

Species and Relative Abundances of Fish and Shellfish in the Vicinity of the Turkey Point Plant Based on Recent Collections

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Introduction

Ecological Associates, Inc. (EAI) was contracted by Florida Power & Light Company (FPL) to characterize fish and shellfish assemblages in Card Sound in the vicinity of its Turkey Point Plant in Miami-Dade County, Florida. Sampling was conducted over a one-year period beginning in March 2008. EAI was asked to provide a summary of monitoring results from the 2008 Card Sound sampling. In addition, EAI was asked to compare those results to similar historical studies conducted within Biscayne Bay. The goal of this comparison was to determine if similar fish and shellfish species assemblages are expected to exist in Card Sound and Biscayne Bay adjacent to the FPL Turkey Point Plant property.

Methods

Field Sampling

General – Sampling was conducted every other week from March 4, 2008 through February 17, 2009 for a total of 26 sampling events. Each sampling event consisted of trawling for juvenile and adult fish and shellfish and towing nets for ichthyoplankton and shellfish larvae. Samples were collected at three locations along the western shore of Card Sound near the southern boundary of Biscayne Bay (Figure 1). The three stations were located between 200 (61.0 m) and 600 ft (182.9 m) from shore over patchy seagrass and algal beds in approximately 7-8 ft (2.1–2.4 m) of water. Sampling at each station was conducted once during the daytime and once at night for a total of six collections per sampling event.

Trawls - Trawl sampling was conducted with a 10-ft (3.0-m) otter trawl towed for 10 minutes along a linear transect at each station. Fish and shellfish were counted, identified, measured, and returned alive to the water after processing. For the purpose of this study, shellfish were defined as commercially important (CI) decapod crustaceans (e.g., shrimp, crabs, and lobster) and other invertebrates potentially harvested by man (e.g., horseshoe crabs). All specimens were identified to the lowest practicable taxon.

Bongo Netting – Ichthyoplankton sampling was conducted using paired bongo nets (20 cm inside diameter) fitted with 0.5 mm mesh conical nets. The nets were towed for 10 minutes at mid-depth at each station along roughly linear transects. Flow meters mounted

at the mouth of each bongo allowed calculation of the amount of water filtered. Upon completion of each tow, the contents of both bongos were combined to yield a single sample for each station and photoperiod and the samples returned to EAI's laboratory for processing. In the laboratory, plankton samples were sorted and specimens assigned to one of three categories: fish eggs, fish larvae, and shellfish larvae.

Results

Juvenile and Adult Fish Captured by Trawl

Taxa – A total of 74 taxa of fish were captured during trawl sampling (Table 1).

Total Abundance – A total of 4,679 individual fish were captured over the 26 sampling events, all stations combined (Table 2). Catch per Unit Effort (CPUE), defined as the number of specimens captured per 100 m trawled, was relatively low, with 7.5 specimens captured per 100 m trawled.

Dominant Taxa – Those species constituting over 10% of the total catch, in order of abundance, consisted of pinfish (*Lagodon rhomboids*; 19.6%), bluestriped grunt (*Haemulon sciurus*; 12.6%), silver jenny (*Eucinostomus gula*; 12.3%), and white grunt (*Haemulon plumieri*; 11.6%; Table 2). A total of nine species comprised over 75% of all taxa collected. In addition to the four listed above, they included fringed pipefish (*Anarchopterus criniger*), scrawled cowfish (*Acanthostracion quadricornis*), gulf toadfish (*Opsanus beta*), gray snapper (*Lutjanus griseus*), and planehead filefish (*Stephanolepis hispidus*). Only pinfish exceeded one specimen per 100 m of bottom trawled.

Seasonal Variability – Most of the dominant taxa were present year round, with numbers often fluctuating considerably between consecutive events (Table 3). However, some seasonal trends were evident. Pinfish were most abundant from mid April through July with a secondary peak in November through February. Bluestriped grunt were present in greatest numbers in late November and early December with several minor peaks during the summer. The silver jenny was present in relatively high numbers from June through August with another isolated peak in early December. Greatest numbers of white grunt were collected from November through February.

Juvenile and Adult Shellfish Captured by Trawl

Taxa – A total of 17 taxa of shellfish were captured during trawl sampling (Table 4).

Total Abundance – A total of 2,063 individual shellfish were captured over the 26 sampling events combined (Table 5). Similar to trawl results for fish, CPUE was relatively low, with only 3.3 specimens captured per 100 m trawled.

Dominant Taxa – Shrimp within the genus *Farfantepenaeus*, primarily pink shrimp (*F. duorarum*) comprised nearly 75% of the total shellfish catch (Table 5). Other common

shellfish included spiny lobster (*Panulirus argus*), blue crabs (*Callinectes sapidus*) and other related species within the genus *Callinectes*, and white shrimp (*Litopenaeus setiferus*). Stone crab (*Menippe mercenaria*), rock shrimp (*Sicyonia typica*), and brown shrimp (*Farfantepenaeus aztecus*) were only rarely captured. CPUE for pink shrimp (including *Farfantepenaeus* spp.) was 2.4 per individuals per 100 m trawled.

Seasonal Variability – Pink shrimp were captured in relatively low numbers throughout the spring, summer and early fall (Table 6). Then numbers began increasing steadily throughout the remainder of the sampling period, peaking in early February. From December through February the average number of pink shrimp captured by trawl was three times greater than the average number captured from March through September.

Ichthyoplankton Sampling - Fish Eggs

Taxa – Seven distinct taxa of fish eggs were identified (Table 7).

Total Abundance – A total of 26,277 fish eggs were collected during plankton sampling in Card Sound (Table 7). That equates to an average of 6.6 eggs per m³ of water filtered.

Dominant Taxa – The vast majority of eggs could not be identified to the family level due to their condition or early stage of development. Of those that could be assigned to a family, the clupeids were the dominant taxon accounting for nearly 12% of all eggs collected (Table 7).

Seasonal Variability – The number of fish eggs collected, all taxa combined, increased from the initiation of monitoring in March 2008, reaching a peak in late May (Table 8). With the exception of one sampling event in early June numbers remained relatively high through the summer before declining to seasonal lows in fall and winter.

Ichthyoplankton Sampling - Fish Larvae

Taxa – A total of 47 ichthyoplankton taxa were identified in plankton samples (Table 9).

Total Abundance – A total of 3,152 fish larvae were present in the samples (Table 10). That equates to an average of 0.8 larvae per m³ of water filtered.

