

## **An Intra- and Inter-annual Analysis of Nassau Grouper Size Distributions from a Recently Protected Spawning Aggregation in the Cayman Islands**

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### **ABSTRACT**

Nassau grouper (*Epinephelus striatus*) migrate to specific sites during the winter full moons in order to reproduce in mass aggregations. The Nassau grouper is listed as endangered by the International Union for Conservation of Nature and Natural Resources (IUCN). Intense harvesting of spawning aggregations is the primary cause of the precipitous decline in populations throughout the Caribbean. Over the last 4 decades, several Caribbean governments have instituted harvest bans on Nassau grouper following stock collapse. In no instance that we are aware of has the species sufficiently recovered following protections.

In 2002, the Reef Environmental Education Foundation (REEF) embarked on the Grouper Moon Project ([http://www.reef.org/programs/grouper\\_moon](http://www.reef.org/programs/grouper_moon)), an international cooperative research program with the Cayman Islands Department of the Environment (CIDOE). Since 1987, the CIDOE has been monitoring Nassau grouper spawning season catches in Grand Cayman and Cayman Brac at the request of fishermen who reported decreased fish size and catch. In 2000, a previously undocumented spawning aggregation on Little Cayman was discovered and heavily harvested with hook and line (approximately 2,000 Nassau groupers were harvested over a nine-day period in 2001). Monitoring efforts associated with the Grouper Moon Project began during the January 2002 aggregation period at which time another 2,000 Nassau grouper were harvested (Whaylen *et al.* 2004). This active aggregation, along with seven other designated aggregations in the Cayman Islands, was protected under legislation enacted in 2003 to prohibit fishing on known grouper spawning sites.

As part of an ongoing effort to monitor changes in the Little Cayman aggregation population, we collected size distribution data on aggregating fish in 2004, 2005, and 2006 (Whaylen *et al.* 2006). In both 2005 and 2006, we collected size data from the spawning site on consecutive within-year aggregations to assess differences in the size of aggregating individuals. Our findings indicated aggregating fish were larger toward the end of spawning periods, and that aggregating fish were larger during subsequent within-year spawning periods. These findings agree with results from an acoustic tagging project showing that larger fish remain at the aggregation site longer during a given spawning period, and are more likely to attend multiple spawning periods within years (Semmens *et al.* 2005). Our findings suggest that older, larger fish are differentially susceptible to harvest on unprotected spawning sites due to the amount of time they spend aggregating. In the context of the Cayman Islands spawning site protections, these findings highlight the importance of continuing to maintain protections into the future.

**KEY WORDS:** Nassau grouper, aggregation, demography, endangered, *Epinephelus striatus*

### **Un Análisis Intra e Inter-Anual de las Distribuciones de Tamaño del Grouper de Nassau del Protegido Recientemente Frezando la Agregación en las Cayman Islands**

Como parte de un esfuerzo en curso para supervisar cambios en un mero grande recientemente protegido de Nassau que frezaba el sitio en los Cayman Islands, recogimos datos de la distribución dimensional sobre la agregación de pescados en 2004, 2005, y 2006. En 2005 y 2006, recogimos datos del tamaño del sitio de freza en agregaciones consecutivas del dentro-año para determinar diferencias en el tamaño de agregar a individuos. Nuestros resultados indicados agregando pescados eran más grandes hacia el final de períodos de freza, y ese pescado de agregación era más grande durante períodos de freza del dentro-año subsecuente. Estos resultados están de acuerdo con resultados de una demostración acústica del proyecto que marca con etiqueta que pescados más grandes permanecen en el sitio de la agregación más de largo durante un período de freza dado, y son más probables atender a períodos de freza del múltiplo dentro de años. Nuestros resultados sugieren eso más viejo, pescados más grandes son diferenciado susceptibles a la cosecha en los sitios de freza desprotegidos debido a la cantidad de tiempo que pasan la agregación.

PALABRAS CLAVES: Nassau grouper, agregación, demografía

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