

**Area 3A GHL Analysis
SUPPLEMENT**

September 26, 2008

This supplemental analysis updates analytical results contained in the *Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for a Regulatory Amendment to Implement Guideline Harvest Level Measures in the Halibut Charter Fishery in IPHC Regulatory Area 3A* issued by the North Pacific Fishery Management Council on August 28, 2008. The proposed action was initiated in October 2005, when the Council first reviewed Alaska Department of Fish and Game (ADF&G) Sport Fish Division data that indicated that the 2004 guideline harvest level (GHL) of 3.65 Milb had been exceeded. The Council took no action on an analysis of the 2004 GHL overage in April 2006 because the overage was less than 1 percent. In October 2007 the Council tabled an analysis of 2005 and 2006 GHL overages when the final estimates of charter halibut harvests also was determined to be less than 1 percent. The Council scheduled final action in October 2008 when 2007 charter halibut harvests were determined to be 109.6 percent of the GHL (Figure 1).

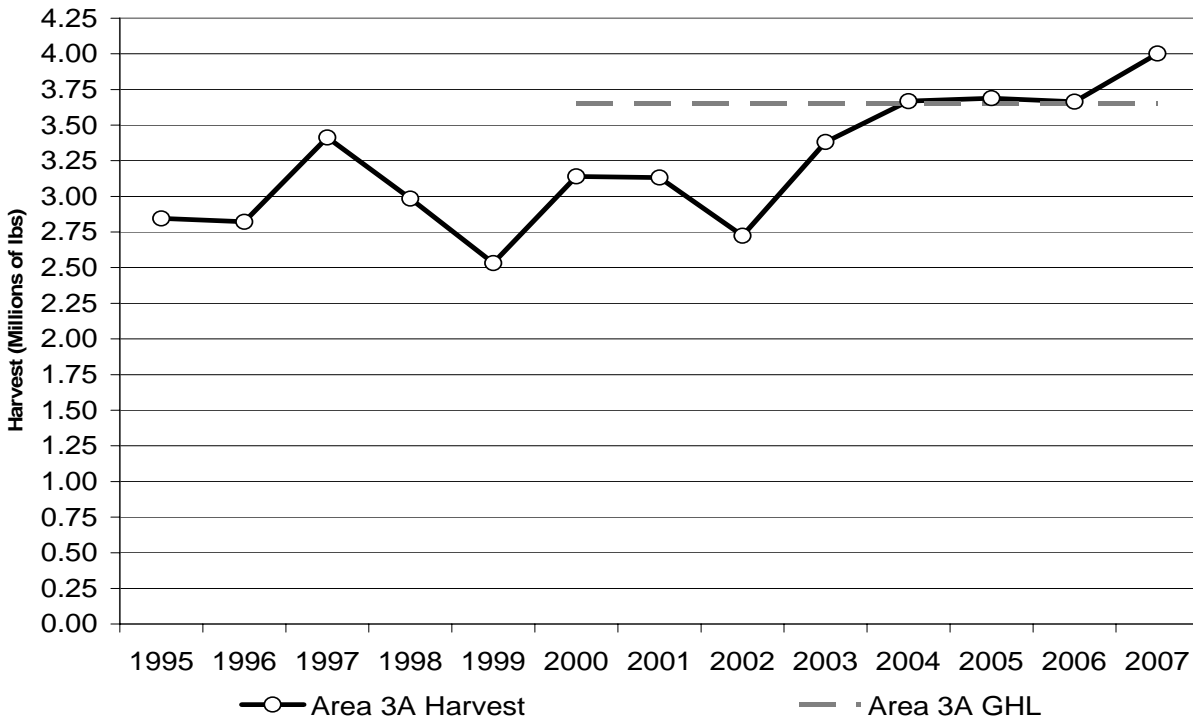


Figure 1. Historic Area 3A Charter Harvest Compared to the Area 3A GHL

The goal of proposed management measures under this action is to reduce sport fishing mortality of halibut in the charter sector in Area 3A to its GHL in a manner that minimizes adverse impacts on the charter fishery, its sport fishing clients, the coastal communities that serve as home port for this fishery, and on fisheries for other species. In addition to the no action alternative, the Council is considering six options to reduce halibut harvests to the Area 3A GHL under Alternative 2:

