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NEW RECORDS OF FISHES IN THE NORTHWESTERN GULF OF MEXICO, WITH NOTES ON SOME RARE SPECIES

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ABSTRACT: Based on submersible, SCUBA, and trawl collections 14 new fish records are reported for the northwestern Gulf of Mexico. In addition the distribution of eight rare species are discussed in detail.

Recent investigations on offshore banks and oil platforms have revealed a diverse tropical reef fish fauna on hard substrate in the northwestern Gulf of Mexico (Bright and Cashman, 1974; Sonnier *et al.*, 1976; Dennis and Bright, 1988). This so-called warm temperate region (Briggs, 1974), which is generally characterized by turbid waters, vast expanses of mud bottom, and widely fluctuating temperature regime, nevertheless harbors a typical, though somewhat depauperate, Caribbean fish fauna. Prior to reports cited above most tropical fish were reported infrequently in this region (Woods, 1942; Baughman, 1947, 1950a, 1950b; Gunter and Knapp, 1951; Hoese, 1958; Moseley, 1966; Causey, 1969). In general tropical fishes were thought to be transient members (*i.e.*, not able to sustain permanent populations) of the ichthyofauna brought into the region by currents from more southerly Caribbean populations (Briggs, 1958; Caldwell, 1959, 1963; Dawson, 1962b). This region is classified as a continental-type ichthyofauna rather than the insular fauna known from the Caribbean (Robins, 1971; Gilbert, 1972).

Although, it is now evident that large populations of tropical reef fish occur year-round on the Flower Garden banks and other natural hard banks under insular environmental conditions (Dennis and Bright, 1988).

Extensive offshore oil exploration in the northwestern Gulf has enhanced the amount of hard substrate habitat, by providing oil platforms available for reef-dwelling organisms (Gallaway, 1981; Gallaway and Lewbel, 1982). Biological studies of natural hard bank and oil platform faunas, under the auspices of the National Marine Fisheries Service (NMFS) and Bureau of Land Management (BLM) (now Mineral Management Service (MMS)). have revealed several new additions to ichthyofauna of this region. These new records are reported herein and several previously reported but questionable records are discussed in light of the transient to permanent nature of the northwestern Gulf tropical ichthyofauna.

METHODS

Many new records and observations of reef fish were obtained during the BLM topographical features studies from 1974 to 1981 (Rezak *et al.*, 1985). The research

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submersible DIAPHUS was the primary vehicle of collection during this study, with supplemental SCUBA diver collections. In many instances color photographs taken from the submersible or by divers were used to confirm sight records. All photographs reported herein are archived in the Texas A&M University, Department of Oceanography Systematic Collection, College Station, TX 77843. Several species were collected by shrimp trawlers during studies of inshore soft bottom fish communities at the Buccaneer Oil and Gas Field (BGOF) off Galveston, Texas (Gallaway, *et al.*, 1981b) and the Strategic Petroleum Reserve brine disposal site off Freeport, Texas (Chittenden *et al.*, 1981). Specimens col-

lected are deposited in the Texas Cooperative Wildlife Collection (TCWC) at Texas A&M University, College Station, TX, except where noted. Additional specimens were examined or deposited at Texas A&M University at Galveston (TAMUG), Gulf Coast Research Laboratory (GCRL), Ocean Springs, MS, and California Academy of Science (CAS), San Francisco, CA.

Table 1 lists the locations of banks and oil platforms where samples were collected during this study. Under each species account information is listed as to the date of collection (or observation), number of individuals, size range in millimeters standard length (in parentheses), location, depth, collection

Table 1. Locations of sites referred to in this report. Oil platforms designated by their Mineral Management Service area and block number. Latitude and longitude reported in degrees and minutes.

| Location | Latitude (N) | Longitude (W) |
|---------------------------|--------------|---------------|
| Hard Banks | | |
| Applebaum | 27° 33' | 94° 15' |
| Aransas | 27° 35' | 96° 27' |
| Baker | 27° 45' | 96° 14' |
| Bouma | 28° 02' | 92° 27' |
| Bright | 27° 53' | 93° 18' |
| Diaphus | 28° 05' | 93° 55' |
| Dream | 27° 03' | 96° 42' |
| East Flower Garden (EFG) | 27° 54' | 93° 36' |
| Eivers | 27° 50' | 92° 54' |
| Ewing | 28° 06' | 91° 02' |
| Fishnet | 28° 09' | 91° 48' |
| Geyer | 27° 51' | 93° 04' |
| Hospital (Rock) | 27° 33' | 96° 29' |
| Jakkula | 27° 59' | 91° 40' |
| Rezak-Sidner | 27° 57' | 92° 23' |
| Sackett | 28° 38' | 89° 33' |
| Southern | 27° 26' | 96° 31' |
| Stetson | 28° 10' | 94° 18' |
| West Flower Garden (WFG) | 27° 52' | 93° 48' |
| 18 Fathom (Rankin) | 27° 58' | 92° 36' |
| 28 Fathom | 27° 55' | 93° 27' |
| 32 Fathom | 28° 04' | 94° 32' |
| Oil Platforms | | |
| Buccaneer Gas & Oil Field | | |
| GA-288 and GA-296 (BGOF) | 28° 53' | 94° 42' |
| HI-389 | 27° 54' | 93° 38' |
| HI-595 | 27° 53' | 93° 59' |
| MI-749 | 27° 44' | 97° 01' |
| SPI-1048 | 26° 31' | 97° 08' |
| VM-241 | 28° 38' | 92° 32' |

method, and catalog number (if available). Species names follow the nomenclature of Robins *et al.* (1980).

SPECIES ACCOUNTS

OPHICHTHIDAE

Myrichthys acuminatus (Gronow)

sharptail eel

30 September 1978; 1; EFG; 56 m; photograph.

A single individual of the sharptail eel was identified from a color transparency taken from the research submersible DIAPHUS at the East Flower Garden bank. This eel was observed on a night dive within an aggregation of white urchins (*Pseudoboletia maculata*). Pale green background color and the lack of ocellation around the white spots separate this species from *M. oculatus* Kaup (Böhlke and Chaplin, 1968). This tropical species was previously reported from the Gulf of Mexico at OREGON station 313 (79 m) south of Mobile Bay, Alabama (Springer and Bullis, 1956) and at Garden Key, Dry Tortugas, Florida (Jordan and Bradby, 1892).

ANTENNARIIDAE

Antennarius multiocellatus

(Valenciennes) longlure frogfish

24 September 1981; 1; 28°14'N, 94°32'W; 48 m; 12.2-m trawl (TCWC uncat.).

One longlure frogfish was taken while trawling off Sabine Pass, Texas over a shell-sand bottom. This frogfish was kept alive in an aquarium and color transparencies were taken. Body color was bright orange with a white mottling; dark spots were conspicuous on the upper body surface, dorsal, caudal, and anal fins. The specimen was partially consumed by a spiny lobster while in the aquarium, and thus was preserved in poor condition. This specimen matched

the color phase of the similar frogfish species *A. (Lophocharon) tenebrosus* Poey (see Schultz, 1957; pl. 7a). The esca was not evident in macroscopic examination of the first dorsal spine. It may have been broken off during capture, though Schultz (1957) reported no filaments at the tip of the first dorsal in *A. tenebrosus*. The illicium was about twice the length of the second dorsal spine. Böhlke and Chaplin (1968) regarded *A. tenebrosus* and *A. multiocellatus* as separate species but Randall (1983) questioned the validity of *A. tenebrosus*. Since then Pietsch and Grobecker (1987) have synonymized *A. tenebrosus* with *A. multiocellatus*.

