

# Recovery breeds reorganization: changes in migratory and spawning behaviors of Nassau Grouper (*Epinephelus striatus*) across 2 decades of population growth in Little Cayman, Cayman Islands

## La recuperación genera reorganización: cambios en los comportamientos migratorios y de desove del mero de Nassau (*Epinephelus striatus*) a lo largo de 2 décadas de crecimiento de la población en Little Cayman, Cayman Islands

## Réorganisation des races de rétablissement: changements dans les comportements migratoires et de reproduction du mérrou de Nassau (*Epinephelus striatus*) au cours de 2 décennies de croissance démographique à Little Cayman, Cayman Islands

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### EXTENDED ABSTRACT

Over the last 2 decades, the population of Nassau Grouper (*Epinephelus striatus*) on Little Cayman has more than tripled, driven by adaptive and concerted management actions. Today, the population is likely more than 8,000 individuals on an island less than 12 km in length, and 1.5km in width. Throughout this recovery, we have used a whole-island acoustic array, coupled with acoustic tagging of individuals, to monitor the reproductive behaviors of the species (Blinchow et al. 2020). We found that, as the population recovered, individuals: 1) were less likely to visit alternate spawning sites before arriving at the main spawning site (i.e. migrated over less distance during spawning season), and 2) took less time to spawn and return to home reefs (i.e. spent less time at the spawning site during spawning season). We hypothesize that these changes are due to the strengthening of social cues for both migration and spawning brought about by increased fish density. It may also be that learned behaviors and an increase in the ratio of repeat spawners in the population (older individuals) have contributed to this reorganization.

Under the assumption that our findings are generalizable to other regions of the Caribbean with overfished populations, they suggest a behavioral mechanism for the lack of population recovery following a course of heavy harvest and subsequent protection. That is, heavy harvest is simultaneously causing population decline, and eroding the social fabric underlying healthy spawning behaviors. On the other hand, the recovery and reorganization of Nassau Grouper spawning aggregations in the Cayman Islands following effective and adaptive fisheries management suggests that populations of the species can recover both numerically and behaviorally, given effective and enforced management (Waterhouse et al. 2020).

KEYWORDS: Nassau Grouper, Fish Spawning Aggregation, reproductive migration, fish behavior

### LITERATURE CITED

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