- Alternative 1. No action. Maintain the existing 2007 Status Quo management structure.
- Alternative 2. Implement one or more measures to restrict charter halibut harvest to the Area 3A GHJ
 - Option 1. No more than one trip per charter vessel per day.
 - Option 2¹.
 - i. No harvest by skipper or crew while clients are on board; and/or
 - ii. Line limits not to exceed the number of paying clients on board.
 - Option 3. Annual limits of four, five, or six halibut, per angler, caught from a charter vessel fishing in Area 3A.
 - Option 4. Reduced bag limits of one fish per day in May, June, July, August, or the entire season
 - Option 5. A two-fish bag limit with one fish of any size and one fish larger than 45 inches or 50 inches
 - Option 6. A two-fish bag limit with one fish of any size and one fish 32, 34 or 36 inches in length

The 2007 Status Quo

On January 26, 2007, ADF&G instituted Emergency Order No. 2-R-3-02-07, which banned the retention of sport fish by skipper and crew while clients were onboard the vessel and placed a limit on the number of lines allowed to be fished from a charter vessel equal to the number of paying clients aboard the vessel from May 1, 2007 through December 31, 2007. A similar order (Emergency Order No. 2-R-3-03-08) was effective from May 24, 2008 to September 1, 2008. Thus, ADF&G's final harvest estimate for 2007 differs from previous harvest estimates in that retention of skipper and crew fish was prohibited and could not have been included in the estimate. Therefore, Option 2 has the same effect as status quo, except that it would replace state action with federal action. A federal action would be less restrictive than state action because it would apply only to halibut, rather than all salt water fish as occurred with state action. Prior to 2007, ADF&G estimates of charter halibut harvest included a portion of harvest that was attributable to skipper and crew. *To maintain consistency with prior analyses, and because the status quo harvest level is above the current GHJ and includes a state ban on skipper and crew harvest and line limits, the analysis projects the effect of Options 1, 3, 4, 5, and 6 as if they were enacted **with** Option 2(or a continued state action on the same measures).*² *The Council should consider the following two points.*

- *The Council may wish to select an option in combination with Option 2 as its preferred alternative to achieve the desired reduction in charter halibut harvest and to replace state action with less restrictive federal action.*
- *If the Council's intent is not to combine Status Quo/Option 2 with another management measure(s), then we would expect to lose the benefits of the Status Quo/Option 2. For example, if*

¹ Option 2 measures were implemented through an emergency order issued by ADF&G for 2008, and is considered part of the No Action Alternative.

² The October 2007 Initial Review EA/RIR/IRFA presented the effect of each option in conjunction with the then existing 2007 status quo including Emergency Order No. 2-R-3-02-07. The effect of each option was presented as if that status quo had been in effect in 2006 while noting that the State of Alaska reserves its right to issue, or not issue, emergency orders regarding skipper and crew harvests to enable the best management of the resource. To maintain consistency between analyses we continue that approach in this analysis.

the Council selected Option 1 (as analyzed in combination with the Status Quo/Option 2) as its preferred alternative, the analysis estimates the measure would have reduced 2007 harvest by 287,000 lb to 318,000 lb (to approximately 100.9 to 101.8 percent of the GHL). However, if the Council does not include Option 2 in its preferred alternative, but instead selected only Option 1 as its preferred alternative (for example), then the analysis predicts that 2007 harvest would have actually increased by 109,000 lb to 144,000 lb. This result occurs because while the action would gain the 287,000 lb to 318,000 lb of harvest savings from Option 1, it would lose a portion of the approximately 464,000 lb of harvest savings from the skipper and crew ban (assuming ADF&G would not release another emergency order).³

Table 1. Estimated Effect of One Trip per Day with and without the Inclusion of Option 2

Estimate Level	Estimated Effect In Conjunction with Option 2 (As Analyzed)				Without Option 2		
	Harvest Reduction (Mlb)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlb GHL (%)	Harvest Reduction (Mlb)	Post-Management Harvest (Mlb)	As a Portion of the 3.650 Mlb GHL (%)
Lower	0.287	7.2%	3.715	101.8%	-0.144	4.146	113.6%
Upper	0.318	8.0%	3.684	100.9%	-0.109	4.111	112.6%

Source: Northern Economics, Inc. estimates, 2008.

