



Rocky Point Spawning Site at Bacalar Chico NP/ MR

By Henry Brown Jr. –Marine Biologist at BCNPMR (Belize Fisheries Department)

The Rocky Point Spawning Aggregation Area is located within the Bacalar Chico Marine Reserve. This site is a multi-species Spawning Aggregation site found within the country of Belize. It is known to host 5 confirmed finfish species which are the Mutton Snapper, Dog Snapper, Black Grouper, Horse - Eye Jack and the White Margate. However, there have been sightings of small groups of other reef fish species such as Permit, Rainbow Runner, Ocean Trigger, Yellowfin Grouper and Nassau Grouper. Spawning occurs all year round at the Rocky Point Spawning site. In the Bacalar Chico Marine Reserve the Spawning Aggregation monitoring program is geared specifically to monitor the Spawning Aggregation of certain Grouper species, which are the Black Grouper, Yellowfin Grouper and Nassau Grouper. That is why the monitoring of this site during the spawning season of these particular species, is done during the months of November, December, January, February, and March.

All Sightings were taken at the Rocky Point Spawning Site			
Diving Dates	Black Grouper	Yellowfin Grouper	Nassau Grouper
13-Jan-09	50	0	0
14-Jan-09	100	0	0
2-Feb-10	50	0	0
28-Jan-11	65	0	0
20-Jan-12	100	0	2
11-Feb-12	80	0	0
29-Nov-12	35	0	0
28-Jan-13	0	0	0
16-Dec-13	4	2	0
22-Jan-14	22	35	0
25-Jan-14	25	18	20
26-Jan-14	32	0	0
27-Jan-14	65	0	6
15-Feb-14	10	0	0
17-Feb-14	13	0	0
27-Feb-14	20	0	0
15-Mar-14	5	0	0

The Rocky Point Spawning Aggregation Area is monitored through a collaborative effort of the staff of the Bacalar Chico National Park & Marine Reserve (BCNPMR) and the staff of Hol Chan Marine Reserve (HCMR) of the Belize Fisheries Department. For the last 5 years, there has been only one of the three specified Grouper species sighted in large numbers: the black grouper. For the month of January 2014, the staff at BCNPMR conducted three additional dives between the 10 to 12 days after the full moon. During those three dives an average of 26 Nassau Groupers were seen, of which two were Bicolored. So for the ending of this year's and the beginning of next year's monitoring, we are planning to do additional dives each month between the 10 to 12 days time frame after each full moon, to see if we can observe the Nassau Grouper species spawning.



The SPAGS Working Group finalized its new logo which was designed by Dirk Francisco from Belize Audubon Society.

Electronic copies of this twelfth issue of the SPAGS newsletter are also available at www.spagbelize.org

This issue was designed and compiled by Eli Romero, the Marine Biologist at Belize Audubon Society.

Follow us on Facebook (<https://www.facebook.com/BelizeSPAG>) for updates and news on the Working Group and related events.

If you would like more information about the Nassau Grouper, the Belize Spawning Aggregation Working Group or anything mentioned in this newsletter, please contact:

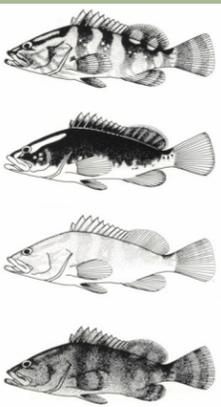
Dr. Leandra Cho-Ricketts
 Chairperson, Spawning Aggregation Working Group
 Environmental Research Institute, University of Belize.
 Tel:(501) 822-2701; Fax:(501)822-2701
 E-mail: lricketts@ub.edu.bz



The Belize Spawning Aggregation Working Group Newsletter

Princess Margaret Drive, Belize City
 Tel: +501-223-2623

Belize Central America
 email: species@btl.net



Shown at the right, from top to bottom: Four color-phase changes of the Nassau Grouper, *Epinephelus striatus*—Barred, Bicolor, White belly and Dark

Glover's Nassau Grouper Management from a Fisherman's Point of View

By **Leomir Santoya**, Project Coordinator, Sarteneja Fishermen Association
 Based on interview with Sarteneja fisherman, **Leovichildo Tamai**



Mr. Tamai cleaning conch on his fishing sail boat at Glover's

I am a fisherman with more than thirty years of experience in the area. I have witnessed many changes in the fishing sector over the years. I can remember Glover's Reef before hurricanes Mitch and Gilbert. In that time the marine fauna was stunning with its amazing diversity of marine life that emerges from the mangrove cays and runs toward the sea grass beds, rapidly meeting with the coral colonies and suddenly dropping off into the depth of the Blue. Schools of Nassau grouper, Parrotfish, Hogfish, and Red Snapper could be observed around the patches and inside the reef.

