Table 18b (cont.). Taxonomic list of larval and early-juvenile fishes from offshore of Cape Lookout to Cape Hatteras including the region known as "The Point".

Family Genus and Species	Common name
Monolene sessilicauda	deepwater flounder
Paralichthys dentatus	summer flounder
Paralichthys lethostigma	southern flounder
Paralichthys oblongus	fourspot flounder
Paralichthys squamilentus	broad flounder
Scophthalamus aquosus	windowpane
Syacium papillosum	dusky flounder
unidentified	flounder
Pleuronectidae	righteye flounders
Glyptocephalus cynoglossus	witch flounder
Pleuronectes ferrugineus	yellowtail flounder
Soleidae	soles
Symphurus sp(p).	tonguefish
Balistidae	leatherjackets
Aluterus heudeloti	dotterel filefish
Aluterus monoceros	unicorn filefish
Aluterus schoepfi	orange filefish
Aluterus scriptus	scrawled filefish
Balistes capriscus	gray triggerfish
Balistes vetula	queen triggerfish
Cantherhines macrocerus	whitespotted filefish
Cantherhines pullus	orangespotted filefish
Cantheridermis maculata	rough triggerfish
Cantherdermis sufflamen	ocean triggerfish
Monacanthus ciliatus	fringed filefish
Monacanthus hispidus	planehead filefish
Monacanthus setifer	pygmy filefish
Monacanthus tuckeri	slender filefish
Xanthichthys ringins	sargassum triggerfish
unidentified	leatherjacker
Ostraciidae	boxfishes
Lactophrys sp(p).	boxfish
Tetraodontidae	puffers
Diodon holcanthus	ballonfish
Sphoeroides spengleri	bandtail puffer
Sphoeroides sp.	puffer
unidentified	puffers
Molidae	molas
unidentified	mola

3.3 Managed Species Distribution and Use of Essential Fish Habitat

The following life history tables (Tables 19a-21b) are based on originals provided by NOAA SEA Division as modified by Council staff and representatives of NMFS SEFSC Beaufort Laboratory. Tabular descriptions of habitat associations by life stage for each species. These tables summarize how each species uses the environment and provides information to assess the relative importance of different habitat types. The three tables developed are: 1) Habitat Associations (Tables 19a & 19b); 2) Biological Attributes (Tables 20a & 20b); and 3) Reproduction Tables (21a & 21b).

Table 19a. Habitat Associations for Select Managed Species (Source: NOAA 1998b, NMFS SEFSC, and SAFMC).

SE EFH	Habitat Associations																																								
	Domain																																								
9/29/98	Freshwater				Estuarine																				Marine			Substrate preference										Depth preference				
								Salinity range								Temperature range																				Littoral		Sublittoral		
								NEI			Venice system																														
Species	Life stage	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Tidal fresh (0-0.5‰)	Mixing (0.5-25‰)	Seawater (>25‰)	Limnetic (0-0.5‰)	Oligohaline (0.5-5‰)	Mesohaline (5-18‰)	Polyhaline (18-30‰)	Euhaline (>30‰)	0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Beach/surf	Neritic	Oceanic	Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Intertidal	Subtidal	Inner shelf (10-50 m)	Middle shelf (50-100 m)	Outer shelf (100-200 m)
Brown shrimp	A				•				•	•		•	•	•	•	•	•	•	•	•	•	•		•		•	•										•	•	
Penaeus	S									•					•				•	•	•			•		•	•											•	
aztecus	J				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•					•	•			•	•				
	L					•			•	•				•	•			•	•	•	•	•		•		•					•			•			•	•	
	E									•					•						•	•		•										•				•	
Pink shrimp	A				•	•	•			•				•	•		•	•	•	•	•	•		•		•	•			•						•	•	•	
Penaeus	S									•					•				•	•	•	•		•		•	•			•						•	•		
duorarum	J						•		•	•		•	•	•	•	•	•	•	•	•	•	•				•	•			•	•	•	•	•	•	•	•		
	L									•					•					•	•			•	•									•		•	•		
	E									•					•					•	•	•		•	•									•		•	•		
White shrimp	A					•			•	•		•	•	•	•		•	•	•	•	•	•		•		•	•						•				•		
Penaeus	S									•					•				•	•	•			•		•	•										•		
setiferus	J					•	•		•	•		•	•	•	•		•	•	•	•	•	•				•	•				•	•	•		•	•				
	L									•					•			•	•	•	•			•							•			•			•		
	E									•					•				•	•	•			•										•			•		
Black seabass	A				•	•			•	•			•	•	•			•	•	•	•		•	•			•	•	•	•						•	•	•	
Centropristis	S																	•	•	•	•			•										•					
ocyurus	J				•	•			•	•				•	•			•	•	•	•		•	•			•	•	•	•	•					•	•	•	
	L																	•	•	•	•			•										•			•		
	E																	•	•	•	•			•										•			•		
Gag	A				•				•	•				•	•				•	•	•			•		•	•	•	•	•	•					•	•		
Mycteroperca	S																							•												•	•		
microlepis	J				•				•	•				•	•				•	•	•			•		•	•	•	•	•	•					•	•		
	L																							•												•	•		
	E																							•												•	•		
Cobia	A									•				•	•					•	•	•		•	•									•			•		
Rachycentron	S																			•	•	•		•										•			•		
canadum	J								•	•				•	•					•	•	•	•	•	•		•									•	•		
	L									•				•	•					•	•	•		•										•			•		
	E																			•	•	•		•										•			•		
Mutton snapper	A								•	•				•	•				•	•	•	•		•		•		•	•	•	•					•	•	•	
Lutjanus	S									•				•	•					•	•	•		•		•		•	•	•						•	•	•	
analis	J				•	•	•		•	•			•	•	•				•	•	•	•		•		•		•	•	•	•	•				•	•		
	L								•	•				•	•				•	•	•			•							•						•	•	
	E									•				•	•					•	•			•													•	•	
Red snapper	A									•				•	•			•	•	•	•	•		•		•		•	•	•	•					•	•	•	
Lutjanus	S									•				•	•					•	•	•		•		•		•	•	•						•	•	•	
campechanus	J								•	•				•	•				•	•	•	•		•		•		•	•	•	•	•				•	•		
	L								•	•				•	•				•	•	•			•		•					•						•	•	
	E									•					•					•	•			•													•	•	

Table 19a (cont.). Habitat Associations for Select Managed Species.

