A Review of Charter Halibut Management Measures

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October 6, 2011

Introduction

In June 2011 the North Pacific Fishery Management Council requested a discussion paper on potential management measures that could replace the most restrictive measure under the proposed Catch Sharing Plan (CSP) for the charter and commercial Pacific halibut sectors[1]. The Council proposed a daily harvest (bag) limit of one-fish of a maximum size under the lowest tier of halibut abundance to limit the harvest in the charter halibut sector to its proposed allocations in Southeast (Area 2C) and Southcentral (Area 3A). The Council determined it to be the best option to constrain charter halibut harvests under Tier 1 of the proposed halibut CSP at the time it was adopted by the Council in October 2008. Since then the halibut stock in the two areas have seen a steep decline compared to stock projections in the Council's CSP analysis and commercial catch limits were cut drastically. A restriction that limits charter halibut anglers in Southeast to one fish of a 37-inch maximum size was implemented by NMFS in 2011 based on a recommendation by the International Pacific Halibut Commission (IPHC), which used a maximum length methodology in the proposed CSP to guide its selection of the measure it determined was needed to keep the charter sector to its Guideline Harvest Level (GHL) of 788,000 lb. Southcentral Alaska has remained under a 2-fish (of any size) bag limit since its GHL of 3.65 M lb was implemented however it too could be placed under a reduced bag limit if its GHL undergoes a (step-down) reduction. The GHL would be reduced to 3.103 M lb if the annual total constant exploitation yield for halibut in Southcentral Alaska is determined by the IPHC to be between 19,042,000 lb and 21,581,000 lb.

Staff has projected that the charter halibut sector would have been under a one-fish of any size bag limit in Southcentral Alaska if the proposed CSP had been implemented in 2011. Stakeholders, both charter halibut limited entry permit (LEP) holders and charter halibut anglers, have reported to the Council and NMFS that this measure has had severe negative effects on charter halibut LEP holders, their businesses and related tourism businesses, and their willingness to pay, respectively, in Southeast Alaska. A similar measure likely would have similar effects in Southcentral Alaska.

In response to stakeholder concerns, the Council created a stakeholder committee in June 2011 and appointed its membership in August 2011. The Charter Management Implementation Committee was tasked with identifying potential management measures that could be considered by the Council as an alternative to the one fish of a maximum size daily bag limit, including measures that would be in combination with a one fish of any size daily bag limit. The Council has noticed the public that any proposed change would occur as a trailing regulatory amendment and would not affect implementation of the proposed CSP.

This discussion paper reviews past analyses of potential management measures to restrict the harvest in the charter halibut fishery and concludes that there is no single option that can control charter halibut demand in all situations. The paper is intended to assist the Charter Management Implementation Committee in its exploration of alternative management measures during its October 26, 2011 meeting. The committee will report its recommendations to the Council in December 2011.

On September 29, 2011 NMFS informed the Council that it would not proceed with implementation of the proposed CSP until the Council provided additional guidance on several issues that were identified during the public comment period on the CSP proposed rule[2]. Therefore the charter sectors in Southeast and Southcentral Alaska will remain under the GHL program in 2012. NMFS strongly encouraged the

[1] http://www.alaskafisheries.noaa.gov/prules/76fr44156.pdf
[2] http://www.alaskafisheries.noaa.gov/newsreleases/2011/halibut092911.htm

Council to schedule time at an appropriate meeting to consider developing guidance to the IPHC for 2012 halibut management. NMFS encouraged the Council to consider the existing GHL and the suite of management measures developed under the proposed CSP to manage the charter halibut fleet within its GHL. The IPHC will meet in Anchorage in January 2012 to set fishing levels and management measures for halibut along the Pacific Coast.

Background

Since the early 1990s when the North Pacific Fishery Management Council (Council) first began studying the growth of the charter halibut sector in the Gulf of Alaska (GOA) and through the 2000s when a number of management programs failed to maintain charter halibut removals to target levels, the Council has been challenged with developing effective management tools to limit these harvests. To complement a guideline harvest level (GHL) program that set target levels of charter halibut removals in 2004, two major policy initiatives are changing the landscape for the charter halibut sector in 2011. A charter halibut limited entry program (LEP), which paired the issuance of transferable and non-transferable permits based on past and recent participation in the charter halibut sector with issuance of new permits to certain Gulf coastal communities with underdeveloped charter halibut components, was implemented in 2010 and permits were required in 2011. Many in the charter fleet felt that the LEP would reduce angler effort and aid in restricting harvest to the charter sector's GHL program despite conclusions in the Council's analysis that a reduction in the number of active vessels would still provide adequate capacity. A number of factors, including 1) two reductions in the GHL for Southeast Alaska, caused by 2) large reductions in halibut biomass, also confounded that contention.

The Council quickly followed the LEP with a Catch Sharing Plan (CSP) that would 1) set the allocation to the charter sector based on 125 percent of the 2001-2005 average charter harvest [also the GHL formula updated through 2005]) and 2) hold the sector accountable to stay at or below that allocation through a tier system of management measures that would be paired with halibut biomass and charter sector allocations in Southeast (Area 2C) and Southcentral (Area 3A) Alaska. The Council adopted the CSP to resolve conservation and allocation concerns that have resulted from 1) increased harvests in the charter halibut fishery in both areas, 2) continued overages of the GHL in Southeast, and 3) decreased catch limits in the commercial setline fisheries in both areas. A public comment period on the proposed rule closed on September 21, 2011,[3] after which a final rule and decision by the Secretary of Commerce is expected by January 2012.

The CSP would 1) replace the current GHLs with a percentage allocation; 2) set initial allocations for both the commercial and charter sectors; 3) implement management measures to limit charter harvests to their respective allocations; and 4) allow charter halibut LEP holders to lease halibut individual fishing quota (IFQ) from commercial quota share holders, to increase their seasonal allocations for use by their clients. The CSP would require pre-season notice of upcoming management measures to allow an uninterrupted charter season.

The Council intends that the allocations to both sectors vary with halibut abundance; hence, allocations to both commercial and charter sectors are set as a fixed percentage. The initial charter sector allocation would be 17.3 percent of the Area 2C combined commercial and charter catch limit when the combined limit is determined by the International Pacific Halibut Commission (IPHC) to be less than 5 million pound (Mlb); the allocation would be 15.1 percent (equal to the 2005 charter harvest) when the combined catch limit is 5 Mlb or more. The initial charter sector allocation would be 15.4 percent of the Area 3A combined catch limit when it is determined by the IPHC to be less than 10 Mlb; the allocation would be 14 percent when the combined catch limit is 10 Mlb or more.

