



Research paper

Rights-based management for recreational for-hire fisheries: Evidence from a policy trial

Joshua K. Abbott^{a,*}, Daniel Willard^b^a School of Sustainability, Arizona State University, PO Box 875502, Tempe, AZ 85287, United States^b Environmental Defense Fund, 301 Congress Avenue, Suite 1300, Austin, TX 78701, United States

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ABSTRACT

Most for-hire recreational fisheries are managed using season, bag and size limits. Yet these approaches do little to control fishing effort or mortality and may dissipate value to anglers and vessel owners. Rights-based management approaches could theoretically address these shortcomings but are untested in the for-hire recreational context. We address this knowledge gap by examining the outcome of a two-year policy “experiment” in the U.S. Gulf of Mexico – a system plagued by shrinking seasons and tighter bag limits. Participating for-hire vessels in the Gulf Headboat Collaborative received individual allocations of red snapper (*Lutjanus campechanus*) and gag grouper (*Mycteroperca microlepis*) that they were free to fish outside of the usual seasons in exchange for enhanced accountability. We find that participants smoothed their offerings of red snapper and gag trips across the year, increasing anglers’ access to these species. Regulatory discards of the allocated species declined as well. Vessel revenues and net revenues increased respectably despite a relatively unchanged number of trips after the policy change. Revenue increases were driven by increased anglers per trip in off-season periods and by shifting customers to longer, higher value trips through the promise of catching desirable species outside of the restrictive federal season. Surveys of vessel owners confirm the overall success of the policy trial and corroborate the quantitative analysis of the mechanisms underlying its economic benefits. We conclude with a discussion of the usefulness and limitations of this policy trial for predicting the long-run outcomes of permanent rights-based management policies for the for-hire sector.

1. Introduction

The recreational contribution to fish mortality is significant and growing (Coleman et al., 2004; Ihde et al., 2011) with approximately 11 million marine anglers taking 68 million fishing trips in the U.S. annually (National Marine Fisheries Service, 2016). These trips contribute significant economic value and impacts for coastal economies (Lovell et al., 2013). Recreational fisheries have grown in importance in the European Union (Pawson et al., 2008), Australia and New Zealand (Borch, 2010; Kearney, 2001), and other developed nations (World Bank, 2012), and are increasingly important in developing nations as well (Pitcher and Hollingworth, 2002).

Despite their importance, marine recreational fisheries have seen little policy innovation. Most fisheries have long operated under a regime of license fees and season, size and retention constraints. While perhaps sufficient for stocks faced with limited angler demand, these approaches have done little to curb fishing mortality (Cox et al., 2002;

Woodward and Griffin, 2003; Lewin et al., 2006) due to their inability to contain overall effort or adequately adjust to anglers’ adaptive behaviour (Fenichel et al., 2013). As a result, recreational fisheries for many popular species are following a well-trod path observed in commercial fisheries governed by regulated open access institutions (Reimer and Wilen, 2013): an escalating pattern of shorter seasons and increasingly tight regulation (Wilen, 2006). This management may dissipate angler welfare in several ways, including excessive participation (Anderson, 1993; Fenichel and Abbott, 2014; Stoeven, 2014), congestion during brief fishing seasons (Timmins and Murdock, 2007), and misallocation of scarce landings to anglers with low valuations through inflexible bag limits (Abbott and Wilen, 2009) and seasonal openings (Holzer and McConnell, 2014; Abbott, 2015).

While anglers often access marine species by fishing from piers, the shore, or using their own vessels, many others rely upon the services of the for-hire sector (e.g., charter, headboat, or party boat vessels).¹ Regulation of the for-hire sector has closely mirrored the management

* Corresponding author.

E-mail address: Joshua.k.abbott@asu.edu (J.K. Abbott).¹ 22% of US recreational landings are estimated to come from the for-hire sector (Figueira and Coleman, 2010). This share increases substantially for offshore species (e.g., tunas and billfish) that are out of reach for small private vessels.

of private anglers, often being subject to the same bag and size limits and seasonal closures. For-hire recreational fisheries are therefore prone to the same symptoms of regulated open access management as private recreational fisheries – albeit, with the added symptom of dissipated industry profits (Abbott and Wilen, 2009). Theoretical work has outlined how rights-based management (RBM) approaches, such as individual transferable quotas (ITQs), could be adapted to for-hire fisheries to enhance accountability for fishing mortality, provide operators the flexibility to offer year-round trips customized for their customers, and enhance consumer and producer surplus (Abbott and Wilen, 2009; Abbott et al., 2009; Leal and Maharaj, 2009). Rights-based approaches in commercial fisheries have enhanced economic efficiency and reduced overcapacity, while helping align the interests of fishermen with resource sustainability (e.g., Arnason, 2012; Grafton et al., 2006). The for-hire sector often shares features with the commercial sector that suggest it may be amenable to RBM. Like commercial fishermen, for-hire operators are profit-seeking and rely upon fish as an input to a marketed product (a service); they often hail from a relatively small and well-defined set of ports – fostering economies of scale in enforcement; and permit registries for-hire vessels can be used to define exclusion rights, while catch histories (when present) can facilitate initial allocations of these rights.

The theoretical promise of RBM has not, to the authors' knowledge, been actualized in any real-world for-hire fishery. This paper fills this void by reporting the results of a unique policy trial in the U.S. Gulf of Mexico (GOM), the Gulf Headboat Collaborative (GHC). For-hire vessels in the GHC operated under a two-year experimental pilot program of RBM for red snapper (*Lutjanus campechanus*) and gag grouper (*Mycteroperca microlepis*). This unique collaboration between the fishing industry, government, academia, and the environmental NGO community provides a first-of-its-kind examination of the performance of RBM approaches in for-hire recreational fisheries, providing useful insights for the expansion of these approaches to similar fisheries around the world.

