



## Abstract of scientific paper by WCS' Virginia Burns and Alexander Tewfik on the SPAG site at Glover's Reef Atoll for Nassau Grouper

### Brief history of management and conservation of Nassau grouper and their spawning aggregations in Belize: A Collaborative Approach

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#### Abstract

The Belize Spawning Aggregation Working Group has been in existence since 2001. For the past fourteen years, this group of conservation NGOs, fisher organizations, academic institutions and the Belize Fisheries Department have collaborated and made significant progress in the protection and management of Belize's reef fish spawning aggregation sites. This includes advocating for protecting the endangered Nassau grouper (*Epinephelus striatus*) through a network of thirteen fully protected spawning sites, a four month closed season (Dec. 1<sup>st</sup> – March 31<sup>st</sup>) and implementation of minimum, 20 inches (50.8 cm), and maximum, 30 inches (76.2 cm), harvestable size limits. Of the thirteen fully protected spawning aggregations sites for Nassau grouper eight have had some level of direct population monitoring for Nassau Grouper conducted over the last 15 years. The size of spawning populations at these sites have varied with the maintenance and/or reemergence of spawning aggregations along Belize's barrier reef (e.g. Caye Glory) lending evidence to the movement of Nassau grouper from great distances. In contrast, the existence of barriers to movement (i.e. deep water) and strong spawning site fidelity potentially make offshore (i.e. atolls) sites more vulnerable to the effects of overfishing than those on the main barrier reef. Northeast Point, Glover's Reef Atoll, is one of the last viable spawning aggregation sites for Nassau Grouper in Belize. This site has seen considerable variation in the spawning population, with highs of more than 3000 in 2001, 2005, and 2010, but a general decline over time to a low of 450 individuals in 2015. This decline coincides with evidence of illegal fishing at the spawning aggregation site even with the existence of special patrols starting in 2008. In spite of such setbacks, the efforts and successes of the Belize Spawning Aggregation Working Group highlight the need for and impact of a national coalition in promoting sustainable resource use and conservation.

## Notes and Acknowledgments

The SPAGS Working Group finalized its new logo which was designed by Dirk Francisco from Belize Audubon Society and Janet Gibson, retired from the Wildlife Conservation 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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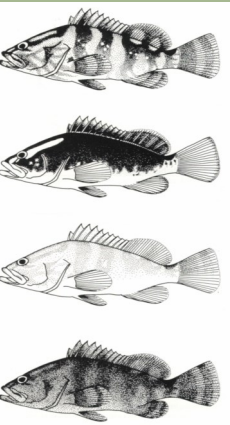


## The Belize Spawning Aggregation Working Group Newsletter

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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



### Special Tribute to Janet Gibson

By: Dr. Leandra Cho-Ricketts—UB-Environmental Research Institute

### Dedicated to the Conservation of Spawning Aggregations: Mrs. Janet Gibson



Mrs. Janet Gibson, recently retired from the Wildlife Conservation Society and the Belize SPAG Working Group, has left an indelible mark from her years of dedication and leadership in the conservation of Nassau Groupers in Belize. Mrs. Gibson was one of the founding members of the Belize SPAG Working Group and was one of the key persons that advocated for protection of these SPAG sites. She has served as the Secretary to the Working Group since its establishment in 2003 up until December 2015. During her term as Secretary, meetings were always well organized and the participation of fishers was strengthened through her efforts in providing travel assistance, which ensured that the fishers were present at meetings. She was instrumental during her tenure at WCS in building public awareness of the SPAG sites and the Nassau Grouper closed season through the airing of TV ads and training of managers and fishers in monitoring techniques. She also worked diligently to engage the Fisheries Department in more robust and comprehensive patrols of the SPAG sites during the spawning season and helped to sponsor special night patrols.

The Belize SPAG Working Group wholeheartedly thanks Mrs. Gibson for all her years of service and commitment to Nassau Grouper conservation. The Working Group will sorely miss her. Without a doubt she has left some very big shoes to fill!

Happy Retirement Mrs. Gibson!





## SPAGS training at HMC

The SPAGS training was conducted at HMC at the newly rediscovered snapper spawning site. This training was organized by the Spawning Aggregation Working Group and BAS was tasked with the logistics since we were hosting at HMC. The training took place from November 28-30 and it included participants from the network members. BAS was also responsible to cost the expenses and distribute between trainees, which was based on 10 participants, bringing the cost to \$1725.00 and \$172.5 per person. Since BAS was very much interested in establishing the site and thus hosting the training, BAS agreed to cover the charter boat from Belize to HMC and back. This was at a cost of \$2600.00 for the 3 days. The money collected from the trainees was to cover fuel, food, cooks and boat captain. The trainers were Reylando Castro and Henry Brown, who had received the training some years ago from Dr Sadovy.

