A	B	C	D	E	F	G	H
SAFMC Managed Species by Life Stage		Citation	EFH_1	EFH_2	EFH_3	Alterations	Notes
Gag_Grouper_Eggs		Sedberry, G. R. (Ed.). (2001). Island in the stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society.	shoals w/eddies	High-relief shelf-edge reefs	Oculina varicosa pinnacles		Koenig, C. C., Coleman, F. C., Grimes, C. B., Fitzhugh, G. R., Scanlon, K. M., Gledhill, C. T., & Grace, M. (2000). Protection of fish spawning habitat for the conservation of warm-temperate reef-fish fisheries of shelf-edge reefs of Florida. Bulletin of Marine Science, 66(3), 593-616.
Gag_Grouper_Larva		Levin, P. S., & Grimes, C. B. (2002). Reef fish ecology and grouper conservation and management. Coral reef fishes: dynamics and diversity in a complex ecosystem (PF Sale, ed.) p, 377-390.	continuouse seagrass meadows associated with marshes				
Gag_Grouper_YoY		Sedberry, G. R. (Ed.). (2001). Island in the stream and Ross, S. W., & Moser, M. L. (1995). Life history of juvenile gag, Mycteroperca microlepis, in North Carolina estuaries. Bulletin of marine science, 56(1), 222-237.	estuarine inlets	oyster banks	leave estuaries for offshore reefs mid-late autumn		
Gag_Grouper_Juvenile							
Gag_Grouper_Adult		Sedberry, G. R. (Ed.). (2001). Island in the stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society.	continental shelf reefs				Harter, S. L., Ribera, M. M., Shepard, A. N., & Reed, J. K. (2009). Assessment of fish populations and habitat on Oculina Bank, a deep-sea coral marine protected area off eastern Florida. Fishery Bulletin, 107(2), 195-206; rock outcrops and live O.varicosa
Red_Grouper_Eggs							
Red_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom <10m			
Red_Grouper_YoY							
Red_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom	estuaries and inshore reefs		
Red_Grouper_Adult		Sluka, R. D., Chiappone, M., & Sealey, K. M. (2001). Influence of habitat on grouper abundance in the Florida Keys, USA. Journal of fish biology, 58(3), 682-700. and Burgos, J.M. et al., 2007.	inshore	patch reef	migration from estuary to offshore reef to spawn		Burgos, J. M., Sedberry, G. R., Wyanski, D. M., & Harris, P. J. (2007). Life history of red grouper (Epinephelus morio) off the coasts of North Carolina and South Carolina. Bulletin of Marine Science, 80(1), 45-65. Burgos states lack of research on EH, but "the data indicate that red grouper remain in shallow waters (<40m) until reaching sexual maturity then move offshore to spawn , then return to shallow waters "

A	B	C	D	E	F	G	H
Scamp_Eggs		Koenig, C. C., Coleman, F. C., Grimes, C. B., Fitzhugh, G. R., Scanlon, K. M., Gledhill, C. T., & Grace, M. (2000). Protection of fish spawning habitat for the conservation of warm-temperate reef-fish fisheries of shelf-edge reefs of Florida. Bulletin of Marine Science, 66(3), 593-616.	High-relief shelf-edge reefs	Oculina varicosa pinnacles			Additional Info: Reproductive behavior 48-65 m. @ shelf edge reefs: Schobernd, C. M., & Sedberry, G. R. (2009). Shelf-edge and upper-slope reef fish assemblages in the South Atlantic Bight: habitat characteristics, spatial variation, and reproductive behavior. Bulletin of Marine Science, 84(1), 67-92.
Scamp_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom or coral	sediments	10-20 meters		
Scamp_YoY							
Scamp_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom or coral	sediments			
Scamp_Adult		Schobernd, C. M., & Sedberry, G. R. (2009). Shelf-edge and upper-slope reef fish assemblages in the South Atlantic Bight: habitat characteristics, spatial variation, and reproductive behavior. Bulletin of Marine Science, 84(1), 67-92.	high-relief bioeroded rock and blocked boulders	shelf edge ridges			
Black_Grouper_Eggs							
Black_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom <10m depth			
Black_Grouper_YoY							
Black_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom <10m depth			
Black_Grouper_Adult		Sluka, R. D., Chiappone, M., & Sealey, K. M. (2001). Influence of habitat on grouper abundance in the Florida Keys, USA. Journal of fish biology, 58(3), 682-700.	inshore	patch reef			
Rock_Hind_Eggs							
Rock_Hind_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	5-20 m depth		
Rock_Hind_YoY							
Rock_Hind_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	5-20 m depth		
Rock_Hind_Adult		Potts, J. C., and C. S. Manooch III. (1995). Age and growth of red hind and rock hind collected from North Carolina through the Dry Tortugas, FL. Bulletin of Marine Science 56(3), 784-794	coral reefs	rocky substrates			"…relatively uncommon along the southeastern United States north of Florida."

A	B	C	D	E	F	G	H
Red_Hind_Eggs		Levin, P. S., & Grimes, C. B. (2002). Reef fish ecology and grouper conservation and management. Coral reef fishes: dynamics and diversity in a complex ecosystem (PF Sale, ed.) p, 377-390.	several hundred meters of edge of insular shelf -SW Coast of Puerto Rico	8km offshore	patchy hard coral		Caribbean based research of spawning aggregations with temporal and spatial data from: Sadovy, Y., Rosario, A., & Román, A. (1994). Reproduction in an aggregating grouper, the red hind, Epinephelus guttatus. In Women in ichthyology: an anthology in honour of ET, Ro and Genie (pp. 269-286). Springer Netherlands. and from: Shapiro, D. Y., Sadovy, Y., & McGehee, M. A. (1993). Size, composition, and spatial structure of the annual spawning aggregation of the red hind, Epinephelus guttatus (Pisces: Serranidae). Copeia, 399-406
Red_Hind_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom coral and sediments 5-20 meters				
Red_Hind_YoY							
Red_Hind_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom coral and sediments 5-20 meters				
Red_Hind_Adult		Heemstra, P. C., & Randall, J. E. (1993). Groupers of the World (Family Serranidae, Subfamily Epinephelinae). An annotated and illustrated catalogue of the grouper, rockcod, hind, coral grouper and lyretail species known to date. FAO Species Catalogue Vol. 16. FAO Fish. Synop. (125), 125.	coral reefs	rocky bottoms			
Graysby_Eggs							
Graysby_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom coral and sediments 5-20 meters				
Graysby_YoY							
Graysby_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom coral and sediments 5-20 meters				
Graysby_Adult		Sluka, R. D., Chiappone, M., & Sealey, K. M. (2001). Influence of habitat on grouper abundance in the Florida Keys, USA. Journal of fish biology, 58(3), 682-700.	offshore	relict reef	high relief ledges		"significant positive curvilinear relationship between percent coral cover and graysby biomass" and "…under large coral heads."
Yellowfin_Grouper_Eggs							
Yellowfin_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	5-20m depth		
Yellowfin_Grouper_YoY							
Yellowfin_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956 & Burton ML, Potts JC, Carr DR. (2015) Age, growth, and natural mortality of yellowfin grouper (Mycteroperca venenosa) from the southeastern U.S. PeerJ 3:e1099	hard bottom	sediments	shallow turtle grass		

