, 520, 644, 658, 692, 946
<i>Peneaus setiferus</i>	Sheridan, Subrahmanyam
Grass shrimp	859, 946
<i>Palaemonetes pugio</i>	Menzel, Sheridan, Subrahmanyam
Spiny lobster	658
<i>Panulirus argus</i>	Subrahmanyam
Blue crab	392, 658, 699, 846, 963
<i>Callinectes sapidus</i>	Steele, Subrahmanyam
Gulf stone crab	658, 947
<i>Menippe adina</i>	Bert, Menzel, Lindberg, Subrahmanyam
Stone crab	658, 947
<i>Menippe mercenaria</i>	Bert, Menzel, Lindberg, Subrahmanyam
Bull shark	77, 157, 463, 512, 592, 829
<i>Carcharhinus leucas</i>	Subrahmanyam
Tarpon	219, 462, 463, 592, 658, 685
<i>Megalops atlanticus</i>	Subrahmanyam
Alabama shad	504, 766, 767
<i>Alosa alabamae</i>	Subrahmanyam
Gulf menhaden	66, 463, 493, 685, 909
<i>Brevoortia patronus</i>	Subrahmanyam
Yellowfin menhaden	152, 909
<i>Brevoortia smithii</i>	Subrahmanyam
Gizzard shad	460, 592
<i>Dorosoma cepedianum</i>	Subrahmanyam
Bay anchovy	76, 750, 860, 859
<i>Anchoa mitchilli</i>	Subrahmanyam
Hardhead catfish	56, 463, 512, 592, 645, 685, 686, 963
<i>Arius felis</i>	Subrahmanyam
Sheepshead minnow	859, 963
<i>Cyprinodon variegatus</i>	Subrahmanyam
Gulf killifish	130, 859, 963
<i>Fundulus grandis</i>	Subrahmanyam
Silversides	463, 512, 592, 685, 686, 963
<i>Menidia species</i>	Subrahmanyam
Snook	173, 462, 592, 658, 747, 955
<i>Centropomus undecemalis</i>	Subrahmanyam
Bluefish	259, 462, 463, 512, 658, 733
<i>Pomatomus saltatrix</i>	Subrahmanyam
Blue runner	60, 301, 302, 462, 463, 592
<i>Caranx crysos</i>	Subrahmanyam
Crevalle jack	14, 174, 324, 462, 463, 512, 592, 666, 921
<i>Caranx hippos</i>	Subrahmanyam
Florida pompano	462, 463, 658
<i>Trachinotus carolinus</i>	Subrahmanyam
Gray snapper	592
<i>Lutjanus griseus</i>	Subrahmanyam
Sheepshead	56, 219, 445, 463, 512, 592
<i>Archosargus probatocephalus</i>	Subrahmanyam
Pinfish	66, 76, 219, 463, 643, 685, 860
<i>Lagodon rhomboides</i>	Subrahmanyam
Silver perch	219, 463, 512, 685, 686, 963
<i>Bairdiella chysoura</i>	Subrahmanyam
Sand seatrout	217, 218, 219, 658, 815, 816, 860
<i>Cynoscion arenarius</i>	Menzel, Subrahmanyam
Spotted seatrout	217, 219, 463, 476, 496, 526, 592, 598, 859, 937
<i>Cynoscion nebulosus</i>	Menzel, Subrahmanyam
Spot	130, 219, 463, 805, 860, 963
<i>Leiostomus xanthurus</i>	Menzel, Subrahmanyam
Atlantic croaker	217, 219, 275, 463, 805, 859, 963
<i>Micropogonias undulatus</i>	Subrahmanyam
Black drum	56, 463, 592
<i>Pogonias cromis</i>	Subrahmanyam
Red drum	420, 515, 596, 597, 657, 658, 731
<i>Sciaenops ocellatus</i>	Subrahmanyam
Striped mullet	163, 219, 463, 685
<i>Mugil cephalus</i>	Subrahmanyam
Code goby	76, 502, 592
<i>Gobiosoma robustum</i>	Subrahmanyam
Spanish mackerel	217, 219, 251, 261, 298
<i>Scomberomorus maculatus</i>	Subrahmanyam
Gulf flounder	76, 219, 291, 512, 658, 860, 859
<i>Paralichthys albigutta</i>	Subrahmanyam
Southern flounder	76, 219, 512, 859, 860
<i>Paralichthys lethostigma</i>	Subrahmanyam

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Apalachicola Bay, FL
Bay scallop <i>Argopecten irradians</i>	Menzel
American oyster <i>Crassostrea virginica</i>	13, 57, 58, 514, 515, 593, 845
Common rangia <i>Rangia cuneata</i>	Menzel
Hard clam <i>Mercenaria species</i>	Menzel
Bay squid <i>Lolliguncula brevis</i>	56, 498, 513, 515, 519, 520
Brown shrimp <i>Peneaus aztecus</i>	1, 7, 172, 177, 332, 435, 437, 506, 514, 515, 517, 519, 520, 538, 592, 692, 933
Pink shrimp <i>Peneaus duorarum</i>	Sheridan
White shrimp <i>Peneaus setiferus</i>	64, 514, 515, 517, 658, 692, 729, 946
Grass shrimp <i>Palaemonetes pugio</i>	Sheridan
Spiny lobster <i>Parulirus argus</i>	514, 515, 517, 519, 520, 644, 658, 692
Blue crab <i>Callinectes sapidus</i>	16, 361, 515, 517, 518, 729
Gulf stone crab <i>Menippe adina</i>	Sheridan
Stone crab <i>Menippe mercenaria</i>	658
Bull shark <i>Carcharhinus leucas</i>	514, 517, 520, 661, 662, 699, 729, 846
Tarpon <i>Megalops atlanticus</i>	Steele
Alabama shad <i>Alosa alabamiae</i>	511, 947
Gulf menhaden <i>Brevoortia patronus</i>	Bert, Lindberg
Yellowfin menhaden <i>Brevoortia smithii</i>	511, 947
Gizzard shad <i>Dorosoma cepedianum</i>	Bert, Lindberg
Bay anchovy <i>Anchoa mitchilli</i>	77, 157, 520, 829
Hardhead catfish <i>Arius felis</i>	7, 219, 592, 658
Sheepshead minnow <i>Cyprinodon variegatus</i>	47, 499, 504, 603, 956
Gulf killifish <i>Fundulus grandis</i>	Menzel
Silversides <i>Menidia species</i>	66, 494, 515, 517, 518, 520, 685, 729, 805, 909
Snook <i>Centropomus undecemalis</i>	
Bluefish <i>Pomatomus saltatrix</i>	47, 115, 188, 460
Blue runner <i>Caranx crysos</i>	66, 115, 513, 514, 515, 517, 519, 802, 805
Crevalle jack <i>Caranx hippos</i>	66, 115, 518, 513, 519, 520, 515, 645
Florida pompano <i>Trachinotus carolinus</i>	515, 853
Gray snapper <i>Lutjanus griseus</i>	213, 235, 512, 515
Sheepshead <i>Archosargus probatocephalus</i>	115, 513, 515, 518, 520
Pinfish <i>Lagodon rhomboides</i>	7, 173, 592, 747, 955
Silver perch <i>Bairdiella chysoura</i>	7, 259, 513, 515, 518, 520, 592, 599, 658
Sand seatrout <i>Cynoscion arenarius</i>	7, 60, 301, 302, 348, 349, 518, 592
Spotted seatrout <i>Cynoscion nebulosus</i>	7, 174, 324, 513, 515, 518, 520, 666, 921
Spot <i>Leiostomus xanthurus</i>	463, 518, 539
Atlantic croaker <i>Micropogonias undulatus</i>	56, 66, 115, 219, 445, 518, 520, 515
Black drum <i>Pogonias cromis</i>	66, 115, 219, 463, 528, 529, 643
Red drum <i>Sciaenops ocellatus</i>	66, 115, 219, 513, 518, 519, 520, 805
Striped mullet <i>Mugil cephalus</i>	217, 218, 219, 514, 515, 517, 519, 520, 802, 805, 815, 816
Code goby <i>Gobiosoma robustum</i>	66, 219, 440, 446, 476, 496, 595, 609, 673
Spanish mackerel <i>Scomberomorus maculatus</i>	217, 219, 479, 514, 515, 517, 519, 520, 802, 805
Gulf flounder <i>Paralichthys albigutta</i>	479, 504, 514, 515, 517, 519, 520, 802, 803, 945
Southern flounder <i>Paralichthys lethostigma</i>	66, 515

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	St. Andrew Bay, FL
Bay scallop <i>Argopecten irradians</i>	254, 777 Fable, Fonseca, Menzel
American oyster <i>Crassostrea virginica</i>	279, 335, 360, 845, 958 Fable, Menzel, Ogren
Common rangia <i>Rangia cuneata</i>	491 Naughton
Hard clam <i>Mercenaria species</i>	249, 279, 335 Menzel, Naughton
Bay squid <i>Lolliguncula brevis</i>	56 Fable, Finucane
Brown shrimp <i>Peneaus aztecus</i>	172, 177, 332, 435, 437, 506, 515, 519, 538, 592, 692, 933, 958 Fable, Ogren, Sheridan
Pink shrimp <i>Peneaus duorarum</i>	110, 692, 777 Ogren, Sheridan
White shrimp <i>Peneaus setiferus</i>	110, 692, 958 Ogren, Sheridan, Young
Grass shrimp <i>Palaemonetes pugio</i>	777 Fable, Ogren, Sheridan, Young
Spiny lobster <i>Panulirus argus</i>	Fable
Blue crab <i>Callinectes sapidus</i>	658, 662, 699, 777, 846, 958 Naughton, Steele
Gulf stone crab <i>Menippe adina</i>	62, 320, 511, 946, 947 Bert, Lindberg, Naughton
Stone crab <i>Menippe mercenaria</i>	947
Bull shark <i>Carcharhinus leucas</i>	77, 157, 829, 921 Fable, Finucane
Tarpon <i>Megalops atlanticus</i>	219, 349, 584, 658, 862, 921 Fable
Alabama shad <i>Alosa alabamae</i>	504, 584, 720, 721 Finucane
Gulf menhaden <i>Brevoortia patronus</i>	14, 584, 665, 720, 721, 906, 921 Finucane
Yellowfin menhaden <i>Brevoortia smithii</i>	Fable
Gizzard shad <i>Dorosoma cepedianum</i>	460 Fable, Finucane
Bay anchovy <i>Anchoa mitchilli</i>	14, 191, 665, 921 Finucane
Hardhead catfish <i>Arius felis</i>	14, 56, 584, 645, 654, 665, 720, 721, 862, 921 Fable, Finucane
Sheepshead minnow <i>Cyprinodon variegatus</i>	14, 654, 720, 921 Finucane
Gulf killifish <i>Fundulus grandis</i>	191, 654, 921 Finucane
Silversides <i>Menidia species</i>	348, 654, 921 Fable, Finucane
Snook <i>Centropomus undecemalis</i>	173, 349, 658, 747, 862, 921, 955 Fable
Bluefish <i>Pomatomus saltatrix</i>	111, 250, 259, 463, 584, 658, 665, 721, 862, 906, 921 Fable
Blue runner <i>Caranx crysos</i>	14, 60, 111, 250, 301, 302, 349, 584, 665, 721, 862, 906, 921 Fable
Crevalle jack <i>Caranx hippos</i>	14, 111, 191, 349, 584, 654, 665, 721, 862, 921 Fable
Florida pompano <i>Trachinotus carolinus</i>	14, 349, 584, 721, 862 Finucane
Gray snapper <i>Lutjanus griseus</i>	14, 191, 584, 654, 665, 721, 862, 921 Fable
Sheepshead <i>Archosargus probatocephalus</i>	14, 56, 219, 348, 445, 584, 665, 721, 862, 921 Fable, Finucane
Pinfish <i>Lagodon rhomboides</i>	14, 191, 219, 349, 584, 665, 720, 721, 862, 906, 921 Fable
Silver perch <i>Bairdiella chysoura</i>	14, 191, 219, 348, 654, 665, 721, 862 Fable, Finucane
Sand seatrout <i>Cynoscion arenarius</i>	14, 218, 219, 584, 654, 665, 721, 862, 906, 921 Fable
Spotted seatrout <i>Cynoscion nebulosus</i>	14, 191, 219, 584, 654, 665, 721, 862, 906, 921 Fable
Spot <i>Leiostomus xanthurus</i>	14, 219, 349, 584, 654, 665, 721, 862, 906, 921 Fable
Atlantic croaker <i>Micropogonias undulatus</i>	14, 584, 654, 665, 720, 721, 862, 906, 921 Fable
Black drum <i>Pogonias cromis</i>	191, 584, 721, 862 Fable, Finucane
Red drum <i>Sciaenops ocellatus</i>	191, 862, 921 Fable
Striped mullet <i>Mugil cephalus</i>	14, 191, 219, 349, 584, 654, 721, 921 Fable
Code goby <i>Gobiosoma robustum</i>	654 Fable
Spanish mackerel <i>Scomberomorus maculatus</i>	251, 349, 584, 653, 665, 720, 721, 862, 906, 921 Fable
Gulf flounder <i>Paralichthys albigutta</i>	14, 219, 349, 584, 654, 665, 721, 862, 906, 921 Naughton
Southern flounder <i>Paralichthys lethostigma</i>	14, 219, 721, 862, 921 Naughton

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Choctawhatchee Bay, FL
Bay scallop <i>Argopecten irradians</i>	67 Barkuloo
American oyster <i>Crassostrea virginica</i>	116, 360, 845 Menzel, Barkuloo
Common rangia <i>Rangia cuneata</i>	67 Barkuloo
Hard clam <i>Mercenaria species</i>	67, 249 Menzel, Barkuloo
Bay squid <i>Lolliguncula brevis</i>	56, 516 Moon
Brown shrimp <i>Peneaus aztecus</i>	493, 692 Barkuloo, Sheridan
Pink shrimp <i>Peneaus duorarum</i>	516, 658, 692, 946 Barkuloo, Sheridan
White shrimp <i>Penaeus setiferus</i>	516, 658, 692, 946 Barkuloo, Sheridan
Grass shrimp <i>Palaemonetes pugio</i>	516 Barkuloo, Menzel, Sheridan
Spiny lobster <i>Panulirus argus</i>	Barkuloo
Blue crab <i>Callinectes sapidus</i>	516 Barkuloo, Steele
Gulf stone crab <i>Menippe adina</i>	62, 511, 658, 947 Barkuloo, Bert
Stone crab <i>Menippe mercenaria</i>	947
Bull shark <i>Carcharhinus leucas</i>	39, 77, 157, 829 Moon
Tarpon <i>Megalops atlanticus</i>	39, 219, 349, 658 Barkuloo
Alabama shad <i>Alosa alabamiae</i>	29, 39, 47, 67, 119, 439, 504, 516, 895 Barkuloo
Gulf menhaden <i>Brevoortia patronus</i>	39, 349, 516, 895, 909 Barkuloo
Yellowfin menhaden <i>Brevoortia smithii</i>	Barkuloo
Gizzard shad <i>Dorosoma cepedianum</i>	39, 47, 460 Moon
Bay anchovy <i>Anchoa mitchilli</i>	39, 67, 119, 516, 895 Barkuloo
Hardhead catfish <i>Arius felis</i>	39, 56, 119, 439, 516, 645 Moon
Sheepshead minnow <i>Cyprinodon variegatus</i>	29, 349 Barkuloo
Gulf killifish <i>Fundulus grandis</i>	29 Barkuloo
Silversides <i>Menidia species</i>	39, 67, 119, 349 Moon
Snook <i>Centropomus undecemalis</i>	173, 658, 746, 747, 955 Barkuloo
Bluefish <i>Pomatomus saltatrix</i>	259, 348, 349, 439, 516, 658, 733 Barkuloo
Blue runner <i>Caranx crysos</i>	60, 301, 302, 348, 349, 439 Barkuloo
Crevalle jack <i>Caranx hippos</i>	39, 324, 348, 349, 439, 516 Barkuloo
Florida pompano <i>Trachinotus carolinus</i>	29, 349, 439, 516 Barkuloo
Gray snapper <i>Lutjanus griseus</i>	29, 39, 349, 439, 516, 895 Barkuloo
Sheepshead <i>Archosargus probatocephalus</i>	39, 56, 119, 219, 349, 439, 445, 516 Moon
Pinfish <i>Lagodon rhomboides</i>	29, 39, 119, 219, 349, 439, 516, 895 Menzel, Barkuloo
Silver perch <i>Bairdiella chysoura</i>	39, 349, 219, 516 Moon
Sand seatrout <i>Cynoscion arenarius</i>	29, 218, 219, 349, 516, 895 Barkuloo, Menzel
Spotted seatrout <i>Cynoscion nebulosus</i>	39, 119, 219, 349, 439, 516, 895 Barkuloo, Menzel
Spot <i>Leiostomus xanthurus</i>	29, 39, 119, 219, 349, 516, 895 Barkuloo
Atlantic croaker <i>Micropogonias undulatus</i>	29, 39, 119, 349, 516, 895 Barkuloo
Black drum <i>Pogonias cromis</i>	39, 56, 349, 439 Moon
Red drum <i>Sciaenops ocellatus</i>	29, 39, 349, 439, 516, 674, 697 Barkuloo
Striped mullet <i>Mugil cephalus</i>	29, 47, 102, 119, 163, 212, 219, 349, 439, 463, 516, 658 Barkuloo
Code goby <i>Gobiosoma robustum</i>	349, 516, 895 Barkuloo
Spanish mackerel <i>Scomberomorus maculatus</i>	251, 261, 298, 349, 439, 516 Barkuloo
Gulf flounder <i>Paralichthys albigutta</i>	29, 219, 349, 439, 516, 895 Barkuloo
Southern flounder <i>Paralichthys lethostigma</i>	119, 219, 349, 516, 658, 732, 895 Barkuloo

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Pensacola Bay, FL
Bay scallop	174
<i>Argopecten irradians</i>	Kruczynski, Flemer, Young
American oyster	36, 37, 174
<i>Crassostrea virginica</i>	Young, Flemer
Common rangia	174, 491
<i>Rangia cuneata</i>	Dardeau, Flemer, Young
Hard clam	174
<i>Mercenaria species</i>	Flemer, Young
Bay squid	56, 174
<i>Loliguncula brevis</i>	Bortone
Brown shrimp	37, 174, 666, 692, 959
<i>Peneaus aztecus</i>	Flemer, Sheridan, Young
Pink shrimp	36, 37, 666, 692
<i>Peneaus duorarum</i>	Flemer, Sheridan, Young
White shrimp	36, 37, 174, 666, 692
<i>Penaeus setiferus</i>	Flemer, Sheridan, Young
Grass shrimp	666
<i>Palaemonetes pugio</i>	Flemer, Sheridan, Young
Spiny lobster	658
<i>Panulirus argus</i>	Flemer, Young
Blue crab	36, 37, 666, 948
<i>Callinectes sapidus</i>	Flemer, Steele, Young
Gulf stone crab	658, 947
<i>Menippe adina</i>	Bert, Flemer, Young
Stone crab	947
<i>Menippe mercenaria</i>	
Bull shark	77, 157, 829
<i>Carcharhinus leucas</i>	Bortone
Tarpon	219, 658, 881, 882
<i>Megalops atlanticus</i>	Bortone, Young
Alabama shad	24, 37, 47, 504
<i>Alosa alabamae</i>	Bortone, Young
Gulf menhaden	36, 37, 666, 882
<i>Brevoortia patronus</i>	Bortone, Young
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Bortone, Young
Gizzard shad	24, 36, 37, 460
<i>Dorosoma cepedianum</i>	Bortone
Bay anchovy	24, 36, 37, 174, 347, 666, 882
<i>Anchoa mitchilli</i>	Bortone, Young
Hardhead catfish	24, 36, 37, 56, 174, 347, 645, 666, 882
<i>Arius felis</i>	Bortone
Sheepshead minnow	24, 37, 174, 347, 882
<i>Cyprinodon variegatus</i>	Bortone, Young
Gulf killifish	24, 37, 174, 347, 882
<i>Fundulus grandis</i>	Bortone, Young
Silversides	24, 36, 37, 174, 347, 666, 882
<i>Menidia species</i>	Bortone
Snook	173, 658, 746, 747, 955
<i>Centropomus undecemalis</i>	Bortone, Young
Bluefish	174, 259, 348, 347, 733
<i>Pomatomus saltatrix</i>	Bortone, Young
Blue runner	60, 174, 301, 302, 348, 347
<i>Caranx crysos</i>	Bortone, Young
Crevalle jack	36, 37, 174, 347, 348, 666, 882
<i>Caranx hippos</i>	Bortone, Young
Florida pompano	174, 347
<i>Trachinotus carolinus</i>	Bortone, Young
Gray snapper	174, 347, 666, 882
<i>Lutjanus griseus</i>	Bortone, Young
Sheepshead	37, 56, 174, 219, 347, 445, 666
<i>Archosargus probatocephalus</i>	Bortone
Pinfish	36, 37, 174, 219, 347, 643, 666, 882
<i>Lagodon rhomboides</i>	Bortone, Young
Silver perch	24, 36, 37, 219, 347, 666, 882
<i>Bairdiella chysoura</i>	Bortone
Sand seatrout	24, 36, 37, 174, 218, 219, 347, 666, 882
<i>Cynoscion arenarius</i>	Bortone, Young
Spotted seatrout	24, 36, 37, 174, 219, 347, 446, 496, 595, 673, 697, 813, 882
<i>Cynoscion nebulosus</i>	Bortone, Young
Spot	24, 36, 37, 174, 219, 347, 666, 882
<i>Leiostomus xanthurus</i>	Bortone, Young
Atlantic croaker	24, 36, 37, 174, 219, 341, 347, 504, 666, 882
<i>Micropogonias undulatus</i>	Bortone, Young
Black drum	36, 56, 174
<i>Pogonias cromis</i>	Bortone
Red drum	37, 174, 347, 666, 697, 882
<i>Sciaenops ocellatus</i>	Bortone, Young
Striped mullet	24, 36, 37, 47, 163, 219, 658, 666, 882
<i>Mugil cephalus</i>	Bortone, Young
Code goby	24, 37, 174, 347
<i>Gobiosoma robustum</i>	Bortone, Young
Spanish mackerel	174, 251, 666, 882
<i>Scomberomorus maculatus</i>	Bortone, Young
Gulf flounder	174, 219, 291
<i>Paralichthys albigutta</i>	Bortone, Young
Southern flounder	24, 37, 38, 174, 219, 504, 882
<i>Paralichthys lethostigma</i>	Bortone, Young

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Perdido Bay, FL/AL
Bay scallop <i>Argopecten irradians</i>	Flemer, Kruczynski, Young, Heath
American oyster <i>Crassostrea virginica</i>	578, 579 Flemer, Heath, Menzel, Young, Van Hoose
Common rangia <i>Rangia cuneata</i>	489, 490, 491, 872, 959 Kruczynski, Heath, Flemer, Young
Hard clam <i>Mercenaria species</i>	870 Heck, Heath, Flemer, Young
Bay squid <i>Loliguncula brevis</i>	56 Van Hoose
Brown shrimp <i>Penaeus aztecus</i>	151, 362, 363, 521, 692, 870, 873, 874 Heath, Flemer, Sheridan, Young, Van Hoose
Pink shrimp <i>Penaeus duorarum</i>	692, 870, 873 Heath, Flemer, Sheridan, Young, Van Hoose
White shrimp <i>Penaeus setiferus</i>	692, 870, 873 Heath, Flemer, Sheridan, Young, Van Hoose
Grass shrimp <i>Palaemonetes pugio</i>	870, 873 Heath, Flemer, Sheridan, Young
Spiny lobster <i>Panulirus argus</i>	658 Heath, Flemer, Young
Blue crab <i>Callinectes sapidus</i>	870, 873, 948 Heath, Flemer, Lane, Steele, Young, Van Hoose
Gulf stone crab <i>Menippe adina</i>	870, 947 Bert, Heath, Flemer, Young
Stone crab <i>Menippe mercenaria</i>	947
Bull shark <i>Carcharhinus leucas</i>	77, 157, 829 Van Hoose
Tarpon <i>Megalops atlanticus</i>	24, 658, 870 Heath, Young
Alabama shad <i>Alosa alabamae</i>	504, 870, 873 Heath, Young
Gulf menhaden <i>Brevoortia patronus</i>	870, 873 Heath, Young, Van Hoose
Yellowfin menhaden <i>Brevoortia smithii</i>	Heath, Young
Gizzard shad <i>Dorosoma cepedianum</i>	460 Van Hoose
Bay anchovy <i>Anchoa mitchilli</i>	870, 873 Heath, Young, Van Hoose
Hardhead catfish <i>Arius felis</i>	56, 645 Van Hoose
Sheepshead minnow <i>Cyprinodon variegatus</i>	870, 873 Heath, Young
Gulf killifish <i>Fundulus grandis</i>	870, 873 Heath, Young
Silversides <i>Menidia species</i>	56 Van Hoose
Snook <i>Centropomus undecemalis</i>	24, 658, 746, 747, 955 Heath, Young
Bluefish <i>Pomatomus saltatrix</i>	259, 658, 733 Heath, Young
Blue runner <i>Caranx crysos</i>	60, 301, 302, 348, 347 Heath, Young
Crevalle jack <i>Caranx hippos</i>	324, 866, 873 Heath, Young
Florida pompano <i>Trachinotus carolinus</i>	870 Heath, Young
Gray snapper <i>Lutjanus griseus</i>	870 Heath, Young
Sheepshead <i>Archosargus probatocephalus</i>	56, 219, 445 Van Hoose
Pinfish <i>Lagodon rhomboides</i>	219, 866, 870, 873 Heath, Young, Van Hoose
Silver perch <i>Bairdiella chysoura</i>	56, 219 Van Hoose
Sand seatrout <i>Cynoscion arenarius</i>	218, 219, 866, 870 Heath, Young
Spotted seatrout <i>Cynoscion nebulosus</i>	219, 870 Heath, Young
Spot <i>Leiostomus xanthurus</i>	219, 866, 870, 873 Heath, Young, Van Hoose
Atlantic croaker <i>Micropogonias undulatus</i>	866, 870 Heath, Young, Van Hoose
Black drum <i>Pogonias cromis</i>	56 Van Hoose
Red drum <i>Sciaenops ocellatus</i>	870 Heath, Young, Van Hoose
Striped mullet <i>Mugil cephalus</i>	219, 870, 873 Heath, Young, Van Hoose
Code goby <i>Gobiosoma robustum</i>	811, 870, 873 Heath, Young
Spanish mackerel <i>Scomberomorus maculatus</i>	870 Heath, Young
Gulf flounder <i>Paralichthys albigutta</i>	219, 873 Heath, Young
Southern flounder <i>Paralichthys lethostigma</i>	219, 870 Heath, Young

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Mobile Bay, AL
Bay scallop	870, 873
<i>Argopecten irradians</i>	Dardeau, Heath, Shipp
American oyster	238, 363, 503, 578, 579, 580, 581, 582, 795
<i>Crassostrea virginica</i>	Dardeau, Heath, Shipp
Common rangia	464, 491, 870, 872, 922
<i>Rangia cuneata</i>	Dardeau, Heath, Shipp
Hard clam	249, 872
<i>Mercenaria species</i>	Dardeau, Heath, Shipp
Bay squid	56
<i>Lolliguncula brevis</i>	Shipp, Van Hoose
Brown shrimp	151, 362, 363, 521, 692, 828, 870, 874
<i>Peneaus aztecus</i>	Dardeau, Heath, Sheridan, Shipp
Pink shrimp	56, 153, 692, 870, 873
<i>Peneaus duorarum</i>	Dardeau, Heath, Sheridan, Shipp
White shrimp	56, 153, 522, 523, 692, 769
<i>Penaeus setiferus</i>	Dardeau, Heath, Sheridan, Shipp
Grass shrimp	71, 810, 870, 873
<i>Palaemonetes pugio</i>	Dardeau, Heath, Sheridan, Shipp
Spiny lobster	
<i>Panulirus argus</i>	Dardeau, Heath, Shipp
Blue crab	56, 363, 527, 581, 810, 846, 888, 948
<i>Callinectes sapidus</i>	Dardeau, Heath, Shipp, Steele
Gulf stone crab	870, 947
<i>Menippe adina</i>	Bert, Dardeau, Heath, Shipp, VanHoose
Stone crab	947
<i>Menippe mercenaria</i>	
Bull shark	77, 157, 829
<i>Carcharhinus leucas</i>	Shipp, Van Hoose
Tarpon	243, 870, 924, 925
<i>Megalops atlanticus</i>	Heath, Shipp
Alabama shad	499, 504, 603, 766, 767, 870, 873, 908, 949
<i>Alosa alabamae</i>	Heath, Shipp
Gulf menhaden	56, 363, 811, 812, 814, 869, 873, 950
<i>Brevoortia patronus</i>	Heath, Shipp
Yellowfin menhaden	56, 812, 814, 869, 870, 873, 950
<i>Brevoortia smithii</i>	Heath, Shipp
Gizzard shad	460, 811, 908
<i>Dorosoma cepedianum</i>	Shipp, Van Hoose
Bay anchovy	814
<i>Anchoa mitchilli</i>	Heath, Shipp, VanHoose
Hardhead catfish	56, 645, 811
<i>Arius felis</i>	Shipp, Van Hoose
Sheepshead minow	811, 869, 873
<i>Cyprinodon variegatus</i>	Heath, Shipp
Gulf killifish	811, 869, 873
<i>Fundulus grandis</i>	Heath, Shipp
Silversides	811, 812, 813, 814, 869, 908
<i>Menidia species</i>	Shipp, Van Hoose
Snook	
<i>Centropomus undecimalis</i>	Heath, Shipp
Bluefish	56, 259, 263, 870
<i>Pomatomus saltatrix</i>	Heath, Shipp
Blue runner	447, 814, 870
<i>Caranx crysos</i>	Heath, Shipp
Crevalle jack	14, 72, 812, 870, 873
<i>Caranx hippos</i>	Heath, Shipp
Florida pompano	56, 869, 870, 924
<i>Trachinotus carolinus</i>	Heath, Shipp
Gray snapper	56, 869, 870
<i>Lutjanus griseus</i>	Heath, Shipp
Sheepshead	56, 219, 445, 811, 812, 813, 814, 908
<i>Archosargus probatocephalus</i>	Shipp, Van Hoose
Pinfish	56, 72, 219, 811, 814, 869, 870, 873, 908
<i>Lagodon rhomboides</i>	Heath, Shipp
Silver perch	219, 504, 811, 812, 813, 869, 950
<i>Bairdiella chrysoura</i>	Shipp, Van Hoose
Sand seatrout	56, 72, 218, 219, 363, 811, 812, 813, 814, 869, 870, 873, 908, 924, 950
<i>Cynoscion arenarius</i>	Heath, Shipp
Spotted seatrout	56, 72, 219, 363, 504, 811, 812, 813, 814, 873, 908, 911, 924, 950
<i>Cynoscion nebulosus</i>	Heath, Shipp
Spot	56, 217, 219, 363, 656, 811, 812, 814, 869, 870, 873, 950
<i>Leiostomus xanthurus</i>	Heath, Shipp, Van Hoose
Atlantic croaker	217, 219, 363, 504, 515, 656, 812, 813, 814, 869, 870, 871, 873, 924, 945, 950
<i>Micropogonias undulatus</i>	Heath, Shipp
Black drum	811, 812, 813, 814, 950
<i>Pogonias cromis</i>	Shipp, Van Hoose
Red drum	56, 72, 363, 634, 811, 812, 813, 814, 869, 870, 908, 911, 924, 950
<i>Sciaenops ocellatus</i>	Heath, Shipp
Striped mullet	56, 72, 219, 363, 811, 812, 869, 870, 873, 908, 924
<i>Mugil cephalus</i>	Heath, Shipp
Code goby	811, 812, 813, 870, 873
<i>Gobiosoma robustum</i>	Heath, Shipp
Spanish mackerel	56, 72, 363, 812, 814, 869, 870, 924
<i>Scomberomorus maculatus</i>	Heath, Shipp
Gulf flounder	56, 72, 219, 870, 873, 924, 949
<i>Paralichthys albigutta</i>	Heath, Shipp
Southern flounder	56, 72, 219, 363, 504, 812, 869, 870, 873, 924
<i>Paralichthys lethostigma</i>	Heath, Shipp

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Mississippi Sound, MS/AL/LA
Bay scallop <i>Argopecten irradians</i>	155, 631 Demoran
American oyster <i>Crassostrea virginica</i>	73, 124, 129, 155, 231, 245, 319, 328, 536, 631, 663, 664 Demoran
Common rangia <i>Rangia cuneata</i>	155, 601, 631 Demoran
Hard clam <i>Mercenaria species</i>	155, 631 Demoran
Bay squid <i>Lolliguncula brevis</i>	32, 56, 155, 631, 700, 743, 744, 870, 932 Warren
Brown shrimp <i>Peneaus aztecus</i>	32, 56, 73, 153, 154, 155, 280, 319, 336, 696, 858, 870, 932, 941, 942 Warren
Pink shrimp <i>Peneaus duorarum</i>	56, 153, 154, 155, 696, 858, 870, 932 Warren
White shrimp <i>Penaeus setiferus</i>	32, 56, 73, 153, 154, 155, 280, 319, 696, 858, 870, 932, 942 Warren
Grass shrimp <i>Palaemonetes pugio</i>	32, 155, 336, 743, 744, 870, 932 Warren
Spiny lobster <i>Panulirus argus</i>	Waller
Blue crab <i>Callinectes sapidus</i>	32, 56, 73, 155, 601, 696, 700, 702, 870, 932 Warren
Gulf stone crab <i>Menippe adina</i>	32, 155, 856, 857, 947
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	6, 273, 441, 743, 744 Waller
Tarpon <i>Megalops atlanticus</i>	743, 744 Waller
Alabama shad <i>Alosa alabamae</i>	504 Warren
Gulf menhaden <i>Brevoortia patronus</i>	6, 32, 56, 155, 248, 319, 336, 530, 696, 701, 762, 768, 870, 932 Warren
Yellowfin menhaden <i>Brevoortia smithii</i>	155 Warren
Gizzard shad <i>Dorosoma cepedianum</i>	Warren
Bay anchovy <i>Anchoa mitchilli</i>	32, 56, 73, 155, 239, 273, 336, 530, 696, 701, 743, 744, 762, 768, 870, 932 Warren
Hardhead catfish <i>Arius felis</i>	6, 32, 56, 155, 239, 273, 336, 346, 696, 762, 870, 930 Warren
Sheepshead minnow <i>Cyprinodon variegatus</i>	155, 171, 273, 336, 696, 743, 870 Warren
Gulf killifish <i>Fundulus grandis</i>	73, 155, 171, 273, 336, 696, 743, 764 Warren
Silversides <i>Menidia species</i>	32, 56, 155, 171, 273, 286, 696, 743, 762, 768, 870 Warren
Snook <i>Centropomus undecimalis</i>	Waller
Bluefish <i>Pomatomus saltatrix</i>	6, 56, 441, 743, 744, 762 Waller
Blue runner <i>Caranx crysos</i>	155, 219, 273, 743, 744, 798 Warren
Creville jack <i>Caranx hippos</i>	6, 32, 56, 155, 219, 273, 441, 696, 743, 744, 762, 870, 932 Warren
Florida pompano <i>Trachinotus carolinus</i>	6, 56, 155, 696, 762, 870 Warren
Gray snapper <i>Lutjanus griseus</i>	56, 762 Warren
Sheepshead <i>Archosargus probatocephalus</i>	6, 32, 56, 155, 219, 248, 273, 336, 441, 677, 696, 762, 768, 870, 932 Warren
Pinfish <i>Lagodon rhomboides</i>	6, 56, 155, 219, 273, 441, 530, 696, 762, 768, 870, 932 Warren
Silver perch <i>Bairdiella chysoura</i>	6, 32, 155, 219, 273, 441, 504, 696, 762, 768, 870, 932 Warren
Sand seatrout <i>Cynoscion arenarius</i>	6, 32, 56, 73, 155, 218, 219, 248, 273, 336, 441, 530, 677, 696, 743, 744, 768, 870, 932 Warren
Spotted seatrout <i>Cynoscion nebulosus</i>	6, 32, 56, 73, 155, 195, 219, 248, 273, 319, 336, 441, 504, 677, 696, 768, 870, 932 Warren
Spot <i>Leiostomus xanthurus</i>	6, 32, 56, 155, 219, 273, 336, 441, 504, 530, 696, 762, 768, 870, 932 Warren
Atlantic croaker <i>Micropogonias undulatus</i>	6, 32, 56, 73, 155, 219, 248, 273, 319, 441, 504, 530, 675, 696, 768, 870, 932 Warren
Black drum <i>Pogonias cromis</i>	6, 32, 56, 73, 124, 155, 248, 319, 441, 677, 768 Warren
Red drum <i>Sciaenops ocellatus</i>	6, 56, 73, 155, 248, 273, 319, 441, 504, 531, 674, 676, 696, 768, 847 Warren
Striped mullet <i>Mugil cephalus</i>	6, 56, 73, 155, 219, 248, 273, 319, 336, 696, 762, 870 Warren
Code goby <i>Gobiosoma robustum</i>	743, 744 Warren
Spanish mackerel <i>Scomberomorus maculatus</i>	6, 32, 56, 155, 219, 441, 696, 743, 744, 762, 870, 932 Warren
Gulf flounder <i>Paralichthys albigutta</i>	56, 155, 219, 273 Warren
Southern flounder <i>Paralichthys lethostigma</i>	6, 32, 56, 155, 219, 248, 273, 441, 504, 677, 696, 762, 768, 932 Warren

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Lake Borgne, LA
Bay scallop <i>Argopecten irradians</i>	Savoie, Soniat
American oyster <i>Crassostrea virginica</i>	73, 129, 231, 288, 319 Savoie, Soniat
Common rangia <i>Rangia cuneata</i>	267 Savoie, Soniat
Hard clam <i>Mercenaria species</i>	Savoie
Bay squid <i>Loliguncula brevis</i>	32, 155, 267, 696 Savoie, Soniat
Brown shrimp <i>Peneaus aztecus</i>	32, 73, 155, 201, 267, 280, 319, 696, 941, 942 Savoie, Soniat
Pink shrimp <i>Peneaus duorarum</i>	155, 696 Savoie, Soniat
White shrimp <i>Penaeus setiferus</i>	32, 73, 155, 201, 280, 319, 696, 942 Savoie, Soniat
Grass shrimp <i>Palaemonetes pugio</i>	32, 155, 267 Savoie, Soniat
Spiny lobster <i>Panulirus argus</i>	Savoie, Soniat
Blue crab <i>Callinectes sapidus</i>	32, 73, 155, 201, 267, 696, 700, 702 Savoie, Soniat
Gulf stone crab <i>Menippe adina</i>	32, 155, 201, 696, 947 Savoie, Soniat
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	6, 267 Savoie
Tarpon <i>Megalops atlanticus</i>	Savoie
Alabama shad <i>Alosa alabamae</i>	201, 504 Savoie
Gulf menhaden <i>Brevoortia patronus</i>	6, 32, 73, 155, 201, 267, 319, 696, 763 Savoie
Yellowfin menhaden <i>Brevoortia smithii</i>	Savoie
Gizzard shad <i>Dorosoma cepedianum</i>	171, 201, 267, 485 Savoie
Bay anchovy <i>Anchoa mitchilli</i>	32, 73, 155, 201, 267, 696, 763 Savoie
Hardhead catfish <i>Arius felis</i>	6, 32, 155, 201, 267, 696, 763 Savoie
Sheepshead minnow <i>Cyprinodon variegatus</i>	155, 267, 696 Savoie
Gulf killifish <i>Fundulus grandis</i>	155, 267, 696 Savoie
Silversides <i>Menidia species</i>	32, 155, 201, 267, 696 Savoie
Snook <i>Centropomus undecimalis</i>	Savoie
Bluefish <i>Pomatomus saltatrix</i>	6 Savoie
Blue runner <i>Caranx crysos</i>	Savoie
Crevale jack <i>Caranx hippos</i>	6, 32, 155, 201, 267, 696 Savoie
Florida pompano <i>Trachinotus carolinus</i>	6, 155, 267, 696 Savoie
Gray snapper <i>Lutjanus griseus</i>	155 Savoie
Sheepshead <i>Archosargus probatocephalus</i>	5, 6, 32, 46, 155, 201, 267, 696, 763 Savoie
Pinfish <i>Lagodon rhomboides</i>	6, 155, 201, 267, 696, 763 Savoie
Silver perch <i>Bairdiella chysoura</i>	6, 155, 201, 219, 267, 696, 763 Savoie
Sand seatrout <i>Cynoscion arenarius</i>	5, 6, 32, 73, 155, 201, 218, 219, 267, 696, 763 Savoie
Spotted seatrout <i>Cynoscion nebulosus</i>	5, 6, 32, 73, 155, 201, 219, 275, 696, 763, 861 Savoie
Spot <i>Leiostomus xanthurus</i>	6, 32, 155, 201, 219, 681, 696, 763 Savoie
Atlantic croaker <i>Micropogonias undulatus</i>	5, 6, 32, 73, 155, 201, 219, 275, 681, 696, 763 Savoie
Black drum <i>Pogonias cromis</i>	5, 6, 32, 73, 201, 267 Savoie, Soniat
Red drum <i>Sciaenops ocellatus</i>	6, 73, 155, 201, 267, 696, 927 Savoie
Striped mullet <i>Mugil cephalus</i>	5, 6, 73, 155, 201, 219, 266, 486, 696 Savoie
Code goby <i>Gobiosoma robustum</i>	Savoie
Spanish mackerel <i>Scomberomorus maculatus</i>	6, 32, 155, 201, 267, 696 Savoie
Gulf flounder <i>Paralichthys albigutta</i>	Thompson
Southern flounder <i>Paralichthys lethostigma</i>	5, 6, 32, 155, 201, 267, 696, 763 Savoie

