

**COMPARISON OF 1998 AND 1999 CHARTER VESSEL LOGBOOK
SUMMARIES**

1998

	AREA 2C	AREA 3A
# OF CFEC VESSEL LICENSES	1,250	1,320
# OF LOGBOOKS ISSUED	910	655
# OF ACTIVE VESSELS	578	500
# OF CLIENT DAYS	62,141	97,434
# OF HALIBUT HARVESTED	63,945	157,784
AVE. HALIBUT/CLIENT DAY	1.03	1.62
# OF HALIBUT RELEASED	29,134	146,125

1999

	AREA 2C	AREA 3A
# OF CFEC VESSEL LICENSES	1,279	NA
# OF LOGBOOKS ISSUED	834	711
# OF ACTIVE VESSELS	561	484
# OF CLIENT DAYS	50,183	69,505
# OF HALIBUT HARVESTED	58,075	135,113
AVE. HALIBUT/CLIENT DAY	1.16	1.94
# OF HALIBUT RELEASED	27,124	114,975

MEMORANDUM

TO: Council and Commission Members

FROM: Jane DiCosimo, NPFMC
Rob Bentz, ADF&G

DATE: October 4, 1999

SUBJECT: Charterboat/Recreational Catch

BACKGROUND

Logbook Program

Rob Bentz, ADF&G Sportfish Division, will provide a brief update on the status of the Saltwater Sportfishing Charter Vessel Logbook Program. A summary of 1998 and preliminary 1999 bottomfish logbook data for Areas 2C and 3A is provided in Item 1.

Guideline Harvest Level Analysis

In September 1997, the Council adopted Guideline Harvest Levels (GHLs) for the halibut charter fishery in International Pacific Halibut Commission (IPHC) Regulatory Areas 2C and 3A only. With this action, the Council stated its intent to manage the guided sport fishery to not exceed 12.76% of the combined commercial and guided sport halibut quota in Area 2C, and 15.61% in Area 3A. The GHL rates were based on assigning charter fishermen 125% of their 1995 catch. The Council also stated its intent that the GHLs would not shut the fishery down, but would manage the charter fishery to maintain a stable charter season of historic length. The Council also recommended additional recordkeeping and reporting requirements for the halibut charter fishery. ADF&G Sportfish Division began a Saltwater Sportfish Charter Vessel Logbook Program in 1998. This data, along with the ongoing Statewide Harvest Survey and area creel surveys will be the basis for much of the current analysis. A separate report on the logbook program will also be provided.

The 1999 analysis will consider revisions to the GHL for 1998 participation; adjustments during years of low stock abundance; its approach as a cap, allocation, or guideline; management measures to achieve the GHLs and whether or not to implement a moratorium on the charter fleet. A staff discussion paper of the alternatives is attached as Item 2.

1999 Saltwater Sportfishing Charter Vessel Logbook Summary

Summary of 1999 and 1998 Saltwater Sportfishing Charter Logbooks

The following table compares 1999 and 1998 saltwater sportfishing charter trips targeting bottomfish by IPHC area.

* This summary is generated from edited trips through: September 15

* Summaries tables without at least three businesses operating will not be shown.

* Residency for unique registered businesses or guides is based on permanent mailing address

* A trip targeting bottomfish is one in which the number of rods or hours fished is greater than zero.

* For a map of IPHC areas, click [here](#).

Year-To-Date Total (to September 15), IPHC area 2C :												
	1999						1998					
	Resident	Non-Resident	Unknown	Total			Resident	Non-Resident	Unknown	Total		
Number of unique active businesses	324	47	2	373			348	45	1	394		
Number of unique active vessels	492	67	2	561			501	76	1	578		
	1999						1998					
	Resident	Non-Resident	Unknown	Client Total	Crew	Total	Resident	Non-Resident	Unknown	Client Total	Crew	Total
Angler-Days	1,133	49,050	0	50,183	1,818	52,001	1,874	59,402	865	62,141		
Rods Fished for Bottomfish	1,002	44,946	0	45,948	1,638	47,586	1,561	50,892	762	53,215	360	53,575
Boat Hours Fished	1,698	45,435	0	47,133	1,808	48,941	n/a	n/a	n/a	55,371	n/a	55,371
Halibut Kept	1,300	56,775	0	58,075	2,054	60,129	1,886	60,936	1,123	63,945	444	64,389
Halibut Released	575	26,549	0	27,124	330	27,454	1,036	27,473	625	29,134	13	29,147
Pelagic Rockfish Kept	347	10,777	0	11,124	119	11,243	401	11,267	232	11,900	0	11,243
Pelagic Rockfish Released	484	16,625	0	17,109	126	17,235	n/a	n/a	n/a	n/a	n/a	n/a
Other Rockfish Kept	336	13,090	0	13,426	146	13,572	345	12,900	195	13,440	50	13,490
Other Rockfish Released	182	5,784	0	5,966	41	6,007	n/a	n/a	n/a	n/a	n/a	n/a
All Rockfish	666	22,409	0	23,075	167	23,242	1,187	25,489	748	27,424	0	27,424

All Rockfish Released	666	22,409	0	23,075	167	23,242	1,187	25,489	748	27,424	0	27,424
Lingcod Kept	230	9,068	0	9,298	81	9,379	299	10,429	255	10,983	52	11,035
Lingcod Released	50	1,748	0	1,798	17	1,815	n/a	n/a	n/a	n/a	n/a	n/a

Year-To-Date Total (to September 15), IPHC area 3A :												
	1999						1998					
	Resident	Non-Resident	Unknown	Total			Resident	Non-Resident	Unknown	Total		
Number of unique active businesses	395	12	2	409			401	14	3	418		
Number of unique active vessels	468	16	0	484			477	20	3	500		
	1999						1998					
	Resident	Non-Resident	Unknown	Client Total	Crew	Total	Resident	Non-Resident	Unknown	Client Total	Crew	Total
Angler-Days	21,604	47,901	0	69,505	7,860	77,365	30,843	65,008	1,583	97,434		
Rods Fished for Bottomfish	25,552	55,436	0	80,988	9,128	90,116	28,504	59,065	2,648	90,217	942	91,159
Boat Hours Fished	36,829	58,666	0	95,495	17,167	112,662	n/a	n/a	n/a	84,993	n/a	84,993
Halibut Kept	43,623	91,490	0	135,113	11,180	146,293	47,806	103,034	6,944	157,784	1,725	159,509
Halibut Released	38,353	76,622	0	114,975	6,069	121,044	44,627	94,330	7,168	146,125	691	146,816
Pelagic Rockfish Kept	5,251	8,264	0	13,515	249	13,764	5,456	7,656	1,454	14,566	2	13,764
Pelagic Rockfish Released	1,652	3,938	0	5,590	184	5,774	n/a	n/a	n/a	n/a	n/a	n/a
Other Rockfish Kept	1,649	1,968	0	3,617	163	3,780	2,393	3,593	264	6,250	10	6,260
Other Rockfish Released	214	410	0	624	73	697	n/a	n/a	n/a	n/a	n/a	n/a
All Rockfish Released	1,866	4,348	0	6,214	257	6,471	2,629	5,810	495	8,934	5	8,939
Lingcod Kept	1,040	1,914	0	2,954	148	3,102	1,147	2,116	137	3,400	1	3,401
Lingcod												