A	B	C	D	E	F	G	H
Yellowfin_Grouper_Adult		Burton ML, Potts JC, Carr DR. (2015) Age, growth, and natural mortality of yellowfin grouper (Mycteroperca venenosa) from the southeastern United States. PeerJ 3:e1099	hard bottom	coral reefs	<137m		
Coney_Eggs							
Coney_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	5-20m depth		
Coney_YoY							
Coney_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	5-20m depth		
Coney_Adult							could not find anything significant north of the FKNMS.
Yellowmouth_Grouper_Eggs							
Yellowmouth_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>15m depth		
Yellowmouth_Grouper_YoY							
Yellowmouth_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>15m depth		
Yellowmouth_Grouper_Adult		Burge, E. J., Atack, J. D., Andrews, C., Binder, B. M., Hart, Z. D., Wood, A. C., ... & Jagannathan, K. (2012). Underwater video monitoring of groupers and the associated hard-bottom reef fish assemblage of North Carolina. Bulletin of Marine Science, 88(1), 15-38.	High relief ledges with outcrops	Low relief ledges with hard substrate	benthic fauna and flora		
Goliath_Grouper_Eggs		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146					spawning aggregations used to assemble off Hobe Sound and Palm Beach in 5m depth
Goliath_Grouper_Larva							
Goliath_Grouper_YoY		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	grass beds				
Goliath_Grouper_Juvenile		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	mangroves	2-3m depth			
Goliath_Grouper_Adult		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	mangroves	high relief rock ledges	holes and caves		
Nassau_Grouper_Eggs		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	small specific sites	edge of insular platforms			350m from shore
Nassau_Grouper_Larva		Levin, P. S., & Grimes, C. B. (2002). Reef fish ecology and grouper conservation and management. *Coral reef fishes: dynamics and diversity in a complex ecosystem (PF Sale, ed.) p* , 377-390.	coral clumps	holes adjacent to algal covered reefs			The Levin, P.S. (2002) research refers to Eggleston, D. B. (1995). Recruitment in Nassau grouper Epinephelus striatus: post-settlement abundance, microhabitat features, and ontogenetic habitat shifts. Marine ecology progress series. Oldendorf, 124(1), 9-22 and Sadovy, Y. (1999) states "little is known".
Nassau_Grouper_YoY							

A	B	C	D	E	F	G	H
Nassau_Grouper_Juvenile		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	shallow seagrass beds	macro-algal clumps	Porites spp. coral	Gregg, K. (2013). Literature review and synthesis of land-based sources of pollution affecting essential fish habitats in southeast Florida. *NOAA: West Palm Beach,*	David Eggleston published most of the NG research post settlement, but from sampling in the Caribbean.
Nassau_Grouper_Adult		Sadovy, Y., & Eklund, A. M. (1999). Synopsis of biological data on the Nassau grouper, Epinephelus striatus (Bloch, 1792), and the jewfish, E. itajara (Lichenstein, 1822). NOAA TR NMFS 146	smaller inshore larger offshore	shallow high relief coral reefs			
Snowy_Grouper_Eggs							
Snowy_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Snowy_Grouper_YoY							
Snowy_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Snowy_Grouper_Adult		Barans, C. A., Wyanski, D. M., & White, D. B. (2000). Growth, population age structure, and aspects of the reproductive biology of snowy grouper, Epinephelus niveatus, off North Carolina and South Carolina. South Carolina State Documents Depository.	rocky ledges and cliffs	swift currents	upper continental slope 116 - 259m depth		
Yellowedge_Grouper_Eggs							
Yellowedge_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Yellowedge_Grouper_YoY							
Yellowedge_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Yellowedge_Grouper_Adult		Parker, R., & Mays, R. (1998). Southeastern US deepwater reef fish assemblages, habitat characteristics catches, and life history summaries. NOAA techncial report NMFS. 138. 1Á41.	hard bottom	rocky outcroppings	190 - 220m depth		
Warsaw_Grouper_Eggs							
Warsaw_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Warsaw_Grouper_YoY							
Warsaw_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Warsaw_Grouper_Adult		Parker, R., & Mays, R. (1998). Southeastern US deepwater reef fish assemblages, habitat characteristics catches, and life history summaries. NOAA techncial report NMFS. 138. 1Á41.	steep cliffs	notches in rocky ledges	76 - 219m depth		
Speckled_Hind_Eggs							

A	B	C	D	E	F	G	H
Speckled_Hind_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediment	>10m depth		
Speckled_Hind_YoY							
Speckled_Hind_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediment	>10m depth		
Speckled_Hind_Adult		Farmer, N. A., & Karnauskas, M. (2013). Spatial distribution and conservation of speckled hind and warsaw grouper in the Atlantic Ocean off the southeastern US. PloS one, 8(11), e78682.	hard bottom	shelf-edge	45 - 182m depth		
Misty_Grouper_Eggs							
Misty_Grouper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediment	>10m depth		
Misty_Grouper_YoY							
Misty_Grouper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediment	>10m depth		
Misty_Grouper_Adult		Grimes, C. B., Manooch, C. S., & Huntsman, G. R. (1982). Reef and rock outcropping fishes of the outer continental shelf of North Carolina and South Carolina, and ecological notes on the red porgy and vermilion snapper. Bulletin of Marine Science, 32(1), 277-289.	shelf edge				
Black_Sea_Bass_Eggs		Edwards, K. P., Hare, J. A., & Werner, F. E. (2008). Dispersal of black sea bass (Centropristis striata) larvae on the southeast US continental shelf: results of a coupled vertical larval behavior–3D circulation model. Fisheries Oceanography, 17(4), 299-315.	Eggs released near bottom mud and sand	spawning occurs on the rocky reefs mid shelf from 15 to 56m depth			Drohan, A. F., Manderson, J. P., & Packer, D. B. (2007). Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE, 200, 68.
Black_Sea_Bass_Larva		Tucker Jr, J. W. (1989). Energy utilization in bay anchovy, Anchoa mitchilli, and black sea bass, Centropristis striata striata, eggs and larvae. Fishery Bulletin, 87(2), 279-293.	planktonic and occur in shelf waters of 15-51m depth				Drohan, A. F., Manderson, J. P., & Packer, D. B. (2007). Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE, 200, 68.
Black_Sea_Bass_YoY		Drohan, A. F., Manderson, J. P., & Packer, D. B. (2007). Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE, 200, 68.	structurally complex estuarine habitats				
Black_Sea_Bass_Juvenile		Tucker Jr, J. W. (1989). Energy utilization in bay anchovy, Anchoa mitchilli, and black sea bass, Centropristis striata striata, eggs and larvae. Fishery Bulletin, 87(2), 279-293.	high salinity estuaries and bays				"...but move into deeper water as they grow."
Black_Sea_Bass_Adult		Tucker Jr, J. W. (1989). Energy utilization in bay anchovy, Anchoa mitchilli, and black sea bass, Centropristis striata striata, eggs and larvae. Fishery Bulletin, 87(2), 279-293. & McGovern, J.C., Collins, M.R., Pashuk, O., Meister, H.S. (2002) Temporal and spatial differences in life history parameters of black sea bass in the southeastern US. North American Journal of Fisheries Management, 22(4), 1151-1163.	rough bottom over the inner shelf	artificial and natural reefs	pilings		Drohan, A. F., Manderson, J. P., & Packer, D. B. (2007). Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE, 200, 68.
Bank_Sea_Bass_Eggs							