Nassau Grouper was harvested throughout the year back then, but suddenly the population decreased drastically. Biologists and fishers started to wonder what happened to the countless numbers of Nassau Groupers. The question being asked over the years was what led to this sudden decline? I strongly believe that the decline was led by multiple factors, but the one I saw that affected the population the most was hurricanes. Hurricanes totally destroyed the spawning sites where the Nassau Groupers came every year to spawn. In addition, there were no protective measures in place to control the decline. Nassau Groupers were harvested with no size limit. I can remember myself spearing large-sized Nassau Groupers in the past. Also I can remember line fishers harvesting countless Nassau Groupers at night under the moonlight. Sailboat fishermen like me are not accustomed to harvesting Nassau Groupers in large quantities. We don't fish with lines; we use spear guns on a seasonal basis, especially when Conch and Lobster seasons are closed or when their production decreases. After remembering that time in the past when Nassau Groupers were countless and how the population drastically declined, I realized that both nature and humans are contributing to these changes.

Gradually, over the years protective measures for the Nassau Grouper were placed in effect to prevent the extinction of this species. Currently, at Glover's harvesting of Nassau Grouper is banned, but it is not a law, it is a gentleman's agreement that was negotiated when the Fisheries Department wanted to preserve North East Point. The agreement accepted brought benefits for both fishermen and the Fisheries Department. Hence fishing for Conch and Lobster was allowed in the Seasonal closure area (excluding the actual SPAG site), and in turn fishermen agreed to protect the existing Nassau Grouper population. Since then the protection of the North East Point during the spawning season has worked well. The majority of the fishermen have respected the closed season, but there are a few that still don't understand the reason why we should protect our resources. This has created an imbalance in responsibilities between both fishermen and fisheries officers. Over the past year and a half the enforcement has decreased and the Rangers' performance is about 60%. They make their routine patrols during the day but are not present during the night, when illegal fishing occurs the most. On the other hand, fishermen should understand that we need to protect the resources on which we depend. If we don't protect our resources no one will do it for us. Despite all these issues the Nassau Grouper population has increased over the years. I can see Nassau grouper on both the shallow and deep patches; also the reef has both juvenile and adult groupers swimming and feeding around the coral colonies.

I can say that all the work being done to protect the Nassau Grouper is paying off slowly. As the spawning season comes closer the Nassau Groupers are emerging from the Blue to the shallow areas of the reef, preparing to spawn. I as a boat captain try to teach my crew the right things to do because at the end when I retire from fishing I want to leave my legacy of good behaviour to my crew members. My general observation during the years as a fisherman is that the law enforcement of the Nassau Grouper regulations is working, but there are many gaps in between the implementation of the law by the fisheries officers. Also, too many activities can't be done if funding is not available, because the little amount of funds used to monitor one area also has to be shared to monitor other areas, resulting in limited protection of the sites.

The distribution of information about the Nassau Grouper has been fruitful. I am informed through the media when is the opening and closing of the season for Nassau Grouper. I feel thankful toward the initiative Belizeans have embarked on in the protection of the Nassau Grouper. In the future the Belizean people will be able to say that they fought for the protection of the Nassau Grouper.

TEN YEARS OF MANAGING NASSAU SPAGS: WHERE ARE WE?

By: Dr Leandra Cho-Ricketts (Chair of the Spawning Aggregation Working Group and UB-ERI representative)

In 2002 after over a year of planning and advocating for the protection of Nassau grouper spawning aggregation (SPAG) sites, a coalition of seven NGOs working with fishermen was successful in getting the Government of Belize to protect 11 Nassau grouper spawning sites across the Belize Barrier Reef. Most of these SPAG sites fell within already existing marine protected areas and were declared as fully protected no-take areas. Two sites, Northern Two Caye and Mauge Caye were still open to traditional fishing during the spawning season.

Since 2004 there has been annual biological monitoring at 7 of the SPAG sites identified as primary Nassau grouper spawning sites to determine the abundance of groupers during the December to March full moons. This has been supported with enforcement patrols during these times and throughout the year at varying levels depending on the marine protected area and its level of management. Some sites have had sustained enforcement over the ten years while others have not. The data on fish abundance at the SPAG sites show varying trends in counts from year to year. Natural fluctuations in numbers are normal and counts can also be affected by poor weather conditions (e.g. poor visibility) and time of day. However large changes in numbers from year to year may be primarily based on enforcement presence. Sites such as Sandbore, Lighthouse Caye and Northeast Point, Glovers Reef which have been fully no-take since 2004, and where patrols and management presence have been sustained, show a constant or increasing trend in fish abundance between 1800-2900 fish (Figures 1 and 2) from over 1000 (in 2008).