OGCOCEPHALIDAE

Ogcocephalus corniger Bradbury

longsnout batfish

3 August 1971; 1(141); 23°54.45'N, 97°13'W; 167 m; 20-m trawl (TCWC uncat.)

20 November 1972; 2(184-187); EFG; 80-120 m; dredge. (TCWC 5153.1)

12 October 1978; 1; Geyer; 78 m; photograph.

19 October 1978; 2; Jakkula; 110-116 m; photograph.

9 March 1979; 2(35-49); 28°54'N, 94°41'W; 21 m; 12.2-m trawl.

10 April 1979; 2(134-151); 27°56.30'N, 95°15.10'W; 86 m; 10.3-m trawl. (TCWC 3342.4)

Previously known from the northwestern Gulf (based on one specimen taken by trawl just west of the Mississippi delta at the shelf edge 182 m) (SILVER BAY Station 175; Bradbury, 1980), this species' range is extended further west to off Galveston, Texas and into the southern Gulf off Rio Soto La Marina, Mexico. Two specimens of the longsnout batfish from the base of the East Flower Garden bank were previously erroneously reported by Cashman

(1973) as *O. vespertilio*. *Ogcocephalus corniger* is the most commonly observed batfish on soft bottom around the bases of the hard banks. Two juvenile specimens were also taken by trawl off Galveston at 21 m depth. Bradbury's (1980) revision of the western Atlantic *Ogcocephalus* has resulted in nomenclatural changes for all species of batfish known from the northwestern Gulf. The longsnout batfish is not uncommon in the eastern Gulf, but is not restricted to that region as suggested by Bradbury's records. Once other northwestern Gulf batfish specimens are more closely examined, *O. corniger* will probably be as frequently reported in the northwestern Gulf as in the eastern Gulf.

HOLOCENTRIDAE

Holocentrus marianus (Cuvier)

longjaw squirrelfish

27 August 1976; 1; 28 Fathom; 72 m; photograph.

31 August 1976; 1; 28 Fathom; 52 m; photograph.

11 September 1977; 1; Ewing; 58 m; photograph.

28 September 1977; 1; 18 Fathom; 47 m; photograph.

29 September 1977; 1; Bouma; 82 m; photograph.

6 September 1978; 1; EFG; 81 m; photograph.

16 October 1978; 1; Diaphus; 84 m; photograph.

22 October 1978; 1; EFG; ?; photograph.

Longjaw squirrelfish records are restricted to shelf-edge banks of the northwestern Gulf of Mexico with all but one individual (18 Fathom bank) observed in the algal-sponge zone (Dennis and Bright, 1988). *Holocentrus marianus* is found in the West Indies from the Bahamas to Trinidad (Woods and Sonoda, 1973), where it is the most

common squirrelfish below 30 m (Randall, 1983). One specimen was reported by Darcy and Gutherz (1984) from the southwestern Florida shelf (eastern Gulf of Mexico). This species may be an ecological replacement for *H. bullisi*, which is the common deepwater squirrelfish in the northeastern Gulf, southeastern U.S. Atlantic coast and Bermuda (Woods and Sonoda, 1973; Shipp and Hopkins, 1978). *Holocentrus bullisi* has only been reported from the northwestern Gulf based on one specimen (106 mm SL) taken by trawl south of Galveston, Texas (OREGON Station 1795, 28°04'N, 94°51'W, 64 m) (Bullis and Thompson, 1965).

EXOCOETIDAE

Hemiramphus balao Lesueur balao

19 October 1979; 1 (171); 27°56'N, 93°36'W; surface; dipnet.

This halfbeak was dipnetted at the surface near the East Flower Garden bank. One specimen was retained for identification while several others were discarded. It did not possess the characteristic red coloration on the tip of the lower jaw and upper caudal fin lobe, but the pectoral fin length was greater than the distance from the pectoral fin base to the anterior edge of the nostril. The balao tends to range farther offshore than *H. brasiliensis* (Linnaeus), although both have been taken together in the Bahamas (Böhlke and Chaplin, 1968). In the Gulf of Mexico *H. balao* has been found 56 to 117 km offshore (off the continental shelf) from Veracruz to Tampico, Mexico and there is a single record for the northern Gulf, 184 km south of Timbalier, Louisiana (Springer and Bullis, 1956). It was thought to be a tropical straggler in this region, but may represent a small shelf-edge population. The present specimen is the first continental shelf record of *Hemiramphus balao* in

the northwestern Gulf.

SERRANIDAE

Epinephelus (Cephalopholis) fulvus

- (Linnaeus) coney
 12 October 1978; 1; Geyer; 50 m;
 visual sighting, submersible.
 21 October 1981; 1; WFG; 21 m;
 visual sighting, diver.
 15 August 1983; 2; EFG; 21 m; visual
 sightings, diver.
 28 October 1983; 2; EFG; 21 m;
 photograph, diver.

This small serranid, one of the most abundant groupers on Caribbean coral reefs, has only recently been reported from the northwestern Gulf of Mexico (Cordova, 1986). Four additional individuals have now been reported from the northwestern Gulf. Two individuals were observed during SCUBA dives at the East Flower Garden and one at the West Flower Garden; one small pale colored grouper observed at Geyer bank is believed to be the xanthic form of *E. fulvus*. All remaining individuals were either brown/white or red/white bicolor phases. The lack of records prior to 1980 and the contemporaneous occurrence of the tiger grouper (see below) suggests an unusual recruitment event from outside the region. This species is believed to be transient in the northwestern Gulf and seems to occur under similar circumstances in the eastern Gulf (Smith, 1976). The coney may require shallow-water coral reef habitats (<20 m) during early life history stages which are lacking in the northwestern Gulf.

Table 2. Depth range, abundance (number per hour of submersible survey time), and number observed of *Epinephelus inermis* on the hard banks of the northwestern Gulf based on submersible observations.

| Bank | Depth Range | Abun. | No. Obs. |
|--------|-------------|-------|----------|
| Bright | 52 | 0.81 | 6 |
| EFG | 21-82 | 0.10 | 7 |
| Elvers | 79 | 0.17 | 1 |
| Ewing | 61 | 0.30 | 1 |

Epinephelus (Dermatolepis) inermis

(Valenciennes) marbled grouper

- August 1977; 1; Flower Gardens;
 ?; photograph, submersible.
 25 September 1977; 2; Bright; 68 m;
 photograph, submersible.
 28 September 1977; 1; 18 Fathom; 47
 m; photograph, submersible.
 12 October 1978; 1; Geyer; 91 m;
 photograph, submersible.
 20 October 1978; 1; Elvers; 79 m;
 photograph, submersible.
 1980; 3; WFG; 70 m; photograph,
 submersible.

See Table 2 for visual sightings.

The marbled grouper was originally reported from the northwestern Gulf at the West Flower Garden bank not long ago (Bright and Cashman, 1974), and more recently in the eastern Gulf (Bullock and Godcharles, 1982). It was the most commonly diver-observed large grouper at the Flower Garden banks until October 1981, when it was replaced in abundance by the tiger grouper (see below). It is reported from submersible observations only on shelf-edge banks at six locations (Table 2).

