



 **Goliath Grouper**
Review and Discussion
September 11, 2014
Florida Fish and Wildlife Conservation Commission

Version 1

This presentation is a review and discussion of the biology, research, and management status of goliath grouper. The presentation will also describe a stakeholder survey conducted by the University of Florida on fishers' attitudes and goals for goliath grouper management in Florida.

Authors: Jessica McCawley, Luiz Barbieri, and Kai Lorenzen (University of Florida)
Report date: August 18, 2014

Background

- Goliath grouper harvest is closed in both state and federal waters
 - Managed in state waters by FWC
 - Managed in federal waters by Gulf and South Atlantic Councils
- As population rebuilds the species is encountered more frequently
- Stock status unknown
- Many opinions about how to move forward with management



The goliath grouper fishery was closed in 1990 in both state and federal waters because of severe overexploitation. Harvest is currently closed in both state and federal waters off Florida and throughout the Gulf of Mexico and South Atlantic. Goliath grouper are managed in state waters by the FWC and in federal waters by the Gulf of Mexico Fishery Management Council (GMFMC) and the South Atlantic Fishery Management Council (SAFMC).

As the population rebuilds the species is encountered more frequently by fishermen and divers. Although stock status remains unknown, different surveys indicate that substantial stock recovery has occurred since the fishery was closed. However, the extent to which the population has recovered is unclear.

There are many opinions from various types of stakeholders about how to proceed with management of goliath grouper.

Outline

- Brief management history
- Biology
- Range
- Research
- Last stock assessment results
- University of Florida stakeholder survey results
- Current joint Council committee actions
- Next steps



Management History

Prior to 1983: No state or federal regulations

1983: South Atlantic Council - prohibited spearing

1985: Florida - 18 inch min length

1986: Florida - Included in grouper bag limit

1989: Gulf Council - 50 inch min length

1990: Gulf Council, South Atlantic Council, and Florida - prohibited harvest and possession



Prior to 1983 there were no state or federal regulations regarding the commercial or recreational harvest of goliath grouper. In 1983, the SAFMC prohibited the spearing of goliath grouper because harvest using such gear was increasing rapidly. In 1985, to protect juveniles, the State of Florida implemented an 18-inch minimum size limit for the species. In 1986, Florida implemented a 5-fish aggregate recreational grouper bag limit that included goliath grouper. The GMFMC implemented a minimum size limit of 50 inches in Gulf federal waters in 1989 in response to a decline in goliath grouper landings. However in 1990, the GMFMC, SAFMC, and the State of Florida all prohibited the harvest and possession of the species in response to concern that the stock was more severely depleted than previously thought.

Biology

- Their biology and life history make them especially vulnerable to overexploitation (long-lived, late maturity, slow growth)
- Approachable, sedentary; form spawning aggregations at specific, predictable sites
- Dependent on mangrove habitat during early life; sustainability may be impacted by habitat loss
- Susceptible to mass mortality events from red tides and cold kills



The life history of goliath grouper makes the species especially vulnerable to overexploitation. They are long-lived (the oldest age recorded is 37 years but they are presumed to live over 40 yrs), and exhibit late maturity and slow growth. They are sedentary, and gather predictably in large groups to spawn at specific, high relief sites. Indeed, the majority of reported landings for goliath grouper coincided with their spawning season. Aggregations are typically reported from relatively shallow water (<50 m), making goliath grouper aggregations accessible to a larger group of fishers and divers. Increasing coastal development and the resulting loss of mangrove nursery habitat has also been suggested as a bottleneck to the recovery of goliath grouper. In addition, this species is susceptible to large-scale mortality events from red tide or cold weather kills.

The long-term fishery closure in U.S. waters is also representative of the species vulnerability and susceptibility to overfishing. Only one other species, Nassau grouper, has been closed in southeastern U.S. waters for more than 10 years.

Range

- Subtropical and tropical Atlantic Ocean, Caribbean Sea, and Gulf of Mexico
- U.S. waters and south to the coast of Brazil
- Mixing between Gulf and Atlantic stocks is limited but there is evidence of migrations between regions
- Possible single stock throughout Caribbean



Goliath grouper are found in subtropical and tropical waters of the northwest Atlantic. The center of population abundance has historically been along the southwest coast of Florida, but their geographic range spans the subtropical and tropical Atlantic Ocean, Caribbean Sea and Gulf of Mexico all the way down to the southeast coast of Brazil. Mixing between the Gulf and Atlantic stocks is likely limited, but there is evidence that individuals are capable of migrating between regions. It is believed that there is a single stock throughout the Caribbean, but local extirpations and a lack of data within this area impede attempts to assess the species' recovery throughout its range.

Ecosystem Considerations

- Historically, goliath grouper were an important part of Florida's reef ecosystems
- High but patchy abundance is expected in a healthy goliath grouper stock
- Goliath grouper are opportunistic predators that feed mainly on crustaceans and other slow moving prey



Historically, goliath grouper were an important part of Florida's reef ecosystem. A high but patchy abundance is expected in a healthy goliath grouper stock.