SE EFH 9/29/98		Habitat Associations																																						
		Domain																																	Substrate preference									Depth preference				
		Freshwater			Estuarine																					Marine															Littoral		Sublittoral		
								Salinity range									Temperature range																													
								NEI			Venice system																																				
Species	Life stage	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Tidal fresh (0-0.5‰)	Mixing (0.5-25‰)	Seawater (>25‰)	Limnetic (0-0.5‰)	Oligohaline (0.5-5‰)	Mesohaline (5-18‰)	Polyhaline (18-30‰)	Euhaline (>30‰)	0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Beach/surf	Neritic	Oceanic	Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Intertidal	Subtidal	Inner shelf (10-50 m)	Middle shelf (50-100 m)	Outer shelf (100-200 m)
Gray snapper	A		•		•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•		•		•		•	•	•	•					•	•	•		
Lutjanus	S									•					•					•	•			•		•		•	•	•						•	•		
griseus	J		•		•	•	•	•	•	•	•	•	•	•	•				•	•	•	•		•		•			•	•	•	•			•	•	•		
	L								•	•		•	•	•	•				•	•	•			•		•					•					•	•	•	
	E									•				•	•					•	•			•												•	•	•	
Lane snapper	A				•	•	•		•	•				•	•				•	•	•	•		•		•		•	•	•	•					•	•		
Lutjanus	S									•				•	•					•	•			•		•		•	•	•		•				•	•		
synagris	J				•	•	•		•	•			•	•	•				•	•	•	•	•	•		•	•	•	•	•	•	•				•	•		
	L								•	•				•	•				•	•	•			•							•					•	•		
	E									•				•	•					•	•			•												•	•		
Yellowtail snapper	A				•	•				•				•	•				•	•	•	•		•		•		•	•	•	•		•			•	•		
ocyurus	S									•				•	•					•	•			•		•		•	•	•						•	•		
chrysurus	J				•	•	•		•	•			•	•	•				•	•	•	•		•		•		•	•	•	•	•				•	•		
	L								•	•				•	•				•	•	•			•							•					•	•		
	E									•				•	•					•	•			•												•	•		
Vermilion snapper	A									•					•				•	•	•	•		•		•		•	•	•							•	•	
Rhomboplites	S									•					•					•	•			•		•		•	•	•							•	•	
aurorubens	J									•					•				•	•	•	•		•		•			•	•							•		
	L									•					•				•	•	•			•												•		
	E									•					•					•	•			•												•		
White grunt	A				•	•			•	•			•	•	•				•	•	•	•		•		•		•	•	•	•					•	•		
Haemulon	S									•				•	•					•	•			•		•		•	•	•						•	•		
plumieri	J				•	•	•		•	•			•	•	•				•	•	•	•		•		•		•	•	•	•	•			•	•	•		
	L								•	•			•	•	•				•	•	•			•		•					•					•	•		
	E									•					•					•	•			•												•	•		
Sheepshead	A				•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•		•		•			•	•		•				•	•		
Archosargus	S									•					•					•	•			•												•	•		
probatocephalus	J				•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•					•			•	•	•				•				
	L				•	•	•		•	•			•	•	•					•	•			•							•				•	•	•		
	E									•					•					•	•			•												•	•		
Red drum	A				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•						•	•	•	
Sciaenops	S																			•				•										•		•	•		
ocellatus	J				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•	•		•		•	•			
	L						•	•	•	•	•	•	•	•	•				•	•	•	•		•		•	•				•		•	•	•	•			
	E						•		•	•				•	•					•	•			•										•		•	•		
Hogfish	A									•					•					•	•	•		•		•		•	•	•	•					•	•		
Lachnolaimus	S									•					•					•	•			•		•		•	•	•						•	•		
maximus	J				•	•	•		•	•			•	•	•				•	•	•			•		•		•	•	•	•	•				•	•		
	L									•					•					•	•			•		•					•					•	•		
	E									•					•					•	•			•												•	•		
Spanish mackerel	A				•					•				•	•					•	•	•	•	•			•						•			•	•		
Scomberomorus	S																			•	•	•		•			•										•		
maculatus	J				•	•	•		•	•			•	•	•			•	•	•	•	•	•	•			•									•	•		
	L																		•	•	•			•												•	•		
	E																			•	•	•		•													•		

Table 19b. Habitat Associations for Other Managed and Prey Species Using South Atlantic Estuaries (Source: NOAA 1998).

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Species	Life stage	Habitat Associations: Domain: Freshwater: Lacustrine	Riverine - coastal plain	Riverine - inland	Estuarine: Inlet mouth	Channel	Inter- and subtidal flats	Salinity range: NEI: Tidal fresh (0-0.5‰)	Mixing (0.5-25‰)	Seawater (>25‰)	Venice system: Limnetic (0-0.5‰)	Oligohaline (0.5-5‰)	Mesohaline (5-18‰)	Polyhaline (18-30‰)	Euhaline (>30‰)	Temperature range: 0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Marine: Beach/surf	Neritic	Oceanic	Substrate preference: Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Depth preference: Littoral: Intertidal	Subtidal	Sublittoral: Inner shelf (10-50 m)	Middle shelf (50-100 m)	Outer shelf (100-200 m)
Bay anchovy	A		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●								●	●	●		
Anchoa	S					●	●			●					●					●	●			●										●	●	●	●		
mitchilli	J		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●								●	●	●		
	L					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●										●	●	●	●		
	E					●			●	●			●	●	●					●	●	●		●										●	●	●	●	●	●
Sheepshead minnow	A		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●					●	●			
Cyprinodon	S						●	●	●	●	●	●	●	●	●				●	●	●					●	●			●					●	●			
variegatus	J		●			●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●					●	●			
	L						●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●					●	●			
	E						●	●	●	●	●	●	●	●	●				●	●	●					●	●			●					●	●			
American shad	A		●	●				●	●	●	●	●	●	●	●		●	●	●	●	●	●		●									●		●		●	●
Alosa	S		●	●				●	●		●	●						●	●	●							●	●											
sapidissima	J		●	●				●	●	●	●	●	●	●	●		●	●	●	●	●	●													●				
	L		●	●				●	●		●	●	●																						●				
	E		●	●				●	●		●	●					●	●	●	●							●	●											
Atlantic menhaden	A		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●			●									●		●	●	●	●
Brevoortia	S									●				●	●		●	●	●	●				●										●			●	●	●
tyrannus	J		●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●		●						●	●					●	●	●	●
	L				●	●		●	●	●		●	●	●	●	●	●	●	●	●	●	●		●						●	●					●	●	●	●
	E								●	●			●	●	●		●	●	●	●				●										●			●	●	●

Terms Used in Habitat Association Life History Tables:

Life stage definitions

Life stages were defined in the three life history tables (Habitat Associations, Biological Attributes, and Reproduction) as follows:

A - Adults; mature individuals, but not necessarily in spawning condition.
S - Spawning; adults in spawning condition.
J - Juveniles; not mature but otherwise morphologically similar to adults.
L - Larvae; individuals which have hatched, but not yet attained the characteristic juvenile/adult morphology.
E - Eggs; which have been spawned but not yet hatched.

