Apex predators target mutton snapper spawning aggregation

Fig. 1 Mutton snappers spawning, 30–40 m depth at Gladden Spit, Belize

Fig. 2 *Tursiops truncatus* and *Carcharhinus leucas* stalking courting mutton snapper

Mutton snappers (*Lutjanus analis*) occupy both coastal and coral reef habitats during their life cycle and represent economically important food fish for coastal communities throughout the Caribbean and Gulf of Mexico. Mutton snapper populations have been strongly impacted by overfishing particularly on spawning aggregations (Claro et al. 2001; Graham et al. 2008). We document novel observations on both the mass spawning of mutton snappers and predation by three species of apex predators. On six occasions around midday (May 21, 2008; May 29, 2010–June 2, 2010), aggregations of over 3,000 fish coalesced into a tight aggregation at 35–50 m depth along the forereef edge at Gladden Spit (Belize Barrier Reef Fig. 1). From 1315 h onwards, subgroups of 20–45 fish performed vertical spawning rushes 5-10 m from the school, released gametes and returned to the aggregation. Cessation of spawning could not be determined due to air constraints posed by SCUBA. We concurrently document predation on the spawn by a whale shark (*Rhincodon typus*) at 1330 h on May 21, 2008 and of the spawning fish by bull sharks (*Carcharhinus leucas*) and bottlenose dolphins (*Tursiops truncatus*) on May 29, 2010 and June 2, 2010 (Fig. 2). Unlike *L. cyanopterus* that spawn extensive shallow opalescent clouds of gametes that feed a seasonally predictable aggregation of whale sharks (Heyman et al. 2001), mutton snapper spawn disperses rapidly (10–15 min), possibly accounting for the lack of observations of predation on this species' eggs. These findings suggest that the importance of reef fish spawning aggregations in sustaining apex predators requires further investigation.

Acknowledgments The Summit Foundation for funding fieldwork.

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Received: 1 December 2011 / Accepted: 21 May 2012 / Published online: 14 June 2012

Coral Reefs (2012) 31:1017
DOI 10.1007/s00338-012-0921-0