A number of stakeholders have expressed concerns regarding the potential impacts of goliath grouper's increased abundance on Florida's reef ecosystems. However, several lines of evidence suggest these concerns are unwarranted. High levels of abundance are expected in a healthy goliath grouper stock, and the fact that this species is a Florida native indicates that reef systems here have evolved to have goliath as natural ecosystem components. The fact that goliath groupers are opportunistic predators that feed mainly on crustaceans and other slow moving prey also support the assessment that they are unlikely to impact the abundance or recovery of snapper and grouper species.

FWC Research

- FWC has been conducting research and monitoring projects to help fill in knowledge gaps on goliath grouper:
 - Monitoring of natural and artificial reef sites
 - Genetic population structure and connectivity
 - Tagging to determine movements and sight fidelity
 - Catch and release mortality



FWC's research is aimed at developing more complete information on the density and size distribution, habitat use, site fidelity, and movement patterns of goliath grouper at natural and artificial reefs along the west-central coast of Florida. Studies have been conducted with the active participation of spearfishers (St. Petersburg Underwater Club) and funded by grants from NOAA-NMFS.

Year-round underwater visual surveys are performed at established sites across a range of depths and habitats to determine how goliath grouper density and size distribution are affected by depth, season and habitat type. Sites are thoroughly surveyed to determine goliath grouper abundance, and size distribution is assessed using underwater video cameras equipped with a laser measuring device. Additionally, fish are fitted with identification tags in order to gather data on site fidelity and movement patterns.

Since November 2007, FWC researchers have performed over 450 Goliath grouper survey trips at 78 different artificial and natural reef habitats over a wide range of depths. Of the 165 fish tagged to date, 27 have been re-sighted (16.4%) with 7 having been re-sighted multiple times. Time at large for tagged fish has ranged from 1 to 204 days (mean = 53 days). Although research is still ongoing, results to date indicate that goliath grouper density is highest over artificial reefs, that goliath grouper are more abundant at greater depth, and that there is high variability in individual movements—i.e., some individuals seem to move a lot while others have been more stationary.

Other Ongoing Research

- Ongoing studies on biology and ecology also being conducted by FSU, UF, and USF
 - Life history, feeding habits, movements and migration, and habitat utilization
 - Non-lethal sampling; some opportunistic sampling of dead fish
- New research on the use of genetic techniques for estimating population size being proposed by UM/NMFS



Additional goliath grouper research is being conducted by researchers at Florida State University (FSU), the University of Florida (UF), and the University of South Florida (USF). These projects, conducted in collaboration with FWC, have been focused on developing information on the life history, feeding habits, movements and migrations, and habitat utilization of juvenile and adult goliath grouper. These studies rely mostly on non-lethal sampling of tissues but are supplemented by opportunistic sampling of dead fish (mostly from cold kills or red tide events) and collect information about age, growth, and reproduction.

Researchers from the University of Miami (UM) and the Southeast Fisheries Science Center (NMFS) are also developing a grant proposal focused on the use of state-of-the-art genetic techniques to estimate goliath grouper population size.

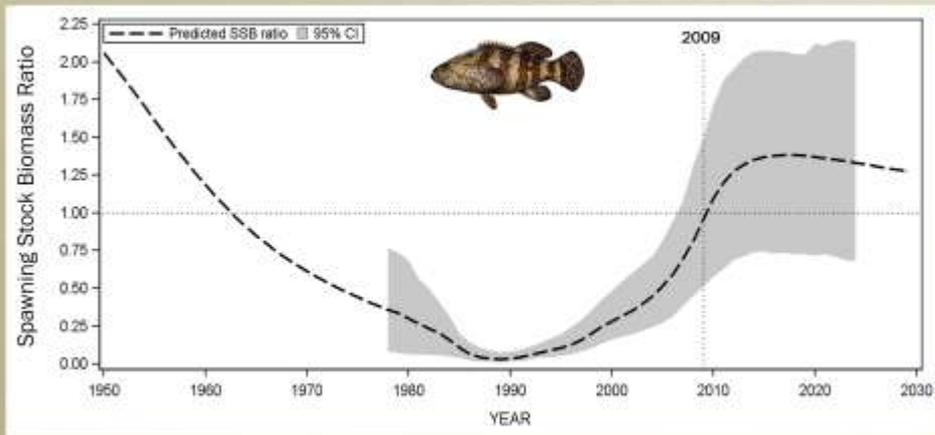
Last Stock Assessment

- Conducted in 2010 by FWC under the federal SEDAR process (public participation & transparency)
 - Data gaps caused the assessment to be considered inconclusive
 - Stock status unknown
- Council management goal of 50% SPR chosen due to vulnerability of the stock to overfishing
- In summary, harvest closure has increased abundance and stock may be at or near recovery



The last stock assessment of goliath grouper was completed in 2010 through the regional/federal process known as SEDAR (Southeast Data Assessment and Review) and included data through 2009. The assessment indicated that the 1990 harvest ban has reduced fishing pressure by about 83% and that the stock might be recovered. However, given the long term lack of landings data and the high degree of uncertainty in results, the assessment was considered inconclusive and the stock status remains unknown.