Terms used

Domain - General habitat of life stages.
• *Freshwater*- Rivers and lakes above head-of-tide; freshwater lentic and lotic habitats.
Lacustrine - Freshwater lentic areas (lakes) with riverine connections to the sea..
Riverine - coastal plain - River portions in the relatively flat land along a coast.
Riverine - inland - River portions away from the coast.
• *Estuarine* - Embayment with tidal fresh, mixing, and seawater zones.
Inlet mouth - The seaward end of an estuary.
Channel - The drowned river channel or tributary channels of an estuary.
Inter- and subtidal flats - Broad, shallow estuarine areas.
Salinity range, NEI - Three salinity zones used by the ELMR program for compilation of distribution and abundance data.
Tidal fresh zone - Salinities of 0.0-0.5 ppt.
Mixing zone - Salinities of 0.5-25.0 ppt.
Seawater zone - Salinities >25 ppt.
Salinity range, Venice system - Five salinity zones according to the Venice system of estuarine classification.
Limnetic - Salinities of 0.0-0.5 ppt.
Oligohaline - Salinities of 0.5-5.0 ppt.
Mesohaline - Salinities of 5-18 ppt.
Polyhaline - Salinities of 18-30 ppt.
Euhaline - Salinities >30 ppt.
Temperature range - The temperatures at which a life stage is typically found, from 0_C to >30_C
• *Marine* - Coastal and offshore
Beach/surf - Shore areas receiving ocean waves and wash.
Neritic - Residing from the shore to the edge of the continental shelf.
Oceanic - Residing beyond the edge of the continental shelf.

Substrate preference - Size of substrate that life stages reside on or in.
• *Mud/clay/silt* - Fine substrates <0.0625 mm in diameter.
• *Sand* - Substrates 0.0625-4.0 mm in diameter.
• *Pebble/cobble/gravel* - Substrates 4-256 mm in diameter.
• *Boulder/rocky outcrop/reef*- Large substrate >256 mm in diameter, exposed solid bedrock, or coral reef.
• *Shell* - Mollusc shell substrate, such as oyster.
• *Submergent vegetation* - Rooted aquatic vegetation that does not grow above the water's surface, e.g., turtle grass (*Thalassia testudinum*), shoal grass (*Halodule wrightii*), and widgeon grass (*Ruppia maritima*).
• *Emergent vegetation* - Rooted aquatic vegetation that grows above the water's surface, e.g., cordgrass (*Spartina*) and mangrove.
• *Floating vegetation* - Non-rooted aquatic vegetation, e.g., *Sargassum*, and other vegetation that can form floating mats.
• *None* - No known substrate preferences.

Depth preference -
• *Littoral* -
Intertidal - From the high tide mark to depths of 1 m.
Subtidal - At depths of 1-10 m.
• Sublittoral -
Inner shelf (10-50 m) - On or over the continental shelf at depths of 10-50 m.
Middle shelf (50-100) - On or over the continental shelf at depths of 50-100 m.
Outer shelf (100-200 m) - On or over the continental shelf at depths of 100-200 m.

Table 19b.(cont.) Habitat Associations for Other Managed and Prey Species Using South Atlantic Estuaries.

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1/26/98

Species	Life stage	Freshwater: Lacustrine	Freshwater: Riverine - coastal plain	Freshwater: Riverine - inland	Estuarine: Inlet mouth	Estuarine: Channel	Estuarine: Inter- and subtidal flats	Salinity range NEI: Tidal fresh (0-0.5‰)	NEI: Mixing (0.5-25‰)	NEI: Seawater (>25‰)	Venice system: Limnetic (0-0.5‰)	Venice system: Oligohaline (0.5-5‰)	Venice system: Mesohaline (5-18‰)	Venice system: Polyhaline (18-30‰)	Venice system: Euhaline (>30‰)	Temperature range: 0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Marine: Beach/surf	Marine: Neritic	Marine: Oceanic	Substrate: Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Depth Littoral: Intertidal	Littoral: Subtidal	Sublittoral: Inner shelf (10-50 m)	Sublittoral: Middle shelf (50-100 m)	Sublittoral: Outer shelf (100-200 m)
Blue mussel	A						●		●	●			●	●	●		●	●	●	●			●	●				●	●	●					●	●	●	●	
Mytilis	S						●		●	●			●	●	●				●	●			●	●											●	●	●	●	
edulis	J						●		●	●			●	●	●		●	●	●	●			●	●				●	●	●					●	●	●	●	
	L						●		●	●			●	●	●		●	●	●	●			●	●						●	●				●	●	●	●	
	E						●		●	●			●	●	●				●	●			●	●											●	●	●	●	
Bay scallop	A						●		●	●				●	●		●	●	●	●	●	●		●		●	●				●				●	●	●		
Argopecten	S						●		●	●				●	●						●			●		●	●				●				●	●	●		
irradians	J						●		●	●				●	●		●	●	●	●	●	●		●		●	●			●	●		●		●	●	●		
	L						●		●	●				●	●				●	●	●			●						●	●	●	●		●	●	●		
	E						●		●	●				●	●				●	●				●										●	●	●	●		
Atlantic rangia	A		●				●	●	●		●	●	●	●			●	●	●	●	●	●				●	●					●	●			●			
Rangia	S		●				●	●	●		●	●	●	●					●	●						●	●					●	●			●			
cuneata	J		●				●	●	●		●	●	●	●			●	●	●	●	●	●				●	●					●	●			●			
	L		●				●	●	●		●	●	●	●			●	●	●	●	●	●				●	●					●	●			●			
	E		●				●	●	●		●	●	●	●					●	●	●	●												●		●			
Quahog	A						●		●	●			●	●	●	●	●	●	●	●	●	●		●		●	●			●	●		●		●	●	●		
Mercenaria	S						●		●	●				●	●					●	●			●		●	●			●	●		●		●	●	●		
species	J						●		●	●			●	●	●	●	●	●	●	●	●	●		●		●	●			●	●		●		●	●	●		
	L						●		●	●				●	●			●	●	●	●	●		●				●	●	●	●				●	●	●		
	E						●		●	●				●	●			●	●	●	●	●		●										●	●	●	●		
Grass shrimp	A		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								●	●	●	●		●	●			
Palaemonetes	S						●		●	●			●	●	●				●	●	●	●											●		●	●			
pugio	J		●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								●	●	●			●	●			
	L						●		●	●			●	●	●					●	●												●	●	●	●			
	E						●		●	●			●	●	●				●	●	●													●	●	●			