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Lake Pontchartrain, LA
Bay scallop	
<i>Argopecten irradians</i>	Savoie, Soniat
American oyster	231, 233, 467, 867, 886, 887
<i>Crassostrea virginica</i>	Savoie, Soniat
Common rangia	73, 196, 198, 233, 252, 315, 467, 507, 867, 884, 885, 887
<i>Rangia cuneata</i>	Savoie, Soniat
Hard clam	
<i>Mercenaria species</i>	Savoie, Soniat
Bay squid	155, 696
<i>Lolliguncula brevis</i>	Savoie, Soniat
Brown shrimp	73, 155, 201, 280, 389, 696, 867, 887, 941, 942
<i>Peneaus aztecus</i>	Savoie, Soniat
Pink shrimp	155, 696, 867
<i>Peneaus duorarum</i>	Savoie, Soniat
White shrimp	73, 155, 196, 198, 201, 280, 389, 486, 696, 867, 915, 944
<i>Penaeus setiferus</i>	Savoie, Soniat
Grass shrimp	155, 389, 486, 507, 867, 887
<i>Palaemonetes pugio</i>	Savoie, Soniat
Spiny lobster	
<i>Panulirus argus</i>	Savoie, Soniat
Blue crab	73, 155, 196, 197, 198, 201, 389, 486, 507, 696, 867, 887
<i>Callinectes sapidus</i>	Savoie, Soniat
Gulf stone crab	155, 201, 696, 947
<i>Menippe adina</i>	Savoie, Soniat
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	6, 196, 198, 210, 867
<i>Carcharhinus leucas</i>	Savoie
Tarpon	210, 867
<i>Megalops atlanticus</i>	Savoie
Alabama shad	210, 350, 504, 600
<i>Alosa alabamae</i>	Savoie
Gulf menhaden	6, 155, 196, 201, 210, 315, 350, 389, 696, 864, 867, 887
<i>Brevoortia patronus</i>	Savoie
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Savoie
Gizzard shad	156, 196, 198, 201, 210, 315, 350, 486, 600, 696, 826, 887
<i>Dorosoma cepedianum</i>	Savoie
Bay anchovy	73, 156, 196, 198, 201, 210, 315, 350, 389, 507, 600, 696, 867, 887
<i>Anchoa mitchilli</i>	Savoie
Hardhead catfish	6, 155, 196, 198, 201, 210, 315, 350, 389, 441, 507, 696, 867, 887
<i>Arius felis</i>	Savoie
Sheepshead minnow	155, 196, 210, 507, 696, 867, 887
<i>Cyprinodon variegatus</i>	Savoie
Gulf killifish	73, 155, 210, 350, 507, 696, 867, 887
<i>Fundulus grandis</i>	Savoie
Silversides	155, 196, 198, 201, 210, 315, 350, 507, 600, 696, 867, 887
<i>Menidia species</i>	Savoie
Snook	
<i>Centropomus undecimalis</i>	Savoie
Bluefish	6
<i>Pomatomus saltatrix</i>	Savoie
Blue runner	
<i>Caranx crysos</i>	Savoie
Crevalle jack	6, 155, 196, 198, 201, 210, 350, 600, 696, 867, 887
<i>Caranx hippos</i>	Savoie
Florida pompano	6, 210
<i>Trachinotus carolinus</i>	Savoie
Gray snapper	210
<i>Lutjanus griseus</i>	Savoie
Sheepshead	5, 6, 46, 156, 196, 198, 201, 210, 315, 350, 507, 600, 696, 887
<i>Archosargus probatocephalus</i>	Savoie
Pinfish	6, 155, 196, 198, 201, 210, 507, 696, 867, 887
<i>Lagodon rhomboides</i>	Savoie
Silver perch	6, 155, 196, 198, 201, 210, 696, 867, 887
<i>Bairdiella chrysoura</i>	Savoie
Sand seatrout	5, 6, 73, 155, 196, 198, 201, 210, 218, 315, 350, 389, 507, 696, 867, 887
<i>Cynoscion arenarius</i>	Savoie
Spotted seatrout	5, 6, 73, 155, 196, 198, 201, 210, 219, 315, 319, 507, 696, 867, 887
<i>Cynoscion nebulosus</i>	Savoie
Spot	6, 155, 196, 198, 201, 217, 219, 315, 507, 696, 867, 887
<i>Leiostomus xanthurus</i>	Savoie
Atlantic croaker	5, 6, 73, 155, 196, 198, 201, 210, 219, 315, 319, 350, 389, 507, 600, 696, 867, 887
<i>Micropogonias undulatus</i>	Savoie
Black drum	5, 6, 73, 155, 196, 198, 201, 210, 319, 350, 696, 867, 887
<i>Pogonias cromis</i>	Savoie
Red drum	5, 6, 73, 155, 198, 201, 210, 319, 507, 696, 867, 887
<i>Sciaenops ocellatus</i>	Savoie
Striped mullet	6, 73, 155, 196, 198, 201, 210, 219, 315, 319, 350, 486, 600, 696, 867, 887
<i>Mugil cephalus</i>	Savoie
Code goby	202, 210
<i>Gobiosoma robustum</i>	Savoie
Spanish mackerel	6, 201, 210, 867
<i>Scomberomorus maculatus</i>	Savoie
Gulf flounder	887
<i>Paralichthys albigutta</i>	Thompson
Southern flounder	5, 6, 155, 196, 198, 201, 210, 315, 350, 466, 600, 696, 867, 887
<i>Paralichthys lethostigma</i>	Savoie

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Breton/Chandeleur Sounds, LA
Bay scallop <i>Argopecten irradians</i>	401, 682 Ancelet
American oyster <i>Crassostrea virginica</i>	129, 230, 231, 288, 319, 401, 682, 713, 880 Ancelet
Common rangia <i>Rangia cuneata</i>	682 Ancelet
Hard clam <i>Mercenaria species</i>	232, 401, 682 Ancelet
Bay squid <i>Loliguncula brevis</i>	32, 267, 713 Ancelet
Brown shrimp <i>Peneaus aztecus</i>	30, 31, 32, 73, 267, 280, 713, 941, 942 Ancelet
Pink shrimp <i>Peneaus duorarum</i>	401 Ancelet
White shrimp <i>Penaeus setiferus</i>	30, 31, 32, 73, 267, 280, 713, 942 Ancelet
Grass shrimp <i>Palaemonetes pugio</i>	267, 401, 713 Ancelet
Spiny lobster <i>Panulirus argus</i>	Ancelet
Blue crab <i>Callinectes sapidus</i>	32, 73, 267, 401, 713 Ancelet
Gulf stone crab <i>Menippe adina</i>	267, 401, 947 Ancelet
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	267, 321, 468 Ancelet
Tarpon <i>Megalops atlanticus</i>	Ancelet
Alabama shad <i>Alosa alabamae</i>	504 Ancelet
Gulf menhaden <i>Brevoortia patronus</i>	32, 73, 267, 318, 468, 492, 713, 763 Ancelet
Yellowfin menhaden <i>Brevoortia smithii</i>	Ancelet
Gizzard shad <i>Dorosoma cepedianum</i>	32, 267, 468, 485 Ancelet
Bay anchovy <i>Anchoa mitchilli</i>	32, 73, 267, 468, 492, 713, 763 Ancelet
Hardhead catfish <i>Arius felis</i>	32, 267, 468, 492, 713, 763 Ancelet
Sheepshead minnow <i>Cyprinodon variegatus</i>	267, 468, 492, 763 Ancelet
Gulf killifish <i>Fundulus grandis</i>	267, 468, 492, 763 Ancelet
Silversides <i>Menidia species</i>	267, 468, 492 Ancelet
Snook <i>Centropomus undecimalis</i>	Ancelet
Bluefish <i>Pomatomus saltatrix</i>	492 Ancelet
Blue runner <i>Caranx crysos</i>	293, 301, 302 Ancelet
Crevalle jack <i>Caranx hippos</i>	32, 267, 293, 302, 468, 492, 713 Ancelet
Florida pompano <i>Trachinotus carolinus</i>	267, 293, 492 Ancelet
Gray snapper <i>Lutjanus griseus</i>	492 Ancelet
Sheepshead <i>Archosargus probatocephalus</i>	32, 46, 267, 468, 492, 713, 763 Ancelet
Pinfish <i>Lagodon rhomboides</i>	267, 468, 492, 713, 763 Ancelet
Silver perch <i>Bairdiella chysoura</i>	32, 267, 468, 492, 713, 763 Ancelet
Sand seatrout <i>Cynoscion arenarius</i>	32, 73, 218, 267, 468, 492, 713 Ancelet
Spotted seatrout <i>Cynoscion nebulosus</i>	32, 219, 267, 468, 492, 713 Ancelet
Spot <i>Leiostomus xanthurus</i>	32, 73, 267, 468, 492, 713, 763 Ancelet
Atlantic croaker <i>Micropogonias undulatus</i>	32, 73, 267, 468, 492, 713, 763 Ancelet
Black drum <i>Pogonias cromis</i>	32, 267, 468, 492, 713 Ancelet
Red drum <i>Sciaenops ocellatus</i>	69, 267, 468, 492, 927 Ancelet
Striped mullet <i>Mugil cephalus</i>	267, 468, 485, 492, 763 Ancelet
Code goby <i>Gobiosoma robustum</i>	492 Ancelet
Spanish mackerel <i>Scomberomorus maculatus</i>	267, 468, 492, 713 Ancelet
Gulf flounder <i>Paralichthys albigutta</i>	492 Ancelet, Thompson
Southern flounder <i>Paralichthys lethostigma</i>	32, 267, 294, 468, 492, 763 Ancelet

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Mississippi River, LA
Bay scallop <i>Argopecten irradians</i>	Ancelet
American oyster <i>Crassostrea virginica</i>	682 Ancelet
Common rangia <i>Rangia cuneata</i>	Ancelet
Hard clam <i>Mercenaria species</i>	Ancelet
Bay squid <i>Loliguncula brevis</i>	Ancelet
Brown shrimp <i>Peneaus aztecus</i>	30, 32, 34, 73, 240, 280, 826 Ancelet
Pink shrimp <i>Peneaus duorarum</i>	Ancelet
White shrimp <i>Penaeus setiferus</i>	30, 34, 240, 280, 826 Ancelet
Grass shrimp <i>Palaemonetes pugio</i>	Ancelet
Spiny lobster <i>Panulirus argus</i>	Ancelet
Blue crab <i>Callinectes sapidus</i>	Ancelet
Gulf stone crab <i>Menippe adina</i>	947 Ancelet
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	468 Ancelet
Tarpon <i>Megalops atlanticus</i>	Ancelet
Alabama shad <i>Alosa alabamae</i>	504 Ancelet
Gulf menhaden <i>Brevoortia patronus</i>	304, 305, 468, 830, 865, 931 Ancelet
Yellowfin menhaden <i>Brevoortia smithii</i>	Ancelet
Gizzard shad <i>Dorosoma cepedianum</i>	281, 468 Ancelet
Bay anchovy <i>Anchoa mitchilli</i>	468 Ancelet
Hardhead catfish <i>Arius felis</i>	468, 505 Ancelet
Sheepshead minnow <i>Cyprinodon variegatus</i>	468, 583 Ancelet
Gulf killifish <i>Fundulus grandis</i>	468, 583 Ancelet
Silversides <i>Menidia species</i>	281, 468 Ancelet
Snook <i>Centropomus undecemalis</i>	Ancelet
Bluefish <i>Pomatomus saltatrix</i>	Ancelet
Blue runner <i>Caranx crysos</i>	Ancelet
Crevalle jack <i>Caranx hippos</i>	302, 468 Ancelet
Florida pompano <i>Trachinotus carolinus</i>	Ancelet
Gray snapper <i>Lutjanus griseus</i>	Ancelet
Sheepshead <i>Archosargus probatocephalus</i>	46, 468 Ancelet
Pinfish <i>Lagodon rhomboides</i>	468 Ancelet
Silver perch <i>Bairdiella chysoura</i>	468 Ancelet
Sand seatrout <i>Cynoscion arenarius</i>	218, 468 Ancelet
Spotted seatrout <i>Cynoscion nebulosus</i>	468, 830 Ancelet
Spot <i>Leiostomus xanthurus</i>	303, 304, 468 Ancelet
Atlantic croaker <i>Micropogonias undulatus</i>	304, 468, 830 Ancelet
Black drum <i>Pogonias cromis</i>	468 Ancelet
Red drum <i>Sciaenops ocellatus</i>	468 Ancelet
Striped mullet <i>Mugil cephalus</i>	468 Ancelet
Code goby <i>Gobiosoma robustum</i>	Ancelet
Spanish mackerel <i>Scomberomorus maculatus</i>	468 Ancelet
Gulf flounder <i>Paralichthys albigutta</i>	Ancelet, Thompson
Southern flounder <i>Paralichthys lethostigma</i>	468 Ancelet

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Barataria Bay, LA
Bay scallop <i>Argopecten irradians</i>	Dameier, Schexnayder
American oyster <i>Crassostrea virginica</i>	117, 207, 266, 288, 319, 398, 912 Dameier, Schexnayder
Common rangia <i>Rangia cuneata</i>	117, 712 Dameier, Schexnayder
Hard clam <i>Mercenaria species</i>	Dameier, Schexnayder
Bay squid <i>Loliguncula brevis</i>	32 Dameier, Schexnayder
Brown shrimp <i>Peneaus aztecus</i>	30, 31, 32, 33, 34, 65, 73, 126, 168, 207, 280, 316, 319, 442, 826, 844, 941, 942 Dameier, Schexnayder
Pink shrimp <i>Peneaus duorarum</i>	Dameier, Schexnayder
White shrimp <i>Peneaus setiferus</i>	30, 31, 32, 33, 34, 65, 73, 126, 168, 207, 280, 319, 826, 942 Dameier, Schexnayder
Grass shrimp <i>Palaemonetes pugio</i>	32, 126 Dameier, Schexnayder
Spiny lobster <i>Panulirus argus</i>	Dameier, Schexnayder
Blue crab <i>Callinectes sapidus</i>	32, 73, 126, 207, 444, 961 Dameier, Schexnayder
Gulf stone crab <i>Menippe adina</i>	32, 427, 947 Dameier, Schexnayder
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	23, 210, 314 Dameier, Schexnayder
Tarpon <i>Megalops atlanticus</i>	210, 314 Dameier, Schexnayder
Alabama shad <i>Alosa alabamae</i>	210, 271, 314, 504 Dameier, Schexnayder
Gulf menhaden <i>Brevoortia patronus</i>	23, 32, 73, 126, 207, 210, 217, 219, 236, 271, 304, 305, 314, 316, 322, 765, 775, 821, 830, 926, 931, 961 Dameier, Schexnayder
Yellowfin menhaden <i>Brevoortia smithii</i>	Dameier, Schexnayder
Gizzard shad <i>Dorosoma cepedianum</i>	23, 32, 126, 210, 236, 314, 765, 775, 926, 961 Dameier, Schexnayder
Bay anchovy <i>Anchoa mitchilli</i>	23, 32, 73, 126, 207, 210, 236, 271, 314, 322, 775, 926 Dameier, Schexnayder
Hardhead catfish <i>Arius felis</i>	23, 32, 126, 210, 236, 271, 314, 765, 775 Dameier, Schexnayder
Sheepshead minnow <i>Cyprinodon variegatus</i>	23, 126, 207, 210, 236, 270, 271, 314, 765, 775 Dameier, Schexnayder
Gulf killifish <i>Fundulus grandis</i>	23, 126, 207, 210, 236, 270, 271, 310, 314, 765, 775 Dameier, Schexnayder
Silversides <i>Menidia species</i>	23, 32, 126, 207, 210, 236, 271, 314, 765, 775, 961 Dameier, Schexnayder
Snook <i>Centropomus undecemalis</i>	317 Dameier, Schexnayder
Bluefish <i>Pomatomus saltatrix</i>	126, 210, 236, 271, 314 Dameier, Schexnayder
Blue runner <i>Caranx crysos</i>	271, 293, 301, 302, 314 Dameier, Schexnayder
Crevalle jack <i>Caranx hippos</i>	23, 32, 210, 236, 271, 293, 314, 322, 775 Dameier, Schexnayder
Florida pompano <i>Trachinotus carolinus</i>	12, 23, 32, 48, 49, 210, 236, 271, 293, 314, 775 Dameier, Schexnayder
Gray snapper <i>Lutjanus griseus</i>	23, 210, 314, 775 Dameier, Schexnayder
Sheepshead <i>Archosargus probatocephalus</i>	23, 32, 126, 210, 217, 219, 236, 264, 271, 314, 765, 775 Dameier, Schexnayder
Pinfish <i>Lagodon rhomboides</i>	23, 126, 210, 217, 219, 236, 264, 271, 314, 765, 775 Dameier, Schexnayder
Silver perch <i>Bairdiella chysoura</i>	23, 32, 126, 210, 219, 236, 271, 314, 322, 775 Dameier, Schexnayder
Sand seatrout <i>Cynoscion arenarius</i>	23, 32, 73, 126, 207, 210, 217, 218, 219, 236, 271, 314, 322, 775 Dameier, Schexnayder
Spotted seatrout <i>Cynoscion nebulosus</i>	23, 32, 126, 207, 210, 219, 236, 271, 314, 322, 374, 376, 707, 765, 775, 830 Dameier, Schexnayder
Spot <i>Leiostomus xanthurus</i>	23, 32, 73, 126, 207, 210, 217, 219, 236, 271, 275, 303, 304, 305, 314, 322, 755, 765, 775, 926 Dameier, Schexnayder
Atlantic croaker <i>Micropogonias undulatus</i>	23, 32, 73, 126, 207, 210, 217, 219, 236, 271, 275, 304, 303, 305, 314, 322, 755, 758, 775, 830, 926, 961 Dameier, Schexnayder
Black drum <i>Pogonias cromis</i>	23, 126, 210, 227, 271, 314, 765, 775 Dameier, Schexnayder
Red drum <i>Sciaenops ocellatus</i>	40, 126, 210, 217, 219, 271, 314, 375, 707, 765, 775, 927 Dameier, Schexnayder
Striped mullet <i>Mugil cephalus</i>	23, 126, 207, 210, 217, 219, 271, 314, 765, 775, 961 Dameier, Schexnayder
Code goby <i>Gobiosoma robustum</i>	210, 314 Dameier, Schexnayder
Spanish mackerel <i>Scomberomorus maculatus</i>	23, 32, 126, 210, 214, 217, 219, 271, 314, 775 Dameier, Schexnayder
Gulf flounder <i>Paralichthys albigutta</i>	271, 775 Dameier, Schexnayder, Thompson
Southern flounder <i>Paralichthys lethostigma</i>	23, 32, 126, 210, 236, 271, 272, 314, 322, 775, 801 Dameier, Schexnayder

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Terrebonne/Timbalier Bays, LA
Bay scallop <i>Argopecten irradians</i>	Adkins, Bourgeois, Guillory
American oyster <i>Crassostrea virginica</i>	288 Adkins, Bourgeois, Guillory
Common rangia <i>Rangia cuneata</i>	Adkins, Bourgeois, Guillory
Hard clam <i>Mercenaria species</i>	253 Adkins, Bourgeois, Guillory
Bay squid <i>Lolliguncula brevis</i>	4, 32 Adkins, Bourgeois, Guillory
Brown shrimp <i>Peneaus aztecus</i>	4, 30, 31, 32, 73, 253, 280, 316, 941, 942 Adkins, Bourgeois, Guillory
Pink shrimp <i>Peneaus duorarum</i>	4, 31, 32 Adkins, Bourgeois, Guillory
White shrimp <i>Penaeus setiferus</i>	4, 30, 31, 32, 73, 280, 534, 942 Adkins, Bourgeois, Guillory
Grass shrimp <i>Palaeomonetes pugio</i>	4, 32 Adkins, Bourgeois, Guillory
Spiny lobster <i>Panulirus argus</i>	Adkins, Bourgeois, Guillory
Blue crab <i>Callinectes sapidus</i>	2, 3, 4, 32, 73, 253
Gulf stone crab <i>Menippe adina</i>	3, 4, 947 Adkins, Bourgeois, Guillory
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	3, 5 Adkins, Bourgeois, Guillory
Tarpon <i>Megalops atlanticus</i>	5 Adkins, Bourgeois, Guillory
Alabama shad <i>Alosa alabamae</i>	Adkins, Bourgeois, Guillory
Gulf menhaden <i>Brevoortia patronus</i>	3, 4, 32, 73, 316, 698 Adkins, Bourgeois, Guillory
Yellowfin menhaden <i>Brevoortia smithii</i>	Adkins, Bourgeois, Guillory
Gizzard shad <i>Dorosoma cepedianum</i>	3, 4, 32, 698 Adkins, Bourgeois, Guillory
Bay anchovy <i>Anchoa mitchilli</i>	4, 32, 73, 698 Adkins, Bourgeois, Guillory
Hardhead catfish <i>Arius felis</i>	3, 4, 5, 32, 698 Adkins, Bourgeois, Guillory
Sheepshead minnow <i>Cyprinodon variegatus</i>	4 Adkins, Bourgeois, Guillory
Gulf killifish <i>Fundulus grandis</i>	4 Adkins, Bourgeois, Guillory
Silversides <i>Menidia species</i>	4
Snook <i>Centropomus undecimalis</i>	Adkins, Bourgeois, Guillory
Bluefish <i>Pomatomus saltatrix</i>	3, 4, 5, 698 Adkins, Bourgeois, Guillory
Blue runner <i>Caranx crysos</i>	5, 301, 302 Adkins, Bourgeois, Guillory
Crevalle jack <i>Caranx hippos</i>	3, 4, 5, 32, 698 Adkins, Bourgeois, Guillory
Florida pompano <i>Trachinotus carolinus</i>	3, 5 Adkins, Bourgeois, Guillory
Gray snapper <i>Lutjanus griseus</i>	4, 5 Adkins, Bourgeois, Guillory
Sheepshead <i>Archosargus probatocephalus</i>	3, 4, 5 Adkins, Bourgeois, Guillory
Pinfish <i>Lagodon rhomboides</i>	3, 4, 5, 32
Silver perch <i>Bairdiella chysoura</i>	3, 4, 32, 219, 698 Adkins, Bourgeois, Guillory
Sand seatrout <i>Cynoscion arenarius</i>	3, 4, 32, 73, 218, 698
Spotted seatrout <i>Cynoscion nebulosus</i>	3, 4, 5, 32, 219, 698 Adkins, Bourgeois, Guillory
Spot <i>Leiostomus xanthurus</i>	3, 4, 5, 32, 73, 698 Adkins, Bourgeois, Guillory
Atlantic croaker <i>Micropogonias undulatus</i>	3, 4, 5, 32, 73, 698 Adkins, Bourgeois, Guillory
Black drum <i>Pogonias cromis</i>	3, 4 Adkins, Bourgeois, Guillory
Red drum <i>Sciaenops ocellatus</i>	3, 4, 5, 927 Adkins, Bourgeois, Guillory
Striped mullet <i>Mugil cephalus</i>	3, 4, 32 Adkins, Bourgeois, Guillory
Code goby <i>Gobiosoma robustum</i>	Adkins, Bourgeois, Guillory
Spanish mackerel <i>Scomberomorus maculatus</i>	3, 4, 5, 698 Adkins, Bourgeois, Guillory
Gulf flounder <i>Paralichthys albigutta</i>	Adkins, Bourgeois, Guillory, Thompson
Southern flounder <i>Paralichthys lethostigma</i>	3, 4, 5, 32, 698 Adkins, Bourgeois, Guillory

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Atchafalaya/Vermillion Bays, LA
Bay scallop <i>Argopecten irradians</i>	Juneau, D. Rogers
American oyster <i>Crassostrea virginica</i>	319 Juneau, D. Rogers
Common rangia <i>Rangia cuneata</i>	229, 299, 300, 397, 481 Juneau, D. Rogers
Hard clam <i>Mercenaria species</i>	Juneau, D. Rogers
Bay squid <i>Lolliguncula brevis</i>	32, 465 Juneau, D. Rogers
Brown shrimp <i>Peneaus aztecus</i>	30, 31, 32, 73, 228, 229, 280, 364, 380, 385, 465, 466, 481, 760, 934, 935 Juneau, D. Rogers
Pink shrimp <i>Peneaus duorarum</i>	Juneau, D. Rogers
White shrimp <i>Penaeus setiferus</i>	30, 31, 32, 73, 228, 229, 280, 364, 380, 465, 466, 481, 534, 760, 934, 935, 942 Juneau, D. Rogers
Grass shrimp <i>Palaemonetes pugio</i>	32, 380, 418, 465, 481, 760, 934, 935 Juneau, D. Rogers
Spiny lobster <i>Parulirus argus</i>	Juneau, D. Rogers
Blue crab <i>Callinectes sapidus</i>	32, 73, 228, 229, 380, 418, 465, 481, 693, 760, 934, 935 Juneau, D. Rogers
Gulf stone crab <i>Menippe adina</i>	32, 465, 947 Juneau, D. Rogers
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	120, 210, 659 Juneau, D. Rogers
Tarpon <i>Megalops atlanticus</i>	659 Juneau, D. Rogers
Alabama shad <i>Alosa alabamae</i>	Juneau, D. Rogers
Gulf menhaden <i>Brevoortia patronus</i>	32, 73, 208, 209, 210, 211, 228, 229, 418, 465, 481, 659, 695, 760, 883, 934, 935 Juneau, D. Rogers
Yellowfin menhaden <i>Brevoortia smithii</i>	659 Juneau, D. Rogers
Gizzard shad <i>Dorosoma cepedianum</i>	32, 210, 229, 292, 380, 418, 465, 481, 485, 659, 695, 883, 934, 935 Juneau, D. Rogers
Bay anchovy <i>Anchoa mitchilli</i>	32, 73, 210, 229, 380, 418, 465, 481, 659, 695, 760, 883, 935 Juneau, D. Rogers
Hardhead catfish <i>Arius felis</i>	32, 210, 229, 380, 465, 481, 659, 695, 883, 934, 935 Juneau, D. Rogers
Sheepshead minow <i>Cyprinodon variegatus</i>	210, 380, 418, 465, 659, 760, 883, 934, 935 Juneau, D. Rogers
Gulf killifish <i>Fundulus grandis</i>	210, 380, 418, 465, 659, 760, 883, 935 Juneau, D. Rogers
Silversides <i>Menidia species</i>	210, 380, 418, 465, 659, 695, 760, 883, 934, 935 Juneau, D. Rogers
Snook <i>Centropomus undecimalis</i>	Juneau, D. Rogers
Bluefish <i>Pomatomus saltatrix</i>	434, 883 Juneau, D. Rogers
Blue runner <i>Caranx crysos</i>	434 Juneau, D. Rogers
Crevalle jack <i>Caranx hippos</i>	210, 228, 380, 418, 465, 659, 695, 883, 935 Juneau, D. Rogers
Florida pompano <i>Trachinotus carolinus</i>	659, 883 Juneau, D. Rogers
Gray snapper <i>Lutjanus griseus</i>	883 Juneau, D. Rogers
Sheepshead <i>Archosargus probatocephalus</i>	32, 210, 228, 229, 380, 418, 465, 466, 659, 695, 883, 934, 935 Juneau, D. Rogers
Pinfish <i>Lagodon rhomboides</i>	210, 229, 380, 418, 465, 481, 659, 695, 883, 934, 935 Juneau, D. Rogers
Silver perch <i>Bairdiella chysoura</i>	32, 210, 380, 418, 465, 481, 659, 695, 883, 935 Juneau, D. Rogers
Sand seatrout <i>Cynoscion arenarius</i>	32, 73, 210, 218, 228, 229, 380, 418, 465, 466, 481, 659, 695, 760, 883, 935 Juneau, D. Rogers
Spotted seatrout <i>Cynoscion nebulosus</i>	32, 210, 219, 228, 229, 380, 383, 465, 481, 659, 695, 883 Juneau, D. Rogers
Spot <i>Leiostomus xanthurus</i>	32, 73, 210, 228, 229, 380, 418, 465, 466, 481, 659, 695, 760, 883, 934, 935 Juneau, D. Rogers
Atlantic croaker <i>Micropogonias undulatus</i>	32, 73, 210, 228, 380, 418, 465, 466, 481, 659, 695, 760, 883, 934, 935 Juneau, D. Rogers
Black drum <i>Pogonias cromis</i>	32, 210, 229, 380, 418, 465, 466, 481, 659, 695, 883, 934, 935 Juneau, D. Rogers
Red drum <i>Sciaenops ocellatus</i>	210, 465, 481, 659, 883, 927, 934, 935 Juneau, D. Rogers
Striped mullet <i>Mugil cephalus</i>	210, 228, 229, 292, 380, 418, 465, 485, 659, 695, 760, 883, 934, 935 Juneau, D. Rogers
Code goby <i>Gobiosoma robustum</i>	Juneau, D. Rogers
Spanish mackerel <i>Scomberomorus maculatus</i>	32, 228, 465, 659, 695, 883 Juneau, D. Rogers
Gulf flounder <i>Paralichthys albigutta</i>	Juneau, D. Rogers, Thompson
Southern flounder <i>Paralichthys lethostigma</i>	32, 210, 228, 229, 380, 465, 466, 481, 659, 695, 883, 934, 935 Juneau, D. Rogers

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Calcasieu Lake, LA
Bay scallop	
<i>Argopecten irradians</i>	Carver, Ferguson, B. Rogers
American oyster	288, 319, 914, 943
<i>Crassostrea virginica</i>	Carver, Ferguson, B. Rogers
Common rangia	287, 397
<i>Rangia cuneata</i>	Carver, Ferguson, B. Rogers
Hard clam	
<i>Mercenaria species</i>	Carver, Ferguson, B. Rogers
Bay squid	27, 32, 434, 917, 918, 919
<i>Loliguncula brevis</i>	Carver, Ferguson, B. Rogers
Brown shrimp	30, 31, 32, 73, 280, 287, 316, 345, 381, 382, 384, 434, 478, 540, 703, 756, 757, 759, 941, 942
<i>Peneaus aztecus</i>	Carver, Ferguson, B. Rogers
Pink shrimp	
<i>Peneaus duorarum</i>	Carver, Ferguson, B. Rogers
White shrimp	30, 31, 32, 73, 280, 381, 382, 384, 434, 540, 678, 703, 756, 757, 759, 942
<i>Penaeus setiferus</i>	Carver, Ferguson, B. Rogers
Grass shrimp	32, 287, 381, 384, 756, 757, 759
<i>Palaemonetes pugio</i>	Carver, Ferguson, B. Rogers
Spiny lobster	
<i>Panulirus argus</i>	Carver, Ferguson, B. Rogers
Blue crab	32, 73, 287, 345, 381, 382, 384, 434, 756, 757, 759
<i>Callinectes sapidus</i>	Carver, Ferguson, B. Rogers
Gulf stone crab	32, 757, 947
<i>Menippe adina</i>	Carver, Ferguson, B. Rogers
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	21
<i>Carcharhinus leucas</i>	Carver, Ferguson, B. Rogers
Tarpon	
<i>Megalops atlanticus</i>	Carver, Ferguson, B. Rogers
Alabama shad	
<i>Alosa alabamae</i>	Carver, Ferguson, B. Rogers
Gulf menhaden	21, 32, 73, 255, 256, 257, 316, 345, 381, 382, 384, 434, 540, 541, 756, 757, 759, 797, 800, 799, 915, 916
<i>Brevoortia patronus</i>	Carver, Ferguson, B. Rogers
Yellowfin menhaden	704
<i>Brevoortia smithii</i>	Carver, Ferguson, B. Rogers
Gizzard shad	21, 32, 255, 256, 381, 704, 757
<i>Dorosoma cepedianum</i>	Carver, Ferguson, B. Rogers
Bay anchovy	21, 32, 73, 257, 345, 381, 382, 384, 434, 704, 756, 757, 759, 915, 916
<i>Anchoa mitchilli</i>	Carver, Ferguson, B. Rogers
Hardhead catfish	21, 32, 381, 434, 704, 756, 757
<i>Arius felis</i>	Carver, Ferguson, B. Rogers
Sheepshead minnow	21, 255, 256, 381, 384, 704, 756, 757, 759
<i>Cyprinodon variegatus</i>	Carver, Ferguson, B. Rogers
Gulf killifish	21, 256, 381, 384, 704, 756
<i>Fundulus grandis</i>	Carver, Ferguson, B. Rogers
Silversides	32, 255, 256, 381, 384, 704, 756, 757, 759
<i>Menidia species</i>	Carver, Ferguson, B. Rogers
Snook	
<i>Centropomus undecimalis</i>	Carver, Ferguson, B. Rogers
Bluefish	21
<i>Pomatomus saltatrix</i>	Carver, Ferguson, B. Rogers
Blue runner	
<i>Caranx crysos</i>	Carver, Ferguson, B. Rogers
Crevalle jack	32, 434, 704, 757
<i>Caranx hippos</i>	Carver, Ferguson, B. Rogers
Florida pompano	48, 49, 434, 757
<i>Trachinotus carolinus</i>	Carver, Ferguson, B. Rogers
Gray snapper	757
<i>Lutjanus griseus</i>	Carver, Ferguson, B. Rogers
Sheepshead	21, 32, 381, 434, 704, 757
<i>Archosargus probatocephalus</i>	Carver, Ferguson, B. Rogers
Pinfish	21, 32, 384, 434, 757
<i>Lagodon rhomboides</i>	Carver, Ferguson, B. Rogers
Silver perch	21, 32, 384, 434, 704, 757
<i>Bairdiella chysoura</i>	Carver, Ferguson, B. Rogers
Sand seatrout	21, 32, 73, 184, 186, 187, 218, 345, 381, 382, 384, 434, 704, 756, 757, 759, 799, 934
<i>Cynoscion arenarius</i>	Carver, Ferguson, B. Rogers
Spotted seatrout	21, 32, 219, 381, 382, 383, 384, 434, 704, 756, 757
<i>Cynoscion nebulosus</i>	Carver, Ferguson, B. Rogers
Spot	21, 32, 73, 184, 186, 381, 382, 384, 434, 704, 757
<i>Leiostomus xanthurus</i>	Carver, Ferguson, B. Rogers
Atlantic croaker	21, 22, 32, 73, 156, 184, 185, 186, 345, 381, 382, 384, 434, 477, 540, 704, 756, 757, 759, 944, 945
<i>Micropogonias undulatus</i>	Carver, Ferguson, B. Rogers
Black drum	21, 32, 184, 186, 384, 434, 757
<i>Pogonias cromis</i>	Carver, Ferguson, B. Rogers
Red drum	21, 32, 381, 384, 434, 704, 756, 757, 927
<i>Sciaenops ocellatus</i>	Carver, Ferguson, B. Rogers
Striped mullet	21, 32, 345, 381, 382, 384, 434, 604, 704, 756, 757
<i>Mugil cephalus</i>	Carver, Ferguson, B. Rogers
Code goby	757
<i>Gobiosoma robustum</i>	Carver, Ferguson, B. Rogers
Spanish mackerel	21, 32, 434, 757
<i>Scomberomorus maculatus</i>	Carver, Ferguson, B. Rogers
Gulf flounder	757
<i>Paralichthys albigutta</i>	Carver, Ferguson, B. Rogers, Thompson
Southern flounder	21, 32, 381, 384, 434, 704, 756, 757
<i>Paralichthys lethostigma</i>	Carver, Ferguson, B. Rogers

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Sabine Lake, TX/LA
Bay scallop	
<i>Argopecten irradians</i>	LeBlanc, Mambretti
American oyster	339, 377, 480, 850
<i>Crassostrea virginica</i>	LeBlanc, Mambretti
Common rangia	17, 480, 850, 954
<i>Rangia cuneata</i>	LeBlanc, Mambretti
Hard clam	
<i>Mercenaria species</i>	LeBlanc, Mambretti
Bay squid	850
<i>Loliguncula brevis</i>	LeBlanc, Mambretti
Brown shrimp	339, 377, 501, 591, 611, 612, 850, 954
<i>Penaeus aztecus</i>	LeBlanc, Mambretti
Pink shrimp	339, 377, 591, 611, 612
<i>Penaeus duorarum</i>	LeBlanc, Mambretti
White shrimp	337, 339, 377, 501, 591, 611, 612, 850, 852, 954
<i>Penaeus setiferus</i>	LeBlanc, Mambretti
Grass shrimp	954
<i>Palaemonetes pugio</i>	LeBlanc, Mambretti
Spiny lobster	
<i>Panulirus argus</i>	Pattillo
Blue crab	337, 339, 591, 639, 850, 954
<i>Callinectes sapidus</i>	LeBlanc, Mambretti
Gulf stone crab	947
<i>Menippe adina</i>	LeBlanc, Mambretti
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	
<i>Carcharhinus leucas</i>	Green, LeBlanc, Mambretti
Tarpon	
<i>Megalops atlanticus</i>	LeBlanc, Mambretti
Alabama shad	
<i>Alosa alabamae</i>	LeBlanc, Mambretti
Gulf menhaden	591, 742, 797, 800, 849
<i>Brevoortia patronus</i>	LeBlanc, Mambretti
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Pattillo
Gizzard shad	849
<i>Dorosoma cepedianum</i>	LeBlanc, Mambretti
Bay anchovy	591, 849
<i>Anchoa mitchilli</i>	LeBlanc, Mambretti
Hardhead catfish	742, 849
<i>Arius felis</i>	LeBlanc, Mambretti
Sheepshead minnow	849
<i>Cyprinodon variegatus</i>	LeBlanc, Mambretti
Gulf killifish	849
<i>Fundulus grandis</i>	LeBlanc, Mambretti
Silversides	
<i>Menidia species</i>	LeBlanc, Mambretti
Snook	
<i>Centropomus undecemalis</i>	LeBlanc, Mambretti
Bluefish	849
<i>Pomatomus saltatrix</i>	LeBlanc, Mambretti
Blue runner	
<i>Caranx crysos</i>	Pattillo
Crevalle jack	849
<i>Caranx hippos</i>	LeBlanc, Mambretti
Florida pompano	
<i>Trachinotus carolinus</i>	LeBlanc, Mambretti
Gray snapper	
<i>Lutjanus griseus</i>	LeBlanc, Mambretti
Sheepshead	337, 742, 849
<i>Archosargus probatocephalus</i>	LeBlanc, Mambretti
Pinfish	591, 849
<i>Lagodon rhomboides</i>	LeBlanc, Mambretti
Silver perch	
<i>Bairdiella chysoura</i>	LeBlanc, Mambretti
Sand seatrout	218, 337, 591, 742, 849
<i>Cynoscion arenarius</i>	LeBlanc, Mambretti
Spotted seatrout	219, 337, 591, 742, 849
<i>Cynoscion nebulosus</i>	LeBlanc, Mambretti
Spot	591, 742, 849
<i>Leiostomus xanthurus</i>	LeBlanc, Mambretti
Atlantic croaker	337, 591, 742, 849
<i>Micropogonias undulatus</i>	LeBlanc, Mambretti
Black drum	337, 591, 742, 849
<i>Pogonias cromis</i>	LeBlanc, Mambretti
Red drum	193, 337, 591, 742, 849
<i>Sciaenops ocellatus</i>	LeBlanc, Mambretti
Striped mullet	337, 591, 742, 849
<i>Mugil cephalus</i>	LeBlanc, Mambretti
Code goby	
<i>Gobiosoma robustum</i>	LeBlanc, Mambretti
Spanish mackerel	591, 849
<i>Scomberomorus maculatus</i>	LeBlanc, Mambretti
Gulf flounder	
<i>Paralichthys albigutta</i>	LeBlanc, Mambretti
Southern flounder	569, 591, 742, 849
<i>Paralichthys lethostigma</i>	LeBlanc, Mambretti

Numbers correspond to references in Appendix 4, p. 230-273.
Names correspond to individuals in Appendix 3, p. 226-229.