Estimated Goliath Grouper 2009 Stock Status



This graph shows the spawning stock biomass (SSB) ratio (annual biomass relative to biomass at 50% SPR) of goliath grouper for the period 1950-2025 as estimated by the stock assessment model (values beyond 2009 represent model projections). Results indicate that goliath grouper abundance has greatly increased since the fishery was closed in 1990 and suggest the stock could be already recovered (although results are highly uncertain).

The catch-free model used for the goliath grouper stock assessment assumes the stock was lightly fished in 1950 and projects forward estimating the annual stock biomass each year relative to the expected biomass if the stock was at 50% SPR (the benchmark defined by the regional fishery management Councils for goliath grouper). This relative estimate is referred to as the predicted SSB ratio. The estimated SSB ratio for 2010 is at about 1.0, meaning the stock has just reached the 50% SPR mark. The model predicts that at current levels of fishing mortality and natural mortality the stock could reach a relative biomass level around 1.5 by 2015 or so, but this result is highly uncertain.

**Slides 13 through 32 will be presented by
Kai Lorenzen of the University of Florida**



Goliath grouper management stakeholder project



Kai Lorenzen, Jessica Sutt, Joy Hazell,
Bryan Fluech, Martha Monroe
University of Florida

Scientific uncertainty is only one aspect of the goliath grouper management controversy. FWC has teamed up with University of Florida and Florida Sea Grant to better understand and manage the stakeholder conflict surrounding goliath grouper. Kai Lorenzen (UF) will present the results of a study on Florida fishers' attitudes and goals for goliath grouper management in Florida.

The Management Challenge

Scientific uncertainty is only one aspect of the goliath grouper management controversy. Others are:

- Divergent stakeholder views and interests
- Many stakeholders feel their views and experiences are being ignored in decision making

This Goliath Grouper Stakeholder Project aimed to:

- Provide a representative and in-depth exploration of stakeholder views and experiences
- Facilitate constructive debate to develop shared understanding of management issues and options

In addition to scientific uncertainty, goliath grouper management is complicated by divergent stakeholder view and interests and the fact that many stakeholders feel their views and experiences are being ignored by managers. The goliath grouper stakeholder project sought to provide a representative and in-depth exploration of stakeholder views and experiences, as well as facilitate a constructive debate in order to develop a shared understanding of management issues and options.

Goliath Grouper Stakeholder Project Activities

- **Stakeholder survey:** An internet-based survey of diverse stakeholders' views and experiences regarding goliath grouper and its management.
- **Stakeholder workshop:** A project workshop with invited representatives of diverse stakeholder groups, aimed at developing a shared understanding of management issues and options.

This project had two parts, an in-depth stakeholder survey and a focused stakeholder workshop. The internet-based survey was aimed at capturing the diversity of stakeholders' views and experiences regarding goliath grouper and its management. The stakeholder workshop included invited participants representing a diversity of stakeholder interests and was aimed at developing a shared understanding of management issues and options.

Who are the Stakeholders?

- **People interacting directly with goliath**
 - Fishers (recreational and commercial)
 - Divers
- **Businesses serving the above**
 - Fishing and dive charter operators
 - Dive shops, tackle shops etc.
- **Others with an interest in goliath**
 - Members of conservation organizations

Who are the stakeholders for goliath grouper? The stakeholders are comprised of people who interact directly with goliath, which includes recreational and commercial fishermen and divers. Business serving the fishermen and divers are another group of stakeholders and this includes fishing and dive charter operators as well as dive shop and tackle shops. Other stakeholders include people with an interest in goliath grouper, such as members of conservation organizations.

Survey implementation

- **Open: May 3rd – June 13th, 2013**
- **Respondents approached through:**
 - *Stratified random samples of FL fishing license holders:*
 - Recreational saltwater license holders
 - Commercial license holders
 - Charter license holders
 - *Email lists, websites, forums, personal contacts:*
 - Dive community (dive shops, clubs, PADI Facebook)
 - Sea Grant network
 - Project website
 - CCA Email list
 - Ocean Conservancy Email list
- **Responses received:**
 - 5882, with representation of all major stakeholder groups

The online survey was open from May 3 through June 13, 2013. Potential stakeholders who might be interested in responding to the survey were contacted and invited to participate. The invited participants included a random sample of recreational, commercial, and for-hire saltwater fishing license holders and people whose contact information was acquired from the dive community, the Sea Grant network, the project website, and the Coastal Conservation Association's (CCA) and Ocean Conservancy's email lists.

There were 5882 responses received and the responses represented all major stakeholder groups.

Response rates and response bias

Response rates (stratified random samples)

- Recreational license: **8%** (3,130 responses out of 40,000 sampled)
- Commercial license: **21%** (731 responses out of 3,588 population)
- Charter license: **25%** (196 responses out of 781 population)

Response bias assessment (response patterns and telephone interviews with non-respondents)

- Survey captures fishing license holders most interested and engaged in the goliath issue, but underrepresents those with no interest in or interaction with goliath
- Good representation of **stakeholders** (those with interest in the issue) but need to be careful extrapolating to “all fishing license holders”

The survey was sent to representative samples of fishing license holders with registered email addresses. Response rates, response patterns and telephone interviews with non-respondents suggest that license holders who were most interested and engaged in goliath issues are likely to be overrepresented and those with no interests or interactions are underrepresented in the survey responses. This means that we have a good representation of stakeholders (by definition, those who have an interest in or are affected by the issue), but care should be taken in extrapolating to “all license holders”.