Table 19b.(cont.) Habitat Associations for Other Managed and Prey Species Using South Atlantic Estuaries.

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Species	Life stage	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Tidal fresh (0-0.5‰)	Mixing (0.5-25‰)	Seawater (>25‰)	Limnetic (0-0.5‰)	Oligohaline (0.5-5‰)	Mesohaline (5-18‰)	Polyhaline (18-30‰)	Euhaline (>30‰)	0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Beach/surf	Neritic	Oceanic	Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Intertidal	Subtidal	Inner shelf (10-50 m)	Middle shelf (50-100 m)	Outer shelf (100-200 m)
Habitat Associations																																							
		Domain																								Substrate preference									Depth preference				
		Freshwater			Estuarine																		Marine												Littoral		Sublittoral		
								Salinity range								Temperature range																							
								NEI			Venice system																												
Striped mullet *Mugil cephalus*	A		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●				●				●	●			
	S																			●				●												●	●		
	J		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●				●				●	●			
	L																		●	●	●			●										●		●	●		
	E																	●	●	●	●	●		●										●		●	●		
Spot *Leiostomus xanthurus*	A				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●			●						●	●	●	
	S									●									●	●				●										●			●	●	
	J		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●					●		●				●	●	
	L									●				●	●				●	●				●										●		●	●	●	
	E									●									●	●				●										●			●	●	
Southern kingfish ***Menticirrhus americanus***	A																																						
	S																																						
	J																																						
	L																																						
	E																																						
Atlantic croaker *Micropogonias undulatus* GM/SE	A		●		●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●			●						●	●	●	
	S																		●	●				●										●			●	●	
	J		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●								●	●	●		
	L				●	●	●		●	●				●	●			●	●	●				●										●				●	●
	E									●					●				●	●				●										●				●	●
Black drum *Pogonias cromis*	A				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●			●							●		
	S				●	●			●	●			●	●	●				●	●				●										●			●		
	J		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●			●					●	●	●		
	L					●	●		●	●			●	●	●			●	●					●										●	●	●	●		
	E					●			●	●			●	●	●				●					●										●		●	●		
Red drum *Sciaenops ocellatus*	A				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●			●						●	●	●	
	S																			●				●										●		●	●		
	J				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●			●	●		●		●	●			
	L						●	●	●	●	●	●	●	●	●				●	●	●	●		●		●	●				●		●	●	●	●			
	E						●		●	●				●	●					●	●			●										●		●	●		

Table 19b.(cont.) Habitat Associations for Select Managed and Prey Species Using South Atlantic Estuaries.

Table 19b.(cont.) Habitat Associations for Select Managed and Prey Species Using South Atlantic Estuaries.

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Species	Life stage	Habitat Associations																																					
		Domain																																					
		Freshwater				Estuarine																		Marine			Substrate preference									Depth preference				
									Salinity range							Temperature range																								
									NEI			Venice system																											
		Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Tidal fresh (0-0.5‰)	Mixing (0.5-25‰)	Seawater (>25‰)	Limnetic (0-0.5‰)	Oligohaline (0.5-5‰)	Mesohaline (5-18‰)	Polyhaline (18-30‰)	Euhaline (>30‰)	0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C	Beach/surf	Neritic	Oceanic	Mud/silt/clay	Sand	Pebble/cobble/gravel	Boulder/rocky outcrop	Shell	Submergent vegetation	Emergent vegetation	Floating vegetation	None	Intertidal	Subtidal	Inner shelf (10-50 m)	Middle shelf (50-100 m)	Outer shelf (100-200 m)
Silversides *Menidia* species	A		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●	●	●			●	●			
	S		●				●	●	●	●	●	●	●	●	●				●	●	●	●									●	●			●	●			
	J		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●				●	●			●	●	●			●	●			
	L		●				●	●	●	●	●	●	●	●	●					●	●					●	●			●	●	●			●	●			
	E		●				●	●	●	●	●	●	●	●	●			●	●	●	●	●				●	●			●	●	●			●	●			
Gulf flounder *Paralichthys albigutta*	A						●		●	●			●	●	●		●	●	●	●	●	●		●			●								●	●	●		
	S																		●	●				●			●									●	●		
	J						●		●	●			●	●	●		●	●	●	●	●	●		●			●				●		●		●	●	●		
	L					●	●			●					●				●	●				●									●	●	●	●		
	E									●					●				●	●				●									●		●	●		
Summer flounder *Paralichthys dentatus*	A																																						
	S																																						
	J																																						
	L																																						
	E																																						
Southern flounder *Paralichthys lethostigma*	A		●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●									●	●		
	S								●	●			●	●	●			●	●	●				●									●			●	●		
	J		●		●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●		●		●	●				●		●			●	●		
	L				●	●	●		●	●			●	●	●	●	●	●	●	●	●			●									●			●	●		
	E								●	●			●	●	●		●	●	●	●	●			●									●			●	●		

Table 19b.(cont.) Habitat Associations for Select Managed and Prey Species Using South Atlantic Estuaries.

