Is there Hope for Nassau grouper?

"Island of hope for the threatened Nassau grouper" by Yvonne Sadovy de Mitcheson

João P. Barreiros

Universidade dos Açores, Faculdade de Ciências Agrárias e do Ambiente and ce3c – Centre for Ecology, Evolution and Environmental Changes – Azorean Biodiversity Group. 9700-402 Angra do Heroísmo, Portugal
e-mail: joao.ps.barreiros@uac.pt

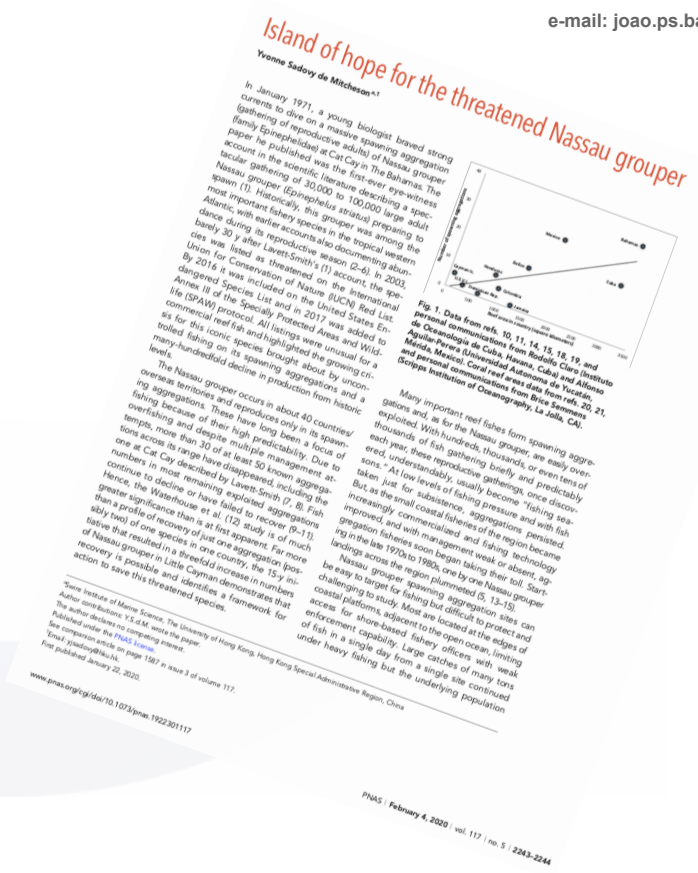
In February 2020, Yvonne Sadovy de Mitcheson published a commentary in the journal PNAS (see reference below), which sheds some "light of hope" for the Nassau Grouper, *Epinephelus striatus* (Bloch, 1792) stemming from successful work in the Cayman Islands and recently published by Waterhouse et al. (2020) .

In her commentary, Yvonne briefly describes how, once abundant and healthy populations of this grouper in the 1970's and 1980's in The Bahamas, were subsequently overfished for decades by artisanal and traditional fisheries. Such heavy exploitation occurred as a result of fisheries adopting better technology, growing commercialization and an increase in the grouper's market value alongside weak management and lack of adequate monitoring of the fishery to understand trends in catches. This fishery situation led to the loss of an estimated 30 to 50 known spawning aggregation sites in the Bahamas, including some that were once famous at the time (Erisman et al., 2013). Without aggregation for spawning, the species does not reproduce and so the fish numbers declined leading to smaller and smaller catches.

However, in the Cayman Islands Waterhouse et al. (2020) revealed how efficient MPA's with adequate enforcement of protective measures can boost grouper numbers, allowing population recovery at protected spawning aggregation sites. This scenario in the Cayman Islands could readily easily be followed and applied in other geographic locations and countries where this grouper was once plentiful – from Belize and Mexico eastwards to the Dominican Republic and Puerto Rico, and beyond. In these countries, some fishery restrictions and fishing ban periods are in place, along with other measures, such as minimum sizes, which should help to improve grouper populations. However, these measures are typically poorly enforced with little or ineffective surveillance and monitoring.