Species	Galveston Bay, TX
Bay scallop <i>Argopecten irradians</i>	623, 809 Benefield, Trimm
American oyster <i>Crassostrea virginica</i>	52, 215, 337, 339, 340, 367, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 537, 586, 684, 723, 735, 809, 834, 835, 967. Benefield, Trimm
Common rangia <i>Rangia cuneata</i>	17, 26, 454, 537, 623, 723, 809, 967 Benefield, Trimm
Hard clam <i>Mercenaria species</i>	189, 190, 215, 415, 453, 586, 623, 809 Benefield, Trimm
Bay squid <i>Loliguncula brevis</i>	20, 113, 142, 390, 391, 537, 586, 623, 723, 735, 809 Benefield, Forsythe, Trimm
Brown shrimp <i>Peneaus aztecus</i>	8, 17, 43, 44, 53-55, 122, 125, 127, 150, 169, 178, 289, 337, 339, 340, 454-457, 484, 501, 566, 575, 576, 586, 591, 605, 607, 608, 611-625, 680, 691, 723, 725, 727, 735, 739, 809, 889, 905, 907, 960, 965, 967, 968, 970. Baxter, Benefield, Trimm
Pink shrimp <i>Peneaus duorarum</i>	53, 54, 55, 150, 339, 340, 484, 575, 586, 591, 611-625, 809, 889, 907, 967, 968 Baxter, Benefield, Trimm
White shrimp <i>Penaeus setiferus</i>	8, 17, 20, 26, 44, 53, 54, 55, 125, 127, 150, 159, 169, 178, 237, 337, 339, 340, 421, 454-457, 484, 501, 537, 575, 586, 591, 605, 608, 611-625, 691, 723, 725, 727, 728, 735, 739, 806, 809, 889, 907, 960, 966, 967, 968. Baxter, Benefield, Trimm
Grass shrimp <i>Palaemonetes pugio</i>	17, 127, 169, 178, 421, 454, 455, 537, 586, 623, 691, 723, 809, 907, 929, 953, 968 Benefield, Trimm
Spiny lobster <i>Panulirus argus</i>	Pattillo
Blue crab <i>Callinectes sapidus</i>	10, 17, 20, 26, 50, 54, 55, 127, 135, 142, 147, 169, 178, 282, 337, 338, 339, 340, 454, 455, 456, 537, 586, 591, 627, 637, 638, 639, 640, 667, 691, 723, 726, 735, 809, 893, 894, 907, 967, 968. Benefield, Trimm
Gulf stone crab <i>Menippe adina</i>	178, 402, 405, 454, 623, 723, 809, 947, 968 Benefield, Trimm
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	42, 77, 307, 623, 679, 722, 724, 739 Benefield, Green, Trimm
Tarpon <i>Megalops atlanticus</i>	247, 679, 968 Benefield, Trimm
Alabama shad <i>Alosa alabamae</i>	Benefield, Trimm
Gulf menhaden <i>Brevoortia patronus</i>	17, 20, 26, 45, 127, 169, 178, 192, 268, 283, 284, 393, 416, 421, 454, 455, 456, 487, 488, 537, 573, 585, 586, 591, 623, 679, 722, 724, 734, 735, 737, 739, 742, 804, 967, 968. Benefield, Trimm
Yellowfin menhaden <i>Brevoortia smithii</i>	Pattillo
Gizzard shad <i>Dorosoma cepedianum</i>	17, 20, 127, 169, 178, 284, 487, 537, 586, 623, 679, 722, 724, 734, 735, 737, 739, 804 Benefield, Trimm
Bay anchovy <i>Anchoa mitchilli</i>	17, 20, 45, 127, 169, 178, 216, 283, 284, 393, 421, 454, 455, 487, 537, 573, 586, 623, 679, 722, 724, 734, 735, 737, 739, 804, 967, 968. Benefield, Trimm
Hardhead catfish <i>Arius felis</i>	17, 20, 45, 127, 178, 192, 216, 283, 284, 487, 488, 537, 585, 586, 591, 623, 679, 722, 724, 734, 735, 737, 537, 742, 804, 807, 808, 968. Benefield, Trimm
Sheepshead minnow <i>Cyprinodon variegatus</i>	9, 20, 127, 169, 178, 284, 453, 455, 487, 543, 544, 586, 623, 679, 722, 724, 735, 737, 739, 804, 824, 968 Benefield, Trimm
Gulf killifish <i>Fundulus grandis</i>	9, 20, 127, 169, 216, 453, 455, 487, 586, 623, 679, 722, 724, 735, 737, 739, 804, 824, 967, 968 Benefield, Trimm
Silversides <i>Menidia species</i>	9, 17, 20, 127, 169, 216, 283, 421, 455, 586, 623, 734, 737, 739, 804, 967, 968 Benefield, Trimm
Snook <i>Centropomus undecemalis</i>	574, 586 Benefield, Trimm
Bluefish <i>Pomatomus saltatrix</i>	20, 487, 623, 679, 724, 739, 967 Benefield, Trimm
Blue runner <i>Caranx crysos</i>	679 Pattillo
Crevalle jack <i>Caranx hippos</i>	20, 45, 178, 284, 393, 487, 488, 586, 623, 679, 722, 724, 734, 737, 804 Benefield, Trimm
Florida pompano <i>Trachinotus carolinus</i>	20, 284, 337, 623, 679, 734, 737, 739 Benefield, Trimm
Gray snapper <i>Lutjanus griseus</i>	623, 679 Benefield, Trimm
Sheepshead <i>Archosargus probatocephalus</i>	17, 20, 45, 85, 88-91, 192, 284, 337, 393, 488, 537, 546, 570, 585, 586, 591, 623, 635, 636, 670, 672, 722, 724, 734, 735, 737, 739, 742, 804, 851, 852, 967, 968. Benefield, Trimm
Pinfish <i>Lagodon rhomboides</i>	9, 17, 20, 127, 169, 192, 216, 284, 393, 421, 487, 488, 585, 586, 591, 623, 679, 724, 734, 735, 737, 739, 742, 804, 967, 968 Benefield, Trimm
Silver perch <i>Bairdiella chysoura</i>	20, 178, 216, 219, 284, 393, 487, 488, 586, 623, 679, 722, 724, 734-737, 739, 804, 967 Benefield, Trimm
Sand seatrout <i>Cynoscion arenarius</i>	17, 20, 45, 51, 127, 169, 178, 192, 216, 218, 283, 284, 337, 393, 421, 455, 487, 488, 537, 585, 586, 591, 623, 626, 670, 679, 722, 724, 734-737, 742, 804, 807, 808. Benefield, Trimm
Spotted seatrout <i>Cynoscion nebulosus</i>	17, 20, 25, 85, 88-91, 127, 192, 193, 216, 219, 284, 337, 393, 453, 454, 488, 537, 546, 547, 570, 585, 586, 591, 623, 635, 636, 670, 672, 679, 722, 724, 734, 735, 737, 739, 742, 804, 851, 852, 967, 968. Benefield, Trimm
Spot <i>Leiostomus xanthurus</i>	9, 17, 20, 45, 127, 169, 178, 192, 216, 283, 284, 393, 421, 453, 454, 487, 488, 537, 585, 586, 591, 623, 679, 724, 735, 737, 738, 739, 742, 804, 807, 808, 967, 968. Benefield, Trimm
Atlantic croaker <i>Micropogonias undulatus</i>	17, 20, 45, 85, 127, 169, 178, 192, 216, 220, 283, 284, 337, 393, 453, 454, 455, 487, 488, 537, 573, 585, 586, 591, 623, 670, 672, 679, 722, 724, 734-739, 742, 804, 807, 808, 851, 852, 945, 968. Benefield, Trimm
Black drum <i>Pogonias cromis</i>	17, 20, 85, 88-91, 127, 178, 192, 216, 221, 284, 337, 393, 453, 454, 487, 488, 537, 546, 547, 568, 570, 585, 586, 591, 623, 635, 636, 670, 672, 679, 722, 724, 734, 735, 737, 739, 742, 804, 851, 852. Benefield, Trimm
Red drum <i>Sciaenops ocellatus</i>	17, 20, 85, 88-91, 127, 192, 193, 216, 221, 284, 337, 373, 393, 453, 454, 487, 488, 546, 547, 563-567, 570, 585, 586, 591, 623, 635, 636, 670-672, 679, 722, 734-737, 739, 742, 804, 851, 852, 939, 968. Benefield, Trimm
Striped mullet <i>Mugil cephalus</i>	9, 17, 20, 127, 169, 178, 192, 283, 284, 337, 393, 421, 453, 454, 487, 488, 537, 586, 591, 623, 679, 722, 724, 735, 737, 739, 742, 804, 967, 968. Benefield, Trimm
Code goby <i>Gobiosoma robustum</i>	284, 487, 586, 623, 679, 968 Benefield, Trimm
Spanish mackerel <i>Scomberomorus maculatus</i>	41, 487, 591, 623, 679, 734, 739 Benefield, Trimm
Gulf flounder <i>Paralichthys albigutta</i>	178, 284, 421, 562, 586, 679 Benefield, Trimm
Southern flounder <i>Paralichthys lethostigma</i>	17, 20, 85, 88-91, 169, 178, 192, 216, 284, 393, 453, 454, 455, 537, 546, 547, 562, 569, 570, 585, 586, 591, 623, 628, 635, 636, 670, 672, 679, 722, 724, 734-737, 739, 742, 804, 838, 851, 852, 967, 968. Benefield, Trimm

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Brazos River, TX
Bay scallop <i>Argopecten irradians</i>	
American oyster <i>Crassostrea virginica</i>	457
Common rangia <i>Rangia cuneata</i>	
Hard clam <i>Mercenaria species</i>	
Bay squid <i>Lolliguncula brevis</i>	113, 457
Brown shrimp <i>Peneaus aztecus</i>	125, 457
Pink shrimp <i>Peneaus duorarum</i>	457
White shrimp <i>Penaeus setiferus</i>	18, 125, 457
Grass shrimp <i>Palaemonetes pugio</i>	457
Spiny lobster <i>Panulirus argus</i>	Pattillo
Blue crab <i>Callinectes sapidus</i>	457
Gulf stone crab <i>Menippe adina</i>	457, 947
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	77
Tarpon <i>Megalops atlanticus</i>	18, 457
Alabama shad <i>Alosa alabamiae</i>	
Gulf menhaden <i>Brevoortia patronus</i>	18, 457
Yellowfin menhaden <i>Brevoortia smithii</i>	Pattillo
Gizzard shad <i>Dorosoma cepedianum</i>	18, 457
Bay anchovy <i>Anchoa mitchilli</i>	18, 457
Hardhead catfish <i>Arius felis</i>	18, 457
Sheepshead minnow <i>Cyprinodon variegatus</i>	18, 457
Gulf killifish <i>Fundulus grandis</i>	18, 457
Silversides <i>Menidia species</i>	457
Snook <i>Centropomus undecemalis</i>	
Bluefish <i>Pomatomus saltatrix</i>	457
Blue runner <i>Caranx crysos</i>	Pattillo
Crevalle jack <i>Caranx hippos</i>	457
Florida pompano <i>Trachinotus carolinus</i>	457
Gray snapper <i>Lutjanus griseus</i>	
Sheepshead <i>Archosargus probatocephalus</i>	457
Pinfish <i>Lagodon rhomboides</i>	18, 457
Silver perch <i>Bairdiella chysoura</i>	219, 457
Sand seatrout <i>Cynoscion arenarius</i>	218, 457, 816
Spotted seatrout <i>Cynoscion nebulosus</i>	18, 219, 457
Spot <i>Leiostomus xanthurus</i>	18, 457
Atlantic croaker <i>Micropogonias undulatus</i>	18, 457
Black drum <i>Pogonias cromis</i>	457, 761
Red drum <i>Sciaenops ocellatus</i>	457, 761
Striped mullet <i>Mugil cephalus</i>	18, 457
Code goby <i>Gobiosoma robustum</i>	
Spanish mackerel <i>Scomberomorus maculatus</i>	457
Gulf flounder <i>Paralichthys albigutta</i>	
Southern flounder <i>Paralichthys lethostigma</i>	457, 569

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Matagorda Bay, TX
Bay scallop <i>Argopecten irradians</i>	Dailey, Weixelman
American oyster <i>Crassostrea virginica</i>	204, 206, 337, 339, 367, 404, 403, 406, 407, 409, 410, 470, 472, 533, 629, 929
Common rangia <i>Rangia cuneata</i>	Dailey, Weixelman
Hard clam <i>Mercenaria species</i>	Dailey, Weixelman
Bay squid <i>Lolliguncula brevis</i>	17, 113, 142, 204, 205, 390, 641
Brown shrimp <i>Peneaus aztecus</i>	Dailey, Weixelman
Pink shrimp <i>Peneaus duorarum</i>	17, 53, 54, 55, 125, 204, 205, 206, 339, 340, 456, 471, 501, 575, 591, 611, 613, 614, 616-622, 624, 625, 641, 647, 651, 652, 725, 929, 969. Dailey, Weixelman
White shrimp <i>Penaeus setiferus</i>	54, 55, 204, 339, 575, 591, 611, 613, 614, 616-622, 624, 625, 641, 647, 651, 652, 969
Grass shrimp <i>Palaemonetes pugio</i>	Dailey, Weixelman
Spiny lobster <i>Panulirus argus</i>	205, 641, 969
Blue crab <i>Callinectes sapidus</i>	Dailey, Weixelman
Gulf stone crab <i>Menippe adina</i>	Pattillo
Stone crab <i>Menippe mercenaria</i>	17, 54, 55, 135, 169, 147, 205, 206, 337, 338, 339, 340, 473, 591, 610, 638, 639, 641, 929, 969
Bull shark <i>Carcharhinus leucas</i>	Dailey, Weixelman
Tarpon <i>Megalops atlanticus</i>	641, 947
Alabama shad <i>Alosa alabamiae</i>	Dailey, Weixelman
Gulf menhaden <i>Brevoortia patronus</i>	17, 192, 203, 205, 532, 585, 591, 606, 641, 742, 929, 940, 969
Yellowfin menhaden <i>Brevoortia smithii</i>	Dailey, Weixelman
Gizzard shad <i>Dorosoma cepedianum</i>	Pattillo
Bay anchovy <i>Anchoa mitchilli</i>	203, 205, 532, 641
Hardhead catfish <i>Arius felis</i>	Dailey, Weixelman
Sheepshead minnow <i>Cyprinodon variegatus</i>	17, 203, 471, 532, 606, 641, 929, 969
Gulf killifish <i>Fundulus grandis</i>	Dailey, Weixelman
Silversides <i>Menidia species</i>	203, 205, 532, 606, 641, 969
Snook <i>Centropomus undecimalis</i>	Dailey, Weixelman
Bluefish <i>Pomatomus saltatrix</i>	641
Blue runner <i>Caranx crysos</i>	Dailey, Weixelman
Crevalle jack <i>Caranx hippos</i>	Pattillo
Florida pompano <i>Trachinotus carolinus</i>	203, 532, 641
Gray snapper <i>Lutjanus griseus</i>	Dailey, Weixelman
Sheepshead <i>Archosargus probatocephalus</i>	85, 88-91, 192, 203, 337, 471, 532, 546, 585, 591, 628, 641, 646, 670, 672, 742, 851, 969
Pinfish <i>Lagodon rhomboides</i>	Dailey, Weixelman
Silver perch <i>Bairdiella chysoura</i>	192, 203, 205, 532, 585, 591, 606, 641, 742, 969
Sand seatrout <i>Cynoscion arenarius</i>	Dailey, Weixelman
Spotted seatrout <i>Cynoscion nebulosus</i>	17, 192, 203, 471, 532, 585, 591, 606, 641, 742, 929, 940, 969
Spot <i>Leiostomus xanthurus</i>	17, 85, 88-91, 164, 192, 193, 203, 205, 219, 337, 471, 497, 532, 546, 547, 585, 591, 606, 628, 641, 646, 670, 672, 742, 851, 929, 940, 969. Dailey, Weixelman
Atlantic croaker <i>Micropogonias undulatus</i>	Dailey, Weixelman
Black drum <i>Pogonias cromis</i>	85, 88-91, 160, 192, 193, 203, 221, 337, 471, 546, 547, 585, 591, 628, 641, 646, 670, 672, 742, 819, 851, 929, 940
Red drum <i>Sciaenops ocellatus</i>	Dailey, Weixelman
Striped mullet <i>Mugil cephalus</i>	17, 85, 88-91, 192, 193, 203, 205, 221, 337, 373, 471, 497, 546, 547, 563, 564, 571, 585, 591, 628, 641, 646, 670-672, 742, 819, 851, 929, 940, 969. Dailey, Weixelman
Code goby <i>Gobiosoma robustum</i>	17, 192, 203, 205, 219, 262, 337, 532, 591, 606, 641, 742, 929, 940, 969
Spanish mackerel <i>Scomberomorus maculatus</i>	Dailey, Weixelman
Gulf flounder <i>Paralichthys albigutta</i>	203, 532, 641
Southern flounder <i>Paralichthys lethostigma</i>	Dailey, Weixelman

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	San Antonio Bay, TX
Bay scallop <i>Argopecten irradians</i>	683 Marwitz, Wagner
American oyster <i>Crassostrea virginica</i>	52, 132, 134, 139, 140, 145, 337, 340, 367, 394, 404, 403, 406, 408, 409, 410, 537, 577, 683, 684 Marwitz, Wagner
Common rangia <i>Rangia cuneata</i>	17, 365, 537, 577, 683 Marwitz, Wagner
Hard clam <i>Mercenaria species</i>	394, 683 Marwitz, Wagner
Bay squid <i>Loliguncula brevis</i>	17, 132, 390, 537 Marwitz, Wagner
Brown shrimp <i>Peneaus aztecus</i>	17, 53, 54, 55, 132, 138, 144, 149, 339, 340, 394, 474, 501, 537, 575, 577, 591, 611, 613, 614, 616-622, 624, 625, 725 Marwitz, Wagner
Pink shrimp <i>Peneaus duorarum</i>	53, 54, 55, 132, 340, 394, 474, 575, 591, 611, 613, 614, 616-622, 624, 625, 725 Marwitz, Wagner
White shrimp <i>Peneaus setiferus</i>	17, 53, 54, 55, 113, 132, 138, 144, 149, 337, 339, 340, 365, 394, 474, 501, 537, 575, 577, 591, 611, 613, 614, 616-622, 624, 625, 725. Marwitz, Wagner
Grass shrimp <i>Palaemonetes pugio</i>	17, 132, 175, 537, 577 Marwitz, Wagner
Spiny lobster <i>Panulirus argus</i>	Pattillo
Blue crab <i>Callinectes sapidus</i>	17, 54, 55, 132, 134, 137, 142, 143, 147, 148, 338, 339, 340, 365, 394, 474, 537, 577, 638, 639, 820 Marwitz, Wagner
Gulf stone crab <i>Menippe adina</i>	132, 134, 537, 577, 947 Marwitz, Wagner
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	307, 394 Green, Marwitz, Wagner
Tarpon <i>Megalops atlanticus</i>	133, 823 Marwitz, Wagner
Alabama shad <i>Alosa alabamae</i>	Marwitz, Wagner
Gulf menhaden <i>Brevoortia patronus</i>	17, 132, 192, 537, 585, 591, 742 Marwitz, Wagner
Yellowfin menhaden <i>Brevoortia smithii</i>	Pattillo
Gizzard shad <i>Dorosoma cepedianum</i>	132, 133, 537 Marwitz, Wagner
Bay anchovy <i>Anchoa mitchilli</i>	17, 132, 133, 136, 141, 327, 537 Marwitz, Wagner
Hardhead catfish <i>Arius felis</i>	17, 132, 133, 192, 394, 537, 585, 591, 742, 820 Marwitz, Wagner
Sheepshead minnow <i>Cyprinodon variegatus</i>	132, 327, 394, 537, 824 Marwitz, Wagner
Gulf killifish <i>Fundulus grandis</i>	327, 394, 537, 824 Marwitz, Wagner
Silversides <i>Menidia species</i>	17, 132, 133, 327, 537 Marwitz, Wagner
Snook <i>Centropomus undecemalis</i>	133, 574 Marwitz, Wagner
Bluefish <i>Pomatomus saltatrix</i>	Marwitz, Wagner
Blue runner <i>Caranx crysos</i>	Pattillo
Crevalle jack <i>Caranx hippos</i>	132, 327 Marwitz, Wagner
Florida pompano <i>Trachinotus carolinus</i>	133 Marwitz, Wagner
Gray snapper <i>Lutjanus griseus</i>	132 Marwitz, Wagner
Sheepshead <i>Archosargus probatocephalus</i>	17, 85, 91, 132, 133, 192, 337, 394, 474, 537, 546, 570, 585, 591, 670, 672, 742, 820, 851 Marwitz, Wagner
Pinfish <i>Lagodon rhomboides</i>	17, 132, 133, 136, 141, 192, 327, 585, 591, 742, 820 Marwitz, Wagner
Silver perch <i>Bairdiella chysoura</i>	132, 219, 327, 394, 820 Marwitz, Wagner
Sand seatrout <i>Cynoscion arenarius</i>	17, 132, 133, 192, 218, 394, 537, 585, 591, 670, 672, 742, 820 Marwitz, Wagner
Spotted seatrout <i>Cynoscion nebulosus</i>	17, 85, 88, 89, 91, 133, 136, 141, 146, 192, 219, 327, 337, 394, 474, 537, 546, 547, 570, 585, 591, 670, 672, 742, 820, 851. Marwitz, Wagner
Spot <i>Leiostomus xanthurus</i>	17, 132, 133, 136, 141, 192, 327, 394, 537, 585, 591, 742, 820 Marwitz, Wagner
Atlantic croaker <i>Micropogonias undulatus</i>	17, 85, 132, 133, 136, 141, 192, 327, 394, 537, 585, 591, 670, 672, 742, 820, 851 Marwitz, Wagner
Black drum <i>Pogonias cromis</i>	17, 85, 89, 91, 132, 133, 136, 141, 146, 160, 192, 221, 327, 337, 474, 537, 546, 547, 570, 585, 591, 670, 672, 742, 819, 820, 851. Marwitz, Wagner
Red drum <i>Sciaenops ocellatus</i>	17, 85, 88-91, 133, 136, 141, 146, 192, 193, 194, 221, 327, 337, 373, 474, 546, 547, 564, 570, 585, 591, 670-672, 742, 819, 820, 836, 902. Marwitz, Wagner
Striped mullet <i>Mugil cephalus</i>	17, 132, 133, 192, 262, 327, 337, 394, 537, 591, 742 Marwitz, Wagner
Code goby <i>Gobiosoma robustum</i>	537 Marwitz, Wagner
Spanish mackerel <i>Scomberomorus maculatus</i>	133, 591 Marwitz, Wagner
Gulf flounder <i>Paralichthys albigutta</i>	474, 562 Marwitz, Wagner
Southern flounder <i>Paralichthys lethostigma</i>	17, 85, 90, 91, 132, 133, 136, 141, 145, 192, 327, 394, 474, 537, 546, 547, 562, 569, 570, 585, 591, 670, 672, 742, 820, 851. Marwitz, Wagner

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Aransas Bay, TX
Bay scallop	400, 683, 965
<i>Argopecten irradians</i>	Campbell, Meador
American oyster	179, 337, 340, 366, 367, 368, 369, 370, 717
<i>Crassostrea virginica</i>	Campbell, Meador
Common rangia	365, 683
<i>Rangia cuneata</i>	Campbell, Meador
Hard clam	190, 683, 745
<i>Mercenaria species</i>	Campbell, Meador
Bay squid	17, 176, 326, 372, 390, 399, 745
<i>Loliguncula brevis</i>	Campbell, Meador
Brown shrimp	17, 53, 54, 55, 166, 167, 176, 181, 277, 323, 326, 334, 339, 340, 371, 372, 399, 456, 501, 575, 591, 611, 613, 614, 616-622, 624, 625, 691, 725, 785, 788, 791. Campbell, Meador
<i>Peneaus aztecus</i>	
Pink shrimp	53, 54, 55, 176, 181, 277, 326, 339, 340, 372, 399, 400, 456, 575, 591, 611, 613, 614, 616-622, 624, 672, 785, 788, 791, 964. Campbell, Meador
<i>Peneaus duorarum</i>	
White shrimp	17, 53, 54, 55, 113, 277, 323, 326, 337, 339, 340, 365, 371, 372, 399, 456, 501, 575, 591, 611, 613, 614, 616-622, 624, 625, 691, 725, 785, 788, 791, 964. Campbell, Meador
<i>Penaeus setiferus</i>	
Grass shrimp	17, 371, 372, 400, 691, 964
<i>Palaemonetes pugio</i>	Campbell, Meador
Spiny lobster	
<i>Panulirus argus</i>	Pattillo
Blue crab	17, 54, 55, 135, 142, 147, 176, 323, 326, 334, 338, 339, 340, 365, 371, 372, 400, 591, 638, 639, 691, 783, 787, 790, 964. Campbell, Meador
<i>Callinectes sapidus</i>	
Gulf stone crab	326, 334, 372, 394, 716, 745, 947, 964
<i>Menippe adina</i>	Campbell, Meador
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	42, 307, 395, 792, 964
<i>Carcharhinus leucas</i>	Campbell, Green, Meador
Tarpon	324, 842
<i>Megalops atlanticus</i>	Campbell, Meador
Alabama shad	
<i>Alosa alabamae</i>	Campbell, Meador
Gulf menhaden	15, 17, 75, 176, 339, 323, 324, 371, 395, 399, 585, 591, 740, 742, 745
<i>Brevoortia patronus</i>	Campbell, Meador
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Pattillo
Gizzard shad	324, 334, 371, 372, 740, 745
<i>Dorosoma cepedianum</i>	Campbell, Meador
Bay anchovy	15, 17, 68, 324, 327, 329, 371, 372, 395, 399, 430, 591, 633, 740, 964
<i>Anchoa mitchilli</i>	Campbell, Meador
Hardhead catfish	17, 176, 192, 323, 324, 325, 334, 371, 372, 399, 585, 591, 633, 742, 745, 792, 964
<i>Arius felis</i>	Campbell, Meador
Sheepshead minnow	68, 176, 324, 327, 329, 371, 372, 543, 544, 740, 745, 824
<i>Cyprinodon variegatus</i>	Campbell, Meador
Gulf killifish	68, 310, 324, 329, 371, 372, 740, 745, 824
<i>Fundulus grandis</i>	Campbell, Meador
Silversides	15, 17, 68, 323, 324, 327, 329, 334, 371, 372, 395, 400, 430, 740, 745, 964
<i>Menidia species</i>	Campbell, Meador
Snook	574, 842
<i>Centropomus undecemalis</i>	Campbell, Meador
Bluefish	176, 324, 395, 745, 842
<i>Pomatomus saltatrix</i>	Campbell, Meador
Blue runner	
<i>Caranx crysos</i>	Campbell, Pattillo
Crevalle jack	176, 324, 327, 371, 395, 842, 964
<i>Caranx hippos</i>	Campbell, Meador
Florida pompano	324, 329, 337, 395, 842
<i>Trachinotus carolinus</i>	Campbell, Meador
Gray snapper	334, 842
<i>Lutjanus griseus</i>	Campbell, Meador
Sheepshead	15, 17, 68, 85, 88-91, 176, 192, 323, 324, 334, 337, 400, 546, 570, 585, 591, 670, 672, 742, 745, 784, 786, 792, 851, 964. Campbell, Meador
<i>Archosargus probatocephalus</i>	
Pinfish	15, 17, 68, 75, 121, 176, 192, 323, 324, 327, 334, 371, 372, 395, 400, 430, 431, 432, 585, 591, 633, 742, 745, 792, 964. Campbell, Meador
<i>Lagodon rhomboides</i>	
Silver perch	15, 68, 75, 176, 219, 323, 324, 327, 334, 371, 372, 395, 400, 419, 422, 430, 633, 745, 792, 964
<i>Bairdiella chysoura</i>	Campbell, Meador
Sand seatrout	15, 17, 176, 192, 218, 323, 324, 337, 395, 422, 585, 591, 633, 670, 672, 742, 745, 792, 920, 964
<i>Cynoscion arenarius</i>	Campbell, Meador
Spotted seatrout	15, 17, 68, 85, 88-91, 109, 176, 192, 219, 323, 324, 327, 334, 371, 372, 419, 422, 430, 546, 547, 570, 585, 591, 633, 670, 672, 688, 708, 742, 745, 784, 786, 789, 793, 842, 851, 920, 964. Campbell, Meador
<i>Cynoscion nebulosus</i>	
Spot	15, 17, 68, 192, 323, 324, 327, 334, 371, 372, 395, 399, 400, 422, 430, 585, 591, 633, 742, 745, 964
<i>Leiostomus xanthurus</i>	Campbell, Meador
Atlantic croaker	15, 17, 68, 75, 85, 176, 192, 219, 324, 329, 334, 337, 371, 372, 395, 399, 422, 430, 585, 591, 633, 670, 672, 688, 742, 745, 792, 851, 964. Campbell, Meador
<i>Micropogonias undulatus</i>	
Black drum	15, 17, 75, 85, 88-91, 160, 192, 221, 323, 324, 327, 337, 371, 372, 395, 422, 546, 547, 568, 570, 585, 591, 670, 672, 742, 786, 789, 792, 819, 851, 964. Campbell, Meador
<i>Pogonias cromis</i>	
Red drum	15, 17, 68, 75, 85, 88-91, 192, 193, 221, 323, 324, 327, 329, 337, 371-373, 395, 400, 422, 423, 430, 546, 547, 563-565, 570, 572, 585, 591, 670-672, 688, 742, 745, 784, 786, 789, 792, 819, 836, 842, 851, 964. Campbell, Meador
<i>Sciaenops ocellatus</i>	
Striped mullet	15, 17, 68, 176, 192, 262, 323, 324, 327, 334, 337, 371, 395, 400, 591, 632, 633, 740, 742, 745, 964
<i>Mugil cephalus</i>	Campbell, Meador
Code goby	15, 68, 395, 400, 430, 431, 432, 745, 964
<i>Gobiosoma robustum</i>	Campbell, Meador
Spanish mackerel	41, 176, 324, 395, 591, 633, 741, 792, 842, 964
<i>Scomberomorus maculatus</i>	Campbell, Meador
Gulf flounder	15, 68, 324, 395, 430, 562, 633, 855
<i>Paralichthys albigutta</i>	Campbell, Meador
Southern flounder	15, 17, 68, 75, 85, 88, 89, 90, 176, 192, 324, 327, 372, 400, 430, 546, 547, 562, 569, 570, 585, 591, 633, 670, 672, 742, 745, 784, 786, 789, 792, 822, 851, 855, 964. Campbell, Meador
<i>Paralichthys lethostigma</i>	

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Corpus Christi Bay, TX
Bay scallop <i>Argopecten irradians</i>	400, 417, 965 Fuls
American oyster <i>Crassostrea virginica</i>	179, 340, 379, 400, 417, 550, 553, 745 Fuls
Common rangia <i>Rangia cuneata</i>	417 Fuls
Hard clam <i>Mercenaria species</i>	190, 417, 745 Fuls
Bay squid <i>Lolliguncula brevis</i>	17, 74, 176, 343, 390, 399, 745 Fuls
Brown shrimp <i>Peneaus aztecus</i>	17, 54, 55, 74, 166, 167, 176, 181, 277, 339, 340, 343, 379, 399, 417, 501, 551, 552, 556, 575, 591, 611, 613, 614, 616-622, 624, 625, 725, 848. Fuls
Pink shrimp <i>Peneaus duorarum</i>	54, 55, 74, 176, 181, 277, 339, 340, 343, 399, 400, 575, 591, 611, 613, 614, 616-622, 624, 625, 725, 367, 848 Fuls
White shrimp <i>Peneaus setiferus</i>	17, 54, 55, 74, 113, 277, 337, 339, 340, 343, 379, 399, 501, 551, 552, 556, 575, 591, 611, 613, 614, 616-622, 624, 625, 725, 848, 964. Fuls
Grass shrimp <i>Palaemonetes pugio</i>	837, 848, 964 Fuls
Spiny lobster <i>Panulirus argus</i>	Patillo
Blue crab <i>Callinectes sapidus</i>	17, 54, 55, 74, 135, 142, 147, 176, 338, 339, 340, 343, 379, 400, 417, 548, 555, 558, 591, 638, 639, 964 Fuls
Gulf stone crab <i>Menippe adina</i>	417, 745, 947, 964 Fuls
Stone crab <i>Menippe mercenaria</i>	947 Czapla
Bull shark <i>Carcharhinus leucas</i>	42, 307, 395, 792 Fuls, Green
Tarpon <i>Megalops atlanticus</i>	964 Fuls
Alabama shad <i>Alosa alabamæ</i>	Fuls
Gulf menhaden <i>Brevoortia patronus</i>	15, 17, 75, 176, 192, 379, 395, 399, 461, 585, 591, 742, 745, 848 Fuls
Yellowfin menhaden <i>Brevoortia smithii</i>	848 Patillo
Gizzard shad <i>Dorosoma cepedianum</i>	745 Fuls
Bay anchovy <i>Anchoa mitchilli</i>	15, 17, 68, 74, 329, 343, 395, 399, 430, 848, 964 Fuls
Hardhead catfish <i>Arius felis</i>	17, 74, 176, 192, 334, 399, 461, 585, 591, 742, 745, 792, 848, 964 Fuls
Sheepshead minnow <i>Cyprinodon variegatus</i>	68, 176, 213, 329, 745, 824 Fuls
Gulf killifish <i>Fundulus grandis</i>	68, 213, 745, 824 Fuls
Silversides <i>Menidia species</i>	15, 68, 329, 334, 343, 395, 400, 430, 461, 745, 964 Fuls
Snook <i>Centropomus undecemalis</i>	504, 574, 842 Fuls
Bluefish <i>Pomatomus saltatrix</i>	176, 343, 395, 745, 842 Fuls
Blue runner <i>Caranx crysos</i>	848 Patillo
Creville jack <i>Caranx hippos</i>	74, 176, 395, 842, 848, 964 Fuls
Florida pompano <i>Trachinotus carolinus</i>	329, 337, 395, 842, 848 Fuls
Gray snapper <i>Lutjanus griseus</i>	334, 842, 848 Fuls
Sheepshead <i>Archosargus probatocephalus</i>	15, 17, 68, 74, 85, 88, 89, 91, 176, 192, 334, 337, 343, 372, 400, 461, 546, 549, 554, 557, 570, 585, 591, 670, 672, 742, 745, 792, 848, 851, 964. Fuls
Pinfish <i>Lagodon rhomboides</i>	15, 17, 68, 74, 75, 121, 176, 192, 334, 343, 395, 400, 430, 431, 432, 461, 585, 591, 742, 745, 792, 848, 964 Fuls
Silver perch <i>Bairdiella chysoura</i>	15, 68, 74, 75, 176, 219, 334, 395, 419, 430, 461, 745, 792, 848, 964 Fuls
Sand seatrout <i>Cynoscion arenarius</i>	15, 17, 81, 176, 192, 218, 337, 343, 395, 400, 461, 585, 591, 670, 672, 742, 745, 792, 848, 964 Fuls
Spotted seatrout <i>Cynoscion nebulosus</i>	15, 17, 68, 85, 88-91, 109, 176, 192, 219, 334, 337, 343, 379, 419, 430, 497, 546, 547, 549, 554, 557, 570, 585, 591, 688, 708, 742, 745, 793, 842, 848, 851, 964. Fuls
Spot <i>Leiostomus xanthurus</i>	15, 17, 68, 74, 192, 334, 343, 379, 395, 399, 400, 430, 461, 585, 591, 670, 672, 848, 964 Fuls
Atlantic croaker <i>Micropogonias undulatus</i>	15, 17, 68, 74, 75, 85, 176, 192, 219, 329, 334, 337, 343, 379, 395, 399, 430, 461, 585, 591, 670, 672, 688, 742, 745, 792, 848, 851, 964. Fuls
Black drum <i>Pogonias cromis</i>	15, 17, 75, 85, 88, 89, 91, 160, 192, 221, 337, 343, 395, 546, 547, 549, 554, 557, 568, 570, 585, 591, 670, 672, 742, 792, 819, 848, 851, 964. Fuls
Red drum <i>Sciaenops ocellatus</i>	15, 17, 19, 68, 75, 85, 88-91, 192, 193, 194, 221, 329, 334, 343, 373, 395, 400, 423, 430, 497, 546, 547, 548, 554, 557, 564, 565, 570, 585, 611, 670-672, 688, 742, 745, 792, 819, 836, 842, 848, 851, 964. Fuls
Striped mullet <i>Mugil cephalus</i>	15, 17, 68, 74, 176, 192, 262, 334, 337, 343, 379, 395, 400, 461, 591, 632, 742, 745, 848, 964 Fuls
Code goby <i>Gobiosoma robustum</i>	15, 68, 396, 395, 400, 430, 431, 432, 745, 964 Fuls
Spanish mackerel <i>Scomberomorus maculatus</i>	176, 343, 395, 591, 741, 792, 842, 848, 964 Fuls
Gulf flounder <i>Paralichthys albigutta</i>	15, 68, 395, 430, 562, 848, 855 Fuls
Southern flounder <i>Paralichthys lethostigma</i>	15, 17, 19, 68, 74, 75, 85, 89, 90, 91, 176, 192, 343, 371, 400, 430, 461, 497, 546, 547, 549, 554, 557, 562, 569, 570, 585, 591, 670, 672, 742, 745, 792, 822, 848, 851, 855, 964. Fuls

