

## South Atlantic Nassau Grouper Landings and Discards

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### Introduction

On June 29, 2016, the National Marine Fisheries Service (NMFS) published a final rule in the Federal Register listing Nassau grouper as threatened under the Endangered Species Act; the listing will be effective July 29, 2016. Consequently, the ongoing consultation on the continued authorization of Snapper-Grouper fishing must now consider potential effects on Nassau grouper as well. Although Snapper-Grouper regulations prohibit retention of the species, they can still be incidentally caught during fishing for other snapper-grouper species off Florida, so may be adversely affected.

NMFS Southeast Regional Office Protected Resources Division has requested information on the number of regulatory discards of Nassau grouper in federal snapper-grouper fisheries (commercial by gear and recreational by sector to the extent available) as well as the best available information (e.g. proxy) on which to estimate post-release mortality. Estimates of future incidental catch levels of Nassau grouper and associated mortality levels were also requested.

### Methods

#### *Data Sources*

Recreational landings for headboat, MRIP private angler, and MRIP charter mode were summarized from the Southeast Fisheries Science Center (SEFSC)'s MRIP-based Recreational Annual Catch Limit (ACL) Database (accessed March 2016). Recreational discards for MRIP private angler and charter mode were also summarized from the Recreational Annual Catch Limit (ACL) Database (accessed March 2016). Headboat discards were summarized based on captain reported releases from the Southeast Region Headboat Survey (SRHS) logbook program (accessed 2016).

Commercial landings were summarized from the SEFSC Commercial ACL Database (accessed Dec 2015). Commercial discards per unit effort by were computed for Nassau grouper by year and gear from the SEFSC's Supplemental Discard Logbook Program (accessed April 2016). The Supplemental Discard Logbook Program began in 2001 and has provided approximately 20% random sampling coverage of the South Atlantic Snapper-Grouper fishery since 2002. Discard per unit effort estimates were expanded by the total effort in the Snapper-Grouper fishery south of 28° N, based on information from the SEFSC's Coastal Fisheries Logbook Program (April 2016). The range for this analysis was truncated near Cape Canaveral to reflect the distribution of Nassau grouper. Uncertainty was expressed as 95% confidence intervals. Snapper-Grouper trips were defined as any commercial trip landing at least one pound of a species in the [Snapper-Grouper Fishery Management Unit](#). Effort was defined as hook-hours for hook-and-line gears (includes handline and electric/bandit rig), yard-hours for gillnet, number of traps for trap

gear, total hooks fished on a trip for bouy gear and longline gear, and number of divers for spear and powerhead gear.

### *Release Mortality*

Estimates of Nassau grouper (*Epinephelus striatus*) release mortality are probably best approximated in the SATL region by estimates for Red grouper (*Epinephelus morio*), which is a very similar species with regards to appearance, behavior, and phylogeny. Red grouper was last assessed in the SATL region by [SEDAR-19](#) (2010). The following information summarizes SEDAR-19 release mortality estimates for red grouper:

- The Life History Working Group reviewed the scientific studies on release mortality available for red grouper. Values ranged from 8 to 70% depending on the depth of capture and if post-release mortality were included.
- The Commercial workgroup recommended using 20% as the point estimate release mortality for red grouper with a sensitivity range of 10-30%.
- The Recreational workgroup recommended a discard mortality of 20%, with a sensitivity range of 10-30%.
- The Assessment Workshop decided to support the point estimates and range of values recommended by the Data Workshop: 20% (range of 10-30%).
- The Review Panel was concerned with the lack of empirical data to support the discard mortality estimate of 20%. Sensitivity runs were performed that varied this estimate from 10 – 70%. These results support the high impact of this parameter. In the absence of any substantive empirical data the panel did not see a strong basis to change the value from 20%, however, attempts should be made to obtain a more accurate estimate of both immediate and delayed discard mortality.

The more recent [SEDAR-42](#) (2015) Gulf of Mexico red grouper stock assessment produced release mortality rate estimates of 11.6% for the recreational sector, 19% for commercial vertical line gear, and 41.5% pre-IFQ and 43.6% post-IFQ for commercial bottom longline gear.

