



Performance of federally managed catch share fisheries in the United States



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ABSTRACT

In 2011 the National Marine Fisheries Service began a systematic collection of performance indicators for U.S. fisheries managed under catch shares. Catch shares are a fishery management tool that dedicate a secure share of quota allowing individual fishermen, fishing cooperatives, fishing communities, or other entities to harvest a fixed amount of fish. Catch share design varies widely across different programs and regions. Many programs share similar biological, social, and economic management objectives even though these design features are tailored to accommodate particular fishery characteristics. This paper evaluates fisheries using standardized indicators to measure the basic economic performance, regardless of catch share program design. Data collected were used to evaluate the economic and distribution effects of U.S. catch share programs. Catch share fishery performance is compared to a baseline period prior to implementation of the catch share program. Overall, the majority of objectives to improve the economic performance of catch share fisheries were achieved. Catch share programs have been effective in reducing fishing capacity. However, catch share programs have had distributional consequences as there are indications that consolidation is occurring in a number of programs. For example, there have been considerable reductions in the number of active vessels and entities holding quota share in the Alaska Halibut and Sablefish and the Mid-Atlantic Surfclam and Ocean Quahog catch share programs. However, it is important to note that the accumulation of ownership share may be less of a concern than consolidation in the use of quota. Thus, to the extent that consolidation is considered a management problem, it may be more effective to consider caps on the use of quota than by imposing more restrictive ownership caps.

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1. Introduction

Catch share programs are management tools that dedicate a secure share of a quota, allowing individual fishermen, fishing cooperatives, fishing communities, or other entities to harvest a fixed amount of fish. These management tools are known as Limited Access Privilege Programs or Individual Fishing (or Transferable) Quota (IFQ/ITQ) Programs. The goals of these programs vary based upon the individual needs of the associated fishery, but generally catch share programs are designed to reduce overcapacity, promote safety at sea, and provide social and economic benefits (Anderson and Holliday, 2007; National Research Council, 1999, p. 33). Catch share programs also include a number of biological goals (e.g., reduction in bycatch, adhering to annual catch limits, etc.). How-

ever, these biological goals would have been required in the United States whether or not a catch share program was implemented as they are required by the Reauthorized Magnuson Stevens Act (MSA, 2007). The performance of catch share programs relative to biological goals has been evaluated in many studies, including Essington et al. (2012). Our focus is on the social and economic performance of catch share fisheries.

Catch share management is not unique to the United States as the management regime has been implemented in several other countries. Some of the early adopters of ITQs include The Netherlands (Salz, 1996), Iceland (Arnason, 2002, 2008; Haraldsson, 2008), Canada (Dupont and Grafton, 2000; Marsden and Sumaila, 2005), and Australia (Campbell et al., 2000; Grafton and McIlgorm, 2009). Bonzon et al. (2013) estimated that catch shares in one form or another have been implemented in 40 countries, covering over 900 species in about 200 programs. In the United States, catch share management was first introduced in the surfclam and ocean quahog fisheries in 1990 (Wang, 1995) then in

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Table 1
U.S. federal catch share programs, implementation year and respective Fishery Management Council.

Catch Share Program Name	Year	Council
Surfclam & Ocean Quahog ITQ ^{a,b}	1990	Mid-Atlantic
Wreckfish ITQ ^{a,c}	1992	South Atlantic
Western Alaska Community Development Quota ^d	1992	North Pacific
Alaska Halibut & Sablefish IFQ ^{a,b,e}	1995	North Pacific
American Fisheries Act (AFA) Pollock Cooperatives ^e	1999	North Pacific
Pacific Sablefish Permit Stacking ^f	2001	Pacific
Bering Sea and Aleutian Islands (BSAI) Crab Rationalization	2005	North Pacific
Red Snapper IFQ ^a	2007	Gulf of Mexico
Central Gulf of Alaska Rockfish Cooperatives ^e	2007	North Pacific
Amendment 80 Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives	2008	North Pacific
Golden Tilefish IFQ ^a	2009	Mid-Atlantic
General Category Atlantic Sea Scallop IFQ ^a	2010	New England
Northeast Multispecies Sectors	2010	New England
Grouper-Tilefish IFQ ^a	2010	Gulf of Mexico
Pacific Groundfish Trawl Rationalization (Shoreside Whiting and Shoreside Non-whiting) ^{b,e,g}	2011	Pacific

^a Refers to Individual Transferable/Fishing Quota (ITQ/IFQ).

^b The two components of the Program will be presented separately as singular fisheries.

^c Not included in forthcoming analyses due to confidentiality issues.