On four occasions the distinctively colored young of this species were observed (Figure 1). Interestingly, in all instances they were associated with aggregations of sea urchins (*Astropyga magnifica* Clark) at Bright (2, 68 m), Geyer (1, 91 m), Rezak-Sidner (1, ?), and WFG (3, 70 m) banks. On approach of the submersible these young marbled groupers would retreat amongst the closely packed urchins. The exclusive

| Bank | Depth Range | Abun. | No. Obs. |
|--------------|-------------|-------|----------|
| Geyer | 37-67 | 1.31 | 14 |
| Rezak-Sidner | 59-64 | 0.53 | 7 |
| WFG | 21-70 | 0.17 | 4 |
| 18 Fathom | 44-47 | 0.91 | 4 |

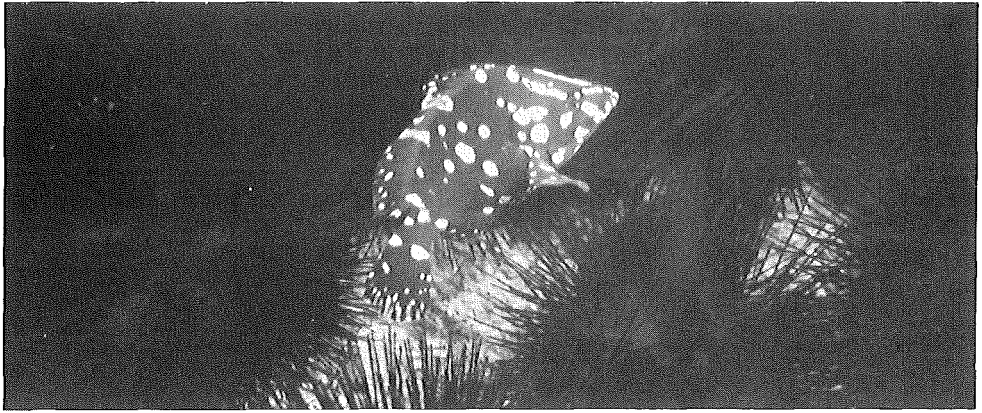


Figure 1. Young marbled grouper (*E. inermis*) associated with urchin aggregation at West Flower Garden (70 m).

occurrence of young marbled grouper with urchin aggregations apparently as a refuge from predation suggests that this may be a significant life history aspect, at least in this region.

Holanthias martinicensis

- (Guichenot) roughtongue bass
- 1 June 1975; 3; Southern; 67 m; photograph.
- 22 June 1975; 1; EFG; 67 m; photograph.
- 27 August 1976; 18; 28 Fathom; 76 m; photograph.
- 12 September 1977; 3; Sackett; 64 m; photograph.
- 28 September 1977; 20; 18 Fathom; 81 m; photograph.
- 29 September 1977; 4; Bouma; 82 m; photograph.
- 10 October 1978; 1(69); Applebaum; 85 m; rock dredge. (TCWC 3707.1)
- 16 October 1978; 1; Diaphus; 84 m; photograph.
- 16 October 1978; 2; Diaphus; 91 m; photograph.
- 22 October 1982; 2(82, 91); 27°53'W; 110 m; 12.2-m trawl.
- Numerous locations for visual sightings (see Table 3).

Holanthias martinicensis is the only deep-bodied anthiin species known from the northwestern Gulf and is an insular

species occurring throughout the Caribbean (Colin, 1974; 1976). It is apparently replaced in abundance by *Anthias nicholsi* Firth in the northeastern Gulf of Mexico (Shipp and Hopkins, 1978) and southeastern U.S. Atlantic coast (Burgess *et al.*, 1979).

The roughtongue bass was first identified in this region from a specimen taken in a dredge sample at Applebaum bank (verified by Dr. William Anderson, Grice Marine Lab., Charleston, SC). Earlier, an anthiin species denoted as deep-reef fish species "A" was observed to be common at the depths of 80 to 125 m at the West Flower Garden bank (Fig. 46; p. 51; Bright *et al.*, 1974). This form was also determined to be *H. martinicensis* by the junior author who commented on its wide distribution in the but gave no further details (Bright *et al.*, 1980). Table 3 lists the depth range and abundance of the roughtongue bass based on submersible observations from other hard banks in the northwestern Gulf. This species is the most conspicuous and common member of the drowned reef community, where it was observed to hover up to a meter above drowned reefs from 57 to 140 m (Dennis and Bright, 1988). In situ colors, based on Kodoachrome transparencies, indicate a blue hue to the pelvic and anal fins and

Table 3. Depth range, abundance (number per hour of submersible survey time), and number observed of *Holanthias martinicensis* on the hard banks of the northwestern Gulf based on submersible observations.

| Bank | Depth Range | Abun. | No. Obs. | Bank | Depth Range | Abun. | No. Obs. |
|-----------|-------------|-------|----------|--------------|-------------|-------|----------|
| Alderdice | 62- 76 | 0.75 | 3 | Geyer | 64-100 | 2.25 | 24 |
| Aransas | 61 | 0.47 | 1 | Hospital | 59- 67 | 1.45 | 10 |
| Baker | 57- 64 | 3.70 | 6 | Jakkula | 70- 98 | 5.45 | 14 |
| Bouma | 67- 82 | 36.00 | 126 | Rezak-Sidner | 85-127 | 5.43 | 20 |
| Diaphus | 82-107 | 22.77 | 87 | Sackett | 62- 66 | 7.19 | 34 |
| Dream | 62 | 1.33 | 4 | South Baker | 63- 76 | 17.97 | 23 |
| EFG | 61- 94 | 4.40 | 87 | Southern | 61- 70 | 2.09 | 10 |
| Elvers | 82- 94 | 3.97 | 23 | WFG | 64-140 | 31.03 | 423 |
| Ewing | 70- 79 | 12.01 | 40 | 18 Fathom | 81- 91 | 0.68 | 3 |
| Fishnet | 64- 73 | 7.49 | 29 | 28 Fathom | 66-116 | 4.36 | 49 |

a distinctive dark bar (yellow if the light source was close enough) across the mid-body just behind the pelvic fins. This bar corresponds with the posterior yellow body blotches shown in Robins *et al.* (1986; PL. 26), but no dark line on the dorsal profile was evident. The elongate third dorsal spine was quite prominent on some individuals and may be a secondary sex characteristic. Two additional specimens were collected between the East and West Flower Garden banks by trawl on 22 October 1982. Both specimens possessed the characteristic anchor-shaped vomerine tooth patch and oval tooth patch on the tongue (Anderson and Heemstra, 1980). The third dorsal spine was elongate in one specimen, but no filamentous caudal-fin rays were present.

Mycteroperca tigris

(Valenciennes) tiger grouper
 September 1970; 2; WFG; 25 m;
 photograph.
 21 November 1976; 1; WFG; 26 m;
 photograph.
 3 June 1979; 1; EFG; 22 m;
 photograph.
 9 July 1981; 2 (219, 635); EFG; 21 m;
 spear, diver.
 17 October 1981; 10; EFG; 21m;
 visual sightings, diver.

21 October 1981; 1; WFG; 23 m;
 visual sighting, diver.

14-15 August 1983; 2; EFG; 21 m;
 visual sightings, diver.