The Council selected a different percentage of the combined catch limit in each area. The CSP would also identify specific management measures that would be triggered at different combined catch limits and

[3] http://www.regulations.gov/#!documentDetail;D=NOAA-NMFS-2011-0180-0744

identifies a market-based approach for individual charter LEP holders, who would be willing buyers, to increase the charter sector allocation by compensating individual commercial IFQ holders, who would be willing sellers, for their transferred IFQs. The CSP would include a prohibition on retention of charter halibut by skippers and crew onboard under all allocations and triggers in both areas to prevent those fish from counting against the charter allocation.

The allocations for the lowest tier of combined catch limits used the same formula selected by the Council to set the GHLs. These percentages were the highest charter percentage allocation options that were considered by the Council and would yield the largest projected gross revenue of those considered for the charter sector each year. The allocations at higher combined catch limits are based on 125% of the 2001 – 2005 average charter harvest (GHL formula updated through 2005) and are the second highest percentage allocation options for each area that were considered by the Council. At the time that Council adopted these allocations in 2008, the analysis projected that these allocations would exceed projected future harvests and that more restrictive management measures would not be required. Since then, the IPHC has set commercial catch limits that are considerably lower than those set for 2008 because exploitable biomass has declined. While there are high numbers of halibut, for unknown reasons they have not grown to a size where they are large enough to contribute to the fishable biomass. As a result in 2011, the combined catch limit in Area 2C would have been about 3.12 Mlb, putting Area 2C in Tier 1. The combined catch limit would have been about 18 Mlb in Area 3A in 2011, putting it in Tier 2.

The Council passed the CSP with a vote of 10:1. The proposed halibut allocation under the CSP was selected after a lengthy public process that started in 1993 and included: 1) four stakeholder committees; 2) a dozen analyses of proposed management programs, including guideline harvest levels; 3) a program to include the charter halibut sector into the commercial halibut Individual Fishing Quota Program (which would have been the first in the world for a recreational fishery), and was submitted to the Secretary of Commerce (before a third vote against the proposed program was successful); and 4) days of public testimony for each of the Council actions. The Council has stated that it does not intend to revisit the sector allocation and that only a market-driven, compensated reallocation between the sectors through the GAF program can address the need for greater allocation to the charter sector (through willing buyer/willing seller transactions).

Alaska is not alone in responding to decreased halibut biomass and catch limits. Washington State is managing its recreational halibut fishery with limits of one halibut per day and two in possession, with openings between 9 days and 49 days depending on the available harvest and location fished. Oregon uses similar measures, but has an annual limit of six halibut per year. In British Columbia, the recreational halibut fishery has limits of one halibut per day and two in possession (there is no annual limit), and the season was open for 260 days in 2010. The Canadian government recently announced an unprecedented closure of its recreational fisheries on September 5, 2011. Sport fishing for halibut after the closure will be allowed under an experimental fishery permit program in which operators can lease fish from commercial individual quota shareholders, similar to the Guided Angler Fish program under the CSP. Proposed allocations under the CSP compare favorably to Canada's 88%:12% halibut allocation.

The current IPHC stock assessment revised the 2010 total exploitable biomass estimate of 334 Mlb provided at the start of 2010 downwards to 275 Mlb, and projects an increase of 16 percent over that value to arrive at the 2011 value of 318 Mlb. Female spawning biomass of Pacific halibut is estimated at 350 Mlb at the start of 2011. This biomass is an increase of nearly 6 percent over the beginning of 2010 estimate of 331 Mlb. Ongoing declines in size-at-age, which strongly affect selectivity-at-age, caused the downward revision in total exploitable biomass. Projections based on current age compositions suggest that both exploitable and spawning biomass will increase over the next several years as several strong year classes recruit to the fishable and spawning components of the population. These projected increases are tempered both by potential ongoing decreases in size-at-age, as well as realized harvest rates which continue to be above target in several regulatory areas (e.g., Area 2C).

The methodology used to estimate recreational halibut catch data was peer-reviewed and approved by the Council's Scientific and Statistical Committee in 2001 and 2008. The U.S. has used this methodology to report recreational harvests to the IPHC and meet its international obligations under the halibut treaty with Canada.

The Council is required to prepare rigorous, peer reviewed economic analyses for each change to halibut fishery regulations. These requirements include Executive Order 12866 the Regulatory Flexibility Act to assess economic impacts of the proposed action on small entities. Answering detailed questions about the economic effects of allocation between the charter sector and commercial IFQ sector requires a very specific and complex set of economic analyses that captures the net national benefits and defines local and regional economic effects. The results of such an analysis would be highly controversial and the analysis would have to be redone whenever inputs into the analysis change (e.g., fish prices, angler demand, energy prices). Collection of these data would be costly, and the time lag between collection of the data and completion of the analysis likely would mean the results are outdated when the analysis is published. Even if attempted, the estimates may be insufficient, for allocation purposes, to address the question of best economic use. Instead the Council has identified market-based transfers between commercial and recreational fishing interests (e.g., its withdrawn charter IFQ program, its proposed CSP, or its proposed GAF program (part of the proposed CSP)) as the means to allocate the halibut resource to its "best use." Catch share programs allow individuals to determine the "best use" of halibut for their fishing operation, and harvest privileges tend to flow to the individuals that place the highest value on them. To date, transfers are limited in volume and duration between commercial halibut harvesters only. The CSP would allow one way, annual transfers of allocation from commercial IFQ holders to charter LEP holders.

Charter Management Implementation Committee

In June 2011 the Council requested a discussion paper on alternative management measures for the charter halibut sector under the proposed CSP in times of low abundance (Tier 1) to reduce uncertainty and mitigate negative economic impacts of the current CSP measure: one fish of a maximum size. The Council formed a Charter Management Implementation Committee and charged it to recommend management measures to replace the current proposed measure under Tier 1. The committee will review this discussion paper during its October 26, 2011 meeting; committee recommendations will be considered by the Council at a subsequent meeting (tentatively identified as December 2011).

Previously Considered Measures

This section describes measures considered by the Council between 2005 and 2008. In all, during this period the Council considered more than 30 discrete options and combinations of options for managing charter halibut harvests in Area 2C and 3A. At times, such as in 2005, the Council chose to take no action in either area beyond initial review. At other times, such as in the 2007 Area 2C analysis, the Council chose to move from initial review to final action and increased the number of considered management measures by combining measures in the analysis between meetings.