1.1. Case study

The lack of innovation in recreational fisheries management is illustrated in the U.S. Gulf of Mexico. This is a multispecies fishery with large for-hire and private recreational components sharing fish populations with a commercial sector. Reef fish, such as snapper and grouper species (along with coastal pelagics, tunas, and sharks), are popular offshore target species in the region.² Three of these – red snapper, gray triggerfish, and greater amberjack – are overfished and managed under rebuilding plans, while gag grouper was overfished until 2014 (NOAA Fisheries, 2014). For several reef fish species recreational fishing mortality exceeds commercial fishing mortality (NOAA Fisheries Southeast Regional Office, 2016). These large recreational harvests are fostered by significant allocations to the recreational sector, and yet persistent recreational overharvests are commonplace (NOAA Fisheries Southeast Regional Office, 2017). Accordingly, recreational seasons for popular species such as red snapper, gag grouper, and others are now closed for much of the year,³ fostering distrust of management and increasing allocation tensions with commercial sector vessels fishing for red snapper and groupers year-round under rights-based policies (Abbott, 2015; Doeringhaus et al., 2014).

The for-hire industry in the GOM has been particularly harmed by

² The GOM also has a large recreational fishery in state waters for spotted sea trout, red drum, and other species, but our focus is the offshore marine recreational fishery under federal management. Across all GOM recreational fisheries an average of 3 million anglers took 23 million fishing trips annually in the GOM from 2005 to 2014 (National Marine Fisheries Service, 2016).

³ The recreational season for red snapper reached a low of nine days in 2014 (Gulf of Mexico Fishery Management Council, 2014) despite recovering stocks and larger annual catch limits over the years.

this state of affairs. For-hire vessels are the primary means for anglers without access to a private vessel to fish offshore. The GOM for-hire sector includes over 1300 vessels distributed across five states with permits to fish for reef fish species in federal waters. The sector includes a large charter boat component and approximately 70 headboats (or party boats) comprised of relatively large vessels that mostly charge per customer or “head” (Gulf of Mexico Fishery Management Council, 2016b). Shrinking seasons and bag limits, a reef fish for-hire permit moratorium, relatively lax regulations in state waters off-limits to federally permitted for-hire vessels, and expanding private recreational fishing effort have all contributed to a nearly 20% attrition of for-hire fishing permits (Gulf of Mexico Fishery Management Council, 2014). While it is common for anglers on for-hire reef fish trips to catch a varied “bag” of species, and a number of fisheries remain open much of the year, many vessel owners cite the inability to land popular or even iconic (e.g., red snapper) species outside of increasingly short seasons as a severe constraint on their business.

In this atmosphere, an affiliation of headboat operators in the GOM developed a pilot project to test an alternative approach. In partnership with Environmental Defense Fund, these operators organized as the Gulf Headboat Collaborative (GHC) and applied to NOAA Fisheries for an exempted fishing permit (EFP) to test a RBM approach.⁴ This EFP authorized a unique experiment in a fundamentally different form of management, exempting participating vessels from federal recreational season closures and allowing potential year-round fishing subject to quota availability and enhanced reporting and monitoring requirements.

GHC's EFP application was endorsed by the Gulf of Mexico Fishery Management Council in April 2012 and approved by NOAA Fisheries in August 2013. The two-year pilot began in January 2014 and concluded in December 2015. Membership was voluntary and organized through contracting among participants. The GHC began with 17 vessels owned by 13 businesses in 2014, expanding to 19 vessels and 15 businesses in 2015. Vessels were 47–78' in length, accommodating 20–80 passengers per trip. The GHC received annual allocations of red snapper and gag in proportion to participating vessels' collective 2011 landings of these species (National Marine Fisheries Service Southeast Regional Office, 2015), totalling 5% and 3% of total recreational catch limits for the two EFP species.

While the EFP yields insights for a range of for-hire fisheries, we limit direct inferences to the GOM headboat sector. Headboats are unique for having the landings histories required to support a vessel-based allocation process,⁵ which has lead policymakers to propose separate RBM plans for the headboat (Gulf of Mexico Fishery Management Council, 2016b) and charter fleets (Gulf of Mexico Fishery Management Council, 2016a). Participation in the GHC was voluntary, but membership was geographically representative, with vessels distributed across Alabama, Florida and Texas.⁶ The GHC also contains the range of firm sizes and economic contexts in the GOM headboat fleet – with some multi-vessel operators operating in tourist hotspots and single-vessel companies based in more remote ports. Altogether, our sample comprises approximately 25% of federally-permitted headboats in the GOM.

Regulators allocated quota and enforced accountability at a collective level, but the common pool of red snapper and gag quota was internally allocated to individual GHC vessels. The GHC was not bound to

⁴ An EFP is a temporary permit issued to individuals for the purposes of conducting research or other fishing activities for species under federal regulation (50 C.F.R. § 600.745(b)(1)).

⁵ Unlike headboats, GOM charter boats are not required to report vessel-level landings histories.

⁶ In 2015 there were 4 (5) GHC vessels in NW (SW) Florida, 5 vessels in Alabama, and 5 in Texas. These proportions are similar to industry-wide proportions (Gulf of Mexico Fishery Management Council, 2016b), albeit with a slight overrepresentation of Alabama vessels and the absence of any vessels from Louisiana/Mississippi, which together reflect ~10% of the headboat fleet.

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