Lingcod Released	1,174	1,297	0	2,471	118	2,589	n/a	n/a	n/a	n/a	n/a	n/a
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Webmaster: Jennifer Bond (Jennifer_Bond@fishgame.state.ak.us)
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AREA 2C SPORT AND COMMERCIAL HALIBUT HARVESTS: 1995 - 1998

YEAR	<u>SPORT CHARTER HARVEST*</u>			<u>COMMERCIAL HARVEST</u>	
	# OF FISH	MILLION LBS.	% HARVEST	MILLION LBS.	QUOTA
1995	47,338	0.94	9.5%	7.79	9.00
1996	41,060	0.92	9.3%	8.53	9.00
1997	42,206	0.86	7.9%	9.64	10.00
1998	60,810	1.77	14.4%	10.23	10.50

*Charter harvest data are from the annual Statewide Harvest Study data.

(1998 64,204 1.78 14.5% LOGBOOK DATA)

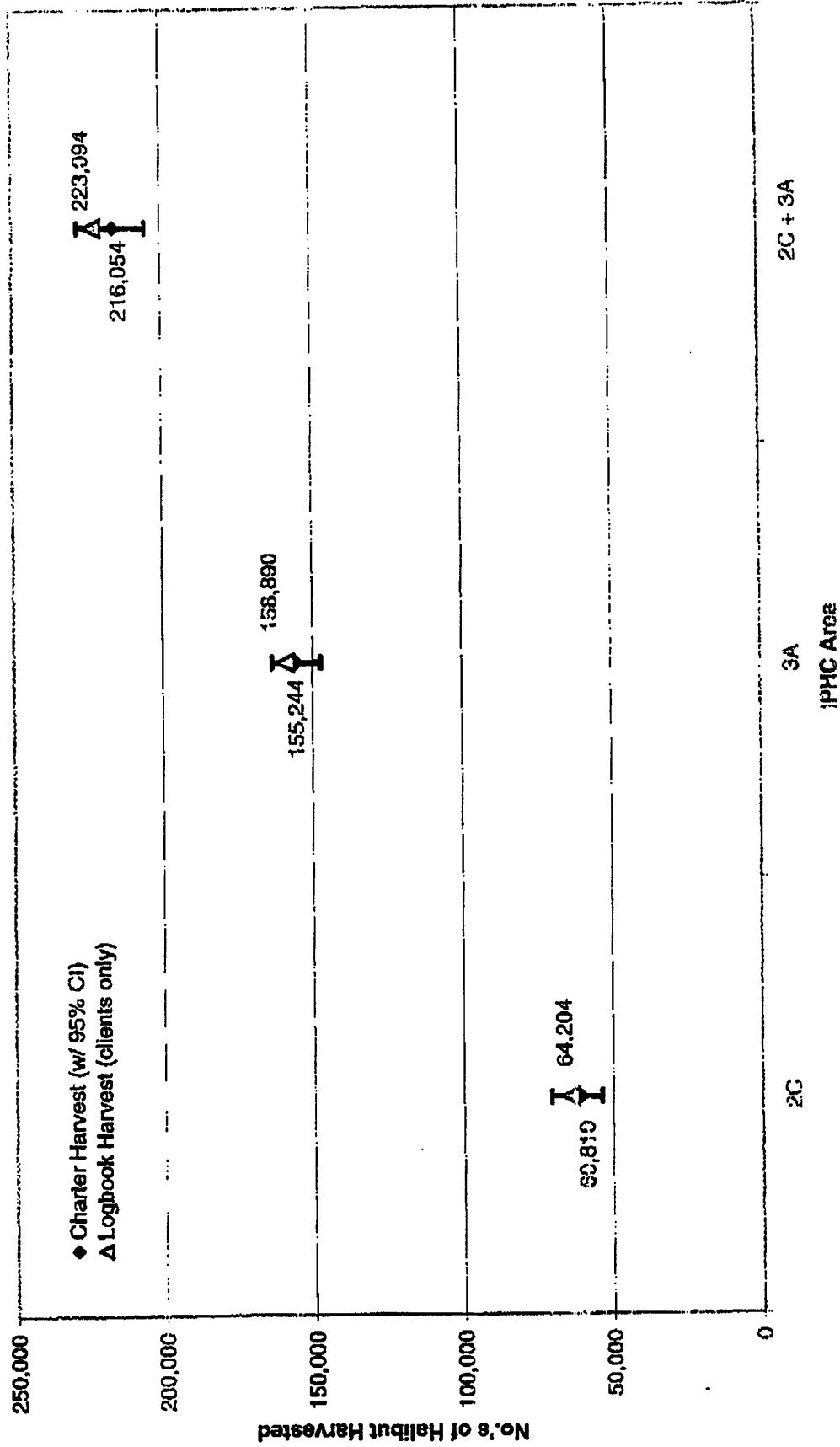
AREA 3A SPORT AND COMMERCIAL HALIBUT HARVESTS: 1995 - 1998

YEAR	<u>SPORT CHARTER HARVEST*</u>			<u>COMMERCIAL HARVEST</u>	
	# OF FISH	MILLION LBS.	% HARVEST	MILLION LBS.	QUOTA
1995	138,025	2.84	12.4%	18.19	20.00
1996	146,066	2.86	12.5%	19.69	20.00
1997	156,924	3.49	12.2%	24.68	25.00
1998	155,244	3.23	11.1%	25.87	26.00

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(1998 158,890 3.38 11.5% LOGBOOK DATA)

Comparison between the Number of Halibut Harvested by Charter Anglers from Logbook Summaries and Statewide Harvest Survey Estimates in 1998.



**COMPARISON OF LOGBOOK AND CREEL SURVEY EFFORT AND CHARTER
HALIBUT HARVEST AT 3 PORTS IN 2C DURING 1998**

PORT	BOAT HOURS		HALIBUT HARVEST	
	LOGBOOK	CREEL	LOGBOOK	CREEL
KETCHIKAN	20,927	18,451	3,558	2,993
SITKA	40,878	35,048	18,662	17,313
JUNEAU	10,826	10,092	2,441	1,865

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WEEK OF April 26-May 2, 1999. This sheet must be postmarked by May 9, 1999. No. 1060

State of Alaska - Department of Fish & Game - Division of Sport Fish - Saltwater Sport Fishing Charter Vessel Logbook
INSTRUCTIONS: Mark each inactive date. Mail white copy to ADF&G; keep pink copy for your records. Return signed logbook for ADF&G. Retain original logbook for 2000-2001. Retention period may vary for 1999 charter trips.



This form has my FIRST charter of the season. This form has my LAST charter of the season.