In general, the many discrete management measures considered by the Council can be aggregated into a handful of management themes. The themes considered by the Council range from controlling the number of trips per day by vessel, to size restrictions, to annual harvest limits and season restrictions. The Council rejected nearly all of these management measures before settling on a preferred alternative (i.e., the two fish daily bag limit with one fish less than 32 inches in length) in Area 2C in June 2007; the Council then went on to incorporate some of these measures in its proposed Catch Sharing Plan (affecting both areas) in 2008. Figure 1 evaluates the various management themes presented before the Council between 2005 and 2007.

During 2005-2007, the Council found that most of the management measures presented had significant weaknesses in aiding the Council to address its problem statement(s). The exceptions to this were the

"Skipper and Crew Ban" and "Maximum Size" measures. With biomass declining in Areas 2C and 3A, the Council included variants of the one-fish bag limit into the CSP for use during periods of exceptionally low abundance. In the absence of implementation of the CSP for 2011, as had been anticipated, the IPHC recommended a bag limit of one fish of a maximum 37 inches for Area 2C in 2011, using the Council's proposed CSP matrix of management measures to address continued GHL overages in Southeast. Had the CSP been implemented in 2011, it may have called for a one-fish bag limit (of any size) in Area 3A; or it may have called for implementation of a 2 fish bag limit, with one fish < 32 inches, depending on assumptions used in the projection of harvest under a one fish bag limit. Public response to the effects of the reduced bag limits in both areas has resulted in the Council's direction to consider other management options under Tier 1 conditions.

Figure 1. Evaluation of Previously Proposed Management Measures

General Measure/Weakness	One Trip per Day	Skipper and Crew Ban	Annual Limits	Minimum Size	Maximum Size	Reverse Slot	1 Fish Bag-Shoulder Season	1 Fish Bag-Peak of the Season	1 Fish Bag-Full Season
Not Effective Enough	●	Periodically Enacted by ADF&G and/or NMFS	●		Enacted in Area 2C in 2007	●	●		
Effect of Option Easily Diluted by Changes in Behavior	●						●	●	
Potential for Increased Mortality				●					
Difficulty Measuring Larger Fish				●					
Reduce Harvest by Too Great an Amount								●	●
Economic Effects on Charter Industry								●	●
Economic Effect Falls on A Small Number of Businesses	●								
Does Not Eliminate State EO Banning Skipper & Crew Fish			●						

Source: (NPFMC 2005; Northern Economics 2006; NPFMC 2007; NPFMC 2007)

Individual Measures

This sub-section discusses previously considered measures on an individual basis. In 2007, many of these options were discussed in combination with each other. This draft, however, does not discuss the combined options as part of the discussion. Moreover, it is important to remember that the effects of the management measures are not additive, as very often there are combined effects between management measures. For example, the estimated effect of prohibiting skipper and crew harvest plus placing a maximum size on the second fish is less than the sum obtained from adding the estimated individual effect of each option, as skipper and crew harvest was included in the baseline of many of the "maximum size" estimates.

Daily Trip Limits

The Council considered restricting charter halibut vessels to one trip per day in both Areas 2C and 3A in 2005 and 2007. The Council's analysis in 2005 estimated that the management measure would reduce harvest by less than one percent in Area 2C and between 3.1 percent and 6.4 percent in Area 3A. In 2007, the Council's analysis estimated that the measure would reduce harvest by between 1.8 and 2.4 percent in Area 2C and between 5.5 percent and 6.3 percent in Area 3A. The expected increased in the efficacy of the measure between 2005 and 2007 reflected the growth in the number of clients taking "half day" charters.

Table 1 Estimated Maximum Effect of Daily Trip Limits in Areas 2C and 3A

	Estimated Harvest Reduction (%)	
Year	Area 2C	Area 3A
2005	0.3-0.9	3.1-6.4
2007	1.8-2.4	5.5-6.3

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

- The Council declined to adopt this option for a number of reasons, including: The Council's analysis expressed concern that there was enough latent capacity in the industry for the majority of displaced passengers to find replacement seats on other trips vessels, thus significantly diluting the measure's effect. The Limited Entry Permit Program has reduced the amount of latent capacity compared to peak historic demand, but the Council could reevaluate the potential efficacy of this management measure under current conditions.
- Table 1 shows that the measure would have had little effect on reducing charter harvests but would have had distributional impacts on only those ports where half day charters predominated. Half-day charter operations are geographically concentrated in both Areas 2C and 3A. In Area 2C the half-day option is concentrated in communities frequented by large cruise ships (e.g., Juneau, Sitka, and Ketchikan). In Area 3A, the half-day model is limited to Cook Inlet waters where halibut grounds are located very close to the port of Homer and the beach launch operations at Deep Creek and Anchor Point. The Council's analysis expressed concern about the burden of the management measure falling on a small number of vessels in a limited geographic area.

Ban on Skipper and Crew Harvest

Over the last five years, the Alaska Department of Fish and Game (ADF&G) and/or the National Marine Fisheries Service have implemented a prohibition on retention of halibut by skipper and crew of charter halibut vessels as a management tool to control harvest in Area 2C. Prior to 2006, it was customary for skipper and crew of charter halibut vessels to be able to catch and keep halibut alongside their paying customers. For many charter operators and their employees, the ability to catch and keep halibut effectively increased the wages associated with their jobs, as they were able to replace store purchases of protein with self-caught halibut. At the same time, these halibut also provided the charter businesses with a form of insurance and way to increase customer loyalty if all anglers did not catch their bag limits. If clients did not catch their daily bag limits on the trip, the skipper and crew of some businesses were able to gift their catch to the client. Prior Council analyses show that this practice was more common in some geographical areas than in others (NPFMC, 2005a).

The Council considered the prohibition of halibut retention in skipper and crew in both 2005 and 2007. In 2005, the analysis estimated that banning skipper and crew from harvesting halibut would reduce the overall halibut harvest between 3.3 percent and 4.6 percent in Area 2C. The 2007 analysis provided a very similar estimate. For Area 3A, the 2005 analysis estimated a potential harvest reduction of 7.7 to 10.5 percent and the 2007 analysis corresponded with the upper end of the range.[4]

Table 2 Estimated Maximum Effect of Prohibiting Halibut Retention by Skipper and Crew in Areas 2C and 3A

	Estimated Harvest Reduction (%)	
Year	Area 2C	Area 3A
2005	3.3-4.6	7.7-10.5
2007	3.3-4.5	10.4

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

[4] ADF&G's logbook program allowed for the creation of a point estimate in 2007.

