

# Notes and Acknowledgments



**Fig 5 Aggregating Nassau**

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

Electronic copies of this eleventh issue of the SPAGS newsletter are also available at [www.spagbelize.org](http://www.spagbelize.org)

This issue was designed and put together 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:

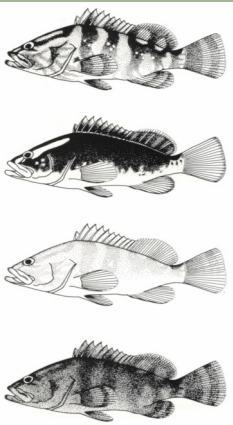
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# The Belize Spawning Aggregation Working Group Newsletter

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

## SPAGS WORKING GROUP ANNUAL HIGHLIGHTS

By: Dr. Leandra Cho-Ricketts—UB-Environmental Re-

Table 1. Maximum counts *E. striatus* from 2003-2013 across SPAG sites in Belize's waters (<sup>1</sup> Only one dive; <sup>2</sup> Site only monitored in February; <sup>3</sup> Site only monitored in January; <sup>4</sup> Probably missed peak spawning due to bad weather; <sup>5</sup> # for Gladden Split revised by SEA in 2011)

Maximum Nassau Grouper Counts 2003-2013											
Site	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Rocky Point</b>	0	200	200	0 <sup>1</sup>	N/A	0	N/A	N/A	0	2	0
<b>Dog Flea Caye, Turneffe</b>	1500	100 <sup>3</sup>	N/A	2 <sup>2</sup>	N/A	N/A	N/A	N/A	4	4	0
<b>Sandbore, Lighthouse</b>	1800	2500	1800	1205 <sup>4</sup>	1495	1250	2050	2000	1300	1350	1203
<b>Caye Glory, BBR</b>	1000	1000	350	7 <sup>5</sup>	69	405	3000	N/A	400	120	10
<b>NE Pt., Glover's</b>	2400	1700	2240	3000	800	1190	1100	3328	1800	1050	1725
<b>Gladden Split MR<sup>5</sup></b>	250	450	360	700	500	1106	260	238	375	164	200
<b>Nicolas Caye, Sapodilla</b>	52	50	80	48	80	100	25	30	45	85	150
<b>Maugre Caye, Turneffe</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	390

In 2012-13, the Belize SPAG Working Group successfully completed its work plan. There were several major achievements in this year based on the annual work plan objectives. Under our Monitoring objective, the Working Group through the support of WCS, SEA and Dr. Sadovy conducted training on the new fish count protocol and a SPAG refresher at Gladden Spit in late October. This training provided the Working Group members with hands-on review of the fish count methodology, which was subsequently used in the 2012-13 SPAG season. The training session also touched on tips and techniques for using video in monitoring SPAGS. All 7 sites were monitored during the season running December 2012-March 2013.

Under Meetings, regular quarterly meetings of the SPAG Working Group were held to work on implementation of the work plan. Elections for Chair and Secretary were held with both UB and WCS being elected for another 2-year term. The Working Group also reviewed membership and reached out to the fishing representatives to have active engagement by the fishing sector. Hopkins Fishermen Association and Belize Federation of Fishers participated as active members.

For the Database/Data Analysis objective, the SPAG database managed by ERI was updated to reflect changes in the methodology and interactive reports were created to show results by season. The ERI also conducted data quality control to correct errors and inconsistencies in the data and campaigned to have members enter backlogged data. All the data from previous years have been entered but only 3 sites have data entered for 2012-13.

Education and Public Awareness activities completed this year included uploading of news items and articles to the website and the Facebook page and the production of the annual newsletter. The newsletter was distributed to members and the fishing community and a decision was taken to produce an electronic newsletter through BAS. The Nassau grouper TV spots were also aired on local TV and cable during the December-March SPAG season.

Finally under our last objective of Enforcement Monitoring, the Fisheries Department regularly collaborated with the Coast Guard to conduct enforcement monitoring at the

## Sandbore Caye Spawning Site at Lighthouse Reef Atoll

By: Eli Romero - Marine Biologist/GIS Tech, BAS

Consistency in data collection has become crucial in all marine-related monitoring across Belize and the region and Belize Audubon Society has maintained a consistent yearly monitoring and patrol of its spawning aggregation sites since 2003. All spawning aggregation sites in Belize face similar challenges from fishermen, but current legislation has made it easier, from a legal stand point, to enforce the protection of key species during their spawning months.

The Nassau Grouper, *Epinephelus striatus* and its endangered status was one of the main factors that led to the creation of Spawning Aggregation reserves, as part of the network of marine reserves in Belize. The Sandbore spawning aggregation site, in the northeast tip of Lighthouse Reef Atoll, has consistently hosted a healthy population of *E. striatus* for many years. Local fishermen have historically fished this site during the spawning season, but thanks to changes in legislation the *E. striatus* is fully protected during the time of the year when it reproduces. BAS conducts yearly monitoring at this SPAG site during the months of



Fig 1 Spawning sites at LHRRA, Sandbore and South Point

January and February, sometimes as early as December and as late as March, depending on available funds. Apart from the monitoring, BAS also maintains an established presence at and around this SPAG site throughout the year as part of its marine enforcement program. Sandbore Caye and the SPAG site are important for many marine species, apart from *E. striatus*, including sea turtles and the commercially important *Strombus gigas* (Queen Conch) and *Panulirus argus* (Caribbean Spiny Lobster). There have always been pressures on the ecosystem, both natural and anthropogenic, and with plans for massive development on Sandbore Caye and Northern Two Caye there will surely be added negative pressure on all species.

