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Stated preferences for size and bag limits of Alaska charter boat anglers ☆

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ABSTRACT

Over the last several years, significant regulatory changes related to Pacific halibut *Hippoglossus stenolepis* have occurred in the for-hire recreational charter boat fishing sector in Alaska. In addition to limited entry restrictions and adoption of a catch sharing plan that provides a formal means of determining allocation between the commercial and charter boat fishing sectors, more restrictive harvest regulations were placed on anglers fishing from charter boats. This article provides insights into how the value anglers place on charter boat fishing is affected by these regulations, principally bag and size limits. Such information is helpful in assessing the trade-offs in economic benefits associated with different regulatory tools used to manage angler harvest levels. Stated preference choice experiment data from a 2012 survey are analyzed using a panel rank-ordered mixed logit model to estimate the economic value, or willingness to pay (WTP), non-resident anglers place on saltwater charter boat fishing trips in Alaska and to assess how changes in characteristics of fishing trips, particularly harvest restrictions related to Pacific halibut, affect this value. The model specification accounts for a wide array of size and bag limit restrictions that have been recently implemented or are under consideration by Pacific halibut fishery managers. The results indicate that very strict harvest restrictions have the effect of driving WTP to zero, while allowing at least one (potentially) large fish to be caught is valuable to anglers. The results also suggest that WTP for fishing trips with bag limits that allow two or more fish to be harvested with no size restrictions on the first fish harvested are not statistically different from the value for trips for larger bag limits or for the case where all the fish in the limit can be any size. This suggests that fishery managers can restrict the size of the second fish in a two-fish bag limit and still maintain economic values for fishing trips.

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1. Introduction

In Alaska, almost all recreational fishing for saltwater fish occurs in Southeast Alaska or Southcentral Alaska (Fig. 1). These regions represent different fishery management areas for state-managed Pacific salmon (*Oncorhynchus* spp.) and for federally-managed Pacific halibut (*Hippoglossus stenolepis*). For these species, which are the primary fish targeted by recreational anglers in saltwater in the state, fishery managers rely on bag and size limit restrictions as the principal management tools to manage harvest levels. For salmon, bag limits and minimum size limits (minimum length of a fish) vary depending upon the time of year and specific location.[1] For Pacific halibut, management of the sport fishery in Alaska has undergone a makeover in recent years due to concerns over declining stocks and allocation disputes between commercial and recreational charter boat fishing interests, leading to changes

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[1] See http://www.adfg.alaska.gov/index.cfm?adfg=fishingSportFishingInfo.main for the latest regulations.

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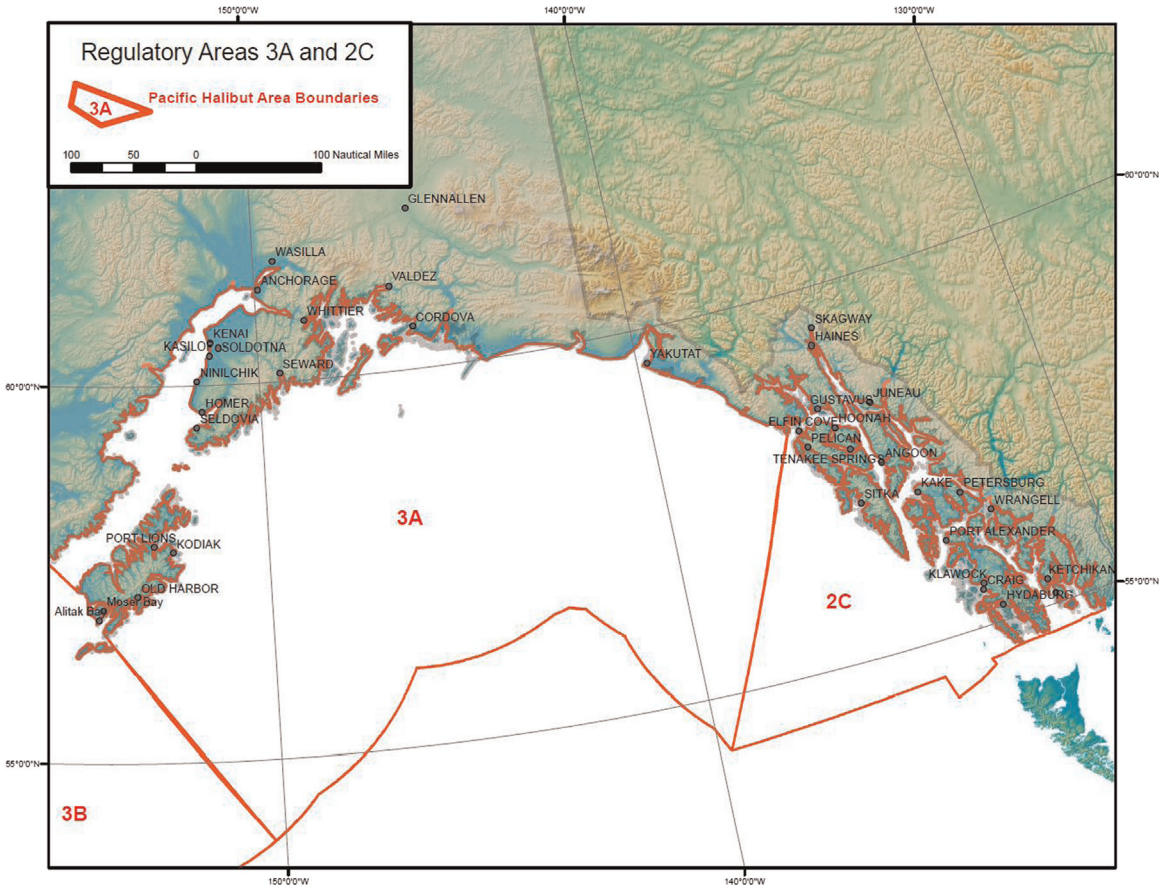