Goliath encounters, responses and perceptions

	Commercial fishers			Recreational fishers			Sightseeing divers (Non-fishing)
	All	Bandit gear	Spear fishers	All	Hook & line	Spear Fishers	
Respondents (n)	697	117	146	3005	1518	574	352
Encountered goliath in the past 12 months (%)	61	75	90	25	20	59	inshore 20 reef 50
Targeted goliath for:							
Catch & release fishing (%)				12	11		
Diving/viewing (%)			18			16	54
Take measures to avoid goliath interaction (%)	42	43	87	21	15	56	(not asked)
Judge measures effective (%)	52	38	59	60	68	64	(not asked)
Interested in harvesting (%)	68	82	80	78	72	81	(not asked)
View goliath encounters as:							
Desirable (%)	32	28	25	52	50	49	87
Neutral (%)	33	33	32	32	35	26	6
Undesirable (%)	35	39	43	16	15	25	7

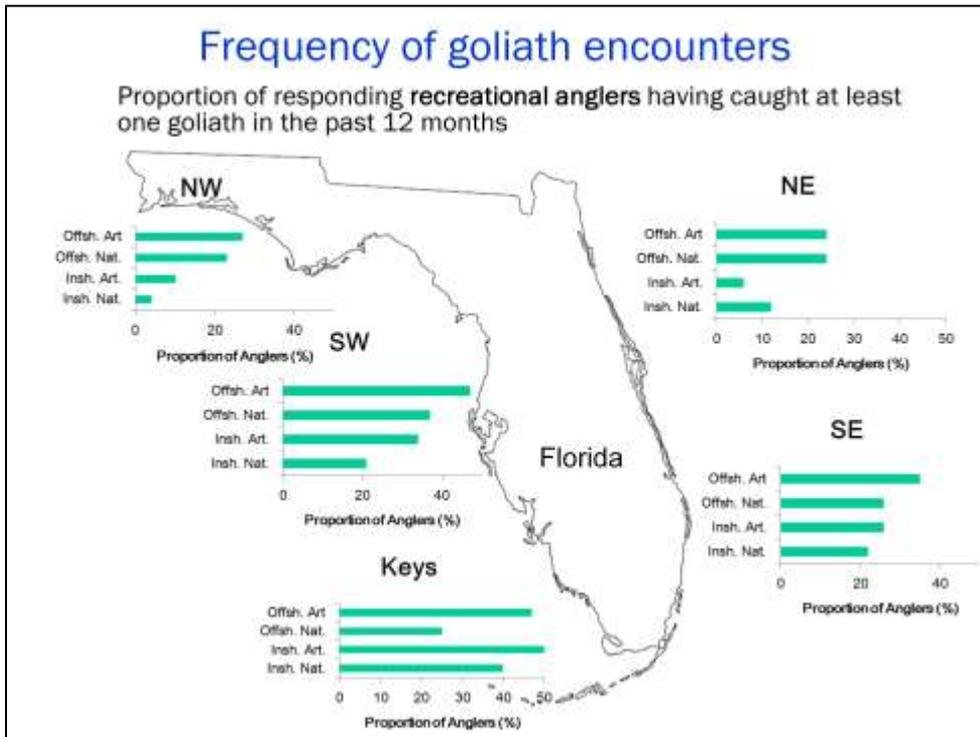
Many respondents reported encounters with goliath grouper over the past 12 months. Commercial reef fishers reported the highest level of encounters with goliath grouper (75% of bandit gear and 90% of spearfishers), followed by recreational spear fishers (56%). Of hook and line saltwater recreational fishers, an overall average of 20% reported having caught at least one goliath in the past 12 months.

Between 20% (inshore) and 50% (on reefs) of sightseeing divers (recreational divers who do not spearfish) reported seeing at least one goliath over the past 12 months. About half (54%) of sightseeing divers reported having undertaken dives specifically to see goliath, in contrast to fishing stakeholders whose encounters with goliath were predominantly incidental (with only 11% of recreational anglers specifically targeting them).

A high proportion but not a majority of commercial fishers (37% overall, 39% of bandit gear and 43% of spear fishers) considered goliath encounters undesirable (with the remainder being mostly neutral). Impacts of encounters on bandit gear fishers included (in rank order): time spent releasing goliath, damaged or lost gear and damaged or lost catch. Impacts of encounters on spear fishers included damaged or lost catch and damaged or lost gear.

A high proportion of recreational saltwater fishers (around 50%) found goliath encounters desirable, with only 15% hook and line and 25% spear fishers considering goliath encounters undesirable. Among saltwater recreational hook and line fishers who had caught at least one goliath in the past 12 months, the proportion finding encounters undesirable was moderately higher at 25%.