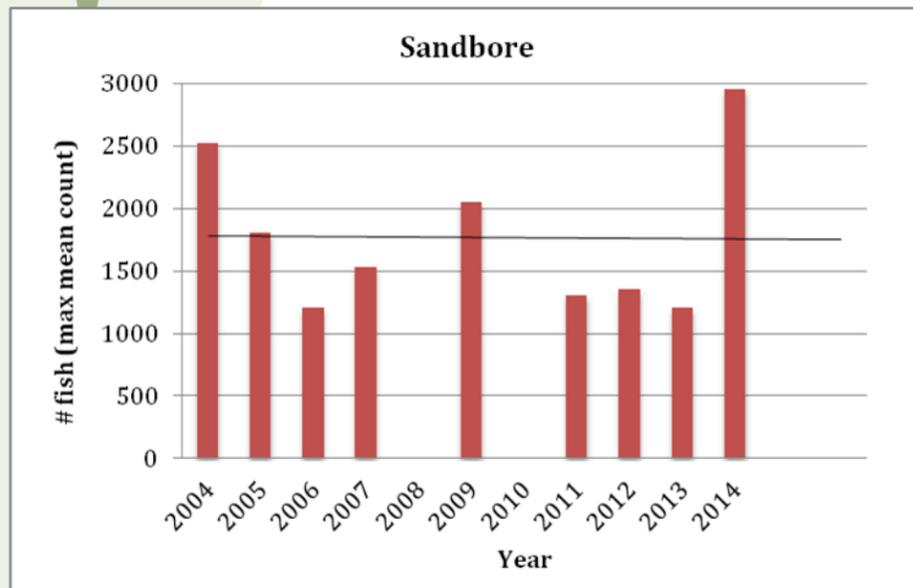


Figure 1 Changes in fish abundance at the Sandbore SPAG site, Lighthouse Reef from 2004-2014

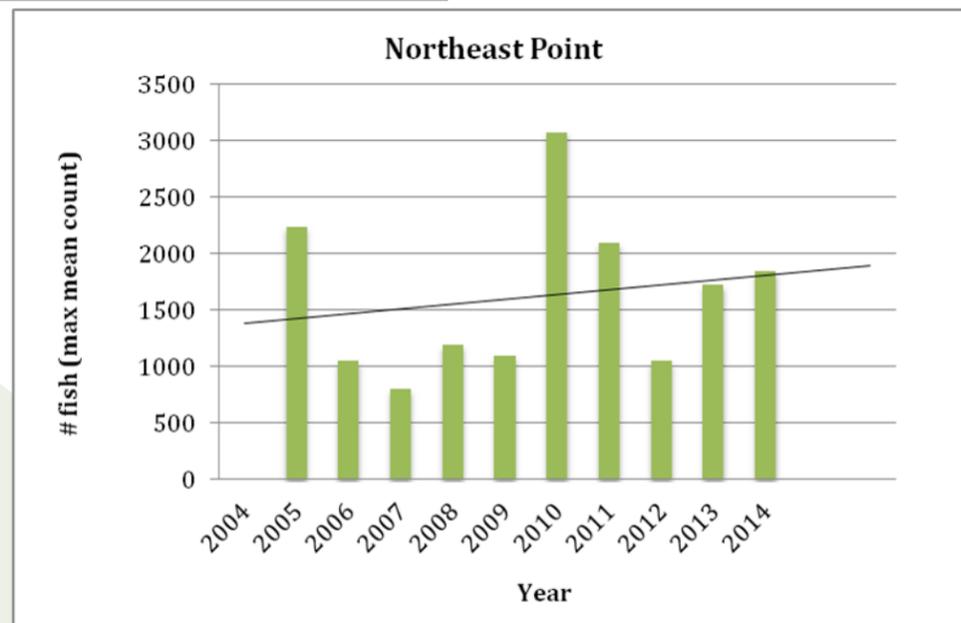


Figure 2 Changes in fish abundance at the Northeast Point SPAG site, Glovers Reef from 2004-2014

TEN YEAR OF MANAGING NASSAU SPAGS: WHERE WE ARE? CONT'