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Laguna Madre, TX
Bay scallop	82, 128, 951
<i>Argopecten irradians</i>	Dansby, Rice, Tunnell
American oyster	81, 82, 92, 98, 112, 337, 339, 367, 403, 409, 449, 667, 684, 818
<i>Crassostrea virginica</i>	Dansby, Rice, Tunnell
Common rangia	
<i>Rangia cuneata</i>	Dansby, Rice, Tunnell
Hard clam	81, 82, 415
<i>Mercenaria species</i>	Dansby, Rice, Tunnell
Bay squid	17, 81, 82, 92, 128, 387, 390, 796, 818
<i>Loliguncula brevis</i>	Dansby, Rice, Tunnell
Brown shrimp	17, 53, 54, 55, 81, 82, 92, 96, 98, 112, 128, 277, 339, 373, 352, 355, 357, 387, 448, 451, 456, 501, 575, 591, 611, 613, 614, 616-622, 624, 625, 667, 669, 691, 725, 817, 854. Dansby, Rice, Tunnell
<i>Peneaus aztecus</i>	
Pink shrimp	53, 54, 55, 82, 96, 98, 277, 339, 340, 352, 355, 357, 448, 451, 456, 575, 591, 611, 613, 614, 616-622, 624, 625, 667, 669, 725, 817, 854. Dansby, Rice, Tunnell
<i>Peneaus duorarum</i>	
White shrimp	17, 53, 54, 55, 81, 82, 92, 96, 98, 112, 277, 339, 340, 352, 355, 357, 387, 448, 451, 456, 501, 575, 591, 611, 613, 614, 616-622, 624, 625, 667, 669, 725, 796, 817, 854. Dansby, Rice, Tunnell
<i>Peneaus setiferus</i>	
Grass shrimp	17, 82, 96, 387, 691, 817, 837
<i>Palaemonetes pugio</i>	Dansby, Rice, Tunnell
Spiny lobster	
<i>Panulirus argus</i>	Pattillo, Tunnell, Hockaday
Blue crab	17, 54, 55, 81, 82, 92, 96, 98, 112, 135, 142, 147, 338, 339, 340, 344, 351, 356, 359, 387, 450, 452, 591, 638, 639, 667, 668, 691, 796, 817, 818. Dansby, Rice, Tunnell
<i>Callinectes sapidus</i>	
Gulf stone crab	817, 818, 947
<i>Menippe adina</i>	Dansby, Rice, Tunnell
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	42, 307
<i>Carcharhinus leucas</i>	Dansby, Edwards, Green, Rice
Tarpon	82, 112, 817
<i>Megalops atlanticus</i>	Dansby, Edwards, Rice
Alabama shad	
<i>Alosa alabamae</i>	Dansby, Edwards, Rice
Gulf menhaden	17, 82, 92, 96, 98, 112, 128, 192, 387, 424, 585, 591, 742, 796, 817
<i>Brevoortia patronus</i>	Dansby, Edwards, Rice
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Pattillo
Gizzard shad	82, 98, 112, 344, 387, 751, 817
<i>Dorosoma cepedianum</i>	Dansby, Edwards, Rice
Bay anchovy	17, 83, 92, 98, 112, 128, 377, 387, 424, 751, 796, 817, 818
<i>Anchoa mitchilli</i>	Dansby, Edwards, Rice
Hardhead catfish	17, 81, 82, 92, 96, 98, 112, 192, 344, 377, 387, 424, 585, 591, 742, 751, 796, 817, 818
<i>Arius felis</i>	Dansby, Edwards, Rice
Sheepshead minnow	82, 96, 112, 128, 330, 354, 377, 387, 424, 751, 796, 817, 824
<i>Cyprinodon variegatus</i>	Dansby, Edwards, Rice
Gulf killifish	82, 96, 112, 128, 330, 424, 817, 824
<i>Fundulus grandis</i>	Dansby, Edwards, Rice
Silversides	330, 377, 387, 424, 742, 796, 817
<i>Menidia species</i>	Dansby, Edwards, Rice
Snook	428, 504, 574, 818
<i>Centropomus undecimalis</i>	Dansby, Edwards, Rice
Bluefish	796, 817
<i>Pomatomus saltatrix</i>	Dansby, Edwards, Rice
Blue runner	
<i>Caranx crysos</i>	Harrington, Rice, Pattillo
Crevalle jack	82, 92, 112, 424, 796, 817
<i>Caranx hippos</i>	Dansby, Edwards, Rice
Florida pompano	337, 424, 796, 817
<i>Trachinotus carolinus</i>	Dansby, Edwards, Rice
Gray snapper	82, 424, 796
<i>Lutjanus griseus</i>	Dansby, Edwards, Rice
Sheepshead	17, 81, 82, 85-91, 95-101, 112, 192, 337, 344, 353, 358, 354, 424, 546, 570, 585, 591, 628, 670, 672, 742, 796, 817, 851. Dansby, Edwards, Rice
<i>Archosargus probatocephalus</i>	
Pinfish	17, 82, 83, 92, 98, 112, 128, 192, 354, 377, 424, 585, 591, 742, 796, 817, 818
<i>Lagodon rhomboides</i>	Dansby, Edwards, Rice
Silver perch	82, 83, 92, 112, 128, 219, 377, 387, 424, 796, 817
<i>Bairdiella chysoura</i>	Dansby, Edwards, Rice
Sand seatrout	17, 83, 98, 112, 192, 218, 337, 344, 387, 424, 585, 591, 670, 672, 742, 817
<i>Cynoscion arenarius</i>	Dansby, Edwards, Rice
Spotted seatrout	17, 81, 82, 83, 85-101, 112, 128, 192, 219, 337, 344, 353, 358, 354, 377, 387, 424, 546, 547, 570, 585, 591, 670, 672, 742, 796, 817, 818, 851. Dansby, Edwards, Rice
<i>Cynoscion nebulosus</i>	
Spot	192, 344, 354, 377, 387, 424, 585, 591, 742, 796, 817
<i>Leiostomus xanthurus</i>	Dansby, Edwards, Rice
Atlantic croaker	17, 83, 92, 96, 98, 112, 128, 192, 219, 337, 344, 377, 387, 424, 585, 591, 670, 672, 742, 751, 796, 817, 851
<i>Micropogonias undulatus</i>	Dansby, Edwards, Rice
Black drum	17, 81-92, 94-101, 112, 192, 221, 337, 344, 353, 358, 354, 377, 387, 424, 546, 547, 568, 570, 585, 591, 670, 672, 742, 796, 817, 818, 819, 851. Dansby, Edwards, Rice
<i>Pogonias cromis</i>	
Red drum	17, 81, 82, 83, 85-92, 94-101, 112, 128, 192, 193, 221, 337, 344, 353, 354, 358, 373, 377, 387, 424, 546, 547, 563, 564, 566, 570, 614, 741, 670, 672, 742, 751, 796, 817, 818, 819, 851. Dansby, Edwards, Rice
<i>Sciaenops ocellatus</i>	
Striped mullet	17, 81, 82, 92, 96, 98, 112, 128, 192, 219, 262, 337, 344, 354, 377, 387, 424, 591, 632, 742, 751, 796, 817
<i>Mugil cephalus</i>	Dansby, Edwards, Rice
Code goby	128, 424
<i>Gobiosoma robustum</i>	Dansby, Edwards, Rice
Spanish mackerel	82, 83, 112, 330, 591, 796
<i>Scomberomorus maculatus</i>	Dansby, Edwards, Rice
Gulf flounder	82, 377, 562, 817
<i>Paralichthys albigutta</i>	Dansby, Edwards, Rice
Southern flounder	17, 81, 82, 83, 85-92, 94-101, 112, 192, 330, 344, 353, 358, 377, 387, 424, 546, 547, 569, 570, 585, 591, 670, 672, 742, 817, 851. Dansby, Edwards, Rice
<i>Paralichthys lethostigma</i>	

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Species	Baffin Bay, TX
Bay scallop	
<i>Argopecten irradians</i>	Martin
American oyster	655
<i>Crassostrea virginica</i>	Martin
Common rangia	
<i>Rangia cuneata</i>	Martin
Hard clam	
<i>Mercenaria species</i>	Martin
Bay squid	182, 537
<i>Loliguncula brevis</i>	Martin
Brown shrimp	80, 180, 537, 822
<i>Peneaus aztecus</i>	Martin
Pink shrimp	822
<i>Peneaus duorarum</i>	Martin
White shrimp	80, 182, 537, 822
<i>Penaeus setiferus</i>	Martin
Grass shrimp	537, 837
<i>Palaemonetes pugio</i>	Martin
Spiny lobster	
<i>Parulirus argus</i>	Pattillo
Blue crab	80, 180, 182, 537, 822
<i>Callinectes sapidus</i>	Martin
Gulf stone crab	182, 822, 947
<i>Menippe adina</i>	Martin
Stone crab	947
<i>Menippe mercenaria</i>	Czapla
Bull shark	
<i>Carcharhinus leucas</i>	Green, Martin
Tarpon	80, 182
<i>Megalops atlanticus</i>	Martin
Alabama shad	
<i>Alosa alabamae</i>	Martin
Gulf menhaden	182, 276, 482, 537, 822, 902
<i>Brevoortia patronus</i>	Martin
Yellowfin menhaden	
<i>Brevoortia smithii</i>	Pattillo
Gizzard shad	80, 182, 276, 482, 822, 902
<i>Dorosoma cepedianum</i>	Martin
Bay anchovy	182, 222, 223, 482, 537, 822
<i>Anchoa mitchilli</i>	Martin
Hardhead catfish	80, 180, 182, 276, 482, 822, 902
<i>Arius felis</i>	Martin
Sheepshead minnow	80, 180, 182, 222, 223, 482, 537, 822, 824
<i>Cyprinodon variegatus</i>	Martin
Gulf killifish	80, 182, 482, 822, 824
<i>Fundulus grandis</i>	Martin
Silversides	80, 180, 182, 222, 223, 482, 537, 822
<i>Menidia species</i>	Martin
Snook	80
<i>Centropomus undecemalis</i>	Martin
Bluefish	
<i>Pomatomus saltatrix</i>	Martin
Blue runner	
<i>Caranx crysos</i>	Pattillo
Crevalle jack	822, 902
<i>Caranx hippos</i>	Martin
Florida pompano	
<i>Trachinotus carolinus</i>	Martin
Gray snapper	
<i>Lutjanus griseus</i>	Martin
Sheepshead	182, 822
<i>Archosargus probatocephalus</i>	Martin
Pinfish	80, 180, 182, 276, 482, 537, 822, 902
<i>Lagodon rhomboides</i>	Martin
Silver perch	80, 182, 219, 276, 482, 822, 902
<i>Bairdiella chysoura</i>	Martin
Sand seatrout	80, 182, 218, 276, 822, 902
<i>Cynoscion arenarius</i>	Martin
Spotted seatrout	80, 180, 182, 219, 222, 223, 276, 482, 537, 822, 902
<i>Cynoscion nebulosus</i>	Martin
Spot	80, 182, 222, 223, 276, 482, 537, 822, 902
<i>Leiostomus xanthurus</i>	Martin
Atlantic croaker	80, 180, 182, 222, 223, 276, 482, 537, 822, 902
<i>Micropogonias undulatus</i>	Martin
Black drum	80, 180, 182, 183, 221, 222, 223, 276, 482, 537, 545, 568, 819, 822, 902
<i>Pogonias cromis</i>	Martin
Red drum	80, 180, 182, 221, 276, 482, 537, 819, 822, 836, 902
<i>Sciaenops ocellatus</i>	Martin
Striped mullet	80, 180, 182, 276, 482, 537, 822, 902
<i>Mugil cephalus</i>	Martin
Code goby	182
<i>Gobiosoma robustum</i>	Martin
Spanish mackerel	
<i>Scomberomorus maculatus</i>	Martin
Gulf flounder	822
<i>Paralichthys albiquita</i>	Martin
Southern flounder	80, 180, 182, 276, 482, 537, 569, 822, 902
<i>Paralichthys lethostigma</i>	Martin

Numbers correspond to references in Appendix 4, p. 230-273.

Names correspond to individuals in Appendix 3, p. 226-229.

Appendix 3. Reviewers and personal communications

<u>Name</u>	<u>Affiliation</u>
Adkins, G.B.	Louisiana Dept. of Wildlife and Fisheries, Borg, LA
Ahrenholz, D.	National Marine Fisheries Service, Beaufort, NC
Ancelet, R.	Louisiana Dept. of Wildlife and Fisheries, New Orleans, LA
Barkuloo, J.	U.S. Fish and Wildlife Service, Panama City, FL
Baxter, K.N.	National Marine Fisheries Service, Galveston, TX
Benefield, R.L.	Texas Parks and Wildlife Dept., Seabrook, TX
Bert, T.	Florida Dept. of Natural Resources, St. Petersburg, FL
Bortone, S.	University of West Florida, Pensacola, FL
Bourgeois, M.	Louisiana Dept. of Wildlife and Fisheries, Borg, LA
Browder, J.	National Marine Fisheries Service, Miami, FL
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Appendix 4. References

1. Abele, L.G. 1970. The marine decapod crustacea of the northeastern Gulf of Mexico. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
2. Adkins, G. 1972. Notes on the occurrence and distribution of the rhizocephalan parasite (*Loxothylacus texanus* Boschma) of the blue crabs (*Callinectes sapidus* Rathbun) in Louisiana estuaries. Louis. Wildl. Fish. Comm., Oyster Water Bottoms and Seafood Div., Tech. Bull. No. 2: 13 p.
3. Adkins, G., and M.J. Bourgeois. 1982. An evaluation of gill nets of various mesh sizes. Louis. Dept. Wildl. Fish. Tech. Bull. No. 36: 59 p.
4. Adkins, G., and P. Bowman. 1976. A study of the fauna in dredged canals of coastal Louisiana. Louis. Wildl. Fish. Comm. Tech. Bull. No. 18: 72 p.
5. Adkins, G., V. Guillory, and M. Bourgeois. Unpublished Manuscript. An access point survey of recreational saltwater anglers. Project No. 2-349-R, Louis. Dept. Wildl. Fish. 43 p.
6. Adkins, G., J. Tarver, P. Bowman, and B. Savoie. 1979. A study of the commercial finfish in coastal Louisiana. Louis. Dept. Wildl. Fish. Tech. Bull. No. 29: 87 p.
7. Ager, L.A. 1985. Fishery study, Apalachicola River maintenance dredging disposal site evaluation program. Fla. Game and Freshwater Fish Comm., Tallahassee, Fla., for U.S. Army Corps of Engineers, Mobile, Ala.
8. Aldrich, D.V., C.E. Wood and K.N. Baxter. 1969. An ecological interpretation of low temperature responses in *Penaeus aztecus* and *P. setiferus*. Bull. Mar. Sci. 18: 61-71.
9. Alexander, S.K. 1983. Summer diet of finfish from nearshore habitats of West Bay, Texas. Tex. J. Sci. 35: 93-95.
10. Alexander, S.K. 1986. Diet of the blue crab, *Callinectes sapidus* Rathbun, from nearshore habitats of Galveston Island, Texas. Tex. J. Sci. 38: 85-89.
11. Allen, D.M., J.H. Hudson, and T.J. Costello. 1980. Postlarval shrimp *Penaeus* in the Florida USA keys: species, size, and seasonal abundance. Bull. Mar. Sci. 30(1): 21-33.
12. Allen, K.O., and J.W. Avault, Jr. 1970. Effects of salinity and water quality on survival and growth of juvenile pompano, *Trachinotus carolinus*. Coast. Stud. Bull. 5: 147-155.
13. Allen, R.L., and R.E. Turner. 1989. Environmental influences on the oyster industry along the west coast of Florida. J. Shellfish Res. 8: 95-104.
14. Allison, D.T. 1961. List of fishes from St. Andrew system and adjacent Gulf of Mexico. Student paper (unpubl.). Fla. St. Univ., Tallahassee, Fla.
15. Allshouse, W.C. 1983. The distribution of immigrating larval and postlarval fishes into the Aransas-Corpus Christi Bay complex. M.S. thesis, Corpus Christi St. Univ., Corpus Christi, Texas, 118 p.
16. Anderson, G. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)- grass shrimp. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.35).
17. Armstrong, N.E. 1987. The ecology of open-bay bottoms of Texas: a community profile. U.S. Fish Wildl. Serv. Biol. Rep. 85(7.12): 104 p.
18. Armstrong, N.E., and A. Goldstein. 1975. Determination of effects of Dow Chemical Company discharge and organisms of the lower Brazos River (Final Report Submitted to the Dow Chemical Company, Texas Division, Freeport, Tex.). Center for Research in Water Resources, Univ. Texas, Austin, Tex.
19. Arnold, C.R., W.H. Bailey, T.D. Williams, A. Johnson and J.L. Lasswell. 1977. Lab. spawning and larval rearing of red drum and southern flounder. Proc. Southeast. Assoc. Fish Wildl. Agen. 31: 437-440.
20. Arnold, E.L., Jr., R.S. Wheeler and K.N. Baxter. 1960. Observations on fishes and other biota of East Lagoon, Galveston Island. U.S. Fish Wildl. Serv., Spec. Sci. Rep. Fish. No. 344: 30 p.
21. Arnoldi, D.C. 1982. Certain aspects of the life history and habits of spotted seatrout in Calcasieu Lake, Louisiana. Louis. Dept. Wildl. Fish., D-J Completion Report, Project F-32. 97 p.
22. Arnoldi, D.C., W.H. Herke, and E.J. Clairain, Jr. 1973. Estimate of growth rate and length of stay in a marsh nursery of juvenile Atlantic croaker, *Micropogon undulatus* (Linnaeus), "sandblasted" with fluorescent pigments. Proc. Gulf Caribb. Fish. Inst. 26: 158-172.
23. Bahr, L.M., and J.J. Hebrard. 1976. Barataria Basin: Biological characterization. Center for Wetlands Resources, Louis. St. Univ., Baton Rouge, Louis. Sea Grant Pub. No. LSU-T-76-005: 144 p.

24. Bailey, R.M., H.E. Winn, and C.L. Smith. 1954. Fishes from the Escambia River, Alabama and Florida with ecological and taxonomic notes. *Proc. Acad. Natl. Sci. Phila.* 108: 109-164.
25. Baker, W.B., Jr., G.C. Matlock, A.W. Green and H.E. Hegen. 1986. Movement, growth and survival of spotted seatrout tagged in Bastrop Bayou, Texas. *Contrib. Mar. Sci.* 29: 91-101.
26. Baldauf, R.J. 1970. A study of selected chemical and biological conditions of the lower Trinity River and upper Trinity Bay. Water Resources Institute, Texas A&M Univ., College Station, Tex.
27. Bane, G.W., R.L. Allen, J.H. Render, T. Farooqi, and A.C. Wagner. 1985. Biology, ecology and economics of squid and butterfish off the northern Gulf of Mexico. Quarterly Report, July 1985, Coastal Fisheries Institute, Center for Wetlands Resources, Louis. St. Univ., Baton Rouge, Louis. LSU-CFI-85-24: 126 p.
28. Barber, B.J., and N.J. Blake. 1983. Growth and reproduction of the bay scallop, *Argopecten irradians* (Lamarck) at its southern distributional limit. *J. Exp. Mar. Biol. Ecol.* 66: 247-256.
29. Barkuloo, J.M. 1973. Fishery management program - Choctawhatchee striped bass study. U.S. Bureau of Sport Fisheries and Wildlife, Northwest Florida Striped Bass Project Annual Project Report 1972.
30. Barrett, B.B., and M.C. Gillespie. 1973. Primary factors which influence commercial production in coastal Louisiana. *Louis. Wildl. Fish. Comm., New Orleans, Louis.* 9: 28 p.
31. Barrett, B.B., and M.C. Gillespie. 1975. 1975 Environmental conditions relative to shrimp production in coastal Louisiana. *Louis. Wildl. Fish. Comm. Tech. Bull. No. 15:* 22 p.
32. Barrett, B.B., J.L. Merrell, T.P. Morrison, M.C. Gillespie, E.J. Ralph, and J.F. Burdon. 1978. A study of Louisiana's major estuaries and adjacent offshore waters. *Louis. Dept. Wildl. Fish. Tech. Bull. No. 27:* 197 p.
33. Barrett, B.B., and E.J. Ralph. 1976. 1976 Environmental conditions relative to shrimp production in coastal Louisiana. *Louis. Wildl. Fish. Comm. Tech. Bull. No. 21:* 20 p.
34. Barrett, B.B., and E.J. Ralph. 1977. 1977 Environmental conditions relative to shrimp production in coastal Louisiana along with shrimp catch data for the Gulf of Mexico. *Louis. Dept. Wildl. Fish. Tech. Bull. No. 26:* 16 p.
35. Bass, D.G., Jr., and V.G. Hitt. 1973. Sport fishery ecology of the Suwannee and Santa Fe Rivers, Florida. *Fla. Game Freshwater Fish Comm., Northeast Region, Lake City, Florida.*
36. Bass, D.G., Jr., and V.G. Hitt. 1977. Ecology of the Blackwater River system, Florida. Northwest Streams Research Project, Fla. Game Freshwater Fish Comm.
37. Bass, D.G., Jr., and V.G. Hitt. 1978. Sport fishery ecology of the Escambia River, Florida. Northwest Streams Research Project, Fla. Game Freshwater Fish Comm.
38. Bass, D.G., Jr., D.M. Yeager, and V.G. Hitt. 1979. Ecology of the Yellow River system, Florida. Northwest Streams Research Project, Fla. Game Freshwater Fish Comm.
39. Bass, D.G., Jr., D.M. Yeager, and V.G. Hitt. 1980. Ecology of the Choctawhatchee River system, Florida. Northwest Streams Research Project, Fla. Game Freshwater Fish Comm.
40. Bass, R.J., and J.W. Avault. 1975. Food Habits, length-weight relationship, condition factor, and growth of juvenile red drum, *Sciaenops ocellatus*. *Trans. Am. Fish. Soc.* 104: 35-45.
41. Baughman, J.L. 1947. Fishes not previously reported from Texas, with miscellaneous notes on other species. *Copeia* 1947: 280.
42. Baughman, J.L., and S. Springer. 1950. Biological and economic notes on the sharks of the Gulf of Mexico, with special reference to those of Texas, and with a key for their identification. *Am. Midl. Nat.* 44: 96-152.
43. Baxter, K.N. 1962. Abundance of postlarval shrimp - one index of future shrimping success. *Proc. Gulf Caribb. Fish. Inst.* 15: 79-87.
44. Baxter, K.N., and W.C. Renfro. 1966. Seasonal occurrence and size distribution of postlarval brown and white shrimp near Galveston, Texas, with notes on species identification. *Fish. Bull., U.S.* 66: 149-158.

45. Bechtel, T.J., and B.J. Copeland. 1970. Fish species diversity indices as indicators of pollution in Galveston Bay, Texas. *Contrib. Mar. Sci.* 15: 103-132.
46. Beckman, D.W., A.L. Stanley, J.H. Render, and C.A. Wilson. 1991. Age and growth-rate estimation of sheepshead *Archosargus probatocephalus* in Louisiana waters using otoliths. *Fish. Bull.*, U.S. 89: 1-8.
47. Beecher, H.A., and W.C. Hixson. 1982. Seasonal abundance of fishes in three northwest Florida rivers. *Fla. Sci.* 45: 145-171.
48. Bellinger, J.W., and J.W. Avault, Jr. 1970. Seasonal occurrence, growth, and length-weight relationship of juvenile pompano, *Trachinotus carolinus*, in Louisiana. *Trans. Am. Fish. Soc.* 99(2): 353-358.
49. Bellinger, J.W., and J.W. Avault, Jr. 1971. Food habits of juvenile pompano, *Trachinotus carolinus*, in Louisiana. *Trans. Am. Fish. Soc.* 100(3): 486-494.
50. Benefield, R.L. 1968. Survey of the blue crab (*Callinectes sapidus*) sport fishery of the Galveston Bay system, 1968. *Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep.* 1968: 35-44.
51. Benefield, R.L. 1970. A study of sand seatrout of the Galveston Bay area. *Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep.* 1969 and 1970: 217-225.
52. Benefield, R.L. 1976. Shell dredging sedimentations in Galveston and San Antonio Bays 1964-69. *Tex. Parks Wildl. Dept. Tech. Ser. No. 19*, 34 p.
53. Benefield, R.L. 1982. Studies of shrimp populations in selected coastal bays. I. Investigation of brown shrimp (*Penaeus aztecus*) populations in Texas bays. II. Investigation of white shrimp (*Penaeus setiferus*) and pink shrimp (*P. duorarum*) populations in Texas. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 41: 125 p.
54. Benefield, R.L., T.J. Cody, B.E. Fuls and P.C. Hammerschmidt. 1983. Monitoring of coastal shellfish resources, January-December 1982. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 55: 75 p.
55. Benefield, R.L., P.C. Hammerschmidt, R.P. Hofstetter and B. Bowling. 1986. Monitoring the coastal shellfish resources January-December 1984. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 88: 130 p.
56. Benson, N.G. (ed.). 1982. Life history requirements of selected finfish and shellfish in Mississippi Sound and adjacent areas. *U.S. Fish Wildl. Serv., FWS/OBS-81/51*: 97 pp.
57. Berrigan, M.E. 1988. Management of oyster resources in Apalachicola Bay following Hurricane Elena. *J. Shellfish Res.* 7: 281-288.
58. Berrigan, M.E. 1990. Biological and economical assessment of an oyster resource project in Apalachicola Bay, Florida. *J. Shellfish Res.* 9: 149-158.
59. Berry, F.H. 1958. Additions to the fishes of Cedar Key, Florida and a list of Gulf of Mexico Carangidae. *Q. J. Fla. Acad. Sci.* 21: 190.
60. Berry, F.H. 1959. Young jack crevalles (*Caranx* species) off the southeastern Atlantic coast of the United States. *Fish. Bull.*, U.S. 59: 417-535.
61. Bert, T.M., and J.M. Stively. 1989. Population characteristics of the stone crab, *Menippe mercenaria*, in Florida Bay and the Florida Keys (Abstract). *Bull. Mar. Sci.* 44(1): 515.
62. Bert, T.M., J. Tilmant, J. Dodrill, and G.E. Davis. 1986. Aspects of the population dynamics and biology of the stone crab (*Menippe mercenaria*) in Everglades and Biscayne National Parks as determined by trapping. *South Florida Research Center Report SFRC-86/04*.
63. Bert, T.M., R.E. Warner, and L.D. Kessler. 1978. The biology and Florida fishery of the stone crab, *Menippe mercenaria* (Say), with emphasis on southwest Florida. *Fla. Sea Grant Tech. Paper* 9.
64. Bielsa, L.M., W.H. Murdich, and R.F. Labisky. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida)-pink shrimp. *U.S. Fish Wildl. Serv. FWS/OBS-82/11.17*.
65. Blackmon, J.H., Jr. 1974. Observations on the emigration of the brown shrimp, *Penaeus aztecus*, through a tidal pass in the Caminada Bay, Louisiana, area. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 58 p.
66. Blanchet, R.H. 1979. The distribution and abundance of ichthyoplankton in the Apalachicola Bay, Florida area. Unpubl. M.S. thesis, Fla. St. Univ. Tallahassee, Fla.

67. Blaylock, D.A. 1983. Choctawhatchee Bay: Analysis and interpretation of baseline data. Fla. Sea Grant Paper 29.
68. Bonin, R.E. 1977. Juvenile marine fishes of Harbor Island, Texas. M.S. thesis, Texas A&M Univ., College Station, Tex., 109 pp.
69. Boothby, R.N., and J.W. Avault. 1971. Food habits, length-weight relationship, and condition factor of the red drum (*Sciaenops ocellatus*) in Southeastern Louisiana. Trans. Am. Fish. Soc. 100: 290-295.
70. Bortone, S.A., and J.L. Williams. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Florida) - gray, lane, mutton, and yellowtail snappers. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.52).
71. Borum, J.L. 1975. A descriptive study of seasonal fluctuations of macroscopic fauna in the submerged grassbeds in Mobile Bay, Alabama. Ph.D. thesis, Univ. South. Miss.
72. Boschung, H.T., Jr. 1957. The fishes of Mobile Bay and the Gulf coast of Alabama. Ph.D. thesis, Univ. Ala., University, Ala.
73. Boudreaux, C., G. Adkins, J. Shepard, R. Dugas, V. Guillory, and A. Scarborough-Bull. 1988. Assessment and management of Louisiana's coastal fisheries. Annual Report. Completion Report, Project No. 2-412-R, Interjurisdictional Fisheries Research Act (PL99-659), NOAA/NMFS/St. Petersburg, FL: 214 p.
74. Bradley, E. 1965. Populations of fin-fish on artificial shell reefs in the Corpus Christi Bay and upper Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 87-96.
75. Bradley, E., and H. Compton. 1963. Survey of larval and post-larval fin-fish in Aransas and Corpus Christi Channels and in the inshore Gulf of Mexico. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 6; 7 p.
76. Brady, K.D. 1981. Seasonal and spatial distribution of ichthyoplankton in seagrass beds of Apalachee Bay. Unpubl. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
77. Branstetter, S.G. 1986. Biological parameters of the sharks of the northeastern Gulf of Mexico in relation to their potential as a commercial fishery resource. Ph.D. dissertation, Texas A&M Univ., College Station, Tex., 138 p.
78. Breder, C.M., Jr. 1940. The spawning of *Mugil cephalus* on the Florida west coast. Copeia 1940: 138-139.
79. Breder, C.M., Jr. 1942. On the reproduction of *Gobiosoma robustum* Ginsburg. Zoologica 27: 61-64.
80. Breuer, J.P. 1957. An ecological survey of Baffin and Alazan Bays, Texas. Publ. Inst. Mar. Sci., Univ. Texas 4: 134-155.
81. Breuer, J.P. 1960. An ecological survey of the South Bay area, especially that area which was influenced by Boca Chica Pass while it was open. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-9-D-5: Job No. G-1; 10 p.
82. Breuer, J.P. 1962. An ecological survey of the lower Laguna Madre of Texas, 1953-1959. Publ. Inst. Mar. Sci., Univ. Texas 8: 153-183.
83. Breuer, J.P. 1963. Population studies of the sports and commercial fin-fish and forage species of the lower Laguna Madre. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 12; 33 p.
84. Breuer, J.P. 1963. Analysis of black drum harvest. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-M-4: Job No. 4; 7 p.
85. Breuer, J.P. 1964. Coordination of coastwide fin-fish investigation project. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 231-279.
86. Breuer, J.P. 1964. Population studies of the sports and commercial fin-fish and forage species of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 387-401.
87. Breuer, J.P. 1965. Population studies of the sports and commercial fin-fish of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 355-382.
88. Breuer, J.P. 1965. Analysis of populations of sports and commercial fin-fish in the coastal bays of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 31-54.
89. Breuer, J.P. 1966. Analysis of populations of sports and commercial fin-fish in the coastal bays of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 81-103.

90. Breuer, J.P. 1967. Analysis of populations of sports and commercial fin-fish in the coastal bays of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1967: 61-76.
91. Breuer, J.P. 1968. Analysis of populations of sports and commercial fin-fish in the coastal bays of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1968: 45-66.
92. Breuer, J.P. 1970. A biological survey of the tidewater areas of the Rio Grande. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 127-139.
93. Breuer, J.P. 1970. A survey of spotted sea trout nursery areas of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 141-146.
94. Breuer, J.P. 1970. Juvenile and adult food and game fish of the Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 207-216.
95. Breuer, J.P. 1971. Juvenile and adult food and game fish of the Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1971: 125-134.
96. Breuer, J.P. 1971. A survey of the North Floodway system of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1971: 93-105.
97. Breuer, J.P. 1972. Juvenile and adult food and game fish of the Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1972: 78-92.
98. Breuer, J.P. 1972. Biological survey of the Brownsville Ship Channel. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1972: 93-145.
99. Breuer, J.P. 1973. A survey of the juvenile and adult food and game fish of Laguna Madre, 1973. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1973: 173-202.
100. Breuer, J.P. 1974. Juvenile and adult food and game fish of the Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1974: 109-130.
101. Breuer, J.P. 1975. Biological studies in the lower Laguna Madre of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1975: 158-196.
102. Broadhead, G.C. 1953. Investigations of the black mullet, *Mugil cephalus* L., in northwest Florida. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 7.
103. Brockman, F. W. 1974. Seasonality of fishes in a south Florida brackish canal. Fla. Sci. 37(2): 65-70.
104. Brook, I.M. 1981. Epibenthic and benthic sampling survey of the Whitewater Bay-Shark River estuary of Everglades National Park. Final Rep., Part 2 for NPS Contract No. CXS 280-9-1593 to Univ. Miami, RSMAS, Miami, FL from South Florida Research Center, Everglades National Park, Homestead, Fla. 74 p.
105. Browder, J.A. 1985. Relationship between pink shrimp production on the Tortugas Grounds and water flow patterns in the Florida Everglades. Bull. Mar. Sci. 37: 839-856.
106. Browder, J.A., A. Dragovich, J. Tashiro, E. Coleman-Duffie, C. Foltz, and J. Zweifel. 1986. A comparison of biological abundances in three adjacent bay systems downstream from the Golden Gate Estates canal system. NOAA Tech. Memo. NMFS-SEFC-185.
107. Browder, J.A., J. Tashiro, E. Coleman-Duffie, and A. Rosenthal. 1988. Comparison of ichthyoplankton concentrations and water transport in three bay systems of the Ten Thousand Islands affected by the Golden Gate Estate canal system. Final Report to the South Florida Water Management District Contract No. 156-M88-0172-A3.
108. Browder, J.A., and J.D. Wang. 1987. Modeling water management effects on marine resource abundances in Faka Union Bay, Florida. Proc. Symp. on Ecol. and Conserv. Wetlands of the Usumacinta and Grijalva Delta, Villahermosa, Tabasco, Mexico.
109. Brown-Peterson, N., P. Thomas and C.R. Arnold. 1988. Reproductive Biology of the spotted seatrout, *Cynoscion nebulosus*, in South Texas. Fish. Bull., U.S. 86: 373-388.
110. Brusher, H.A., and L.H. Ogren. 1976. Distribution, abundance, and size of penaeid shrimps in the St. Andrew Bay system, Florida. Fish. Bull., U.S. 74: 158-166.
111. Brusher, H.A., L.A. Trent, and M.L. Williams. 1978. Recreational fishing for king mackerel in Bay county, Florida, during 1975. In C.B. Austin, J.A. Browder, R.D. Brugger, and J.C. Davis, (eds.). Mackerel workshop, sponsored by NMFS-SEFC, Roesenteil School of Marine and Atmospheric Sciences, Univ. Miami, Miami, Florida. NOAA contract no. 03-6-042-35137.

112. Bryan, C.E. 1971. An ecological survey of the Arroyo Colorado, Texas 1966-1969. Tex. Parks Wildl. Dept. Tech. Ser. No. 10: 28 p.
113. Bryan, C.E., and T.J. Cody. 1975. White shrimp, *Penaeus setiferus* (Linnaeus), spawning in the Gulf of Mexico, 1973-1975. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1975: 36-42.
114. Bryant, H.E., M.R. Dewey, N.A. Funicelli, G.M. Ludwig, D.A. Meineke, and L.J. Mengal. 1989. Movement of five selected sports species of fish in Everglades National Park (Abstract). Bull. Mar. Sci. 44(1): 515.
115. Buckley, E.N. III. 1973. The fishes of Apalachicola Bay system with reference to life history, abundance, distribution, and species diversity. Honors thesis (unpubl.), Fla. St. Univ., Tallahassee, Fla.
116. Burch, T.A. 1983. Characterization of oyster beds in Choctawhatchee Bay, Florida. Northwest Florida Water Management District Water Resources Special Report 83-6.
117. Burke, W.W., III. 1976. Vertical and horizontal distribution of macroinvertebrates on cord grass, *Spartina alterniflora*, in a Louisiana salt marsh. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 117 p.
118. Burrell, V.G., Jr. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)-American oyster. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.57).
119. Byrd, K. (Project Leader). 1960. Choctawhatchee watershed, Lake and Stream Survey Team no. I.
120. Caillouet, C.W., Jr, W.S. Perret, and B.J. Fontenot, Jr. 1969. Weight, length and sex ratio of immature bull sharks, *Carcharhinus leucas*, from Vermillion Bay, Louisiana. Copeia 1969: 196-197.
121. Cameron, J.N. 1969. Growth, respiratory metabolism and seasonal distribution of juvenile pinfish (*Lagodon rhomboides*) in Redfish Bay, Texas. Contrib. Mar. Sci. 14: 19-36.
122. Carothers, P.E., and W.E. Grant. 1987. Fishery management implications of recruitment seasonality: Simulation of the Texas fishery for brown shrimp, *Penaeus aztecus*. Ecol. Mod. 36: 239-268.
123. Carter, M.R., L.A. Burns, T.R. Cavinder, K.R. Dugger, P.L. Fore, D.B. Hicks, H.L. Revello, and T.W. Schmidt. 1973. Ecosystem analysis of the Big Cypress Swamp and estuaries. U.S. Environmental Protection Agency, Region IV, South Florida Ecological Study. EPA 904/9-74-002.
124. Cave, R.N. 1978. Predator-prey relationships involving the American oyster, *Crassostrea virginica* (Gmelin), and the black drum, *Pogonias cromis* (Linnaeus), in Mississippi Sound. M.S. thesis, Southeastern Louis. Univ., Hammond, Louis: 43 p.
125. Chamberlain, G.W., and A.L. Lawrence. 1983. Reproductive activity and biochemical composition of *Penaeus setiferus* and *Penaeus aztecus* in the Gulf of Mexico. Texas A&M Univ. Sea Grant Publication 84-203: 1-35.
126. Chambers, D.G. 1980. An analysis of nekton communities in the upper Barataria Basin, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge: 286 p.
127. Chambers, G.V., and A.K. Sparks. 1959. An ecological survey of the Houston ship channel and adjacent bays. Publ. Inst. Mar. Sci., Univ. Texas 6: 213-250.
128. Chaney, A.H. 1988. An analysis of the nekton and plankton around a shoalgrass bed in the Laguna Madre of Texas. A Contract Study performed for Padre Island National Seashore, Texas A&I Univ., Kingsville, Tex.
129. Chatry, M., and M.J. Millard. 1986. Effects of the 1983 floodwaters on oysters in Lake Borgne, the Louisiana marsh, western Mississippi Sound, and the Chandeleur Sound. Contrib. Marine Res. Lab., 1980-1985, Louis. Dept. Wildl. Fish. Tech. Bull. No. 40: 1-13.
130. Cheer, G.D. 1974. Species composition and diel variations in the ichthyofaunal community of an intertidal grassbed in the northeastern Gulf of Mexico. Unpubl. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
131. Chester, A.J., and G.W. Thayer. 1990. Distribution of spotted seatrout (*Cynoscion nebulosus*) and gray snapper (*Lutjanus griseus*) juveniles in seagrass habitats of western Florida Bay. Bull. Mar. Sci. 46(2): 345-357.
132. Childress, R., E. Bradley, E. Hegen and S. Williamson. 1975. The effects of freshwater inflows on hydrological and biological parameters in the San Antonio Bay System, Texas. Coast. Fish. Branch, Tex. Parks Wildl. Dept., Austin, Tex.

Appendix 4, continued. References

133. Childress, U.R. 1960. Analysis of forage and predator species. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-5-R-1: Job No. A-2; 11 p.
134. Childress, U.R. 1960. Survey of oyster reef populations in San Antonio and Espiritu Santo Bays. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-5-R-1: Job No. B-4; 5 p.
135. Childress, U.R. 1963. Coordination of the blue crab studies of the Texas coast. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 1; 15 p.
136. Childress, U.R. 1963. Population studies of the sports and commercial fin-fish and forage species of the San Antonio Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 4; 13 p.
137. Childress, U.R. 1963. Population studies of the blue crabs of the Espiritu Santo - San Antonio Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 4; 8 p.
138. Childress, U.R. 1963. Populations of juvenile shrimp in the San Antonio Bay complex. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 5; 7 p.
139. Childress, U.R. 1963. Study of oyster growth and population structure in San Antonio and Espiritu Santo Bays. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 8; 8 p.
140. Childress, U.R. 1964. A study of oyster growth and population structure in San Antonio and Espiritu Santo Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 213-221.
141. Childress, U.R. 1964. Population studies of the sports and commercial fin-fish and forage species of the San Antonio Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 323-334.
142. Childress, U.R. 1964. Coordination of the blue crab studies of the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 515-529.
143. Childress, U.R. 1964. Population studies of the blue crabs of the San Antonio - Espiritu Santo Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 545-551.
144. Childress, U.R. 1964. A study of populations of juvenile shrimp in the San Antonio Bay complex. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 79-89.
145. Childress, U.R. 1965. Study of oyster growth and population structure in San Antonio and Espiritu Santo Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 223-226.
146. Childress, U.R. 1965. Population studies of the sports and commercial fin-fish of the San Antonio Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 283-293.
147. Childress, U.R. 1965. Coordination of the blue crab studies of the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 535-549.
148. Childress, U.R. 1965. Population studies of the blue crabs of the San Antonio - Espiritu Santo Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 589-594.
149. Childress, U.R. 1965. A study of the juvenile shrimp populations of the San Antonio Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 89-96.
150. Chin, E. 1960. The bait shrimp fishery of Galveston Bay, Texas. Trans. Am. Fish. Soc. 89: 135-141.
151. Christmas, J.Y., and D.J. Etzold. 1977. The shrimp fishery of the Gulf of Mexico, United States: a regional management plan. Gulf Coast Res. Tech. Rep. Ser. 2. 128 p.
152. Christmas, J.Y., D.J. Etzold, and L.B. Simpson. 1983. The menhaden fishery of the Gulf of Mexico United States: a regional management plan. Gulf States Mar. Fish. Comm., Ocean Springs, Miss.
153. Christmas, J.Y., G. Gunter, and P. Musgrave. 1966. Studies of annual abundance of postlarval penaeid shrimp in the estuarine waters of Mississippi, as related to subsequent commercial catches. Gulf Res. Rep. 2:177-212.
154. Christmas, J.Y., W. Langley, and T. Van Devender. 1976. Investigations of commercially important penaeid shrimp in Mississippi. Gulf Coast Research Laboratory, NOAA/NMFS Project No. 2-124-R, 66 p.