Day No. of Day Trip	MEMBER OF CREW'S NAME	PORT OR SITE OF OFF-LOADING	Primary Area Fished (Which subarea/contour per Date)	No. Rods Fished for Salmon	20' and Larger Fish (Species)	"Slabbers" Less Than 20"	Number of Other Salmon			Number of Halibut			Number of Pelagic Rockfish (Black Goby, etc.)		Number of Other Rockfish (Red Snapper, etc.)		Number of Target	
							Coastal	Open	Other	Coastal	Open	Other	Coastal	Open	Other	Coastal		Open
ADAF 26																		
ADAF 27																		
ADAF 28																		
ADAF 29																		
ADAF 30																		

CERTIFICATION: I certify that the information contained in this document is true and correct to the best of my knowledge. X

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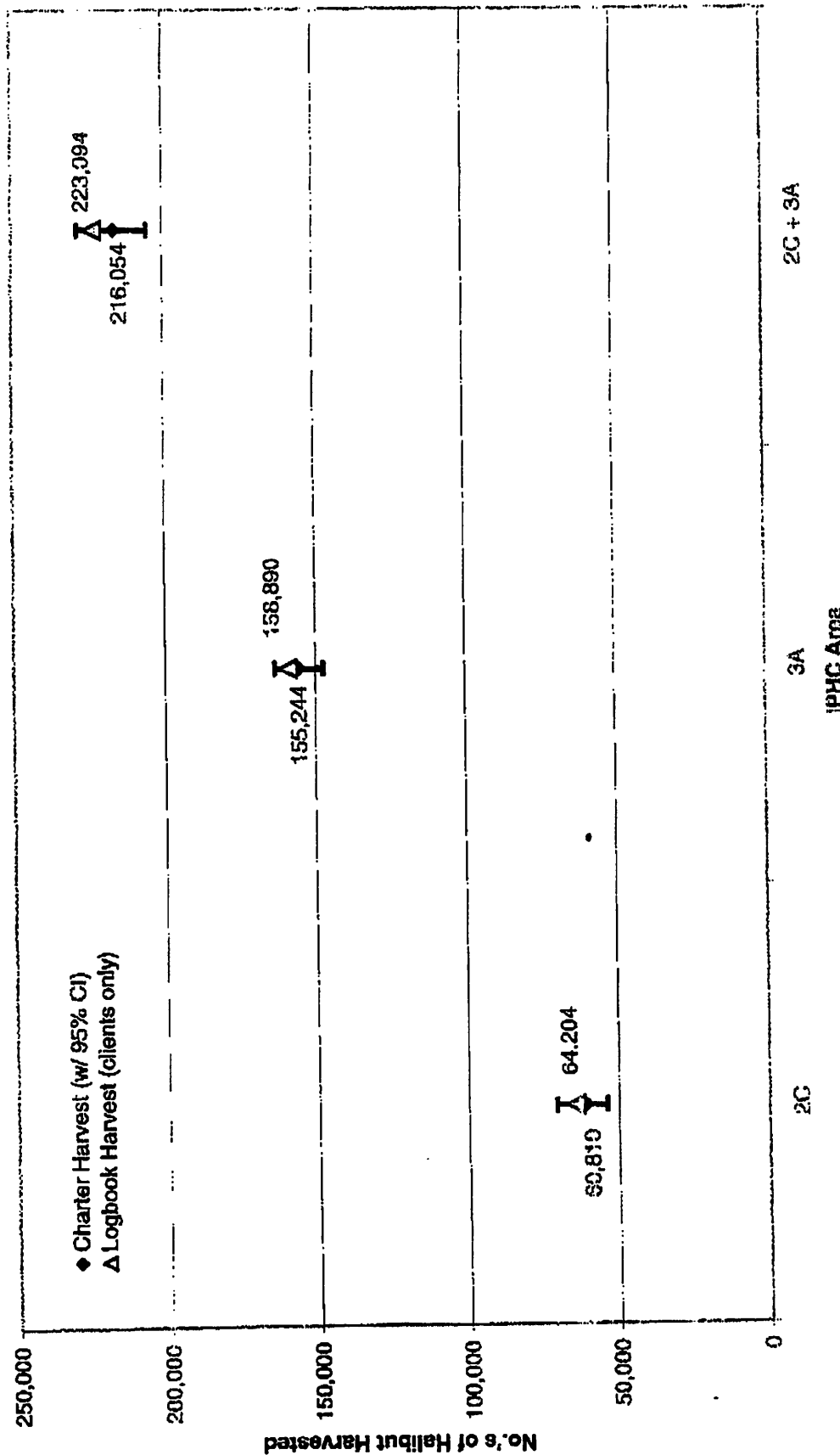
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JUNEAU	10,826	10,092	2,441	1,865

UPDATE ON ANALYTICAL DESIGN OF THE HALIBUT GHL/MCRATORIUM ANALYSIS

The Guideline Harvest Level/Moratorium analysis will examine the impacts of the alternatives identified by the Council to control halibut charter boat (or guided sport) fisheries in IPHC areas 2C (Southeast) and 3A (Southcentral). This decision is scheduled for initial review in December 1999 and final action in February 2000. The final analysis will then be submitted along with the original September 1997 GHL decision document (EA/RIR/IRFA) to the Secretary of Commerce for approval and implementation.

Brief History

In September 1997, based on the analyses prepared by the Council and ISER staffs, the Council adopted GHLs for the halibut charter fishery, based on 125% of their 1995 catch. This is equivalent to 12.76% of the combined commercial and guided sport halibut quota in Area 2C, and 15.61% in Area 3A. The Council also stated its intent to not close the fishery upon reaching the GHL, but rather to manage it by applying additional measures to maintain a stable charter season of historic length. The fishery is open from February 1 through December 31, but the season generally runs from May through September. When end-of-season catch data indicate that the GHL was reached or exceeded in either Area 2C or Area 3A, NMFS would implement measures to slow down harvests in subsequent years.

In December 1997, the NMFS Alaska Regional Administrator informed the Council that the GHL would not be published as a regulation. Further, since the Council had not recommended specific management measures to be implemented by NMFS if the GHL was reached, no formal decision by the Secretary was required for the GHL and the analysis was not forwarded. The Council's intent, however, finally was met by publishing the GHL as a notice in the *Federal Register* on March 10, 1998. It does not constrain the charter fishery, but it did formally announced the Council's intent to establish measures to maintain charter catch at or below the GHL. NMFS also published a new control date for possible limited entry into the halibut charter fishery of June 24, 1998 in the *Federal Register*.

A more comprehensive discussion of the alternatives is presented in Part of this discussion paper, followed by an overview of the economic analysis that will be used to evaluate impacts of the Council's proposed alternatives in Part II.

