The Snapper Saga: An Assessment of Sector Separation on the Gulf of Mexico Recreational Red Snapper Fishery

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The Red Snapper Issue

Red snapper (*Lutjanus campechanus*) is one of the most iconic species in the Gulf of Mexico. Because it has been historically overfished, the fishery has been on a rebuilding plan since 2005. Management changes in the last decade have led to the rebuilding of the stock; both the average size of the fish caught and the stock biomass are increasing. However, the recreational season length continues to decrease every year. In 2007, the recreational red snapper season was 190 days. The season length in 2013 is predicted to be 27 days, which is an 86% decrease in season length in six years. Additionally, another management challenge is that the recreational sector continues to exceed their Total Allowable Catch (TAC) by an average of 49.6% each year. This disconnect between the biology of the fishery and the restrictive management applied yields dissatisfaction among stakeholders.

Current Management

The Gulf of Mexico red snapper fishery is managed in two sectors: commercial and recreational. A Total Allowable Catch (TAC) is determined for the year based on the status of the fishery. While the TAC allocated to both the commercial and recreational sectors are nearly the same, there are significant differences in both the management and fishing behavior between these two groups.

Sector Characteristics

	Commercial	Recreational
TAC	51%	49%
Regulations	Tradable Permits, min. size limit	Bag limit, min. size limit, season closure
Landings (2011)	3,240,000 lbs.	4,590,000 lbs.
Jobs	128,000	92,000
Exceeds TAC?	**NO**	**YES**

Sector Separation: A Solution?

The Gulf of Mexico Fishery Management Council is considering sector separation to address the dissatisfaction of regional stakeholders. If implemented, sector separation would split the recreational sector into two separately managed components: a for-hire sector and a private sector. Most importantly, sector separation would split the allocation of the recreational TAC between these two groups. Under sector separation, it is thought that the TAC overage would decrease because the federally regulated for-hire sector could be held accountable for their landings.

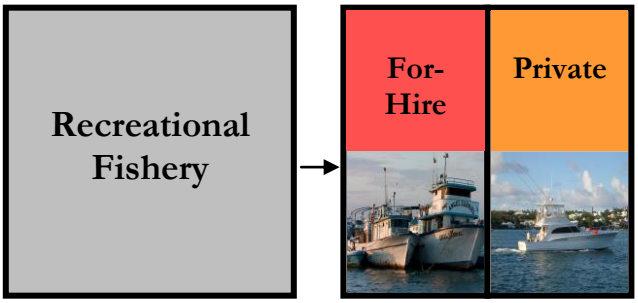


Photo: Fotomedia Photo:Wikimedia

Impacts

Sector separation could have the following impacts on the recreational red snapper fishery:

1. **Improve red snapper stock**
2. **Increase profits in the for-hire sector**
3. **Allow for flexibility in fishing season length with the implementation of an ITQ system**

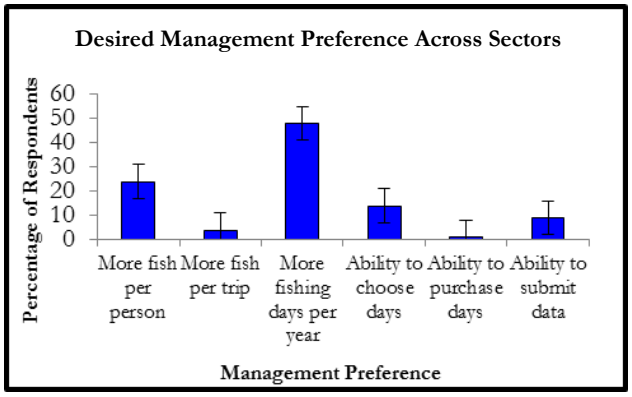
Photo: Sarah Willett

Project Objectives

1. **Develop a biological model for the Gulf of Mexico recreational red snapper fishery to reflect stock biomass changes under sector separation**
2. **Develop an economic model to determine the impacts of sector separation on the welfare of stakeholder groups**
3. **Survey the fishing community to determine the current level of knowledge of sector separation and the values of the fishermen**

Anglers Want A Longer Season:

Fishermen in the Gulf of Mexico are an important group that must be incorporated into any management change. To determine angler preferences and their knowledge about sector separation, we surveyed 1,200 commercial, for-hire, and private anglers in the Gulf of Mexico. Respondents indicated that their most desired outcome from a change in management in the recreational red snapper fishery would be a longer fishing season.



Management Issues:

Managers must decide how to divide the TAC between the for-hire and private sectors. Thus, sector separation is really an issue of allocation. Additionally, the lack of data on catch means that assumptions must be made about which sector is responsible for the overages. Because it is unknown how the TAC will be allocated and which sector is currently responsible for landing more fish than it should, we evaluated several allocation and overage scenarios. Throughout this brief, we present the highlighted allocation and overage.