A	B	C	D	E	F	G	H
Bank_Sea_Bass_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments			
Bank_Sea_Bass_YoY							
Bank_Sea_Bass_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments			
Bank_Sea_Bass_Adult							
Rock_Sea_Bass_Eggs							
Rock_Sea_Bass_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	sediments	<10m depth			
Rock_Sea_Bass_YoY							
Rock_Sea_Bass_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	sediments	<10m depth			
Rock_Sea_Bass_Adult							
Wreckfish_Eggs		Sedberry, G. R., Carlin, J. L., Chapman, R. W., & Eleby, B. (1996). Population structure in the pan-oceanic wreckfish, Polyprion americanus (Teleostei: Polyprionidae), as indicated by mtDNA variation. Journal of Fish Biology, 49(sA), 318-329.	pelagic				
Wreckfish_Larva							
Wreckfish_YoY							
Wreckfish_Juvenile		Sedberry, G. R., Carlin, J. L., Chapman, R. W., & Eleby, B. (1996). Population structure in the pan-oceanic wreckfish, Polyprion americanus (Teleostei: Polyprionidae), as indicated by mtDNA variation. Journal of Fish Biology, 49(sA), 318-329.	pelagic	floating debris			
Wreckfish_Adult		Sedberry, G. R. (Ed.). (2001). Island in the stream: oceanography and fisheries of the Charleston Bump. American Fisheries Society.	undercut ledges	scarps	rock piles		not specifically "essential habitat" but large numbers were qualitatively documented in these habitats at the Charleston Bump
Queen_Snapper_Eggs							
Queen_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>30m depth		Most research on Queen is Caribbean associated
Queen_Snapper_YoY							
Queen_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>30m depth		Most research on Queen is Caribbean associated
Queen_Snapper_Adult							Most research on Queen is Caribbean associated
Yellowtail_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom				Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Yellowtail_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	submerged vegetation	sediments		0-20m depth

A	B	C	D	E	F	G	H
Yellowtail_Snapper_YoY							
Yellowtail_Snapper_Juvenile		Smith, S. G., Ault, J. S., Bohnsack, J. A., Harper, D. E., Luo, J., & McClellan, D. B. (2011). Multispecies survey design for assessing reef-fish stocks, spatially explicit management performance, and ecosystem condition. Fisheries Research, 109(1), 25-41. & Lindeman, K.C et al., 2000	Patch reefs	Fore reefs	submerged vegetation		0-20m depth
Yellowtail_Snapper_Adult		Smith, S. G., Ault, J. S., Bohnsack, J. A., Harper, D. E., Luo, J., & McClellan, D. B. (2011). Multispecies survey design for assessing reef-fish stocks, spatially explicit management performance, and ecosystem condition. Fisheries Research, 109(1), 25-41. & Lindeman, K.C et al., 2000	Patch reefs	Fore reefs	submerged vegetation		
Gray_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	coral slope			Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Gray_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Gray_Snapper_YoY							
Gray_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Gray_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	coral slope			
Mutton_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	sand/hard bottom	coral slope		Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Mutton_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom	<10m depth		
Mutton_Snapper_YoY							
Mutton_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	hard bottom	<10m depth		
Mutton_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	sand/hard bottom	coral slope		
Lane_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	grass			Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Lane_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	submerged vegetation	sediments		<10m depth
Lane_Snapper_YoY							

A	B	C	D	E	F	G	H
Lane_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	submerged vegetation	sediments		<10m depth
Lane_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	grass			
Cubera_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	high relief wreck			Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Cubera_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Cubera_Snapper_YoY							
Cubera_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Cubera_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	coral/hard bottom	high relief wreck			
Dog_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	coral			Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Dog_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Dog_Snapper_YoY							
Dog_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	submerged vegetation	sediments	<10m depth		
Dog_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	coral			
Schoolmaster_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	coral	coral ledge		Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Schoolmaster_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	submerged vegetation	<10m depth		
Schoolmaster_YoY							

A	B	C	D	E	F	G	H
Schoolmaster_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	submerged vegetation	<10m depth		
Schoolmaster_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	coral	coral ledge		
Mahogany_Snapper_Eggs							
Mahogany_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	<10m depth		
Mahogany_Snapper_YoY							
Mahogany_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	<10m depth		
Mahogany_Snapper_Adult							
Vermilion_Snapper_Eggs							
Vermilion_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Vermilion_Snapper_YoY							
Vermilion_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>20m depth		
Vermilionn_Snapper_Adult		Schobernd, C. M., & Sedberry, G. R. (2009). Shelf-edge and upper-slope reef fish assemblages in the South Atlantic Bight: habitat characteristics, spatial variation, and reproductive behavior. Bulletin of Marine Science, 84(1), 67-92.	high relief shelf edge	bioeroded rock	blocked boulders		
Red_Snapper_Eggs		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	mud			Spawning aggregation sites; based on sites with abundant catches of fishes with running ripe during spawning months.
Red_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	<10m depth		
Red_Snapper_YoY							
Red_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	<10m depth		
Red_Snapper_Adult		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	mud			
Silk_Snapper_Eggs							

