

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

SE EFH 9/29/98	Habitat Associations																																					
	Domain																																					
	Freshwater										Estuarine										Marine	Substrate preference	Depth preference															
	Life stage	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Salinity range			Temperature range							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)				
								NEI	Venice system		0-5°C	5-10°C	11-15°C	16-20°C	21-25°C	26-30°C	>30°C																		Littoral	Sublittoral		
Species							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‰)	Eurohaline (>30‰)																								
Gray snapper <i>Lutjanus griseus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
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Lane snapper <i>Lutjanus synagris</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		
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Yellowtail snapper <i>Ocyurus chrysurus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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Vermilion snapper <i>Rhomboplites aurorubens</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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White grunt <i>Haemulon plumieri</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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Sheepshead <i>Archosargus probatocephalus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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Red drum <i>Sciaenops ocellatus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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Hogfish <i>Lachnolaimus maximus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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Spanish mackerel <i>Scomberomorus maculatus</i>	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
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**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.

3.0 Description, Distribution and Use of Essential Fish Habitat

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

Species	Habitat Associations																																			
	Domain																																			
	Freshwater/Estuarine					Marine							Substrate preference						Depth preference																	
	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	NEI	Salinity range			Temperature range				Marine			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)					
Life stage							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												
Blue mussel																																				
<i>Mytilus edulis</i>																																				
Bay scallop																																				
<i>Argopecten irradians</i>																																				
Allantic rangia																																				
<i>Rangia cuneata</i>																																				
Quahog																																				
<i>Mercenaria</i>																																				
species																																				
Grass shrimp																																				
<i>Palaemonetes pugio</i>																																				



3.0 Description, Distribution and Use of Essential Fish Habitat

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





3.0 Description, Distribution and Use of Essential Fish Habitat

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

Species	Habitat Associations																																										
	Domain												Marine																														
	Freshwater												Estuarine																														
	Life stage	Lacustrine	Riverine - coastal plain	Riverine - inland	Inlet mouth	Channel	Inter- and subtidal flats	Salinity range			Temperature range			Substrate preference			Depth preference																										
							NEI	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)					
Ladyfish																																											
<i>Elops saurus</i>	A																																										
American eel																																											
<i>Anguilla rostrata</i>	A																																										
Blueback herring																																											
<i>Alosa aestivalis</i>	A																																										
Atlantic sturgeon																																											
<i>Acipenser oxyrinchus</i>	A																																										
	S																																										
	J																																										
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Table 20a. Biological Attributes of Select Managed Species (Source: NOAA 1998b, NMFS SEFSC, and SAFMC).

Species	Biological Attributes																						Value																						
	Life Mode					Spatial Strategy					Mobility		Feedi		Prey Items						Longevity						Recreational	Commercial	Ecological	Indicator of stress															
	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										
Brown shrimp <i>Penaeus aztecus</i>	A			•				•				•		•	•			•	•				•												•	•	•								
	S			•				•																													•	•	•						
	J			•				•					•		•	•			•	•				•														•	•	•					
	L				•			•				•		•				•	•																										
Pink shrimp <i>Penaeus duorarum</i>	A			•				•	•			•		•	•			•	•				•															•	•	•					
	S			•				•																																•	•	•			
	J			•				•					•		•	•			•	•				•																	•	•	•		
	L				•			•				•		•				•	•																										
White shrimp <i>Penaeus setiferus</i>	A			•				•	•			•		•	•			•	•				•																	•	•	•			
	S			•				•																																		•	•	•	
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Black seabass <i>Centropristis ocyurus</i>	A			•				•	•	•		•		•				•	•			•	•																			•	•	•	
	S			•				•																																					
	J			•				•	•	•			•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										
Gag <i>Mycteroperca microlepis</i>	A			•				•	•	•		•		•				•	•			•	•																				•	•	•
	S			•				•																																					
	J	•						•	•	•			•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										
Scamp <i>Mycteroperca phenax</i>	A			•				•				•		•				•	•			•																							
	S			•				•																																					
	J	•						•					•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										
Cobia <i>Rachycentron canadum</i>	A			•				•	•	•		•		•				•	•			•																							
	S			•				•																																					
	J			•				•	•	•			•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										
Mutton snapper <i>Lutjanus analis</i>	A			•				•				•		•				•	•			•																							
	S			•				•																																					
	J	•						•	•	•			•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										
Red snapper <i>Lutjanus campechanus</i>	A			•				•				•		•				•	•			•																							
	S			•				•																																					
	J	•						•	•	•			•		•	•			•	•			•																						
	L				•			•				•		•				•	•																										