Sightseeing divers had overwhelmingly positive views of goliath, with only 7% perceiving encounters as undesirable, 9% viewing the species as nuisance and 13% perceiving a negative impact on biodiversity.



About 40% of both inshore and reef anglers in southwest Florida and the Keys reported catching at least one goliath in the past 12 months, compared to about 20% in southeast Florida. In North Florida, some 20-25% of reef anglers reported catches of goliath but few inshore anglers did. Note that the survey respondents were mostly avid anglers who fished many trips over 12 months and that “catching at least one goliath in 12 months” need not imply that goliath are encountered on many or most trips.

Measures taken to avoid/reduce interactions with goliath

	Recreational hook and line anglers	Spear fishers (comm. & rec.)	Commercial bandit gear
Proportion taking measures	15 %	56% (rec.) -87% (comm.)	43 %
Measures taken (not complete list)	<ul style="list-style-type: none"> • Move away • Use leader that breaks • Reel in fast 	<ul style="list-style-type: none"> • Avoid goliath • Scare goliath • Bag & protect catch • Send catch to boat quickly 	<ul style="list-style-type: none"> • Move away
Proportion seeing their measures as effective	68 %	59-64 %	38 %

A majority of commercial and recreational spear fishers (87% and 56% respectively) reported taking measures to reduce goliath interactions and their impacts, including: avoiding goliath, scaring them, nudging them with their spear gun, bagging and protecting their catch, and sending their catch to the boat quickly. These measures were seen as effective by a majority (59%-64%) of those using them. Of commercial bandit gear fishers, only 43% took measures to avoid incidental catches of goliath or the taking of catch from their line by goliath. These measures focused on avoiding locations where goliath were abundant but also included technical strategies such as using a leader that breaks when large fish are hooked or take hooked catches. Only 38% of bandit gear fishers taking such measures found them effective and many stated that 'there is nothing you can do.' Only 15% of recreational hook and line fishers attempted to avoid incidental catches of goliath or the taking of catch from their line. These measures focused on avoiding locations where goliath are abundant and reeling in the catch as fast as possible (68% of those using them found these measures effective).

It is clear from the measures reportedly taken to avoid interactions with goliath that many commercial fishers have had to adapt the way they fish in order to 'live with the goliath.'

Views on goliath & biodiversity

	Commercial fishers			Recreational fishers			Sightseeing divers ^(a)
	All	Bandit gear ^(a)	Spear fishers ^(b)	All	Hook & line ^(c)	Spear Fishers ^(d)	(Non-fishing)
Respondents (n)	697	117	146	3005	1518	574	352
View goliath as a nuisance species (%)	42	61	57	20	14	37	9
Perceive negative impact of goliath on biodiversity (%)	49	59	68	27	19	51	13
Goliath and biodiversity: Contributes positively (LS)	2.96	2.75	2.75	3.49	3.59	3.08	4.21
Impacts negatively (LS)	3.36	3.54	3.78	2.83	2.67	3.38	1.95
Reasons for participation in decision making: Impacts own livelihood (LS)	3.26	3.63	3.69	2.33	2.23	2.53	2.47
Impacts ecosystem (LS)	3.91	4.06	4.22	3.74	3.60	3.99	4.44

Over half (49-68%) of commercial bandit gear and spear fishers, recreational spear fishers and charter fishing operators perceived impacts of goliath grouper on reef biodiversity to be negative. By contrast, only 19% of recreational saltwater hook and line fishers, 13% of sightseeing divers, and 10% of dive charter operators perceived negative ecological impacts of goliath. The latter groups felt more strongly that goliath contributed positively to biodiversity than that it impacted negatively, while the reverse was true for the former groups.

It is interesting to note here that the stakeholder groups who have the most direct opportunity to observe goliath in the natural environment (spear fishing and sightseeing divers) reported very conflicting perceptions on the species' impact on reef biodiversity.

Views on importance of goliath as a threat to coral reefs among stakeholders who perceive a negative impact of goliath

	Commercial	Comm. Bandit	Comm. Spear	Rec. spear	Avg.	Rank
Declining water quality	4.26	4.11	4.26	4.24	4.22	1
Invasive species	3.93	3.98	4.19	4.06	4.04	2
Habitat loss	4.06	3.98	4.00	4.11	4.04	3
Coastal development	4.05	4.05	4.09	3.93	4.03	4
Ocean acidification	3.70	3.50	3.69	3.67	3.64	5
Overfishing	3.56	3.37	3.54	3.75	3.56	6
Increasing goliath populations	3.39	3.40	3.52	3.31	3.41	7
Climate change	3.40	3.17	3.40	3.32	3.32	8
Marine debris	3.23	2.86	3.01	3.25	3.09	9