In Area 2C, ADF&G banned skipper and crew from harvesting any species while guiding saltwater fishing clients in 2006 and 2007 via Emergency Order (EO).[5] A federal rule prohibiting halibut retention by skippers and crew in Area 2C also occurred in 2007. In 2008, ADF&G did not reissue its emergency order (as federal rulemaking included the measure) but a court injunction halted proposed federal rules. From 2009 and onward, federal rules continued to ban halibut retention by skipper and crew. In Area 3A, ADF&G issued EOs in 2007, 2008, and 2009 prohibiting skipper and crew harvest on saltwater charters. However, the state did not renew these EOs in 2010 or 2011 because charter halibut harvests had declined sufficiently to allow such retention (which accrues against the GHL). If charter halibut harvests were estimated to exceed the Area 3A allocation the State of Alaska could ban this practice again by EO.

Banning the retention of skipper and crew-caught halibut has generally been seen as a first step towards managing charter halibut harvests because the measure has no effect on the client experience except in the instances where an operator or crew member might have gifted their fish to the client. In general, the measure had a limited effect on the operators' business models. During the preparation of the 2005 and 2007 analyses, charter operators mentioned the effect the ban would have on their households and their crewmembers' households, but were generally more supportive of this management measure than other measures.

Annual Harvest Limits

The Council considered enacting an annual harvest limit on anglers during its 2005 and 2007 deliberations. In 2005, the Council considered the effects of 6-fish and 5-fish annual limits in Area 2C only. The Council analysis estimated that these measures would reduce harvest by 7.0 to 8.3 percent and 12.2 to 13.7 percent, respectively. The Council did not consider the effects of an annual limit on anglers in Area 3A during 2005. In 2007, however, the Council considered the effect of an annual limit in both areas and added a 4-fish annual limit for consideration. In Area 2C, the effect of these estimates ranged from a 4.3 percent reduction for a 6-fish annual limit to a 16.4 percent reduction for a 4-fish annual limit. This estimated effect includes only the reduction associated with including client catch as the analytical status quo in Area 2C at the time included a ban on the skipper and crew harvest and there is a significant interaction between skipper and crew harvest and the effects of an annual limit. In Area 3A, the 2007 analysis estimated that the annual limits would reduce harvest between 10.7 percent and 15.3 percent. This estimate included the effect on client, skippers, and crew.

Table 3 Estimated Maximum Effect of Annual Harvest Limits in Areas 2C and 3A

	Estimated Harvest Reduction (%)					
	Area 2C			Area 3A		
Year	6-Fish	5-Fish	4-Fish	6-Fish	5-Fish	4-Fish
2005	7.0-8.3	12.2-13.7	N/A	N/A	N/A	N/A
2007	4.3	9.3	16.4	10.7	12.9	15.3

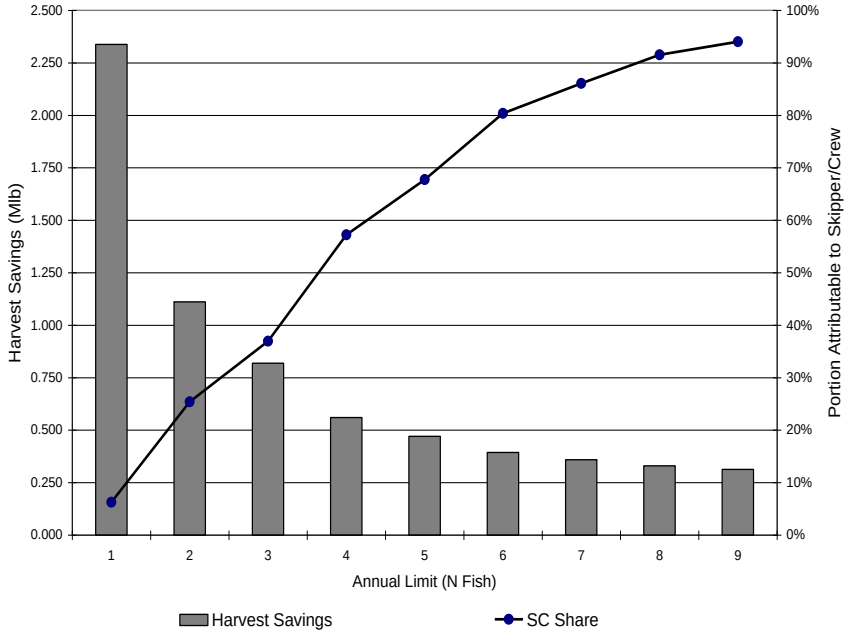
Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)
Note: Area 2C estimates for 2007 are "client only" estimates. The Area 3A estimates and the 2005 estimates for Area 2C include both clients and operators/crew.

The Council declined to enact an annual limit for a number of reasons, including:

- In 2005, the Council took no action overall to address overages in the first year of the GHL program and adopted a "wait and see" approach to managing the fishery until the next year's evaluation.

[5] A side effect of the state's Emergency Order was that the ban on retention of fish by skipper and crew during a saltwater charter had to be applied to all species because the state lacks authority to regulate halibut specifically. Thus, the EO prevented operators and their employees also from harvesting salmon, ling cod, rockfishes, etc.

- In April 2006, the Council adopted a motion for an annual limit of 5 halibut per angler in Area 2C. NOAA reported back to the Council in June 2006 that "current Federal and State laws do not allow the use of state reporting documents by Federal enforcement personnel for the Council's preferred alternative to implement a 5-fish annual limit for charter anglers in Area 2C. Instead of State reporting documents, NOAA determined that the proposed limit would require a Federal charter vessel halibut angler permit and a charter vessel halibut logbook. The costs for implementing Federal reporting could be substantial, and redundant to state reporting requirements" The issue of Federal reporting via the logbook may now be resolved given that draft Federal regulations for the Catch Sharing Plan required certain data be recorded within State Logbooks.
- In 2007, the Council recognized that there was a significant interaction between the issue of crew harvest and the annual limit management measure (see Table 4 and



- Figure 2). For example, the 2007 analysis for Area 3A noted that up to 80 percent of the harvest associated with anglers who kept more than six fish annually belonged to skipper and crew. Even at the 4-fish annual limit level, nearly 60 percent of the management measure's saving would be associated with reduced harvest by skipper and crew. Since ADF&G had moved to prohibit skipper and crew harvest to Area 2C in 2006 and Area 3A in 2007 (and NMFS appeared ready to enact such a measure in the future), the Council recognized that much of the benefit of this type of management measure had already been gained by banning operator harvests.