155. Christmas, J.Y., and R.S. Waller. 1973. Estuarine vertebrates, Mississippi. In J.Y. Christmas (ed.). Cooperative Gulf of Mexico estuarine inventory and study, Mississippi. Gulf Coast Research Laboratory, Ocean Springs, Miss., p. 320-434.
156. Clairain, E.J., Jr. 1974. Correlations between environmental factors and emigration of juvenile Atlantic croaker, *Micropogon undulatus*, from a Louisiana marsh nursery. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 116 p.
157. Clark, E., and K. Von Schmidt. 1965. Sharks of the central Gulf coast of Florida. Bull. Mar. Sci. 15: 13-83.
158. Clark, S.H. 1971. Factors affecting the distributions of fishes in Whitewater Bay, Everglades National Park, Florida. Univ. Miami, Sea Grant Tech. Bull. 8.
159. Clark, S.H., and C.W. Caillouet, Jr. 1973. White shrimp (*Penaeus setiferus*) population trends in a tidal marsh pond. Mar. Fish. Rev. 35: 27-39.
160. Cody, T., K.W. Rice and C.E. Bryan. 1985. Distribution and gonadal development of black drum in Texas gulf waters. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 72: 16 p.
161. Colby, D.R., G.W. Thayer, W.F. Hettler, and D.S. Peters. 1985. A comparison of forage fish communities in relation to habitat parameters in Faka Union Bay, Florida and eight collateral bays during the wet season. NOAA Tech. Memo. NMFS-SEFC-162.
162. Collins, L.A., and J.H. Finucane. 1984. Ichthyoplankton survey of the estuarine and inshore waters of the Florida Everglades, May 1971 to February 1972. NOAA Tech. Rep. NMFS 6.
163. Collins, M.R. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Florida) -striped mullet. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.24).
164. Colura, R.L., and A.F. Maciorowski. 1988. An evaluation of the collection of preovulatory females and hormone induced tank-spawning of spotted trout. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 144: 6 p.
165. Comp, G.S. 1985. A survey of the distribution and migration of the fishes in Tampa Bay. In S.F. Treat, J.L. Simon, R.R. Lewis III, R.L. Whitman, Jr. (eds.), Proc. Tampa Bay Area Sci. Info. Symp., p. 393-419. Fla. Sea Grant Coll. Rep. 65.
166. Compton, H., and E. Bradley. 1963. A study of the post-larval penaeid shrimp entering Aransas Bay. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 2; 9 p.
167. Compton, H., and E. Bradley. 1964. A study of the post-larval penaeid shrimp entering Aransas Bay. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 127-141.
168. Condrey, R.E., J.G. Gosselink, and H.J. Bennett. 1972. Comparison of the assimilation of different diets by *Penaeus setiferus* and *P. aztecus*. Fish. Bull., U.S. 70(4): 1281-1292.
169. Conner, J.V., and F.M. Truesdale. 1972. Ecological implications of a freshwater impoundment in a low-salinity marsh. Proceedings of the Coastal Marsh and Estuary Management Symposium: 259-276.
170. Conservation Consultants, Inc. (CCI). 1976. Twenty-sixth quarterly report on the Big Bend thermal and ecological surveys; five year summary. Prepared for Tampa Electric Company, Marine Research Lab., Tampa, Fla.
171. Cook, F.A. 1959. Freshwater Fishes in Mississippi. Miss. Game and Fish Comm. 239 pp.
172. Cook, H.L., and M.J. Lindner. 1970. Synopsis of Biological data on the brown shrimp, *Penaeus aztecus aztecus* Ives 1891. FAO Fisheries Synopsis No. 102. Contribution No. 242, Bur. Comm. Fish. Biol. Lab., Galveston, Texas.
173. Cooley, N.R. 1974. Occurrence of snook on the north shore of the Gulf of Mexico. Fla. Sci. 37: 98-99.
174. Cooley, N.R. 1978. An inventory of the estuarine fauna in the vicinity of Pensacola, Florida. Fla. Mar. Res. Publ. 31.
175. Cooper, D.C. 1967. Ecological parameters concerning the zooplankton community of the San Antonio Estuarine System. M.A. thesis, Univ. Texas, Austin, Tex., 124 p.
176. Copeland, B.J. 1965. Fauna of the Aransas Pass Inlet, Texas. I. Emigration as shown by tide trap collections. Publ. Inst. Mar. Sci., Univ. Texas 10: 9-21.
177. Copeland, B.J., and T.J. Bechtel. 1974. Some environmental limits of six Gulf coast estuarine organisms. Mar. Sci. 8: 170-204.

178. Copeland, B.J., and E.G. Fruh. 1969. Ecological studies of Galveston Bay, 1969. Final Report to Texas Water Quality Board. 482 pp.
179. Copeland, B.J., and H.D. Hoese. 1966. Growth and mortality of the American oyster, *Crassostrea virginica*, in high salinity shallow bays in central Texas. *Contrib. Mar. Sci.* 11: 149-158.
180. Copeland, B.J., and S.W. Nixon. 1974. Hypersaline Lagoons. In H.T. Odum, B.J. Copeland and E.A. McMahon (eds.), *Coastal Ecological Systems of the United States*. The Conservation Foundation, Washington, DC.
181. Copeland, B.J., and M.V. Truitt. 1966. Fauna of the Aransas Pass Inlet, Texas. II. Penaeid shrimp postlarvae. *Tex. J. Sci.* 18: 65-74.
182. Cornelius, S.E. 1984. An ecological survey of Alazan Bay, Texas, Volume I. Caesar Kleberg Wildlife Research Institute, Tech. Bull. No. 5, Texas A&I Univ., Kingsville, Tex. 1: 1-163.
183. Cornelius, S.E. 1984. Contribution to the life history of black drum and analysis of the commercial fishery in Baffin Bay. Volume II. Caesar Kleberg Wildlife Research Institute, Tech. Bull. No. 6, Texas A&I Univ., Kingsville, Tex. 2: 1-53.
184. Cowan, J.H., Jr. 1985. The distribution, transport and age structure of drums (family Sciaenidae) spawned in the winter and early spring in the continental shelf waters off west Louisiana. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis. 185 pp.
185. Cowan, J.H., Jr. 1988. Age and growth of Atlantic croaker, *Micropogonias undulatus*, larvae collected in the coastal waters of the northern Gulf of Mexico as determined by increments in saccular otoliths. *Bull. Mar. Sci.* 42: 349-357.
186. Cowan, J.H., Jr., and R.F. Shaw. 1988. The distribution, abundance, and transport of larval sciaenids collected during winter and early spring from the continental shelf waters off west Louisiana. *Fish. Bull., U.S.* 86: 129-142.
187. Cowan, J.H., Jr., R.F. Shaw, and J.G. Ditty. 1989. Occurrence, age, and growth of two morphological types of sand seatrout (*Cynoscion arenarius*) larvae in the winter and early spring coastal waters off west Louisiana. *Contrib. Mar. Sci.* 31: 39-50.
188. Cox, D.T., and D. Auth. 1971. Annual Progress Report 1970-1971. Investigations Project Dingell-Johnson Project F-25-4, Stream Investigations. Fla. Game and Fresh Water Fish Commission.
189. Craig, M.A., and T.J. Bright. 1986. Abundance, age distributions and growth of the Texas hard clam, *Mercenaria mercenaria texana*, in Texas bays. *Contrib. Mar. Sci.* 29: 59-72.
190. Craig, M.A., T.J. Bright and S.R. Gittings. 1988. Growth of *Mercenaria mercenaria* and *Mercenaria mercenaria texana* seed clams planted in two Texas bays. *Aquaculture* 71: 193-207.
191. Crittenden, E. 1958. A pre-impoundment fishery study of North Bay and associated water, Bay County, Florida. In J.W. Webb (ed.), *Proc. 11th Ann. Conf. Southeast. Assoc. Game Fish Comm.*, p. 211-219.
192. Crowe, A.L., L.W. McEachron and P.C. Hammerschmid. 1986. Trends in relative abundance and size of selected finfish in Texas bays: November 1975 - December 1985. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 114: 259.
193. Dailey, J. 1988. Fish stocking in Texas Bays: 1975-1987. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 147: 26 p.
194. Dailey, J.A., and L.W. McEachron. 1986. Survival of unmarked red drum stocked into two Texas bays. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 116: 8 p.
195. Danker, S.A. 1979. A Food Habit Study of the Spotted Seatrout, *Cynoscion nebulosus*, in Mississippi Sound and Adjacent Areas. Unpubl. M.S. thesis, Miss. St. Univ., Miss. St., Miss.: 45 pp.
196. Darnell, R.M. 1958. Food habits of fishes and larger invertebrates of Lake Pontchartrain, Louisiana, an estuarine community. *Publ. Inst. Mar. Sci.* 5: 353-416.
197. Darnell, R.M. 1959. Studies on the life history of the blue crab (*Callinectes sapidus*) in Louisiana waters. *Trans. Am. Fish. Soc.* 88: 294-304.
198. Darnell, R.M. 1961. Trophic spectrum of an estuarine community, based on studies of Lake Pontchartrain, Louisiana. *Ecology* 42(3): 553-568.

199. Davis, G.E., and C.A. Hilsebeck. 1974. The effects of watershed management on the Shark Slough-Whitewater Bay estuary of Everglades National Park, Florida. Final Rep. RSP-EVER-N-65. Homestead, FL: Everglades National Park. 16 p.
200. Davis, G.E., and J.W. Dodrill. 1989. Recreational fishery and population dynamics of spiny lobsters, *Panulirus argus*, in Florida Bay, Everglades National Park, 1977-1980. Bull. Mar. Sci. 44(1): 78-88.
201. Davis, J.T., B.J. Fontenot, C.E. Hoenke, A.M. Williams, and J.S. Hughes. 1970. Ecological factors affecting anadromous fishes of Lake Pontchartrain and its tributaries. Louis. Wildl. Fish. Comm., Fish. Bull. No. 6: 63 p.
202. Dawson, C.E. 1966. Studies on the gobies (Pisces: Gobiidae) of Mississippi Sound and adjacent waters. I. Gobiosoma. Am. Midl. Nat. 76(2): 379-409.
203. Day, D.S. 1959. Inventory of vertebrate forms present and relative abundance. Tex. Game and Fish Comm., Mar. Lab. Rep., 1959, Proj. No. M-4-R-1: Job No. A-2; 7 p.
204. Day, D.S. 1959. Inventory of invertebrate forms present with annotations on the commercial species of shrimp. Tex. Game and Fish Comm., Mar. Lab. Rep., 1959, Proj. No. M-4-R-1: Job No. B-2; 5 p.
205. Day, D.S. 1960. Inventory of vertebrate forms present and relative abundance. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-4-R-2: Job No. A-2; 5 p.
206. Day, D.S. 1960. Inventory of invertebrate forms present with annotations. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-4-R-2: Job No. B-2; 5 p.
207. Day, J.W., Jr, W.C. Smith, P.R. Wagner, and W.C. Stowe. 1975. Community structure and carbon budget of a salt marsh and shallow bay estuarine system in Louisiana. Louis. St. Univ. Publ. 72-04: 1-79.
208. Deegan, L.A. 1985. The population ecology and nutrient transport of gulf menhaden in Fourleague Bay, Louisiana. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 137 pp.
209. Deegan, L.A. 1986. Changes in body composition and morphology of young-of-the-year gulf menhaden, *Brevoortia patronus* Goode, in Fourleague Bay, Louisiana. J. Fish Biol. 29: 403-415.
210. Deegan, L.A., and B.A. Thompson. 1985. The ecology of fish communities in the Mississippi River deltaic plain. In A. Yanez-Arancibia (ed.), Fish Community Ecology in Estuaries and Coastal Lagoons: Towards an Ecosystem Integration. DR (R) UNAM Press, Mexico City. p. 35-56.
211. Deegan, L.A., and B.A. Thompson. 1987. Growth rate and life history events of young-of-the-year gulf menhaden as determined from otoliths. Trans. Am. Fish. Soc. 116: 663-667.
212. DeSylva, D.P., H.B. Stearns, and D.S. Tabb. 1956. Populations of the black mullet (*Mugil cephalus*) in Florida. Fla. Board Cons. Tech. Ser. 19.
213. DeVlaming, V.L., A. Kuris and F.R. Parker Jr. 1978. Seasonal variation of reproduction and lipid reserves in some subtropical Cyprinodontids. Trans. Am. Fish. Soc. 107(3): 464-472.
214. DeVries, D.A., K.L. Lang, D.B. White, C.B. Grimes, and J.H. Finucane. 1989. Age, growth, and food of larval and post-larval king and Spanish mackerel (Abstract). Abstracts from a Symposium titled: "Land-Sea Interactions in the Northern Gulf of Mexico", LUMCON, Cocodrie, Louis., 2.
215. Diener, R.A. 1975. Cooperative Gulf of Mexico estuarine inventory and study - Texas: Area description. NOAA Tech. Rep. NMFS Circ.-393, 129 p.
216. Diener, R.A., A. Inglis and G.B. Adams. 1974. Stomach contents of fishes from Clear Lake and tributary waters, a Texas estuarine area. Contrib. Mar. Sci. 18: 7-17.
217. Ditty, J.G. 1986. Ichthyoplankton in neritic waters of the northern Gulf of Mexico off Louisiana: composition, relative abundance, and seasonality. Fish. Bull., U.S. 84: 935-946.
218. Ditty, J.G. 1991. Life history and ecology of sand seatrout, *Cynoscion arenarius*, in the northern Gulf of Mexico: A review. Northeast Gulf Sci. 12(1): 35-47.
219. Ditty, J.G., G.G. Zieske, and R.F. Shaw. 1988. Seasonality and depth distribution of larval fishes in the northern Gulf of Mexico above latitude 26° 00'N. Fish. Bull., U.S. 86(4): 811-823.
220. Divita, R., M. Creel and P.F. Sheridan. 1983. Foods of coastal fishes during brown shrimp, *Penaeus aztecus*, migration from Texas estuaries (June-July 1981). Fish. Bull., U.S. 81: 396-404.

Appendix 4, continued. References

221. Doerzbacher, J.F., A.W. Green, G.C. Matlock, and H.R. Osburn. 1988. A temperature compensated von Bertalanffy growth model for tagged red drum and black drum in Texas bays. *Fish. Res.* 6: 135-152.
222. Dokken, Q.R. 1981. Spatial and temporal distribution and species composition of larval fish populations within Alazan Bay, Texas. M.A. thesis, Corpus Christi St. Univ., Corpus Christi, Tex., 61.
223. Dokken, Q.R., G.C. Matlock and S. Cornelius. 1984. Distribution and composition of larval fish populations within Alazan Bay, Texas. *Contrib. Mar. Sci.* 27: 205-222.
224. Dragovich, A., and J.A. Kelly, Jr. 1964. Ecological observations of macroinvertebrates in Tampa Bay, Florida 1961-1962. *Bull. Mar. Sci. Gulf Caribb.* 14: 74-102.
225. Dragovich, A., J.A. Kelly, Jr., and H.G. Goodell. 1968. Hydrological and biological characteristics of Florida's west coast tributaries. *Fish. Bull., U.S.* 6: 463-477.
226. Drew, R.D., and N.S. Schomer. 1984. An ecological characterization of the Caloosahatchee River/Big Cypress watershed. U.S. Fish Wildl. Serv. FWS/OBS-82/58.2. 275 p.
227. Dugas, C.N. 1986. Food habits of black drum, *Pogonias cromis*, in southeast Louisiana with emphasis on their predation of the American oyster, *Crassostrea virginica*. Louis. Dept. Wildl. Fish. Tech. Bull. No. 40: 32-38.
228. Dugas, R.J. 1970. An ecological survey of Vermillion Bay, 1968- 1968. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 108 pp.
229. Dugas, R.J. 1975. Variation in day-night trawl catches in Vermillion Bay, Louisiana. Louis. Wildl. Fish. Comm. Tech. Bull. No. 13: 13 p.
230. Dugas, R.J. 1977. Oyster distribution and density on the productive portion of state seed grounds in southeastern Louisiana. Louis. Dept. Wildl. Fish. Tech. Bull. No. 23: 27 p.
231. Dugas, R.J. 1979. Some observations on the post-construction effects of the Mississippi River - Gulf Outlet on Louisiana oyster production. *Contrib. Marine Res. Lab.* - 1977, Louis. Dept. Wildl. Fish. Tech. Bull. No. 28: 1-15.
232. Dugas, R.J. 1980. A status report on commercial clamming efforts in Louisiana. *Contrib. Marine Res. Lab.* - 1978, Louis. Dept. Wildl. Fish. Tech. Bull. No. 31: 23-32.
233. Dugas, R.J., J.W. Tarver, and L.S. Nutwell. 1974. The mollusk communities of Lakes Pontchartrain and Maurepas, Louisiana. Louis. Wildl. Fish. Comm. Tech. Bull. No. 10: 13 p.
234. Duggan, P.J., and R.J. Livingston. 1982. Long-term variation of macro-invertebrate assemblages in Apalachee Bay, Florida. *Est. Coast. Shelf Sci.* 14: 391-403.
235. Duggins Jr., C.F., K.G. Relyea, and A.A. Karlin. 1989. Biochemical systematics in southeastern populations of *Fundulus heteroclitus* and *Fundulus grandis*. *Northeast Gulf Sci.* 10(2): 95-102.
236. Dunham, F. 1972. A study of commercially important estuarine-dependent industrial fishes. Louis. Wildl. Fish. Comm. Tech. Bull. No. 4: 63 p.
237. Duronslet, M.J., J.M. Lyon and F. Marullo. 1972. Vertical distribution of postlarval brown, *Penaeus aztecus*, and white, *P. setiferus*, shrimp during immigration through a tidal pass. *Trans. Am. Fish. Soc.* 101: 748-752.
238. Eckmayer, W.J. 1979. The oyster fishery in Mobile Bay, Alabama. In H.A. Loyacano Jr., and J.P. Smith (eds.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 189-200. U.S. Army Corps of Engineers, Mobile, Ala.
239. Edwards, E.J. 1967. Studies on populations of *Anchoa mitchilli* in Mississippi Sound, with special reference to the life cycle and seasonal variations in abundance. Unpubl. M.S. thesis, Univ. Miss., University, Miss. 27 pp.
240. Edwards, J.C. 1967. Production of the marine shrimp (*Penaeus fluviatilis* and *Penaeus aztecus*) in Texas and Louisiana waters, and the relation of rainfall and freshwater drainage. M.S. thesis, Univ. Miss., University, Miss.
241. Ehrhardt, N.M. 1990. Mortality and catchability estimates for the stone crab (*Menippe mercenaria*) in Everglades National Park. *Bull. Mar. Sci.* 46(2) 324-334.
242. Ehrhardt, N.M., D.J. Die, and V.R. Restrepo. 1990. Abundance and impact of fishing on a stone crab (*Menippe mercenaria*) population in Everglades National Park, Florida. *Bull. Mar. Sci.* 46(2): 311-323.

243. Eldred, B. 1967. Larval tarpon, *Megalops atlanticus*, Valenciennes, (Megalopidae) in Florida waters. Fla. Board Cons. Mar. Lab. Leaf. Ser. Vol. 4, Pt. 1, No. 4. 9 p.
244. Eldred, B., J. Williams, G.T. Martin, and E.A. Joyce. 1965. Seasonal distribution of penaeid larvae and postlarvae of the Tampa Bay area, Florida. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. 44: 1-47.
245. Eleuterius, C.K. 1978. Location of the Mississippi Sound oyster reefs as related to salinity of bottom waters during 1973-1975. Gulf Res. Rep. 6(1): 17-23.
246. Estevez, E.D. 1981 (revised 1984). Charlotte Harbor estuarine ecosystem complex: a summary of scientific information. Mote Marine Lab. Review Series 3. 1077 p.
247. Estinbaum, R. 1990. Tackling a tarpon. The Houston Post, July 12, 1990 : Pg. B-10.
248. Etzold, D.J., and J.Y. Christmas (eds.). 1978. A Mississippi marine finfish management plan. Miss.-Ala. Sea Grant Consort. MASGP-78-046: 36 pp.
249. Eversole, A.G. 1987. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)-hard clam. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.75).
250. Fable, W.A., Jr., H.A. Brusher, L. Trent, and J. Finnegan, Jr. 1981. Possible temperature effects on charter boat catches of king mackerel and other coastal pelagic species in Northwest Florida. Mar. Fish. Rev. 43: 21-26.
251. Fable, W.A., Jr., A.G. Johnson, and L.E. Barger. 1987. Age and growth of Spanish mackerel, *Scomberomorus maculatus*, from Florida and the Gulf of Mexico. Fish. Bull., U.S. 85(4): 777-783.
252. Fairbanks, L.D. 1963. Biodemographic studies of the clam *Rangia cuneata* Gray. Tulane Stud. Zool. 10: 3-47.
253. Farrell, D.H. 1974. Benthic ecology of Timbalier Bay, Louisiana, and adjacent offshore areas in relation to oil production. Ph.D. dissertation, Fla. St. Univ., Tallahassee, Fla.: 164 p.
254. Fay, C.W., R.J. Neves, and G.B. Pardue. 1983. Species profile: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)—bay scallop. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.12).
255. Felley, J.D. 1987. Nekton assemblages of the Calcasieu River/Lake complex. In L.R. DeRouen and L.H. Stevenson (eds.). Ecosystem Analysis of the Calcasieu River/Lake Complex (CALECO), Final Report. McNeese St. Univ., Lake Charles, Louis.
256. Felley, J.D., and S.M. Felley. 1986. Habitat partitioning of fishes in an urban, estuarine bayou. Estuaries 9(3): 208-218.
257. Felley, S.M., M. Vecchione, and S.G.F. Hare. 1987. Incidence of ectoparasitic copepods on ichthyoplankton. Copeia 1987: 778-782.
258. Finucane, J.H. 1969. Ecology of the pompano (*Trachinotus carolinus*) and the permit (*T. falcatus*) in Florida. Trans. Am. Fish. Soc. 98: 478-486.
259. Finucane, J.H., H.A. Brusher, and L.A. Collins. 1980. Spawning of the bluefish, *Pomatomus saltatrix*, in the northeastern Gulf of Mexico. Northeast Gulf Sci. 4: 57-59.
260. Finucane, J.H., and W. Campbell, Jr. 1968. Ecology of American oysters in Tampa Bay, Florida. J. Fla. Acad. Sci. 31: 37-46.
261. Finucane, J.H., and L.A. Collins. 1986. Reproduction of spanish mackerel, *Scomberomorus maculatus*, from the southeastern U.S. Northeast Gulf Sci. 8: 97-106.
262. Finucane, J.H., L.A. Collins, and L.E. Barger. 1978. Spawning of the striped mullet, *Mugil cephalus*, in the northwestern Gulf of Mexico. Northeast Gulf Sci. 2(2): 148-150.
263. Fishery Management Plan (FMP). 1981. Final environmental impact statement. Regulatory impact review. Draft regulations for coastal migratory pelagic resources in the Gulf of Mexico and South Atlantic Region. Gulf of Mexico Fishery Management Council and South Atlantic Fishery Management Council.
264. Fitzsimons, J.M., and R.M. Parker. 1985. Karyology of the sparid fishes *Lagodon rhomboides* and *Archosargus probatocephalus* (Osteichthyes, Perciformes) from coastal Louisiana, North Carolina and Florida. Proc. Louis. Acad. Sci. 48: 86-92.
265. Fla. Dept. Env. Reg. (FDER). 1985. Limnology of the Suwannee River, Florida.
266. Foltz, D.W., and M. Chatry. 1986. Genetic heterozygosity and growth rate in Louisiana oysters (*Crassostrea virginica*). Aquaculture 57: 261-269.

267. Fontenot, B.J., and H.E. Rogillo. 1970. A study of estuarine sportfishes in the Biloxi marsh complex, Louisiana. Louis. Wildl. Fish. Comm. F-8: 1-172.
268. Fore, P.L., and K.N. Baxter. 1972. Diel fluctuations in the catch of larval gulf menhaden, *Brevoortia patronus*, at Galveston entrance, Texas. Trans. Am. Fish. Soc. 101: 729-732.
269. Fore, P.L., and T.W. Schmidt. 1973. Biology of juvenile and adult snook, *Centropomus undecimalis*, in the Ten Thousand Islands, Florida, p. 1-18. In *Ecosystem analysis of the Big Cypress swamps and estuaries*. U.S. EPA, Atlanta, Ga.
270. Forman, W. 1968. The ecology of the Cyprinodontidae (Pisces) of Grand Terre Island, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis. 115 p.
271. Fox, L.S., and W.R. Mock, Jr. 1968. Seasonal occurrence of fishes in two shore habitats in Barataria Bay. Proc. Louis Acad. Sci. 31: 43-53.
272. Fox, L.S., and C.J. White. 1969. Feeding habits of the southern flounder *Paralichthys lethostigma*, in Barataria Bay, Louisiana. Proc. Louis. Acad. Sci. 32: 31-38.
273. Franks, J.S. 1970. An investigation of the fish population within the inland waters of Horn Island, Mississippi, a barrier island in the northern Gulf of Mexico. Gulf Res. Rep. 3(1): 3- 104.
274. Fritzche, R.A. 1978. Development of fishes of the mid-Atlantic Bight, Volume V. U.S. Fish Wildl. Serv. FWS/OBS-78/12.
275. Fruge, D.J., and F.M. Truesdale. 1978. Comparative larval development of *Micropogonias undulatus* and *Leiostomus xanthurus* (Pisces: sciaenidae) from the northern Gulf of Mexico. Copeia 1978: 643-648.
276. Fuls, B.E. 1974. Further ecological studies on the macroichthyofauna of the Laguna Salada, Texas. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 106 p.
277. Fuls, B.E., and T.J. Cody. 1988. Comparison of shrimp catches off Aransas Pass and Mansfield Pass, Texas May-August 1980-1981. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 120: 28 p.
278. Funicelli, N.A., D.A. Meineke, H.E. Bryant, M.R. Dewey, G.M. Ludwig, and L.S. Mengel. 1989. Movements of striped mullet, *Mugil cephalus*, tagged in Everglades National Park, Florida. Bull. Mar. Sci. 44(1): 171-178.
279. Futch, C.R., and J. Martina, Jr. 1967. A survey of the oyster resources of Bay County, Florida, with special reference to selection of clutch planting sites. Fla. Board Cons., Div. Salt Water Fisheries, Spec. Sci. Rep. 16.
280. Gaidry, W.J., III, and C.J. White. 1973. Investigations of commercially important penaeid shrimp in Louisiana estuaries. Louis. Wildl. Fish. Comm. Tech. Bull. No. 8: 154 p.
281. Gallagher, R.P., and J.V. Conner. 1980. Spatio-temporal distribution of ichthyoplankton in the lower Mississippi River, Louisiana. Proceedings of the Fourth Annual Larval Fish Conference. Pp. 101-115.
282. Gallaway, B.J., and K. Strawn. 1972. Seasonal abundance and distribution of the blue crab, *Callinectes sapidus*, in the discharge area of the P.H. Robinson Generating Station, Galveston Bay, Texas. 21st Ann. Mtg. Southern Div. Am. Fish. Soc., Knoxville, Tenn., 24 p.
283. Gallaway, B.J., and K. Strawn. 1974. Seasonal abundance and distribution of marine fishes at a hot-water discharge in Galveston Bay. Contrib. Mar. Sci. 18: 71-137.
284. Gallaway, B.J., and K. Strawn. 1975. Seasonal and areal comparisons of fish diversity indices at a hot-water discharge in Galveston Bay, Texas. Contrib. Mar. Sci. 19: 79-89.
285. Garrity, R.D., W.J. Tiffany, III, and S. Mahadevan (eds.). 1977. Ecological studies at Big Bend Steam Electric station, Tampa Electric Company. Vol. 3, An analysis and summary of studies on the effects of the cooling water system on aquatic fauna, A 316 demonstration biological survey. Conservation Consultants, Inc., Palmetto, Fla.
286. Garwood, G.P. 1968. Notes on the life histories of the silversides, *Menidia beryllina* (Cope) and *Membras martinica* (Valenciennes) in Mississippi Sound and adjacent water. Proc. Annu. Conf. Southeast. Assoc. Game Fish Comm. 21: 314-323.
287. Gaston, G.R., and D.P. Weston. 1983. Benthos. In L.R. DeRouen, R.W. Hann, D.M. Casserly, C. Giammona and V.J. Lascara (eds.). West Hackberry Strategic Petroleum Reserve Site Brine Disposal Monitoring, Year I, Final Report, Volume 3: Biological Oceanography. McNeese St. Univ., Lake Charles, Louis.

288. Gauthier, J.D., and T.M. Soniat. 1989. Changes in the gonadal state of Louisiana oysters during their spawning season. *J. Shellfish Res.* 8(1): 83-86.
289. George, L.C., and W.E. Grant. 1983. A stochastic simulation model of brown shrimp (*Penaeus aztecus*) growth, movement, and survival in Galveston Bay, Texas. *Ecol. Mod.* 19: 41-70.
290. Gilbert, C. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida)-Florida pompano. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.41).
291. Gilbert, C.R. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Florida) -southern, gulf, and summer flounder. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.54).
292. Gingras, L.G. 1982. Seasonal abundance and distribution of some marine and freshwater fishes in a Louisiana coastal polluted river. Unpubl. M.S. thesis, Univ. Southwest. Louis., 100 pp.
293. Ginsburg, I. 1952. Fishes of the family Carangidae of the northern Gulf of Mexico and three related species. *Publ. Inst. Mar. Sci., Univ. Texas* 2: 43-117.
294. Ginsburg, I. 1952. Flounders of the genus *Paralichthys* and related genera in American waters. *Fish. Bull., U.S.* 52: 267-351.
295. Gitschlag, G.R. 1986. Movement of pink shrimp in relation to the Tortugas Sanctuary. *N. Am. J. Fish. Manag.* 6: 328-338.
296. Godcharles, M.F., and W.C. Jaap. 1973. Fauna and flora in hydraulic dredge collections from Florida's west and southwest coast. *Fla. Dept. Nat. Res., Mar. Res. Lab. Spec. Sci. Rep.* 40.
297. Godcharles, M.F., and W.C. Jaap. 1973. Exploratory clam survey of Florida nearshore and estuarine waters with commercial hydraulic dredging gear. *Fla. Dept. Nat. Res. Mar. Res. Lab. Prof. Paper Ser.* 21.
298. Godcharles, M.F., and M.D. Murphy. 1986. Species profiles and environmental requirements of coastal fishes and invertebrates (South Florida)-king mackerel and Spanish mackerel. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.58).
299. Gooch, D.M. 1970. Studies on brackish water clams of the genus *Rangia* in Louisiana. *Proc. Natl. Shellfish Assoc.* 60: 3-4.
300. Gooch, D.M. 1971. A study of *Rangia cuneata* Gray, in Vermilion Bay, Louisiana. Unpubl. M.S. thesis, Univ. Southwest. Louis., 50 pp.
301. Goodwin, J.M., and J.H. Finucane. 1985. Reproductive biology of blue runner (*Caranx crysos*) from the eastern Gulf of Mexico. *Northeast Gulf Sci.* 7(2): 139-146.
302. Goodwin, J.M., and A.G. Johnson. 1986. Age, growth, and mortality of blue runner, *Caranx crysos* from the northern Gulf of Mexico: *Northeast Gulf Sci.* 8: 107-114.
303. Govoni, J.J., A.J. Chester, D.E. Hoss, and P.B. Ortner. 1985. An observation of episodic feeding and growth of larval *Leiostomus xanthurus* in the northern Gulf of Mexico. *J. Plankton Res.* 7: 137-146.
304. Govoni, J.J., D.E. Hoss, and A.J. Chester. 1983. Comparative feeding of three species of larval fishes in the northern Gulf of Mexico: *Brevoortia patronus*, *Leiostomus xanthurus*, and *Micropogonias undulatus*. *Mar. Ecol.* 13: 189-199.
305. Govoni, J.J., D.E. Hoss, and D.R. Colby. 1989. The spatial distribution of larval fishes about the Mississippi River plume. *Limnol. Oceanogr.* 34(1): 178-187.
306. Greeley, M.S., Jr., and R. MacGregor, III. 1983. Annual and semilunar reproductive cycles of the gulf killifish, *Fundulus grandis*, on the Alabama gulf coast. *Copeia* 1983: 711-718.
307. Green, L.M. 1981. Sharks in Texas bays. *Annual Proceedings of the Texas Chapter, Am. Fish. Soc.* 4: 68-93.
308. Greening, H.S. 1980. Diel and seasonal variations in the structure of epibenthic macroinvertebrate communities of seagrass beds in Apalachee Bay, Florida. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
309. Gregory, D.R., Jr., R.F. Labisky, and C.L. Combs. 1982. Reproductive dynamics of the spiny lobster *Panulirus argus* in south Florida. *Trans. Am. Fish. Soc.* 111: 575-584.
310. Griffith, R.W. 1974. Environment and salinity tolerance in the genus *Fundulus*. *Copeia* 1974(2): 319-331.
311. Grimes, C.B. 1971. Thermal addition studies of the Crystal River Steam Electric Station. *Fla. Dept. Nat. Res. Mar. Res. Lab. Prof. Paper Ser.* 11.

312. Grimes, C.B. 1987. Reproductive biology of the Lutjanidae: a review. In J.J. Polovina and S. Ralston (eds.), Tropical snapper and groupers - ecology and fisheries management, p. 239-294. Westview Press, Boulder, Colo.
313. Grimes, C.B., and J.A. Mountain. 1971. Effects of thermal effluent upon marine fishes near the Crystal River Steam Electric Station. Fla. Nat. Res. Mar. Res. Lab. Prof. Paper Ser. 17.
314. Guillory, V. 1982. A comparison of fish population in baseline and dredged areas in Lake Pontchartrain. Contrib. Marine Res. Lab. - 1979, Louis. Dept. Wildl. Fish. Tech. Bull. No. 35: 63-67.
315. Guillory, V. 1982. An annotated checklist of the marine fauna of Grand Isle, Louisiana. Contrib. Marine Res. Lab. - 1979, Louis. Dept. Wildl. Fish. Tech. Bull. No. 35: 1-14.
316. Guillory, V., P. Bowman, and C. White. 1985. Gulf menhaden bycatch in the Louisiana inshore shrimp fishery. Proc. Louis. Acad. Sci. 48: 74-81.
317. Guillory, V., K. Foote, and E. Melancon. 1985. Additions to the Grand Isle, Louisiana fish fauna. Proc. Louis. Acad. Sci. 48: 82-85.
318. Guillory, V., J. Geagan, and J. Roussel. 1983. Influence of environmental factors on Gulf menhaden recruitment. Louis. Dept. Wildl. Fish. Tech. Bull. No. 37: 32 p.
319. Guillory, V., J. Shepard, P. Meier, G. Adkins, and C. Boudreaux. 1988. Assessment and management of Louisiana's coastal fisheries. Annual Report. Completion Report, Project No.2-436-R, Interjurisdictional Fisheries Research Act (PL99-659), NOAA/NMFS, St. Petersburg, FL: 98 p.
320. Gulf of Mexico Fishery Management Council (GMFMC). 1978. Final environmental impact statement and fishery management plan for the stone crab fishery of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, Tampa, Fla.
321. Gunter, G. 1938. Notes on invasion of fresh water by fishes of the Gulf of Mexico, with special reference to the Mississippi-Atchafalaya River system. Copeia 1938: 69-72.
322. Gunter, G. 1938. Seasonal variations in abundance of certain estuarine and marine fishes in Louisiana, with particular reference to life histories. Ecol. Monogr. 8: 313-346.
323. Gunter, G. 1941. Death of fishes due to cold on the Texas coast, January, 1940. Ecology 22: 203-208.
324. Gunter, G. 1945. Studies of marine fishes of Texas. Publ. Inst. Mar. Sci., Univ. Texas 1:1-190.
325. Gunter, G. 1947. Observations on breeding of the marine catfish, *Galeichthys felis*. Copeia 1947:217-223.
326. Gunter, G. 1950. Seasonal population changes and distribution as related to salinity, of certain invertebrates of the Texas Coast, including the commercial shrimp. Publ. Inst. Mar. Sci., Univ. Texas 1: 7-51.
327. Gunter, G. 1950. Distributions and abundance of fishes on the Aransas National Wildlife Refuge, with life history notes. Publ. Inst. Mar. Sci., Univ. Texas 1: 89-101.
328. Gunter, G. 1953. The relationship of the Bonnet Carre Spillway to oyster beds in Mississippi Sound and the "Louisiana Marsh" with a report on the 1950 opening. Publ. Inst. Mar. Sci., Univ. Texas 3: 17-71.
329. Gunter, G. 1958. Population studies of the shallow water fishes of an outer beach in south Texas. Publ. Inst. Mar. Sci., Univ. Texas 5: 186-193.
330. Gunter, G. 1967. Vertebrates in hypersaline waters. Contrib. Mar. Sci. 12: 230-241.
331. Gunter, G. 1967. Some relationships of estuaries to the fisheries of the Gulf of Mexico. In G.H. Lauff (ed.), Estuaries, p. 621-638. Amer. Assoc. Adv. Sci. Spec. Pub. No. 83, Washington, DC. 757 pp.
332. Gunter, G., J.Y. Christmas, and R. Killebrew. 1964. Some relations of salinity to population distributions of motile estuarine organisms, with special reference to penaeid shrimp. Ecology 45: 181-185.
333. Gunter, G., and G.E. Hall. 1965. A biological investigation of the Caloosahatchee estuary of Florida. Gulf Res. Rep. 2: 1-71.
334. Gunter, G., and H.H. Hildebrand. 1951. Destruction of fishes and other organisms on the south Texas coast by the cold wave of January 28-February 3, 1951. Ecology 32: 731-736.
335. Gunter, J.S., and E.L. Barnett. 1986. Comprehensive shellfish harvesting area survey for West Bay, Bay County, Florida. Fla. Dept. Nat. Res., Shellfish Env. Asses. Sec., Tallahassee, Fla. 126 p.

336. Hackney, C.T., and A.A. de la Cruz. 1981. Some notes on the macrofauna of a oligohaline tidal creek in Mississippi. *Bull. Mar. Sci.* 31(3): 658-661.
337. Hamilton, C.L., and G.E. Saul. 1984. Texas commercial harvest statistics, 1977-1983. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 64*: 66 p.
338. Hammerschmidt, P.C. 1985. Relative blue crab abundance in Texas coastal waters. *J. Shellfish Res.* 5(1): 9-11.
339. Hammerschmidt, P.C., and L.W. McEachron. 1986. Trends in relative abundance of selected shellfishes along the Texas coast: January 1977 - March 1986. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 108*: 149 p.
340. Hammerschmidt, P.C., L.W. McEachron, and K.L. Meador. 1988. Trends in relative abundance of selected shellfishes and finfishes along the Texas coast: January 1977 - December 1986. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 133*: 77 p.
341. Hansen, D.J. 1969. Food, growth, migration, reproduction and abundance of pinfish, *Lagodon rhomboides*, and Atlantic croaker, *Micropogon undulatus*, near Pensacola, Florida, 1963-65. *Fish. Bull., U.S.* 68: 135-146.
342. Hardy, J.D., Jr. 1978. Development of fishes of the Mid-Atlantic Bight: an atlas of egg, larval, and juvenile stages, Vol. III. *U.S. Fish and Wildl. Serv. FWS-OBS-78/12*.
343. Harrington, R. 1973. Faunistic changes in Corpus Christi Bay, Texas after completion of an artificial pass and use of the pass by organisms important to the seafood industry, 1971-1973. *Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1973*: 67-110.
344. Harrington, R.A. 1970. Evaluation of the trotline fishery of the upper Laguna Madre. *Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970*: 1-22.
345. Hartman, R.D., and W.H. Herke. 1987. Relative selectivity of five coastal marsh sampling gears. *Contrib. Mar. Sci.* 30: 17-26.
346. Harvey, E.J. 1971. Observations on the distribution of the sea catfish *Arius felis* larvae with and without chorion, with respect to salinity in the Biloxi Bay-Mississippi Sound area. *Miss. Acad. Sci.* 17: 77.
347. Hastings, P.A. 1974. Vertebrates. In A. Long, Project Director. Baseline study of physical, chemical, biological, and socioeconomic parameters of Navarre Beach. National Science Foundation Student Originated Studies Report, Univ. West Fla., Pensacola, Fla.
348. Hastings, R.W. 1972. Origin and seasonality of the fish fauna on a new jetty in the northeastern Gulf of Mexico. Ph.D. thesis, Fla. St. Univ., Tallahassee, Fla. 555 p.
349. Hastings, R.W. 1979. The origin and seasonality of the fish fauna on a new jetty in the northeastern Gulf of Mexico. *Bull. Fla. State Mus. Biol. Sci.* 24: 1-122.
350. Hastings, R.W., D.A. Turner, and R.G. Thomas. 1987. The fish fauna of Lake Maurepas, an oligohaline part of the Lake Pontchartrain estuary. *Northeast Gulf Sci.* 9: 89-98.
351. Hawley, W.C. 1963. Blue crab investigations in the upper Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 7*; 3 p.
352. Hawley, W.C. 1963. Populations of juvenile shrimp in the upper Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 8*; 6 p.
353. Hawley, W.C. 1963. Population studies of the sports and commercial fin-fish and forage fish of the upper Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 9*; 18 p.
354. Hawley, W.C. 1964. Population studies of the sports and commercial fin-fish and forage species of the upper Laguna Madre. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963*: 371-386.
355. Hawley, W.C. 1964. Populations of juvenile shrimp in the upper Laguna Madre. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963*: 111-115.
356. Hawley, W.C. 1964. Population studies of the blue crabs of the upper Laguna Madre. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963*: 577-579.
357. Hawley, W.C. 1965. A study of the juvenile shrimp populations of the upper Laguna Madre. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964*: 117-121.