Fig. 1. International Pacific Halibut Commission Regulatory Areas 2C (Southeast Alaska) and 3A (Southcentral Alaska).

in recreational harvest restrictions.

Until recently, Pacific halibut bag limits were the same for unguided and guided (charter boat) anglers throughout the state – two fish per day with no size restrictions. Starting in 2007 more restrictive bag and size limit regulations were imposed for halibut caught on charter boat fishing trips in Southeast Alaska (74 Federal Register 21194). The most restrictive limits were imposed during the 2011 fishing season, when charter anglers in Southeast Alaska were subject to a one-fish bag limit with a maximum size limit of 37 in. Since then, the bag limit has remained at one fish, but charter anglers have been allowed to harvest either a very large fish or a small fish (called a "reverse slot" size restriction).[2] In 2014, Southcentral Alaska charter boat anglers began facing the same types of charter-specific bag and size limit restrictions, being limited to a two-fish bag limit but with one of the two fish in the bag limit being subject to a maximum size limit restriction (29 in.) (79 Federal Register 13906). Under the Halibut Catch Sharing Plan (CSP), which went into effect during 2014, the management tools used to regulate harvest of Pacific halibut in the recreational sector are evaluated annually (79 Federal Register 13906).

To fully evaluate trade-offs between alternative regulatory tools for managing charter halibut sport harvest, it is important to understand how angler values are affected. In recent years, stated preference (SP) methods have been employed to evaluate the effect harvest restrictions have on recreational fishing values (e.g., [5,14,15,1]). Stated preference methods use responses to carefully-constructed questions, generally asked in a survey, to provide information about people's preferences and values [11,2,21]. Since fisheries managers are often interested in the effects from angler harvest regulations that have yet to be implemented, it is not possible to collect data on observed behavior related to angler responses to new regulations, which precludes the use of revealed preference (RP) methods like the travel cost model (e.g., [4]).

One particular type of SP method, the choice experiment (CE), has increasingly been favored by researchers interested in valuing the effects of angler harvest regulations due to its flexibility for providing economic value information across a range of potential policy changes. A typical CE question presents a survey respondent with a choice between two or more alternatives (e.g., fishing trip options) that are described in terms of several attributes (e.g., trip cost, regulations, fish targeted), one or more of which are policy variables (e.g., bag or size limits). Commonly, each survey will contain multiple CE questions that differ in the levels of the attributes that make up each option. Responses to these CE questions are analyzed using random utility maximization (RUM) models [17] and the estimated model can be used to generate estimates of the marginal value of changes in the attributes.

In the United States, CE studies have been applied to value the effects of regulatory changes on summer flounder fishing in the U. S. Northeast region [18], Pacific salmon fishing in Oregon and Washington [1], and grouper, red snapper, dolphinfish, and king mackerel fishing in the U.S. Southeast region [5]. In addition, several studies examining the effects of bag limit changes on pre-2007 Pacific salmon and Pacific halibut saltwater fishing in Alaska have been conducted [13,14,7]. The CE approach has also been employed to value recreational fishing outside the United States (e.g., [12]; [9]).

This article investigates how economic values for charter boat fishing trips are affected by different angler harvest regulations, specifically bag and size limits. Using CE data from a 2012 survey

[2] This is intended to protect the female spawning biomass [22].