A	B	C	D	E	F	G	H
Silk_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Silk_Snapper_YoY							
Silk_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Silk_Snapper_Adult							
Blackfin_Snapper_Eggs							
Blackfin_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	10-30m depth			
Blackfin_Snapper_YoY							
Blackfin_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	10-30m depth			
Blackfin_Snapper_Adult							
Black_Snapper_Eggs							
Black_Snapper_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>30m depth		
Black_Snapper_YoY							
Black_Snapper_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>30m depth		
Black_Snapper_Adult							
Red_Porgy_Eggs		Koenig, C. C., Coleman, F. C., Grimes, C. B., Fitzhugh, G. R., Scanlon, K. M., Gledhill, C. T., & Grace, M. (2000). Protection of fish spawning habitat for the conservation of warm-temperate reef-fish fisheries of shelf-edge reefs of Florida. Bulletin of Marine Science, 66(3), 593-616.	High-relief shelf-edge reefs	Oculina varicosa pinnacles			
Red_Porgy_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Red_Porgy_YoY							
Red_Porgy_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	hard bottom	sediments	>10m depth		
Red_Porgy_Adult		Grimes, C. B., Manooch, C. S., & Huntsman, G. R. (1982). Reef and rock outcropping fishes of the outer continental shelf of North Carolina and South Carolina, and ecological notes on the red porgy and vermilion snapper. Bulletin of Marine Science, 32(1), 277-289.	shelf edge	inshore live-bottom			
Knobbed_Porgy_Eggs							
Knobbed_Porgy_Larva							
Knobbed_Porgy_YoY							

A	B	C	D	E	F	G	H
Knobbed_Porgy_Juvenile							
Knobbed_Porgy_Adult		Schobernd, C. M., & Sedberry, G. R. (2009). Shelf-edge and upper-slope reef fish assemblages in the South Atlantic Bight: habitat characteristics, spatial variation, and reproductive behavior. Bulletin of Marine Science, 84(1), 67-92.	High and moderate relief bioeroded rock	shelf edge - specifically Scamp Ridge			
Jolthead_Porgy_Eggs							
Jolthead_Porgy_Larva							
Jolthead_Porgy_YoY							
Jolthead_Porgy_Juvenile							
Jolthead_Porgy_Adult							
Scup_Eggs							
Scup_Larva							
Scup_YoY							
Scup_Juvenile							
Whitebone_Porgy_Eggs							
Whitebone_Porgy_Larva							
Whitebone_Porgy_YoY							
Whitebone_Porgy_Juvenile							
Whitebone_Porgy_Adult		Grimes, C. B., Manooch, C. S., & Huntsman, G. R. (1982). Reef and rock outcropping fishes of the outer continental shelf of North Carolina and South Carolina, and ecological notes on the red porgy and vermilion snapper. Bulletin of Marine Science, 32(1), 277-289.	Shelf edge	inshore live-bottom			
Saucereye_Porgy_Eggs							
Saucereye_Porgy_Larva							
Saucereye_Porgy_YoY							
Saucereye_Porgy_Juvenile							
Saucereye_Porgy_Adult							
Longspine_Porgy_Eggs							
Longspine_Porgy_Larva							
Longspine_Porgy_YoY							
Longspine_Porgy_Juvenile							
Longspine_Porgy_Adult							
White_Grunt_Eggs							
White_Grunt_Larva		Lindeman, K. C., Diaz, G. A., Serafy, J. E., & Ault, J. S. (1998). A spatial framework for assessing cross-shelf habitat use among newly settled grunts and snappers. In Proceedings of the Gulf and Caribbean Fisheries Institute (Vol. 50, pp. 385-416)	seagrass and hard structure	<10 m			Biscayne Bay
White_Grunt_YoY							
White_Grunt_Juvenile							
White_Grunt_Adult		Lindeman, K. C., Diaz, G. A., Serafy, J. E., & Ault, J. S. (1998). A spatial framework for assessing cross-shelf habitat use among newly settled grunts and snappers. In Proceedings of the Gulf and Caribbean Fisheries Institute (Vol. 50, pp. 385-416)	found offshore hard bottom waters warmed by Gulf Stream, but in shallower waters off Southern FL				collected from commercial fisheries
Margate_Eggs							
Margate_Larva							
Margate_YoY							
Margate_Juvenile							
Margate_Adult							
Tomtate_Eggs		Darcy, G. H. (1983). Synopsis of biological data on the grunts Haemulon aurolineatum and H. plumieri (Pisces: Haemulidae). United States. National Marine Fisheries Service. NOAA technical report NMFS circular (USA) rocky reefs shelf-edge and live-bottom habitats	mainly offshore on Campeche Bank at >50m depths and are carried by currents from east to west. Spawning in SAB is primarily mid-spring				