PART I. DISCUSSION OF THE ALTERNATIVES

In response to the NMFS decision not to submit the analysis to the Secretary, the Council initiated a public process to identify the necessary management measures to submit with the GHL. It formed a GHL Committee comprised of charter, unguided sport, and subsistence/personal use representatives in 1998 to recommend for analysis potential management measures. The Council discussed and modified the committee and Advisory Panel recommendations in 1998 and early 1999. In April 1999, the Council identified the alternatives listed in Attachment 1 for analysis. A staff-recommended restructuring of the alternatives to facilitate analysis is provided in Attachment 2. Those restructured alternatives maintain all the options and suboptions of the motion approved by the Council in April 1999. The alternatives are not mutually exclusive and may be combined when the Council makes its final decision in February. Taking no action to implement GHL management measures effectively nullifies the 1997 GHL decision by the Council.

In addition to the alternatives for the status quo and to institute management measures under the approved GHL, the Council added two alternatives that depart from the 1997 decision. The restructured alternatives clearly demonstrate that the Council has five main decisions to make to implement the GHL. The analysis will reflect these decision points. They are presented hierarchically below:

1. GHL level. The Council needs to decide whether to maintain the GHL as adopted in 1997, based on 1995 charter halibut removals, or to adopt a more current GHL based on 1998 catches.
2. Application of the GHL. As adopted in 1997, the GHL was truly a *guideline*. It was not intended to close fisheries when reached, but could impact subsequent years' fisheries through implementation of management measures that would reduce catches below the GHL. It also was designed to not constrain the commercial halibut catches. If the Council decision is to set the GHL as a guideline, it may choose to set it at a point estimate or as a fixed range. As an alternative to a guideline, the Council could set the GHL as an *allocation* that would close the fisheries or institute management measures inseason. It would then also cap the commercial fisheries at its assigned preseason allocation. Catches foregone under the charter allocation would remain unharvested.
3. Accommodating years of low abundance. If the abundance of halibut declines substantially in the future, there may be a need to spread the impacts of the diminished harvest levels over both the charter and commercial sectors. Several options are proposed to deal with this circumstance.
4. Management measures to constrain charter harvest. The Council will need to approve management measure(s) that would be implemented through frameworking regulations. It will then be up to the Regional Administrator's discretion to determine which management measure(s) will be triggered as early as the next fishing season once an area GHL is reached or exceeded. Measures could conceivably be implemented in-season if the GHL becomes a hard cap or allocation.
5. Moratorium. This option could be applied in combination with other management measures or as the Council's sole recommendation to constrain charter removals. A moratorium could be applied region-wide or in local areas.

GHL: 1995 vs 1998

The Council's original GHL decision was based on 1995 catch information, the most recent data available at the time of final action in September 1997. The Council may now choose to revise the base year to 1998, the most recent catch information available now for final action in February 2000 on this decision to approve corresponding management measures to implement the GHL.

The effects of this change on the charter industry are significant. Logbook and Statewide Harvest Survey (SWHS) data indicate that charter halibut catches are increasing faster than predicted in the 1997 analysis. ADF&G data indicate that Area 2C has exceeded and Area 3A is approaching their respective GHLs using 1995 as the base year. Therefore, management measures would be immediately triggered for the next fishing season in Area 2C upon publication of the final rule implementing the GHLs in the *Federal Register*. If catches increase in Area 3A, measures soon would be implemented in that area also. However, revising the base year to 1998 allows for an additional 25% growth rate in charter catches.

According to 1998 SWHS data, the 1998 halibut charter harvest in Area 2C (1.77 M lb) exceeded the 1995-based GHL (1.25 M lb). The 1998 halibut harvest in Area 3A totaled 3.23 M lb, still under the 1995-based GHL of 3.56 M lb. And it is intuitive that the 1998 removals would be under a GHL set at 125% of 1998 levels. See Attachment 2 for approximate GHLs under the different alternatives for 1995 and 1998 base years and the box below.

	charter			commercial			combined
1995:	%	TAC	under guideline	%	TAC	under allocation	TAC
Area 2C:	12.76%	1.02 M lb	1.28 M lb	87.24%	9.0 M lb	8.74 M lb	10.023 M lb
Area 3A:	15.61%	2.85 M lb	3.57 M lb	84.39%	20.0 M lb	19.28 M lb	22.850 M lb
1998:							
Area 2C:	18.03%	1.77 M lb	2.21 M lb	81.97%	10.5 M lb	10.06 M lb	12.27 M lb
Area 3A:	13.81%	3.23 M lb	4.04 M lb	86.19%	26.0 M lb	25.19 M lb	29.23 M lb

GHL: guideline or allocation

It has been the Council's understanding that the GHL would not be constraining on the commercial sector, meaning that it would be able to harvest any unused portion of the charter GHL. This could happen only if the GHL is interpreted to be a cap. Under this scenario, the IPHC sets the commercial area quotas as it has always done. There is a fixed amount of exploitable biomass. All subsistence, non-guided sport, guided sport, bycatch, research, deadloss, and other removals are "taken off the top" of the amount that is available to harvest. The guided sport removals are calculated as they have always been, i.e., the previous year's harvests are projected as the upcoming season's removals. This amount is deducted, along with other removals, from the overall available removals. The remainder is available to be set as the commercial quota.

Therefore, the increased halibut under the guideline (not taken by the charter fleet) continues to be assigned to the commercial sector. For example, if the guideline was effective in 1995, the commercial sector would have continued to be allocated 9 M lb in Area 2C and 20 M lb relative to the status quo (no GHL). The GHL becomes constraining on the commercial sector only when the charter removals reach or exceed the GHL. Remember that in-season adjustments of quota are not possible under the IFQ program.

If interpreted as a strict "allocation," however, the GHL would set a limit on both the charter and commercial sectors. This occurs because the equation the Council adopted to calculate the charter GHL is tied to a combined commercial and charter quota and is set prior to the fishing season. Following the IPHC quota setting process outlined above, the Area 2C GHL is equal to 12.76% of 10.023 M lb, the sum of the charter and commercial quotas. The difference between the combined quotas and the GHL is assigned to the commercial sector (8.74 M lb = 87.24% of 10.023 M lb). Therefore, the increased halibut allocation assigned to the charter sector comes from the commercial allocation. For example, if the GHL allocation was effective in 1995, the commercial sector would have lost 256,000 lb in Area 2C (9 - 8.74 M lb) and 720,000 lb in Area 3A (20 - 19.23 M lb) relative to the status quo (no GHL).

A closure is the distinguishing feature of an allocation. For example, NMFS sets a groundfish allocation and closes that fishery when the allocation is reached. Without a closure, the fishery is managed within a guideline, but is not shut down in-season. One outcome of managing by guideline is the possibility of overages in the charter sector. Because the levels of charter removals are low relative to total biomass, an overage is not likely to endanger the status of the halibut stock, but will be examined in the analysis.

To summarize, in years when the GHL does not constrain the charter sector, quota is effectively reallocated from the commercial sector to the charter sector. In years when the GHL does constrain the charter sector, quota is effectively reallocated from the charter sector to the commercial sector.

As a guideline point estimate or range

The Council has proposed an alternative that converts the GHL (guideline) from a point estimate that would be adjusted annually to a fixed range that does not adjust annually. This guideline range is intended to compensate the charter industry for unharvested fish in years of high abundance by offsetting those losses in periods of very low halibut abundance. It is linked to the industry's need for stability, that is, to provide a 'floor' of a minimum number of halibut to sustain the charter fleet near its current level and a 'ceiling' to allow for limited growth.