3.0 Description, Distribution and Use of Essential Fish Habitat

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				Value																				
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 <i>Lutjanus griseus</i>	A			•		•	•	•	•			•		•	•								•									•	•	•	•					
S				•				•	•			•		•	•						•		•										•	•	•	•					
J		•						•	•	•								•						•												•	•				
L																																					•	•			
Lane snapper <i>Lutjanus synagris</i>	A			•				•	•			•		•	•								•												•	•	•				
	S			•				•	•			•		•	•								•													•	•	•			
	J	•						•	•									•					•														•	•			
	L																																					•	•		
Yellowtail snapper <i>Ocyurus chrysurus</i>	A			•				•	•			•		•	•								•													•	•	•			
	S			•				•	•			•		•	•								•														•	•	•		
	J	•						•	•									•					•															•	•		
	L																																					•	•		
Vermilion snapper <i>Rhomboplites aurorubens</i>	A			•				•	•			•		•	•								•													•	•	•			
	S			•				•	•			•		•	•								•														•	•	•		
	J	•						•	•									•					•															•	•		
	L																																					•	•		
White grunt <i>Haemulon plumieri</i>	A			•				•	•			•		•	•								•														•	•	•		
	S			•				•	•			•		•	•								•															•	•	•	
	J	•						•	•									•					•															•	•		
	L																																					•	•		
Sheepshead <i>Archosargus probatocephalus</i>	A			•				•	•			•		•	•								•														•	•	•		
	S			•				•	•			•		•	•								•															•	•	•	
	J			•				•	•									•					•															•	•		
	L																																						•	•	
Red porgy	A			•				•	•			•		•	•								•															•	•	•	
	S			•				•	•			•		•	•								•															•	•	•	
	J			•				•	•									•					•																•	•	
	L																																						•	•	
Hogfish <i>Lachnolaimus maximus</i>	A			•				•	•			•		•	•								•															•	•	•	
	S			•				•	•			•		•	•								•															•	•	•	
	J	•						•	•									•					•																•	•	
	L																																						•	•	
Spanish mackerel <i>Scomberomorus maculatus</i>	A			•				•	•			•		•	•								•															•	•	•	
	S			•				•	•			•		•	•								•																•	•	•
	J			•				•	•									•					•																•	•	
	L																																						•	•	

**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  $\leq 0.5$  ppt) habitats.
- *Estuarine resident* - Resides primarily in estuarine habitats (salinity  $\leq 0.5$  and  $\leq 25$  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.

3.0 Description, Distribution and Use of Essential Fish Habitat

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

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

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

Species / life stage	Biological Attributes												Value																		
	Life Mode			Spatial Strategy			Mobility			Feed* Prey Items				Longevity																	
	Epibenthic	Benthic	Pelagic	Resident	Diurnal migrant	Coastal migrant	Ocean migrant	Non-migrant	Low mobility	High mobility	Filter feeder	Non-filter feeder	Phytoplankton	Zooplankton	Infusans	Epibenthos	Insects	Fish eggs, larvae	Macroalgae, adults	Vascular plants	Tray plants	1-30 days	1-12 months	1.5 years	5-20 years	>20 years	Recreational	Commercial	Ecological	Indicator of stress	
Hard clam	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mercenaria species	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bay squid				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Loliguncula brevis				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Brown shrimp				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Penaeus aztecus				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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

SE EFH 9/29/98	Reproduction													Periodicity	Fecundity				Maturation age			
	Fertilization/ development			Mating type		Spawning strategy		Parent care		Domain		Temporal Schedule										
	External	Internal	Oviparous Ovoviviparous	Viviparous	Mono gamous Poly gamous	Broadcast spawner Andromous	Catastromous Iteroparous	Semeliparous 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					
Species																						
Brown shrimp	*				*				*													
<i>Peneaus aztecus</i>	*				*				*													
Pink shrimp	*				*				*													
<i>Peneaus duorarum</i>	*				*				*													
White shrimp	*				*				*													
<i>Peneaus setiferus</i>	*				*				*													
Black seabass	*				*				*													
<i>Centropristis ocyurus</i>	*				*				*													
Gag	*				*				*													
<i>Mycteroperca microlepis</i>	*				*				*													
Scamp	*				*				*													
<i>Mycteroperca phenax</i>	*				*				*													
Cobia	*				*				*													
<i>Rachycentron canadum</i>	*				*				*													
Mutton snapper	*				*				*													
<i>Lutjanus analis</i>	*				*				*													
Red snapper	*				*				*													
<i>Lutjanus campechanus</i>	*				*				*													
Gray snapper	*				*				*													
<i>Lutjanus griseus</i>	*				*				*													
Lane snapper	*				*				*													
<i>Lutjanus synagris</i>	*				*				*													
Yellowtail snapper	*				*				*													
<i>Ocyurus chrysurus</i>	*				*				*													
Vermilion snapper	*				*				*													
<i>Rhomboplites aurubens</i>	*				*				*													
White grunt	*				*				*													
<i>Haemulon plumieri</i>	*				*				*													
Sheepshead	*				*				*													
<i>Archosargus probatocephalus</i>	*				*				*													
Red drum	*				*				*													
<i>Sciaenops ocellatus</i>	*				*				*													
Hogfish	*				*				*													
<i>Lachnolaimus maximus</i>	*				*				*													
Spanish mackerel	*				*				*													
<i>Scomberomorus maculatus</i>	*				*				*													



**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.

### 3.0 Description, Distribution and Use of Essential Fish Habitat

**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.