A	B	C	D	E	F	G	H
Tomtate_Larva		Darcy, G. H. (1983). Synopsis of biological data on the grunts Haemulon aurolineatum and H. plumieri (Pisces: Haemulidae). United States. National Marine Fisheries Service. NOAA technical report NMFS circular (USA) rocky reefs shelf-edge and live-bottom habitats	settle in shallow water during metamorphosis				
Tomtate_YoY		and age and growth of the tomtate, Haemulon aurolineatum, along the southeastern United States coast [Grunt, fishes]. *Fishery bulletin United States, National Marine Fisheries Service* .	Natural ridges in spring through fall off Carolinas	grass beds and mud flats	among spines of sea urchins		
Tomtate_Juvenile			Natural patch reefs, corals, rock reefs, and jetties	Grass beds and pink shrimp grounds	Live bottom and shelf-edge sponge and coral habitats.		Basic distribution of juvenile and adult are the same except in SAB, juveniles occupied warmer water in the winter and cooler water in the summer than adults. Appear to avoid water shallower than about 20m during winter. Extensive sand and grass flats are essential for providing food, while coral reefs and hard substrates provide diurnal shelter
Tomtate_Adult		Darcy, G. H. (1983). Synopsis of biological data on the grunts Haemulon aurolineatum and H. plumieri (Pisces: Haemulidae). *United States. National Marine Fisheries Service. NOAA technical report NMFS circular 448 (USA)* . Schobernd, C. M., & Sedberry, G. R. (2009). Shelf-edge and upper-slope reef fish assemblages in the South Atlantic Bight: habitat characteristics, spatial variation, and reproductive behavior. *Bulletin of Marine Science* , *84* (1), 67-92.	Shelf-Edge: Buried blocked boulders	Shelf-Edge: high-relief bioeroded rock			Research performed by submersible dives along shelf-edge reefs at an average depth of 51.8m. Upper slope dives had an average depth of 186.3m.
Sailor's_Choice_Eggs							
Sailor's_Choice_Larva		Lindeman, K. C., Diaz, G. A., Serafy, J. E., & Ault, J. S. (1998). A spatial framework for assessing cross-shelf habitat use among newly settled grunts and snappers. In Proceedings of the Gulf and Caribbean Fisheries Institute (Vol. 50, pp. 385-416)	Larva stage (Biscayne Bay) seagrass and hard structure <10 m shallow				
Sailor's_Choice_YoY							
Sailor's_Choice_Juvenile							
Sailor's_Choice_Adult							
Cottonwick_Eggs							
Cottonwick_Larva							
Cottonwick_YoY							
Cottonwick_Juvenile							
Cottonwick_Adult		Lindeman, K. C., Diaz, G. A., Serafy, J. E., & Ault, J. S. (1998). A spatial framework for assessing cross-shelf habitat use among newly settled grunts and snappers. In Proceedings of the Gulf and Caribbean Fisheries Institute (Vol. 50, pp. 385-416)	Hard structure >10 m				
Greater_Amberjack_Eggs		Harris, P. J., Wyanski, D. M., White, D. B., Mikell, P. P., & Eyo, P. B. (2007). Age, growth, and reproduction of greater amberjack off the southeastern US Atlantic coast. *Transactions of the American Fisheries Society* , *136* (6), 1534-1545.	Greater amberjacks spawn in the spring along the outer continental shelf and upper slope when bottom temperatures are approximately 24^{o}C. Their primary spawning area is the Florida Keys				
Greater_Amberjack_Larva							
Greater_Amberjack_YoY		SEDAR 15. (2008) Stock Assessment Report 2 *SAR 2). South Atlantic Greater Amberjack.	a shift in habitat (pelagic to demersal) occurs at 5-6 months of age.				
Greater_Amberjack_Juvenile		SEDAR 15. (2008) Stock Assessment Report 2 *SAR 2). South Atlantic Greater Amberjack.	After shifting to demersal habitats, sub-adults and adults congregate around reefs, rock outcrops, and wrecks. Since greater amberjack are only seasonally abundant in certain parts of their range, they likely utilize a variety of habitats and/or areas each year.				
Greater_Amberjack_Adult		SEDAR 15. (2008) Stock Assessment Report 2 *SAR 2). South Atlantic Greater Amberjack.	After shifting to demersal habitats, sub-adults and adults congregate around reefs, rock outcrops, and wrecks. Since greater amberjack are only seasonally abundant in certain parts of their range, they likely utilize a variety of habitats and/or areas each year.				

A	B	C	D	E	F	G	H
Blue_Runner_Eggs							
Blue_Runner_Larva							
Blue_Runner_YoY							
Blue_Runner_Juvenile							
Blue_Runner_Adult							
Almaco_Jack_Eggs							
Almaco_Jack_Larva							
Almaco_Jack_YoY							
Almaco_Jack_Juvenile							
Almaco_Jack_Adult	McClellan, D. B., & Cummings, N. J. (1996). Information on the Lesser Amberjack, Almaco Jack, and Banded Rudderfish Fishery Complex in the Atlantic Ocean through 1995. U.S. Department of Commerce NOAA. Miami Laboratory Contribution Report No. MIA-96/97-06.						
Banded_Rudderfish_Eggs							
Banded_Rudderfish_Larva							
Banded_Rudderfish_YoY							
Banded_Rudderfish_Juvenile							
Banded_Rudderfish_Adult	McClellan, D. B., & Cummings, N. J. (1996). Information on the Lesser Amberjack, Almaco Jack, and Banded Rudderfish Fishery Complex in the Atlantic Ocean through 1995. U.S. Department of Commerce NOAA. Miami Laboratory Contribution Report No. MIA-96/97-06.						
Bar_Jack_Eggs							
Bar_Jack_Larva							
Bar_Jack_YoY							
Bar_Jack_Juvenile							
Bar_Jack_Adult							
Lesser_Amberjack_Eggs							
Lesser_Amberjack_Larva							
Lesser_Amberjack_YoY							
Lesser_Amberjack_Juvenile							
Lesser_Amberjack_Adult	McClellan, D. B., & Cummings, N. J. (1996). Information on the Lesser Amberjack, Almaco Jack, and Banded Rudderfish Fishery Complex in the Atlantic Ocean through 1995. U.S. Department of Commerce NOAA. Miami Laboratory Contribution Report No. MIA-96/97-06.						
Golden_Tilefish_Eggs							
Golden_Tilefish_Larva	Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.		sediments	>20m depth			
Golden_Tilefish_YoY							
Golden_Tilefish_Juvenile	Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.		sediments	>20m depth			
Golden_Tilefish_Adult	Able, K. W., Grimes, C. B., Jones, R. S., & Twichell, D. C. (1993). Temporal and spatial variation in habitat characteristics of tilefish (Lopholatilus chamaeleonticeps) off the east coast of Florida. Bulletin of Marine Science, 53(3), 1013-1026.		Outer shelf large burrows in sediments w/high clay/silt content	150-200m	8.6-15.4*C		
Blueline_Tilefish_Eggs	Harris, P.J., Wyanski, D.M., & Powers Mikell, P.T. (2004). Age, growth, and reproductive biology of blueline tilefish along the southeastern coast of the US, 1982-1999. Transactions of the American Fisheries Society, 133(5), 1190-1204.		slope waters w/summer bottom temps average 13.7°C				off NC & SC sampling adult spawning fish at depths of 16-190m.