Dominant Taxa – Most of the fish larvae collected were either benthic species, primarily blennies and gobies, or baitfish, such as herrings, silversides, and anchovies. Six taxa comprised over 75% of all ichthyoplankton collected (Table 10). In order of abundance they included: Gobiidae (gobies), Clupeidae (herrings), Labrisomidae (Labrisomid blennies), Chaenopsidae (true blennies), hardhead silverside (*Atherinomorus stipes*), and code goby (*Gobiosoma robustum*).

Seasonal Variability – The number of ichthyoplankton collected per event, all taxa combined, demonstrated a relative increase from the onset of sampling, and peaked in

mid May (Table 8). Numbers remained relatively high throughout the summer. Very few fish larvae were captured during the fall and winter months.

Ichthyoplankton Sampling - Shellfish Larvae

Taxa – Nine taxa of shellfish larvae were identified from plankton samples collected (Table 11). Shellfish larvae included penaeid shrimp, blue crabs, mantis shrimp, and stone crab.

Total Abundance – A total of 1,466 shellfish larvae were present in the samples (Table 12). That equates to an average of 0.4 larvae per m³ of water filtered.

Dominant Taxa – Three taxa accounted for over 75% of all shellfish larvae contained in the samples: commercially important crabs in the genus *Callinectes*, stone crab (*Menippe mercenaria*), and mantis shrimp (*Squilla empusa*; Table 12). Brown shrimp and pink shrimp larvae were also present, although they were present in much smaller numbers.

Seasonal Variability – Over 60% of all *Callinectes* spp. larvae were collected in late April and early May (Table 13). Another 25% were captured from late May through early July. Throughout the remainder of the year, numbers of blue crab larvae were relatively low. Nearly 50% of all stone crab larvae were captured in August. None were collected from early November through early February.

Comparison with Previous Studies Conducted in Biscayne Bay

Results of recent sampling in northern Card Sound compare favorably with previous studies conducted in Biscayne Bay. Berkeley (2004) conducted both creel and trawl surveys in Biscayne Bay in 1982-1983. The most abundant recreational and commercial species captured by trawl were pinfish (n=12,659), white grunt (n=4,216), and bluestriped grunt (n=2,487). Penaeid shrimp (= *Farfantepenaeus* spp.; n=58,438) and ornate blue crabs (n=4,408) were the most abundant shellfish collected. These same species were among the dominant taxa collected by trawl during EAI's study in 2008-2009.

Between 1996 and 2000, a similar trawling study was conducted throughout Biscayne Bay (Ault 2004). This study found that the highest diversity of fish species occurred in the east-central to northeastern portions of the Bay, while “diversity was lowest on the western side of the Bay proximal to areas of canal discharges with highly variable salinities, and in hard bottom habitats.” Of the 177 species collected by trawl, the 10 dominant species included gulf toadfish, pinfish, bluestriped grunt, fringed filefish (*Monocanthus ciliatus*), white grunt, silver jenny, scrawled cowfish, planehead filefish, bronze cardinalfish (*Astrapogon alutus*), and emerald parrotfish (*Nicholsina usta*). Seven of those species were among the dominant taxa collected by trawl in EAI's recent study, and another species, the fringed filefish, was also frequently captured. The study indicated that marine species were usually collected on the east side of Biscayne Bay

while euryhaline species were more prevalent towards the western side of the Bay in areas associated with freshwater discharge.

In another study, Browder *et al.* (2003) used a combination of throw traps and trawls to characterize fish assemblages in Biscayne Bay. Eighty (80) fish species were collected by commercial trawl, with the most abundant being pinfish, yellowfin mojarra (*Gerres cinereus*), rainwater killifish (*Lucania parva*), silver jenny, gulf toadfish, tomtate (*Haemulon aurolineatum*), dwarf seahorse (*Hippocampus zosterae*), gray snapper, bluestriped grunt, and dusky pipefish (*Syngnathus floridae*). Similar to EAI's recent trawl sampling, pinfish was the most abundant species.

With respect to shellfish, Browder *et al.* (2003) found pink shrimp densities to be highest in the fall and lowest in the summer. A similar pattern was documented during EAI's recent sampling. Ault *et al.* (1999) reported that densities of juvenile *F. duorarum* in Biscayne Bay were highest in nearshore seagrass beds and relatively low over hard-bottom and bare-bottom substrates.

Previous studies have shown that Biscayne Bay serves as a critical nursery ground and food web link for many recreational and commercially important fisheries species. Ault *et al.* (2001) used a combination of reef fish visual surveys, creel surveys, and trawls to document the occurrence and relative abundance of these species. The five most abundant species captured in the trawls were pink shrimp (n = 103,896), pinfish (n = 8,163), gulf toadfish (n = 4,480), white grunt (n = 3,855), and silver jenny (n = 3,160). Again, these same species were among the dominant taxa collected by EAI during recent sampling in Card Sound in the vicinity of the Turkey Point Plant. The authors of this study also emphasized that diversity was lowest on the western fringe of the Bay, "particularly at areas proximal to SFWMD canal outfalls and attendant freshwater influxes."

The Essential Fish Habitat (EFH) Assessment prepared in support of the Turkey Point Expansion Project (EAI 2004), listed 27 federally-managed species of fish (24) and shellfish (3) that may potentially utilize habitats that occur in the vicinity of the Turkey Point Plant during some portion of their life cycle. Of those species previously collected, 15 were collected in trawl sampling conducted by EAI in 2008-2009.

Harper *et al.* (2000) conducted a 15-year creel census within Biscayne National Park and surrounding waters from 1976 through 1991. Five taxa accounted for more than 50% of the total landings: white grunt (15.8%); Caribbean spiny lobster (10.6%); gray snapper (10.6%); unidentified grunts (*Haemulon* spp; 7.3%); and dolphin (*Coryphaena hippurus*; 6.6%). Juvenile white grunt, gray snapper and spiny lobster were frequently collected in recent trawling conducted by EAI.