DRAFT SE EFH
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Species	Life stage	Freshwater: Lacustrine	Freshwater: Riverine - coastal plain	Freshwater: Riverine - inland	Estuarine: Inlet mouth	Estuarine: Channel	Estuarine: Inter- and subtidal flats	Salinity NEI: Tidal fresh (0-0.5‰)	Salinity NEI: Mixing (0.5-25‰)	Salinity NEI: Seawater (>25‰)	Venice system: Limnetic (0-0.5‰)	Venice system: Oligohaline (0.5-5‰)	Venice system: Mesohaline (5-18‰)	Venice system: Polyhaline (18-30‰)	Venice system: Euhaline (>30‰)	Temp: 0-5°C	Temp: 5-10°C	Temp: 11-15°C	Temp: 16-20°C	Temp: 21-25°C	Temp: 26-30°C	Temp: >30°C	Marine: Beach/surf	Marine: Neritic	Marine: Oceanic	Substrate: Mud/silt/clay	Substrate: Sand	Substrate: Pebble/cobble/gravel	Substrate: Boulder/rocky outcrop	Substrate: Shell	Substrate: Submergent vegetation	Substrate: Emergent vegetation	Substrate: Floating vegetation	Substrate: None	Littoral: Intertidal	Littoral: Subtidal	Sublittoral: Inner shelf (10-50 m)	Sublittoral: Middle shelf (50-100 m)	Sublittoral: Outer shelf (100-200 m)
Ladyfish *Elops saurus*	A																																						
	S																																						
	J																																						
	L																																						
	E																																						
American eel *Anguilla rostrata*	A	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●			●						●					●			
	S																		●	●					●									●					
	J		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●				●					●			
	L				●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●				●					●	●	●	●
	E																		●	●					●									●					
Blueback herring *Alosa aestivalis*	A	●	●	●				●	●	●	●	●	●	●	●		●	●	●	●	●	●		●										●			●		
	S	●	●	●				●	●		●	●						●	●	●	●						●	●	●		●	●							
	J	●	●	●				●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●					●								
	L	●	●	●				●	●		●	●	●					●	●	●	●										●								
	E	●	●	●				●	●		●	●						●	●	●	●						●	●	●		●								
Atlantic sturgeon *Acipenser oxyrhynchus*	A		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●									●	●	●	●
	S		●	●				●	●		●	●						●	●							●	●	●		●	●					●			
	J		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●		●							●	●	●	●
	L		●	●				●	●		●	●						●	●	●	●													●		●			
	E		●	●				●	●		●	●						●	●	●	●							●			●					●			

Table 20a. Biological Attributes of Select Managed Species (Source: NOAA 1998b, NMFS SEFSC, and SAFMC).

DRAFT SE EFH		Biological Attributes																															Value			
		Life Mode					Spatial Strategy					Mobility			Feedi		Prey Items										Longevity									
Species		Epibenthic	Benthic	Demersal	Nektonic	Planktonic	Freshwater resident	Estuarine resident	Marine resident	Coastal migrant	Ocean migrant	Nonmobile	Low mobility	High mobility	Filter feeder	Non-filter feeder	Detritus	Phytoplankton	Zooplankton	Infauna	Epibenthos	Insects	Fish (eggs, larvae)	Fish (juveniles, adults)	Macroalgae	Vascular plants	1 day	1-30 days	1-12 months	1-5 years	5-20 years	>20 years	Recreational	Commercial	Ecological	Indicator of stress
Brown shrimp	A			•					•					•		•	•			•	•				•					•			•	•	•	
Penaeus	S			•					•																											
aztecus	J			•				•						•		•	•		•	•	•		•		•				•				•	•	•	
	L					•		•	•				•			•		•	•									•								
	E			•					•			•															•									
Pink shrimp	A			•				•	•					•		•	•			•	•				•					•			•	•	•	
Penaeus	S			•					•																											
duorarum	J			•				•						•		•	•		•	•	•				•				•					•	•	
	L					•		•	•				•			•		•	•				•					•								
	E			•					•			•															•									
White shrimp	A			•				•	•					•		•	•			•	•				•	•				•			•	•	•	
Penaeus	S			•					•																											
setiferus	J			•				•						•		•	•			•	•				•	•			•				•	•	•	•
	L				•	•			•				•			•		•	•									•								
	E			•					•			•															•									
Black seabass	A			•				•	•	•				•		•				•	•		•	•							•		•	•	•	
Centropristis	S																																			
ocyurus	J			•				•	•	•				•		•				•	•		•							•						
	L					•			•				•			•			•									•								
	E					•			•			•															•									
Gag	A			•				•	•	•				•		•					•		•	•							•		•	•	•	
Mycteroperca	S			•					•					•																			•	•	•	
microlepis	J	•						•	•	•				•		•			•		•		•	•						•						
	L					•			•				•			•			•																	
	E					•			•			•																								
Scamp	A			•										•																			•	•	•	
Mycteroperca	S			•										•																			•	•	•	
phenax	J	•												•																						
	L					•							•																							
	E					•						•																								
Cobia	A				•				•	•	•			•		•					•			•							•		•	•	•	
Rachycentron	S				•				•																								•	•	•	
canadum	J				•			•	•	•	•			•		•			•		•		•	•						•						
	L					•			•				•			•			•									•								
	E					•			•			•															•									
Mutton snapper	A			•					•	•				•		•					•			•							•		•	•	•	
Lutjanus	S			•					•	•				•		•					•			•							•		•	•	•	
analis	J	•						•	•	•				•		•					•		•							•						
	L					•			•				•			•			•									•								
	E					•			•			•															•									
Red snapper	A			•					•	•				•		•					•			•							•		•	•	•	
Lutjanus	S			•					•	•				•		•					•			•							•		•	•	•	
campechanus	J	•							•	•				•		•					•		•							•						
	L					•			•				•			•			•									•								
	E					•			•			•															•									

Table 20a. (cont.) Biological Attributes of Select Managed Species (Source: NOAA 1998b, NMFS SEFSC, and SAFMC).