Given the focus of this analysis on Nassau grouper in SAFMC waters, the similarities in gears interacting with red grouper and Nassau grouper, the relatively shallow distribution of Nassau grouper relative to the locations where bottom longline gear is permitted in the SAFMC's jurisdiction, and the similarities between Gulf and South Atlantic SEDAR release mortality estimates for red grouper, I recommend using SEDAR-19 (2010)'s 20% release mortality rate as a proxy for Nassau grouper while acknowledging that there is substantial uncertainty in this estimate.

### **Results**

Assuming a 20% release mortality rate, recreational removals in federal waters prior to 1993 averaged 1,359 fish/yr for charter, 13,938 fish/yr for private angler, and 196 fish/yr for headboat mode (**Table 1; Figure 1**). Following the prohibition on harvest in 1993, recreational removals have averaged 130 fish/yr

for charter, 417 fish/yr for private angler, and 6 fish/yr for headboat mode (**Table 1; Figure 1**). Assuming a 20% release mortality rate, total recreational removals in the last 10 years have averaged 270 fish/yr.

Commercial landings since 1993 have averaged 36 lb/year, almost 100X lower than the pre-1993 average. Landings have averaged less than 1 pound per year since 1995. Commercial discard estimates for Nassau grouper have averaged 104 fish per year from 1993-2015, and have been very low since 2008, averaging approximately 5 fish per year (**Figure 2**). All estimated commercial discards are from hook-and-line gear (includes bandit, handline, and electric gear). Assuming a 20% release mortality rate, total commercial removals in the last 10 years have averaged 12 fish/yr.

## Discussion

Commercial discard estimates from the Supplemental Discard Logbook are often lower than estimates generated from the Reef Fish Observer Program where comparisons are available - there may be disincentives to accurate reporting of discards that lead to underestimation by captains. Headboat discard estimates are typically considered inaccurate by stock assessments due to the difficulty in estimating discards on a large boat with many anglers. Nassau grouper discard estimates may be more accurate than most simply because it is a somewhat memorable species and probably not encountered all that frequently. Many people, including trained divers, confuse red grouper with Nassau grouper, which may lead to errors in Nassau grouper discard estimates.

The Nassau Grouper ESA risk analysis group's assessment of extinction risk identified the primary sources of concern across the distribution of the species as historical harvest, spawning aggregation overfishing, and limited law enforcement (**Figure 3**). In the SAFMC's jurisdiction, Nassau grouper have been closed to harvest since 1992. No spawning aggregations for this species have been documented in SAFMC waters, and the prohibition on retention is probably a reasonable disincentive for spawning aggregation overfishing. The lack of reported landings in the SAFMC's jurisdiction suggests reasonably effective law enforcement for the species. Given the stability of Nassau grouper management measures, the mean of the last ten years appears to be a reasonable approximation for future removals of Nassau grouper.