Literature Cited

- Ault, J.S., G.A. Diaz, S.G. Smith, J. Luo, and J.E. Serafy. 1999. An efficient sampling survey design to estimate pink shrimp population abundance in Biscayne Bay, Florida. *North American Journal of Fisheries Management* 19: 696-712.
- Ault, J.S., S.G. Smith, G.A. Meester, J. Luo, and J.A. Bohnsack. 2001. Site characterization for Biscayne National Park: Assessment of fisheries resources and habitats. NOAA Technical Memorandum NMFS-SEFSC-468. 185 pp.
- Ault, J.S. 2004. Turkey Point Expansion Project: Assessment of impacts on regional fisheries and ecosystem processes in Biscayne Bay. Turkey Point Expansion Project Expert Opinion Final Document. Prepared for Florida Power & Light Company, Juno Beach, Florida. 20 pp. + figures.
- Berkeley, S.A. 2004. Fisheries assessment of Biscayne Bay 1983. NOAA/University of Miami Joint Publication. NOAA Technical Memorandum NOS NCCOS CCMA 166. University of Miami RSMAS TR 2004-01.
- Browder, J., J. Hall, L. Uzgiden, P. Eyo, M. Robblee, D. Moore, and A. Daniels. 2003. Faunal density and community composition of the nearshore zone. Part I. Annual Report C13401: Biscayne Bay coastal and nearshore community baseline study to develop biological performance measures.
- EAI (Ecological Associates, Inc.). 2004. Florida Power & Light Company Turkey Point Expansion Project, Final Essential Fish Habitat Assessment. Prepared for Florida Power & Light Company, Juno Beach, Florida. 43 pp.
- Harper, D.E., J.A. Bohnsack, and B.R. Lockwood. 2000. Recreational fisheries in Biscayne National Park, Florida, 1976-1991. *Marine Fisheries Review* 62(1): 8-26.



Figure 1. Location of the Area Used to Sample for Fish and Shellfish in Relation to the FPL Turkey Point Plant.



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Table 1. Common and Scientific Names of Fish Captured by Trawl in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Scientific Name	Common Name
<i>Acanthostracion quadricornis</i>	Scrawled cowfish
<i>Achirus lineatus</i>	Lined sole
<i>Aluterus schoepfii</i>	Orange filefish
<i>Anarchopterus criniger</i>	Fringed pipefish
<i>Anisotremus virginicus</i>	Porkfish
<i>Archosargus rhomboidalis</i>	Sea bream
<i>Astrapogon alutus</i>	Bronze cardinalfish
<i>Atherinomorus stipes</i>	Hardhead silverside
Atherinopsidae	New World Silversides
<i>Bairdiella chrysoura</i>	Silver perch
<i>Calamus arctifrons</i>	Grass porgy
<i>Chaetodipterus faber</i>	Atlantic spadefish
<i>Chilomycterus antillarum</i>	Web burrfish
<i>Chilomycterus schoepfii</i>	Striped burrfish
<i>Cosmocampus albirostris</i>	Whitenose pipefish
<i>Cynoscion nebulosus</i>	Spotted sea trout
<i>Diplectrum formosum</i>	Sand perch
<i>Diplogrammus pauciradiatus</i>	Spotted dragonet
<i>Elacatinus macrodon</i>	Tiger goby
<i>Eucinostomus argenteus</i>	Spotfin mojarra
<i>Eucinostomus gula</i>	Silver jenny
<i>Eucinostomus harengulus</i>	Tidewater mojarra
<i>Eucinostomus jonesii</i>	Slender mojarra
<i>Eucinostomus</i> spp.	Mojarra
<i>Gerres cinereus</i>	Yellowfin mojarra
<i>Gobiosoma robustum</i>	Code goby
<i>Haemulon aurolineatum</i>	Tomtate
<i>Haemulon flavolineatum</i>	French grunt
<i>Haemulon parra</i>	Sailor's choice
<i>Haemulon plumieri</i>	White grunt
<i>Haemulon sciurus</i>	Bluestriped grunt
<i>Haemulon</i> spp.	Grunt
<i>Hippocampus erectus</i>	Spotted seahorse
<i>Hippocampus zosterae</i>	Dwarf seahorse
<i>Histrion histrio</i>	Sargassumfish
<i>Lachnolaimus maximus</i>	Hogfish
<i>Lactophrys bicaudalis</i>	Spotted trunkfish

Table 1.
(Continued)

Scientific Name	Common Name
<i>Lactophrys trigonus</i>	Trunkfish
<i>Lagodon rhomboides</i>	Pinfish
<i>Lucania parva</i>	Rainwater killifish
<i>Lutjanus analis</i>	Mutton snapper
<i>Lutjanus apodus</i>	Schoolmaster
<i>Lutjanus griseus</i>	Gray snapper
<i>Lutjanus synagris</i>	Lane snapper
<i>Monacanthus ciliatus</i>	Fringed filefish
<i>Nicholsina usta</i>	Emerald parrotfish
<i>Ocyurus chrysurus</i>	Yellowtail snapper
<i>Opsanus beta</i>	Gulf toadfish
<i>Orthopristis chrysoptera</i>	Pigfish
<i>Paraclinus fasciatus</i>	Banded blenny
<i>Paraclinus marmoratus</i>	Marbled blenny
<i>Paraclinus</i> spp.	Blenny
<i>Paralichthys albigutta</i>	Gulf flounder
<i>Pareques acuminatus</i>	High-hat
<i>Phaeoptyx pigmentaria</i>	Dusky cardinalfish
<i>Prionotus scitulus</i>	Leopard searobin
<i>Scorpaena grandicornis</i>	Plumed scorpionfish
Sparidae	Porgies
<i>Sparisoma chrysopteron</i>	Redtail parrotfish
<i>Sparisoma radians</i>	Bucktooth parrotfish
<i>Sparisoma rubripinne</i>	Redfin parrotfish
<i>Sphoeroides nephelus</i>	Southern puffer
<i>Sphoeroides spengleri</i>	Bandtail puffer
<i>Sphoeroides testudineus</i>	Checkered puffer
<i>Sphyraena barracuda</i>	Great barracuda
<i>Sphyraena borealis</i>	Northern sennet
<i>Stephanolepis hispidus</i>	Planehead filefish
<i>Stephanolepis setifer</i>	Pygmy filefish
<i>Stephanolepis</i> spp.	Filefish
<i>Syngnathus louisianae</i>	Chain pipefish
<i>Syngnathus scovelli</i>	Gulf pipefish
<i>Syngnathus</i> spp.	Pipefish
<i>Synodus foetens</i>	Inshore lizardfish
<i>Urobatis jamaicensis</i>	Yellow stingray