DRAFT SE EFH		Biological Attributes																														Value			
		Life Mode					Spatial Strategy					Mobility			Feedi		Prey Items									Longevity									
Species		Epibenthic	Benthic	Demersal	Nektonic	Planktonic	Freshwater resident	Estuarine resident	Marine resident	Coastal migrant	Ocean migrant	Nonmobile	Low mobility	High mobility	Filter feeder	Non-filter feeder	Detritus	Phytoplankton	Zooplankton	Infauna	Epibenthos	Insects	Fish (eggs, larvae)	Fish (juveniles, adults)	Macroalgae	Vascular plants	1 day	1-30 days	1-12 months	1-5 years	5-20 years	>20 years	Recreational	Commercial	Ecological	Indicator of stress
Gray snapper	A			•			•	•	•	•				•		•					•			•							•		•	•	•	•
Lutjanus	S			•					•	•				•		•					•			•							•		•	•	•	
griseus	J	•					•	•	•	•				•		•					•		•							•					•	•
	L					•			•				•			•			•									•								
	E					•			•			•														•									
Lane snapper	A			•					•	•				•		•					•			•							•		•	•	•	
Lutjanus	S			•					•	•				•		•					•			•							•		•	•	•	
synagris	J	•						•	•	•				•		•					•		•							•						
	L					•			•				•			•			•									•								
	E					•			•			•														•									
Yellowtail snapper	A			•					•	•				•		•					•			•							•		•	•	•	
Ocyurus	S			•					•	•				•		•					•			•							•		•	•	•	
chrysurus	J	•						•	•	•				•		•					•		•							•						
	L					•			•				•			•			•									•								
	E					•			•			•														•									
Vermilion snapper	A			•					•	•				•		•															•		•	•	•	
Rhomboplites	S			•					•	•				•		•															•		•	•	•	
aurorubens	J	•							•	•				•		•														•						
	L					•			•				•			•												•								
	E					•			•			•														•									
White grunt	A			•					•	•				•		•					•										•		•	•	•	•
Haemulon	S			•					•	•				•		•					•										•		•	•	•	
plumieri	J	•						•	•	•				•		•					•									•					•	•
	L					•			•				•			•			•									•								
	E					•			•			•														•									
Sheepshead	A				•			•	•					•		•					•			•		•					•		•	•	•	
Archosargus	S				•				•							•																	•	•	•	
probatocephalus	J				•			•						•		•			•		•	•		•		•				•					•	•
	L					•		•	•					•		•			•										•							
	E					•			•					•														•								
Red porgy	A																																			
Red drum	A				•				•					•		•					•			•	•	•						•	•	•	•	•
Sciaenops	S				•											•																	•	•	•	
ocellatus	J				•	•		•	•					•		•					•		•	•	•	•				•						•
	L					•			•				•			•			•									•								
	E					•			•			•														•									
Hogfish	A			•					•	•				•		•																•	•	•	
Lachnolaimus	S			•					•	•				•		•																•	•	•	
maximus	J	•						•	•	•				•		•														•						
	L					•			•				•			•												•								
	E					•			•			•														•									
Spanish mackerel	A				•				•	•	•			•		•					•			•							•		•	•	•	•
Scomberomorus	S				•				•																								•	•	•	
maculatus	J				•			•	•	•	•			•		•					•									•						•
	L					•			•				•			•			•		•		•					•								
	E					•			•			•															•								

Terms Used in Biological Attributes Life History Tables:

Life Mode - The usual location within the water column.
• *Benthic* - In the bottom sediments.
• *Epibenthic* - On, but not in, the bottom.
• *Demersal* - In the water column, but near the bottom.
• *Nektonic* - In the water column away from the bottom, and capable of locomotion.
• *Planktonic* - In the water column, but not capable of extensive movements.

Spatial strategy - Use of habitats by life stages.
• *Freshwater resident* - Resides primarily in freshwater (salinity _ 0.5 ppt) habitats.
• *Estuarine resident* - Resides primarily in estuarine habitats (salinity _0.5 and _25 ppt).
• *Marine resident* - Resides primarily in seawater habitats (salinity >25 ppt).
• *Coastal migrant* - Migrates within nearshore waters of the continental shelf.
• *Ocean migrant* - Migrates in ocean waters beyond the continental shelf.

Mobility -
• *Non-mobile* - Sessile, sedentary, or planktonic.
• *Low mobility* - Capable of limited directed movements.
• *High mobility* - Capable of extensive directed movements.

Feeding Type -
• *Filter feeder* - Obtains food items by filtering water or fine sediments.
• *Non-filter feeder* - Obtains food items by other means, such as selective predation.

Prey Items - Food items typically consumed by an organism, such as detritus, phytoplankton, zooplankton, fish, etc.

Longevity - Average lifespan of a particular life stage, from 1 day to >20 years.

Value-
• *Recreational* - Often sought and harvested by sport anglers.
• *Commercial* - Harvested by commercial fishermen for market.
• *Ecological* - Of major importance in aquatic ecosystems as a predator or prey species, etc.
• *Indicator of stress* - Often used in studies of environmental stress.

Table 20b. Biological Attributes of Other Managed and Prey Species Using South Atlantic Estuaries (Source: NOAA 1998, NOAA 1991b).

Life stage
A - Adults
S - Spawning
J - Juveniles
L - Larvae
E - Eggs

Species / life stage		Biological Attributes: Life Mode										Spatial Strategy										Mobility					Feed*					Prey Items										Longevity					Value				
		Epibenthic	Benthic	Demersal	Nektonic	pelagic	Partitionic	Freshwater resident	Estuarine resident	Marine resident	Coastal resident	Ocean migrant	Nonmigrant	Low mobility	High mobility	Filter feeder	Non-filter feeder	Detritus feeder	Phytoplankton	Zooplankton	Infauna	Epibenthos	Insects	Fish	Fish (eggs, larvae)	Fish (juveniles, adults)	Macrobenthos	Vascular plants	1 day	1-30 days	1-12 months	1-5 years	5-20 years	>20 years	Recreational	Commercial	Ecological	Indicator of stress
Bay scallop	A	●							●	●				●	●		●	●	●																	●	●	●							●	●	●		
	S	●							●	●							●	●	●																	●	●	●							●	●	●		
Argopecten irradians	J	●							●	●				●	●		●	●	●																	●	●	●							●	●	●		
	L	●				●	●		●	●				●	●		●	●	●										●							●	●	●							●	●	●		
	E	●				●	●		●	●				●	●		●	●	●										●							●	●	●							●	●	●		
American oyster	A							●	●			●					●		●																	●	●	●											
	S							●	●			●					●		●																	●	●	●											
Crassostrea virginica	J							●	●			●					●		●																	●	●	●											
	L							●	●			●					●		●																	●	●	●											
	E							●	●			●					●		●																	●	●	●											
Atlantic rangia	A						●	●	●			●					●		●																	●	●	●											
	S						●	●	●			●					●		●																	●	●	●											
Rangia cuneata	J						●	●	●			●					●		●																	●	●	●											
	L						●	●	●			●					●		●																	●	●	●											
	E						●	●	●			●					●		●																	●	●	●											

Table 20b. (cont.) Biological Attributes of Other Managed and Prey Species Using South Atlantic Estuaries (Source: NOAA 1998b, NOAA 1991b).