Summary Results

The August 28, 2008 draft of the EA/RIR/RFA was completed using the final 2006 harvest estimate of 3.664 Mlb because the 2007 charter halibut harvest had not been released by ADF&G at the time the draft was released by the Council for public review. Table 2 updates the analytical results of the draft EA/RIR/RFA using the final 2007 Area 3A charter harvest estimate of 4.002 Mlb. This table is an updated version of Table 6 in the draft EA/RIR/IRFA. Three groups of options are identified in Table 2 (below):

- Options which, as estimated, would clearly not have reduced 2007 harvest to *above the GHL* under 2007 conditions. This group includes Option 2 (i.e., the status quo under federal action), Option 3 (i.e., the five or six halibut annual limits), and Option 4 (i.e., a one-halibut daily bag limit in May and September).
- Options which, as estimated, may have reduced 2007 harvest to *near the GHL* under 2007 conditions. These options include Option 1 (ban on second trips in a day) and Option 3 (four halibut annual limit).
- Options which, as estimated, would clearly have reduced 2007 harvest to *below the GHL*. These options include all sub-options of Option 6 (i.e., maximum size on the second halibut in the daily bag limit), both sub-options of Option 5 (i.e., minimum size on the second halibut in the angler's daily bag limit), and Option 4 (June, July, and August one halibut bag limits).

³ The numbers in this example do not add to the number in the table because of the ban on second trips per day would theoretically affect skipper and crew harvest. Consequently, the analysis accounts for this interaction effect and the results are displayed in Table 1.

Table 2. Estimated Effect of Analyzed Management Options

	Management Option (Each Option Assumes the Inclusion of Option 2)	Sub-Option	Estimated 2007 Harvest with Option (Mlb)		Post-Option Harvest as a Portion of the GHL (%)	
			Less Effective	More Effective	Less Effective	More Effective
Below the GHL	Option 4. One Fish Bag Limit	Full Season	2.098	1.469	57.5%	40.2%
	Option 5. Minimum Size on the Second Fish	50"	2.476	2.228	67.8%	61.0%
	Option 5. Minimum Size on the Second Fish	45"	2.621	2.359	71.8%	64.6%
	Option 4. One Fish Bag Limit	July	3.277	3.041	89.8%	83.3%
	Option 6. Maximum Size on the Second Fish	32"	3.341	3.073	91.5%	84.2%
	Option 6. Maximum Size on the Second Fish	34"	3.470	3.213	95.1%	88.0%
	Option 4. One Fish Bag Limit	June	3.522	3.364	96.5%	92.2%
	Option 4. One Fish Bag Limit	August	3.542	3.388	97.0%	92.8%
	Option 6. Maximum Size on the Second Fish	36"	3.600	3.322	98.6%	91.0%
Near the GHL	Option 3. Annual Limit	4 Fish	3.695	3.695	101.2%	101.2%
	Option 1. One Trip per Day	None	3.715	3.684	101.8%	100.9%
Above The GHL	Option 3. Annual Limit	5 Fish	3.799	3.799	104.1%	104.1%
	Option 4. One Fish Bag Limit	May	3.842	3.788	105.3%	103.8%
	Option 3. Annual Limit	6 Fish	3.888	3.888	106.5%	106.5%
	Option 4. One Fish Bag Limit	September	3.930	3.905	107.7%	107.0%
	<i>Option 2. No Harvest by Skipper & Crew (Status Quo)</i>	<i>None</i>	<i>4.002</i>	<i>4.002</i>	<i>109.6%</i>	<i>109.6%</i>

Source: Northern Economics, Inc. estimates, 2008.

Figure 2 shows the estimated effect of implementing each proposed option (in conjunction with Option 2) in 2007 relative to the Area 3A GHL.