Table 2. Total Number of Individuals, CPUE, and Percent Composition by Taxa for All Fish Captured by Trawl in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Common Name ¹	Scientific Name	Total Number	Total CPUE ²	Percentage of Total
Bronze cardinalfish	<i>Astrapogon alutus</i>	1	0.00	0.02%
Hardhead silverside	<i>Atherinomorus stipes</i>	1	0.00	0.02%
Sand perch	<i>Diplectrum formosum</i>	1	0.00	0.02%
Tiger goby	<i>Elacatinus macrodon</i>	1	0.00	0.02%
Spotted trunkfish	<i>Lactophrys bicaudalis</i>	1	0.00	0.02%
Schoolmaster	<i>Lutjanus apodus</i>	1	0.00	0.02%
Blenny	<i>Paraclinus</i> spp.	1	0.00	0.02%
High-hat	<i>Pareques acuminatus</i>	1	0.00	0.02%
Dusky cardinalfish	<i>Phaeoptyx pigmentaria</i>	1	0.00	0.02%
Porgies	Sparidae	1	0.00	0.02%
Bucktooth parrotfish	<i>Sparisoma radians</i>	1	0.00	0.02%
Southern puffer	<i>Sphoeroides nephelus</i>	1	0.00	0.02%
Pygmy filefish	<i>Stephanolepis setifer</i>	1	0.00	0.02%
Lined sole	<i>Achirus lineatus</i>	2	0.00	0.04%
Porkfish	<i>Anisotremus virginicus</i>	2	0.00	0.04%
New World Silversides	Atherinopsidae	2	0.00	0.04%
Whitenose pipefish	<i>Cosmocampus albirostris</i>	2	0.00	0.04%
Spotfin mojarra	<i>Eucinostomus argenteus</i>	2	0.00	0.04%
Rainwater killifish	<i>Lucania parva</i>	2	0.00	0.04%
Gulf flounder	<i>Paralichthys albigutta</i>	2	0.00	0.04%
Northern sennet	<i>Sphyraena borealis</i>	2	0.00	0.04%
Filefish	<i>Stephanolepis</i> spp.	2	0.00	0.04%
Sargassumfish	<i>Histrio histrio</i>	3	0.00	0.06%
Mutton snapper	<i>Lutjanus analis</i>	3	0.00	0.06%
Great barracuda	<i>Sphyraena barracuda</i>	3	0.00	0.06%
Pipefish	<i>Syngnathus</i> spp.	3	0.00	0.06%
Yellow stingray	<i>Urobatis jamaicensis</i>	3	0.00	0.06%
Yellowfin mojarra	<i>Gerres cinereus</i>	4	0.01	0.09%
Redfin parrotfish	<i>Sparisoma rubripinne</i>	4	0.01	0.09%
Atlantic spadefish	<i>Chaetodipterus faber</i>	5	0.01	0.11%
Yellowtail snapper	<i>Ocyurus chrysurus</i>	5	0.01	0.11%
Pigfish	<i>Orthopristis chrysoptera</i>	5	0.01	0.11%
Leopard searobin	<i>Prionotus scitulus</i>	5	0.01	0.11%
Orange filefish	<i>Aluterus schoepfii</i>	6	0.01	0.13%
Silver perch	<i>Bairdiella chrysoura</i>	6	0.01	0.13%
Spotted sea trout	<i>Cynoscion nebulosus</i>	6	0.01	0.13%

Table 2.
(Continued)

Common Name¹	Scientific Name	Total Number	Total CPUE²	Percentage of Total
French grunt	<i>Haemulon flavolineatum</i>	6	0.01	0.13%
Banded blenny	<i>Paraclinus fasciatus</i>	6	0.01	0.13%
Web burrefish	<i>Chilomycterus antillarum</i>	9	0.01	0.19%
Spotted dragonet	<i>Diplogrammus pauciradiatus</i>	9	0.01	0.19%
Tomtate	<i>Haemulon aurolineatum</i>	9	0.01	0.19%
Grunt	<i>Haemulon</i> spp.	9	0.01	0.19%
Chain pipefish	<i>Syngnathus louisianae</i>	9	0.01	0.19%
Redtail parrotfish	<i>Sparisoma chrysopteron</i>	11	0.02	0.24%
Inshore lizardfish	<i>Synodus foetens</i>	13	0.02	0.28%
Sailor's choice	<i>Haemulon parra</i>	14	0.02	0.30%
Slender mojarra	<i>Eucinostomus jonesii</i>	16	0.03	0.34%
Dwarf seahorse	<i>Hippocampus zosterae</i>	17	0.03	0.36%
Lane snapper	<i>Lutjanus synagris</i>	17	0.03	0.36%
Code goby	<i>Gobiosoma robustum</i>	18	0.03	0.38%
Marbled blenny	<i>Paraclinus marmoratus</i>	19	0.03	0.41%
Emerald parrotfish	<i>Nicholsina usta</i>	20	0.03	0.43%
Plumed scorpionfish	<i>Scorpaena grandicornis</i>	24	0.04	0.51%
Checkered puffer	<i>Sphoeroides testudineus</i>	26	0.04	0.56%
Gulf pipefish	<i>Syngnathus scovelli</i>	30	0.05	0.64%
Spotted seahorse	<i>Hippocampus erectus</i>	36	0.06	0.77%
Tidewater mojarra	<i>Eucinostomus harengulus</i>	37	0.06	0.79%
Grass porgy	<i>Calamus arctifrons</i>	39	0.06	0.83%
Trunkfish	<i>Lactophrys trigonus</i>	40	0.06	0.85%
Hogfish	<i>Lachnolaimus maximus</i>	57	0.09	1.22%
Fringed filefish	<i>Monacanthus ciliatus</i>	72	0.11	1.54%
Bandtail puffer	<i>Sphoeroides spengleri</i>	81	0.13	1.73%
Striped burrefish	<i>Chilomycterus schoepfii</i>	82	0.13	1.75%
Sea bream	<i>Archosargus rhomboidalis</i>	104	0.17	2.22%
Mojarra	<i>Eucinostomus</i> spp.	130	0.21	2.78%
Planehead filefish	<i>Stephanolepis hispidus</i>	152	0.24	3.25%
Gray snapper	<i>Lutjanus griseus</i>	156	0.25	3.33%
Gulf toadfish	<i>Opsanus beta</i>	172	0.27	3.68%
Scrawled cowfish	<i>Acanthostracion quadricornis</i>	192	0.31	4.10%
Fringed pipefish	<i>Anarchopterus criniger</i>	324	0.52	6.92%
White grunt	<i>Haemulon plumieri</i>	544	0.87	11.63%
Silver jenny	<i>Eucinostomus gula</i>	577	0.92	12.33%

Table 2.
(Continued)

Common Name¹	Scientific Name	Total Number	Total CPUE²	Percentage of Total
Bluestriped grunt	<i>Haemulon sciurus</i>	591	0.94	12.63%
Pinfish	<i>Lagodon rhomboides</i>	919	1.47	19.64%
Contribution by Dominant Taxa		3,627	5.79	77.52%
Total		4,679	7.46	100.00%
Species Richness		74		

¹ Rows in yellow represent taxa contributing to at least 75% of total catch.