Life stage
A - Adults
S - Spawning
J - Juveniles
L - Larvae
E - Eggs

Species / life stage		Biological Attributes: Life Mode					Spatial Strategy					Mobility			Feed*		Prey Items										Longevity						Value			
		Epibenthic	Benthic	Demersal	Nektonic	Planktonic	Freshwater resident	Estuarine resident	Marine resident	Coastal migrant	Ocean migrant	Nonmobile	Low mobility	High mobility	Filter feeder	Non-filter feeder	Detritus	Phytoplankton	Zooplankton	Infauna	Epibenthos	Insects	Fish (eggs, larvae)	Fish (juveniles, adults)	Macroalgae	Vascular plants	1 day	1-30 days	1-12 months	1-5 years	5-20 years	>20 years	Recreational	Commercial	Ecological	Indicator of stress
Hard clam *Mercenaria* species	A		●					●	●			●			●			●	●												●		●	●	●	●
	S		●					●	●																											
	J		●					●	●				●		●			●	●											●			●	●	●	●
	L	●				●		●	●				●		●			●	●										●							
	E					●		●	●				●														●									
Bay squid *Lolliguncula brevis*	A				●			●	●					●		●					●			●		●				●			●	●	●	
	S				●			●	●																											
	J				●			●	●					●		●					●			●		●			●				●		●	
	L				●			●	●					●		●			●				●					●								
	E	●						●	●			●																●								
Brown shrimp *Penaeus aztecus*	A			●					●					●		●	●			●	●				●					●			●	●	●	
	S			●					●																											
	J			●				●						●		●	●		●	●	●		●		●				●				●	●	●	
	L					●		●	●					●		●		●	●									●								
	E			●					●			●				●											●									

Table 21a. Reproductive Attributes of Select Managed Species(Source: NOAA 1998b, NMFS SEFSC, and SAFMC).

SE EFH 9/29/98	Reproduction																																																
	Fertilization/ development					Mating type			Spawning strategy					Parent care		Domain			Temporal Schedule													Periodicity				Fecundity								Maturation age					
Species	External	Internal	Oviparous	Ovoviviparous	Viviparous	Monogamous	Polygamous	Broadcast spawner	Andromous	Catadromous	Iteroparous	Semelparous	Batch	Protected	Non-protected	Riverine	Estuarine	Marine	January	February	March	April	May	June	July	August	September	October	November	December	Annual spawning	2 or more per year	2 or more years	Undescribed	<100	100-1,000	1,000-10,000	10,000-100,000	100,000-1 million	1-10 million	>10 million	Undescribed	<6 months	0.5 to 1 Year	1 to 3 Years	3 to 5 Years	> 5 Years	Undescribed
Brown shrimp *Peneaus aztecus*	•		•				•				•			•				•	•	•	•	•	•	•	•	•	•	•	•		•							•				•					
Pink shrimp *Peneaus duorarum*	•		•				•				•			•				•				•	•	•	•						•							•				•					
White shrimp *Penaeus setiferus*	•		•				•				•			•			•	•			•	•	•	•	•	•	•	•			•							•				•					
Black seabass *Centropristis ocyurus*	•		•												•			•		•	•	•	•	•																					•		
Gag *Mycteroperca mircolepis*	•		•				•	•			•		•		•			•	•	•	•										•							•							•		
Scamp *Mycteroperca phenax*	•		•				•	•			•		•		•			•													•							•									
Cobia *Rachycentron canadum*	•		•				•				•		•		•								•	•	•	•					•								•						•		
Mutton snapper *Lutjanus analis*	•		•				•	•			•		•		•			•			•	•	•	•	•	•	•				•							•								•		
Red snapper *Lutjanus campechanus*	•		•				•	•			•		•		•			•					•	•	•	•	•	•			•							•							•			
Gray snapper *Lutjanus griseus*	•		•				•	•			•		•		•			•				•	•	•	•	•	•	•			•							•							•			
Lane snapper *Lutjanus synagris*	•		•				•	•			•		•		•			•			•	•	•	•	•	•	•				•							•							•			
Yellowtail snapper *Ocyurus chrysurus*	•		•				•	•			•		•		•			•			•	•	•	•	•	•	•	•	•		•							•							•			
Vermilion snapper *Rhomboplites aurorubens*	•		•				•	•			•		•		•			•				•	•	•	•	•	•				•							•							•			•
White grunt *Haemulon plumieri*	•		•				•	•			•		•		•			•	•	•	•	•	•	•	•	•	•	•	•		•							•							•			
Sheepshead *Archosargus probatocephalus*	•		•				•	•			•		•		•			•			•	•									•										•				•			
Red drum *Sciaenops ocellatus*	•		•				•	•			•		•		•		•	•	•							•	•	•	•	•	•								•							•		
Hogfish *Lachnolaimus maximus*	•		•				•	•			•		•		•			•	•				•	•	•				•	•	•							•										•
Spanish mackerel *Scomberomorus maculatus*	•		•				•	•			•		•		•			•				•	•	•	•	•	•	•			•								•							•		

Terms Used in Reproduction Life History Tables:

Fertilization/development - Method of egg fertilization and development.
• *External* - Egg fertilization occurs after eggs and sperm are shed into the water.
• *Internal* - Egg fertilization occurs when a male inseminates an egg within a female.
• *Oviparous* - Eggs are laid and fertilized externally.
• *Ovoviviparous* - Eggs are fertilized and incubated internally, and usually released as larvae. Little or no maternal nourishment is provided.
• *Viviparous* - Eggs are fertilized, incubated, and develop internally until birth. Maternal nourishment is provided.

Mating Type - Mate selection strategy.
• *Monogamous* - A single male and a single female pair for a prolonged and exclusive relationship.
• *Polygamous* - A male mates with numerous females or vice-versa.
• *Broadcast spawner* - Numerous males and females release gametes during mass spawning.

Spawning strategy - Spawning mode.
• *Anadromous* - Species spends most of its life at sea but migrates to fresh water to spawn.
• *Catadromous* - Species spends most of its life in fresh water but migrates to salt water to spawn.
• *Iteroparous* - Species reproduces repeatedly during a lifetime.
• *Semelparous* - Species reproduces only once during a lifetime.
• *Batch* - Species spawns (releases gametes) several times during a reproductive period.