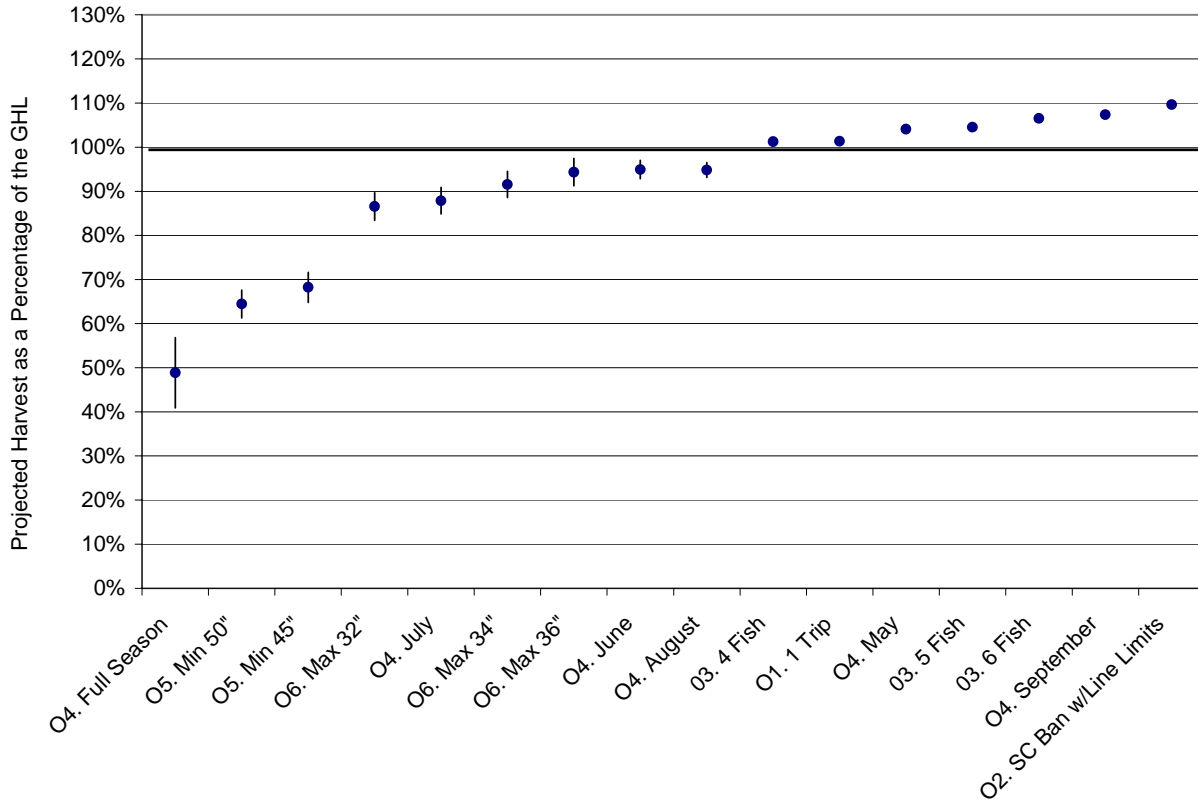


Figure 2. Estimated Effect of Analyzed Management Options

The effect of certain options may be easily eroded by changes in angler behavior. In particular, anglers may high grade halibut to reduce the effect of Options 4 and 6 and anglers may redistribute their trips throughout the year to avoid a month-long reduction in the one halibut bag limit (i.e., Option 4). Additionally, the estimated effect of Option 1 may be eroded if displaced anglers can find seats on another vessel at a different time of year. The net effect of all of the options may be eroded by an increase in angler days, catch per unit of client effort, or a sudden shift upward in average harvest weight, as may have occurred in Area 2C in 2007 when charter harvests were higher than generally expected.

Detailed Results by Option

This section provides detailed tables by option.

Option 1 –No More than One Trip per Vessel per Day

ADF&G estimates that harvest from “second trips” comprised 7.2 percent to 8.0 percent of the 2007 harvest; equivalent to between 287,000 lb and 318,000 lb.⁴ In combination with a continuing ban on skipper and crew harvest and line limits (Option 2), Option 1 would have reduced 2007 harvest to between 100.9 percent and 101.8 percent of the GHL. A portion of displaced anglers are likely to find

⁴ “Second trips in a day” account for growing portion of harvest each year. ADF&G logbook data show long-term increasing trends. In 2000, the harvest associated with second trips was estimated at between 3.0 and 3.5 percent. By 2006 that portion increased to between 5.5 and 6.3 percent.

replacement trips. Thus, the estimated reductions likely overstate actual reductions. In addition, the economic effect of this option is likely to be disproportionately located in the Cook Inlet fishery, where multiple trips in a given day are a common business model.