^d The Community Development Quota Program is a unique program with the goal of preserving Alaska Native and community involvement in Alaskan fisheries. For this reason, it is not included in the forthcoming analyses.

^e These indicators only cover the harvesting sectors because the inclusion of the mothership or catcher-processor sectors would confuse comparison across all of the catch share programs.

^f Pacific sablefish permit stacking was only partially implemented in 2001; data from 2002 represent the first full year of the program and will be used as year 1 in the forthcoming analyses.

^g The 2011 implementation of the Trawl Rationalization combines the non-whiting and whiting components of the fishery. The whiting component has three sectors: shore-based harvesters, catcher-processors and motherships. The shoreside whiting and shoreside non-whiting components will be treated as separate fisheries for comparison sake.

the wreckfish fishery in 1992 (Gauvin et al., 1994) and in the Alaska halibut and sablefish fisheries in 1995 (Hartley and Fina, 2001). Citing a number of concerns over the social and economic effects of IFQ programs, the U.S. Congress included a moratorium on the adoption of any new IFQ programs with the passage of the 1996 reauthorization of the Magnuson Stevens Act. With this Act, the Ocean Studies Board of the National Research Council was commissioned to study the impacts of IFQs and make recommendations toward a national policy on the use of IFQs (National Research Council, 1999). During the moratorium, the Alaska Pollock Cooperatives were created by the American Fisheries Act in 1998 and a program that allowed the stacking of Pacific sablefish permits was developed in 2000. The moratorium expired in 2000, but was extended through a Congressional appropriations bill to 2002 with an exception that allowed the implementation of the Pacific Sablefish Permit Stacking Program to move forward. Nine additional catch share programs have been implemented since the moratorium was lifted in 2002 (Table 1).

As with other management tools, there are both supporting and opposing arguments for managing fisheries using catch shares. These differing viewpoints have been thoroughly reviewed by others (see for example, Yandle and Dewees, 2008; Abbot et al., 2010), which we do not repeat in detail here. A sample of studies on the economic benefits or performance of individual catch share fisheries includes efficiency gains (Wang, 1995; Weninger, 1998), productivity (Felthoven et al., 2009; Walden et al., 2012), employment (Abbot et al., 2010), transferability (Criddle and Strong, 2013), capacity (Felthoven, 2002), markets and prices (General Accounting Office, 1999; Herrmann, 1996; Lee, 2014), welfare analysis (Lee and Thunberg, 2013), and effects on processors (Matulich, 2008; Matulich and Clark, 2003). The negative effects, particularly those of ITQs, include economic inefficiencies associated with highgrading (Anderson, 1994), excessive consolidation (Yandle and Dewees, 2008) or changes in bargaining power due to vertical integration (Dawson, 2006). Other researchers have called for a comprehensive review of the different dimensions of catch share fisheries to complete an impact assessment (Thébaud et al., 2012), while others have noted distributional consequences among individuals

(Bromley, 2009; Macinko, 2014) and communities following implementation of catch share programs (Carothers et al., 2010; Olson, 2011).

Typically, the social science literature comprises studies on the evaluation of catch share program performance based upon expectations from economic theory or social dislocations. In this paper, we depart from this approach and evaluate catch share program performance based on the stated goals, objectives and anticipated impacts as they were articulated by the Fishery Management Councils, following Clay et al. (2014). The majority of social and economic studies on catch share fishery performance focus on specific programs with far fewer studies of multiple catch share programs using a common set of metrics. Grafton and McIlgorm (2009) reviewed seven Australian catch share programs using a mix of quantitative and qualitative criteria. More recently Grimm et al. (2012) used publicly available data to evaluate 15 major U.S. and Canadian catch share fisheries. In this paper, we build on Grimm et al. (2012) for U.S. catch share programs by using a set of quantitative indicators with more recent data. Additionally, we apply these indicators to U.S. catch share program subcomponents that were not covered in Grimm et al. (2012) and we include recently implemented programs. We also provide updates to the catch share indicators reported in Brinson and Thunberg (2013) as well as recently completed estimates of multi-factor productivity (MFP) change (a measure of changes in quantities of inputs used to harvest fish and outputs produced) in U.S. catch shares fisheries (Walden et al., 2014).

2. Methods and data

We depart from the approach of evaluating catch share program performance based upon economic theory or social dislocation. Instead we develop indicators based on the stated goals, objectives and anticipated impacts as they were articulated by the Fishery Management Councils at the time the programs were designed and implemented (Clay et al., 2014). While there is considerable variability in the stated objectives of all of the catch share programs, the interest here is on goals and objectives that are common

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