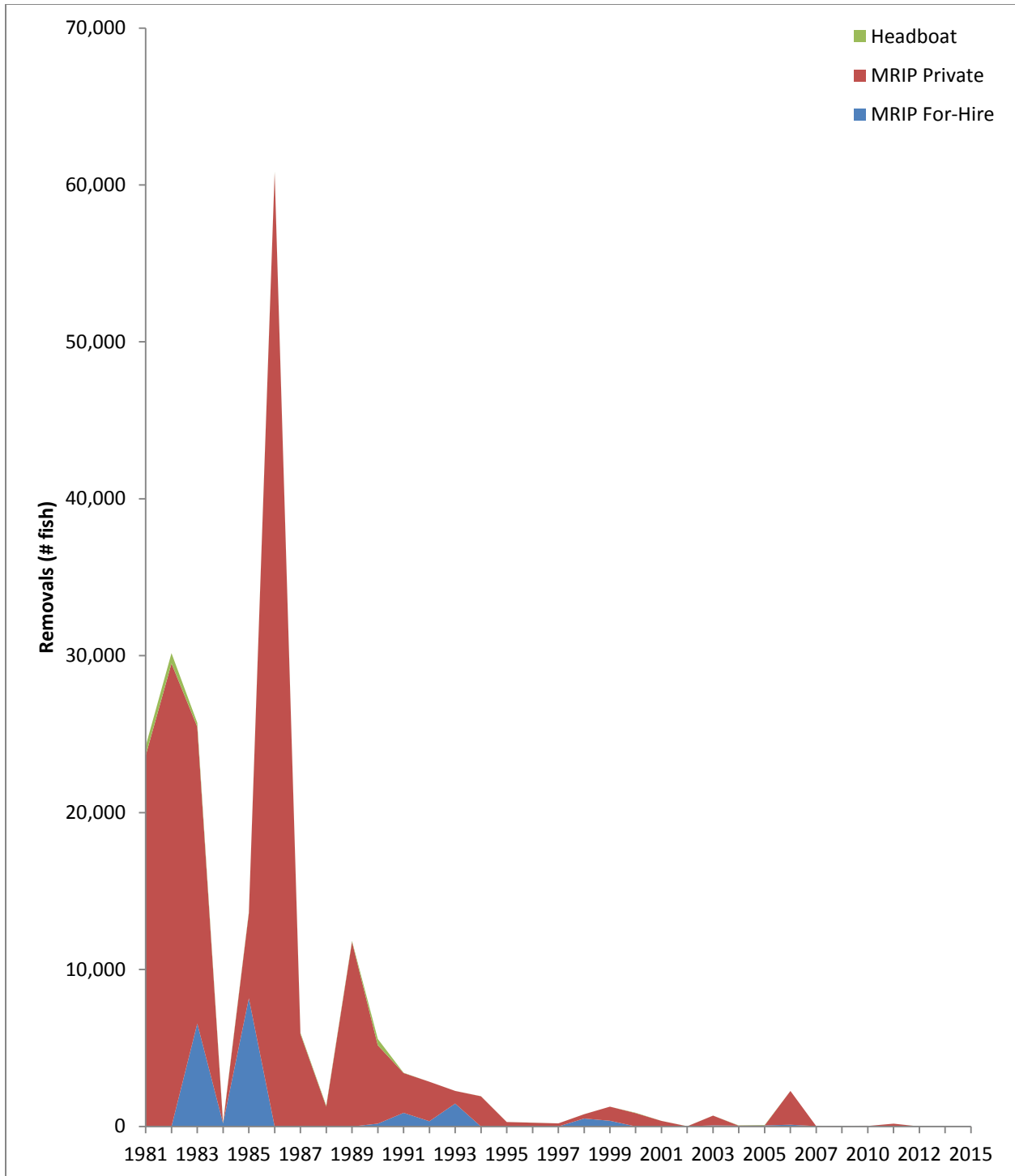
## References

- Southeast Data Assessment and Review (SEDAR) 19. 2010. Stock assessment report: South Atlantic red grouper. SEDAR, North Charleston, SC. Available online: [http://sedarweb.org/docs/sar/Red\\_grouper\\_SAR\\_FINAL.pdf](http://sedarweb.org/docs/sar/Red_grouper_SAR_FINAL.pdf)
- Southeast Data Assessment and Review (SEDAR) 42. 2015. Stock assessment report: Gulf of Mexico red grouper. SEDAR, North Charleston, SC. Available online: [http://sedarweb.org/docs/sar/S42\\_SAR\\_0.pdf](http://sedarweb.org/docs/sar/S42_SAR_0.pdf)

**Table 1.** Average recreational landings, discards, and removals (landings plus dead discards at a 20% estimated release mortality rate), in numbers of fish, in federal waters in the SAFMC jurisdiction, by mode of fishing. Note that harvest was prohibited in 1993.