28-29 October 1983; 6; EFG; 21 m;
 visual sightings, diver.

The tiger grouper was originally recorded in a photograph at the West Flower Garden bank (1970), and was tentatively reported on the coral reef at the West Flower Garden bank in 1971 (Taylor and Bright, 1973). The next record of occurrence is a 1976 photograph of *M. tigris* at the West Flower Garden bank. In recent quarterly sampling (October 1978 to October 1983) at the East Flower Garden bank this species was first observed in June 1979 and subsequently became the most common large grouper species observed by the senior author in the coral reef zone, replacing the marbled grouper in abundance. Two specimens of *M. tigris* were collected by spear in July 1981 to verify this identification. Both specimens possessed the distinctive striped pattern of the tiger grouper and low gill raker counts of eight on the first arch lower limb (Smith, 1971).

The sporadic observation of this species suggests a transient occurrence in the northwestern Gulf. The tendency of this grouper to aggregate and follow divers supports the belief that the lack

of observations between 1972-1976 and 1976-1979 are real and that, in recent years, the tiger grouper has become more abundant at the Flower Garden banks. The tiger grouper is previously reported in the southern Gulf of Mexico at Cayo Arcas (Smith, 1971), Cayo Arenas (Taylor and Bright, 1973) and Triangulos Oeste (Chavez, 1966) and quite recently in the eastern Gulf (Bullock and Godcharles, 1982).

Serranus annularis

(Günther) orangeback bass
 18 September 1976; 1; Southern; 61 m; photograph.
 25 September 1977; 1; Bright; 52 m; photograph.
 22 June 1975; 1; EFG; 55 m; photograph.
 29 August 1976; 1; EFG; 57 m; photograph.
 31 August 1976; 1; 28 Fathom; 57 m; photograph.
 Numerous locations for visual sightings (see Table 4).

Serranus annularis is reported as a new record to the northwestern Gulf of Mexico. This distinctively colored bass is an "indicator" species of the algal-sponge zone, where it is one of the most abundant species (Dennis and Bright, 1988). The orangeback bass is a diminutive form (to 65 mm-SL) which uses the spaces among coralline algal nodules for shelter. *Serranus annularis* is most abun-

dant on shelf-edge banks where the algal-sponge zone is most well developed (Table 4). This species is found at similar depths in the Florida Keys (Starck, 1968) and throughout the Antilles to Brazil (Robins and Starck, 1961). Based on its geographic range and distribution in this region, the species should be considered an insular form.

MALACANTHIDAE

Caulolatilus cyanops

Poey blackline tilefish
 28 January 1971; 1; 28°04.0'N, 91°27.5'W; 117 m; 6.1-m trawl. (TCWC 5149.1)
 15 July 1981; 2(211, 314); WFG; 91 m; hook and line.

Two specimens of the blackline tilefish were caught on hook and line at the West Flower Garden over a carbonate rubble bottom. Several tilefish of this genus were observed from the submersible at the hard banks, but no distinctive markings were evident in photographs that allowed further identification. Early reports of *C. cyanops* from the region proved to be *C. intermedius* Howell (Hoese, 1958; Dooley, 1978). Previous records from the Gulf of Mexico are from the Dry Tortugas, Florida (Longley and Hildebrand, 1941) and Yucatan, Mexico (Dooley, 1978). One additional specimen of this species was found in the TCWC (determined by J.E. McEachran, Dept. Wildlife & Fisheries,

Table 4. Depth range, abundance (number per hour of submersible survey time), and number observed of *Serranus annularis* on the hard banks of the northwestern Gulf based on submersible observations.

| Bank | Depth Range | Abun. | No. Obs. | Bank | Depth Range | Abun. | No. Obs. |
|----------|-------------|-------|----------|-----------|-------------|-------|----------|
| Bouma | 61 | 0.57 | 2 | Jakkula | 64-67 | 1.17 | 3 |
| Bright | 52-69 | 1.89 | 14 | Sackett | 64-72 | 2.75 | 13 |
| EFG | 47-79 | 0.81 | 34 | Southern | 61 | 0.21 | 1 |
| Elvers | 67-68 | 0.34 | 2 | WFG | 50-73 | 0.93 | 11 |
| Ewing | 58-67 | 4.20 | 14 | 18 Fathom | 43-78 | 1.37 | 6 |
| Geyer | 75-78 | 1.03 | 11 | 28 Fathom | 52-75 | 0.53 | 6 |
| Hospital | 60 | 0.29 | 2 | | | | |

Texas A&M Univ., College Station, TX) collected by trawl at the shelf edge, west of Ewing bank. These records represent a range extension from the Yucatan Peninsula to the northwestern Gulf.

SPARIDAE

Upon the examination of many *Calamus* specimens from the hard banks and in regional museums it became apparent that only two species could be confirmed in the northwestern Gulf: *Calamus leucosteus* Jordan and Gilbert and *C. nodosus* Randall and Caldwell. This is in agreement with the study of *Calamus* by Randall and Caldwell (1966), although historically *Calamus bajonado* (Schneider) and *C. macrops* (since then synonymized with *bajonado*) were reported from the region (Baughman, 1950b). The senior author examined the specimens from the Stanford University museum (now housed at the California Academy of Science) reported by Baughman as *C. bajonado* and *C. macrops* from off Texas, and found all six specimens (CAS-SU- 40480, 40481, 40482) to be *C. leucosteus*. One other species, *C. arctifrons* Goode and Bean, has been reported from only two locations in the northwestern Gulf (OREGON Stations 295 and 1795; Bullis and Thompson, 1965). The above suggests a depauperate *Calamus* fauna in the northwestern Gulf when compared with the six species known from the northeastern Gulf.

SCARIDAE

Sparisoma atomarium

(Poey) greenblotch parrotfish
 May 1972; 1; WFG; 49 m;
 photograph.
 29 August 1976; 1; EFG; 57 m;
 photograph.
 12 September 1976; 1; Hospital; 60
 m; photograph.

12 September 1977; 2; Bright; 55 m;
 photograph.

30 September 1978; 1; EFG; 82 m;
 photograph.

5 September 1984; 1; EFG; 21 m;
 photograph.

The greenblotch parrotfish was first reported in the Gulf of Mexico from off Panama City, Florida (Williams and Shipp, 1980) and this report represents the first records for the northwestern Gulf. Six individuals of the greenblotch parrotfish were identified in color transparencies taken on the northwestern Gulf hard banks. The diminutive size of this species (to 100-mm TL) and its tendency to lay still on the bottom when approached reduces the chance of observing *S. atomarium* from the submersible. An intensive search for this species by the senior author in the coral reef zone at the EFG revealed only one individual, which was observed and photographed at 21 m. *Sparisoma atomarium* may be represented by a resident population in this region based in its wide distribution here. It is apparently most common at deeper (below 50 m) depths (Randall, 1965), yet it is not uncommon at depths as shallow as 10 m in the Florida Keys where it could easily be mistaken for juveniles of *Sparisoma aurofrenatum* and *S. radians* (GDD, pers. obs.).

OPISTHOGNATHIDAE

Opisthognathus aurifrons

(Jordan and Thompson) yellowhead
 jawfish

11 September 1977; 1; Ewing; 58 m;
 photograph.

25 September 1977; 6; Bright; 59 m;
 visual sightings, submersible.

23 September 1978; 1; WFG; 49 m;
 visual sighting, submersible.

27 September 1979; 4; EFG; 32 m;
 photograph.

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15 August 1983; 8; EFG; 25 m; photograph.