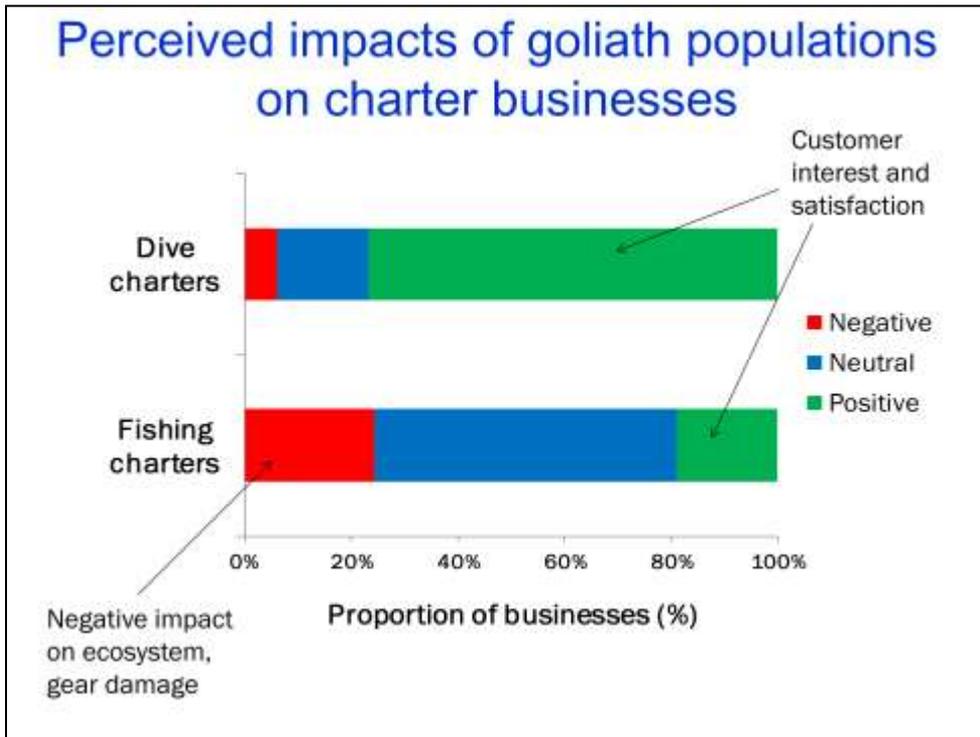
All groups, including those where a majority perceived negative impacts of goliath on reef biodiversity, rated the importance of goliath as a factor impacting Florida's reefs as low compared to other threats, including declining water quality, coastal development, habitat loss, and invasive species.

Fishing and dive charters

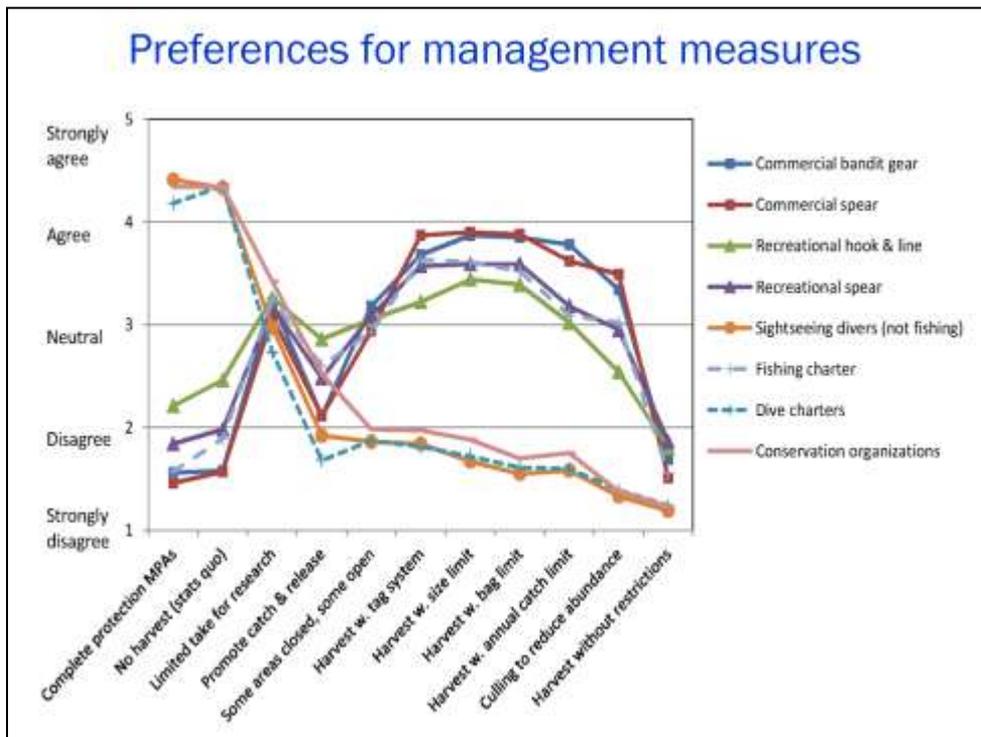
	Fishing charters	Dive charters
Respondents (n)	191	116
Perceive present business impact of goliath as:		
Positive (%)	19	75
Neutral (%)	57	17
Negative (%)	24	8
Expect business impact of harvest to be:		
Positive (%)	56	10
Neutral (%)	36	8
Negative (%)	8	82
View goliath as a nuisance species (%)	42	5
Perceive negative impact of goliath on biodiversity (%)	51	10
Goliath and biodiversity:		
Contributes positively (LS)	3.05	4.45
Impacts negatively (LS)	3.40	1.63
Reasons for participation in decision making:		
Impacts own livelihood (LS)	3.21	4.05
Impacts ecosystem (LS)	4.09	4.66

Dive charter businesses viewed impacts of the goliath situation as predominantly positive (75%), with only 8% perceiving a negative impact.

