

Halichoeres garnoti (Yellowhead Wrasse)

Family: Labridae (Wrasses)

Order: Perciformes (Perch and Cichlids)

Class: Actinopterygii (Ray-finned Fish)



Fig. 1. Yellowhead wrasse, *Halichoeres garnoti*.

[<http://eastep.photoshelter.com/image/I0000rx4VuTgpqsw>, downloaded 23 March 2015]

TRAITS. The yellowhead wrasse grows to approximately 19 cm. Similar to other species of wrasses, it is a protogynous hermaphrodite, meaning its life cycle starts with an individual being female and then changing to male as it grows (Jones, 1980). Due to the sex change occurring, the colour and size of the fish changes throughout its life cycle, therefore as its sex changes, its appearance also changes. Juvenile: yellow with a bright-blue stripe that is laterally spread across its body (Fig. 3). Female (initial stage): back darkly coloured, with a blue hue, two characteristic dark lines branching near each eye and underside is yellow (Fig. 1). When the yellowhead wrasse gets to about 7 cm it undergoes its sex change into a male. Male (terminal stage): front of the body is yellow; the back half is silver with black bar that goes vertically down the side and along the ridge of the back, the two characteristic dark lines branching from the back of each eye (Fig. 4).

DISTRIBUTION. Widespread over the Western Atlantic and can be found in Florida, the Caribbean Sea (Bermuda and Bahamas) as well as the Gulf of Mexico to southern Brazil (Fig. 2). Ranging from 32°N to 24°S of the equator (Robins and Ray, 1986).

HABITAT AND ACTIVITY. The yellowhead wrasses are generally found both on the shallow and deep parts of coral reefs, close to the bedrock. Depth ranging from 2-80m within the temperature range of 23-27° C. It takes advantage of hollow spaces to hide, then to sleep, they burrow into the sand and with the exception of sexual activity they are seldom territorial (Coyer, 1995). Whether they are fully mature or juveniles all roam the sea as individuals, having large home ranges that are broad and overlap. Domination is not imposed by the larger males to the smaller fishes (Thresher, 1979). The mature males get territorial when they congregate in a lek, which is a gathering of the males of a particular species during breeding season, where larger males dominate mates when they go to spawning sites (Robertson, 1981). They also have distinct teeth to enable them to feed on crustaceans and seize prey that are attached to rocks at the bedrock. The yellowhead wrasse is also diurnal, where there is more activity at daytime (Coyer, 1995).

FOOD AND FEEDING. *Halichoeres garnoti* are carnivores, and their diet consists of small invertebrates (e.g. shrimp, sea urchins and crabs) which are captured on the sand and facilitated with aid of their powerful teeth (Coyer, 1995). It is also known for foraging with goatfish, *Pseudupeneus maculatus* as well as *Mulloidichthys martinicus*. These other species use chemosensory barbels to detect and dig up invertebrates from soft substrates; giving the skilful yellowhead wrasse food that would not usually be available to them. This process is known as heterospecific foraging (Aronson and Sanderson, 1987).

POPULATION ECOLOGY. *Halichoeres garnoti* is usually solitary, roaming alone (Thresher, 1979). Although there is no available information regarding its population, it is considered to be abundant throughout its range. In Barbuda, the populations express a colour pattern that is different but is still identical in terms of its genetics to the global population. Research by Kuitert indicates that this genus of wrasses is the largest having over 75 species, which includes having twenty in the Atlantic as well as in the eastern Pacific. The life-span of these species ranges between 3-5 years (Kuitert, 2002). Their population involves a system where if the supermale (which is the dominant/ largest male in the terminal phase) is removed, within days it is replaced by the fish that is the next largest in size (as size mean dominance), where it is quickly transformed into the supermale. Similarly if the previous supermale is reintroduced, then reversion occurs and the fish returns to its primary phase. The reasons for this sex change are primarily for survival by maintaining reproductive balance (Snyderman and Wiseman, 1996).

REPRODUCTION. These fish are pelagic spawners (eggs are released in the water column of open water) where spawning transpires with a ratio of one male, in terminal phase, to many females in the initial phase (sexually mature). This reproduction process occurs daily before sunset. Subsequent to the hatching of the eggs, larvae are also pelagic, and remain above the bottom of the ocean subject to the ocean currents, until they are settled at relatively large sizes (9-12mm) on the reef (Warner and Robertson, 1978 and Robertson, 1981). Although all are initially female and have the ability to change sex, the females that are larger are usually the prime candidates to become male since males are larger than females (Robertson, 1981).

BEHAVIOUR. The juvenile behaviour of *H. garnoti*, in its initial-phase, is the same as its terminal mature phase; they roam the ocean individually, where their home ranges are broad and overlap each other (Thresher, 1979). Since there is a wide distribution of their food source, they are not territorial as there is no need to defend any territory (except during breeding period). They hide under the sand, near the ledges of rocks, during the night to sleep as their anti-predator behaviour, disguising their vibrant colours from known predators such as *Lutjanus analis*, (snapper) and Nassau grouper. The colours are most vibrant during breeding periods to attract as many mates possible and the intensity of the colour lessens when they are feeding or are in states of aggression with peers (Aronson and Sanderson, 1987).

APPLIED ECOLOGY. On the Red-list category and criteria this species is deemed of least concern. Although there are no known threats that are posed towards this species and no conservation measures, its distribution overlies in many marine areas in the United States and Caribbean that are protected. They are utilized the most for aquarium trade, for research and catch the attraction of divers. Due to its small size they are not a major interest to fisheries or for sporting activities (Rocha and Craig, 2010).

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Fig. 2. Native distribution map for *Halichoeres garnoti*.

[http://www.aquamaps.org/receive.php?type_of_map=regular#, downloaded 30 March 2015]



Fig. 3. Juvenile *Halichoeres garnoti*.

[<http://www.ryanphotographic.com/images/JPEGS/Halichoeres%20garnoti%20Yellowhead%20wrasse%20juvenile%20Belize%20copy.jpg>, downloaded 30 March 2015]



Fig. 4. Male *Halichoeres garnoti* (terminal phase).

[http://aquafind.com/imagesalt/Halichoeres_garnoti.jpg, downloaded 30 March 2015]

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