² CPUE = Catch Per Unit Effort.

**Table 3. CPUE for Dominant Taxa and All Taxa Combined by Sampling Event for Fish Captured by Trawl
in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.**

Date	Total Fish CPUE ¹	Dominant Fish Taxa CPUE								
		<i>Lagodon rhomboides</i>	<i>Haemulon sciurus</i>	<i>Eucinostomus gula</i>	<i>Haemulon plumierii</i>	<i>Anarchopterus criniger</i>	<i>Acanthostracion quadricornis</i>	<i>Opsanus beta</i>	<i>Lutjanus griseus</i>	<i>Stephanolepis hispida</i>
3/4/2008	6.35	0.93	1.75	0.70	0.58		0.12	0.08	0.19	0.86
3/18/2008	4.02	0.83	0.55	0.60	0.46		0.51			0.23
4/1/2008	4.97	0.67	1.03	0.13	1.34	0.04	0.22	0.09	0.09	0.31
4/15/2008	7.23	3.03	0.77	0.28	0.73	0.16	0.12	0.12	0.12	0.44
4/29/2008	3.64	0.58	0.22	0.18	0.40	0.13	0.31	0.09	0.04	0.04
5/13/2008	4.17	0.99	0.38	0.15	0.54	0.23	0.54	0.08	0.04	0.08
5/28/2008	7.90	2.25	1.12	0.43	0.65	0.09	0.60	0.22	0.26	0.17
6/10/2008	5.58	2.39	0.35	0.35	0.25	0.14	0.42	0.14	0.07	0.21
6/24/2008	15.04	1.12	0.81	4.12	0.56	0.56	0.46	0.25	0.46	0.20
7/8/2008	12.82	4.06	1.81	2.20	0.83	0.39	0.20	0.29	0.29	0.20
7/22/2008	8.72	3.14	0.61	1.22	0.15	0.50	0.15	0.23	0.11	0.61
8/5/2008	10.65	2.21	1.44	2.66	0.27	0.68	0.30	0.11	0.42	0.34
8/26/2008	10.68	0.66	0.99	1.81	0.29	2.39	0.08	1.69	0.82	0.12
9/16/2008	7.46	0.45	0.35	0.40	0.55	2.59	0.45	0.50	0.55	0.20
9/23/2008	6.72	0.93	0.98	0.56	0.37	1.26	0.28	0.33	0.47	0.19
10/7/2008	10.03	0.97	0.97	0.69	0.64	2.30	0.18	1.84	0.46	0.28
10/14/2008	4.97	0.77	0.54	0.59	0.45	0.68	0.09	0.36	0.14	0.14
10/28/2008	4.62	0.82	0.71	0.07	0.52	0.30	0.22	0.41	0.15	
11/11/2008	7.24	1.85	0.62	0.82	1.03	0.25	0.25	0.21	0.29	0.33
11/24/2008	9.95	1.52	2.32	0.85	1.87	0.36	0.58	0.09	0.18	
12/9/2008	14.90	1.06	3.33	3.15	2.57	0.35	0.31	0.04	0.44	0.13
12/22/2008	7.85	1.66	1.08	0.97	1.82	0.12	0.39	0.04	0.31	0.12
1/6/2009	2.13	0.24	0.12	0.20	0.47	0.16	0.12	0.04	0.08	
1/20/2009	6.70	1.80	0.66	0.81	1.25	0.26	0.44	0.11	0.26	0.22
2/3/2009	6.51	1.65	0.79	0.25	1.26	0.29	0.29	0.04	0.32	0.40
2/17/2009	6.51	1.11	0.61	0.61	2.52		0.36	0.04	0.07	0.36

¹ CPUE = Catch Per Unit Effort.

Table 4. Common and Scientific Names of Shellfish Captured by Trawl in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Scientific Name	Common Name
<i>Callinectes ornatus</i>	Ornate blue crabs
<i>Callinectes sapidus</i>	Blue crab
<i>Callinectes similis</i>	Lesser blue crab
<i>Callinectes</i> spp.	Swimming crab
<i>Farfantepenaeus aztecus</i>	Brown shrimp
<i>Farfantepenaeus duorarum</i>	Pink shrimp
<i>Farfantepenaeus</i> spp.	Penaeid shrimp
<i>Limulus polyphemus</i>	Horseshoe crab
<i>Litopenaeus setiferus</i>	White shrimp
<i>Menippe mercenaria</i>	Florida stone crab
<i>Menippe</i> spp.	Stone crab
<i>Octopus</i> spp.	Octopus
<i>Panulirus argus</i>	Caribbean spiny lobster
Penaeidae	Penaeid shrimp
<i>Pickfordiateuthis pulchella</i>	Pickford squid
<i>Sepioteuthis</i> spp.	Squid
<i>Sicyonia typica</i>	Kinglet rock shrimp

Table 5. Total Number of Individuals, CPUE, and Percent Composition by Taxa for All Shellfish Captured by Trawl in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Common Name¹	Scientific Name	Total Number	Total CPUE²	Percentage of Total
Brown shrimp	<i>Farfantepenaeus aztecus</i>	1	0.00	0.05%
Horseshoe crab	<i>Limulus polyphemus</i>	1	0.00	0.05%
Stone crab	<i>Menippe</i> spp.	1	0.00	0.05%
Octopus	<i>Octopus</i> spp.	1	0.00	0.05%
Pickford squid	<i>Pickfordiateuthis pulchella</i>	1	0.00	0.05%
Squid	<i>Sepioteuthis</i> spp.	1	0.00	0.05%
Kinglet rock shrimp	<i>Sicyonia typica</i>	1	0.00	0.05%
Florida stone crab	<i>Menippe mercenaria</i>	3	0.00	0.15%
Penaeid shrimp	Penaeidae	3	0.00	0.15%
Lesser blue crab	<i>Callinectes similis</i>	10	0.02	0.48%
Blue crab	<i>Callinectes sapidus</i>	17	0.03	0.82%
Swimming crab	<i>Callinectes</i> spp.	77	0.12	3.73%
White shrimp	<i>Litopenaeus setiferus</i>	80	0.13	3.88%
Caribbean spiny lobster	<i>Panulirus argus</i>	172	0.27	8.34%
Ornate blue crabs	<i>Callinectes ornatus</i>	187	0.30	9.06%
Penaeid shrimp	<i>Farfantepenaeus</i> spp.	354	0.56	17.16%
Pink shrimp	<i>Farfantepenaeus duorarum</i>	1153	1.84	55.89%
Contribution by Dominant Taxa		1,507	2.70	82.11%
Total		2,063	3.29	100.00%
Species Richness		17		

¹ Rows in yellow represent taxa contributing to at least 75% of total catch.