Under a range, if the charter halibut harvest exceeds the upper limit of the range in a year, it would be restricted by some measure(s) to reduce the harvest back to within the allocation range in subsequent years. If under restrictive measures, the charter halibut harvest is reduced below the lower limit of the range, those restrictions would then be liberalized to increase the harvest back within the allocation range.

GHL reductions during low halibut abundance

The 1997 GHL (cap) is tied to abundance; when abundance is high, the charter fleet is unable to take advantage of the full GHL and when abundance is low there may be insufficient allocation to meet the industry's minimum needs to retain the bag limit and season length.

IPHC has reported that halibut biomass estimates are at their highest recorded levels and are predicted to decline in the future. The triggers and accompanying reductions were proposed to address that decline and its distributional impacts on various sectors. Options and suboptions were proposed to reduce the guideline range during periods of low stock abundance. Two types of triggers and reduction scenarios were proposed to specify the upper and lower end of the guideline range. One trigger mechanism would drop the range by 25% based on set percentages (15, 20, or 25%) between the GHL and the combined GHL and commercial quota. A second mechanism would reduce the GHL allocation range by 10, 15, or 20% based on specified levels of total removals. The latter trigger levels for these reductions were based on the lowest levels of halibut abundance reported by the IPHC.

The above trigger levels differ in that the first describes charter fishing levels based on the charter/commercial split at levels fairly close to current levels (approved GHL is 12.76% in Area 2C and 15.61% in Area 3A). The second set of trigger levels would occur at ranges much below current levels of total removals (4-8 M lb compared with 1998 preliminary estimates of 12 M lb in Area 2C and 10-20 M lb compared with preliminary estimates of 35 M lb in Area 3A).

GHL management measures

Approval of specific management measures (listed at right) to implement the GHL is the goal of this analysis. A preliminary examination of these alternatives in a discussion paper presented to the Council in February 1999 indicated that probably only bag limits, and perhaps line limits, may

- | | |
|-----------------------|----------------------------------|
| • line limits | • super-exclusive registration |
| • boat limit | • sport catcher vessel only area |
| • annual angler limit | • sportfish reserve |
| • vessel trip limit | • rod permit |
| | • bag limits |

reduce harvests levels to below the GHL once it is exceeded. Bag limits, line limits, annual limits, and vessel

trip limits will be quantitatively assessed in the analysis, as data and time permits. Super-exclusive registration, sport catcher vessel only area, boat limits, and the sportfish reserve will be treated qualitatively.

Implementing GHL regulations will framework the measure or measures approved by the Council and Secretary. However, such a framework will rely on the Regional Administrator's discretion to annually select an appropriate management measure to return charter removals to below the area-specific GHL. While the analysis may provide a general hierarchy of the practicality of these measures, the uncertainty underlying their effectiveness in reducing charter removals renders the prediction of impacts an extremely difficult task. For example, even if we could quantify how charter fishermen might react to a bag limit today, there could be offsetting effects such as an overall increase in the angler population over time. The analysis also will not be able to assess cumulative effects of various combinations of measures. NMFS staff will address this issue further in the analysis.

Moratorium: area-wide or LAMPs

A moratorium on halibut charter licenses was analyzed in the Council's 1997 decision document. Insufficient information on participation was identified as a limiting factor in approving a moratorium then. Since then ADF&G has implemented a logbook program that identifies participation, target fisheries, and removals. The data is limited in that its source is a newly implemented data reporting vehicle that is less than two years old, with problems inherent in any new data collection program. The staff discussion on these issues was brought to the Council and its Scientific and Statistical Committee in April 1999 and is attached as Attachment 2.

A moratorium, either area-wide (2C and 3A) or within local area management plans (LAMPs) would or could be an ongoing and separate management decision by the Council or Alaska Board of Fisheries (Board), respectively, as it does not directly address the issues related with implementing measures to return charter removals below a preset level once that level was exceeded. In April 1999, the Council added area-wide and LAMP moratoria to all of the alternatives (they are implicit under Alternative 1). A decision to select LAMPs as the vehicle for limiting entry in the halibut charter fleet would be forwarded to the Board, which is the lead agency for developing LAMPs. Progress towards developing additional LAMPs is on hold pending Council final action. A decision to implement area-wide moratoria would initiate development of a license limitation program (i.e., database development, application period, appeals process) similar to that instituted for IFQs and the groundfish and crab license limitation programs. This could be a multi-year project.

PART II. Draft Analytical Economic Outline for the Halibut GHL/Moratorium

AVAILABLE RESOURCES FOR ECONOMIC ANALYSIS

In September 1997, the Council recommended additional recordkeeping and reporting requirements for the halibut charter fishery. In 1998, ADF&G Sportfish Division began a Saltwater Sportfish Charter Vessel Logbook Program. This data, along with the ongoing Statewide Harvest Survey and Area 2C and 3A creel surveys will be the basis for much of the current analysis. Relevant data and analyses from the September 1997 decision document will be brought forward to compare with more recent fishery information and alternative GHL configurations.

Data limitations and time constraints prohibit the development of a full complement of quantitative models to estimate net benefit and impact assessments of the halibut charter and commercial fisheries. However, there are a number of past studies and ongoing projects that will be used to address some of the economic issues relevant to the GHL/moratorium analysis. The models used in these studies range from bioeconomic models of the commercial fishery to impact analyses of the marine sport sector. While the information provided by these studies might at best provide a fragmented description of the economics of the halibut charter and commercial industries, their results should be useful for predicting directional changes in benefits and impacts that would arise from alternative specifications of the GHL and/or moratorium.

The quantitative tools that will be briefly discussed generally fall into two camps: those that are useful for the estimation of value and net benefits, and those used to calculate the distributional impacts of monetary transactions. The former are addressed by studies that utilize market models of supply and demand for the exvessel and wholesale markets of the commercial fishery, as well as a current study that assesses the value of recreational fishing with contingent valuation. The impact analyses employ input-output modeling, which has long been the most commonly used technique in regional economics.

This discussion will reference a number of the more recent halibut-related studies in terms of the modeling techniques employed. A discussion of their applicability in addressing a number of economic concerns that were listed by the SSC in its February, 1999 minutes will then follow. The extent to which these concerns can be addressed is limited to the intended purposes of the referenced studies; however, some of the results should be helpful toward providing answers on a qualitative level.