The yellowhead jawfish is a new record to the northwestern Gulf ichthyofauna. Previously *O. aurifrons* was known from as deep as 50 m off the Florida Keys (Colin, 1972). The sporadic sightings suggest a transient nature to its occurrence in the northwestern Gulf. Four individuals of the yellowhead jawfish were observed to form a "colony" in a rubble trough at the base of the high diversity coral reef at the East Flower Garden bank in September 1979, but subsequently disappeared. Another colony of eight individuals (one juvenile) was sighted in August 1983 within a sand flat (25 m) in the coral reef zone at the EFG. Eight jawfish observed from the submersible at Ewing, Bright, and WFG banks were identified as *O. aurifrons* based on coloration, colonial aggregation, and hovering behavior known only in this species (Colin, 1972). The Ewing bank individual possessed the dusky head typical of Bahamian specimens while the remaining individuals observed possessed all-yellow heads (Böhlke and Thomas, 1961).

Opistognathus lonchurus Jordan and Gilbert
moustache jawfish
10 October 1978; 1(60); 32 Fathom; 54 m; rock trawl; photograph. (TCWC 5152.1).

Opistognathus lonchurus was originally described from specimens collected from the stomachs of red snapper (*Lutjanus campechanus* Poey) at the snapper banks off Pensacola, Fla. (Jordan and Gilbert, 1882). It is now known from the eastern Gulf of Mexico (Powell *et al.*, 1972), Dry Tortugas (Longley and Hildebrand, 1941), Haiti, and South America (Böhlke and Thomas, 1961). Our specimen is the first record of this species from the northwestern Gulf of

Mexico. This specimen differed from previous accounts in the following meristic count: anal III,11.

This specimen was much more colorful than previously described by Longley and Hildebrand (1941) and Böhlke and Thomas (1961). Coloration was similar to Plate 43 in Robins *et al.* (1986), but the body was darker comparable to Fig. 355 in Walls (1975).

CLINIDAE

Emblemaria atlantica

Jordan and Evermann banner blenny

8 October 1980; 1(57); WFG; 75 m; submersible arm (TCWC 3818.1).

This species is another fish originally described from the gut contents of red snappers off Pensacola, Fla. (Jordan and Evermann, 1898). It has since been reported on "rocky" reefs off Tampa, Fla. (17-18 m) (Springer and Woodburn, 1960), frequently at the Florida Middle Ground (Clarke, 1986), and from Bermuda (Stephens, 1970). An adult male *Emblemaria atlantica* specimen, the first from the northwestern Gulf, was collected by the submersible along with several algal nodules at 75 m on the WFG. Dr. John Stephens (Occidental College, Los Angeles, CA.) kindly verified this identification.

BLENNIIDAE

Hypsoblennius invemar

Smith-Vaniz and Acero tessellated blenny

December 1979; occasional; BGOF; 1-3 m; visual sighting, diver.

March 1980; frequent; BGOF; 1-3 m; visual sighting, diver.

22 June 1981; 9(33-40); VM-241-A; 1-15 m; hand net, diver (TCWC 6322.1).

July 1981; rare; HI-595; 2 m; visual sighting, diver.

August 1981; occasional; SPI-1048;
1-3 m; visual sighting, diver.

August 1981; frequent; MU-749L-1;
1-3 m; visual sighting, diver.

29 May 1983; occasional; MI-749;
1-2.5 m; visual sighting, diver.

26 March 1984; rare; HI-389; 2 m;
visual sighting, diver.

4 September 1984; frequent; HI-389;
1-4 m; visual sighting, diver.

This recently described tropical species is represented by an apparently disjunct population in the northwestern Gulf (Smith-Vaniz, 1980). The following line of evidence suggests that *H. invemar* has been recently recruited to the region. The earliest record of this species in the northwestern Gulf found by the authors is a photograph taken by Childs (1980) (apparently taken pre-1979) on a platform off Louisiana (misidentified as *H. ionthas*). Paratypes of this form were first collected off Cameron, Louisiana in August 1979 by L.R. Martin and senior author. Additional specimens were obtained on a subsequent visit to the same location in December 1979 and on the same trip a few individuals were also observed at the BGOF off Galveston, Texas. The blenny assemblage at the BGOF had been intensively studied in 1977 through 1979, without revealing the presence of *H. invemar* (Workman and Jones, 1979; Gallaway *et al.*, 1981b). Diver census at the BGOF in March 1980 noted a more frequent occurrence of this species. Earlier oil platform investigations off Louisiana (east of Cameron) in the summer 1978 failed to record this blenny (Gallaway *et al.*, 1981a). Since that time observations on oil platforms throughout the region have revealed a distribution of the tessellated blenny from off Cameron, Louisiana to south Texas.

This blenny parallels closely the distribution of the Mediterranean bar-

nacle *Megabalanus antillensis* (Pilsbry) (= *Balanus tintinnabulum*) in which it makes its home. The tessellated blenny is found on nearshore platforms off south Texas to the continental shelf edge (HI-389). It rarely ranges deeper than 3 m, though when potential shelters (dead barnacles) are rare, it was found as deep as 15 m. Competition with three other co-occurring blenny species (*Hypleurochilus geminatus* (Wood), *Parablennius marmoratus* (Poey), and *Scartella cristata* (Linnaeus)) may limit its depth range.

The lack of reports before 1978 and the apparently rapid spread of this highly visible and photogenic blenny suggests recent introduction into the region. This may have been accomplished either by adults or eggs traveling by ship to a Louisiana port from the Caribbean, as the Mediterranean barnacle is a common ship-fouling barnacle. The dispersal south down the Texas coast follows known current patterns and the distribution of potential habitat. *Hypsoblennius invemar* is now a well established element of the oil platform fish fauna.

MICRODESMIDAE

Microdesmus lanceolatus

Dawson lancetail wormfish
9 March 1980; 1; 28°17'N, 96°11'W,
off Port O'Connor, Texas; 22 m;
sled-type benthic dredge (GCRL
16951).

6 December 1980; 1(95); 26°58'N,
97°11'W; 26 m; Smith-McIntyre
grab (TCWC 6322.1).

This rare species of wormfish previously known only from the type specimen off Louisiana (Dawson, 1962a) was collected twice off Texas in 1980. It was previously reported by Harper *et al.* (1981) as occurring at the BGOF (21 m), but could not be confirmed. C.E. Dawson (Gulf Coast Research Laboratory, Ocean

Springs, MS) verified the identification of the benthic dredge specimen which is now in the GCRL collection. Based on the limited data this species inhabits deeper waters than its sympatric congener *M. longipinnis* (Weymouth).

CYNOGLOSSIDAE

Symphurus urospilus

- Ginsburg spottail tonguefish
11 July 1971; 1(89); 29°08'N,
93°20'W; 19-m; 6.1-m trawl (TCWC
3460-3).
- 21 June 1978; 1; BGOF; 21 m; 12.2-m
trawl.
- 30 November 1978; 7(105-124 TL);
BGOF; 21 m; 12.2-m trawl (TCWC
5157.1).
- 1 December 1978; 1; 28°20'N,
95°19'W; 36 m; 10.4-m trawl (TCWC
3307.1).
- 11 February 1980; 1(80); 28°45'N,
95°14'W; 22 m; 10.4-m trawl (TCWC
3314.1).
- 3 December 1980; 1; 28°25'N,
95°10'W; 27-47 m; 10.4-m trawl
(TCWC 3303.1).
- 6 May 1981; 1(94); 28°44'N, 95°10'W;
27-47 m; 10.4-m trawl (TCWC
4145.1).