² CPUE = Catch Per Unit Effort.

Table 6. CPUE for Dominant Taxa and All Taxa Combined by Sampling Event for Shellfish Captured by Trawl in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Date	Total Shellfish CPUE ¹	Dominant Shellfish Taxa CPUE				
		<i>Farfantepenaeus</i> spp.	<i>Callinectes ornatus</i>	<i>Panulirus argus</i>	<i>Litopenaeus setiferus</i>	<i>Callinectes</i> spp.
3/4/2008	2.77	0.43	0.19	0.04	1.71	0.31
3/18/2008	2.08			0.09	1.66	0.18
4/1/2008	1.25	0.81		0.18		0.22
4/15/2008	1.90	1.49	0.32			0.08
4/29/2008	1.75	0.99	0.54	0.04		0.18
5/13/2008	2.68	2.22	0.23	0.19		0.04
5/28/2008	1.99	0.91	0.78	0.30		
6/10/2008	3.54	2.49	0.53	0.35		0.11
6/24/2008	4.57	3.00	0.56	0.71		0.30
7/8/2008	5.67	2.05	1.27	0.59		1.76
7/22/2008	3.79	2.22	0.69	0.50		0.38
8/5/2008	3.73	2.36	0.57	0.53		0.27
8/26/2008	2.64	0.87	0.58	0.99		0.16
9/16/2008	2.44	1.69	0.10	0.65		
9/23/2008	2.66	2.19	0.14	0.28		0.05
10/7/2008	1.93	1.61	0.18	0.14		
10/14/2008	4.06	3.70	0.05	0.23		0.09
10/28/2008	1.83	1.38	0.07	0.26		0.11
11/11/2008	2.14	1.93	0.12	0.04		0.04
11/24/2008	2.85	2.59	0.18	0.09		
12/9/2008	5.59	5.28	0.09	0.22		
12/22/2008	4.48	4.14	0.27	0.04		0.04
1/6/2009	2.09	1.85	0.08	0.12		
1/20/2009	4.71	4.16	0.07	0.29		0.18
2/3/2009	6.62	6.44	0.07	0.07		
2/17/2009	5.00	4.39	0.18	0.32		0.04

¹ CPUE = Catch Per Unit Effort.

Table 7. Total Number, Number per m³, and Percent Composition by Taxa for Fish Eggs Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Area Sampled		Card Sound		
Vol. Filtered (m ³)		3,991.6		
Scientific Name	Common Name	Number Collected	Number per m ³	% of Total Catch
Carangidae	Jacks	1	0.000	0.00%
Labridae	Wrasses	1	0.000	0.00%
Serranidae	Groupers	5	0.001	0.02%
Achiridae	American Soles	40	0.010	0.15%
Engraulidae	Anchovies	199	0.050	0.76%
Clupeidae	Herrings	3,050	0.764	11.63%
UnID eggs	Unidentified	22,931	5.745	87.43%
Total		26,227	6.571	100.00%

Table 8. Number of Individuals per m³ for Dominant Taxa and All Taxa Combined by Sampling Event for Fish Eggs and Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Date	Total Fish Eggs per m ³	Total Fish Larvae per m ³	Dominant Fish Larvae Taxa per m ³					
			Gobiidae	Clupeidae	Labrisomidae	Chaenopsidae	<i>Atherinomorus stipes</i>	<i>Gobiosoma robustum</i>
3/4/2008	2.1155	0.3276	0.1499	0.0111	0.0555	0.0222		0.0167
3/18/2008	9.0364	0.7991	0.1175	0.0294	0.1116	0.1116	0.0764	0.1234
4/1/2008	5.8161	2.3236	1.4754	0.1212	0.2851	0.0855	0.0713	0.0428
4/15/2008	4.4052	2.6209	0.2941	1.4575	0.1438	0.1111		
4/29/2008	9.4496	1.4296	0.3360	0.0357	0.2001	0.0357	0.0143	0.3788
5/13/2008	13.1860	3.1404	0.0390	1.1248	0.0260	0.2406	0.1040	
5/28/2008	22.3986	1.8144	0.7973	0.0619	0.2887	0.1100	0.1993	0.1306
6/10/2008	0.8040	1.1502	0.3350	0.1898	0.2345	0.1452	0.0112	0.1173
6/24/2008	10.8576	1.6505	0.8010	0.1133	0.0647	0.0485	0.1052	0.3155
7/8/2008	11.7012	0.8991	0.3493	0.0388	0.1682	0.1358	0.1229	0.0388
7/22/2008	8.6167	0.5728	0.1950		0.0548	0.0792	0.1097	0.0670
8/5/2008	17.2925	1.5930	0.6723	0.0424	0.0121	0.0061	0.6118	0.1030
8/26/2008	4.8294	0.5315	0.2231	0.0525	0.0328	0.0066	0.0394	
9/16/2008	9.3508	0.1900	0.0238	0.0079	0.0158	0.0713	0.0238	0.0158
9/23/2008	5.1509	0.2390	0.0440		0.0377	0.0503		0.0189
10/7/2008	4.5900	0.1757	0.0366		0.0439	0.0439		0.0146
10/14/2008	3.6494	0.2011	0.0359		0.0216	0.0718	0.0144	
10/28/2008	3.4935	0.2135	0.0534		0.0178	0.0890		
11/11/2008	0.9574	0.0393			0.0066	0.0328		
11/24/2008	0.2910	0.0639	0.0142		0.0284			
12/9/2008	2.1926	0.0572	0.0191					
12/22/2008	3.3846	0.2646	0.0738	0.0062	0.0492	0.0246		
1/6/2009	3.7618	0.0251		0.0063		0.0125		
1/20/2009	1.5123	0.1700	0.0821		0.0528	0.0176		
2/3/2009	1.1334	0.0687	0.0057			0.0458		
2/17/2009	12.3826	0.2119	0.0172	0.0172	0.0802	0.0515		