The training involved 4 dives and the focus was on estimation of the number of fish, average size and identifying the species using the site. The following are the average maximum counts observed during the training:



**Fig 1 Multi-species spawning site within HMC Natural Monu-**

Horse-eye Jacks	1250
Bermudan Chubs	250
White Margate	500
Smooth Trunkfish	45
Bar Jacks	100
Black Groupers	27
Permit	2
Dog Snapper	900
Cubera Snapper	8
Nassau Grouper	3
Rainbow Runners	80
Midnight Parrotfish	3
Blue Parrotfish	24
Nurse Shark	1
Reef Shark	2
Black-tip Shark	1

In all the training was a success and the trainees gain a lot of experience and knowledge in fish sizing and estimation.



**Fig 2. Pictures during the SPAGS training at HMC that included several biologist from the network's members.**

The economic importance of Belize's marine ecosystem services may be evaluated in the significant contribution of the fisheries and marine tourism sectors to the nation's GDP. Fisheries' value as a livelihood and cultural tradition to many Belizeans is invaluable, hence the need to safeguard this fragile sector. Realizing this, the Southern Environmental Association (SEA) established its Special Enforcement Unit (SEU) in late 2007 with the main goal of maintaining an effective presence within the Southern Barrier Reef Complex (SBRC).

The SEU within SEA's Protected Areas Program, focuses on ensuring the maintenance of healthy, functional ecosystems, through surveillance and enforcement, direct biodiversity management interventions and visitor management within Laughing Bird Caye National Park (LBCNP), and Gladden Spit and Silk Cayes Marine Reserve (GSSCMR). All SEA Rangers are Fisheries Officers and four of seven are Special Constables, with significant training in their field of work.

Enforcement forms one aspect of Protected Areas Management. In effectively managing two protected areas, SEA is also involved in Science and Research and Education and Awareness. All three program areas work collaboratively to inform strategic management plans and stakeholders while upholding the law. It is important to note, however, that to achieve any level of success, it is absolutely essential for SEA to have the active participation and support of the Fisheries and Forestry Department, in co-managing Gladden Spit and Silk Caye Marine Reserve (GSSCMR) and Laughing Bird Caye National Park (LBCNP) respectively. The cooperation and commitment of the Belize Coast Guard and the Police Formations in Independence and Placencia continues to be outstanding and without it, SEA would not be able to conduct routine patrols.

## Spawning Site Description

The spawning site at Gladden Spit and Silk Cayes Marine Reserve (GSSCMR) is also a Whale Shark Zone due to the transient whale sharks of the Mesoamerican Barrier Reef gathering at Gladden Spit to feed on the spawn during the months of March to June annually. Spawning species include Mutton, Dog and Cubera Snappers. The primary spawn of interest for the whale shark are those of Cubera snappers, which produce relatively large eggs. Hence, the congregation of snappers and whale sharks result in a combination of events that is of biological significance and touristic value. This was recognized by local tour operators who started to capitalize on the whale shark tourism, SEA recognized the need for effective management of the site. SEA manages whale shark visitation at the site and collaborates with a Whale Shark Working Group to set guidelines to ensure a safe and ecologically sound experience for not only the visitors, but also the whale sharks.

## Surveillance and Enforcement

For the year 2015, a total of \$160,390.00 was invested by SEA on enforcement patrols, the majority of which was spent in GSSCMR, including the spawning site. 92 patrols were conducted with a total of 6,118.5 gallons of fuel used on "Enforcement" vessel, the boat used primarily for patrols. 6 special night patrols were conducted during the spawning time from March to June, and a total of 5 warnings, 8 summonses, 8 charges were issued, with 2 arrests made. Later in the year, a Honduran vessel was confiscated during a night patrol near the SPAG site. 2 Honduran fishermen aboard the boat were arrested and were charged with fishing and immigration offenses. They were found guilty and eventually paid the fine.

Having seen enforcement successes and field staff that are passionate stewards of the marine resources, SEA is motivated to continue improving compliance while educating stakeholders. Surveillance and patrols are extremely expensive and dangerous activities. Given financial constraints, SEA has seen the need to become more strategic and effective by collaborating with the Fisheries Department, employing investigative techniques and investing in a drone (expected to commence use later this year). SEA expects further successes in the coming years.

