

The Distribution and Density of Wrasse Mating Sites is Influenced by Fish Feeding Stations

La Distribucion y Densidad de Los Sitios de Reproducción de los Loros esta Influenciada por las Estaciones de Alimentación de Peces

La Répartition et la Densité des Sites d'Accouplement Wrasse est Influencé par les Stations d'Alimentation des Poissons

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EXTENDED ABSTRACT

Various species of wrasses (Labridae) utilize specific sites for courtship and spawning, either in an harem mating system or temporary, resident spawning aggregations. These sites are usually distributed in discrete locations. At Apra Harbor, Guam, harem mating sites are distributed along the edge of a reef slope at discrete intervals, are defended by terminal-phase males, and the mating group consists typically of 2-6 females for most species. At Finger Reef, a protrusion into the harbor at the western end of the reef slope, a spawning aggregation site exists for various species of wrasses. This site is utilized both by species that form spawning aggregations and by species that migrate to the site and spawn there as individuals. This site is also popular with groups of scuba divers and snorkelers that frequently feed fishes at this site. Our data indicate that the numbers of terminal-phase males, and initial-phase males and females of a number of species, but especially *Thalassoma Hardwicke* (Figure 1), *Gomphosus varius* (Figure 2), *Cheilinus trilobatus*, *Hemigymnus melapterus*, *Epibulus insidiator*, and *Halichoeres hortulanus*, are significantly higher than in non-feeding areas of the reef. There is a marked increase in both male-male territorial interactions in a lek-like system and also in sneaking during spawning events. The increased abundance of fishes and corresponding behavioral interactions are likely the result of fish-feeding at this spawning aggregation site. Depending upon the species, we attribute a shift from a harem mating system to that of either a lek-like system or group spawning with an increase of density resulting from fish feeding (Figures 1, 2). In addition, some species, such as, *Cheilinus chlorurus*, *Cheilinus fasciatus*, *Cheilio inermis*, *Novaculichthys taeniourus*, *Oxycheilinus unifasciatus*, and *Thalassoma trilobatum*, court and spawn in relatively low numbers, either as pairs or small harem groups. We found also that compared to non-fish feeding areas there is also a corresponding increase in the density of planktivorous damselfishes (Pomacentridae) and, seasonally, reef herring (Clupeidae) at the site. These fishes are active predators upon fish eggs released into the water column by spawning wrasses. Predation activity appears to be intense

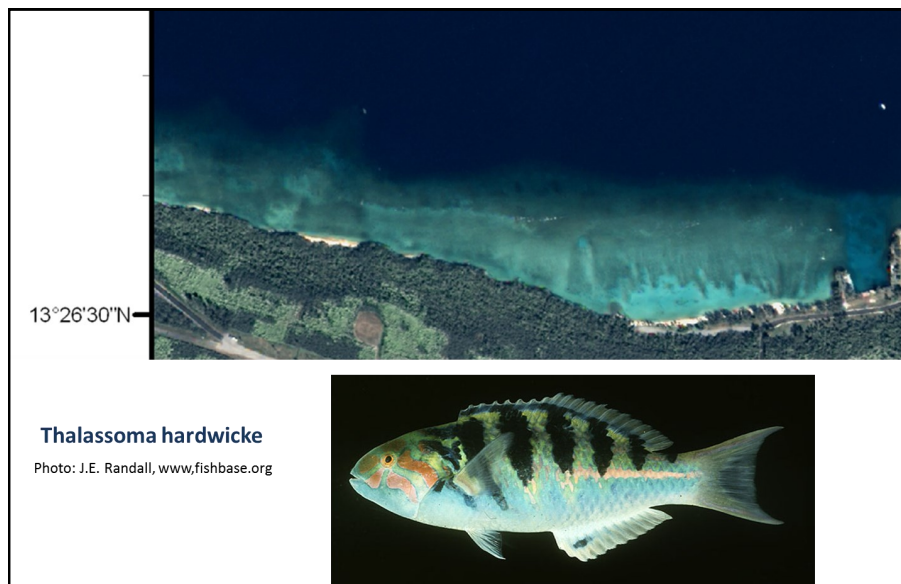


Figure 1. Distribution of male *Thalassoma hardwicke* mating territories at Gab Gab (GG) and Finger (FR) Reefs, Guam. IKONOS image from D. Burdick (2005), Guam Coastal Atlas, University of Guam Marine Laboratory.

enough to affect wrasse courtship success because male wrasses of a number of species often interrupt courtship activity to engage in aggressive territorial behavior towards egg predators nearby. Similarly, females may break-off courtship, especially the ascent, if egg predators are present and close by. Thus, interrupted courtship and egg predation are costs to reproductive success that are probably much greater at fish feeding sites where aggregative spawning occurs compared to elsewhere on the reef.

KEY WORDS: Courtship, lek-like mating, reef fishes, spawning aggregation, territorial behavior

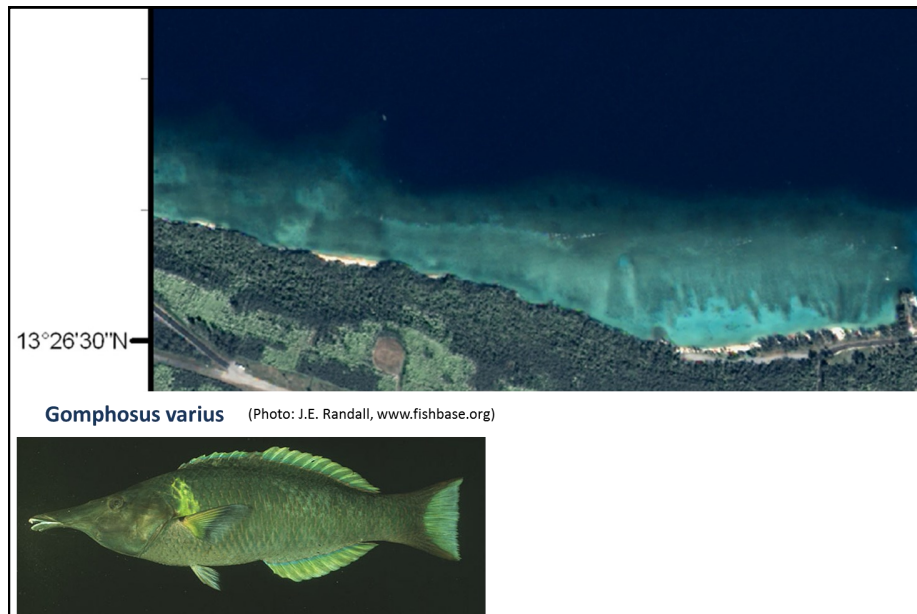


Figure 2. Distribution of male bird wrasse mating territories at Gab Gab (GG) and Finger (FR) Reefs, Guam. IKONOS image from D. Burdick (2005), Guam Coastal Atlas , University of Guam Marine Laboratory.