Sadovy provides a powerful statement about spawning aggregations of the Nassau grouper in her commentary when referring to the potential for Nassau grouper recovery: "These fragile life-history events are saveable, with the Little Cayman spawning aggregation now the largest one currently known for this species, and merit the attention and commitment needed to preserve them and to ensure the future of the Nassau grouper".

Yes, there is definitely still hope for the Nassau grouper.


Island of hope for the threatened Nassau grouper

Yvonne Sadovy de Mitcheson[a,1]

In January 1971, a young biologist braved strong currents to dive on a massive spawning aggregation (gathering of reproductive adults) of Nassau grouper (family Epinephelidae) at Cat Cay in The Bahamas. The paper he published was the first-ever eye-witness account in the scientific literature describing a spectacular gathering of 30,000 to 100,000 large adult Nassau grouper (*Epinephelus striatus*) preparing to spawn (1). Historically, this grouper was among the most important fishery species in the tropical western Atlantic, with earlier accounts also documenting abundance during its reproductive season (2–6). In 2003, barely 30 y after Lavett-Smith's (1) account, the species was listed as threatened on the International Union for Conservation of Nature (IUCN) Red List. By 2016 it was included on the United States Endangered Species List and in 2017 was added to Annex III of the Specially Protected Areas and Wildlife (SPAW) protocol. All listings were unusual for a commercial reef fish and highlighted the growing crisis for this iconic species brought about by unregulated fishing on its spawning aggregations and a many-hundredfold decline in production from historic levels.

The Nassau grouper occurs in about 40 countries/overseas territories and reproduces only in its spawning aggregations. These have long been a focus of fishing because of their high predictability. Due to overfishing and despite multiple management attempts, more than 30 of at least 50 known aggregations across its range have disappeared, including the one at Cat Cay described by Lavett-Smith (7, 8). Fish numbers in most remaining exploited aggregations continue to decline or have failed to recover (9–11). Hence, the Waterhouse et al. (12) study is of much greater significance than is at first apparent. Far more than a profile of recovery of just one aggregation (possibly two) of one species in one country, the 15-y initiative that resulted in a threefold increase in numbers of Nassau grouper in Little Cayman demonstrates that recovery is possible and identifies a framework for action to save this threatened species.

[a]Rosenstiel School of Marine Science, The University of Hong Kong, Hong Kong Special Administrative Region, China

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[1]Email: ysadovy@hku.hk.

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Fig. 1. Data from refs. 10, 11, 14, 15, 18, 19, and personal communications from Rodolfo Claro (Instituto de Oceanología de Cuba, Havana, Cuba) and Alfonso Aguilar-Perera (Universidad Autónoma de Yucatán, Mérida, Mexico). Coral reef areas data from refs. 20, 21, and personal communications from Brice Semmens (Scripps Institution of Oceanography, La Jolla, CA).

Many important reef fishes form spawning aggregations and, as for the Nassau grouper, are easily overexploited. With hundreds, thousands, or even tens of thousands of fish gathering briefly and predictably each year, these reproductive gatherings, once discovered, understandably usually become vulnerable to fishing pressure and with fish sons.[1] At low levels of fishing pressure and with fish taken just for subsistence, aggregations persisted. But, as the small coastal fisheries of that region became increasingly commercialized and fishing technology improved, and with management weak or absent, aggregation fisheries soon began taking their toll. Starting in the late 1970s to 1980s, one by one Nassau grouper landings across the region plummeted (5, 13–15). Nassau grouper aggregations can be easy to target for fishing but difficult to protect and challenging to study. Most are located at the edges of coastal platforms, adjacent to the open ocean, limiting access for shore-based fishery officers with weak enforcement capability. Large catches of many tons of fish in a single day from a single site continued under heavy fishing but the underlying population

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