

Common Name: **Humphead wrasse**, also known as Napoleon wrasse



Photograph by John E. Randall, B.P. Bishop Museum

Scientific Name: *Cheilinus undulatus* Ruppell, 1835

Taxonomy: Class: Actinopterygii; Order: Perciformes; Family: Labridae

Area of Concern: Indo-Pacific region, from the Red Sea to the Tuamotus, north to the Ryukyus, including China and Chinese Taipei, east to Wake Island, south to New Caledonia, throughout Micronesia (Myers, 1999; Huang, 2001; FishBase, 2002). Its range falls within the jurisdiction of 48 countries and overseas territories, including the U.S. territories of Guam, American Samoa, Howland Island, Baker Island, Jarvis Island, Palmyra Atoll

Year First Listed as a “Species of Concern”: 2004

Species Description:

Humphead wrasse are slow growing and long-lived, with delayed reproduction and low replenishment rates. This species can live at least 30 years and becomes sexually mature at 5-7 years. Its generation time is expected to be in excess of 10 years and that the rate of intrinsic population increase is likely to be low. The species is hermaphroditic (with female-to-male sex change) which may make it more vulnerable to overfishing than species that do not change sex. This species recruits episodically and actively selects branching hard and soft corals and seagrasses at settlement.

Rationale for “Species of Concern” Listing:

Demographic and Diversity Concerns:

C. undulatus is extremely patchily distributed with adults confined to steep outer reef slopes, channel slopes, and lagoon reefs in water 1-100 m deep. Adults appear to be sedentary over a given patch of reef according to multiple accounts by divers or dive operations that return repeatedly to the same spots and report seeing the same individuals. Adults, however, move periodically to local spawning aggregation site where they concentrate to spawn at certain times of the year. Juveniles tend to prefer a more cryptic existence in areas of dense branching corals, while larger individuals and adults prefer to occupy limited home ranges in more open habitat on the edges of reefs, channels, and reef passes (Donaldson and Sadovy, 2001). Overall, humphead wrasse density is strongly correlated with the percentage of hard bottom or coral cover, while fish size is inversely proportional to coral cover (i.e., the smallest fishes were abundant in areas with high live coral) (Sadovy *et al.*, unpublished manuscript). The species is most often observed in solitary male-female pairs, or groups of two to seven individuals (Donaldson, 1995; Donaldson and Sadovy, 2001).

It is believed to be uncommon to rare wherever it occurs, and natural densities are evidently never high even in preferred habitats. Survey results throughout the species’ range in preferred habitats have shown adult densities of *C. undulatus* in unfished or lightly fished areas at 1 to 10 animals per 5,000 square meters of reef (Donaldson and Sadovy, 2001; O’Connell in litt.; Sadovy *et al.*, unpublished manuscript). Once an economically important species in Guam, it is now rarely seen on reefs, and infrequently reported on inshore survey catch results. In Wake Atoll (U.S.), the humphead wrasse is completely protected by regulation of the U.S. Department of Defense. In this unfished habitat, there are reports of several hundred adults along a 5-km section of reef. Juveniles-adults are rare at Swains Island and Rose Atoll, and uncommon at Tutuila, American Samoa, based on diver-observations made on a February–March 2002

NMFS research cruise. The species has been rare on analogous surveys made during 2000, 2001, and 2002 at Howland and Baker Islands in the Phoenix Island chain and at Jarvis Island, and Palmyra and Kingman atolls in the Line Islands..

Humphead wrasse were listed as Vulnerable in the 2000 IUCN Red List. In the IUCN classification system, a taxon is considered “vulnerable” when it is not considered Critically Endangered or Endangered (as per IUCN definitions) but is facing a high risk of extinction in the wild in the medium-term future, as defined by a multitude of criteria.

Factors for decline

Threats include 1) intensive and species-specific removal in the live reef food fish trade (see below); 2) spearfishing at night with SCUBA gear; 3) lack of coordinated, consistent national and regional management; 4) illegal, unregulated, or unreported (IUU) fisheries; and 5) loss of habitat (Donaldson and Sadovy, 2001). The species’ essential coral reef habitat is seriously threatened by human activity throughout the Indo-Pacific region and juvenile habitat is being degraded by coral bleaching and other disturbances. Destructive fishing practices, such as sodium cyanide use which stuns animals for capture and incidentally kills living coral, have been well documented and are spreading in the Indo-Pacific region (Barber and Pratt, 1998; Jones and Hoegh-Guldberg, 1999; Burke et al., 2002; Bryant et al., 1998; Johannes and Riepen, 1995). Larger fish are difficult to catch any other way, other than by nighttime capture.

The most serious threat to this species is overfishing. This species is long-lived, and if it is similar to other reef fishes of similar size and biology (e.g., sequential hermaphroditism) it is expected to have low rates of replacement and therefore be particularly vulnerable to fishing pressure (Donaldson and Sadovy, 2001). Moreover, being one of the largest of all reef fishes, they have few natural predators which means that fishing mortality may rapidly exceed natural mortality, possibly accounting for the rapid declines noted once fishing intensifies.

Humphead wrasse are being cultured or “farmed” to supply a growing international demand. However, culture techniques currently undertaken may actually pose a threat to wild populations in certain circumstances. Typically, small fish are taken from the wild and raised in floating net cages until saleable size. This activity is commonly referred to as ‘culture’, or ‘cultivation’, but is essentially a capture fishery of juveniles and their maintenance in captivity to legal or marketable size. Moreover, there is a developing export market for juvenile humphead wrasse for the marine aquarium trade (Y. Sadovy, pers. obs. Hong Kong Tung Choi Street aquarium shops). The impact on the age structure and reproductive potential of wild populations depends on the size of fish taken and their likelihood of reaching adulthood and reproduction (Sadovy and Pet, 1998). Early life history mortality is unknown for this species, and thus surplus production at small size classes cannot be determined. Humphead wrasse are sequential hermaphrodites, meaning they first mature as females at smaller sizes then can subsequently mature into males. The controlling factors in this sequential change are not well understood, but selective removal of particular size classes of fish could significantly impact a population’s reproductive potential through excessive targeting of males (large fish) or juveniles likely to survive to adulthood. Sexual maturity takes from 5 to 7 years, and, according to life history strategy theory, many older juveniles of such species are very likely to be able to survive to adulthood.

American Samoa (U.S.) banned the use of spear-fishing with SCUBA gear in April 2001, after declines in grouper and wrasse populations coincided with the advent of commercial harvest in 1994. When this fishery moved to neighboring Independent Samoa, two districts comprising 20 villages immediately imposed an identical ban and are advocating a national prohibition (Birkeland and Friedlander, 2001). All U.S. Pacific territories require licenses to export marine fishery products, and American Samoa requires that export ventures are locally owned.

It is listed as Management Unit Species (Currently Harvested Coral Reef Taxa) in the Coral Reef Ecosystems FMP.

Status Reviews/Research Completed or Underway:

References:

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact Ms. Marta Nammack, NMFSs, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, Marta.Nammack@noaa.gov; or Dr. Jason Baker, NMFS, Pacific Islands Fishery Science Center, 2570 Dole Street, Honolulu, HI 96822-2396, (808) 983-5303, Jason.Baker@noaa.gov.