Table 4 Effect of an Annual Limit on Charter Industry Halibut Harvest in Area 3A

Measure	Harvest Reduction Expected	Percentage Points Attributable to Crew	Percentage Points Attributable to Clients	Total Portion Attributable to Crew
Four Fish	15.3%	8.7%	6.6%	57%
Five Fish	12.9%	8.7%	4.2%	67%
Six Fish	10.7%	8.6%	2.1%	80%

Source: (NPFMC, 2007a)

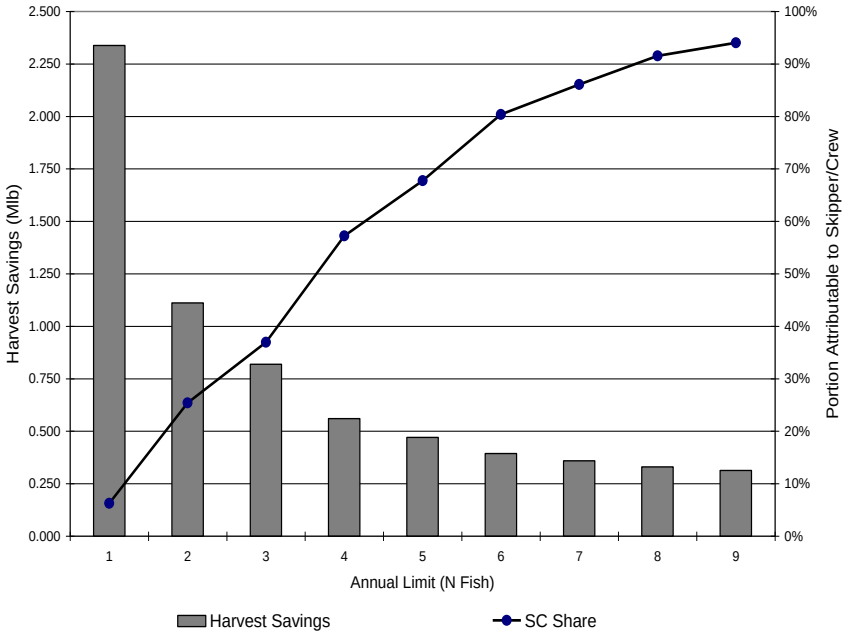


Figure 2. Area 3A Relationship between Annual Harvest Limit and the Portion of the Savings Coming from Crew Bans.

- Lastly, the Council recognized that in a limited manner anglers could skirt the annual limit ban because of the structure of the state's angler licensing and catch recording system. Alaska issues paper licenses to anglers annually, who must record their catch of species with annual limits on the reverse sides of these licenses at the time of harvest. The state has no individualized record of these catches except that which the anglers record on their license. If anglers were to "lose" their license after harvesting an annual limit they could acquire a clean replacement license at any time and no record of their prior harvest would exist.

One Fish of Any Size with a Minimum Size Limit

In 2007, the Council considered limiting anglers to one fish of any size and one fish measuring at or above selected minimum lengths. Setting a minimum size limit to incorporate only fish of a relatively large and uncommon size would reduce harvests by lowering the portion of anglers who were able to keep a second fish. In this case, the Council directed staff to analyze the effects of 45-inch and 50-inch minimum lengths. The analysis indicated that:

- the 45-inch minimum length would reduce harvest by 19.2 to 27.4 percent in Area 2C and 32.5 to 39.3 percent in Area 3A;
- The 50-inch minimum length would reduce harvest by 23.5 to 31.3 percent in Area 2C and 36.9 to 43.3 percent in Area 3A

In both cases, the higher-end estimated effect included a 10 percent assumed reduction in demand, as many anglers would be unlikely to catch a second fish. Based on interviews, the analysis presumed that this measure would most likely affect demand from resident anglers who target fish with the best eating characteristics and have less effect on trophy anglers.

The analysis also noted that this measure likely would be more effective at reducing harvest in Area 3A because a higher portion of anglers in Area 3A catch and keep a second fish. At the time of the analyses, second fish in the daily bag limit accounted for just less than 40 percent of the harvest in Area 2C while

accounting for over 47 percent of the harvest in Area 3A. Although charter anglers are more likely to keep a second fish in Area 3A, they are less likely to catch a fish that is greater than 45 or 50 inches in length.

Table 5 Estimated Effect of a Minimum Size Limit on the Second Fish in Areas 2C and 3A

	Estimated Harvest Reduction (%)	
Minimum Size of the Second Fish	Area 2C	Area 3A
>=45 Inches	19.2-27.4	32.5-39.3
>=50 Inches	23.5-31.3	36.9-43.3

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

The Council rejected these management measures for a number of reasons:

- In both Areas 2C and 3A, ADF&G, the IPHC, and operators expressed concern for increased discard mortality from fish that otherwise would have been kept under the existing regulations.
- In both Areas 2C and 3A, the public and operators expressed concern about the feasibility of measuring large fish while at sea. A 50-inch halibut weighs approximately 60 pounds in the round. These fish are occasionally dispatched using gaffs, harpoons, and firearms before being brought into charter vessels. Operators testified that measuring these fish at sea prior to subduing them would be difficult and potentially unsafe.
- In Area 3A, the management measure would have reduced charter harvest by an amount far greater than the Council's stated goal.

One Fish of Any Size with a Maximum Size Limit

In 2007 the Council staff analyzed the effect of a maximum size limit on the second fish in an angler's daily bag limit. The Council reviewed three different maximum lengths: 32 inches, 34 inches, and 36 inches. The analyses found that in all cases the length limits were projected to reduce harvest by more than ten percent even without the inclusion of a reduction in angler demand for trips. The primary mechanism for the harvest reduction was the reduction in the average weight of the second fish compared to the existing average weight in the fishery. For example, a 32-inch halibut has an average dressed weight of approximately 10.7 pounds per the IPHC's length/weight relationship equation, but the average dressed weight in the Area 2C and 3A fisheries was frequently between 16 and 20 pounds. Thus, the analysis concluded length restriction had the potential to substantially reduce the average weight of the second fish. The analyses also found that the measures would likely result in a higher percent reduction in harvest in Area 3A than in Area 2C because Area 3A anglers have historically had a higher success rate at harvesting second fish.

Table 6 Estimated Effect of a One Fish of Any Size with a Maximum Size Limit in Areas 2C and 3A[6]

	Estimated Harvest Reduction (%)	
Size of the Second Fish	Area 2C[7]	Area 3A[8]
Less than or Equal to 32 Inches	18.8-25.4	20.2-26.9
Less than or Equal to 34 Inches	N/A	17.0-23.3
Less than or Equal to 36 Inches	N/A	13.7-20.3

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

In Area 2C the Council adopted the 32-inch length limit as part of a package to reduce charter halibut harvest. The package also included line limits and a restriction on harvest by skipper and crew during paid charters. The final analysis submitted to NMFS indicated that the Council expected the measure to reduce harvest by between 18.8 and 25.4 percent overall. The Council considered all three maximum size limit options for Area 3A, but declined to advance the analysis to the final review stage.