A	B	C	D	E	F	G	H
Blueline_Tilefish_Larva		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	sediments	>10m depth			
Blueline_Tilefish_YoY							
Blueline_Tilefish_Juvenile		Lindeman, K. C., Pugliese, R., Waugh, G. T., & Ault, J. S. (2000). Developmental patterns within a multispecies reef fishery: management applications for essential fish habitats and protected areas. Bulletin of marine science, 66(3), 929-956.	sediments	>10m depth			
Blueline_Tilefish_Adult		Harris, P.J., Wyanski, D.M., & Powers Mikell, P.T. (2004). Age, growth, and reproductive biology of blueline tilefish along the southeastern coast of the US, 1982-1999. Transactions of the American Fisheries Society, 133(5), 1190-1204.	outer shelf, shelf break, and upper sloper	ledges and crevices around boulders and rubble piles	48–236 m at 15–238C		
Sand_Tilefish_Eggs							
Sand_Tilefish_Larva							
Sand_Tilefish_YoY							
Sand_Tilefish_Juvenile							
Sand_Tilefish_Adult							
Gray_Triggerfish_Eggs		Sedberry, G. R., Pashuk, O., Wyanski, D. M., Stephen, J. A., & Weinbach, P. (2006). Spawning locations for Atlantic reef fishes off the southeastern US. In *Proceedings of the Gulf and Caribbean Fisheries Institute* (Vol. 57, pp.	egg massess in shallow cleared depression nests on shelf-edge reefs.				
Gray_Triggerfish_Larva		Burton, Michael L., Potts, J.C., Carr, D.R., Cooper, M., & Lewis, J. (2015). Age, growth, and mortality of gray triggerfish (Balistes capriscus) from the southeastern United States. Fishery Bulletin, 113:27-39 doi:10.7755/FB.113.1.3	drifting mats of brown algae (Sargassum spp.)				
Gray_Triggerfish_YoY		Burton, Michael L., Potts, J.C., Carr, D.R., Cooper, M., & Lewis, J. (2015). Age, growth, and mortality of gray triggerfish (Balistes capriscus) from the southeastern United States. Fishery Bulletin, 113:27-39 doi:10.7755/FB.113.1.4	drifting mats of brown algae (Sargassum spp.)				
Gray_Triggerfish_Juvenile		Burton, Michael L., Potts, J.C., Carr, D.R., Cooper, M., & Lewis, J. (2015). Age, growth, and mortality of gray triggerfish (Balistes capriscus) from the southeastern United States. Fishery Bulletin, 113:27-39 doi:10.7755/FB.113.1.5	drifting mats of brown algae (Sargassum spp.)				
Gray_Triggerfish_Adult		Sedberry, G. R., Pashuk, O., Wyanski, D. M., Stephen, J. A., & Weinbach, P. (2006). Spawning locations for Atlantic reef fishes off the southeastern US. In *Proceedings of the Gulf and Caribbean Fisheries Institute* (Vol. 57, pp. 463-514).	middle-shelf to shelf-edge reefs (20 - 75 m)				Tag and recapture studies indicated that gray triggerfish are highly sedentary as adults, owing to territorial behavior and suggesting that adult migration is not a likely mechanism promoting gene flow. On another hand gene flow could be promoted at the larval and juvenile stage. Gray triggerfish larvae are known to utilize the pelagic habitat and juveniles are found associated with seaweed and flotsam, where they can stay for a relatively long time
Ocean_Triggerfish_Eggs							Antoni, L., Emerick, N., & Saillant, E. (2011). Genetic variation of gray triggerfish in US waters of the Gulf of Mexico and Western Atlantic Ocean as inferred from mitochondrial DNA sequences. North American Journal of Fisheries Management, 31(4). 714-721.
Ocean_Triggerfish_Larva							
Ocean_Triggerfish_YoY							
Ocean_Triggerfish_Juvenile							
Ocean_Triggerfish_Adult							

A	B	C	D	E	F	G	H
Hogfish_Eggs		Seyoum, S., Collins, A. B., Puchulutegui, C., McBride, R. S., & Tringali, M. D. (2015). Genetically determined population structure of hogfish (Labridae: Lachnolaimus maximus) in the southeastern United States. Fishery Bulletin, 113(4), 442-456.	buoyant pelagic dispersal from nearshore and offshore reefs	10-70m depths			
Hogfish_Larva		Seyoum, S., Collins, A. B., Puchulutegui, C., McBride, R. S., & Tringali, M. D. (2015). Genetically determined population structure of hogfish (Labridae: Lachnolaimus maximus) in the southeastern United States. Fishery Bulletin, 113(4), 442-456.	transported inshore	strong benthic orientation			
Hogfish_YoY							
Hogfish_Juvenile		Seyoum, S., Collins, A. B., Puchulutegui, C., McBride, R. S., & Tringali, M. D. (2015). Genetically determined population structure of hogfish (Labridae: Lachnolaimus maximus) in the southeastern United States. Fishery Bulletin, 113(4), 442-456.	shallow, nearshore grass beds	<30m depth			
Hogfish_Adult		Muñoz, R. C., Burton, M. L., Brennan, K. J., & Parker, R. O. (2010). Reproduction, habitat utilization, and movements of hogfish (Lachnolaimus maximus) in the Florida Keys, USA: comparisons from fished versus unfished habitats. Bulletin of Marine Science, 86(1), 93-116.	gorgonian areas	rubble habitats with sand			
Atlantic_Spadefish_Eggs		Hayse, J. W. (1987). *Feeding habits, age, growth and reproduction of Atlantic spadefish, Chaetodipterus Faber(Pisces: Ephippidae), in*	coastal spawning aggregations				
Atlantic_Spadefish_Larva							
Atlantic_Spadefish_YoY		Hayse, J. W. (1987). *Feeding habits, age, growth and reproduction of Atlantic spadefish, Chaetodipterus Faber(Pisces: Ephippidae), in*	estuarine habitats				
Atlantic_Spadefish_Juvenile		Hayse, J. W. (1987). *Feeding habits, age, growth and reproduction of Atlantic spadefish, Chaetodipterus Faber(Pisces: Ephippidae), in*	Estuarine habitats	shallow nearshore habitats <20m depth			
Atlantic_Spadefish_Adult		Hayse, J. W. (1987). *Feeding habits, age, growth and reproduction of Atlantic spadefish, Chaetodipterus Faber(Pisces: Ephippidae), in*	coastal waters	high relief offshore reefs			
Cero_Eggs							
Cero_Larva							
Cero_YoY							
Cero_Juvenile							
Cero_Adult							
Cobia_Eggs							
Cobia_Larva							
Cobia_YoY							
Cobia_Juvenile							
Cobia_Adult							
King_Mackerel_Eggs		Collins, M. R., & Stender, B. W. (1987). Larval king mackerel (Scomberomorus cavalla), Spanish mackerel (S. maculatus), and bluefish (Pomatomus saltatrix) off the southeast coast of the United States, 1973–1980. Bulletin of Marine Science, 41(3), 822-834. Bruce, A. C. (1978). Mackerel Workshop report: results of a workshop to examine the Spanish and king mackerel fisheries from the systems viewpoint, held in Miami on April 28 and 29, 1977 [Florida]. Sea grant special report (USA), no. 14.	spawn at depths >40m. Further offshore in Spring than Summer.	Eggs are pelagic and occur near the surface			concentration of larvae between 32° and 33° N suggests Charleston Bump is an important spawning and nursery area.)