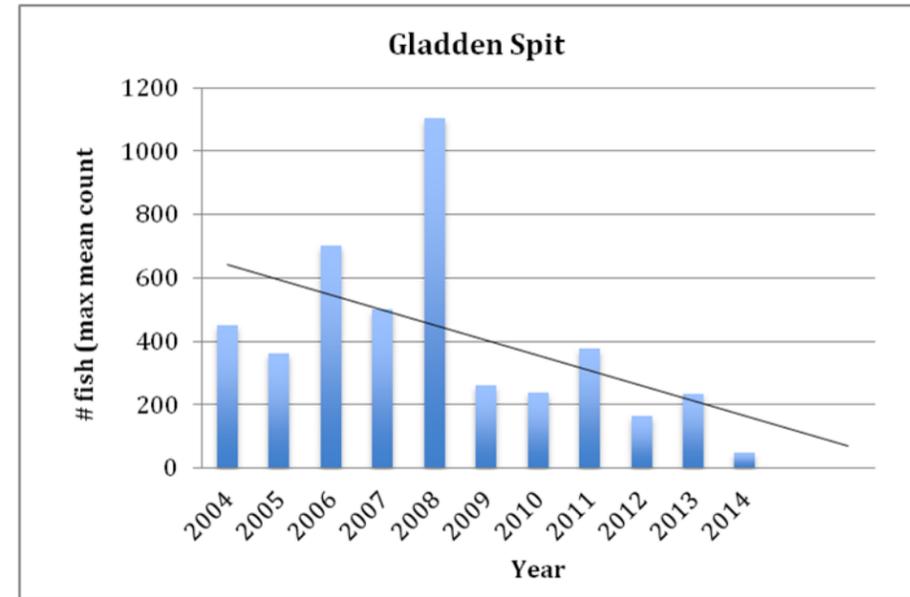


Figure 3 Changes in fish abundance at the Gladden Spit SPAG site from 2004-2014

At Gladden Spit, a site open to traditional fishing of snappers, Nassau grouper numbers fluctuated and show an overall declining trend (Figure 3). Since 2009 numbers have dwindled from over 1000 (in 2008) to less than 400, with only 29 Nassau counted in 2014.

The data suggest that these SPAG sites are most effective when they are fully protected, no-take areas with regular enforcement patrols, especially during the Nassau grouper season. The data from other sites, such as Emily and Dog Flea Caye in particular, show that numbers declined with complete disappearance of the aggregations at both sites in 2014 (Figure 4). This may be due largely to informal reports of illegal fishing at these sites occurring due to inadequate enforcement.

However, it is important to note that even at well-managed SPAG sites Nassau grouper numbers are still nowhere near historical averages when aggregations were at their peak. In moving forward, the various co-managers, the Fisheries Department and the SPAG Working Group need to ensure that these SPAG sites are managed as no-take areas (no fishing of any kind), patrols are strengthened, particularly during the closed seasons, and illegal harvesting of Nassau groupers does not occur.

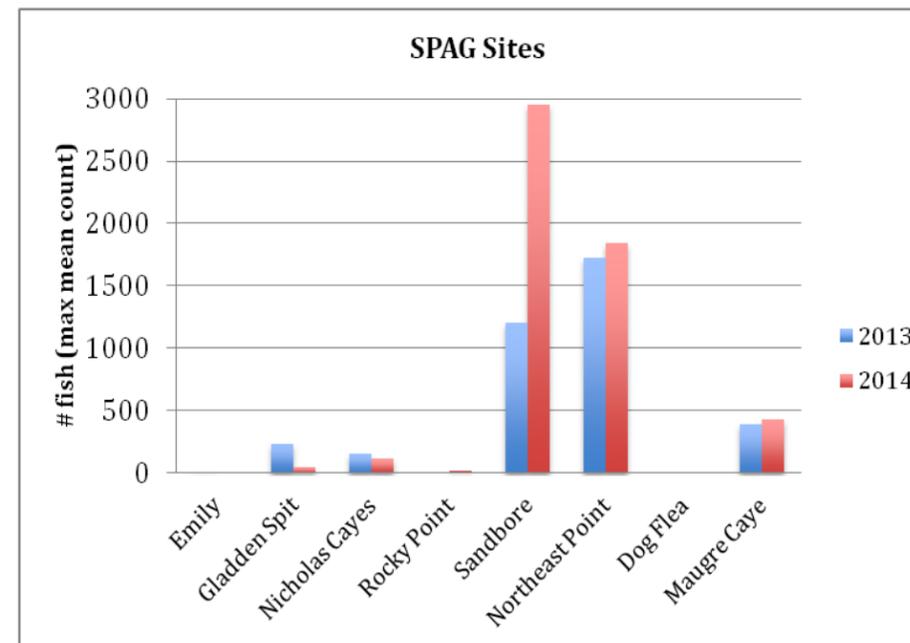


Figure 4 Fish abundance at eight SPAG sites between 2013-14

Fig 5-6 Top right: only a part of the large school of aggregating Nassau. Bottom right: Nurse shark swimming through the school of Nassau. Bottom left: BAS surveyer taking notes on the aggregating Nassau. All pictures are at Sandbore SPAG site, pictures by Celso Sho.