Appendix 4, continued. References

358. Hawley, W.C. 1965. Population studies of the sports and commercial fin-fish of the upper Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 339-354.
359. Hawley, W.C. 1965. Population studies of the blue crabs of the upper Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 609-612.
360. Hayes, P.F., and R.W. Menzel. 1981. The reproductive cycle of early setting *Crassostrea virginica* (Gmelin) in the northern Gulf of Mexico, and its implications for population recruitment. Biol. Bull. (Woods Hole) 160: 80-88.
361. Heard, R.W. 1982. Guide to common tidal marsh invertebrates of the northeastern Gulf of Mexico. Miss. Ala. Sea Grant Consortium MASGP-79-004.
362. Heath, S.R. 1979. Shrimp assessment and management in the Mobile estuary. In H.A. Loyacano Jr., and J.P. Smith (editors.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 201-209. U.S. Army Corps of Engineers, Mobile, Ala.
363. Heath, S.R., M. Van Hoose, H.G. Lazauski, H.A. Swingle, and W.M. Tatum. 1986. Annual report. Ala. Dept. Cons. Nat. Res., Mar. Res. Div., Dauphin Island, Ala.
364. Hebert, H.F. 1968. Abundance and size distribution of white and brown shrimp in the North Lake area of Redfish Point, Vermilion Bay, Louisiana, 1965-1967. Unpubl. M.S. thesis, Univ. Southwest. Louis., 75 pp.
365. Hedgpeth, J.W. 1950. Notes on the marine invertebrate fauna of the salt flat areas in Aransas National Wildlife Refuge, Texas. Publ. Inst. Mar. Sci., Univ. Texas 1: 103-119.
366. Heffernan, T.L. 1960. Survey and inventory of the invertebrate forms associated with the oyster reefs in Aransas and Copano bays. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. MO-2-R-2: Job No. B-2; 3 p.
367. Heffernan, T.L. 1963. Computation, analysis and preparation of coastwide oyster population data. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 1; 12 p.
368. Heffernan, T.L. 1963. Plotting and survey of the major oyster reefs in Aransas, Copano and Mesquite Bays. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 4; 4 p.
369. Heffernan, T.L. 1963. Study of oyster growth and population structure in Aransas, Mesquite and Copano Bays. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 5; 10 p.
370. Heffernan, T.L. 1964. A study of oyster growth and population structure in Aransas, Mesquite and Copano Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 191-194.
371. Heffernan, T.L. 1970. An ecological evaluation of some tributaries of the Aransas Bay area. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 23-126.
372. Heffernan, T.L. 1971. Port Bay, an evaluation of the marine habitat. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1971: 63-91.
373. Heffernan, T.L. 1973. Survey of the adult red drum (*Sciaenops ocellatus*), 1973. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1973: 37-66.
374. Hein, S., and J. Shepard. 1979. Spawning of spotted seatrout in a Louisiana estuarine ecosystem. Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agen. 33: 451-465.
375. Hein, S., and J. Shepard. 1984. Spawning peak of red drum (*Sciaenops ocellatus*) in southeast Louisiana. Contrib. Marine Res. Lab. - 1980, Louis. Dept. Wildl. Fish. Tech. Bull. No. 38: 9-11.
376. Hein, S.H., and J.A. Shepard. 1979. A size disparity between "inside" and "outside" spotted seatrout (*Cynoscion nebulosus*) during a three-month study in south-central Louisiana. Contrib. Marine Res. Lab. - 1977, Louis. Dept. Wildl. Fish. Tech. Bull. No. 28: 16-28.
377. Hellier, T.R., Jr. 1950. Fish production and biomass studies in relation to photosynthesis in the Laguna Madre of Texas. Publ. Inst. Mar. Sci., Univ. Texas 2: 1-22.
378. Henderson-Arzapalo, A., R.L. Colura, and A.F. Maciorowski. 1988. Temperature and photoperiod induced maturation of southern flounder. Mgt. Data Ser., Coast. Fish. Branch 154: 20 pp.

379. Henley, D.E., and D.G. Rauscher. 1981. Freshwater needs of fish and wildlife resources in the Nueces Corpus Christi Bay area, Texas: A literature synthesis. FWS/OBS-80/10, Washington, D.C., 410 pp.
380. Herke, W.H. 1971. Use of natural and semi-impounded Louisiana tidal marshes as nurseries for fishes and crustacea. Ph.D. dissertation, Louis. St. Univ., Baton Rouge, Louis. 242 p.
381. Herke, W.H., and B.D. Rogers. 1984. Comprehensive estuarine nursery study completed. Fisheries 9: 12-16.
382. Herke, W.H., and B.D. Rogers. 1989. Threats to coastal fisheries. (p). In W.G. Duffy, and D. Clark (eds.), Marsh Management in Coastal Louisiana: Effects and Issues - Proceedings of a Symposium. U.S. Fish Wildl. Serv. Biol. Rep. 89(22). 378 p.
383. Herke, W.H., B.D. Rogers, and E.E. Knudsen. 1984. Habits and habitats of young spotted seatrout in Louisiana marshes. Louis. Agric. Exp. Stn. Res. Rep. 3: 1- 48.
384. Herke, W.H., E.E. Knudsen, P.A. Knudsen, and B.D. Rogers. 1987. Effects of semi-impoundment on fish and crustacean nursery use: evaluation of a "solution". Coastal Zone 87: 2562-2576.
385. Herke, W.H., M.W. Wengert, and M.E. LaGory. 1987. Abundance of young brown shrimp in natural and semi-impounded marsh nursery areas: relation to temperature and salinity. Northeast Gulf Sci. 9: 9-28.
386. Hettler Jr., W.F. 1989. Food habits of juveniles of spotted sea trout and gray snapper in western Florida Bay. Bull. Mar. Sci. 44(1): 155-162.
387. Hildebrand, H.H., and D. King. 1975. A biological study of the Cayo Del Oso and the Pita Island area of the Laguna Madre. Ann. Rep. 1973-1974 Central Power and Light Co. 290 pp.
388. Hildebrand, S.F. 1917. Notes on the life history of the minnows *Gambusia affinis* and *Cyprinodon variegatus*. U.S. Comm. Fish. Rep. 6: 1-14.
389. Hinchey, R.E. 1977. Selected aspects of the biology of Lake Pontchartrain, Louisiana. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 75 pp.
390. Hixon, R.F. 1980. Growth, reproductive biology, distribution and abundance of three species of Loliginid squid (Myopsida, Cephalopoda) in the northwest Gulf of Mexico. Ph.D. dissertation, Univ. Miami, Coral Gables, Fla., 233 p.
391. Hixon, R.F., R.T. Hanlon, S.M. Gillepsie and W.L. Griffin. 1980. Squid fishery in Texas: Biological, economic, and market considerations. Mar. Fish. Rev. 42: 44-50.
392. Hochberg, R.J., T.M. Bert, P. Steele, and S.D. Brown. 1992. Parasitization of *Loxothylacus texanus* on *Callinectes sapidus*: Aspects of population biology and effects on host morphology. Bull. Mar. Sci. 50(1): 117-132.
393. Hoese, H.D. 1959. A checklist of fishes of area M-3. Tex. Game and Fish Comm., Mar. Lab. Rep., 1959, Proj. No. M-3-R-1: Job No. A-3; 5 p.
394. Hoese, H.D. 1960. Biotic changes in a bay associated with the end of a drought. Limnol. Oceanogr. 5: 326-336.
395. Hoese, H.D. 1965. Spawning of marine fishes in Port Aransas, Texas area as determined by the distribution of young larvae. Ph.D. dissertation, Univ. Texas, Austin, Tex., 144 p.
396. Hoese, H.D. 1966. Habitat segregation in aquaria between two sympatric species of *Gobiosoma*. Publ. Inst. Mar. Sci., Univ. Texas 11: 7-11.
397. Hoese, H.D. 1973. Abundance of the low salinity clam, *Rangia cuneata* in southwestern Louisiana. Proc. Natl. Shellfish Assoc. 63: 99-106.
398. Hoese, H.D., and R. Ancelet. 1987. Anoxia induced mortality of oysters, *Crassostrea virginica*, associated with a spoil bank bisecting a bay. J. Shellfish Res. 6(1): 41-44.
399. Hoese, H.D., B.J. Copeland, F.N. Moseley and E.D. Lane. 1968. Fauna of the Aransas Pass Inlet, Texas. III. Diel and seasonal variations in trawlable organisms of the adjacent area. Tex. J. Sci. 20: 33-60.
400. Hoese, H.D., and R.S. Jones. 1963. Seasonality of larger animals in a Texas turtle grass community. Publ. Inst. Mar. Sci., Univ. Texas 9: 37-47.
401. Hoese, H.D., and J.M. Valentine., Jr. 1972. USL studies on the Chandeleur Islands. Univ. Southwest. Louis. Res. Ser. No. 10: 60 p.

Appendix 4, continued. References

402. Hofstetter, R.P. 1963. Study of oyster growth and population structure of the public reefs in East Bay, Galveston Bay and Trinity Bay. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 10; 23 p.
403. Hofstetter, R.P. 1964. A summary of oyster studies along the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963:163-176.
404. Hofstetter, R.P. 1965. A summary of oyster studies along the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 159-164.
405. Hofstetter, R.P. 1965. Study of oyster population in the Galveston Bay area. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 165-185.
406. Hofstetter, R.P. 1965. Study of the oyster (*Crassostrea virginica*) along the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 97-118.
407. Hofstetter, R.P. 1966. Oyster mortality studies along the Texas coast during 1966. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 55-68.
408. Hofstetter, R.P. 1966. Study of the oyster population on public reefs in Galveston Bay. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 69-80.
409. Hofstetter, R.P. 1967. Oyster studies along the Texas coast, 1967. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1967: 49-59.
410. Hofstetter, R.P. 1968. Oyster studies along the Texas coast, 1968. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1968: 23-33.
411. Hofstetter, R.P. 1970. Oyster studies - 1969. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 147-153.
412. Hofstetter, R.P. 1970. Oyster studies - 1970. Tex. Parks Wildl. Dept., Coastal Fisheries Proj. Rep. 1969 and 1970: 155-167.
413. Hofstetter, R.P. 1971. Galveston Bay oyster studies. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1971: 107-124.
414. Hofstetter, R.P. 1977. Trends in population levels of the American oyster (*Crassostrea virginica*) on public reefs in Galveston Bay. Tex. Parks Wildl. Dept. Tech. Ser. No. 24. 90 pp.
415. Hofstetter, R.P., and R.B. Johnson. 1965. A study of the southern quahog (*Mercenaria mercenaria*) in Texas waters. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 235-243.
416. Holcomb Jr., H.W. 1970. An ecological study of the gulf menhaden (*Brevoortia patronus*) in a low salinity estuary in Texas. Texas A&M Univ., College Station, Tex., 47 p.
417. Holland, J.S., N.J. Maciolek, R.D. Kalke and C.H. Oppenheimer. 1973. A benthos and plankton study of the Corpus Christi, Copano and Aransas Bay Systems. I. Report on the methods used and data collected during the period September, 1972 - June, 1973. First Final Report to Texas Water Development Board.
418. Holloway, L.F. 1969. Surface trawl and plankton studies in an estuary at Marsh Island, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 51 p.
419. Holt, G.J., A.H. Scott and C.R. Arnold. 1985. Diel periodicity of spawning in sciaenids. Mar. Ecol. Prog. Ser. 27: 1-7.
420. Holt, J., A.G. Johnson, C.R. Arnold, W.A. Fable, Jr., and T.O. Williams. 1981. Description of eggs and larvae of laboratory reared red drum, *Sciaenops ocellatus*. Copeia 1981: 751-756.
421. Holt, J., and K. Strawn. 1983. Community structure of macrozooplankton in Trinity and upper Galveston Bays. Estuaries 6: 66-75.
422. Holt, S.A., G.J. Holt, and L. Young-Abel. 1988. A procedure for identifying sciaenid eggs. Contrib. Mar. Sci. 30(Sup): 99-108.
423. Holt, S.A., C.L. Kitting and C.R. Arnold. 1983. Distribution of young red drums among different sea-grass meadows. Trans. Am. Fish. Soc. 112: 267-271.
424. Hook, J.H. 1986. Seasonal variations, relative abundance and distribution of fishes of South Bay, Cameron County, Texas. M.S. thesis, Pan Am. Univ., Edinburg, Tex., 79 p.
425. Hooks, T.A. 1973. An analysis and comparison of the benthic invertebrate communities in Fenholloway and Econfinia estuaries of Apalachee Bay, Florida. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
426. Hooks, T.A., K.L. Heck, Jr., and R.J. Livingston. 1976. An inshore marine invertebrate community: structure and habitat associations in the northeastern Gulf of Mexico. Bull. Mar. Sci. 26: 99-109.

427. Horst, J., and D. Bankston. 1985. The potential for a stone crab (*Menippe mercenaria*) commercial fishery in Barataria Bay, Louisiana. Coastal Fisheries Institute, Louis. St. Univ., Baton Rouge, Louis. Tech. Rep. No. TS-85-06: 1-20.
428. Howells, R.G., and A.J. Sonski. 1990. Lower temperature tolerance of snook, *Centropomus undecimalis*. Northeast Gulf Sci. 11(2): 155-158.
429. Hudson, J.H., D.M. Allen, and T.J. Costello. 1970. The flora and fauna of a basin in central Florida Bay. U.S. Fish Wildl. Serv. Spec. Sci. Rep. Fish. 604 p.
430. Huh, S.H. 1984. Seasonal variations in populations of small fishes concentrated in shoalgrass and turtlegrass meadows. J. Oceanol. Soc. Kor. 19: 44-55.
431. Huh, S.H. 1986. Ontogenetic food habits of four common fish species in seagrass meadows. J. Oceanol. Soc. Kor. 21: 25-33.
432. Huh, S.H., and C.L. Kitting. 1985. Trophic relationships among concentrated populations of small fishes in seagrass meadows. J. Exp. Mar. Biol. Ecol. 92: 29-43.
433. Hunt, J.H., and W.G. Lyons. 1986. Factors affecting growth and maturation of spiny lobsters, *Panulirus argus*, in the Florida Keys. Can. J. Fish. Aquat. Sci. 43: 2243-2247.
434. Ilg, R.J., T.L. Kirby, and G. Stacy, III. 1983. Nekton (p). In L.R. DeRouen, R.W. Hann, D.M. Casserly, and C. Giamona (eds.), West Hackberry Strategic Petroleum Reserve Site Brine Disposal Monitoring, Year I Report. Final Report, Biological Oceanography. McNeese St. Univ., Lake Charles, Louis. 7.1- 7.111.
435. Ingle, R.M. 1957. Intermittent shrimp sampling in Apalachicola Bay with biological notes and regulatory applications. Proc. Gulf Caribb. Fish. Inst. 9: 6-17.
436. Ingle, R.M. 1962. Intermittent shrimp sampling in Apalachicola Bay with biological notes and regulatory applications. Fla. Board Cons. Mar. Lab. Contrib. 67.
437. Ingle, R.M., and C.E. Dawson, Jr. 1953. A survey of Apalachicola Bay. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 10.
438. Ingle, R.M., B. Eldred, H.W. Sims, and E.A. Eldred. 1963. On the possible Caribbean origin of Florida's spiny lobster populations. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 40.
439. Irby, E.W., Jr. 1974. A fishing survey of Choctawhatchee Bay and adjacent Gulf of Mexico waters. Fla. Res. Publ. 2.
440. Iversen, E.S., and D.C. Tabb. 1962. Sub-populations based on growth and tagging studies of spotted seatrout, *Cynoscion nebulosus*, in Florida. Copeia 1962: 544-548.
441. Jackson, G.A. 1972. A sport fishing survey of Biloxi Bay and the adjacent Mississippi Sound. Unpubl. M.S. thesis, Miss. St. Univ., Mississippi State, Miss.: 101 pp.
442. Jacob, J.W., Jr. 1971. Observations on the distribution, growth, survival and biomass of juvenile subadult *Penaeus aztecus* in southern Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 68 p.
443. Jannke, T.E. 1971. Abundance of young sciaenid fishes in Everglades National Park, Florida in relation to season and other variables. Univ. Miami Sea Grant Program Sea Grant Tech. Bull. 11. 126 p.
444. Jaworski, E. 1972. The blue crab fishery of Barataria estuary. Center for Wetland Resources, Louis. St. Univ. LSU-SG- 72-01: 104 p.
445. Jennings, C.A. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)—sheepshead. U.S. Fish Wildl. Serv. Biol. Rept 82(11.29).
446. Johnson, D.R., and W. Seaman, Jr. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida)-spotted seatrout. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.43).
447. Johnson, G.D. 1978. Development of fishes of the mid-Atlantic Bight, Vol. IV. U.S. Fish Wildl. Serv. FWS/OBS-78/12.
448. Johnson, R.B. 1964. A study of the juvenile shrimp populations of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 117-126.
449. Johnson, R.B. 1964. Life history study of the commercial oyster in the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 177-183.
450. Johnson, R.B. 1964. Population studies of the blue crabs of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 581-585.

Appendix 4, continued. References

451. Johnson, R.B. 1965. A study of the juvenile shrimp populations of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 123-133.
452. Johnson, R.B. 1965. Population studies of the blue crabs of the lower Laguna Madre. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 613-621.
453. Johnson, R.B. 1966. The effects of engineering projects on the ecology of Jones Bay. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 147-158.
454. Johnson, R.B. 1966. The effects of engineering projects on the ecology of Moses Lake. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 159-168.
455. Johnson, R.B., Jr. 1974. Ecological changes associated with the industrialization of Cedar Bayou and Trinity Bay, Texas. Tex. Parks Wildl. Dept. Tech. Ser. No. 16: 79 p.
456. Johnson, R.B., Jr. 1975. A study of Texas shrimp populations, 1975. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1975: 1-35.
457. Johnson, R.B., Jr. 1977. Fishery survey of Cedar Lakes and the Brazos and San Bernard River Estuaries. Tex. Parks Wildl. Dept. Tech. Ser. No. 23: 65 p.
458. Jones, A.C., D.E. Dimoutrou, J.J. Ewald, and J. Tweedy. 1970. Distribution of early developmental stages of pink shrimp, *Penaeus duorarum*, in Florida waters. Bull. Mar. Sci. 20: 634-661.
459. Jones, D.S., I.R. Quitmyer, W.S. Arnold, and D.C. Marelli. 1990. Annual shell landings, age, and growth rate of hard clams (*Mercenaria* spp.) from Florida. J. Shellfish Res. 9(1): 215-226.
460. Jones, P.W., F.D. Martin, and J.D. Hardy, Jr. 1978. Development of fishes of the mid-Atlantic Bight, Vol. I. U.S. Fish Wildl. Serv. FWS/OBS-78/12.
461. Jones, R.S. 1965. Fish stocks from a helicopter-borne purse net sampling Corpus Christi Bay, Texas, 1962-1963. Publ. Inst. Mar. Sci., Univ. Texas 10: 68-75.
462. Joseph, E.B. 1952. The fishes of Alligator Harbor, Florida, with notes on their natural history. Unpubl. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
463. Joseph, E.B., and R.W. Yerger. 1956. The fishes of Alligator Harbor, Florida, with notes on their natural history. Paper Oceanogr. Inst. Fla. St. Univ. Stud. 2:111-156.
464. Jovanovich, M.C., and K.R. Marion. 1989. Gametogenic cycle of *Rangia cuneata* (Mactridae, Mollusca) in Mobile Bay, Alabama, with Comments of geographic variation. Bull. Mar. Sci. 45: 130-138.
465. Juneau, C.L., Jr., and B. Barrett. 1975. An inventory and study of the Vermillion Bay - Atchafalaya Bay complex. Louis. Wildl. Fish. Comm. Tech. Bull. No. 13: 153 p.
466. Juneau, C.L., Jr., and J.F. Pollard. 1981. A survey of the recreational shrimp and finfish harvests of the Vermillion Bay area and their impact on commercial fishery resources. Louis. Dept. Wildl. Fish. Tech. Bull. No. 33: 40 p.
467. Junot, J.A., M.A. Poirrier, and T.M. Soniat. 1983. Effects of saltwater intrusion from the inner harbor navigation canal on the benthos of Lake Pontchartrain, Louisiana. Gulf Res. Rep. 7(3): 247-254.
468. Kelley Jr., J.R. 1965. A taxonomic survey of the fishes of Delta National Wildlife Refuge with emphasis upon distribution and abundance. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 133 pp.
469. Kilby, J.B. 1955. The fishes of two Gulf coastal marsh areas of Florida. Tulane Stud. Zool. 2: 174-247.
470. King, B.D., III. 1964. A study of oyster growth and population structure of the public reefs in Matagorda, Tres Palacios and East Matagorda Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 223-230.
471. King, B.D., III. 1964. Population studies of the sports and commercial fin-fish and forage species of the Matagorda Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 311-322.
472. King, B.D., III. 1965. Study of oyster growth and population structures of the public reefs in Matagorda, East Matagorda, Tres Palacios and Lavaca Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 207-221.
473. King, B.D., III. 1965. Population studies of the blue crabs of the Matagorda Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 575-587.

474. King, B.D., III. 1971. Study of the migratory patterns of fish and shellfish through a natural pass. Tex. Parks Wildl. Dept. Tech. Ser. No. 9: 54 p.
475. Klima, E.F. 1959. Aspects of the biology and the fishery for Spanish mackerel, *Scomberomorus maculatus*, of southern Florida. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 27.
476. Klima, E.F., and D.C. Tabb. 1959. A contribution to the biology of the spotted weakfish, *Cynoscion nebulosus*, (Cuvier) from northwest Florida, with a description of the fishery. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 30.
477. Knudsen, E.E., and W.H. Herke. 1978. Growth rate of marked juvenile Atlantic croakers, *Micropogon undulatus*, and length of stay in a coastal marsh nursery in Southwest Louisiana. Trans. Am. Fish. Soc. 107: 12-20.
478. Knudsen, P.A., W.H. Herke, and E.E. Knudsen. 1985. Emigration of brown shrimp from a low-salinity shallow-water marsh. Proc. Louis. Acad. Sci. 48: 30-40.
479. Kobylinski, G.J., and P.F. Sheridan. 1979. Distribution, abundance, feeding and long term fluctuations of spot, *Leiostomus xanthurus*, 1972-1977. Contrib. Mar. Sci. 22: 149-161.
480. Kone, H.E. 1961. Occurrence of *Rangia cuneata* and *Crassostrea virginica* in Sabine Lake, Texas-Louisiana. J. Sediment. Petrol. 31: 628.
481. Konikoff, M., and H.D. Hoese. 1989. Marsh management and fisheries on the State Wildlife Refuge - overview and beginning study of the effect of weirs. (p). In W.G. Duffy, and D. Clark (eds.), Marsh Management in Coastal Louisiana: Effects and Issues - Proceedings of a Symposium. U.S. Fish Wildl. Serv. Biol. Rep. 89(22). 378 p.
482. Krull, R.M. 1976. The small fish fauna of a disturbed hypersaline environment. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 112 p.
483. Kunnke, J.T., and T.F. Palik. 1984. Tampa Bay environmental atlas. U.S. Fish Wildl. Serv. Biol. Rep. 85. 73 p.
484. Kutkuhn, J.H., H.L. Cook and K.N. Baxter. 1969. Distribution and density of prejuvenile *Penaeus* shrimp in Galveston entrance and the nearby Gulf of Mexico (Texas). FAO Fisheries Report 57: 1075-1099.
485. Lambou, V.W. 1959. Fish populations of back-water lakes in Louisiana. Trans. Am. Fish. Soc. 88: 7-15.
486. Lambou, V.W. 1961. Utilization of macrocrustaceans for food by freshwater fishes in Louisiana and its effects on the determination of predator-prey relations. Prog. Fish-Cult. 23: 18-25.
487. Landry, A.M., Jr. 1977. Life history and susceptibility of fishes in Galveston Bay, Texas to power-plant cooling-water operations. Ph.D. dissertation, Texas A&M Univ., College Station, Tex., 546 p.
488. Landry, A.M., Jr., and K. Strawn. 1973. Annual cycle of sportfishing activity at a warmwater discharge into Galveston Bay, Texas. Trans. Am. Fish. Soc. 102: 573-577.
489. Lane, J.M. 1986. Upper temperature tolerances of summer and winter acclimatized *Rangia cuneata* of different sizes from Perdido Bay, Florida. Northeast Gulf Sci. 8: 163-166.
490. Lane, J.M. 1986. Allometric and biochemical studies on starved and unstarved clams, *Rangia cuneata* (Sowerby, 1831). J. Exp. Mar. Biol. Ecol. 95: 131-143.
491. LaSalle, M.W., and A.A. de la Cruz. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-common rangia. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.31)
492. Laska, A.L. 1973. Fishes of the Chandeleur Islands, Louisiana. Ph.D. dissertation, Tulane Univ., New Orleans, Louis., 260 p.
493. Lassuy, D.R. 1983. Species profiles: life histories and environmental requirements (Gulf of Mexico)-brown shrimp. U.S. Fish Wildl. Serv. FWS/OBS-82/11.1. 15 p.
494. Lassuy, D.R. 1983. Species profiles: life histories and environmental requirements (Gulf of Mexico)-Gulf menhaden. U.S. Fish Wildl. Serv. FWS/OBS-82/11.2. 13 p.
495. Lassuy, D.R. 1983. Species profiles: Life histories and environmental requirements (Gulf of Mexico)-Atlantic croaker. U.S. Fish. Wildl. Serv. FWS/OBS-82/11.3. 12 p.

Appendix 4, continued. References

496. Lassuy, D.R. 1983. Species profiles: life histories and environmental requirements (Gulf of Mexico)-spotted seatrout. U.S. Fish. Wildl. Serv. FWS/OBS-82/11.431. 14 p.
497. Lasswell, J.L., G. Garza and W.H. Bailey. 1977. Status of marine fish introductions into the fresh waters of Texas. Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agen. 31: 399-403.
498. Laughlin, R.A., and R.J. Livingston. 1982. Environmental and trophic determinants of the spatial/temporal distribution of the brief squid (*Lolliguncula brevis*) in the Apalachicola estuary (North Florida, USA). Bull. Mar. Sci. 32: 489-497.
499. Laurence, G.C., and R.W. Yerger. 1967. Life history studies of the Alabama shad, *Alosa alabamiae*, in the Apalachicola River, Florida. Proc. Annu. Conf. Southeast Assoc. Game Fish Comm. 20: 260-272.
500. Leadon, C.J. 1979. Environmental effects of river flows and levels in the Suwannee River estuary, Florida. Interim Report, Suwannee River Water Management District, Live Oak, Fla.
501. Leary, T., and H. Compton. 1960. A study of the bay populations of juvenile shrimp, *Penaeus aztecus* and *Penaeus setiferus*. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-R-5: 32 p.
502. Leber, K.M., and H.S. Greening. 1986. Community studies in seagrass meadows: a comparison of two methods for sampling macroinvertebrates and fishes. Fish. Bull., U.S. 84:443-450.
503. Lee, C. 1979. The seasonal and spatial setting of oyster spat and other settling organisms in Mobile Bay in relation to temperature, salinity, and secchi disc visibility. Unpubl. M.S. thesis, Univ. Alabama, University, Ala.
504. Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. 1980. Atlas of North American Freshwater Fishes. NC St. Mus. Nat. Hist., NC Biol. Surv. Pub. No. 1980-12. 867 p.
505. Lee, G. 1937. Oral gestation in the marine catfish, *Galeichthys felis*. Copeia 1937(1): 49-56.
506. Leitman, S., K. Brady, L. Edmiston, T. McAlppin, and V. Tauxee. 1986. Apalachicola Bay dredged material disposal plan. Fla. Dept. Env. Reg.
507. Levine, S.J. 1980. Gut contents of forty-four Lake Pontchartrain, Louisiana, fish species. In J.H. Stone (ed.), Environmental Analysis of Lake Pontchartrain, Louisiana, Its Surrounding Wetlands, and Selected Land Uses. Center for Wetland Resources, Louis. St. Univ., Baton Rouge, Louis. p. 899-1029.
508. Lewis, R.R. III, and E.D. Estevez. 1988. The ecology of Tampa Bay, Florida: an estuarine profile. U.S. Fish Wildl. Serv. Biol. Rep. 85(7.18). 132 p.
509. Lindall W.N., Jr., J.R. Hall, W.A. Fable, Jr., and L.A. Collins. 1973. A survey of fishes and commercial invertebrates of the nearshore and estuarine zone between Cape Romano and Cape Sable, Florida. National Marine Fisheries Service, National Technical Information Service, Springfield, Va. 62 p.
510. Lindall, W.N., Jr., J.R. Hall, and C.H. Saloman. 1973. Fishes, macroinvertebrates, and hydrological conditions of upland canals in Tampa Bay, Florida. Fish. Bull., U.S. 71:155-163.
511. Lindberg, W.J., and M.J. Marshall. 1984. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida)-stone crab. U.S. Fish Wildl. Serv. FWS/OBS-82/11.21. 17 p.
512. Livingston, R.J. 1975. Impact of Kraft pulp mill effluents on estuarine and coastal fishes in Apalachee Bay, Florida, USA. Mar. Biol. (Berlin.) 32:19-48.
513. Livingston, R.J. 1976. Diurnal and seasonal fluctuations of organisms in a north Florida estuary. Estuarine Coastal Mar. Sci. 4: 373-400.
514. Livingston, R.J. 1983. Resource Atlas of the Apalachicola Estuary. Fla. Sea Grant Rep. SGR-55. 64 p.
515. Livingston, R.J. 1984. The Ecology of the Apalachicola Bay System: an estuarine profile. U.S. Fish Wildl. Serv. FWS/OBS 82/05. 148 p.
516. Livingston, R.J. 1986. Final report: the Choctawhatchee River-Bay System Center for Aquatic Research and Resource Management, Fla. St. Univ., Tallahassee, Fla.
517. Livingston, R.J. 1987. Field sampling in estuaries: The relationship of scale to variability. Estuaries 10(3): 194-207.

518. Livingston, R.J., R.L. Iverson, R.H. Estabrook, V.E. Keys, and J. Taylor Jr. 1974. Major features of the Apalachicola Bay system: physiography, biota, and resource management. *Fla. Sci.* 37: 245-271.
519. Livingston, R.J., G.L. Kobylinski, F.G. Lewis, III, and P.F. Sheridan. 1976. Long term fluctuations of epibenthic fish and invertebrate populations in Apalachicola Bay, Florida. *Fish. Bull., U.S.* 74: 311-321.
520. Livingston, R.J., P.F. Sheridan, B.G. McLane, F.G. Lewis, III and G.G. Kobylinski. 1977. The biota of the Apalachicola Bay system: functional relationships. In R.J. Livingston and E.A. Joyce, Jr., (eds.), *Proceedings of the Conference on the Apalachicola Drainage System, 23-24 April 1976, Gainesville, Florida*, p. 75-100. *Fla. Dept. Nat. Res. Mar. Res. Lab. Mar. Res. Publ.* 26.
521. Loesch, H.C. 1965. Distribution and growth of penaeid shrimp in Mobile Bay, Alabama. *Univ. Texas Inst. Mar. Sci. Publ.* 10: 41-58.
522. Loesch, H.C. 1976. Shrimp population densities within Mobile Bay. *Gulf Res. Rep.* 5: 11-16.
523. Loesch, H.C. 1976. Penaeid shrimp distributions in Mobile Bay, Alabama, including low salinity records. *Gulf Res. Rep.* 5: 43-45.
524. Loftus, W.F., and J.A. Kushlan. 1987. Freshwater fishes of southern Florida. *Bull. Fla. St. Mus., Biol. Sci.* 31(4): 147-344.
525. Loosanoff, V.L., W.S. Miller, and P.B. Smith. 1951. Growth and setting of larvae of *Venus mercenaria* in relation to temperature. *J. Mar. Res.* 10: 59-81.
526. Lorio, W.J., and W.S. Perret. 1980. Biology and ecology of spotted seatrout (*Cynoscion nebulosus* Cuvier). In *Proceedings of the colloquium on the biology and management of red drum and spotted seatrout*, p. 7-13. Gulf States Fisheries Commission, Ocean Springs, Miss.
527. Lowery, T.A., and L.G. Tate. 1986. Effects of hypoxia on hemolymph lactate and behavior of the blue crab, *Callinectes sapidus*, in the laboratory and field. *Comp. Biochem. Physiol.* 85A: 689-692.
528. Luczkovich, J.J. 1987. The Patterns and Mechanisms of Selective Feeding on Seagrass-Meadow Epifauna by Juvenile Pinfish, *Lagodon rhomboides* (Linnaeus). Ph.D dissertation, Florida St. Univ., Tallahassee, FL: 156.
529. Luczkovich, J.J. 1988. The role of prey detection in the selection of prey by pinfish *Lagodon rhomboides* (Linnaeus). *J. Exp. Mar. Biol. Ecol.* 123: 15-30.
530. Lyczkowski-Schultz, J., D.L. Ruple, S.L. Richardson, and J.H. Cowan, Jr. 1990. Distribution of fish larvae relative to time and tide in a Gulf of Mexico barrier island pass. *Bull. Mar. Sci.* 46(3): 563-577.
531. Lyczkowski-Schultz, J., and J.P. Steen, Jr. 1991. Diel vertical distribution of red drum *Sciaenops ocellatus* larvae in the north central Gulf of Mexico. *Fish. Bull., U.S.* 89: 631-641.
532. Lyon, J.M. 1962. Composition of fish species in Area M-4 according to specific sampling. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep.* 1961-1962, Proj. No. M-4-R-3: Job No. A-2; 8 p.
533. Lyon, J.M. 1962. Inventory of invertebrate forms present in Area M-4. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep.* 1961-1962, Proj. No. M-4-R-3: Job No. B-2; 3 p.
534. Lyon, J.M., and C.J. Boudreaux. 1983. Movement of tagged white shrimp, *Penaeus setiferus*, in the Northwestern Gulf of Mexico. *Louis. Dept. Wildl. Fish.* 39: 1-32.
535. Lyons, W.G. 1986. Problems and perspectives regarding recruitment of spiny lobsters, *Panulirus argus*, to the south Florida fishery. *Can. J. Fish. Aquat. Sci.* 43: 2099-2106.
536. MacKenzie, C.L., Jr. 1977. Development of an aquacultural program for rehabilitation of damaged oyster reefs in Mississippi. *Mar. Fish. Rev.* 39(8): 1-13.
537. Mackin, J.G. 1971. A study of the effect of oilfield brine effluents on biotic communities in Texas estuaries. *Texas A&M Res. Found., Proj.* 735, Texas A&M Univ.
538. Mahoney, B.M.S., and R.J. Livingston. 1982. Seasonal fluctuations of benthic macrofauna in the Apalachicola estuary, Florida USA: the role of predation. *Mar. Biol.* 69: 207-213.
539. Manooch, C.H., III. 1984. Fisherman's guide to the fishes of the southeastern United States. North Carolina State Museum of Natural History, Raleigh, N.C.

Appendix 4, continued. References

540. Marotz, B.L. 1984. Seasonal movements of penaeid shrimp, Atlantic croaker, and Gulf menhaden through three marshland migration routes surrounding Calcasieu Lake in southwestern Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 192 p.
541. Marotz, B.L., W.H. Herke, and B.D. Rogers. 1990. Movement of gulf menhaden through three routes in southwestern Louisiana. N. Am. J. Fish. Manag. 10: 408-417.
542. Marshall, A.R. 1958. A survey of the snook fishery of Florida, with studies of the biology of the principal species, *Centropomus undecimalis* (Block). Fla. State Board Cons. Mar. Lab. Tech. Ser. No. 22. 39 pp.
543. Martin, F.D. 1968. Intraspecific variation in osmotic abilities of *Cyprinodon variegatus* Lacepede from the Texas coast. Ecology 49: 1186-1188.
544. Martin, F.D. 1970. Feeding habits of *Cyprinodon variegatus* (Cyprinodontidae) from the Texas coast. Southwest Nat. 14: 368-369.
545. Martin, J.H. 1979. A study of the feeding habits of the black drum in Alazan Bay and the Laguna Salada, Texas. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 106 p.
546. Martin, J.H. 1988. Catches of five finfishes in bag seines, May 1961-May 1976. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 132: 39 p.
547. Martin, J.H., and L.W. McEachron. 1986. Occurrence of select juvenile fishes during post spawning periods in Texas Bay-Gulf passes. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 96: 23 p.
548. Martinez, R. 1963. Survey of blue crab populations in the Corpus Christi Bay System. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 6; 5 p.
549. Martinez, R. 1963. Population studies of the sports and commercial fin-fish and forage species of the Corpus Christi Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 7; 14 p.
550. Martinez, R. 1963. Study of oyster populations and experimental plantings in Corpus Christi Bay. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 7; 3 p.
551. Martinez, R. 1963. Populations of juvenile shrimp in the Corpus Christi Bay complex. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 7; 6 p.
552. Martinez, R. 1964. A study of populations of juvenile shrimp in the Corpus Christi Bay complex. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 105-110.
553. Martinez, R. 1964. A study of oyster population and experimental planting in Corpus Christi Bay. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 185-190.
554. Martinez, R. 1964. Population studies of the sports and commercial fin-fish and forage species of the Corpus Christi Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 355-370.
555. Martinez, R. 1964. Population studies of the blue crabs of the Corpus Christi Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 569-575.
556. Martinez, R. 1965. A study of the juvenile shrimp populations of the Corpus Christi Bay complex. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 107-116.
557. Martinez, R. 1965. Population studies of the sports and commercial fin-fish species of the Corpus Christi Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 315-329.
558. Martinez, R. 1965. Population studies of the blue crabs of the Corpus Christi Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 601-608.
559. Marwitz, S.R. 1986. Young tarpon in a roadside ditch near Matagorda Bay in Calhoun County, Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 100: 8 p.
560. Marx, J.M., and W.F. Herrnkind. 1985. Macroalgae (Rhodophyta: *Laurencia* spp.) as habitat for young juvenile spiny lobsters, *Panulirus argus*. Bull. Mar. Sci. 36(3): 423-431.
561. Marx, J.M., and W.F. Herrnkind. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida)-spiny lobster. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.61).

562. Matlock, G.C. 1982. By-catch of southern flounder and gulf flounder by commercial shrimp trawlers in Texas Bays. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 31: 16 p.
563. Matlock, G.C. 1984. A summary of 7 years of stocking Texas bays with red drum. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 60: 14 p.
564. Matlock, G.C. 1985. Red drum sex ratio and size at sexual maturity. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 85: 7 p.
565. Matlock, G.C. 1987. Maximum total length and age of red drum off Texas. Northeast Gulf Sci. 9: 49-52.
566. Matlock, G.C. 1987. The role of hurricanes in determining year-class strength of red drum. Contrib. Mar. Sci. 30: 39-47.
567. Matlock, G.C. 1988. Survival of red drum fry stocked into Christmas Bay, Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 152: 7 p.
568. Matlock, G.C. 1990. Maximum total length and age of black drum *Pogonias cromis* (Osteichthyes: Sciaenidae) off Texas. Northeast Gulf Sci. 11(2): 171-174.
569. Matlock, G.C. 1991. Growth, mortality, and yield of southern flounder in Texas. Northeast Gulf Sci. 12(1): 61-65.
570. Matlock, G.C. 1992. Growth of five fishes in Texas Bays in the 1960's. Fish. Bull., U.S. 90: 407-411.
571. Matlock, G.C., B.T. Hysmith, and R.L. Colura. 1984. Returns of tagged red drum stocked into Matagorda Bay, Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 63: 6 p.
572. Matlock, G.C., R.J. Kemp, Jr., and T.J. Heffernan. 1986. Stocking as a management tool for red drum fishery, a preliminary evaluation. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 75: 27 p.
573. Matlock, G.C., R.A. Marcello Jr., and K. Strawn. 1975. Standard length-total length relationships of gulf menhaden, *Brevoortia patronus*, bay anchovy, *Anchoa mitchilli*, and atlantic croaker, *Micropogon undulatus*, from Galveston Bay. Trans. Am. Fish. Soc. 104: 408-409.
574. Matlock, G.C., and H.R. Osburn. 1987. Demise of the snook fishery in Texas. Northeast Gulf Sci. 9(1): 53-58.
575. Matthews, G.A. 1982. Relative abundance and size distributions of commercially important shrimp during the 1981 Texas closure. Mar. Fish. Rev. 44: 5-15.
576. Matthews, G.A. 1987. An intensive study of the postlarval brown shrimp entering through Bolivar Roads during March 9 - April 3, 1987. NMFS Unpubl. Rep.
577. Matthews, G.A., C.A. Marcin and G.L. Clements. 1975. A plankton and benthos survey of the San Antonio Bay System. Tex. Parks Wildl. Dept. Proj. Report, 76 p.
578. May, E.B. 1969. Feasibility of off bottom oyster culture in Alabama. Ala. Mar. Res. Bull. 3.
579. May, E.B. 1971. A survey of the oyster and oyster shell resources of Alabama. Ala. Mar. Res. Bull. 4.
580. May, E.B. 1972. The effects of floodwater on oysters in Mobile Bay. Proc. Natl. Shellfish Assoc. 62: 67-71.
581. May, E.B. 1973. Extensive oxygen depletion in Mobile Bay, Alabama. Limnol. Oceanogr. 18: 353-366.
582. May, E.B., and D.G. Bland. 1970. Survival of young oysters in areas of different salinity in Mobile Bay. Proc. Southeast. Assoc. Game Fish Comm. 23: 519-521.
583. May, L.N. 1977. The effects of oil-recovery operations on the biology and ecology of killifishes in a Louisiana salt marsh. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 80 p.
584. May, N., L. Trent, and P.J. Pristas. 1976. Relation of fish catches in gill nets to frontal periods. Fish. Bull., U.S. 74: 449-453.
585. McEachron, L.W., and A.W. Green. 1986. Trends in relative abundance and size of selected finfish in Texas bays: November 1975 - June 1985. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 91: 271.
586. McEachron, L.W., C.R. Shaw and A.W. Moffett. 1977. A fishery survey of Christmas, Drum and Bastrop Bays, Brazoria County, Texas. Tex. Parks Wildl. Dept. Tech. Ser. No. 20: 83 p.