If harvest of goliath were allowed, 56% of fishing charter operators expect a positive impact on their business with the remainder expecting mostly a neutral impact (35%). By contrast, 82% of dive charter operators expect a negative impact.

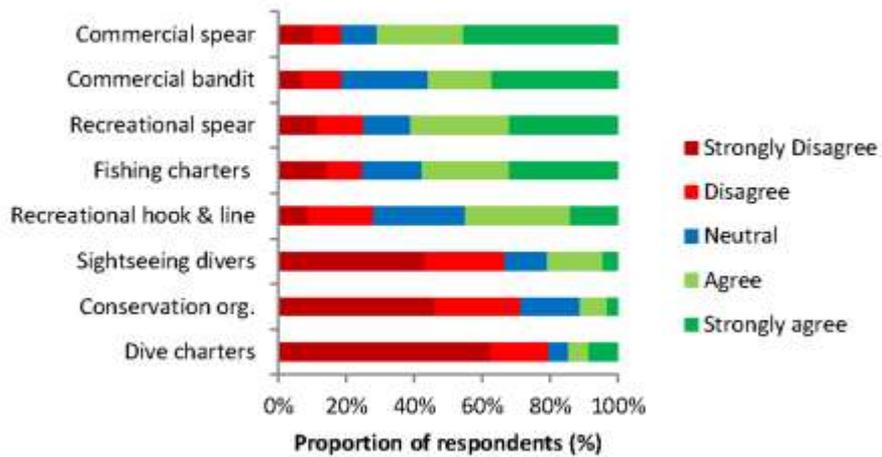


As previously stated, dive charter businesses viewed impacts of the goliath situation as predominantly positive. Positive impacts were associated with customer interest in the species and increased customer satisfaction. About 60% of dive charter operators reported that goliath had positively impacted the amount of customers and their customer revenue.



Survey respondents were divided in their opinion on how the goliath grouper fishery should be managed in the future. Commercial and recreational fishing stakeholders (including spear fishers) on average disagreed with the present closure and preferred opening the fishery for regulated harvest. Sightseeing divers (non-fishers), dive charter operators and members of conservation organizations on average strongly agreed with the present closure and strongly disagreed with opening the fishery to harvest. On average, a limited take for research was viewed neutrally by all groups, but this reflects very divergent views with all groups rather than consensus. Overall, the preferences of sightseeing divers, dive charters and conservation organization members are more extreme than the (generally opposite) preferences of the fishing stakeholders. This may reflect the more variable attitudes of fishing stakeholders towards goliath grouper as documented above. Recreational hook and line fishers hold the most moderate views of all fishing stakeholders. Unrestricted harvest is strongly opposed by all stakeholder groups and culling goliath to reduce abundance is also unpopular with most stakeholders, except for a moderate level of support from commercial fishers. Spatial management with some areas closed to goliath harvest and some open was controversial among fisheries stakeholders and opposed by sightseeing dive and non-fishing conservation stakeholders.

Agreement with “Goliath grouper should be open to harvest via a lottery or tag”



It is instructive to look at the distribution of preferences within stakeholder groups. As an example, the distributions of opinions about whether or not to allow a limited harvest via a lottery or tag is shown on this slide. Preferences are diverse within each group. Recreational hook and line fishers are the most diverse group, with just around half agreeing or strongly agreeing with a limited opening.

Stakeholder Workshop

- May 21-22, 2013, Tampa
- Facilitated workshop with invited participants

Objectives

- Shared understanding of management issues and likely outcomes of different management options
- Brainstorm a menu of management options and explore the pros, cons, and uncertainty of each option



On Tuesday, May 21st and Wednesday, May 22nd, 2013, the University of Florida convened a Goliath Grouper Management Stakeholder Workshop in Tampa, FL. Participants were invited based on a completed situation assessment, as well as interviews with stakeholders, researchers and agency personnel. Criteria for participation included knowledge and passion for the subject as well as a willingness to engage in difficult discussions with people with whom they may disagree. Twenty-four participants were invited and 16 key stakeholders attended the workshop, representing the recreational and commercial fishing sectors, recreational divers, fishing and dive charter operators, conservation organizations and outdoor writers.