The spottail tonguefish identified by its distinctive caudal spots and low caudal-fin ray count (11) was initially collected near the BGOF in summer, 1978. All BGOF specimens were taken during night trawling over silty-sand substrate. Several more specimens were collected just southwest of BGOF off Freeport, Texas on similar type of bottom during a soft bottom fish study (Chittenden *et al.*, 1981). *Symphurus urospilus* has not been previously reported in the northwestern Gulf, but is typically found at similar depths as reported here in the eastern Gulf (18 m) and off Yucatan, Mexico (22-26 m) (Springer and Bullis, 1956; Topp and Hoff, 1972). Recent trawl

collections off Tampico, Mexico by the OREGON II revealed the spottail tonguefish in small numbers in the southwestern Gulf (R. Christian, NMFS Laboratory, Galveston, TX; pers. com.).

Numerous trawling studies in the northwestern Gulf have previously failed to report the spottail tonguefish, suggesting it may be a transient member of the northwestern Gulf ichthyofauna.

BALISTIDAE

Aluterus monoceros

- (Linnaeus) unicorn filefish
8 August 1978; 1(233); BGOF; 2 m;
spear, diver.

One unicorn filefish was speared by the senior author under the research vessel tied to an oil platform at the BGOF. The specimen was identified as *Aluterus* based on the lack of an external pelvic bone spine, high dorsal-fin (47) and anal-fin (48) ray counts. body proportions allowed for the differentiation of *A. monoceros* from the closely related *A. scriptus* (Osbeck), which is not uncommon in this region (Berry and Voegelé, 1961; pers. obs.).

As is typical for this species, the specimen was a uniform pale tan and completely lacked body markings. Several filefish lacking body markings and possessing the distinctive outline of the unicorn filefish were observed by towed-video camera at the EFG (G.S. Boland, LGL Ecological Research Assoc., Bryan, TX, pers. comm.), but these individuals could not be reliably separated from *A. scriptus* which may be similarly shaped.

This record of *A. monoceros* is the first report of this tropical species north of the Dry Tortugas in the Gulf of Mexico.

Canthidermis maculatus

- (Bloch) rough triggerfish
10 October 1980; 1(232); HI-595;

Table 5. Depth range, abundance (number per hour of submersible survey time), and number observed of *Xanthichthys ringens* on the hard banks of the northwestern Gulf based on submersible observations.

| Bank | Depth Range | Abun. | No. Obs. |
|---------|-------------|-------|----------|
| Bright | 52-55 | 0.41 | 3 |
| Diaphus | 84-85 | 1.31 | 5 |
| EFG | 55 | 0.07 | 1 |
| Elvers | 73-79 | 0.34 | 2 |
| Ewing | 58-67 | 1.50 | 5 |

| Bank | Depth Range | Abun. | No. Obs. |
|-----------|-------------|-------|----------|
| Geyer | 82 | 0.09 | 1 |
| Jakkula | 70 | 0.78 | 2 |
| WFG | 46-52 | 2.15 | 14 |
| 18 Fathom | 46 | 0.23 | 1 |
| 28 Fathom | 52-72 | 0.44 | 5 |

surface; dipnet.

14 April 1981; 1(328); HI-595; 10 m; spear, diver.

An adult specimen of *C. maculatus* was dipnetted at the surface near an oil platform (HI-595), just west of the WFG. A second specimen was speared at the same oil platform on a subsequent sampling trip. The dip-net specimen was collected at night, and possessed the characteristic color phase of the species, dark blue on the upper two-thirds of the body with light spots, and paler, ventrally. (Moore, 1967). The spear-collected specimen was observed to be much paler, closely resembling at a distance the ocean triggerfish (*C. sufflamen* (Mitchell)) in shape and color. Once speared this individual displayed a darker coloration. Two or three additional individuals were observed to be associated with the platform.

Juvenile specimens of the rough triggerfish are reported infrequently in the northwestern Gulf (Baughman, 1950b; Cashman, 1973), and most adults from the Gulf of Mexico are reported from off the continental shelf (Bullis and Thompson, 1965).

These specimens are the first continental shelf records for adults in the northwestern Gulf and this is the first record of substrate association for this typically pelagic species.

Xanthichthys ringens

(Linnaeus) sargassum triggerfish

Numerous locations for visual sightings (see Table 5).

The sargassum triggerfish was sighted at ten shelf-edge banks (Table 5). This species, reportedly a common associate of floating *Sargassum*, was rarely found in *Sargassum* community studies in the western Atlantic (Dooley, 1972; Bortone *et al.*, 1977; *pers. obs.*). Although several juvenile specimens have been previously collected in the Gulf of Mexico (Dawson, 1962b; Bullis and Thompson, 1965; Cashman, 1973), adults are unreported from the Gulf of Mexico (Moore, 1967; Randall *et al.*, 1978). Randall (1983) reported this species as most common below 30 m in the Caribbean and it has been reported from 90 to 130 m off Jamaica (Colin, 1974). Individuals reported herein represent the first record of a resident adult population in the Gulf of Mexico.

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LITERATURE CITED

- Anderson, W.D., and P.C. Heemstra. 1980. Two new species of western Atlantic *Anthias* (Pisces: Serranidae): redescription of *A. asperilinguis* and review of *Holanthias martinicensis*. *Copeia* 1980(1): 72-87.
- Baughman, J.L. 1947. Fishes not previously reported from Texas, with miscellaneous notes on the species. *Copeia* 1947(4): 280.
- _____. 1950a. Random notes on Texas fishes: Part I. *Tex. J. Sci.* 2(1): 117-138.
- _____. 1950b. Random notes on Texas fishes: Part II. *Tex. J. Sci.* 2(2): 242-263.
- Berry, F.H., and L.F. Voegelé. 1961. Filefishes (Monacanthidae) of the western north Atlantic. *U.S. Fish. Bull.* 61: 61-109.
- Böhlke, J.E., and C.G.C. Chaplin. 1968. Fishes of the Bahamas and adjacent waters. *Livingston Publ. Co. Wynne-wood, PA.*, 771 p.
- _____, and L.P. Thomas. 1961. Notes on the west Atlantic jawfishes *Opistognathus aurifrons*, *O. lonchurus*, and *Gnathypops bermudezi*. *Bull. Mar. Sci.* 11(4): 503-516.
- Bortone, S.A., P.A. Hastings, and S.B. Collard. 1977. The pelagic-Sargassum ichthyofauna of the eastern Gulf of Mexico. *Northeast Gulf Sci.* 1(2): 60-67.
- Bradbury, M.G. 1980. A revision of the fish genus *Ogcocephalus* with descriptions of new species from the western Atlantic Ocean, (Ogcocephalidae, Lophiiformes). *Proc. Calif. Acad. Sci.* 42(7): 229-285.
- Briggs, J.C. 1958. A list of Florida fishes and their distribution. *Bull. Fla. State Mus. Biol. Sci.* 2(8): 223-318.
- Briggs, J.C. 1972. *Marine zoogeography*. McGraw-Hill Book Co. New York, NY, 475 p.
- Bright, T.J., and C.W. Cashman. 1974. Fishes. p. 339-409 *In*: Bright, T.J. and L.H. Pequegnat (eds.), *Biota of the West Flower Garden Bank*. Gulf Publ. Co., Houston, TX, 435 p.
- _____, J.W. Tunnell, L.H. Pequegnat, T.E. Burke, C.W. Cashman, D.A. Cropper, J.P. Ray, R.C. Tressler, J. Teerling, and J.B. Willis. 1974. Biotic zonation on the West Flower Garden Bank. p. 3-54 *In*: Bright, T.J. and L.H. Pequegnat, eds. *Biota of West Flower Garden Bank*. Gulf Publ. Co., Houston, TX, 435 p.
- _____, P.A. LaRock, R.D. Lauer, and J.M. Brooks. 1980. A brine seep at the East Flower Garden Bank, northwestern Gulf of Mexico. *Int. Revue ges. Hydrobiol.* 65(4): 535-549.
- Bullis, H.R., and J.R. Thompson. 1965. Collections by the exploratory fishing vessels *Oregon*, *Silver Bay*, *Combat*, and *Pelican* made during 1956-1960 in the southwestern north Atlantic. *U.S. Fish & Wildlife Serv. Spec. Sci. Rept.* No. 510, 130 p.
- Bullock, L.H., and M.F. Godcharles. 1982. Range extensions of four sea basses (Pisces: Serranidae) from the eastern Gulf of Mexico with color notes on *Hemanthias leptus* (Ginsburg). *Northeast Gulf Sci.* 5(2): 53-56.