Table 3. Option 1-Estimated Effect of One Trip per Day

Estimate Level	Estimated Effect In Conjunction with Option 2 (As Analyzed)			
	Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
Lower	0.287	7.2%	3.715	101.8%
Upper	0.318	8.0%	3.684	100.9%

Source: Northern Economics, Inc. estimates, 2008.

Option 2 –A Ban on Skipper and Crew Harvest and Line Limits

Option 2 would create a federal ban on harvest by skipper and crew while clients were onboard and would implement line limits equal to the number of paying clients. The option would have the same effect as the status quo for 2007 and 2008, except that these two measures would be implemented in federal regulations.⁵ Federal action would allow ADF&G to lift the blanket prohibition on retention of halibut by skippers and crew for all saltwater species caught on charter trips and for state line limits on all saltwater charter fish. It may provide a greater sense of permanence to the restrictions, but would not result in additional reductions beyond those achieved by state action. It would lift the state restrictions for skipper and crew retention and line limits for salmon, rockfish, and ling cod. If the Council does not select this option, and the ADF&G does not continue to issue similar emergency orders, skipper and crew harvests of halibut would be expected to return to historic levels of approximately 10.4 percent of total harvest (i.e., approximately 464,000 lb based on the 2007 client harvest).

Table 4. Option 2-Estimated Effect of a Federal Ban on Skipper and Crew Harvest with Line Limits

Estimate Level	Estimated Effect			
	Additional Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
Point Estimate	0.000	0.0%	4.002	109.6%

Source: Northern Economics, Inc. estimates, 2008.

Option 3 –The Annual Harvest Limit

Option 3 would establish either a four, five, or six halibut annual limit for charter halibut anglers. Table 5 shows estimates of reductions in harvest associated with this option. Assuming that all else remains equal (e.g., there is no change in overall demand), a six- halibut annual limit, combined with the status quo, would have reduced harvest to approximately 106.5 percent of the GHL (307,000 lb reduction), a five- halibut annual limit would have reduced harvest to 104.1 percent of the GHL (203,000 lb reduction), and a four- halibut annual limit would have reduced harvest to 101.2 percent of the GHL (114,000 lb reduction). The estimated effect of these sub-options is substantially lower than documented in past

⁵ The analysis does not have any data on the effect of line limits. Line limits could limit skipper and crew harvest of non-halibut species as it would prevent them for fishing for other species while all of their clients have lines in the water.

analyses because in 2006 skippers and crew accounted for 80 percent harvest from individuals harvesting six or more fish. Only five percent of charter anglers harvested at least six halibut in 2007.

Table 5. Option 3-Estimated Effect of an Annual Limit

Estimate Level	Estimated Effect			
	Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
Four Fish	0.307	7.7%	3.695	101.2%
Five Fish	0.203	5.1%	3.799	104.1%
Six Fish	0.114	2.8%	3.888	106.5%

Source: Northern Economics, Inc. estimates, 2008.

Option 4 – The One Fish Bag Limit

Implementing a season-long, one- halibut bag limit would have reduced harvest in 2007 to approximately 57.5 percent of the GHL, assuming no demand effects. Under a 30 percent demand reduction, a reasonable upper level predicted by key informant interviews conducted for prior analyses, the measure would reduce harvest to approximately 40.2 percent of the GHL. The analysis also analyzed the effect of reducing the bag limit for one month durations during the summer. While some of these ‘one month’ bag limits may further reduce harvest levels below the GHL, the analysis is not able to account for anglers switching from a month with a reduced bag limit to a month without a reduced bag limit. Over the long run, anglers who change the timing of their trips to account for bag limit changes *will erode the reductions from these options*. Thus, the estimates for single-month reductions in bag limits are viewed as *maximum estimates of the short-term effect of this management sub-option*.