Menu of options with pros and cons

Option	Pros	Cons
Fishery closed to harvest (status quo)	<ul style="list-style-type: none"> Good for dive tourism Avoid returning to overexpl. GG will increase abundance Stability of regulations 	<ul style="list-style-type: none"> User conflict. Exclusion of certain user groups Leads to negative attitude by some user groups
Limited take for science, by scientists	<ul style="list-style-type: none"> Scientific benefits Take limited to research needs Easier to control than other take options 	<ul style="list-style-type: none"> Likely criticism of scientists for consumptive research
Limited take for science, collaborative with fishers	<ul style="list-style-type: none"> Scientific benefits Inclusion of user groups Cost sharing Perception of managers listening 	<ul style="list-style-type: none"> Potential for abuse Difficulty of controlling harvest Likely criticism from general public
Limited take for harvest	<ul style="list-style-type: none"> Stakeholder perception of pro-active management Some economic benefits to fishers and fishing charters 	<ul style="list-style-type: none"> User conflict Negative attitude by some groups Neg. econ. imp. on dive charters Management costs Enforcement concerns Any revenue will not go back to the resource

The workshop generated a menu of options along with pros and cons of each option. Many aspects highlighted the user conflicts already discussed. In addition, two different issues were brought up: (1) different stakeholder's perceptions of management responsiveness to the situation and their needs, and (2) practical difficulties associated with controlling any very restricted harvest.

Stakeholder workshop participants:

- **Felt the public misunderstood the situation**
 - universally advocated more education and communication
- **Considered continued closure of the fishery and a limited take for research as possible options in current situation**
 - no accepted scientific (stock) assessment is available
 - limited take could be by scientists or cooperation with fishers
- **Overall participants were more supportive of continued closure**
 - felt that they could agree to a limited take for research if a solid scientific case for such a take was made

The opinions of the stakeholder workshop participants can be summarized as follows. Participants felt that the public generally misunderstood the situation. To combat this problem, the participants recommended more education and communication related to the topic. Participants considered both a continued closure and a limited take for research purposes to be possible options under the current circumstances, especially considering that no accepted stock assessment is available and the fact that take could include a coordinated effort by scientists in cooperation with fishers.

Overall, the participants in the stakeholder workshop were supportive of a continued closure but felt that they could agree to allow a limited take for research purposes if there was solid scientific justification for the harvest.

Stakeholder Project Summary (Part One)

Stakeholder experiences and attitudes are diverse, particularly within the recreational fishing groups

- Recreational rod and line fishers: Have a positive attitude toward goliath encounters and contribution to biodiversity
 - Very moderately in favor of opening the fishery
- Recreational spear fishers and commercial fishers: View goliath encounters and ecological impacts more negatively
 - More strongly in favor of opening the fishery to harvest
- Sightseeing divers, dive charters and non-fishing conservation organization members: View contribution of goliath to biodiversity as positive
 - oppose opening of the fishery to harvest

Those who view the ecological impacts of goliath as negative nonetheless rank the importance of those impacts as low relative to other impacts (coastal development etc.)

Stakeholder Project Summary (Part Two)

Additional Stakeholder experiences and attitudes

- Charter operators view goliath impacts as predominantly neutral (fishing charters) or positive (dive charters).
- Fishing charters expect a positive, dive charters a negative business impact from re-opening the fishery
- Stakeholders have developed a range of measures to reduce incidental catch of goliath or depredation on hooked or speared fish, which could be assessed and summarized in best practice guidelines
- A stakeholder workshop demonstrated the potential for achieving greater shared understanding of issues and options among stakeholders
- The workshop also highlighted concerns over the practicality of controlling a possible, very limited harvest

The remaining slides will be presented
by FWC staff



Management Progress

- Councils cannot allow harvest without a conclusive stock assessment
- Joint Council Committee formed in 2013 to consider data for new assessment
 - Committee reviewed all new relevant research
 - Agree that new stock assessment can be conducted
 - FWC will take the lead on the new assessment
 - Expected completion date: Spring 2015
- Committee discussed a coordinated approach to potential harvest
- Dissolved goliath committee and goliath given to joint Council South Florida management committee






Although the stock may be recovered, the Gulf and South Atlantic Councils cannot allow any harvest without a conclusive stock assessment. The Council's Science and Statistical Committees must be able to set an Allowable Biological Catch (ABC) for the Councils to consider any harvest. The ABC could be set after a conclusive assessment is completed.

The Gulf and South Atlantic Council formed a joint ad hoc goliath grouper committee in 2013 to consider data for a new stock assessment and to ultimately determine if goliath grouper management can be moved beyond the moratorium. This committee includes FWC representatives and has met a few times, most recently July 24, 2014. It was determined that there is enough new data since the last stock assessment to conduct a new assessment. The FWC will take the lead on this assessment and it is expected to be completed by spring 2015. The committee also discussed possible harvest scenarios if the data were to indicate that harvest could occur. The committee agreed that a coordinated approach in both state and federal waters should take place if harvest is considered.

At the last meeting, the ad hoc goliath committee was dissolved and goliath grouper was given to the joint Council South Florida management committee. This committee will consider the results of the stock assessment and make management recommendations to the Councils.

Next Steps

- Based on 2015 assessment results, Councils will then discuss management alternatives
- **September 2015 Commission meeting** - Staff will bring assessment results, Council suggestions, and possible management alternatives



Based on the assessment results and the recommendations for management from the Council committee, the Councils will make decisions about how manage goliath grouper in the future.

Staff will bring the assessment results and Council management suggestions and possible management alternatives for state waters to the September 2015 Commission meeting.