A	B	C	D	E	F	G	H
King_Mackerel_Larva		Collins, M. R., & Stender, B. W. (1987). Larval king mackerel (Scomberomorus cavalla), Spanish mackerel (S. maculatus), and bluefish (Pomatomus saltatrix) off the southeast coast of the United States, 1973–1980. Bulletin of Marine Science, 41(3), 822-834. Godcharles, M. F., & Murphy, M. D. (1986). Species Profiles. Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Florida). King Mackerel and Spanish Mackerel. FLORIDA DEPT OF NATURAL RESOURCES ST PETERSBURG FL BUREAU OF MARINE RESEARCH	more often found in outer-shelf area	near surface	30-37ppt salinities		
King_Mackerel_YoY							
King_Mackerel_Juvenile							
King_Mackerel_Adult		Bruce, A. C. (1978). Mackerel Workshop report: results of a workshop to examine the Spanish and king mackerel fisheries from the systems viewpoint, held in Miami on April 28 and 29, 1977 [Florida]. Sea grant special report (USA). no. 14.	coastal with prerecruitment sometimes migrating along the beaches				
Little_Tunny_Eggs							
Little_Tunny_Larva							
Little_Tunny_YoY							
Little_Tunny_Juvenile							
Little_Tunny_Adult							
Spanish_Mackerel_Eggs		Collins, M. R., & Stender, B. W. (1987). Larval king mackerel (Scomberomorus cavalla), Spanish mackerel (S. maculatus), and bluefish (Pomatomus saltatrix) off the southeast coast of the United States, 1973–1980. Bulletin of Marine Science, 41(3), 822-834.	spawn at depths <40m.				
Spanish_Mackerel_Larva		Peters, J. S., & Schmidt, D. J. (1997). Daily age and growth of larval and early juvenile Spanish mackerel, Scomberomorus maculatus, from the South Atlantic Bight. Oceanographic Literature Review, 12(44), 1485	limited to middle and inner continental shelf waters. Sampled in 88-89.				Statistical evidence for vertical migration to surface at night (larva).
Spanish_Mackerel_YoY		Peters, J. S., & Schmidt, D. J. (1997). Daily age and growth of larval and early juvenile Spanish mackerel, Scomberomorus maculatus, from the South Atlantic Bight. Oceanographic Literature Review, 12(44), 1485	inshore coastal				
Spanish_Mackerel_Juvenile		Peters, J. S., & Schmidt, D. J. (1997). Daily age and growth of larval and early juvenile Spanish mackerel, Scomberomorus maculatus, from the South Atlantic Bight. Oceanographic Literature Review, 12(44), 1485	inshore coastal				
Spanish_Mackerel_Adult		Godcharles, M. F., & Murphy, M. D. (1986). Species Profiles. Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Florida). King Mackerel and Spanish Mackerel. FLORIDA DEPT OF NATURAL RESOURCES ST PETERSBURG FL BUREAU OF MARINE RESEARCH. Smithsonian Marine Station at Fort Pierce. Scombe_macula. (n.d.). Retrieved October 04, 2016, from http://www.sms.si.edu/irlspec/Scombe_macula.htm	coastal waters in South Florida late fall and winter	salinities of 32-36ppt	Typical habitat for Spanish mackerel includes surface waters of nearshore coastal waters and the lower reaches of tidal estuaries and bays where salinity tends to remain above 10 ppt. Typical depth distribution ranges from 10 - 35 meters (33 - 115 feet)		

A	B	C	D	E	F	G	H
Dolphinfish_Eggs		Oxenford, H. A. (1999). Biology of the dolphinfish (Coryphaena hippurus) in the western central Atlantic: a review. Scientia Marina, 63(3-4), 303-315.	Of shore North Carolina and spawning dolphinfish have been reported in May and June with eggs collected in July and August.				Connolly, K. (2004). An Argument for inclusion of Sargassum as essential fish habitat in the dolphin and wahoo fishery management plan. Consulation Process for the south Atlantic region, 1-23.
Dolphinfish_Larva		Oxenford, H. A. (1999). Biology of the dolphinfish (Coryphaena hippurus) in the western central Atlantic: a review. Scientia Marina, 63(3-4), 303-315.	Larval dolphinfish have been reported off Barbados year-round and both larval and juvenile dolphinfish have been sampled in the southeastern Caribbean waters during April/May.				
Dolphinfish_YoY							
Dolphinfish_Juvenile		Oxenford, H. A. (1999). Biology of the dolphinfish (Coryphaena hippurus) in the western central Atlantic: a review. Scientia Marina, 63(3-4), 303-315.	small sized males and all sizes of females spend more time associated with floating objects than large-sized males, which tend to spend more time in open water, possibly traveling between female dominated schools below rafts.				
Dolphinfish_Adult		SAFMC.(2003).Fishery Management Plan for the dolphin and wahoo fishery o fthe Atlantic. Final Environmental Impact Statement, Review, Analysis, and Social Impact Assessment Fishery Impact Statement. NOAA Administraton Award Number NA17FC2201.	EFHs include the Gulf Stream, Charleston Gyre, Florida Current and pelagic Sargassum. EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The TenFathom Ledge, and Big Rock (NC); The Charleston Bump and the Georgtown Hole (SC); The Point off Jupitor Inlet (FL); The Hump off islamorada, FL; The Marathon Hump ooff Marathon, FL; the "Wall" off of Fl Keys; and Pelagic Sargassum.				
Wahoo_Eggs							
Wahoo_Larva							
Wahoo_YoY							
Wahoo_Juvenile							

A	B	C	D	E	F	G	H
Wahoo_Adult		Oxenford, H. A., Murray, P. A., & Luckhurst, B. E. (2003). The biology of wahoo (Acanthocybium solandri) in the western central Atlantic. Gulf and Caribbean Research, 15(1), 33-49. SAFMC.(2003).Fishery Management Plan for the dolphin and wahoo fishery o fthe Atlantic. Final Environmental Impact Statement, Review, Analysis, and Social Impact Assessment Fishery Impact Statement. NOAA Administraton Award Number NA17FC2201.	In the Atlantic, wahoo are reported off the east coast of Florida year-round and further north off South Carolina during the spring and summer. there is some evidence that wahoo may be present in the Gulf Stream year-round, although they are only considered to be abundant from late July through August. It is generally agreed that they move seasonally, extending into cooler waters in the warmer months. Wahoo congregate in the vicinity of drifting objects including sargassum. Wahoo is believed to migrate through the Fl Straits and along the Gulf Stream EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The TenFathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet (Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic Sargassum.				
Golden_Crab_Eggs		Wenner, E. L., Ulrich, G. F., & Wise, J. B. (1987). Exploration for golden crab, Geryon fenneri, in the South Atlantic Bight: distribution, population structure, and gear assessment. *South Carolina State Documents Depository*	EFHs include the Gulf Stream, Charleston Gyre, Florida Current and pelagic Sargassum				
Golden_Crab_Larva							
Golden_Crab_YoY							
Golden_Crab_Juvenile		Wenner, E. L., Ulrich, G. F., & Wise, J. B. (1987). Exploration for golden crab, Geryon fenneri, in the South Atlantic Bight: distribution, population structure, and gear assessment. *South Carolina State Documents Depository*	Silt-clay and foraminiferan shell @ 458-549m depths.				
Golden_Crab_Adult		Wenner, E. L., & Barans, C. A. (1990). In situ estimates of density of golden crab, Chaceon fenneri, from habitats on the continental slope, southeastern US. *Bulletin of marine science , 46*(3), 723-734	Flat-ooze: silt-clay and foraminiferan shell @ 405-567m depths	Hard substrates: coral mound and black pebble @ 481-564m depth			
White_Shrimp_Eggs		Muncy, R. J. (1984). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic). White shrimp.[Penaeus setiferus] (No. FWS/OBS-82/11.27). Mississippi State Univ., Mississippi State (USA). Mississippi Cooperative Fish and Wildlife Research Unit; Fish and Wildlife Service, Slidell, LA (USA). National Coastal Ecosystems Team.	Spawn along the South Atlantic coast of the U.S. in water more than 9m deep and within 9km from the shore. The eggs of white shrimp are discharged directly into the water and sink to the bottom.				
White_Shrimp_Larva		Muncy, R. J. (1984). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic). White shrimp.[Penaeus setiferus] (No. FWS/OBS-82/11.27). Mississippi State Univ., Mississippi State (USA). Mississippi Cooperative Fish and Wildlife Research Unit; Fish and Wildlife Service, Slidell, LA (USA). National Coastal Ecosystems Team.	Planktonic postlarvae live offshore, and then move inshore with tidal currents toward estuaries.				
White_Shrimp_YoY		Muncy, R. J. (1984). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic). White shrimp.[Penaeus setiferus] (No. FWS/OBS-82/11.27). Mississippi State Univ., Mississippi State (USA). Mississippi Cooperative Fish and Wildlife Research Unit; Fish and Wildlife Service, Slidell, LA (USA). National Coastal Ecosystems Team.	They enter estuaries during the second postlarval stage and then become benthic.				