Appendix 4, continued. References

587. McKenney, T.W., E.C. Alexander, and G.L. Voss. 1958. Early development and larval distribution of the carangid fish, *Caranx crysos* (Mitchell). Bull. Mar. Sci. Gulf Caribb. 8: 167-200.
588. McMichael, R.H. Jr., K.M. Peters, and G.R. Parsons. 1989. Early life history of the snook, *Centropomus undecimalis*, in Tampa Bay, Florida. Northeast Gulf Sci. 10: 113-125.
589. McMichael, R.H., Jr., and K.M. Peters. 1989. Early life history of spotted seatrout, *Cynoscion nebulosus* (Pisces: sciaenidae), in Tampa Bay, Florida. Estuaries 12: 98-110.
590. McNulty, J.K., W.N. Lindall, Jr., and E.A. Anthony. 1974. Data of the biology phase, Florida portion, cooperative Gulf of Mexico estuarine inventory. U.S. Natl. Mar. Fish. Serv. Data Rep. 95. 229 p.
591. Meador, K.L., L.W. McEachron and T.J. Cody. 1988. Trends in relative abundance of selected shellfishes and finfishes along the Texas coast: January 1977 - December 1987. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 153: 77 p.
592. Menzel, R.W. 1971. Checklist of the marine fauna and flora of the Apalachee Bay and the St. George's Sound area. Dept. Oceanogr., Fla. St. Univ., Tallahassee, Fla.
593. Menzel, R.W., N.C. Hulings, and R.R. Hathaway. 1966. Oyster abundance in Apalachicola Bay, Florida, in relation to biotic associations influenced by salinity and other factors. Gulf Res. Rep. 2(2): 73-96.
594. Menzel, R.W., and F.W. Nichy. 1958. Studies of the distribution and feeding habits of some oyster predators in Alligator Harbor, Florida. Bull. Mar. Sci. Gulf Caribb. 8(2): 315-329.
595. Mercer, L.P. 1984. A biological and fisheries profile of spotted seatrout, *Cynoscion nebulosus*. N.C. Div. Mar. Fish. Spec. Sci. Rep. 40. Morehead City, N.C.
596. Mercer, L.P. 1984. A biological and fisheries profile of red drum, *Sciaenops ocellatus*. N.C. Div. Mar. Fish. Spec. Sci. Rep. 41, Morehead City, N.C.
597. Mercer, L.P. 1984. Fishery management plan for the red drum, (*Sciaenops ocellatus*). N.C. Div. Mar. Fish. Spec. Sci. Rep. 44, Morehead City, N.C.
598. Merriner, J.V. 1980. History and management of the spotted seatrout fishery. In Proceedings of the colloquium on the biology and management of red drum and spotted seatrout, p. 55-61. Gulf States Mar. Fish. Comm., Ocean Springs, Miss.
599. Miles, R.W. 1951. An analysis of the "Trash Fish" of shrimp trawlers operating in Apalachicola Bay and the adjacent Gulf of Mexico. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
600. Millican, T., D. Turner, and G. Thomas. 1984. Checklist of the species of fishes in Lake Maurepas, Louisiana. Proc. Louis. Acad. Sci. 47: 30-33.
601. Milligan, M.R. 1979. Species composition and distribution of benthic macroinvertebrates in a Mississippi estuary. Unpubl. M.S. thesis, Univ S. Miss. 259 pp.
602. Millikin, M.R., and A.B. Williams. 1984. Synopsis of biological data on the blue crab, *Callinectes sapidus* Rathbun. FAO Fish. Synop. 138.
603. Mills, J.G., Jr. 1972. Biology of the Alabama shad in northwest Florida. Fla. Dept. Nat. Res. Mar. Res. Res. Lab. Tech. Ser. 60.
604. Mills, W.P., III. 1976. Ichthyofauna of Whisky Chitto Creek, southwest Louisiana. Unpubl. M.S. thesis, Univ. Southwest. Louis., 53 pp.
605. Minello, T.J., and R.J. Zimmerman. 1985. Differential selection of vegetative structure between juvenile brown shrimp (*Penaeus aztecus*) and white shrimp (*P. setiferus*) and implications in predator prey relationships. Est. Coast. Shelf Sci. 20: 707-716
606. Minello, T.J., R.J. Zimmerman, and T.E. Czapla. 1989. Habitat-related differences in diets of small fishes in Lavaca Bay, Texas, 1985-1986. NOAA Tech. Memo. NMFS-SEFC-236. 16 p.
607. Minello, T.J., R.J. Zimmerman, and E.X. Martinez. 1989. Mortality of young brown shrimp *Penaeus aztecus* in estuarine nurseries. Trans. Am. Fish. Soc. 118: 693-708.
608. Mock, C.R. 1966. Natural and altered estuarine habitats of Penaeid shrimp. Proc. Gulf Caribb. Fish. Inst. 19: 86-98.
609. Moffet, A.W. 1961. Movements and growth of spotted seatrout, *Cynoscion nebulosus* (Cuvier), in West Florida. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 36: 1-35.

610. Moffett, A.W. 1963. Population studies of the blue crabs of the Matagorda Bay System. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 3; 6 p.
611. Moffett, A.W. 1964. A study of the Texas populations of juvenile shrimp. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 1-49.
612. Moffett, A.W. 1964. A study of juvenile shrimp populations of the Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 51-67.
613. Moffett, A.W. 1965. A study of the Texas shrimp populations. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 1-30.
614. Moffett, A.W. 1965. A study of the Texas Bay populations of juvenile shrimp. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 1-45.
615. Moffett, A.W. 1965. A study of the juvenile shrimp populations of the Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 47-70.
616. Moffett, A.W. 1966. A study of commercial shrimps in coastal bays of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 1-26.
617. Moffett, A.W. 1967. A study of commercial shrimp populations in coastal bays of Texas, 1967. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1967: 19-48.
618. Moffett, A.W. 1968. A study of Texas shrimp populations - 1968. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1968: 67-93.
619. Moffett, A.W. 1970. A study of Texas shrimp populations - 1969. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 169-183.
620. Moffett, A.W. 1970. A study of Texas shrimp populations - 1970. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1969 and 1970: 185-206.
621. Moffett, A.W. 1971. A study of brown shrimp in the Texas coastal bays. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1971: 191-208.
622. Moffett, A.W. 1972. Shrimp populations in Texas - 1972. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1972: 1-36.
623. Moffett, A.W. 1975. The hydrography and macrobiota of the Chocolate Bayou estuary Brazoria County, Texas (1969-1971). Tex. Parks Wildl. Dept. Tech. Ser. No. 14: 72 p.
624. Moffett, A.W., and L.W. McEachron. 1973. Shrimp populations in Texas, 1973. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1973: 1-21.
625. Moffett, A.W., and L.W. McEachron. 1974. A study of the Texas shrimp populations, 1974. Tex. Parks Wildl. Dept., Coast. Fish. Proj. Rep. 1974: 1-39.
626. Moffett, A.W., L.W. McEachron and J.G. Key. 1979. Observations on the biology of sand seatrout (*Cynoscion arenarius*) in Galveston and Trinity Bays, Texas. Contrib. Mar. Sci. 22: 163-172.
627. Moffett, A.W., and W.R. More. 1964. Population studies of the blue crabs of the Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 531-544.
628. Moffett, A.W., and F.A. Murray. 1963. Population studies of the sports and commercial fin-fish and forage species of the Matagorda Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 3; 9 p.
629. Moffett, A.W., and F.A. Murray. 1963. Study of oyster growth and population structure in of the public reefs in Matagorda, Tres Palacios and East Matagorda Bays. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 9; 13 p.
630. Montague, C.L., R.D. Bartleson, and J.A. Ley. 1989. Assessment of benthic communities along salinity gradients in northeastern Florida Bay. Final Rep. for NPS CA 5280-5-8004 to Univ. of Fla. and South Fla. Water Mgt. Dist., from S. Fla. Research Ctr., Everglades Natl. Park, Homestead, Fla. 155 p. + App.
631. Moore, D.R. 1961. The marine and brackish water Mollusca of the State of Mississippi. Gulf Res. Rep. 1(1): 1-58
632. Moore, R.H. 1974. General ecology, distribution and relative abundance of *Mugil cephalus* and *Mugil curema* on the south Texas coast. Contrib. Mar. Sci. 18: 241-255.
633. Moore, R.H. 1978. Variations in the diversity of summer estuarine fish populations in Aransas Bay, Texas, 1966-1973. Est. Coast. Shelf Sci. 6: 495-501.

634. Morales, J.T., and M.R. Dardeau. 1987. Food habits of early juvenile red drum (*Sciaenops ocellatus*) in coastal Alabama. In T.A. Lowery (ed.), Symposium on the natural resources of the Mobile Bay estuary. p. 38-42. Miss./Ala. Sea Grant, MASGP-87-007.
635. More, W.R. 1964. Population studies of the sports and commercial fin-fish and forage species of the Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 281-309.
636. More, W.R. 1965. Population studies of the sports and commercial fin-fish of the Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 231-249.
637. More, W.R. 1965. A study of the blue crabs of Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1965: 213-234.
638. More, W.R. 1966. Studies of blue crabs in Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1966: 27-38.
639. More, W.R. 1969. A contribution to the biology of the blue crab (*Callinectes sapidus*) in Texas, with a description of the fishery. Tex. Parks Wildl. Dept. Tech. Ser. No. 1: 31 p.
640. More, W.R., and A.W. Moffett. 1965. Population studies of the blue crabs of Galveston Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 551-574.
641. Mosely, F.W., and B.J. Copeland. 1975. Appendix to the Final Report on the Ecology of Cox Bay, Texas 1969-1973. Central Power and Lighting Company.
642. Mountain, J.A. 1972. Further thermal addition studies at Crystal River, Florida - with an annotated checklist of marine fishes collected 1969-1971. Fla. Dept. Nat. Res. Mar. Res. Lab. Prof. Paper Ser. 20.
643. Muncy, R.J. 1984. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)- pinfish. U.S. Fish Wildl. Serv. FWS/OBS-82/11.26.
644. Muncy, R.J. 1984. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)—white shrimp. U.S. Fish Wildl. Serv. FWS/OBS-82/11.20.
645. Muncy, R.J., and W.M. Wingo. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)- sea catfish and gafftopsail catfish. U.S. Fish Wildl. Serv. Biol. Rep. 82-4.
646. Munro, G.J. 1965. Population studies of the sports and commercial fin-fish of the Matagorda Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 267-281.
647. Munro, G.J. 1965. A study of the juvenile shrimp populations of the Matagorda Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 71-88.
648. Munro, J.L., A.C. Jones, and D. Dimitriou. 1968. Abundance and distribution of larval pink shrimp (*Penaeus duorarum*) on the Tortugas Shelf of Florida, August 1962 - October 1964. Fish. Bull., U.S. 67:165-181.
649. Murphy, M.D., and R.G. Taylor 1989. Reproduction and growth of black drum, *Pogonias cromis*, in northeast Florida. NE Gulf Sci. 10(2): 127-137.
650. Murphy, M.D., and R.G. Taylor. 1990. Reproduction, growth, and mortality of red drum *Sciaenops ocellatus* in Florida waters. Fish. Bull., U.S. 88: 531-542.
651. Murray, F.A. 1965. A study of populations of juvenile shrimp in the Matagorda Bay area. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 69-78.
652. Murray, F.A., and A.W. Moffett. 1963. Populations of shrimp in the Matagorda Bay complex. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 4; 7 p.
653. Nakamura, E.L. 1976. Scombrid fishes in St. Andrew Bay, Florida. Bull. Mar. Sci. 26: 619-621.
654. Naughton, S.P., and C.H. Saloman. 1978. Fishes of the nearshore zone of St. Andrew Bay, Florida, and adjacent coast. Northeast Gulf Sci. 2: 43-55.
655. Neck, R.W. 1987. Freshwater bivalves of the Baffin Bay drainage basin, southern Texas. Tex. J. Sci. 39: 177-182.
656. Nelson, W.R. 1969. Studies on the croaker, *Micropogon undulatus* Linnaeus, and the spot, *Leiostomus xanthurus* Lacepede, in Mobile Bay, Alabama. J. Mar. Sci. Ala. 1: 4-92.

657. NMFS (National Marine Fisheries Service). 1986. Secretarial fishery management plan regulatory impact review and regulatory flexibility analysis for the red drum fishery of the Gulf of Mexico. Prepared by the National Marine Fisheries Service, NOAA, U.S. Dept. of Commerce.
658. NOAA (National Oceanic and Atmospheric Administration). 1985. Gulf of Mexico Coastal and Ocean Zones Strategic Assessment: Data Atlas. Strategic Assessment Branch, NOS/NOAA. Rockville, MD.
659. Norden, C.R. 1966. The seasonal distribution of fishes in Vermilion Bay, Louisiana. *Wisc. Acad. Sci. Arts Let.* 55: 119-137.
660. Odum, W.E. 1969. Pathways of energy flow in a south Florida estuary. Ph.D. dissertation, Univ. of Miami, Coral Gables, Fla. 162 p.
661. Oesterling, M.L., and C.A. Adams. 1982. Migration of blue crabs along Florida's Gulf coast. In H.M. Perry and W.A. Engle (eds.), *Proceedings of the Blue Crab Colloquium October 18-19, 1979*. p. 37-57. Gulf States Mar. Fish. Comm., Biloxi, Miss.
662. Oesterling, M.L., and G.L. Evink. 1977. Relationship between Florida's blue crab population and Apalachicola Bay. In R.J. Livingston and E.A. Joyce, Jr. (eds.), *Proceedings of the Conference on the Apalachicola Drainage System, 23-24 April, Gainesville, Florida*, p. 101-121. Fla. Mar. Res. Publ. 26.
663. Ogle, J.T. 1980. A study of four oyster reefs in Mississippi. *Gulf Res. Rep.* 6: 261-265.
664. Ogle, J.T. 1982. Operation of an oyster hatchery utilizing a brown water culture technique. *J. Shellfish Res.* 2(2): 153-156.
665. Ogren, L.H., and H.A. Brusher. 1977. The distribution and abundance of fishes caught with a trawl in the St. Andrew Bay System, Florida. *Northeast Gulf Sci.* 1: 83-105.
666. Olinger, L.W., R.G. Rogers, P.L. Fore, R.L. Todd, B.L. Mullins, F.T. Bisterfeld, L.A. Wise, II. 1975. Environmental and recovery studies of Escambia Bay and the Pensacola Bay system, Florida. U.S. Environmental Protection Agency, Region IV, Surveillance and Analysis Division, Escambia Bay Recovery Study.
667. Osborn, K.W. 1962. Life history study of the commercial oyster in the lower Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MO-R-4: Job No. 2; 6 p.*
668. Osborn, K.W. 1963. Population studies of the blue crabs of the lower Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 8; 5 p.*
669. Osborn, K.W. 1963. Populations of juvenile shrimp in the lower Laguna Madre. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 9; 7 p.*
670. Osburn, H.R., and M.O. Ferguson. 1987. Trends in finfish landings by sport-boat fisherman in Texas marine waters, May 1974 - May 1986. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 119: 464 p.*
671. Osburn, H.R., G.C. Matlock and A.W. Green. 1982. Red drum (*Sciaenops ocellatus*) movement in Texas bays. *Contrib. Mar. Sci.* 25: 885-97.
672. Osburn, H.R., M.F. Osborn and H.R. Maddux. 1988. Trends in finfish landings by sport-boat fishermen in Texas marine waters, May 1974-May 1987. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 150: 573.*
673. Overstreet, R.M. 1983. Aspects of the biology of the spotted seatrout, *Cynoscion nebulosus*, in Mississippi. *Gulf Res. Rep., Suppl. 1: 1-43.*
674. Overstreet, R.M. 1983. Aspects of the biology of the red drum, *Sciaenops ocellatus*, in Mississippi. *Gulf Res. Rep., Suppl. 1: 45-68.*
675. Overstreet, R.M., and R.W. Heard. 1978. Food of the Atlantic croaker, *Micropogonias undulatus*, from Mississippi Sound and the Gulf of Mexico. *Gulf Res. Rep.* 6(2): 145-152.
676. Overstreet, R.M., and R.W. Heard. 1978. Food of the red drum, *Sciaenops ocellatus*, from Mississippi Sound. *Gulf Res. Rep.* 6(2): 131-136.
677. Overstreet, R.M., and R.W. Heard. 1982. Food Contents of six commercial fishes from Mississippi Sound. *Gulf Res. Rep.* 7(2): 137-150.
678. Paille, R.F., T.J. Hess, Jr., R.J. Moertle, and K.P. Guidry. 1989. A comparison of white shrimp production within actively versus passively managed semi-impounded marsh nurseries. In Duffy, W.G., and D. Clark (eds.), *Marsh Management in Coastal Louisiana: Effects and Issues - Proceedings of a Symposium*, p. 170-180. U.S. Fish Wildl. Serv. Biol. Rep. 89(22): 378 pp.

Appendix 4, continued. References

679. Parker, J.C. 1965. An annotated checklist of the fishes of the Galveston Bay System, Texas. Publ. Inst. Mar. Sci., Univ. Texas 10: 201-220.
680. Parker, J.C. 1970. Distribution of juvenile brown shrimp (*Penaeus aztecus* Ives) in Galveston Bay, Texas, as related to certain hydrographic features and salinity. Contrib. Mar. Sci. 15: 1-12.
681. Parker, J.C. 1971. The biology of the spot, *Leiostomus xanthurus*, and Atlantic croaker, *Micropogon undulatus*, in two Gulf of Mexico areas. Tex. A&M Univ. Sea Grant Publ., TAMU-SG-71-210: 182 pp.
682. Parker, R.H. 1956. Macro-invertebrate assemblages as indicators of sedimentary environments in East Mississippi delta region. Bull. Am. Assoc. Petrol. Geol. 40: 295-376.
683. Parker, R.H. 1959. Macroinvertebrate assemblages of Central Texas coastal bays and Laguna Madre. Bull. Am. Assoc. Petrol. Geol. 43: 2100-2166.
684. Parker, R.H. 1960. Ecology and distributional patterns of marine macro-invertebrates, northern Gulf of Mexico. In F.P. Shepard, F.B. Phleger, and T.H. van Andel (eds.), Recent Sediments, Northwest Gulf of Mexico, 1951-1958. Am. Assoc. Petrol. Geol., Tulsa, Oklahoma. 394 pp.
685. Parrish, P.R. 1968. Seasonal occurrence of marine and freshwater fishes in relation to salinity and temperature in the lower Ochlocknee River, Florida. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
686. Parrish, P.R., and R.W. Yerger. 1973. Ochlockonee River fishes: salinity-temperature effects. Fla. Sci. 36:179-186.
687. Parsons, G.R., and K.M. Peters. 1989. Age determination in larval and juvenile sheepshead, *Archosargus probatocephalus*. Fish. Bull., U.S. 87: 985-988.
688. Pearson, J.C. 1928. Natural history and conservation of redfish and other commercial sciaenids on the Texas Coast. Bull. Bur. Fish. U.S. Dept. Co 44: 129-214.
689. Peebles, E.B., and S.E. Davis. 1989. Riverine discharge and estuarine fish nurseries: 1st annual report for the ichthyoplankton survey of the Little Manatee River, Florida. Dept. Mar. Sci., Univ. S. Fla., Tampa, Fla.
690. Peebles, E.B., and S.G. Tolley. 1988. Distribution, growth, and mortality of larval spotted seatrout, *Cynoscion nebulosus*: A comparison between two adjacent estuarine areas of Southwest Florida. Bull. Mar. Sci. 42: 397-410.
691. Penn, G.J. 1979. Decapod crustacean communities in Texas seagrasses. Ph.D. dissertation, Univ. Houston, Houston, Tex., 128 p.
692. Pérez-Farfante, I. 1969. Western Atlantic shrimps of the genus *Penaeus*. Fish. Bull., U.S. 67(3): 461-591.
693. Perret, W.S. 1967. Occurrence, abundance, and size distribution of the blue crab, *Callinectes sapidus*, taken with otter trawl in Vermilion Bay, Louisiana, 1964-65. Proc. Louis. Acad. Sci. 30: 63-69.
694. Perret, W.S., B.B. Barrett, W.R. Latapie, J.F. Pollard, W.R. Mock, G.B. Adkins, W.J. Gaidry, C.J. White. 1971. Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Phase I, area description and Phase IV, biology. Louis. Wildl. Fish. Comm. 175 p.
695. Perret, W.S., and C.W. Caillouet, Jr. 1974. Abundance and sizes of fishes taken by trawling in Vermilion Bay, Louisiana. Bull. Mar. Sci. 24: 52-75.
696. Perret, W.S., W.R. Latapie, J.F. Pollard, W.R. Mock, G.B. Adkins, W.J. Gaidry, and C.J. White. 1971. Fishes and invertebrates collected in trawl and seine samples in Louisiana estuaries. In Cooperative Gulf of Mexico estuarine inventory and study, Louisiana. Louis. Wildl. Fish. Comm., New Orleans, Louis. 41- 105.
697. Perret, W.S., J.E. Weaver, R.O. Williams P.L. Johansen, T.D. McIlwain, R.C. Raulerson, and W.M. Tatum. 1980. Fishery profiles of red drum and spotted seatrout. Gulf States Mar. Fish. Comm. No. 6.
698. Perry, A. 1978. Fish of Timbalier Bay and offshore Louisiana environments collected by trawling. Rice Univ. Stud.: 537-545.
699. Perry, H.M. (ed.). 1982. A profile of the blue crab fishery of the Gulf of Mexico. Completion Report, contract number 000-010, Gulf States Mar. Fish. Comm.
700. Perry, H.M. 1975. The blue crab fishery in Mississippi. Gulf Res. Rep. 5(1): 39-57.
701. Perry, H.M., and D.L. Boyes. 1978. Menhaden and other coastal pelagic fish. Nat. Mar. Fish. Serv., Fisheries Assessment Compl. Rep., Proj. No. PL88-309-2-215-4. Pp. 169-206.

702. Perry, H.M., and K.C. Stuck. 1979. The life history of the blue crab in Mississippi with notes on larval distribution. Proceedings of the Blue Crab Colloquium. Pp. 17-22.
703. Perry, W.G. 1981. Seasonal abundance and distribution of brown and white shrimp in a semi-impounded Louisiana coastal marsh. Proc. Louis. Acad. Sci. 44: 102-111.
704. Perry, W.G. 1983. Observations of the finfish standing stock crop, Sabine National Wildlife Refuge. Proc. Louis. Acad. Sci. 46: 17-28.
705. Peters, K.M., and R.H. McMichael, Jr. 1987. Early life history of the red drum, *Sciaenops ocellatus* (Pisces: sciaenidae), in Tampa Bay, Florida. Estuaries 10: 92-107.
706. Peters, K.M., and R.H. McMichael, Jr. 1990. Early life history of the black drum, *Pogonias cromis*, in Tampa Bay, Florida. Northeast Gulf Sci. 11(1): 39-58.
707. Peterson, G.W. 1986. Distribution, habitat preferences, and relative abundance of juvenile spotted seatrout and red drum in the Caminada Bay estuary, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 96 p.
708. Peterson-Brown, N., P. Thomas and C.R. Arnold. 1988. Reproductive biology of the spotted seatrout, *Cynoscion nebulosus*, in south Texas. Fish. Bull., U.S. 86: 373-388.
709. Phillips, R.C., and V.G. Springer. 1960. A report on the hydrography, marine plants and fishes of the Caloosahatchee River area, Lee County, Florida. Fla. Board Cons. Spec. Sci. Rep. 5.
710. Phillips, T.D. 1976. Ichthyoplankton. In Ecological Studies at Big Bend, Tampa Bay, Florida. Tampa Electric Co. 27th Quarterly report, Appendix 5A, p. 304-316.
711. Phillips, T.D. 1986. Apollo Beach northern embayment fisheries (1984-1986), biological monitoring program, Big Bend Unit 4, final report. Submitted to Tampa Electric Company, Tampa, Fla. by Mote Marine Lab., Sarasota, Florida.
712. Philomena, A.L. 1983. The distribution of macrobenthos in Barataria Basin, Louisiana. Unpubl. M.S. thesis.
713. Pollard, J.F. 1973. Experiments to re-establish historical oyster seed grounds and to control the southern oyster drill. Louis. Wildl. Fish. Comm. Tech. Bull. No. 6: 82 p.
714. Powell, A.B., D.E. Hoss, W.F. Hettler, D.S. Peters, L. Simoneaux, and S. Wagner. 1987. Abundance and distribution of ichthyoplankton in Florida Bay and adjacent waters. South Florida Research Report SFRS-87/01.
715. Powell, A.B., D.E. Hoss, W.F. Hettler, D.S. Peters, and S. Wagner. 1989. Abundance and distribution of ichthyoplankton in Florida Bay and adjacent waters. Bull. Mar. Sci. 44: 35-48.
716. Powell, E.H., Jr., and G. Gunter. 1968. Observations on the stone crab, *Menippe mercenaria*, in the vicinity of Port Aransas, Texas. Gulf Res. Rep. 2(3): 285-300.
717. Powell, E.N., M.E. White, E.A. Wilson, and S.M. Ray. 1987. Small-scale spatial distribution of oysters (*Crassostrea virginica*) on oyster reefs. Bull. Mar. Sci. 41: 835-855.
718. Powell, G.V.N., S. Sogard, and J.G. Holmquist. 1986. Ecology of shallow water bank habitats in Florida Bay. Final report for Contract CX5280-3-2-2339, S. Fla. Res. Ctr., U.S. Natl. Park Serv., Everglades Natl. Park, Homestead, Fla.
719. Price, W.W., and R.A. Schlueter. 1985. Fishes of the littoral zone of McKay Bay, Tampa Bay System, Florida. Fla. Sci. 48: 83-96.
720. Pristas, P.J., and L. Trent. 1977. Comparisons of catches of fishes in gill nets in relation to webbing material, time of day, and water depth in St. Andrew Bay, Florida. Fish. Bull., U.S. 75: 103-108.
721. Pristas, P.J., and L. Trent. 1978. Seasonal abundance, size, and sex ratio of fishes caught with gill nets in St. Andrew Bay, Florida. Bull. Mar. Sci. 28: 581-589.
722. Pullen, E.J. 1960. Collection and identification of vertebrate forms present in Area M-2 and determine their relative seasonal abundance. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-2-R-2: Job No. A-2; 11 p.
723. Pullen, E.J. 1960. A checklist of invertebrate animals: abundance and distribution with regards to hydrologic conditions. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. M-2-R-2: Job No. B-2; 14 p.

Appendix 4, continued. References

724. Pullen, E.J. 1962. An ecological survey of area M-2, a study of the fishes of upper Galveston Bay. Tex. Game and Fish Comm., Mar. Fish Div. Proj. Rep., 1960-1961, Proj. No. M-2-R-3: 1-28.
725. Pullen, E.J. 1963. A study of the bay and gulf populations of shrimp: *Penaeus aztecus*, *Penaeus setiferus* and *Penaeus duorarum*. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 1; 53 p.
726. Pullen, E.J. 1963. Population studies of the blue crabs of the Galveston Bay System. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 2; 11 p.
727. Pullen, E.J. 1963. A study of the juvenile shrimp populations, *Penaeus aztecus* and *Penaeus setiferus*, of Galveston Bay. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 3; 23 p.
728. Pullen, E.J., and W.L. Trent. 1969. White shrimp emigration in relation to size, sex, temperature and salinity. FAO Fish. Rep. 57: 1001-1013.
729. Purcell, B.H. 1977. The ecology of the epibenthic fauna associated with *Vallisneria americana* beds in a North Florida estuary. Unpubl. M.S. thesis, Fla. St. Univ., Tallahassee, Fla.
730. Raney, E.C., R.H. Bachus, R.W. Crawford, and C.R. Robins. 1953. Reproductive behavior in *Cyprinodon variegatus* Lacepede, in Florida. Zoologica 38: 97-104.
731. Reagan, R.E. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-red drum. U.S. Fish Wildl. Serv. Biol. Rep. 82 (11.36).
732. Reagan, R.E., Jr., and W.M. Wingo. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-southern flounder. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.30).
733. Reid, G.K. 1954. An ecological study of the Gulf of Mexico fishes in the vicinity of Cedar Key, Florida. Bull. Mar. Sci. 4: 1-94.
734. Reid, G.K. 1956. Ecological investigations in a disturbed Texas Coastal estuary. Tex. J. Sci. 8: 296-327.
735. Reid, G.K. 1957. Biologic and hydrographic adjustment in a disturbed Gulf coast estuary. Limnol. Oceanogr. 2: 198-212.
736. Reid, G.K., A. Inglis and H.D. Hoese. 1956. Summer foods of some fish species in East Bay, Texas. Southwest Nat. 1: 100-104.
737. Reid, G.K., Jr. 1955. A summer study of the biology and ecology of East Bay, Texas. Part II. The fish fauna of East Bay, the Gulf of Mexico, and summary. Tex. J. Sci. 7: 430-453.
738. Reid, G.K., Jr. 1958. Size distribution of fishes in a Texas estuary. Copeia 3: 225-231.
739. Renfro, W.C. 1959. Check list of the fishes and commercial shrimp of area M-2. Tex. Game and Fish Comm., Marine Lab. Rep., 1959, Proj. No. M-2-R-1: Job No. A2; 30 p.
740. Renfro, W.C. 1960. Salinity relations of some fishes in the Aransas River, Texas. Tulane Stud. Zool. 8: 83-91.
741. Rice, K.W. 1979. An investigation of the Spanish mackerel, *Scomberomorus maculatus* (Mitchill), along the Texas coast. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 3: 11 p.
742. Rice, K.W., L.W. McEachron and P.C. Hammerschmidt. 1988. Trends in relative abundance and size of selected finfishes in Texas bays: November 1975-December 1986. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 139: 192 p.
743. Richmond, E.A. 1962. The fauna and flora of Horn Island, Mississippi. Gulf Res. Rep. 1(2): 59-106.
744. Richmond, E.A. 1968. A supplement to the fauna and flora of Horn Island, Mississippi. Gulf Res. Rep. 2: 213-254.
745. Rickner, J.A. 1975. Seasonal variation of selected marine macro-fauna in a seagrass community bordering Stedman Island, Redfish Bay, Texas. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 107 p.
746. Rivas, L.R. 1954. The origin, relationships, and geographical distribution of the marine fishes of the Gulf of Mexico. Fish. Bull., U.S. 89: 503-505.
747. Rivas, L.R. 1962. The Florida fishes of the genus *Centropomus*, commonly known as snook. Q. Fla. Acad. Sci. 25: 53-64.

748. Robblee, M.B., and J.T. Tilmant. 1989. Distribution, abundance, and recruitment of the pink shrimp (*Penaeus duorarum*) within Florida Bay (Abstract). *Bull. Mar. Sci.* 44(1): 522.
749. Roberts, T.W. 1982. A preliminary analysis of pink shrimp (*Penaeus duorarum*) size and abundance during the Tortugas shrimp sanctuary study, September 1981-February 1982. NOAA Tech. Memo. NMFS-SEFC-104. 95 p.
750. Robinette, H.R. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-bay anchovy and striped anchovy. U.S. Fish Wildl. Serv. FWS/OBS-82/11.14.
751. Robinson, D.T. 1959. The ichthyofauna of the lower Rio Grande, Texas and Mexico. *Copeia* 1959: 253-256.
752. Robison, D.E. 1985. Variability in the vertical distribution of ichthyoplankton in lower Tampa Bay. In S.F. Trent, J.L. Simon, R.R. Lewis III, and R.L. Whitman, Jr. (eds.), Tampa Bay area scientific information symposium May, 1982, p. 359-383. Burgess Publishing Co., Minneapolis, Minn.
753. Roessler, M.A. 1970. Checklist of fishes in Buttonwood Canal, Everglades National Park, Florida, and observations on the seasonal occurrence and life histories of selected species. *Bull. Mar. Sci.* 20: 861-893.
754. Roessler, M.A., and R.G. Rehner. 1971. Relation of catches of postlarval pink shrimp in Everglades Natl. Park, Florida, to the commercial catches on the Tortugas Grounds. *Bull. Mar. Sci.* 21: 790-805.
755. Rogers, B.D. 1979. The spatial and temporal distribution of Atlantic croaker, *Micropogon undulatus*, and spot, *Leiostomus xanthurus*, in the upper drainage basin of Barataria Bay, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 96 p.
756. Rogers, B.D., and W.H. Herke. 1985. Estuarine-dependent fish and crustacean movements and weir management. Fourth Coastal Marsh and Estuarine Management Symposium 4: 201-219.
757. Rogers, B.D., and W.H. Herke. 1985. Temporal patterns and size characteristics of migrating juvenile fishes and crustaceans in a Louisiana marsh. Louisiana Agricultural Experimental Station, Louis. St. Univ. Agricultural Center, Baton Rouge, Louis., Res. Rep. No. 5: 81 p.
758. Rogers, B.D., and W.H. Herke. 1987. Diel otter trawl catch of Atlantic croaker, *Micropogonias undulatus*, in a Louisiana estuary. *Northeast Gulf Sci.* 9: 147-152.
759. Rogers, B.D., W.H. Herke, and J.A. Grimes. 1983. A study of the seasonal presence, relative abundance, movements and use of habitat types by estuarine-dependent fishes and economically important decapod crustaceans of the Sabine National Wildlife Refuge. In Shabica, S.V., N.B. Cofer, and E.W. Cake, Jr. (eds.). Proc. Northern Gulf of Mexico Estuaries and Barrier Islands Research Conference. 13-14 June 1983, Biloxi, Miss. U.S. Natl. Park Serv., Atlanta, Ga. 191 pp.
760. Rogers, D.R. 1989. Effects of rock and standard weirs on fish and macrocrustacean communities. M.S. thesis, Louis. St. Univ., Baton Rouge: 143 p.
761. Ross, J.L. 1983. Seasonal occurrence of black drum, *Pogonias cromis*, and red drum, *Sciaenops ocellatus*, off Texas. *Northeast Gulf Sci.* 6: 67-70.
762. Ross, S.T., R.H. McMichael Jr., and D.L. Ruple. 1987. Seasonal and diel variations in the standing crop of fishes and macroinvertebrates from a Gulf of Mexico surf zone. *Est. Coast. Shelf Sci.* 25: 391-412.
763. Rounsefell, G.A. 1964. Preconstruction study of the fisheries of the estuarine areas traversed by the Mississippi River-Gulf Outlet Project. *Fish. Bull., U.S.* 63: 373-393.
764. Rozas, L.P., and M.W. LaSalle. 1990. A comparison of the diets of gulf killifish, *Fundulus grandis*, entering and leaving a Mississippi brackish marsh. *Estuaries* 13: 332-336.
765. Ruebsamen, R.N. 1972. Some ecological aspects of the fish fauna of a Louisiana intertidal pond system. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 80 p.
766. Rulifson, R.A., and M.T. Huish. 1982. Anadromous fish in the southeastern United States and recommendations for development of a management plan. Contract No. 14-16-0004-80-077 for U.S. Fish Wildl. Serv., Region 4, Regional Office, Atlanta, Ga.
767. Rulifson, R.A., M.T. Huish, and R.W. Thoesen. 1982. Status of anadromous fishes in Southeastern U.S. estuaries. In V.S. Kennedy (ed.), *Estuarine Comparisons*, p. 413-425. Academic Press, New York.
768. Ruple, D.L. 1984. Occurrence of larval fishes in the surf zone of a northern Gulf of Mexico barrier island. *Est. Coast. Shelf Sci.* 18: 191-208.

Appendix 4, continued. References

769. Russell, R. 1965. Some notes on the life history of shrimps of commercial importance in the Gulf of Mexico- a literature review. Unpubl. document. Gulf Coast Research Lab. Library, Ocean Springs, Miss.
770. Rutherford, E.S., T.W. Schmidt, and J. Tilmant. 1986. The distribution and abundance of larval and juvenile spotted seatrout, red drum, gray snapper, and snook within Florida Bay. U.S. Natl. Park Serv. S. Fla. Res. Cent. Rep. SFRC-86/07.
771. Rutherford, E.S., T.W. Schmidt, and J. Tilmant. 1989. Early life history of spotted seatrout (*Cynoscion nebulosus*) and gray snapper (*Lutjanus griseus*) in Florida Bay, Everglades National Park, Florida. Bull. Mar. Sci. 44: 49-64.
772. Rutherford, E.S., E.B. Thue, and D.G. Buker. 1983. Population structure, food habits and spawning activity of gray snapper *Lutjanus griseus*, in Everglades National Park. U.S. Natl. Park Serv., S. Fla. Res. Cent. Rep. SFRC-83/02.
773. Rutherford, E.S., J.T. Tilmant, E.B. Thue, and T.W. Schmidt. 1989. Fishery harvest and population dynamics of spotted seatrout, *Cynoscion nebulosus*, in Florida Bay and adjacent waters. Bull. Mar. Sci. 44(1): 108-125.
774. Rutherford, E.S., J.T. Tilmant, E.B. Thue, and T.W. Schmidt. 1989. Fishery harvest and population dynamics of gray snapper, *Lutjanus griseus*, in Florida Bay and adjacent waters. Bull. Mar. Sci. 44(1): 139-154.
775. Sabins, D.S., and F.M. Truesdale. 1974. Diel and seasonal occurrence of immature fishes in a Louisiana tidal pass. Southeast Assoc. Game and Fish Comm. 28: 161-171.
776. Saloman, C.H., and S.P. Naughton. 1979. Fishes of the littoral zone, Pinellas County, Florida. Fla. Sci. 42(2):85-93.
777. Saloman, C.H., S.P. Naughton, and J.L. Taylor. 1982. Benthic faunal assemblages of shallow water, sand, and seagrass habitats, St. Andrew Bay, Florida. U.S. Fish Wildl. Serv., Panama City, Florida.
778. Sastry, A.N. 1963. Reproduction of the bay scallop, *Aequipecten irradians* Lamarck. Influences of temperature on maturation and spawning. Biol. Bull. 125: 146-153.
779. Schmidt, T.W. 1976. Seasonal biomass estimates of marine and estuarine fishes within Everglades National Park, May 1973 to July 1974. In Proceedings of the First Conference on Scientific Research in the National Parks, Vol 1, p. 665-672. U.S. Dept. Int., Natl. Park Serv.
780. Schmidt, T.W. 1979. Ecological study of fishes and the water quality characteristics of Florida Bay, Everglades Natl. Park, Fla. Final Rep. RSP-EVER-N-36. S. Fla. Research Ctr., Everglades Natl. Park, Homestead, Fla. 144 p.
781. Schmidt, T.W. In press. Life history aspects of selected dominant fishes and decapod crustaceans in the Whitewater Bay/Shark River estuary, Everglades Natl. Park, Florida. Tech. Rep. (submitted). S. Fla. Research Ctr., Everglades Natl. Park, Homestead, Fla.
782. Schomer, N.S., and R.D. Drew. 1982. An ecological characterization of the lower Everglades, Florida Bay and the Florida Keys. U.S. Fish Wildl. Serv. FWS/OBS-82/58.1.
783. Schultz, R.L. 1963. Population studies of the blue crab, *Callinectes sapidus* Rathbun, in the Aransas Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MC-R-1: Job No. 5; 10 p.
784. Schultz, R.L. 1963. Population studies of the sports and commercial fin-fish and forage species of the Aransas Bay system. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MF-R-4: Job No. 5; 24 p.
785. Schultz, R.L. 1963. A study of populations of juvenile shrimp in Aransas Bay complex. Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep. 1961-1962, Proj. No. MS-R-4: Job No. 6; 10 p.
786. Schultz, R.L. 1964. Population studies of the sports and commercial fin-fish and forage species of the Aransas Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 335-354.
787. Schultz, R.L. 1964. Population studies of the blue crabs of the Aransas Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 553-567.
788. Schultz, R.L. 1964. A study of populations of juvenile shrimp in the Aransas Bay complex. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1963: 91-104.

