

# *Program Synopsis*

## **GROUPEL EDUCATION PROGRAM**

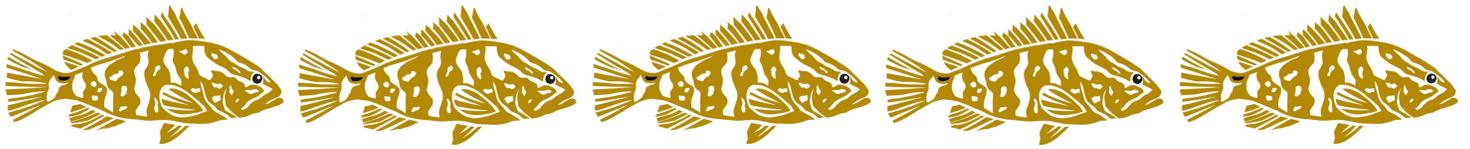
*Curriculum Synopsis and Background Information*

### **What is the Grouper Moon Project?**

Grouper Moon is a collaborative conservation program between the Reef Environmental Education Foundation (REEF) and the Cayman Islands Department of the Environment (CIDOE) studying Nassau grouper (*Epinephelus striatus*) – a social and ecological corner stone of the Caribbean’s coral reefs. Historically, Nassau grouper represented one of the Caribbean’s most economically important fisheries. Unfortunately, due to intense harvest on spawning aggregations, populations have dwindled to a fraction of their historic numbers. The species became one of the first Caribbean reef fish to be listed as endangered by the International Union for the Conservation of Nature (IUCN) and the species is listed under the US Endangered Species Act.

Normally solitary and territorial, during the winter full moons grouper travel, sometimes over great distances, and congregate together to spawn. About fifty of these spawning aggregation sites have been recorded in different places throughout the Caribbean. Historically, once discovered, grouper aggregation sites have become synonymous with fisherman aggregation sites. Due to the timing and site fidelity of the spawning aggregations and the ease with which these fish—which are normally solitary—can be caught while congregating by the hundreds and thousands to spawn, one-third to one-half of the known Caribbean aggregation sites are now inactive. The Cayman Islands used to be home to five Nassau grouper spawning sites. Today, four of these sites are dormant or depleted. But one site, on the west end of Little Cayman Island, is home to one of the last great reproductive populations of this endangered species. In 2003, the Cayman Islands government issued an 8-year ban on fishing at all known aggregation sites in order to protect the Little Cayman aggregation and to allow the historical sites to recover.

In the winter of 2002, REEF launched a groundbreaking expedition to the Cayman Islands – the Grouper Moon Project. The Project’s objectives were to observe the Nassau grouper spawning aggregation off the western tip of Little Cayman, and to develop a protocol for monitoring their numbers and activity at the site. For two weeks, a team of divers from REEF and the Cayman Islands Department of Environment visited the aggregation site and nearby reefs. Since that first year, REEF and the CIDOE have coordinated annual efforts to monitor and study the Little Cayman Nassau grouper aggregation. The project has expanded to study the historical aggregation sites on Grand Cayman and Cayman Brac, and has grown in scope to include an ambitious acoustic tagging project, juvenile habitat research, genetic studies, and a current drifter project to understand how currents and other oceanographic conditions affect grouper larvae recruitment. Results have been published in the scientific literature.



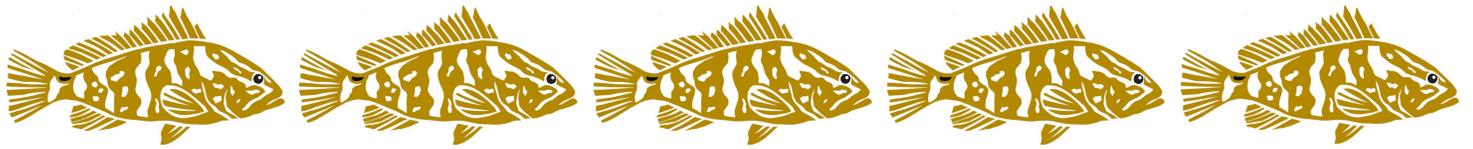
In 2011, REEF began working on the creation and implementation of a curriculum designed for elementary and high school students. This exciting, new project focuses on bringing the Nassau grouper into Cayman elementary and high school classrooms through lesson plans and live-feed videos that will connect classrooms with scientists in the field. Given the importance of the grouper as an apex predator, it is imperative to raise awareness about the aggregations and to help build support for the value of Nassau grouper beyond a fishery resource. The curriculum presents a multi-faceted view of the Nassau grouper and includes key historical, scientific, and conservation concepts. In addition to classroom lessons, the curriculum includes live-feed video sessions that will take place during the winter spawning event, allowing us to bring real-world field science into the classroom. The live feed video discussions will be supplemented with footage of solitary Nassau grouper on their home reef, and the 4,000 mass aggregation of Nassau grouper that gather on the west end of Little Cayman during winter full moons. These video sessions are scaffolded with pre-activities to build background knowledge as well as follow-up activities to help deepen the students' learning experience.

## CONTENT SYNOPSIS

What makes a healthy coral reef? Why are the Nassau Grouper an important part of the reef ecosystem? These are two of the primary, guiding questions that will be answered through our study, and will serve as the intention behind all our activities. Both curricula are designed for two specific age ranges: 4th year students and 11th year students. Each curriculum covers similar content, however, at a depth that is developmentally appropriate for each age group.

In addition to providing an overview of key historical, scientific, and conservation concepts about Nassau grouper, the curriculum focuses on developing the students' understanding of the coral reef ecosystem, specifically the vital role that fish diversity and the presence of top predators such as the Nassau grouper play in maintaining a healthy reef.

Coral reefs are home to thousands of plant and animal species. An intricate balance between fishes, corals, and algae maintains healthy coral reefs. In addition to the number of different species found on a reef, high functional diversity (including trophic diversity) is critical to maintaining resilient coral reef communities. Reef-building corals provide 3-dimensional habitat, resulting in complex refuges in which animals can hide from predators. Herbivores such as parrotfish and sea urchins keep algae cover to a minimum. Without herbivores, algae would quickly grow over the top of the corals, smothering them. Top predators such as sharks, grouper, and snapper, play an important roll in maintaining species and functional diversity on coral reefs. If managed properly, these species will also provide direct benefits to Caribbean societies through viewing opportunities (tourism) and healthy fisheries (sustainable food source).



## CREDITS and ACKNOWLEDGMENTS

Todd Bohannon, developed curriculum content with guidance from Grouper Moon scientists, Dr. Brice Semmens, Dr. Christy Pattengill-Semmens. Cindy Shaw, author of the anchor text Grouper Moon, also provided Invaluable content and input. Technical and logistical support was provided by the Cayman Islands Department of the Environment, especially Gina Ebanks-Petrie, Tim Austin, Philippe Bush, and Bradley Johnson. The Disney Wildlife Conservation Fund provided funding for the development of this curriculum and the technology needed to conduct live-feed sessions