Table 9. Common and Scientific Names of Fish Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Scientific Name	Common Name
Achiridae	American soles
<i>Achirus lineatus</i>	Lined sole
Atherinidae	Old World silversides
Atheriniformes	Silversides
<i>Atherinomorus stipes</i>	Hardhead silverside
<i>Bathygobius soporator</i>	Frillfin goby
Blenniidae	Combtooth blennies
Blennioidei	Blennies
Callionymidae	Dragonets
Carangidae	Jacks
Centropomidae	Snook
Chaenopsidae	True blennies
Clupeidae	Herrings
Clupeidae/Chaenopsidae type	Herring/Flag blenny type
Clupeiformes	Herring-like fishes
<i>Cynoscion nebulosus</i>	Spotted sea trout
Dactyloscopidae	Sand stargazers
<i>Diplogrammus pauciradiatus</i>	Spotted dragonet
Eleotridae	Sleepers
Engraulidae	Anchovies
Exocoetidae	Flyingfishes
Gerreidae	Mojarra
Gobiidae	Gobies
Gobioidei	Gobies
<i>Gobiosoma bosc</i>	Naked goby
<i>Gobiosoma robustum</i>	Code goby
Hemiramphidae	Halfbeaks
<i>Hemiramphus balao</i>	Balao
<i>Hemiramphus spp.</i>	Halfbeak
<i>Hippocampus erectus</i>	Spotted seahorse
<i>Jenkinsia lamprotaenia</i>	Dwarf herring
Labrisomidae	Labrisomid blennies
<i>Menidia spp.</i>	Silverside
<i>Microgobius gulosus</i>	Clown goby
<i>Microgobius thalassinus</i>	Green goby
Monacanthidae	Filefishes

Table 9.
(Continued)

Scientific Name	Common Name
<i>Oligoplites saurus</i>	Leatherjacket
Perciformes	Perch-like fishes
Pomacentridae	Damselfishes
Sciaenidae	Drums and croakers
Sparidae	Porgies
<i>Syngnathus louisianae</i>	Chain pipefish
<i>Syngnathus scovelli</i>	Gulf pipefish
Tetraodontidae	Puffers
Tetraodontiformes	Puffers
Tripterygiidae	Triplefins
Unidentified larvae	Unidentified larvae

Table 10. Total Number, Number per m³, and Percent Composition by Taxa for All Fish Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Stations		Card Sound		
Vol. Filtered (m ³)		3,991.6		
Scientific Name	Common Name	Number Collected	Number per m ³	% of Total Catch
Atherinidae	Old World silversides	1	0.0003	0.03%
Blennioidei	Blennies	1	0.0003	0.03%
Centropomidae	Snook	1	0.0003	0.03%
Exocoetidae	Flyingfishes	1	0.0003	0.03%
<i>Hemiramphus balao</i>	Balao	1	0.0003	0.03%
<i>Menidia spp.</i>	Silverside	1	0.0003	0.03%
Pomacentridae	Damselfishes	1	0.0003	0.03%
Sparidae	Porgies	1	0.0003	0.03%
<i>Syngnathus louisianae</i>	Chain pipefish	1	0.0003	0.03%
Tetraodontidae	Puffers	1	0.0003	0.03%
<i>Achirus lineatus</i>	Lined sole	2	0.0005	0.06%
<i>Bathygobius soporator</i>	Frillfin goby	2	0.0005	0.06%
Carangidae	Jacks	2	0.0005	0.06%
Clupeidae/Chaenopsidae type	Herring/Flag blenny type	2	0.0005	0.06%
<i>Microgobius thalassinus</i>	Green goby	2	0.0005	0.06%
<i>Syngnathus scovelli</i>	Gulf pipefish	2	0.0005	0.06%
Tetraodontiformes	Puffers	2	0.0005	0.06%
<i>Hippocampus erectus</i>	Spotted seahorse	3	0.0008	0.10%
<i>Oligoplites saurus</i>	Leatherjacket	3	0.0008	0.10%
Achiridae	American soles	4	0.0010	0.13%
Callionymidae	Dragonets	4	0.0010	0.13%
<i>Cynoscion nebulosus</i>	Spotted sea trout	4	0.0010	0.13%
<i>Gobiosoma bosc</i>	Naked goby	4	0.0010	0.13%
Sciaenidae	Drums and croakers	4	0.0010	0.13%
Tripterygiidae	Triplefins	4	0.0010	0.13%
Blenniidae	Combtooth blennies	5	0.0013	0.16%
Gerreidae	Mojarra	5	0.0013	0.16%
<i>Hemiramphus spp.</i>	Halfbeak	5	0.0013	0.16%
Hemiramphidae	Halfbeaks	6	0.0015	0.19%
Monacanthidae	Filefishes	8	0.0020	0.25%
Dactyloscopidae	Sand stargazers	12	0.0030	0.38%
Atheriniformes	Silversides	14	0.0035	0.44%
Engraulidae	Anchovies	21	0.0053	0.67%

Table 10.
(Continued)

Scientific Name	Common Name	Number Collected	Number per m ³	% of Total Catch
<i>Jenkinsia lamprotaenia</i>	Dwarf herring	30	0.0075	0.95%
Unidentified larvae	Unidentified larvae	54	0.0135	1.71%
Perciformes	Perch-like fishes	47	0.0118	1.49%
<i>Microgobius gulosus</i>	Clown goby	48	0.0120	1.52%
Clupeiformes	Herring-like fishes	71	0.0178	2.25%
Gobioidei	Gobies	86	0.0215	2.73%
Eleotridae	Sleepers	117	0.0293	3.71%
<i>Diplogrammus pauciradiatus</i>	Spotted dragonet	132	0.0331	4.19%
<i>Gobiosoma robustum</i>	Code goby	203	0.0509	6.44%
<i>Atherinomorus stipes</i>	Hardhead silverside	234	0.0586	7.42%
Chaenopsidae	True blennies	257	0.0644	8.15%
Labrisomidae	Labrisomid blennies	313	0.0784	9.93%
Clupeidae	Herrings	509	0.1275	16.15%
Gobiidae	Gobies	921	0.2307	29.22%
Contribution by Dominant Taxa		2,437	0.6105	77.32%
Total		3,152	0.7897	100.00%
Species Richness		47		

Table 11. Common and Scientific Names of Shellfish Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Scientific Name	Common Name
<i>Callinectes sapidus</i>	Blue crab
<i>Callinectes</i> spp.	Swimming crab
<i>Farfantepenaeus aztecus</i>	Brown shrimp
<i>Farfantepenaeus duorarum</i>	Pink shrimp
<i>Farfantepenaeus</i> spp.	Penaeid shrimp
<i>Menippe mercenaria</i>	Florida stone crab
<i>Squilla empusa</i>	Mantis shrimp
<i>Squilla</i> spp.	Mantis shrimp
Squillidae	Mantis shrimp