Allocation Scenarios:

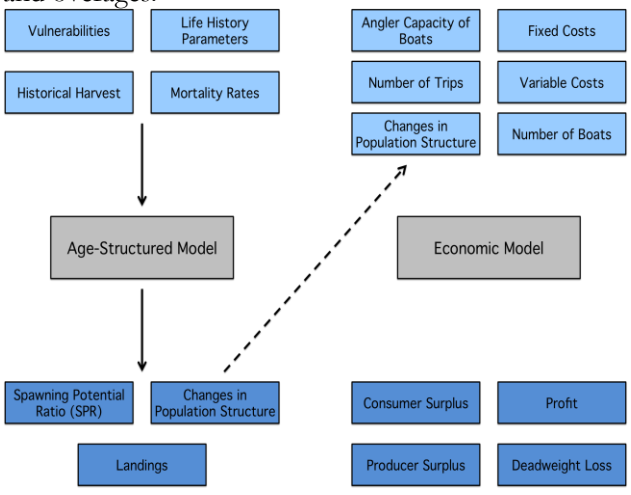
Allocation	Landings Interval	For-Hire	Private
FH 28	Predicted 2013 landings	28%	72%
FH 34	2011 landings	34%	66%
FH 42	**2007-2011**	**42%**	**58%**
FH 56	Historical (1986-2011)	56%	44%

Overage Scenarios:

Scenario	For-Hire	Private
100% attributed to private	0%	100%
Proportional to predicted 2013 landings	**28%**	**72%**
50:50	50%	50%
100% attributed to for-hire	100%	0%

Bio-Economic Model:

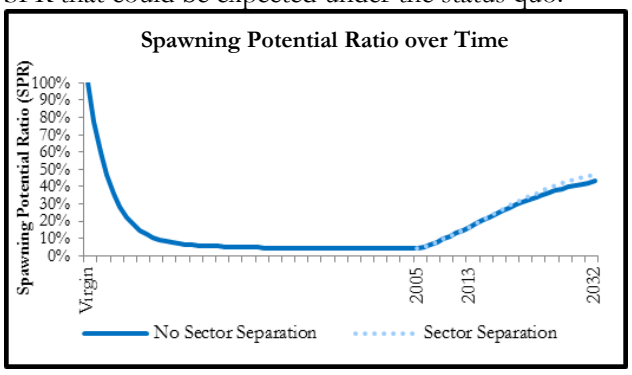
We used an age-structured biological model to determine the biological changes within the fishery that could be expected if sector separation was implemented. Likewise, we developed an economic model to examine the impacts on stakeholder groups. The light blue boxes represent the model inputs and the dark blue boxes are the model outputs that were used to compare the various scenarios analyzed. This model was used for all combinations of allocations and overages.



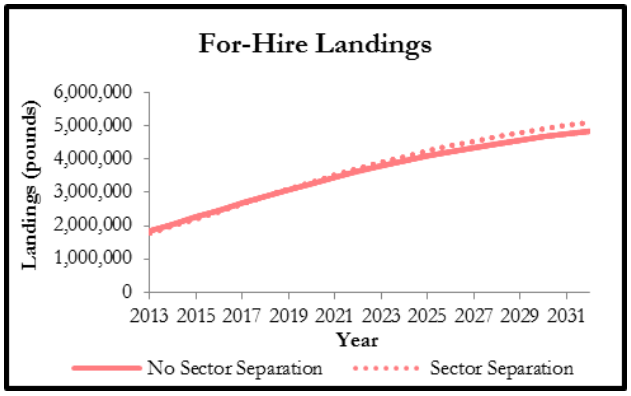
Biological Results:

Our biological model shows that sector separation will yield a slight increase in red snapper spawning biomass by 2032. This shows that sector separation will continue to promote the health of the fishery. While the graph below is just one example, we found that no

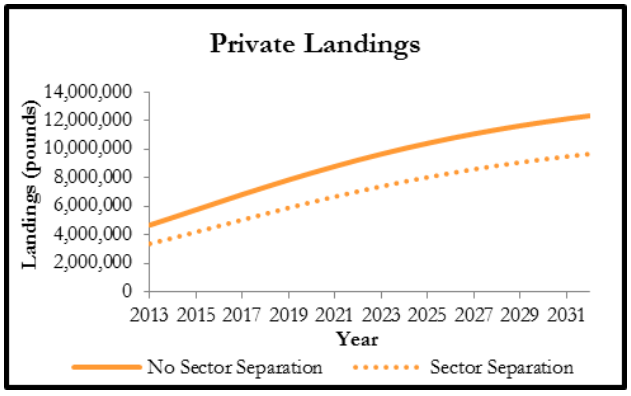
matter the overage assumption or the allocation assigned, sector separation yielded Spawning Potential Ratios (SPRs) approximately four percent above the SPR that could be expected under the status quo.



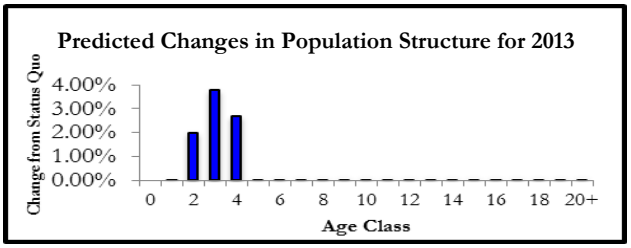
Landings, which allow us to predict which sector might be most impacted by sector separation, varied by allocation and overage. In most cases, the for-hire industry could increase their landings under sector separation, as seen in the graph below.