There needs to be transparent communication and action from all parties involved in ensuring that adverse effects from development are kept to a minimum.

The Sandbore SPAG site is known to host several different fin-fish species during their spawning months, and it would be a pity to lose such a hotspot of biodiversity.

Table 2 Monitoring expense at Sandbore for a season

Jan- Feb Monitoring		
Item	Activity	Cost
Dive Master	Supervision	\$1550
Boat captain	Supervision	\$1800
Fuel	Fuel for SPAGS	\$4451
Food	Provision for team	\$672.81
Equipment	Gears	\$2220
Boat	Boat rental	\$3800
Staff Wages	Day salary for staff	\$1660
		<b>\$16 153.81</b>

Table 3. Patrol related expense at Sandbore for a year

Patrols per Annum		
Item	Activity	Cost
Fuel	Fuel for patrol	\$6 739
Food	Food for patrol team	\$3 600
Staff wage	Day salary for staff	\$6 390
Boat		\$4 000
		<b>\$20 729</b>

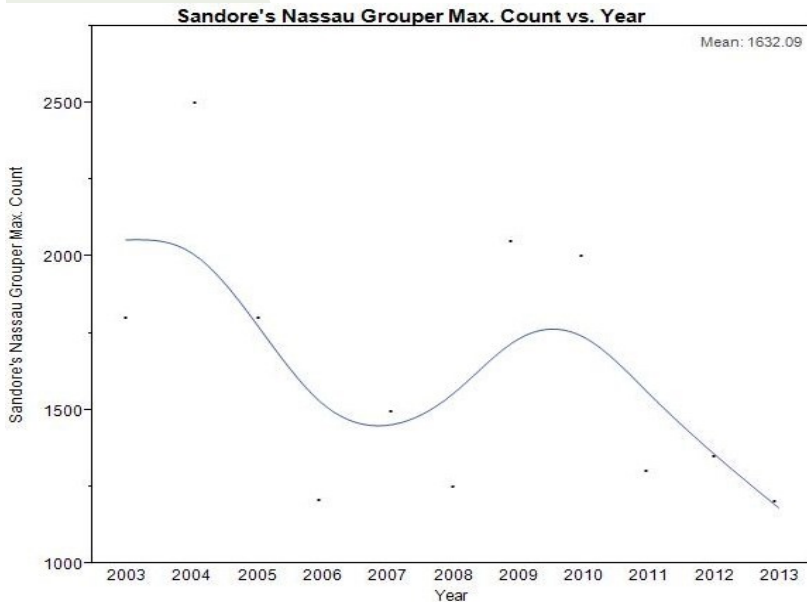


Fig 2. Nassau Grouper counts at Sandbore from 2003-2013

SPAGS Working Group, February, 2014, Issue 11

## UB-ERI Locate SPAG Site at Mauger Caye, Turneffe Atoll

By Celso Cawich- Marine Biologist, UB Environmental Research Institute

Turneffe Atoll spans 52 km long by 19 km wide and hosts 5 reef fish spawning aggregation (SPAG) sites, three of which are protected as SPAG sites (Statutory instrument 162 of 2003). It is the location of Mauger Caye one of seven historic Nassau grouper spawning aggregation sites (Heyman and Requena 2002). There are no historic counts in the literature for Mauger Caye nor any recent data on Nassau groupers since monitoring of SPAG sites began in 2003. The largest count of Nassau groupers at Turneffe Atoll is from Dog Caye Flea in 2001 with 2,000 reported (Paz and Grimshaw, 2001). By 2004 only 100 Nassau groupers were reported and in 2006 only 2, after which monitoring was discontinued at Dog Flea Caye.

In 2010 the Environmental Research Institute (ERI) of the University of Belize (UB) established a marine monitoring program at Turneffe Atoll and a student volunteer program, in which students assist in field data collection. Between 2010 and 2013, UB-ERI has trained and involved 10 students in SCUBA and SPAGS monitoring. These students have played a crucial role in the massive efforts undertaken by marine personnel from the government, NGOs and UB-ERI to monitor the SPAGS sites across Belize.

One of the biggest accomplishments of the UB SPAG team was the rediscovery of the Mauger Caye Nassau grouper aggregation site in January 2013. A site with protected area status but with no historic visual survey records, the Mauger Caye site was believed to have been overfished and depleted. This all changed in January 30, 2013 when UB-ERI personnel and students discovered some 390 Nassau groupers aggregating at this location. This was the first year that the Mauger Caye site was surveyed, as it was open to fishing up until 2011. Mauger Caye now represents 1 of only 5 actively remaining Nassau grouper aggregations in Belize based on the 2013 monitoring data.

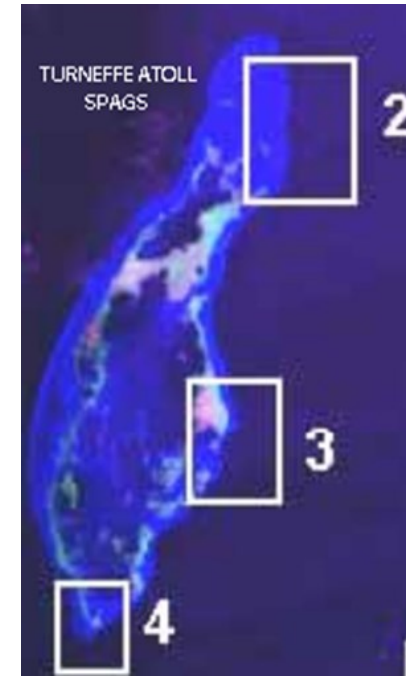


Fig 3 SPAG sites at Turneffe Atoll



Fig 4 SPAG team for Turneffe Atoll