- Burgess, G.H., G.W. Link, and S.W. Ross. 1979. Additional marine fishes new or rare to Carolina waters. *Northeast Gulf Sci.* 3(2): 74-86.
- Caldwell, D.K. 1959. Observations on tropical marine fishes from the north-eastern Gulf of Mexico. *Quart. J. Fla. Acad. Sci.* 22(1): 69-74.
- _____. 1963. Tropical marine fishes in the Gulf of Mexico. *Quart. J. Fla. Acad. Sci.* 26(2): 188-191.
- Cashman, C.W. 1973. Contributions to the ichthyofaunas of the West Flower Garden reef and other reef sites in the Gulf of Mexico and western Caribbean. Ph.D. dissertation. Texas A&M Univ. College Station, TX, 247 p.
- Causey, B.D. 1969. The fish fauna of Seven and One-Half Fathom reef, north-western Gulf of Mexico. Master's Thesis. Texas A&I Univ. Kingsville, TX, 110 p.
- Chavez, H. 1966. Peces colectados en el arrecife Triangulos Oeste y en Cayo Arenas, Sonda de Campeche, Mexico. *Acta Zool. Mex.* 8(1): 1-12.
- Childs, T. 1980. The Silver Lining. *Oceans* 13(2): 50-54.
- Chittenden, M.E., J. Ross, and J. Pavela. 1981. Nekton. Chapter 4. *In*: Hann, R.W., and R.E. Randall (eds.), Pre-disposal studies. Evaluation of brine disposal from the Brine Mound program. Vol. 1. Final report to DOE SPR office, New Orleans, LA. DOE Contract No. DE-FC96-79P010114. 131 p.
- Clarke, D.G. 1986. Visual censuses of fish populations at the Florida Middle Ground. *Northeast Gulf Sci.* 8(1): 65-81.
- Colin, P.L. 1972. Daily activity patterns and effects of environmental conditions on the behavior of the yellowhead jawfish *Opistognathus aurifrons* with notes on its ecology. *Zoologica* 57(4): 137-169.
- _____. 1974. Observations and collections of deep-reef fishes off the coasts of Jamaica and British Honduras (Belize). *Mar. Biol.* 24: 29-38.
- _____. 1976. Observations of deep-reef fishes in the Tongue-of-the-Ocean, Bahamas. *Bull. Mar. Sci.* 26(4): 603-605.
- Cordova, F.G. 1986. Distribution of the coney, *Epinephelus fulvus*, in the north-western Gulf of Mexico. *Northeast Gulf Sci.* 8(2): 161-162.
- Darcy, G.H., and E.J. Gutherz. 1984. Abundance and density of demersal fishes on the west Florida shelf, January 1978. *Bull. Mar. Sci.* 34(1): 81-105.
- Dawson, C.E. 1962a. A new gobioid fish, *Microdesmis lanceolatus*, from the Gulf of Mexico with notes on *M. longipinnis* (Weymouth). *Copeia* 1962(2): 330-336.
- Dawson, C.E. 1962b. New records and notes on fishes from the north-central Gulf of Mexico. *Copeia* 1962(2): 442-444.
- Dennis, G.D., and T.J. Bright. 1988. Reef fish assemblages on hard banks in the northwestern Gulf of Mexico. *Bull. Mar. Sci.* 43(2):
- Dooley, J.K. 1972. Fishes associated with the pelagic Sargassum complex, with a discussion of the Sargassum community. *Contr. Mar. Sci.* 16: 2-32.
- _____. 1978. Systematics and biology of the tilefishes (Perciformes: Branchiostegidae and Malacanthidae) with descriptions of two new species. NOAA Tech. Rep. NMFS Circ. 411. 78 p.
- Gallaway, B.J. 1981. An ecosystem analysis of oil and gas development on the Texas-Louisiana continental shelf. U.S. Fish & Wildlife Serv. Rep. FWS/OBS-81/27, 89 p.
- _____, and G.S. Lewbel. 1982. The ecology of petroleum platforms in the northwestern Gulf of Mexico: a community profile. U.S. Fish & Wildlife Serv. Rep. FWS/OBS-82/27, 92 p.
- _____, M.F. Johnson, L.R. Martin, F.J. Margraf, G.S. Lewbel, R.L.

