



DEPARTMENT OF
ENVIRONMENT
CAYMAN ISLANDS GOVERNMENT

PROGRAM SYNOPSIS

GROUPEL EDUCATION PROGRAM



What is the Grouper Moon Project?

Curriculum Synopsis and Background Information

Grouper Moon is a collaborative conservation program between Reef Environmental Education Foundation (REEF) and Cayman Islands Department of the Environment (CIDOE) studying Nassau Grouper (*Epinephelus striatus*) - a social and ecological cornerstone 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 candidate listed under the US Endangered Species Act.

Normally solitary and territorial, during the winter full moons grouper travel, sometimes over great distances, and "group" 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 relative loners 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 (*Epinephelus striatus*) 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 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 research project, juvenile habitat and genetics studies, and a current drifter project to understand where the grouper larvae travel. 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. With the impending expiration of the existing reserve protections at the aggregation sites, 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 two live-feed video sessions during the school year - once prior to the spawning season (November/December) and the second during the spawning season (January/February), 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.

UPDATE

After 12 years of educational programming, we have successfully implemented the Grouper Education Program in over 25 schools, in 95 unique classrooms and approximately 3,000 students in the Cayman Islands, the Bahamas, Turks & Caicos, the US, and UK. In 2023, we began the process of rewriting and updating our curriculum to reflect the changes that have occurred over time, the ongoing success of the project, and, just as importantly, to align our lessons more closely with the national curriculum. This year we begin by piloting our new Year 4 curriculum. We know all too well that teachers are stretched thin to teach all the required content. Our intention is to create a series of marine science lessons that educate students about the Nassau Grouper while also teaching the specific science content students are required to learn at each grade level. We want to avoid making the Grouper Moon lessons an "add-on" activity but rather something that could replace a current science unit while continuing to meet student's required learning standards. In 2024 we will begin updating our middle and high school curricula.

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. Our curricula was originally designed for two specific age ranges: 4th-year students and 11th-year students. Since then, we have expanded to include middle school lessons as well. 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 student's 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 a 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 role 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 (protein).

CREDITS and ACKNOWLEDGMENTS

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