Models

Input-Output Models

A survey developed by Lee et al. (1999) provides expenditure data for sport fishing anglers off the Kenai Peninsula in 1997. These expenditures along with effort data reported in the annual ADF&G Statewide Harvest Survey serve to construct a baseline for an input-output (I/O) model being developed by Herrmann et al. (1999). This study examines the impacts to the western Kenai Peninsula of marine sport fishing in lower Cook Inlet. The IMPLAN I/O model was selected and the database for four zip codes representing the western Kenai Peninsula was ground-truthed to 1997 values for output, employment and income following guidelines set forth in Geier et al. (1994). Because industries relevant to the recreational fishery are not explicitly reflected in IMPLAN but instead subsumed within highly aggregated sectors, it is necessary to disaggregate these industries into the sectors of interest. The chosen method of disaggregation in the Herrmann study involves running impact scenarios in IMPLAN to simulate the production characteristics of relevant sectors. Response coefficients (multipliers) are generated from this process and can be used as the basis for a separate, free standing recreational I/O model. This process mirrors the methodology used for the Recreational Economic Impact Model (REIM) developed by William Jensen and Hans Radtke of Jensen Consulting (1997), and some of the production recipes in the Herrmann study default to those models. The recreational model predicts

impacts to the regional economy that arise from simulated changes in guided and/or unguided sport fisheries. It should be noted that this study focuses on impacts at a finer regional resolution than is typical, and does not quantitatively expand impacts of the Cook Inlet marine recreational fisheries to the entire state of Alaska, or to the nation. The results are therefore very region-specific.

A comprehensive, area-wide I/O model was developed by ISER and Council staff for the original halibut charter EA/RIR/IRFA (NPFMC 1997). This analysis employed the Fisheries Economic Assessment Model (FEAM), also developed by Jensen Consulting to simulate impacts of the commercial fisheries and the REIM package to simulate impacts of the recreational fisheries. Though IMPLAN does have a commercial fishing sector, it is too highly aggregated to use to model the effects of a specific fishery and thus must be disaggregated much like for the recreational sectors. Both the FEAM and REIM models are based on IMPLAN-generated coefficients from the 1993 database, and run for various levels of projected biomass and growth in the charter industry. Charter costs and angler expenditure patterns were based on survey data collected by ISER for ADF&G.

Knapp (1997a) has also developed a community economic impact model of the IFQ program, presumably based on an I/O methodology. As of the time of this writing, Council staff has not yet seen the results of this work.

Recreational Fishing Demand Models

Contingent Valuation with Stated Preference Models

In addition to angler expenses, Lee et al. (1999) elicited responses to a series of ranking and ratings questions for use in two stated preference models. Estimates of value for marine sport fisheries off the Kenai Peninsula will be generated, but probably not in time to incorporate in this analysis.

Participation Rate Model

Panel data obtained from the Lee et al. (1999) survey are used to estimate the following econometric model:

$$P(T_i) = f(\text{cost}_i, \text{catch}_{ij}, \text{size}_{ij}, \text{other}) \text{ for all } i \text{ and } j.$$

Where $P(T_i)$ is the probability of taking trip i , cost_i is the cost of trip i , catch_{ij} is the number of fish of species j caught on trip i , size_{ij} is the average size of fish of species j caught on trip i , and other includes binary variables to differentiate between the responses of resident and nonresident anglers.

By varying the attributes of a fishing trip such as anticipated catch or cost, we can predict changes in angler participation and adjust angler day expenditures accordingly by making some assumptions concerning the share of daily angler expenditures attributed to the fishing trip. This model was originally intended for use in conjunction with the Herrmann et al. (1999) study since it dictates the magnitude of the changes in angler expenditure that are fed into the recreational I/O model. However, an additional feature of Lee's participation rate model is that a basic, price dependent demand relationship for recreational fishing can be established by varying the price attribute. This constitutes a demand function which can reveal angler surplus and elasticity measures for the marine sport fishery originating from the Kenai Peninsula. Since the model was estimated with interaction terms that account for substitutability of salmon fishing, the demand for halibut can be isolated. However, because the survey question did not differentiate between a charter or private fishing trip, it will not be appropriate to characterize the results as demand for *charter* trips without first ascertaining the prevalence of respondents whose basis for comparing the hypothetical trips was a charter, vs private trip.

Ex-vessel Demand for the Commercial Halibut Fishery

A number of studies have explored price /quantity relationships in the exvessel and wholesale markets for the commercial halibut fishery. However, recent extrapolations of the results obtained in these studies are frustrated by structural changes to the fishery such as implementation of IVQs in Canada and ITQs in Alaska. Much of the published work on halibut markets pre-date these events, see Lin (1988), Criddle (1993), Homans (1993), and Schellberg (1993). However, Herrmann (1996) examined the price effects of IVQs and Knapp (1997b) described market changes following IFQs and provided some observations on how changes in product form may have affected exvessel demand for halibut. Additionally, Herrmann (1999) re-estimated a multivariate single equation demand function from Lin (1988) to provide, among other things, a cursory indication of elasticity.

RESPONDING TO SSC CONCERNS

At its February 1999 meeting, the SSC provided a list of economic issues to be addressed in the GHLM/moratorium analysis. A plan for analyzing these issues using information from the above sources is outlined in the context of excerpts of the SSC minutes.

SSC Concern 1

"The tradeoff between profits earned by charter operators and net benefits obtained by charter customers. For example, while an appropriately specified moratorium may conserve or increase profits for charter operators, it may constrain or reduce the net benefits obtained by charter customers."

To quantitatively assess the above tradeoffs, we would need to estimate profits for charter operators and surplus for guided anglers under various scenarios. We do have a sense for the composition of charter expenditures for segments of the charter fleet in some areas, based on information supplied by industry as well as ISER survey results, but the data is not sufficient for estimation of a cost function. Therefore, estimation of a cost function for charter operators will not be possible in this analysis. If a moratorium effectively prohibits expansion in an otherwise growing charter industry, price increases for charter trips would theoretically benefit eligible charter operators. In the absence of adequate cost data by region and sufficient time for processing such data into a cost function, estimated changes in average gross revenues for the charter sector will be provided in lieu of actual economic profits.

Changes in guided angler surplus caused by alternative specifications of a moratorium would be best modeled by some contingent valuation or stated preference method, or perhaps other model of demand such as the travel cost method. While the stated preference work that will rely on Lee et al. (1999) will not be available in time for incorporation into this analysis, the survey data has been useful for constructing a participation rate model described in the Herrmann I/O study. Since this model includes a price dependent component, it will provide an estimate of the number of halibut sport fishing trips demanded at different prices. Some assumptions will have to be made to relate this information to demand for charter trips vs generic trips for sport caught halibut. As well as serve as an estimator of surplus at a point in time, it will also provide a relative measure of elasticity, which in turn has important implications for qualitatively describing potential changes to angler net benefits.

The consideration of these tradeoffs is further complicated by the regional differences of charter supply and demand, and the fact that a moratorium could be implemented on a local or global level. Charter operations differ from region to region in terms of costs and the types of trips provided. Likewise, the composition of guided anglers also varies regionally, implying differences in the demand for charter trips. Study results for one area may not appropriately address the characteristics of other ports, and this is a limiting factor of the usefulness of the participation rate model being used in the Herrmann I/O study, since it relies exclusively on data collected for marine sport fisheries originating in lower Cook Inlet.