One Fish of Any Size with a Reverse Slot Limit

In 2007 the Council asked staff to analyze the effect of a reverse slot limit where anglers could only keep a second fish above or below a specified size limit. This management measure was quickly discounted as a possibility for both Area 2C and Area 3A, as the analysis found that the narrower reverse slot limit (in both areas) and the wider slot limit (in Area 3A) actually had the potential to increase harvest weight. The results indicated that fish between 32 inches and the upper slot limit would be replaced with fish above the upper end of the slot limit. The halibut length-weight relationship is non-linear and each one-inch increase in length results in an increase in weight that is proportionally greater than the increase in length.

Table 7 Estimated Effect of a Reverse Slot Limit on the Second Fish in Areas 2C and 3A

	Estimated Harvest Reduction (%)	
Size of the Second Fish	Area 2C	Area 3A
<=32 Inches or >=45 Inches	(0.3)-7.5	(6.4)
<=32 Inches or >=50 Inches	0.2-9.5	(0.1)

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

One-Fish Bag Limit

In 2007, the Council analyzed and considered the effects of instituting a one-fish bag limit across all or a portion of the charter halibut season in both Areas 2C and 3A. Charter halibut harvest is concentrated in a five month period running from May to September with harvest peaking in July. A tiny portion (≤1 percent) is harvested outside of this period. As an example, Figure 3 and Table 8 show the distribution of "second fish" in the charter angler harvest in 2006 in Area 2C.

[6] The upper bound estimate presumes that anglers catch the average fish under 32" in length based on catch composition in years prior to the analysis while the lower bound assumes anglers are able to high grade their catch right to the limit. Area 2C estimates include the assumption of a ban on skipper and crew harvest.
[7] Estimates for Area 2C come from the secretarial review draft of the Council's 2C action. The 34-inch and 36-inch options were dropped as analytical options between final action and the secretarial review draft. Thus, no comparable estimates for 34-inch and 36-inch length limits are available for this table.
[8] Does not include a ban on skipper and crew harvest.

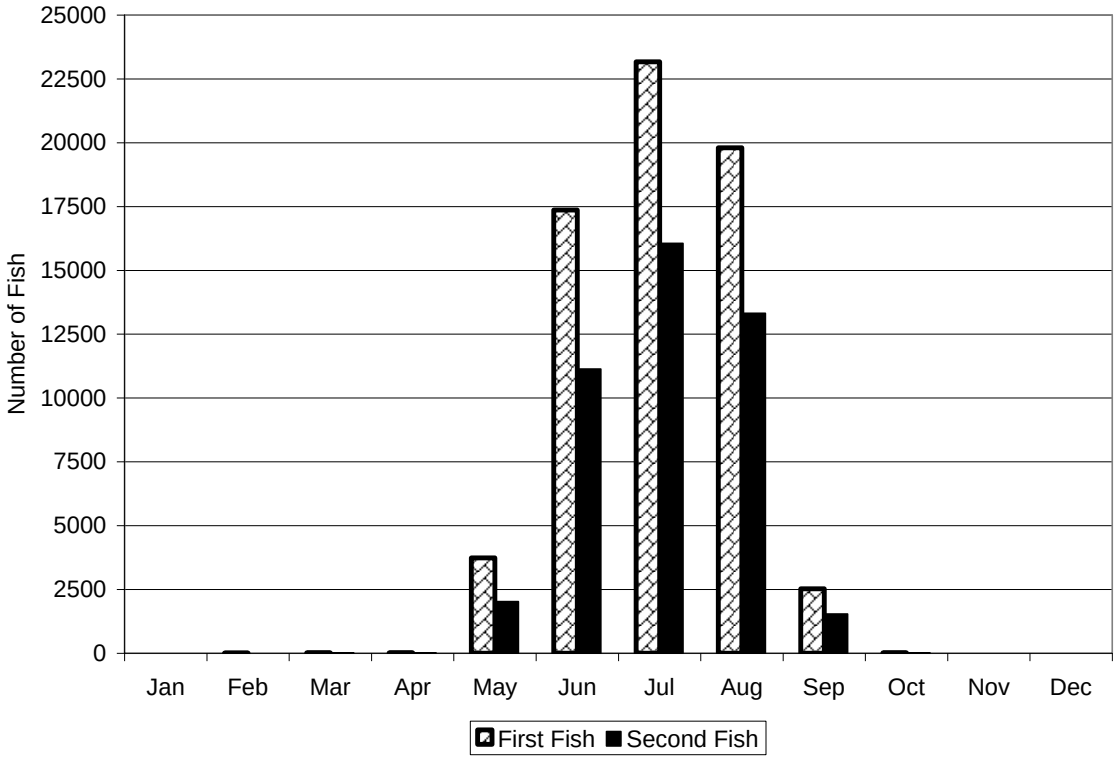


Figure 3 Distribution of Area 2C Harvest Halibut by Number of Fish, 2006
Source: (NPFMC, 2007b)

Table 8 "Second" Fish as Portion of Area 2C Charter Angler Harvests, 2006

Month	Area 2C				
	Harvest of "First" Fish	Harvest of "Second" Fish	Total Harvest	"Second" Fish as a Percentage of Annual Harvest	"Second" Fish by Weight
Jan	0	0	0	0.0	0.00
Feb	4	0	4	0.0	0.00
Mar	15	10	25	0.0	0.00
Apr	18	12	30	0.0	0.00
May	3,616	1,955	5,571	1.8	0.037
Jun	16,813	10,780	27,593	10.1	0.206
Jul	22,435	15,553	37,988	14.5	0.295
Aug	19,177	12,893	32,070	12.0	0.244
Sep	2,445	1,486	3,931	1.4	0.028
Oct	15	14	29	0.0	0.00
Nov	0	0	0	0.0	0.00
Dec	0	0	0	0.0	0.00
Total	64,537	42,701	107,238	39.8	0.81

Source: (NPFMC, 2007b)

In both areas, the analysis of this management measure predicted the highest effect in July, August, and June with minor savings associated with closures in May and September (see Table 9). Both the Area 2C and Area 3A analyses included a 30 percent demand reduction in the upper end estimate of the measure's maximum estimated effect. This estimate is based on industry interviews Council staff conducted for the analyses. However, both analyses also strongly cautioned that the effect of a single-month closure would likely be diluted over time as anglers changed their travel and fishing patterns to adapt to the ban.