Parental Care - Type of egg protection.
• *Protected* - Eggs are protected by parent(s); eggs are buoyant or attached to substrates, or eggs develop in the shelter of a nest.
• *Non-protected* - Eggs are not protected by parent(s).

Domain - Location of spawning.
• *Riverine* - Spawning occurs primarily in fresh water, above head of tide.
• *Estuarine* - Spawning occurs primarily in estuarine waters (to head of tide).
• *Marine* - Spawning occurs primarily in open marine waters.

Temporal Schedule - Months when spawning typically occurs.

Periodicity - Frequency of spawning events.
•*Annual spawning* - Spawning once each year, usually during a restricted season.
•*2 or more per year* - Spawning more than once each year (more than one spawning season).
•*2 or more years* - Spawning events separated by at least two years.
•*Undescribed* - Spawning frequency not documented.

Fecundity - Number of eggs typically produced by a mature female, from <100 to >10 million.

Maturation age - The typical length of time for an individual to reach sexual maturity, from < 6 months to > 5 years.

Table 21b. Reproductive Attributes of Select Managed and Prey Species Using South Atlantic Estuaries (NOAA 1998b, NOAA 1991b).

Species	Reproduction: Fertilization/ development					Mating type			Spawning strategy					Parent care		Domain			Temporal Schedule											Periodicity				Fecundity								Maturation age					
	External	Internal	Oviparous	Ovoviparous	Viviparous	Monogamous	Polygynous	Simultaneous spawner	Anadromous	Catadromous	Iteroparous	Semelparous	Batch	Protected	Non-protected	Reverse	Estuarine	Marine	January	February	March	April	May	June	July	August	September	October	November	December	Annual Spawning	2 or more per year	2 or more years	Unspecified	<100	100-1,000	1,000-10,000	10,000-100,000	100,000-1 million	1-10 million	>10 million	Undescribed	<6 months	0.5 to 1 Year	1 to 3 Years	3 to 5 Years	>5 Years	Unspecified
Spot *Leiostomus xanthurus*	1		1				1	1			1		1		1			1	1	1	1	1							1	1														1			
Pinfish *Lagodon rhomboides*	•		•				•	•			•		•		•			•	•	•	•							•	•	•		•					•							•			
Spotted seatrout *Cynoscion nebulosus*	•		•				•	•			•		•		•		•			•	•	•	•	•	•	•	•					•							•					•			
Atlantic croaker *Micropogonias undulatus*	•		•				•	•			•		•		•			•	•	•	•	•	•				•	•	•	•		•							•					•			
Black drum *Pogonias cromis*	•		•				•	•			•		•		•		•	•	•	•	•	•	•						•	•		•							•					•			
Bluefish *Pomatomus saltatrix*	•		•				•	•			•		•		•			•			•	•	•				•	•	•			•						•						•			
Striped mullet *Mugil cephalus*	•		•				•	•			•		•		•			•	•	•	•							•	•	•		•							•							•		
Gulf flounder *Paralichthys albigutta*	•		•				•	•			•		•		•			•	•	•									•	•		•										•			•			
Southern flounder *Paralichthys lethostigma*	•		•				•	•			•		•		•			•	•	•									•	•		•				•									•			

Table 21b. (cont.) Reproductive Attributes of Other Managed and Prey Species Using South Atlantic Estuaries (NOAA 1998b, NOAA 1991b).

Species	Reproduction																																															
	Fertilization/ development					Mating type			Spawning strategy					Parent care		Domain			Temporal Schedule											Periodicity				Fecundity							Maturation age					
	External	Internal	Oviparous	Ovoviviparous	Viviparous	Monogamous	Polygamous	Broadcast spawner	Androminous	Gynandromous	Iteroparous	Semelparous	Batch	Protected	Non-protected	Riverine	Estuarine	Marine	January	February	March	April	May	June	July	August	September	October	November	December	Annual spawning	2 or more per year	2 or more years	Undescribed	<100	100-1,000	1,000-10,000	10,000-100,000	100,000-1 million	1-10 million	>10 million	Undescribed	<6 months	0.5 to 1 Year	1 to 3 Years	3 to 5 Years	>5 Years	Undescribed
Blue mussel *Mytilus edulis*	●		●					●				●	●		●		●	●						●	●	●	●	●	●	●	●								●					●				
Bay scallop *Argopecten irradians*	●		●					●				●	●		●		●	●								●	●	●			●							●					●				
American oyster *Crassostrea virginica*	1		1					1			1		1		1		1	1	1	1	1	1	1	1	1	1	1	1	1		1									1		1						
Atlantic rangia *Rangia cuneata*	●		●					●			●				●	●	●				●	●	●	●	●	●	●	●	●		●										●			●			
Quahog *Mercenaria species*	●		●					●			●		●		●		●				●	●	●	●	●	●	●	●			●									●				●			
Grass shrimp *Palaemonetes pugio*	●		●				●				●			●			●			●	●	●	●	●	●	●	●	●			●				●							●					
Blue crab *Callinectes sapidus*		1	1				1				1			1		1	1			1	1	1	1	1	1	1	1	1			1							1						1			
Atlantic sturgeon *Acipenser oxyrinchus*	●		●					●	●		●		●		●	●	●			●	●	●	●							●									●							●	
American eel *Anguilla rostrata*	●		●							●		●			●			●		●	●	●								●									●						●	●	
Blueback herring *Alosa aestivalis*	●		●					●	●		●				●	●	●				●	●	●	●						●							●							●		
Alewife *Alosa pseudoharengus*	1		1					1	1		1				1	1	1			1	1	1	1	1						1							1							1		
American shad *Alosa sapidissima*	●		●					●	●		●				●	●	●		●	●	●									●							●							●		
Atlantic menhaden *Brevoortia tyrannus*	●		●					●					●		●				●	●	●								●								●						●			
Bay anchovy *Anchoa mitchili*	●		●				●	●			●		●		●		●	●	●	●	●	●	●	●	●	●	●	●	●		●				●						●					
Sheepshead minnow *Cyprinodon variegatus*	●		●				●	●			●			●			●			●	●	●	●	●	●	●	●	●			●			●							●					
Silversides *Menidia species*	●		●				●	●			●				●		●		●	●	●	●	●	●	●	●	●	●	●		●				●								●				