A	B	C	D	E	F	G	H
White_Shrimp_Juvenile		Muncy, R. J. (1984). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic). White shrimp.[Penaeus setiferus] (No. FWS/OBS-82/11.27). Mississippi State Univ., Mississippi State (USA). Mississippi Cooperative Fish and Wildlife Research Unit; Fish and Wildlife Service, Slidell, LA (USA). National Coastal Ecosystems Team.	While in estuaries juvenile white shrimp tend to move farther upstream than do pink or brown shrimp. Juvenile white shrimp live in coastal wetlands. White shrimp prefer muddy substrates with loose peat and sany mud. Shallow muddy bottoms in waters of low to moderate salinity serve as optimum nursery grounds for juveniel white shrimp.				
White_Shrimp_Adult		Muncy, R. J. (1984). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic). White shrimp.[Penaeus setiferus] (No. FWS/OBS-82/11.27). Mississippi State Univ., Mississippi State (USA). Mississippi Cooperative Fish and Wildlife Research Unit; Fish and Wildlife Service, Slidell, LA (USA). National Coastal Ecosystems Team.	Adult white shrimp are powerful swimmers capable migrating great distances and living in euphotic littoral zones at relatively high light intensities.				
Pink_Shrimp_Eggs			As season progresses they move from shallow marshes into deeper creeks, rivers, and bays.				
Pink_Shrimp_Larva							
Pink_Shrimp_YoY							
Pink_Shrimp_Juvenile							
Pink_Shrimp_Adult							
Brown_Shrimp_Eggs		Larson, S. C., Van Den Avyle, M. J., & Bozeman Jr, E. L. (1989). Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). Brown Shrimp. GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT ATHENS.	Spawn offshore at >18m	eggs are demersal			
Brown_Shrimp_Larva		Larson, S. C., Van Den Avyle, M. J., & Bozeman Jr, E. L. (1989). Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). Brown Shrimp. GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT ATHENS.	Planktonic larvae develop offshore				
Brown_Shrimp_YoY		Larson, S. C., Van Den Avyle, M. J., & Bozeman Jr, E. L. (1989). Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). Brown Shrimp. GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT ATHENS.	Surface ocean currents transport postlarvae to coastal areas during late winter and spring.	Postlarvae begin to move from coastal areas into estuaries when water temps rise above 11°C. They immigrate to nursery areas.	Postlarvae are transported into estuaries by incoming tides. Postlarvae are transported into estuaries by incoming tides. Postlarvae inhabit shallow low salinity areas in marsh-grass communities		
Brown_Shrimp_Juvenile		Larson, S. C., Van Den Avyle, M. J., & Bozeman Jr, E. L. (1989). Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). Brown Shrimp. GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT ATHENS.	Juvenile occupy estuarine nursery grounds in the SAB moving to larger bays as they grow.	They eventually emigrate to deeper more saline water to mature.	Juvenile brown shrimp have been collected over muddy or peaty substrates.		

A	B	C	D	E	F	G	H
Brown_Shrimp_Adult		Larson, S. C., Van Den Avyle, M. J., & Bozeman Jr, E. L. (1989). Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). Brown Shrimp. GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT ATHENS.	Adults burrow in response to low temps. Adults offshore burrowed during winter and juveniles in estuaries burrowed during cold-weather periods in the spring.	They prefer loose peat and sandy mud, although they frequent other substrates such as sand, silt, or clay mixed with rock fragments.			
Spiny_Lobster_Eggs		Marx, J. M., & Herrnkind, W. F. (1986). Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (South Florida): Spiny lobster.[Panulirus argus] (No. TR-EL-82-4/82-11-61). Florida State Univ., Tallahassee (USA). Dept. of Biological Science.	spawning in Florida waters in deep reef areas 30m depth	offshore waters along deeper reef fringes	distribution is regulated by ocean currents and circulation patterns.		
Spiny_Lobster_Larva/Postlarva		Herrnkind, W. F., & Butler IV, M. J. (1986). Panulirus argus. *Mar. Ecol. Prog. Ser , 34 ,* 23-30.	migrate inshore to settle	Preference for dark structurally complex algae: Laurencia spp. And T. testudinum			
Spiny_Lobster__Early_Juvenile		Herrnkind, W. F., & Butler IV, M. J. (1986). Panulirus argus. *Mar. Ecol. Prog. Ser , 34 ,* 23-30.	Benthic hard substrates				
Spiny_Lobster_Later_Juvenile		Butler, I. V., Mark, J., & Herrnkind, W. F. (1992). Spiny lobster recruitment in south Florida: quantitative experiments and management implications. In Gulf and Caribbean Fisheries Institute (Vol. 41).	shallow seagrass meadows	seek daytime shelter among sponges and seawhips			
Spiny_Lobster_Adult		Herrnkind, W. F., & Butler IV, M. J. (1986). Panulirus argus. *Mar. Ecol. Prog. Ser , 34 ,* 23-30.	shallow seagrass meadows	coral reefs			