Period	Landings (# fish)			Discards (# fish)			Removals (# fish)		
	MRIP		SRHS	MRIP		SRHS	MRIP		SRHS
	For-Hire	Private	For-Hire	For-Hire	Private	For-Hire	For-Hire	Private	For-Hire
Pre-1993	1,351	13,678	196	42	1,301	0	1,359	13,938	196
Post-1993	108	78	5	111	1,696	6	130	417	6
2004-2015	0	0	5	155	1,160	7	31	232	7

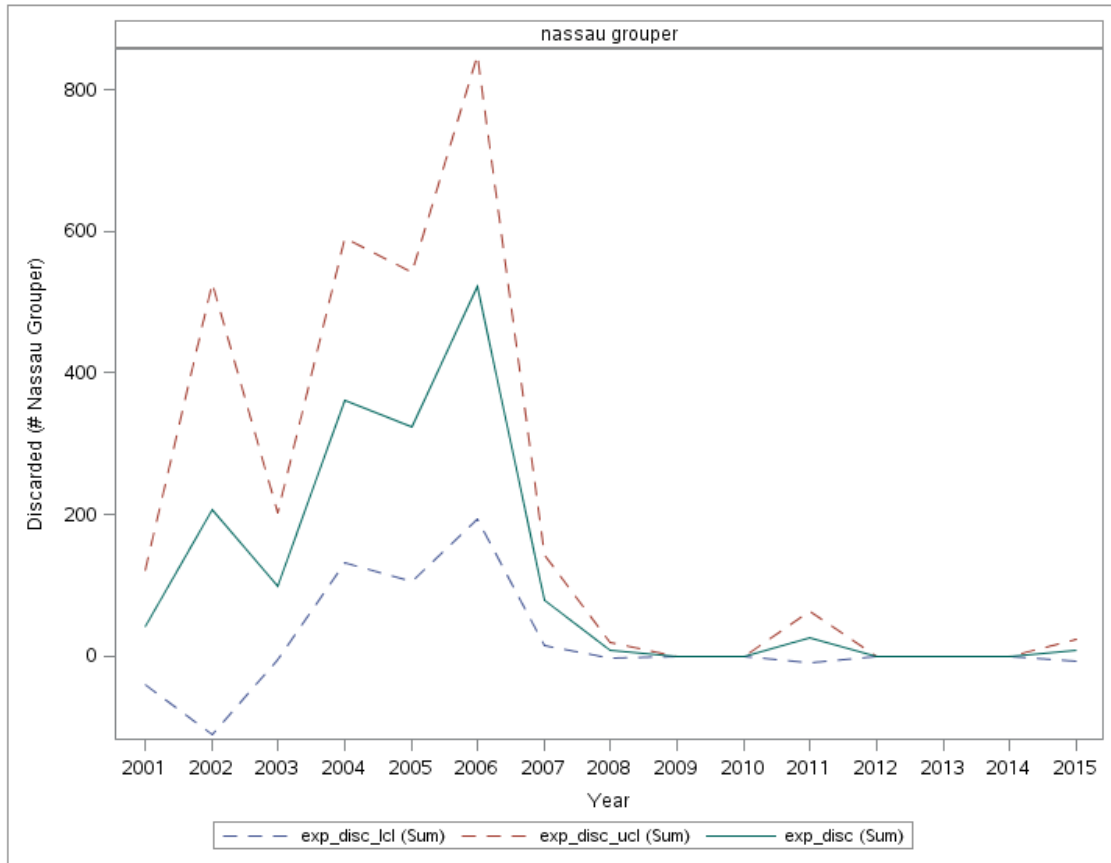
Sources: SEFSC MRIP-based Recreational ACL Data (Mar 2016) and Southeast Region Headboat Survey CRNF file (1973-2015).