- Howard, and G.S. Boland. 1981a. The artificial reef studies *In*: Bedinger, C.A. and L.Z. Kirby (eds.), Ecological investigations of petroleum production platforms in the central Gulf of Mexico. Vol. II. SWRI Report to BLM, OCS Office, New Orleans, LA. NTIS Accession No. PB82-167828, 199 p.
- _____, L.R. Martin, R.L. Howard, G.S. Boland, and G.D. Dennis. 1981b. Effects on artificial reef and demersal fish and macrocrustacean communities. p. 237-293 *In*: Middle-ditch, B.S. (ed.), Environmental Effects of Offshore Oil Production: the Buccaneer Oil and Gas Field Study. Mar. Sci. Ser. Vol. 14. Plenum Press, New York, NY, 446 p.
- Gilbert, C.R. 1972. Characteristics of the western Atlantic reef-fish fauna. *Quart. J. Fla. Acad. Sci.* 35(2-3): 130-144.
- Gunter, G., and L. Knapp. 1951. Fishes, new, rare, or seldom recorded from the Texas coast. *Tex. J. Sci.* 3(1): 134-138.
- Harper, D.E., D.L. Potts, R.R. Salzer, R.J. Case, R.L. Jaschek, and C.M. Walker. 1981. Distribution and abundance of macrobenthic and meiobenthic organisms. p. 133-177 *In*: Middle-ditch, B.S. (ed.), Environmental Effects of Offshore Oil Production: the Buccaneer Gas and Oil Field Study. Mar. Sci. Ser. Vol. 14. Plenum Press. New York, NY, 446 p.
- Hoese, H.D. 1958. A partially annotated checklist of the marine fishes of Texas. *Publ. Inst. Mar. Sci. Univ. Texas* 5: 312-352.
- Jordan, D.S., and M.D. Bradby. 1892. A preliminary review of the apodal fishes or eels inhabiting the waters of America or Europe. *Rep. U.S. Fish. Comm.* 1888. 16: 581-677.
- _____, and B.W. Evermann. 1898. The fishes of north and middle America. Part III. *Bull. U.S. Nat. Mus.* 47: 2183-3136.
- _____, and C.H. Gilbert. 1882. Notes on fishes observed about Pensacola, Florida and Galveston, Texas, with descriptions of new species. *Proc. U.S. Nat. Mus.* 5: 241-307.
- Longley, W.H., and S.F. Hildebrand. 1941. Systematic catalogue of the fishes of Tortugas, Florida, with observations on color, habits, and local distribution. *Pap. Tortugas Lab. Carnegie Inst. Wash. D.C. Publ. No. 535*, 331 p.
- Moore, D. 1967. Triggerfishes (Balistidae) of the western Atlantic. *Bull. Mar. Sci.* 17(3): 689-722.
- Moseley, F.N. 1966. Notes on fishes from the snapper banks off Port Aransas, Texas. *Tex. J. Sci.* 18: 75-79.
- Pietsch, T.W. and D.B. Grobecker. 1987. Frogfishes of the World. Stanford Univ. Press, Stanford, CA.
- Powell, D., L.M. Dwinell, and S.E. Dwinell. 1972. An annotated listing of the fish reference collection at the Florida Department of Natural Resources Marine Research Laboratory. *Dept. Nat. Resour. Mar. Res. Lab. Spec. Sci. Rep. No. 36*, 179 p.
- Randall, J.E. 1965. A redescription of *Sparisoma atomarium* (Poey), a valid West Indian parrotfish. *Acad. Nat. Sci. Phil. Not. Nat.* 26: 194-200.
- _____. 1983. Caribbean reef fishes. 2nd Edition. T.F.H. Publ. Neptune City, NJ, 350 p.
- _____, and D.K. Caldwell. 1966. A review of the sparid fish genus *Calamus*, with descriptions of four new species. *Bull. L.A. Co. Mus. Nat. Hist. Sci.* 2: 1-47.
- _____, K. Matsuura, and A. Zama. 1978. A revision of the triggerfish genus *Xanthichthys* with description of a new genus. *Bull. Mar. Sci.* 28(4): 688-706.
- Rezak, R., T.J. Bright, and D.W. McGrail. 1985. Reefs and Banks of the Northwestern Gulf of Mexico. Wiley-Inter-

- science, New York, NY. 259 p.
- Robins, C.R. 1971. Distribution patterns of fishes from coastal and gulf waters of the tropical western Atlantic. p. 249-255. *In*: Symposium on investigations and resources of the Caribbean Sea and adjacent regions. FAO Fish. Rept. No. 71.2.
- Robins, C.R., and W.A. Starck. 1961. Material for a revision of *Serranus* and related fish genera. Proc. Acad. Nat. Sci. Phil. 113(11): 259-314.
- _____, 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. 4th Edition. Amer. Fish. Soc. Spec. Publ. No. 12, 174 p.
- Robins, C.R., G.C. Ray, J. Douglass. 1986. A Field Guide to Atlantic Coast Fishes of North America. Houghton Mifflin Co. Boston, MA, 354 p.
- Schultz, L.P. 1957. The frogfishes of the family Antennariidae. Proc. U.S. Nat. Mus. 107: 47-105.
- Shipp, R.L., and T.S. Hopkins. 1978. Physical and biological observations of the northern rim of the Desoto Canyon made from a research submersible. Northeast Gulf Sci. 2(2): 113-121.
- Smith, C.L. 1971. A revision of the American groupers: *Epinephelus* and allied genera. Bull. Amer. Mus. Nat. Hist. 146(2): 69-241.
- Smith, G.B. 1976. Ecology and distribution of eastern Gulf of Mexico reef fishes. Fla. Dept. Nat. Resour. Mar. Res. Publ. No. 19, 78 p.
- _____, H.M. Austin, S.A. Bortone, R.W. Hastings, and L.H. Ogren. 1975. Fishes of the Florida Middle Ground with comments on ecology and zoogeography. Fla. Dept. Nat. Resour. Mar. Res. Publ. No. 9, 14 p.
- Smith-Vaniz, W.F. 1980. Revision of western Atlantic species of the blennid fish genus *Hypsoblennius*. Proc. Acad. Nat. Sci. Phil. 132: 285-305.
- Sonnier, F., H.D. Hoese, and J. Teerling. 1976. Observations on the offshore reef and platform fish fauna of Louisiana. Copeia 1976(1): 105-111.
- Springer, S., and H.T. Bullis. 1956. Collections by the *Oregon* in the Gulf of Mexico. U.S. Fish Wildlife Ser. Spec. Sci. Rep. Fish. No. 196, 134 p.
- Springer, V.G., and K.D. Woodburn. 1960. An ecological study of the fishes of the Tampa Bay area. Fla. State Bd. Conserv. Mar. Res. Lab. Prof. Pap. Ser. No. 1, 104 p.
- Starck, W.A. 1968. A list of the fishes of Alligator Reef, Florida with comments on the nature of the Florida reef fish fauna. Undersea Biol. 1: 4-40.
- Stephens, J.S. 1970. Seven new chaenopsid blennies from the western Atlantic. Copeia 1970(2): 280-309.
- Taylor, D.D., and T.J. Bright. 1973. The distribution of heavy metals in reef-dwelling groupers in the Gulf of Mexico and Bahama Islands. Texas A&M Univ. Sea Grant Publ. TAMU-SG-73-208, 249 p.
- Topp, R.W., and F.H. Hoff. 1972. Flatfishes (Pleuronectiformes). Mem. Hourglass Cruise No. 4(2), 135 p.
- Walls, J.G. 1975. Fishes of the Northern Gulf of Mexico. T.F.H. Publ. Neptune City, NJ, 432 p.
- Williams, J.T., and R.L. Shipp. 1980. Observations on fishes unrecorded or rarely encountered in the northeastern Gulf of Mexico. Northeast Gulf Sci. 4(1): 17-27.
- Woods, L.P. 1942. Rare fishes from the coast of Texas. Copeia 1942(3): 191-192.
- _____, and P.M. Sonoda. 1973. Family Holocentridae, Order Berycomorphi (Beryciformes). p. 331-386. *In*: Fishes of the Western North Atlantic. Mem. 1, Pt. 6, Sears Found. Mar. Res. Yale Univ. New Haven, CN.
- Workman, I.K., and C.E. Jones. 1979. Determine effects of oil field

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discharges on species composition and abundance of pelagic fishes and demersal fishes and macrocrustaceans in the oil field. Work Unit 2.35. Environmental assessment of an active oil field in the northwestern Gulf of Mexico, 1977-1978. NOAA/NMFS Annual Report to EPA. EPA-IAG-D5--E693-EO. NMFS Laboratory, Galveston, TX. 146 p.