Table 6. Option 4-Estimated Effect of an One Fish Bag Limit for a Month or for the Entire Season

Sub-Option	Estimate Level	Estimated Effect			
		Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
May	No Demand	0.160	4.0%	3.842	105.3%
	30% Demand	0.214	5.3%	3.788	103.8%
June	No Demand	0.480	12.0%	3.522	96.5%
	30% Demand	0.638	15.9%	3.364	92.2%
July	No Demand	0.725	18.1%	3.277	89.8%
	30% Demand	0.961	24.0%	3.041	83.3%
August	No Demand	0.460	11.5%	3.542	97.0%
	30% Demand	0.614	15.3%	3.388	92.8%
September	No Demand	0.072	1.8%	3.930	107.7%
	30% Demand	0.097	2.4%	3.905	107.0%
Entire Season	No Demand	1.904	47.6%	2.098	57.5%
	30% Demand	2.533	63.3%	1.469	40.2%

Source: Northern Economics, Inc. estimates, 2008.

Option 5 – A Minimum Size on the Second Fish in the Daily Bag Limit

Option 5 would establish a two- halibut bag limit with one halibut of any size and one halibut equal to or larger than 45 inches or 50 inches depending on the sub-option. These options could result in relatively

high levels of harvest reductions. Both of the sub-options would have reduced harvest to a level below the GHL under 2007 conditions, even without some corresponding reduction in demand for trips. ADF&G estimates that the 45-inch sub-option would have reduced 2007 harvest to approximately 71.8 percent of the GHL, while the 50-inch sub-option would have reduced 2007 harvest to 67.8 percent of the GHL. If a 10 percent demand reduction accompanies this action, harvest would have been reduced to 64.6 percent or 61.0 percent, respectively, of the GHL. A ten percent demand reduction means the change must not only reduce demand by ten percent, but also effectively eliminate any growth in the industry, where client demand has been growing at approximately six percent per year. IPHC data show that halibut of 45 inches and larger represent less than ten percent of the total population by number.

Table 7. Option 5-Estimated Effect of a Minimum Size on the Second Fish in the Daily Bag Limit

Sub-Option	Demand Reduction	Estimated Effect			
		Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
45	No Reduction	1.381	34.5%	2.621	71.8%
	10% Demand Reduction	1.643	41.1%	2.359	64.6%
50	No Reduction	1.526	38.1%	2.476	67.8%
	10% Demand Reduction	1.774	44.3%	2.228	61.0%

Source: Northern Economics, Inc. estimates, 2008.

Option 6 – A Maximum Size on the Second Fish in the Daily Bag Limit

Option 6 would allow a two- halibut daily bag limit, with one halibut of any size and one halibut less than or equal to 32, 34, or 36 inches in length. The analysis estimates an upper bound estimate, which is based on the assumption that anglers harvest the “average” halibut below the length limit, and a lower estimate, which depicts how the efficacy of the option could be reduced if the anglers succeeded in high grading their catch by one size class. All three sub-options would have reduced 2007 harvest below the GHL in combination with the state ban on skipper and crew harvest and line limits. The 32-inch limit, which is similar to the 2007 NMFS rule for Area 2C, would have reduced 2007 harvest between 84.2 percent and 91.5 percent of the GHL. The 34-inch limit would have reduced 2007 harvest between 88.0 percent and 95.1 percent of the GHL, while the 36-inch limit would have reduced 2007 harvest between 91.0 percent and 98.6 percent of the GHL. If anglers are not successful at high grading, then the associated harvest reductions would be nearer the upper limit than the lower limit.

Table 8. Option 6-Estimated Effect of a Maximum Size on the Second Fish in the Daily Bag Limit

Sub-Option	Estimate Level	Estimated Effect			
		Harvest Reduction (Mlbs)	Harvest Reduction (%)	Estimated Post-Action Harvest (Mlb)	As a Portion of the 3.650 Mlbs GHL (%)
32"	Highgrading to Next Size Class	0.661	18.1%	3.341	91.5%
	If Anglers Catch Average Fish Below Limit	0.929	25.4%	3.073	84.2%
34"	Highgrading to Next Size Class	0.532	14.6%	3.470	95.1%
	If Anglers Catch Average Fish Below Limit	0.789	21.6%	3.213	88.0%
36"	Highgrading to Next Size Class	0.402	11.0%	3.600	98.6%
	If Anglers Catch Average Fish Below Limit	0.680	18.6%	3.322	91.0%

Source: Northern Economics, Inc. estimates, 2008.