789. Schultz, R.L. 1965. Population studies of the sports and commercial fin-fish of the Aransas Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 295-314.
790. Schultz, R.L. 1965. Population studies of the blue crabs of the Aransas Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 595-600.
791. Schultz, R.L. 1965. A study of the juvenile shrimp populations of the Aransas Bay system. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Proj. Rep. 1964: 97-105.
792. Seagle, J.H. 1969. Predator-prey relationships in turtle grass (*Thalassia testudinum* Konig) beds in Redfish Bay, Texas. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 117 p.
793. Seagle, J.H. 1969. Food habits of spotted sea trout (*Cynoscion nebulosus*, Cuvier) frequenting turtle grass (*Thalassia testudinum*, Konig) beds in Redfish Bay, Texas. TAIUS 1: 58-63.
794. Seaman, W., Jr., and M. Collins. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Florida) - snook. U.S. Fish Wildl. Serv. FWS/OBS-82/11.16. 16p.
795. Settine, R.L., S.A. Barker, and K.R. Marion. 1983. Bivalves as indicators of environmental pollution: A pilot study of oysters (*Crassostrea virginica*) in Mobile Bay. In Shabica, S.V., N.B. Cofer, and E.W. Cake, Jr. (eds.). Proc. Northern Gulf of Mexico Estuaries and Barrier Islands Research Conference. 13-14 June 1983, Biloxi, Miss. U.S. Natl. Park Serv., Atlanta, Ga. 191 pp.
796. Shaver, D.J. 1984. The surf zone fish fauna of the Padre Island National Seashore. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 231 p.
797. Shaw, R.F., J.H. Cowan, Jr, and T.L. Tillman. 1985. Distribution and density of *Brevoortia patronus* (Gulf menhaden) eggs and larvae in the continental shelf waters of western Louisiana. Bull. Mar. Sci. 36: 96-103.
798. Shaw, R.F., and D.L. Drullinger. 1990. Early-life history profiles, seasonal abundance, and distribution of four species of carangid larvae off Louisiana, 1982-1983. NOAA Tech. Rep. NMFS 89, 37 p.
799. Shaw, R.F., B.D. Rogers, J.H. Cowan, Jr, and W.H. Herke. 1988. Ocean-estuary coupling of ichthyoplankton and nekton in the northern Gulf of Mexico (p). In M.P. Weinstein (ed.), Larval Fish and shellfish Transport through Inlets. Am. Fish. Soc. Symposium 3. Am. Fish. Soc., Bethesda, Md.
800. Shaw, R.F., W.J. Wiseman, Jr., R.E. Turner, L.J. Rouse, Jr., and R.E. Condrey. 1985. Transport of larval gulf menhaden *Brevoortia patronus* in continental shelf waters of western Louisiana: A hypothesis. Trans. Am. Fish. Soc. 114: 452-460.
801. Shepard, J. 1986. Spawning peak of southern flounder, *Paralichthys lethostigma*, in Louisiana. Louis. Dept. Wildl. Fish. Tech. Bull. 40: 77-80.
802. Sheridan, P.F. 1978. Trophic relationships of dominant fishes in the Apalachicola Bay system (Florida). Ph.D. thesis, Fla. St. Univ., Tallahassee, Fla.
803. Sheridan, P.F. 1979. Trophic resource utilization by three species of sciaenid fishes in a northwest Florida estuary. Northeast Gulf Sci. 3:1-15.
804. Sheridan, P.F. 1983. Abundance and distribution of fishes in the Galveston Bay system, 1963-1964. Contrib. Mar. Sci. 26: 143-163.
805. Sheridan, P.F., and R.J. Livingston. 1979. Cyclic trophic relationships of fishes in an unpolluted, river-dominated estuary in north Florida. In R.J. Livingston, (ed.), Ecological processes in coastal and marine systems, p. 143-161. Plenum Press, New York.
806. Sheridan, P.F., R.D. Slack, S.M. Ray, L.W. McKinney, E.F. Klima, and T.R. Calnan. 1989. Biological components of Galveston Bay. In Estuarine Programs Office. Galveston Bay: Issues, Resources, Status and Management (NOAA Estuary-of-the-Month Seminar Series No. 13). U.S. Dept. Comm., NOAA, EPO, Washington, D.C.
807. Sheridan, P.F., and D.L. Trimm. 1983. Summer foods of Texas coastal fishes relative to age and habitat. Fish. Bull., U.S. 81: 643-647.
808. Sheridan, P.F., D.L. Trimm, and B.M. Baker. 1984. Reproduction and food habits of seven species of northern Gulf of Mexico fishes. Contrib. Mar. Sci. 27: 175-204.
809. Shidler, J.K. 1960. Preliminary survey of invertebrate species. Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep., 1959-1960, Proj. No. MO-1-R-2: Job No. B-2b; 15 p.

Appendix 4, continued. References

810. Shipp, L.P. 1964. The vertical and horizontal distribution of decapod larvae in relation to some environmental conditions within a salt marsh area of the north central Gulf of Mexico. Unpubl. M.S. thesis, Univ. S. Ala., Mobile, Ala.
811. Shipp, R.L. 1979. Summary of knowledge of forage fish species of Mobile Bay and vicinity. In H.A. Loyacano, Jr., and J.P. Smith, (eds.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 167-176. U.S. Army Corps of Engineers, Mobile, Ala.
812. Shipp, R.L. 1982. Larval fish stocks. Dauphin Island Sea Lab Tech. Rep. 82-003.
813. Shipp, R.L. 1984. Fish stocks of the Alabama coastal area. Dauphin Island Sea Lab Tech. Rep. 84-002.
814. Shipp, R.L. 1987. Temporal distribution of finfish eggs and larvae around Mobile Bay. In T.A. Lowery (ed.), Symposium on the natural resources of the Mobile Bay estuary. p. 44-54. Miss./Ala. Sea Grant, MASGP-87-007.
815. Shlossman, P.A. 1980. Aspects of the life history of the sand seatrout, *Cynoscion arenarius* in the Gulf of Mexico. M.S. thesis, Tex. A&M Univ. College Station.
816. Shlossman, P.A., and M.E. Chittenden, Jr. 1981. Reproduction, movements, and population dynamics of the sand seatrout, *Cynoscion arenarius*. Fish. Bull., U.S. 9: 649-669.
817. Simmons, E.G. 1957. An ecological survey of the upper Laguna Madre of Texas. Publ. Inst. Mar. Sci., Univ. Texas 4: 156-200.
818. Simmons, E.G. 1959. Resurvey of the macroscopic flora and fauna of the upper Laguna Madre. Tex. Game and Fish Comm., Mar. Lab. Rep., 1959, Proj. No. M-8-R-1: Job No. A-2; 12 p.
819. Simmons, E.G., and J.P. Breuer. 1962. A study of redfish, *Sciaenops ocellatus* (Linnaeus) and black drum *Pogonias cromis* (Linnaeus). Publ. Inst. Mar. Sci., Univ. Texas 8: 184-211.
820. Simmons, E.G., and H.D. Hoese. 1959. Studies on the hydrography and fish migrations of Cedar Bayou, a natural tidal inlet on the central Texas coast. Publ. Inst. Mar. Sci., Univ. Texas 6: 56-80.
821. Simoneaux, L.F. 1979. The distribution of menhaden, genus *Brevoortia*, with respect to salinity, in the upper drainage basin of Barataria Bay, Louisiana. Unpubl. M.S. thesis, Louis. St. Univ.: 96 pp.
822. Simons, M.H., and C.P. Huckabee. 1971. An ecological study of a shallow hypersaline portion of the Laguna de los Olmos Bay, Texas. Unpubl. Rep. to the Biology Dept., Texas A&I Univ., Kingsville, Tex., 87 p.
823. Simpson, D.G. 1954. Two small tarpon from Texas. Copeia 1954: 71-72.
824. Simpson, D.G., and G. Gunter. 1956. Notes on habitats, systematic characters and life histories of Texas salt water cyprinodontes. Tulane Stud. Zool. 4: 115-134.
825. Sims, H.W., Jr., and R.J. Stokes. 1967. A survey of the hard shell clam *Mercenaria campechiensis* (Gmelin) population in Tampa Bay, Florida. Fla. Board Cons. Mar. Res. Lab. Spec. Sci. Rep. 17.
826. Smith, D.A. 1979. Documentation of the use of a brackish water estuarine zone as a nursery ground by penaeid shrimp. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 91 p.
827. Smith, D.G. 1980. Early larvae of the tarpon, *Megalops atlanticus*, with notes on spawning in the Gulf of Mexico and the Yucatan Channel. Bull. Mar. Sci. 30:136-141.
828. Smith, M.F., Jr., (ed.). 1984. Ecological characterization atlas of coastal Alabama: map narrative. U.S. Fish Wildl. Serv. FWS/OBS-82/64.
829. Snelson, F.F., Jr., T.J. Mulligan, and S.E. Williams. 1984. Food habits, occurrence and population structure of the bull shark, *Carcharhinus leucas*, in Florida coastal lagoons. Bull. Mar. Sci. 34: 71-80.
830. Sogard, S.M., D.E. Hoss, and J.J. Govoni. 1987. Density and depth distribution of larval gulf menhaden, *Brevoortia patronus*, Atlantic croaker, *Micropogonias undulatus*, and spot, *Leiostomus xanthurus*, in the northern Gulf of Mexico. Fish. Bull., U.S. 85: 601-609.
831. Sogard, S.M., G.V. Powell, and J.G. Holmquist. 1987. Epibenthic fishes on Florida Bay banks: relations with physical parameters and seagrass cover. Mar. Ecol. Prog. Ser. 40: 25-39.
832. Sogard, S.M., G.V.N. Powell, and J.G. Holmquist. 1989. Spatial distribution and trends in abundance of fishes residing in seagrass meadows on Florida Bay mudbanks. Bull. Mar. Sci. 44(1): 179-199.

833. Sogard, S.M., G.V.N. Powell, and J.G. Holmquist. 1989. Utilization by fishes of shallow, seagrass-covered banks in Florida Bay: diel and tidal patterns. *Environ. Biol. Fishes* 24: 81-92.
834. Soniat, T.M., and M.S. Brody. 1988. Field validation of a Habitat Suitability Index Model for the American oyster. *Estuaries* 11: 87-95.
835. Soniat, T.M., L.E. Smith, and M.S. Brody. 1989. Mortality and condition of the American oyster in Galveston Bay, Texas. *Contrib. Mar. Sci.* 31: 77-94.
836. Spears, R.W. 1986. Observations of red drum mortality in the Gulf of Mexico. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 112: 11 p.
837. Spiller, K.W. 1977. Biology of the grass shrimp, *Palaemonetes*, on the lower Texas coast. M.S. thesis, Texas A&I Univ., Kingsville, Texas, 70 p.
838. Spiller, K.W. 1982. The daytime fall southern flounder recreational fishery in three Texas passes. *Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser.*, No. 46: 28 p.
839. Springer, V.G. 1961. Notes on and additions to the fish fauna of the Tampa Bay area in Florida. *Copeia* 4: 480-482.
840. Springer, V.G., and A.J. McErlean. 1961. Spawning seasons and growth of the code goby, *Gobiosoma robustum* (Pisces: Gobiidae), in the Tampa Bay area. *Tulane Stud. Zool.* 9: 87-98.
841. Springer, V.G., and A.J. McErlean. 1962. Seasonality of fishes on a south Florida shore. *Bull. Mar. Sci. Gulf Caribb.* 12: 39-60.
842. Springer, V.G., and J. Pirson. 1958. Fluctuations in the relative abundance of sport fishes as indicated by the catch at Port Aransas, Texas 1952-1956. *Publ. Inst. Mar. Sci., Univ. Texas* 5: 169-185.
843. Springer, V.G., and D.K. Woodburn. 1960. An ecological study of the fishes of the Tampa Bay area. *Fla. Board Cons. Mar. Lab. Prof. Paper Ser.* 1: 1-104.
844. St. Amant, L.S., K.C. Corkum, and J.G. Broom. 1963. Studies on growth dynamics of the brown shrimp, *Penaeus aztecus*, in Louisiana waters. *Gulf Coast Fisheries Institute*: 14-26.
845. Stanley, J.G., and M.A. Sellers. 1986. Species profile: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-American oyster. *U.S. Fish Wildl. Serv. Biol. Rep.* 82(11.64).
846. Steele, P. 1979. A synopsis of the biology of the blue crab *Callinectes sapidus* Rathbun in Florida. In H.M. Perry and W.A. Van Engel (eds.), *Proceedings of the Blue Crab Colloquium, October 18-19, 1979*. p. 29-35. *Gulf States Mar. Fish. Comm.*, Biloxi, Miss.
847. Steen, J.P., Jr., and J.L. Laroche. 1983. The food of red drum (*Sciaenops ocellatus*) larvae and early juveniles taken from Mississippi Sound and the northern Gulf of Mexico. In Shabica, S.V., N.B. Cofer, and E.W. Cake, Jr. (eds.), *Proc. Northern Gulf of Mexico Estuaries and Barrier Islands Research Conference, 13-14 June 1983, Biloxi, Miss.* U.S. Natl. Park Serv., Atlanta, Ga. 191 pp.
848. Stevens, H.R., Jr. 1959. A general survey of fish species in Corpus Christi Bay. *Tex. Game and Fish Comm., Mar. Lab. Rep.*, 1959, Proj. No. M-7-R-1: Job No. A-2a, A-2b; 3 p.
849. Stevens, J.R. 1960. Checklist of the fishes of the Area M-1. *Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep.*, 1959-1960, Proj. No. M-1-R-1: Job No. A-2; 11 p.
850. Stevens, J.R. 1960. Checklist of invertebrates of Area M-1. *Tex. Game and Fish Comm., Mar. Fish. Div., Proj. Rep.*, 1959-1960, Proj. No. M-1-R-1: Job No. B-2; 5 p.
851. Stevens, J.R. 1963. Coordination of coastwide fin-fish investigations project. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep.* 1961-1962, Proj. No. MF-R-4: Job No. 1; 61 p.
852. Stevens, J.R. 1963. Population studies of the sports and commercial fin-fish and forage species of the Galveston Bay system. *Tex. Game and Fish Comm., Coast. Fish. Branch, Proj. Rep.* 1961-1962, Proj. No. MF-R-4: Job No. 2; 16 p.
853. Stickney, R.R. 1984. Estuarine ecology of the Southeastern United States and the Gulf of Mexico. *Tex. A&M Univ., College Station, Tex.*
854. Stokes, G.M. 1974. The distribution and abundance of penaeid shrimp in the lower Laguna Madre of Texas, with a description of the live bait fishery. *Tex. Parks Wildl. Dept. Tech. Ser.* No. 15: 32 p.

Appendix 4, continued. References

855. Stokes, G.M. 1977. Life history studies of southern flounder (*Paralichthys lethostigma*) and gulf flounder (*P. albigutta*) in the Aransas Bay area of Texas. Tex. Parks Wildl. Dept. Tech. Ser. No. 25: 37 p.
856. Stuck, K.C. 1987. Abundance and population characteristics of the stone crab, *Menippe adina*, and gear efficiency in Mississippi coastal waters. Mississippi-Alabama Sea Grant Consortium, MASGP-87-045. 20 p.
857. Stuck, K.C. 1989. Distribution and abundance of the adult stone crab, *Menippe adina*, in Mississippi coastal and offshore waters and the potential for development of a fishery. Final Report to the Mississippi-Alabama Sea Grant Consortium for calendar year 1988. MASGP-89-017.
858. Subrahmanyam, C.B. 1971. The relative abundance and distribution of Penaeid shrimp larvae off the Mississippi Coast. Gulf Res. Rep. 3(2): 291-345.
859. Subrahmanyam, C.B., and C.L. Coultas. 1980. Studies on the animal communities in two north Florida salt marshes. Part III. Seasonal fluctuations of fish and macroinvertebrates. Bull. Mar. Sci. 30: 790-818.
860. Subrahmanyam, C.B., and S.H. Drake. 1975. Studies on the animal communities in two north Florida salt marshes. Bull. Mar. Sci. 25: 445-465.
861. Sundararaj, B.I., and R.D. Suttkus. 1962. Fecundity of the spotted seatrout, *Cynoscion nebulosus* (Cuvier), from Lake Borgne Area, Louisiana. Trans. Am. Fish. Soc. 91: 84-88.
862. Sutherland, D.E. 1977. Catch and catch rates of fishes caught by anglers in St. Andrews Bay system, Florida, and adjacent coastal waters, 1973. NOAA Tech. Rep. NMFS SSRF-708.
863. Sutter, F.C., and T.D. McIlwain. 1987. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico)-sand seatrout and silver seatrout. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.72).
864. Suttkus, R.D. 1956. Early life history of the Gulf Menhaden, *Brevoortia patronus*, in Louisiana. Trans. N. Am. Wildl. Conf. 21: 390-407.
865. Suttkus, R.D., and B.I. Sundararaj. 1961. Fecundity and reproduction in the largescale menhaden, *Brevoortia patronus* Good. Tulane Stud. Zool. 8: 177-182.
866. Suttkus, R.D., and G.E. Gunning. 1986. Biological survey of Perdido Bay. Annual report to St. Regis Paper Company. Cantonment, Fla.
867. Suttkus, R.D., R.M. Darnell, and J.H. Darnell. 1954. Biological study of Lake Pontchartrain. Zoology Dept., Tulane Univ., Ann. Rep. 1953-1954, 73 p.
868. Sweat, D.E. 1968. Growth and tagging studies on *Panulirus argus* in the Florida Keys. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. No. 57.
869. Swift, I.R. 1983. A multivariate assessment of the temporal and spatial distribution patterns of the fishes of Bon Secour Bay, Alabama. Unpubl. M.S. thesis, Univ. S. Ala., Mobile, Ala.
870. Swingle, H.A. 1971. Biology of Alabama estuarine areas- Cooperative Gulf of Mexico estuarine inventory. Ala. Mar. Res. Bull. 5:1-123.
871. Swingle, H.A. 1979. Commercial fisheries and the Mobile estuary. In H.A. Loyacano Jr., and J.P. Smith (eds.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 185-188. U.S. Army Corps of Engineers, Mobile, Ala.
872. Swingle, H.A., and D.G. Bland. 1974. Distribution of the estuarine clam *Rangia cuneata* Gray in coastal waters of Alabama. Ala. Mar. Res. Bull. 10: 9-16.
873. Swingle, H.A., and D.G. Bland. 1974. A study of the fishes of the coastal watercourses of Alabama. Ala. Mar. Res. Bull. 10: 22-102.
874. Swingle, W.E. 1972. Survey of the live bait shrimp industry of Alabama. Ala. Mar. Res. Bull. 8: 1-8.
875. Sykes, J.E., and J.H. Finucane. 1966. Occurrence in Tampa Bay, Florida, of immature species dominant in Gulf of Mexico commercial fisheries. Fish. Bull., U.S. 65: 369-379.
876. Tabb, D.C., D.L. Dubrow, and A.C. Jones. 1962. Studies on the biology of the pink shrimp, *Penaeus duorarum*, in Everglades Natl. Park. Fla. St. Bd. Conserv. Tech. Ser. No. 37. 32 p.
877. Tabb, D.C., D.L. Dubrow, and R.B. Manning. 1962. The ecology of northern Florida Bay and adjacent estuaries. Fla. State Board Cons. Tech. Ser. 39. 81 p.

878. Tabb, D.C., and R.B. Manning. 1961. A Checklist of the flora and fauna of northern Florida Bay and the adjacent brackish waters of the Florida mainland collected during the period July, 1957 through September, 1960. *Bull. Mar. Sci. Gulf Caribb.* 11: 532-649.
879. Tabb, D.C., and M.A. Roessler. 1989. History of studies on juvenile fishes of coastal waters of Everglades National Park. *Bull. Mar. Sci.* 44(1): 23-34.
880. Tabony, M.L. 1972. A study of the distribution of oyster larvae and spat in southeastern Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 70 p.
881. Tagatz, M.E. 1973. A larval tarpon, *Megalops atlanticus*, from Pensacola, Florida. *Copeia* 1973: 140-141.
882. Tagatz, M.E., and E.P.H. Wilkens. 1973. Seasonal occurrence of young gulf menhaden and other fishes in a northwestern Florida estuary. NOAA Tech. Rep. NMFS SSRF-672.
883. Tarbox, K.E. 1974. Seasonal occurrence, distribution, and relative abundance of juvenile fishes at Marsh Island, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louisiana. 122 p.
884. Tarver, J.W. 1972. Occurrence, distribution and density of *Rangia cuneata* in Lakes Pontchartrain and Maurepas, Louisiana. Louis. Wildl. Fish. Comm. Oyster Water Bottoms and Seafood Division, Tech. Bull. No. 1, 8 p.
885. Tarver, J.W., and R.J. Dugas. 1973. A study of the clam, *Rangia cuneata*, in Lake Pontchartrain and Lake Maurepas, Louisiana. Louis. Wildl. Fish. Comm. Oyster Water Bottoms and Seafood Division, Tech. Bull. No. 5, 97 p.
886. Tarver, J.W., and R.J. Dugas. 1973. Experimental oyster transplanting in Louisiana. Louis. Wildl. Fish. Comm. Tech. Bull. No. 7: 10 p.
887. Tarver, J.W., and L.B. Savoie. 1976. An inventory and study of the Lake Pontchartrain - Lake Maurepas estuarine complex. Phase II - Biology. Louis. Wildl. Fish. Comm. Tech. Bull. No. 19: 7-99.
888. Tatum, W.M. 1979. The blue crab fishery of Alabama. In H.A. Loyacano, Jr., and J.P. Smith (eds.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 211-220. U.S. Army Corps of Engineers, Mobile, Ala.
889. Temple, R.F., and C.C. Fischer. 1965. Vertical distribution of planktonic stages of penaeid shrimp. *Publ. Inst. Mar. Sci., Univ. Texas* 10: 59-67.
890. Thayer, G.W., and A.J. Chester. 1989. Distribution and abundance of fishes among basin and channel habitats in Florida Bay. *Bull. Mar. Sci.* 44: 200-219.
891. Thayer, G.W., D.R. Colby, and W.F. Hettler, Jr. 1987. Utilization of the red mangrove prop root habitat by fishes in south Florida. *Mar. Ecol. Prog. Ser.* 36: 25-38.
892. Thayer, G.W., W.F. Hettler, Jr., A.J. Chester, D.R. Colby, P.J. McElhaney. 1987. Distribution and abundance of fish communities among selected estuarine and marine habitats in Everglades National Park. S. Fla. Res. Cent. Rep. SFRC-87/02. 166 p.
893. Thomas, J.L. 1989. A comparative evaluation of *Halodule wrightii*, *Spartina alterniflora* and bare sand as nursery habitats for juvenile *Callinectes sapidus*. Unpub. M.S. thesis, Tex. A&M Univ., College Station, Tex. 119 pp.
894. Thomas, J.L., R.J. Zimmerman and T.J. Minello. 1990. Abundance patterns of juvenile blue crabs (*Callinectes sapidus*) in nursery habitats of two Texas bays. *Bull. Mar. Sci.* 46(1): 115-125.
895. Thompson, R.L. 1983. The distribution and abundance of fishes caught with a trawl in Choctawhatchee Bay, Florida. Northwest Florida Water Management District, Water Resources Special Report 83-5.
896. Thomson, J.M. 1966. The grey mullets. *Oceanogr. Mar. Biol. Ann. Rev.* 4: 301-335.
897. Thue, E.B., E.S. Rutherford, and D.G. Buker. 1982. Age, growth and mortality of the common snook, *Centropomus undecimalis* (Bloch), in Everglades National Park, Florida. NPS/SFRC. Report T-683.
898. Tilmant, J.T. 1989. A history and an overview of recent trends in the fisheries of Florida Bay. *Bull. Mar. Sci.* 44(1): 3-33.
899. Tilmant, J.T., and M.B. Robblee. 1989. Everglades National Park observations. Unpubl. mimeo rept., Everglades Natl. Park. 2 pp.
900. Tilmant, J.T., E.S. Rutherford, and E.B. Thue. 1989. Fishery harvest and population dynamics of red drum (*Sciaenops ocellatus*) from Florida Bay and adjacent waters. *Bull. Mar. Sci.* 44(1): 126-138.

Appendix 4, continued. References

901. Tilmant, J.T., E.S. Rutherford, and E.B. Thue. 1989. Fishery harvest and population dynamics of the common snook (*Centropomus undecimalis*) from Florida Bay and adjacent waters (Abstract). *Bull. Mar. Sci.* 44(1): 523.
902. Tinnin, R.K. 1974. A trammel net survey of a disturbed hypersaline environment. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 75 p.
903. Tolley, S.G., E.T. Dohner, and E.B. Peebles. 1987. Occurrence of larval snook, *Centropomus undecimalis* (Bloch), in Naples Bay, Florida. *Fla. Sci.* 50: 34-38.
904. Topp, R.W., and F.H. Hoff, Jr. 1972. Flatfishes (Pleuronectiformes). *Memoirs of the Hourglass Cruises*, Vol. 4, Part II. Fla. Dept. Nat. Res. Mar. Res. Lab. St. Petersburg, Fla.
905. Trent, L. 1966. Size of brown shrimp and time of emigration from the Galveston Bay System, Texas. *Gulf Caribb. Fish. Inst.* 227: 7-16.
906. Trent, L., and P.J. Pristas. 1977. Selectivity of gill nets on estuarine and coastal fishes from St. Andrew Bay, Florida. *Fish. Bull., U.S.* 75: 185-198.
907. Trent, L., E.J. Pullen and R. Proctor. 1976. Abundance of macrocrustaceans in a natural marsh and marsh altered by dredging, bulkheading and filling. *Fish. Bull., U.S.* 74: 195-200.
908. Tucker, W.H. 1979. Freshwater fish and fisheries resources of the Mobile Delta. In H.A. Loyacano Jr., and J.P. Smith, (eds.), *Symposium on the natural resources of the Mobile estuary*, Alabama, p. 157-166. Alabama Coastal Area Board, Mississippi-Alabama Sea Grant Consortium.
909. Turner, W.R. 1969. Life history of menhaden in the eastern Gulf of Mexico. *Trans. Am. Fish. Soc.* 98: 216-224.
910. Van Den Avyle, M.J., and D.L. Fowler. 1984. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)—blue crab. U.S. Fish Wildl. Serv. FWS/OBS-82/11.19.
911. Van Hoose, M.S. 1987. Biology of spotted seatrout (*Cynoscion nebulosus*) and red drum (*Sciaenops ocellatus*) in Alabama estuarine waters. In T.A. Lowery (ed.), *Symposium on the natural resources of the Mobile Bay estuary*. p. 26-37. Miss./Ala. Sea Grant, MASGP-87-007.
912. Van Sickle, V.R., B.B. Barrett, T.B. Ford, and L.T. Gulick. 1976. Barataria Basin: salinity changes and oyster distribution. *Louis. Wildl. Fish. Comm., Tech. Bull.* 20: 22 p.
913. Vaughan, D.S. 1987. Stock Assessment of the gulf menhaden, *Brevoortia patronus*, fishery. NOAA Tech. Rep. NMFS 58.
914. Vecchione, M. 1987. Variability in the distribution of late-stage oyster larvae in the Calcasieu Estuary. *Contrib. Mar. Sci.* 30: 77-90.
915. Vecchione, M. 1987. Zooplankton in Calcasieu River/Lake Complex: Rationale, general methods, and methods of verification. In L.R. DeRouen and L.H. Stevenson (eds.), *Ecosystem Analysis of the Calcasieu River/Lake Complex (CALECO)*, Final Report. McNeese St. Univ., Lake Charles, Louis.
916. Vecchione, M. 1989. Zooplankton distribution in three estuarine bayous with different types of anthropogenic influence. *Estuaries* 12: 169-179.
917. Vecchione, M. 1991. Dissolved oxygen and the distribution of the euryhaline squid *Lolliguncula brevis* (Abstract). *Bull. Mar. Sci.* 49: 668-669.
918. Vecchione, M. 1991. Observations on the paralarval ecology of a euryhaline squid *Lolliguncula brevis* (Cephalopoda: Loliginidae). *Fish. Bull., U.S.* 89: 515-521.
919. Vecchione, M., C.M. Lascara, C.L. Stubblefield, and W.O. James. 1983. The relationship between brine-diffuser operation and zooplankton distribution. (p). In L.R. DeRouen, R.W. Hann, D.M. Casserly, and C. Giamona (eds.), *West Hackberry Strategic Petroleum Reserve Site Brine Disposal Monitoring, Year I Report. Final Report, Biological Oceanography*. McNeese St. Univ., Lake Charles, Louis. 9.1-9.125.
920. Vetter, R.D. 1982. Seasonal metabolic compensation in sympatric seatrout: Adaptation to the estuary. *Trans. Am. Fish. Soc.* 111: 193-198.
921. Vick, N.G. 1964. The marine ichthyofauna of St. Andrew Bay, Florida, and nearshore habitats of the northeastern Gulf of Mexico. Texas A&M Univ. Res. Found., A&M Project 286-D.
922. Vittor, B.A. 1979. Benthos of the Mobile Bay estuary. In H.A. Loyacano, Jr., and J.P. Smith (eds.), *Symposium on the natural resources of the Mobile estuary*, Alabama, p. 143-149. U.S. Army Corps of Engineers, Mobile, Ala.

923. Volpe, A.V. 1959. Aspects of the biology of the common snook, *Centropomus undecimalis* (Bloch) of southwest Florida. Fla. Board Cons. Mar. Res. Lab. Tech. Ser. 31. 37 p.
924. Wade, C.W. 1979. A summary of information pertinent to the Mobile Bay recreational finfishery and a review of the spotted seatrout life history. In H.A. Loyacano, Jr., and J.P. Smith (eds.), Symposium on the natural resources of the Mobile estuary, Alabama, p. 177-183. U.S. Army Corps of Engineers, Mobile, Ala.
925. Wade, R.A. 1962. The biology of the tarpon, *Megalops atlanticus*, and the ox-eye, *Megalops cyprinodes*, with emphasis on larval development. Bull. Mar. Sci. 13:545-622.
926. Wagner, P.R. 1973. Seasonal biomass, abundance, and distribution of estuarine dependent fishes in the Caminada Bay system of Louisiana. Ph.D. dissertation, Louis. St. Univ., Baton Rouge, Louis., 196 p.
927. Wakeman, J.M., and P.R. Ramsey. 1985. A survey of population characteristics for red drum and spotted seatrout in Louisiana. Gulf Res. Rep. 8: 1-8.
928. Wang, J.C.S., and E.C. Raney. 1971. Distribution and fluctuations in the fish fauna of the Charlotte Harbor estuary, Florida. Mote Marine Lab., Sarasota, Fla.
929. Ward, G.H., and N.E. Armstrong. 1980. Matagorda Bay, Texas: Its hydrography, ecology and fishery resources. U.S. Fish Wildl. Serv., U.S. Dept. Int., 230 p.
930. Ward, J.W. 1957. The reproduction and early development of the sea catfish, *Galeichthys felis*, in the Biloxi (Mississippi) Bay. Copeia 1957(4): 295-298.
931. Warlen, S.M. 1988. Age and growth of larval gulf menhaden, *Brevoortia patronus*, in the northern Gulf of Mexico. Fish. Bull. 86(1): 77-90.
932. Warren, J.R. 1981. Population analysis of the juvenile groundfish on the traditional shrimping grounds in Mississippi Sound before and after the opening of the shrimp season, 1979. Unpubl. M.S. thesis, Louis. St. Univ., Baton Rouge: 121 pp.
933. Wass, M.L. 1955. The decapod crustaceans of Alligator Harbor and adjacent inshore areas of northwestern Florida. Q. J. Fla. Acad. Sci. 18: 129-175.
934. Weaver, J.E. 1969. Otter trawl and benthic studies in an estuary at Marsh Island, Louisiana. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 80 p.
935. Weaver, J.E., and L.F. Holloway. 1974. Community structure of fishes and macrocrustaceans in ponds of a Louisiana tidal marsh influenced by weirs. Publ. Inst. Mar. Sci. 18: 57-69.
936. Weinstein, M.P., and R.W. Yerger. 1976. Electrophoretic investigation of subpopulations of the spotted seatrout, *Cynoscion nebulosus* (Cuvier), in the Gulf of Mexico and Atlantic coast of Florida. Comp. Biochem. Physiol. 54B: 97-102.
937. Weinstein, M.P., C.M. Courtney, and J.C. Kinch. 1977. The Marco Island estuary: a summary of physicochemical and biological parameters. Fla. Sci. 40: 97-124.
938. Weiss, W.R., and T.D. Phillips. 1985. The meroplankton of Tampa Bay. In S.F. Treat, J.L. Simon, R.R. Lewis III, R.L. Whitman, Jr., (eds.), Proceedings Tampa Bay Area Scientific Information Symposium, p. 345-358. Fla. Sea Grant Coll. Rep. 65.
939. Weixelman, M.B. 1982. The fall red drum Gulf of Mexico pier fishery off Galveston Bay, Texas. Tex. Parks Wildl. Dept., Coast. Fish. Branch, Mgt. Data Ser., No. 42: 23 p.
940. Wetzel, G.L., and N.E. Armstrong. 1987. Studies regarding the distribution and biomass densities of, and the influences of freshwater inflow variations on finfish populations in the Matagorda Bay System, Texas. Center For Research in Water Resources, Technical Report 192, Department of Civil Engineering, Univ. of Texas, Austin, Tex.
941. White, C.J. 1975. Effects of the 1973 river flood waters on brown shrimp in Louisiana estuaries. Louis. Wildl. Fish. Comm. Tech. Bull. No. 16: 24 p.
942. White, C.J., and C.J. Boudreaux. 1977. Development of an areal management concept for gulf penaeid shrimp. Louis. Wildl. Fish. Comm. Tech. Bull. No. 22: 77 p.
943. White, C.J., and W.S. Perret. 1974. Efforts to reestablish oyster tonging reefs in Calcasieu Lake, Louisiana. Louis. Wildl. Fish. Comm. Tech. Bull. No. 11: 15 p.
944. White, M.L., and M.E. Chittenden, Jr. 1976. Aspects of the life history of the Atlantic croaker, *Micropogon undulatus*. Tex. A&M Univ. Sea Grant Publ. TAMU-SG-76-205. 54 pp.

Appendix 4, continued. References

945. White, M.L., and M.E. Chittenden, Jr. 1977. Age determination, reproduction, and population dynamics of the Atlantic croaker, *Micropogonias pogonias*. Fish. Bull., U.S. 75: 109-123.
946. Williams, A.B. 1984. Shrimp, lobsters, and crabs of the Atlantic coast of the eastern United States, Maine to Florida. Smithsonian Institution Press, Washington, D.C.
947. Williams, A.B., and D.L. Felder. 1986. Analysis of stone crabs: *Menippe mercenaria* (Say), restricted, and a previously unrecognised species described (Decapoda: Xanthidae). Proc. Biol. Soc. Wash. 99: 517-543.
948. Williams, A.H., L.D. Coen, and M.S. Stoelting. 1990. Seasonal abundance, distribution, and habitat selection of juvenile *Callinectes sapidus* in the northern Gulf of Mexico. J. Exp. Mar. Biol. Ecol. 137: 165-183.
949. Williams, E.H. Jr., and J.L. Gaines, Jr. 1974. Acanthocephala of fishes from marine and brackish waters of the Mobile Bay region. J. Mar. Sci. 2: 135-148.
950. Williams, L.W. 1983. Larval fish assemblages of lower Mobile Bay. Unpubl. M.S. thesis, Univ. S. Ala., Mobile, Ala.
951. Williamson, C.J. 1980. Population dynamics of molluscs in a seagrass bed surrounding a dredged material island, upper Laguna Madre, Texas. M.S. thesis, Corpus Christi St. Univ., Corpus Christi, Tex., 80 p.
952. Wolfe, S., and L. Wolfe. 1985. The ecology of the Suwannee River estuary: analysis of data from 1982-1983. Fla. Dept. Env. Reg., Tallahassee, Fla.
953. Wood, C.E. 1967. Physioecology of the grass shrimp, *Palaemonetes pugio*, in the Galveston Bay estuarine system. Contrib. Mar. Sci. 12: 54-79.
954. Wurtz, C.B., and S.S. Roback. 1955. The invertebrate fauna of some Gulf coast rivers. Proc. Acad. Nat. Sci. Phila. 107: 167-206.
955. Yerger, R.W. 1961. Additional records of marine fishes from Alligator Harbor, Florida and vicinity. Q. J. Fla. Acad. Sci. 24: 111-116.
956. Yerger, R.W. 1977. Fishes of the Apalachicola River. In R.J. Livingston and E.A. Joyce, Jr., (eds.), Proceedings of the Conference on the Apalachicola Drainage System, 23-24 April 1976, Gainesville, Florida, p. 22-33. Fla. Dept. Nat. Res. Mar. Res. Lab. Prof. Paper Ser. 26.
957. Yokel, B. 1966. A contribution to the biology and distribution of the red drum *Sciaenops ocellatus*. M.S. thesis, Univ. Miami, Coral Gables, Fla. 166 p.
958. Young, W.T., G.L. Butts, L.W. Donelon, and D.H. Ray. 1988. A special monitoring project basin survey-biological and physicochemical assessment of St. Andrew Bay estuaries 1986-1987. Fla. Dept. Env. Reg., Northwest Dist., Pensacola, Fla.
959. Young, W.T., and R.W. Cantrell. 1972. Biological survey report: Eleven Mile Creek - Perdido Bay. Fla. Dept. Env. Reg., Northwest Region, Pensacola, Fla.
960. Zein-Eldin, Z.P., and M.L. Renaud. 1986. In-shore environmental effects on brown shrimp, *Penaeus aztecus*, and white shrimp, *P. setiferus*, populations in coastal waters, particularly of Texas. Mar. Fish. Rev. 48(3): 9-19.
961. Zeringue, F.J., II. 1980. An ecological characterization of the Lac des Allemands basin. M.S. thesis, Louis. St. Univ., Baton Rouge, Louis., 100 p.
962. Zieman, J.C. 1982. The ecology of the seagrasses of south Florida: community profile. U.S. Fish Wildl. Serv. FWS/OBS-82/25.
963. Zilberberg, M.H. 1966. Seasonal occurrence of fishes in a coastal marsh of northwest Florida. Publ. Inst. Mar. Sci. Univ. Texas 11: 126-134.
964. Zimmerman, R.J. 1969. An ecological study of the macro-fauna occurring in turtle grass (*Thalassia testudinum* Konig) surrounding Ransom Island in Redfish Bay, Texas. M.S. thesis, Texas A&I Univ., Kingsville, Tex., 129 p.
965. Zimmerman, R.J., and A.H. Chaney. 1969. Salinity decrease as an affector of molluscan density levels in a turtle grass (*Thalassia testudinum* Konig) bed in Redfish Bay, Texas. TAIUS 2: 5-10.
966. Zimmerman, R.J., and T.J. Minello. 1984. Densities of *Penaeus aztecus*, *Penaeus setiferus*, and other natant macrofauna in a Texas salt marsh. Estuaries 7: 421-433.

967. Zimmerman, R., T. Minello, T. Baumer, and M. Castiglione. 1989. Oyster reef habitat for estuarine macrofauna. NOAA Tech. Memo. NMFS-SEFC-249.

968. Zimmerman, R.J., T.J. Minello, M.C. Castiglione, and D.L. Smith. 1990. Utilization of marsh and associated habitats along a salinity gradient in Galveston Bay. NOAA Tech. Memo. NMFS-SEFC-250. 68 p.

969. Zimmerman, R.J., T.J. Minello, D.L. Smith, and J. Kostera. 1990. The use of *Juncus* and *Spartina* marshes by fisheries species in Lavaca Bay, Texas, with reference to the effects of floods. NOAA Tech. Memo. NMFS-SEFC-251. 40 p.

970. Zimmerman, R.J., T.J. Minello and G. Zamora, Jr. 1984. Selection of vegetated habitat by brown shrimp, *Penaeus aztecus*, in a Galveston Bay salt marsh. Fish. Bull., U.S. 82: 325-336.