SSC Concern 2

"The distribution of risk associated with alternative specifications of the GHL. For example, if the charter fishery is allocated a fixed tonnage or number of halibut rather than a fixed percentage of the TAC, the commercial fishery will absorb reductions (increases) in the TAC."

The distribution of risk associated with alternative specifications of the GHL depends on whether it is a strict allocation vs cap to trigger management measures, and whether it is set as a fixed poundage vs a percentage of TAC as discussed in Part I. These tradeoffs can be discussed qualitatively and this framework is included in the 1997 analysis. Quantitative treatment would require simulating various specifications of the GHL and biomass with reliable net benefit and impact models. However, the tools we have to work with will not be amenable to much more than a directional characterization of impacts and benefits.

SSC Concern 3

"The sensitivity of exvessel demand (elasticity) for halibut and the sensitivity of demand (elasticity) for halibut charters."

Methods for arriving at demand for halibut charters were discussed earlier. Demand models or other price quantity relationships for the commercial halibut fishery abound in the existing literature. However, using time series data to estimate recent demand is problematic given structural changes to the fishery such as individual quota programs. The results of the commercial fishery studies mentioned earlier will be presented to characterize the exvessel halibut market as much as practicable, with the caveat that individual quota management has changed the nature of the fishery. Herrmann's 1999 working paper attempts to account for these changes in his estimation of exvessel price flexibility. While Herrmann maintains that his results "should only be used as a gross indication" of current elasticities because of simultaneous equations bias, the work contains the most recent observations and econometric analysis available to date. Therefore, the GHL analysis will likely rely extensively on this study where economic discussion of the commercial fishery is concerned.

SSC Concern 4

"Differences in the regional economic impacts of commercial and charter fishing."

The I/O modeling in the analysis prepared by ISER and Council staff in 1997 includes both recreational (REIM) and commercial (FEAM) models for impact analysis by region. While one could argue that the IMPLAN database relied upon is outdated, this set of models is nonetheless the most complete and consistent methodology available for comparing impacts across both sectors.

These models as they currently exist can be used to compare the multiplicative effects of direct, indirect, and induced effects of exogenous demand changes for each sector, or they could be updated to reflect recent values for charter and commercial operations as well as angler expenditures. Such an exercise could prove useful since there have been some changes in the importance of certain locations as commercial halibut ports as well as similar changes in the charter fishery. However, conducting such updates would be prohibitively time consuming.

The I/O model being developed by Herrmann et al. (1999) is driven by expenditure changes that result from changes in angler activity. Changes in angler activity caused by perceived changes in trip attributes such as cost, catch, and size of fish are predicted by the participation rate model described earlier. As participation rates respond to changes in trip attributes, the resulting changes in expenditure are fed into the recreational I/O model for an estimation of impacts to the western Kenai Peninsula. Despite our limitations in projecting the magnitude of changes outside of the Kenai region, the recreational model may be useful for predicting the direction of change to the extent that similar expenditure patterns hold across the charter clientele of different

regions, and that they have similar motivations for fishing in general. If, however, the reasons that non-resident guided anglers visit Alaska vary substantially by region, then their expenditures should not be similarly apportioned as fishing related expenditures per se. This would make it difficult to use this model to predict impacts to regions other than the one it was designed to represent. Another limitation of this study for purposes of the GHL analysis is that no equivalent model for the commercial fishery exists to make comparisons using a consistent methodology across both sectors.

ANALYSIS OF THE COUNCIL'S ALTERNATIVES

The economic effects of a GHL and/or moratorium will depend on whether it is set as an actual allocation or as a cap that triggers management measures to draw down charterboat harvests in subsequent seasons. Both applications would be binding on the charter sector (assuming attainment of the GHL), however, the allocative effects would be manifested differently. Whether the GHL is set at a percentage of TAC or as a range that includes some fixed level of allowable harvests by the charter sector also has implications for the possible range of economic outcomes. Compounding the complexities for analysis of the alternatives are options for a moratorium on halibut charter licenses. Because the moratorium can be implemented at either an area-wide or local level, the potential outcomes are numerous and difficult to predict. While we can attempt to address the demand and regional impact characteristics of the charter industry using the sources outlined earlier, it will be very difficult to determine how the effects of a policy change that apply to one geographic location will spill over into neighboring fisheries. Because our measures of demand for charter trips and the commercial exvessel market are limited to studies that examine one of several locations that vary in their economic traits on one hand, or the fisheries in the aggregate on the other, we will be very limited in describing the substitution effects of guided anglers whose halibut charter opportunities become constrained in some areas but not in others. Predictions of directional change may be assumed from the models and tools available to us, but reliable estimates of magnitude will not be warranted for many if not all of the scenarios proposed by the alternatives.

The appropriate level of quantitative detail expected for the combined GHL/moratorium economic analyses is the subject of further discussion between the SSC and Council staff.

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April 1999 Alternatives for GHL Analysis

Alternative 1: Status quo. Do not develop regulations to implement a halibut Guideline Harvest Level.

Alternative 2: Convert the GHL to an allocation.

The guided sport halibut fishery would be allocated 12.76% of the combined commercial and guided sport halibut quota in area 2C, and 15.61% in Area 3A. The commercial fishery would be allocated 87.24% and 84.39% of the combined quota in Areas 2A and 3C, respectively. Under a GHL as an allocation, the guided sport fishery would close when that sector reached its allocation.

Option A: Area-wide moratorium

Sub-option: Prohibit new charter licenses upon attainment of the GHL.

Option B: Local moratorium

Alternative 3: Convert the GHL to an allocation range.

The allocation range will have an upper and lower limit and would be a fixed amount expressed in numbers of halibut. The allocation range would be set by IPHC Areas 2C and 3A. Some or all of the management measures listed below would be implemented up to 2 years after attainment of the GHL (1 year if data is available), but prior to January 1 for industry stability. If the guided sport halibut harvest exceeds the upper limit of the range in a year, the guided sport fishery would be restricted to reduce the harvest back within the allocation range using management actions listed below. If the guided sport halibut harvest is restricted and the harvest is reduced below the lower limit of the range guided sport fishery management measures would be liberalized to increase the harvest back within the allocation range.

- line limits
- annual angler limit
- vessel trip limit
- super-exclusive registration
- sport catcher vessel only area
- sportfish reserve
- bag limits

Option A: The upper limit of the allocation range would be set at 125% of the 1995 guided sport halibut harvest. The lower limit of the allocation range would be set at 100% of the 1995 guided sport halibut harvest.

Sub-option 1: Reduce the guided sport halibut allocation to a target range of 75-100% of base year amount during times of significant stock decline. This reduction would be IPHC area-specific and would occur in any year that the guided sport allocation exceeds a specified percentage of the combined commercial and guided sport TAC. Percentages to be analyzed should include:

- a. 15%
- b. 20%
- c. 25%

Sub-option 2: 1) Reduce the guided sport halibut allocation for conservation purposes by a set percentage in years of significant stock decline.

- a. 10%
- b. 15%
- c. 20%

2) The trigger for implementing the reduction would be based on total removals and would be IPHC area-specific.

