Red Grouper (Epinephelus morio) life history for the Gulf of Mexico. Associations and interactions with environmental and habitat variables are listed with citations as footnotes.

Life stage	Eco-region	Habitat Zone	Habitat Type	Season	Temp (°C)	Depth (m)	Prey	Predators	Mortality	Growth
eggs[10, 11, 17, 22]	ER-1, ER-2	offshore	WCA	Apr-May		20-100			*M = 194.93*	hatch in 30 hrs at 24°C
larvae[7, 10, 11, 17, 22]	ER-1, ER-2	offshore	WCA	May-Jun	optimum: 27.4-28.5	20-100	zooplankton		*M= 13.03-153.10 (depending on age)*	stage lasts 30-40 days post-hatch
postlarvae[1, 17, 22]	ER-1, ER-2		WCA	May-Jul					*M = 13.03-153.10 (depending on age)*	stage lasts 35-50 days post-hatch, leave plankton at about 20 mm SL
early juveniles[2, 4, 5, 9, 10, 11, 16, 22]	ER-1, ER-2	estuarine, nearshore	SAV, hard bottom		16.1-31.2	0-15	demersal crustaceans	larger fishes	*M = 2.52-5.73 (depending on age)*; low DO (3.9-4.7 mg/L) has caused mortality	
late juveniles[5, ,8, 10, 11, 16, 19, 20, 22]	ER-1, ER-2	estuarine, nearshore, offshore	hard bottom			0-50	demersal crustaceans, fishes	larger demersal fishes	catch/ release when caught from > 44 m; *M = 2.52-5.73 (depending on age)*	influenced by food availability, population density

adults[3, 5, 8, 10, 11, 12, 13, 14, 15, 16, 18, 24, 25, 27]	ER-1, ER-2	nearshore, offshore	hard bottom, reefs		15-30	3-190	fish, crustaceans, cephalopods	top predators (ex: sharks, barracudas)	competition for food, shelter; predation; catch/ release mortality; red tide; sudden temp. decreases; *Z* = 0.39; *M* (> age 2) = 0.1194-0.2583	influenced by fishing pressure, food availability, population density; max. age 29; L_{inf} = 829 ± 5.50 mm FL, *k* = 0.1251 ± 2.0 x 10^{-3}, t_0 = -1.2022 ± 3.4x10^{-2}
spawning adults[6, 7, 10, 11, 17, 19, 21, 23, 25, 26]	ER-1, ER-2	offshore	shelf edge/slope, hard bottom	Mar-Jun	*16.97-24.08*	20-100				population density and environmental stress may influence sexual transition; 50% maturity = 2.8 yrs, 292 mm FL; 50% transition = 11.2 yrs, 707 mm FL

Notes: Information in asterisks comes from studies conducted outside GMFMC jurisdiction

Early juveniles: salinity = 20.7-35.5 ppt[2, 9]

Adults: more abundant in fishery during summer months, move offshore during winter[8, 11, 12]
can be found on artificial reefs

Spawning Adults: protogynous hermaphrodites[6, 7, 11, 19]

eggs require at least 32 ppt for buoyancy[17]