Table 9 Estimated Effect of a One-Fish Bag Limit in Areas 2C and 3A

IPHC Area	May	June	July	August	September	Full Season
2C	2.6-3.7	14.2-20.7	20.6-30.0	17.1-24.9	2.0-2.9	56.4-82.2
3A	5.0-6.6	12.4-16.5	17.8-23.8	9.9-13.2	1.8-3.3	47.1-62.9

Source: (NPFMC, 2005a; Northern Economics, 2006; NPFMC, 2007a; NPFMC, 2007b)

At the time of the analyses, the Council declined to adopt these management measures for a number of reasons: anglers could easily avoid the restrictions and some months could experience reduced harvests by more than the target amount. The Council cited economic effects on the charter industry and the potential for too great a reduction in harvest as the reason for rejecting the full season sub-option.

The one-fish bag limit as a full-season management measure returned in 2008 as part of the Council's CSP Preferred Alternative (see Table 10 and Table 11). This CSP is now under Secretarial review, but the 2011 Area 2C charter halibut fishery has been managed in accordance with the plan, as recommended by the IPHC (described above).

Table 10. Area 2C Proposed Management Regulations

Tier	Combined Catch Limit (Mlb)	Allocation	Charter Fishery Bag & Length limit Regulations		
			If projected charter harvest within allocation range	If charter harvest projected to exceed allocation range	If charter harvest projected to be below allocation range
1	<5	Comm alloc = 82.7% Charter alloc = 17.3% Charter range = 13.8-20.8%	One Fish ⇨	Maximum length limit imposed that brings harvest to 17.3%	One Fish
2	≥5 - <9	Comm alloc = 84.9% Charter alloc = 15.1% Charter range = 11.6-18.6%	One Fish ⇨	Maximum length limit imposed that brings harvest to 15.1%	Two fish, but one must be less than 32" in length
3	≥9 - <14	Comm alloc = 84.9% Charter alloc = 15.1% Charter range = 11.6-18.6%	Two fish, one must be less than 32" in length	One Fish	Two Fish
4	≥14	Comm alloc = 84.9% Charter alloc = 15.1% Charter range = 11.6-18.6%	Two Fish	Two fish, but one must be less than 32" in length	Two Fish

Table 11. Area 3A Proposed Management Regulations

Tier	Combined Catch Limit (Mlb)	Allocation	Charter Fishery Bag & Length limit Regulations		
			If projected charter harvest within allocation range	If charter harvest projected to exceed allocation range	If charter harvest projected to be below allocation range
1	<10	Comm alloc = 84.6% Charter alloc = 15.4% Charter range = 11.9-18.9%	One Fish ⇨	Maximum length limit imposed that brings harvest to 15.4%	One Fish
2	≥10 - <20	Comm alloc = 86.0% Charter alloc = 14.0% Charter range = 10.5-17.5%	One Fish ⇨	Maximum length limit imposed that brings harvest to 14.0%	Two fish, but one must be less than 32" in length
3	≥20 - <27	Comm alloc = 86.0% Charter alloc = 14.0% Charter range = 10.5-17.5%	Two fish, one must be less than 32" in length	One Fish	Two Fish
4	≥27	Comm alloc = 86.0% Charter alloc = 14.0% Charter range = 10.5-17.5%	Two Fish	Two fish, but one must be less than 32" in length	Two Fish

Common Pool

In October 2007, the Council requested a staff analysis of the potential for compensated reallocation to the commercial IFQ sector by the charter sector. This analysis included a discussion on the challenges of operating a common pool for the charter sector. In summary, the analysis found that all of the common pool options required legislative action at the state and/or federal level, as well as policy changes by the Council. The analysis found that the route requiring the least amount of administrative and legislative action would be through the creation of an individual-based management option. The Council therefore included such an option (Guided Angler Fish) in the proposed Catch Sharing Plan it adopted in 2008.

Element	Option	Common Pool Options			Individual Management Option
		Federal Common Pool	State Common Pool	Regional Non-Profit Association Common Pool	
Element 1.1	Holding QS	?	●	● ●	●
	Loan Programs	■	■ ●	■ ● (Public)	● (Private)
	Buyout Program	■	N/A	N/A	N/A
	Bonding	N/A	●	N/A	N/A
Element 1.2	Charter Stamp	■	●	N/A	● (Individual Business Revenue Stream)
	Sportfishing License Surcharge	N/A	●	N/A	
	Moratorium Permit Fee	■	N/A	N/A	
	Self-Assessment Fee	■	N/A	●	
	Business License Fee	N/A	●	N/A	

●=No regulatory or legislative change required
●=NPFMC regulatory change required
●=State legislative change required
■=Federal legislative change required

Figure 4 Noted Challenges in Operating a Common Pool
Source: (Northern Economics, 2007)

Other Measures

A decade ago the Council also considered the following measures that did not proceed past the analytical stage.

- super-exclusive registration

Super-exclusive registration would restrict a charter boat registered in one community or local area management plan (LAMP) from operating in another community or LAMP in the same year. This action would redistribute fishing effort and removals but would not be expected to constrain halibut removals. An analysis concluded that may, in fact, increase effort and removals because overcapitalization and overcrowding may motivate a particular charter vessel to relocate into a less crowded port.

- sport catcher vessel only area

Analysis of a sport catcher vessel only area to protect locally designated areas for sport (guided and non-guided) use only does not appear to reduce halibut removals, but may be a valid management tool to be included within a LAMP.

- sportfish reserve

A banking concept whereby surplus fish could be banked for use when insufficient allocation is available was rejected by the Council and IPHC for conservation reasons.

- possession limit

A reduced possession limit was determined to not be an effective management tool since most fishermen harvest only one or two halibut per year; however, NMFS implemented a Council recommendation to revise the possession limit to equal two daily bag limits.

Other Approaches

This section describes potential additional ideas for management measures that were not considered previously by the Council . No formal analysis exists for these options and no request has been made to ADF&G to acquire the data necessary to analyze them until they are considered by the committee, recommended to the Council, and adopted by the Council for further analyses.

Allocated Effort-Based Methods

The Council has discussed, although not formally analyzed, the concept of effort-based methods for controlling charter harvest. Many of the concepts for these methods came from discussions of the 2005/2006 Halibut Charter Stakeholder Committee. Effort-based methods can take a variety of forms: individual angler seats or trips, stamps, tags, or effort blocks. These methods would cap potential harvest by limiting overall effort as the amount of the harvest would be limited by the availability of seats, trips, days at sea, tags, etc. The benefit of effort limitation programs derives from the ability to minimize the disruptive effects of the measure on charter LEP holders and their businesses.