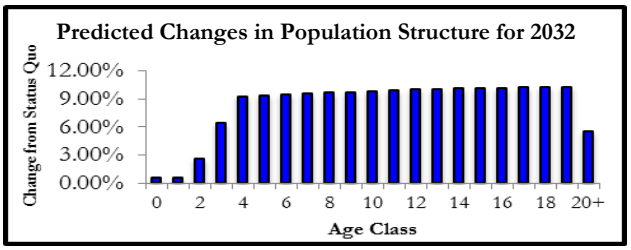


Conversely, because private anglers are held to a lower TAC in most scenarios analyzed, they would experience decreased landings, as seen below.



The third biological output of interest was the age structure of red snapper. Under sector separation, the overall age structure within the recreational fishery increases, which improves the ability for anglers to catch and release fish due to minimum size (ages 2 to 3) or due to bag limit (ages 4 to 20+). While there will be minimal impacts on the status of the stock in the year after sector separation is implemented, there is potential for an increase of approximately 10% in nearly all age classes by 2032 when compared to status quo.

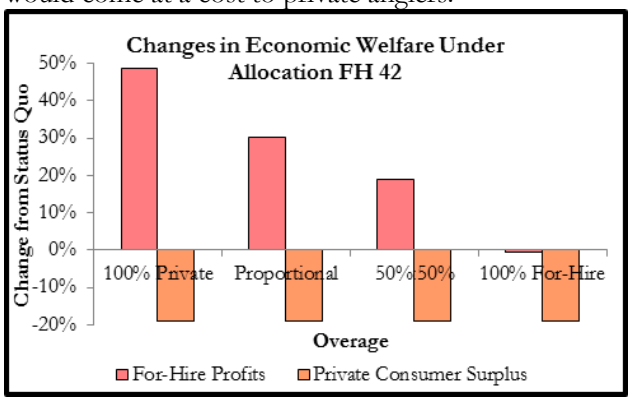




Economic Results:

From the aggregate demand curves we constructed, consumer surplus (CS) for private anglers and profit for the for-hire industry were calculated. Comparing profit and CS calculations for each model with the various assumptions and allocation distributions allowed us to understand how sector separation might translate into economic changes in the region. We found that the economic changes that could be expected will depend on how the TAC is allocated between the private and for-hire sectors. Currently, the private sector is increasing the percentage of landings that they catch each year, and any allocation that distributes less catch than what they are currently landing would result in economic losses in the private sector.

Looking at one example, if the for-hire TAC is based on average landings from the past five years, they could see substantial economic gains. This, of course, would come at a cost to private anglers.



ITQs: Improving the For-Hire Market

Implementing an ITQ system in the commercial fishery has yielded improvements, including increased economic value and flexibility in fishing days. Our model results suggest that the same outcomes could be expected if an ITQ system was implemented in the for-hire industry. Profits will increase under an ITQ system compared to the status quo. This is illustrated in the graph below, where there are profit increases above the increases from sector separation alone.

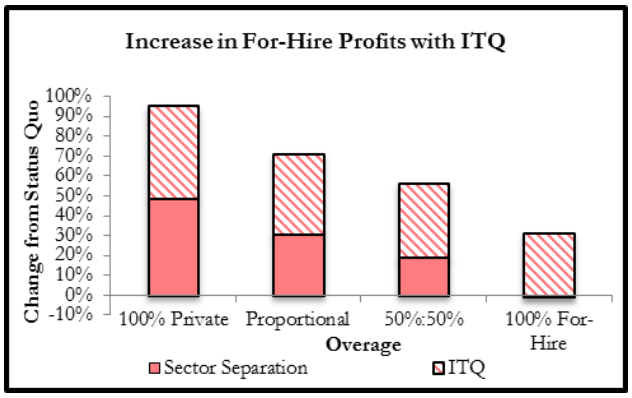


Photo: Capt. Mike Jennings

Recommendations

1. **The Gulf of Mexico Fishery Management Council should consider sector separation because it improves stock biology and could have positive economic effects.**
2. **Allocation decisions should incorporate stakeholder input.**
3. **Better reporting practices should be implemented to assign responsibility of overage.**
4. **An ITQ system should be implemented with sector separation as it can give for-hire fishermen flexibility in fishing days and increased profits.**

The Impacts of Sector Separation

With the implementation of sector separation, our biological model suggests that there will be a slight increase in red snapper spawning biomass along with an increase in population at each age class. Our economic analysis shows that implementing sector separation itself will not cause economic changes, but that the allocation and overage liability will impact the region's economy. Depending on the TAC allocations and which sector is landing the overages, the for-hire sector can see economic gains with the implementation of sector separation. Stakeholders voice concern with the uncertainty of the impacts of new management, as they do not want to be worse off than they are currently. All management changes have tradeoffs, and these tradeoffs become clearer through an analytical analysis, such as the one performed by this project.

References

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Acknowledgements

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