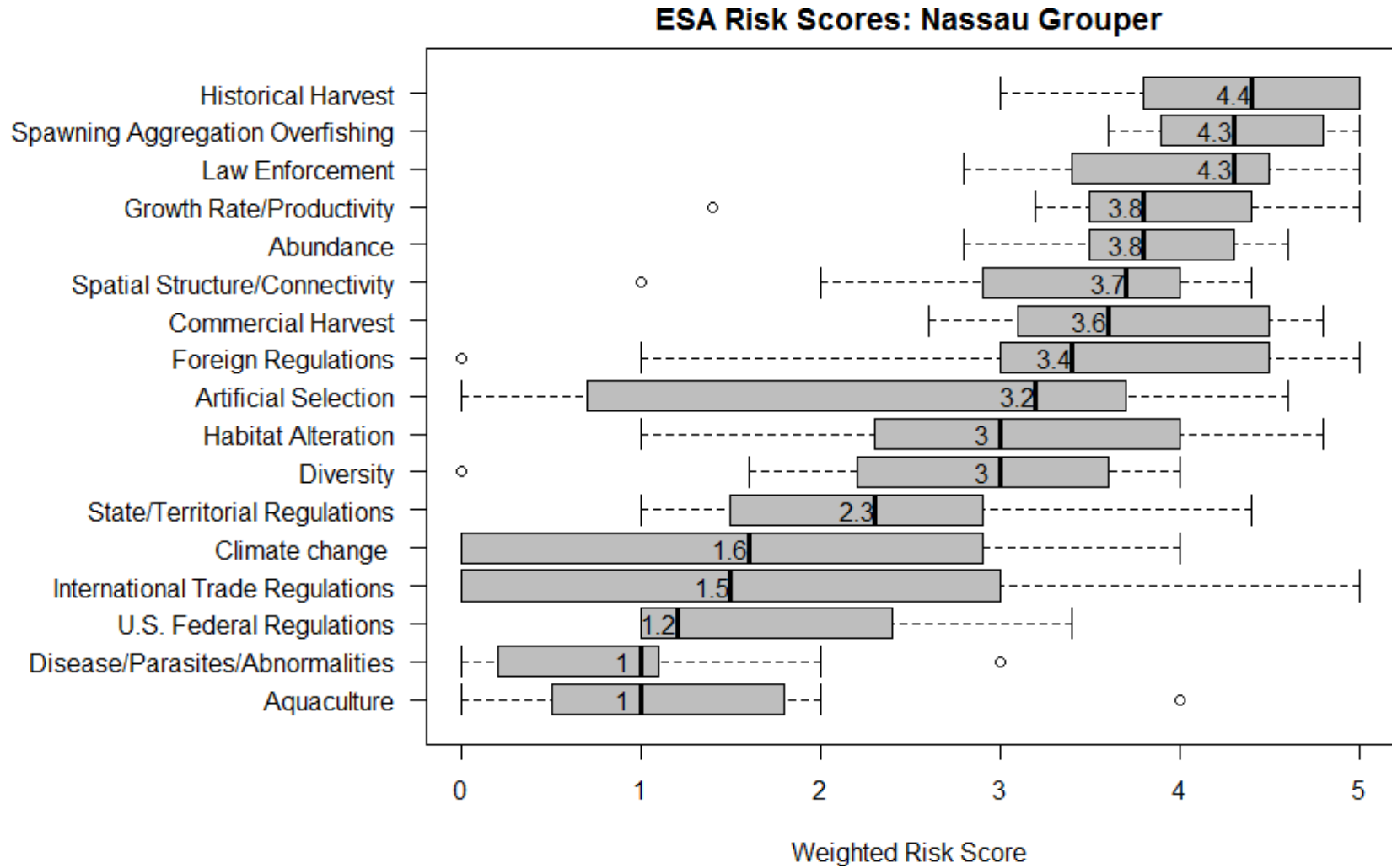
**Figure 1.** Total estimated recreational removals (landings plus dead discards at a 20% estimated release mortality rate), in numbers of fish, in federal waters of the SAFMC jurisdiction, by mode of fishing. Note that harvest was prohibited in 1993. Sources: SEFSC MRIP-based Recreational ACL Data (Mar 2016) and Southeast Region Headboat Survey CRNF file (1973-2015).

Expanded Commercial Discard Estimates

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**Figure 2.** Nassau grouper expanded commercial discard estimates on SAFMC Snapper-Grouper trips (trips landing >1 lb of Snapper-Grouper FMU stocks), with 95% confidence intervals. Sources: SEFSC Commercial Logbook and Supplemental Discard Logbooks (April 2016).



**Figure 3.** Boxplot of aggregated ESA Extinction Risk Analysis group scores for Nassau Grouper. Higher scores correspond to greater perceived risk of extinction.