Under an effort-based system the Council would decide how charter halibut effort would be initially allocated to charter LEP holders. Similar actions within the commercial industry have usually been based on historical harvest within a qualifying period. The Council also would decide whether or not the amount of effort floated with biological abundance or was a fixed amount. At this point the issue of permanent or temporary transferability becomes an important issue. If the capped effort would not change with abundance and the initial allocation exceeds demand then the risk to existing LEP holders (and clients) is low. However, if the capped effort falls with abundance and the plan does not allow transferability then LEP holders may find themselves with the choice of operating with too few "seats" for example to cover their costs. If the unit of effort was transferable then LEP holders could choose to purchase/lease more "seats" or sell/lease their "seats" and put their business on hold for the year in the hopes of returning another year. Thus, the risk to LEP holders in periods of low abundance is higher without some form transferability.

The Stakeholder Committee also expressed concern about "when does an "effort unit" get used? This is more of an issue for an angler seat program than for a tag program. A tag gets used when a fish is harvested. An angler seat could get used when the boat leaves the dock, when bait touches the water, or when a fish is harvested. LEP holders previously have noted that being charged for an angler seat when the boat leaves the docks can result in foregone harvest and lost revenue if the boat is forced to turn back because of weather and the operator refunds the clients' money ((NPFMC, 2005b).

Some other issues (and potential opportunities) regarding these methods include:

- One of the issues that comes forth in many effort-based control systems is that during periods of low abundance the amount of allowed effort could decline. In cases of lower caps on effort, this scarcity relative to potential demand increases may find LEP holders charging higher prices for

their charters. In the end, some individuals may find themselves priced out of the market for available trips.

- One possible option for an effort-based system is to allow "effort stacking." In other words allowing charter operators to sell more than one "effort unit" per day to the same angler. For example, an angler could purchase a trip package that gave her two angler seats and the right to harvest twice the daily limit on a single one-day trip. This type of flexibility could add value in both a transferable and non-transferable system by allowing operators to create a "product" that is attractive to clients while allowing more flexibility in managing their costs. For example, assume that an angler seat day allowed the angler harvest one-fish of any size. The LEP holder may face reduced demand for these trips and lower net revenues if demand decreases (e.g., fewer anglers per trip). However, if he were allowed to market stacked trips he could charge more for the experience and take fewer trips on the water thus lowering overall costs.

Each of the types of methods to cap effort would require its own unique analysis, once the options were narrowed.

Traditional Slot Limits

A traditional slot limit would allow anglers to keep fish above a certain minimum size and below a certain maximum size. The key to making this management measure effective is to balance the competing considerations of providing anglers with a reasonable chance of harvesting an acceptable size halibut while also selecting minimum and maximum lengths that control harvest (see Figure 5). For example, selecting a relatively narrow slot would reduce angler harvest but could drive off angler demand for charter trips. A relatively wide slot would be less effective and could actually increase harvest if relatively small fish below the slot were replaced with larger fish in the slot. There is the potential for a slot limit with a higher minimum size to have the same effect. A relatively low but "wide" slot may provide more opportunities to harvest fish, but replace larger fish with smaller fish.

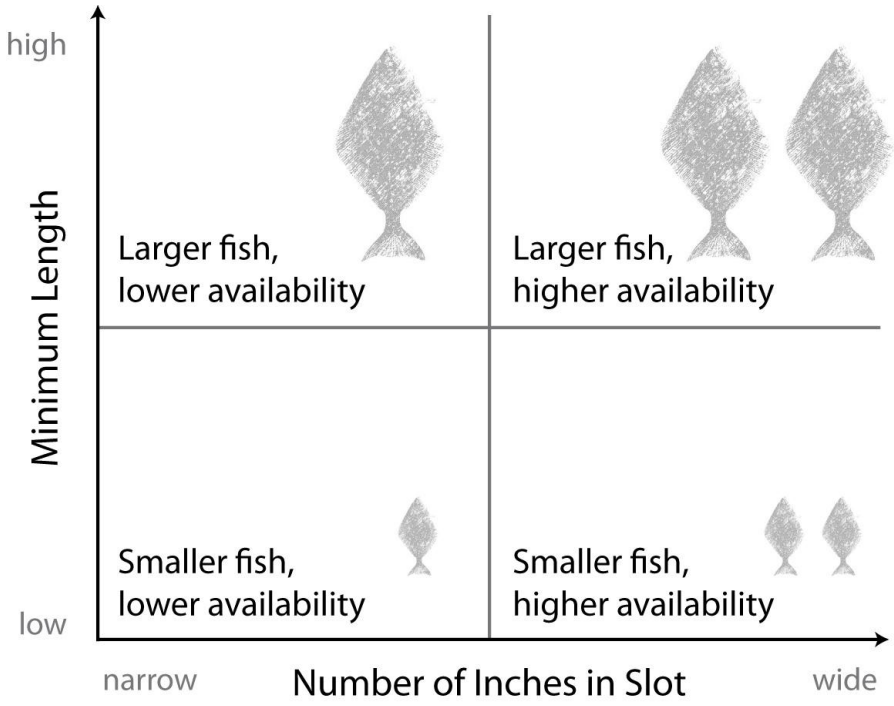


Figure 5 **Tradeoffs in Designing a Slot Limit** Source: Northern Economics, Inc 2011

Two Fish of Maximum Size

Public testimony after the CSP Preferred Alternative was selected proposed another option which has not been formally considered by the Council: establishing a two-fish daily bag limit, both of which must be less than (or equal to) a maximum length. On the surface, this management measure could result in substantial savings over historic harvest levels and could be preferred over other options. For example, in Area 3A the average charter-caught halibut has historically ranged from 17 pounds to 21 pounds: the equivalent of catching fish between 37 inches and just over 39 inches. A 34-inch limit would lower the average harvest weight to a maximum of 13 pounds, assuming all anglers caught 34-inch fish. All things being equal, such a limit would lower total harvest weight by a minimum of one quarter while preserving the ability of anglers to catch and keep two fish. It also has the potential for reducing angler demand by some unknown amount by removing the opportunity to harvest a large fish.

The committee may identify additional management measures for the Council to consider or identify previously rejected measures that may result in more favorable outcomes as a result of changed economic conditions and biological conditions of the halibut resource.

Other

The Committee is expected to propose additional approaches for Council consideration. Those described above cover those previously considered by the Council and its committees and some new approaches in this discussion paper. They are not intended to be an inclusive list that limits the committee or Council for potential future action. The Committee may recommend that the Council drop some of those included in this draft of the discussion paper and/or expand the paper to include other approaches. A second draft of the paper may be considered by the Council prior to initiating an analysis to revise the proposed halibut CSP Tier 1 measure.

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