Table 12. Total Number, Number per m³, and Percent Composition by Taxa for All Shellfish Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Stations		Card Sound		
Vol. Filtered (m ³)		3,991.6		
Scientific Name	Common Name	Number Collected	Number per m ³	% of Total Catch
<i>Squilla</i> spp.	Mantis shrimp	3	0.001	0.20%
<i>Farfantepenaeus</i> spp.	Penaeid shrimp	4	0.001	0.27%
<i>Farfantepenaeus duorarum</i>	Pink shrimp	27	0.007	1.84%
<i>Farfantepenaeus aztecus</i>	Brown shrimp	67	0.017	4.57%
<i>Callinectes sapidus</i>	Blue crab	31	0.008	2.11%
Squillidae	Mantis shrimp	87	0.022	5.93%
<i>Squilla empusa</i>	Mantis shrimp	148	0.037	10.10%
<i>Menippe mercenaria</i>	Florida stone crab	251	0.063	17.12%
<i>Callinectes</i> spp.	Swimming crab	848	0.212	57.84%
Contribution by Dominant Taxa		1,247	0.312	85.06%
Total		1,466	0.367	100.00%
Species Richness		3		

Table 13. Number of Individuals per m³ for Dominant Taxa and All Taxa Combined by Sampling Event for Shellfish Larvae Collected in the Vicinity of the Turkey Point Plant, March 2008 – February 2009.

Date	Total Shellfish Larvae	Dominant Shellfish Larvae Taxa		
		<i>Callinectes spp.</i>	<i>Menippe mercenaria</i>	Squillidae
3/4/2008	0.1943	0.0056	0.0444	0.1055
3/18/2008	0.4994	0.1116		0.1880
4/1/2008	0.2708	0.0499	0.0143	0.1996
4/15/2008	0.0915	0.0327	0.0261	0.0327
4 /29/2008	2.2016	2.1587	0.0286	0.0143
5/13/2008	1.9181	1.6580	0.1951	0.0650
5/28/2008	0.5567	0.2749	0.0893	0.1924
6/10/2008	0.4467	0.3908	0.0391	0.0112
6/24/2008	0.5178	0.4045	0.0728	0.0243
7/8/2008	0.7762	0.4075	0.0065	0.3558
7/22/2008	0.1402	0.0305	0.0975	0.0122
8/5/2008	0.5754	0.0909	0.4058	0.0363
8/26/2008	0.5315	0.1378	0.3346	0.0525
9/16/2008	0.0475		0.0475	
9/23/2008	0.1761	0.0692	0.0503	0.0440
10/7/2008	0.1318		0.1098	0.0220
10/14/2008	0.2514	0.0287	0.0503	0.0216
10/28/2008	0.0119	0.0059	0.0059	
11/11/2008	0.0328	0.0328		
11/24/2008	0.0213	0.0142		
12/9 /2008	0.1525			0.0953
12/22/2008	0.0862	0.0123		
1/6/2009	0.0564			0.0564
1/20/2009	0.0117	0.0059		
2/3/2009	0.0172			0.0172
2/17/2009	0.0344		0.0115	0.0172

**Table 14. Potential Occurrence Within the Project Area of Fish and Shellfish Species
Managed by the South Atlantic Fisheries Management Council.¹**

Common Name	Scientific Name	Comment	Turkey Point ²
Shrimp Fisheries Management Plan (FMP)			
Pink shrimp	<i>Farfantepenaeus duorarum</i>	Most abundant shrimp species; present as postlarvae and juvenile	X
Brown shrimp	<i>F. aztecus</i>	Uncommon; present as postlarvae and juvenile	X
Snapper-Grouper FMP			
Creville jack	<i>Caranx hippos</i>	Pelagic; present as juveniles and adults	
Bar jack	<i>C. ruber</i>	Mainly pelagic; present as juveniles and adults	
Spadefish	<i>Chaetodipterus faber</i>	Estuarine transient	X
French grunt	<i>Haemulon flavolineatum</i>	Potentially present in all life stages	X
Sailor's choice	<i>H. parra</i>	Potentially present in all life stages	X
White grunt	<i>H. plumieri</i>	Potentially present in all life stages	X
Bluestriped grunt	<i>H. sciurus</i>	Potentially present in all life stages	X
Hogfish	<i>Lachnolaimus maximus</i>	Found in shallow grass beds and mangroves as juveniles	X
Mutton snapper	<i>Lutjanis analis</i>	Mainly present as juveniles in grass beds or mangroves	X
Schoolmaster	<i>L. apodus</i>	Mainly present as juveniles in grass beds or mangroves	X
Cubera snapper	<i>L. cyanopterus</i>	Mainly present as juveniles in grass beds or mangroves	
Gray snapper	<i>L. griseus</i>	Most abundant snapper; mainly present as juveniles; mangrove inhabitant	X

Table 14
(Continued)

Common Name	Scientific Name	Comment	Turkey Point²
Dog snapper	<i>L. jocu</i>	Mainly present as juveniles in grass beds or mangroves	
Lane snapper	<i>L. synagris</i>	Mainly present as juveniles in grass beds or mangroves	X
Yellowtail snapper	<i>Ocyurus chrysurus</i>	Common; mainly present as juveniles in grass beds or mangroves	X
Black sea bass	<i>Centropristis striata</i>	Uncommon in S. Florida; possibly present as juveniles.	
Goliath grouper	<i>Epinephelus itajara</i>	Present as juveniles	
Red grouper	<i>E. morio</i>	Occur inshore infrequently as juveniles	
Yellowfin grouper	<i>Mycteroperca venenosa</i>	Occur inshore infrequently as juveniles	
Sheepshead	<i>Archosargus probatocephalus</i>	Common; present as juveniles and adults; mangrove inhabitant	
Grass porgy	<i>Calamus arctifrons</i>	Relatively uncommon; seagrass denizen.	X
Coastal Migratory Pelagics FMP			
Cobia	<i>Rachycentron canadum</i>	Pelagic; Oceanic and estuarine.	
Spanish mackerel	<i>Scomberomorus maculatus</i>	Common in Biscayne Bay but unlikely to utilize Project Area.	
Spiny Lobster FMP			
Spiny Lobster	<i>Panulirus argus</i>	Juveniles and adults may be present	X
Red Drum FMP			
Red drum	<i>Sciaenops ocellata</i>	Mainly present as juveniles	

¹ Source: Ecological Associates, Inc. (2004).

² Captured by Trawl During Sampling Conducted by EAI from March 2008 – February 2009.