Area 2C

- 1) 4 million lb
- 2) 6 million lb
- 3) 8 million lb

Area 3A

- 1) 10 million lb
- 2) 15 million lb
- 3) 20 million lb

Option B: The upper limit of the allocation range would be set at 125% of the 1998 guided sport halibut harvest. The lower limit of the allocation range would be set at 100% of the 1998 guided sport halibut harvest.

Sub-option 1: Reduce the guided sport halibut allocation to a target range of 75-100% of base year amount during times of significant stock decline. This reduction would be IPHC area specific and would occur in any year that the guided sport allocation exceeds a specified percentage of the combined commercial and guided sport TAC. Percentages to be analyzed should include:

- a. 15%
- b. 20%
- c. 25%

Sub-option 2: 1) Reduce the guided sport halibut allocation for conservation purposes by a set percentage in years of significant stock decline.

- a. 10%
- b. 15%
- c. 20%

2) The trigger for implementing the reduction would be based on total removals and would be IPHC area-specific.

Area 2C

- 4) 4 million lb
- 5) 6 million lb
- 6) 8 million lb

Area 3A

- 1) 10 million lb
- 2) 15 million lb
- 3) 20 million lb

Option C: Moratorium (applies to all of the above)

- a. area-wide
- b. local

Alternative 4: Under a GHL, apply a range of management measures listed below to curtail catch rates of guided anglers once GHL is attained.

The GHL functions as a cap. Apply management measures up to 2 years after attainment of GHL (1 year if data is available, but prior to January 1 for industry stability).

- line limits
- boat limit
- annual angler limit
- vessel trip limit
- super-exclusive registration
- sport catcher vessel only area
- sportfish reserve
- rod permit
- bag limits

Option A: Area-wide moratorium

Sub-option: Prohibit new charter licenses upon attainment of the GHL.

Option B: Local moratorium

The criteria for an area-wide halibut charter moratorium under Alternatives 2, 3, and 4 are:

Years of participation

- Option 1: 1995, 1996, and 1997 IPHC licenses and 1998 logbook
- Option 2: 2 of 3 years (1995-97) plus 1998 logbook
- Option 3: 1 of 3 (1995-97), plus 1998 logbook
- Option 4: license or logbook in any one year (1995-98)

Owner vs Vessel

- Option 1: owner/operator or lessee (the individual who has the license and fills out logbook) of the charter vessel/business that fished during the eligibility period (based on an individual's participation and not the vessel's activity)
- Option 2: vessel

Evidence of participation

- mandatory:
 - IPHC license (for all years)
 - CFEC number (for all years)
 - 1998 logbook
- supplementary:
 - Alaska state business license
 - sportfish business registration
 - insurance for passenger for hire
 - ADF&G guide registration
 - enrollment in drug testing program (CFR 46)

Vessel upgrade

- Option 1: license designation limited to 6-pack, if currently a 6-pack, and inspected vessel owner limited to current inspected certification (held at number of people, not vessel size)
- Option 2: allow upgrades in southeast Alaska (certified license can be transferred to similar sized vessel)

Transfers

will be allowed

Duration for review

- Option 1: tied to the duration of the GHL
- Option 2: 3 years
- Option 3: 5 years (3 years, with option to renew for 2 years)

Restructured Alternatives for GHL Analysis

Alternative 1: Status quo. Do not develop implementing regulations.

Alternative 2: Apply GHLs to Areas 2C and 3A as:

Option 1: Guideline point estimate based on 125% of the charter halibut harvest. It would not close fisheries inseason, but would trigger management measures up to 2 years after attainment of the GHL (1 year if data are available), but prior to the start of the charter fishery season for industry stability.

Charter

Based on 1995: Caps equal 12.76% in 2C, 15.61% in 3A.

Based on 1998: Caps equal 18.01% in 2C, 13.82% in 3A.

Option 2: Guideline range in numbers of fish. It would not close fisheries inseason, but would trigger management measures up to 2 years after attainment of the GHL (1 year if data are available), but prior to January 1 for industry stability.

Charter

Based on 1995: Range equals 47 - 59 thousand fish in 2C; 138 - 173 thousand fish in 3A

Based on 1998: Range equals 60 - 75 thousand fish in 2C; 155 - 193 thousand fish in 3A

Option 3: Allocation that closes fisheries inseason.

Charter

Based on 1995: Allocations equal 12.76% in 2C, 15.61% in 3A. 87.24% in 2C; 84.39% in 3A

Based on 1998: Allocations equal 18.01% in 2C, 13.82% in 3A. 81.99% in 2C; 86.18% in 3A

Commercial

Alternative 3: Reduce area-specific GHL ranges during significant stock declines.
(Applicable only to Alternative 2, Option 2)

Option 1: Reduce GHL to 75-100% of base year amount when the guided sport allocation is predicted to exceed a specified percentage (options: 15, 20, or 25%) of the combined commercial and charter TAC. The triggers are presented below:

<u>Area 2C Options</u>			<u>Area 3A Options</u>		
	1,000 fish	M lb		1,000 fish	M lb
1995	16	~9	1995	920	~19
	237	~7		690	~14
	189	~6		552	~12
1998	401	~12	1998	1,033	~22
	301	~9		775	~16
	241	~7		620	~13

based on 1998 wt. averages

GHG range reduced to:

Based on 1995: Range equals 36 - 47 thousand fish in 2C; 104 - 138 thousand fish in 3A

Based on 1998: Range equals 45 - 60 thousand fish in 2C; 116 - 155 thousand fish in 3A

Option 2: Reduce GHG by a set percentage (options: 10, 15 or 20%). The trigger for implementing the reduction would be based on total removals and would be IPHC area-specific:

<u>Area 2C Options</u>	<u>Area 3A Options</u>
4 million lb	10 million lb
6 million lb	15 million lb
8 million lb	20 million lb

GHG range reduced to:

Based on 1995: 10%: Range equals 43 - 53 thousand fish in 2C; 124 - 155 thousand fish in 3A

15%: Range equals 40 - 50 thousand fish in 2C; 117 - 147 thousand fish in 3A

20%: Range equals 38 - 47 thousand fish in 2C; 110 - 138 thousand fish in 3A

Based on 1998: 10%: Range equals 54 - 68 thousand fish in 2C; 139 - 174 thousand fish in 3A

15%: Range equals 51 - 64 thousand fish in 2C; 132 - 164 thousand fish in 3A

20%: Range equals 48 - 60 thousand fish in 2C; 124 - 155 thousand fish in 3A

Alternative 4: Implement management measures. Anywhere from none to all of the following management measures would be implemented up to 2 years after attainment of the GHG (1 year if data is available), but prior to January 1 for industry stability. Restrictions would be tightened or liberalized as appropriate to achieve a guided sport harvest within the GHG. These measures may be applied to any option under alternatives 2 or 3 with/without Alternative 5.

- | | |
|-----------------------|----------------------------------|
| • line limits | • super-exclusive registration |
| • boat limit | • sport catcher vessel only area |
| • annual angler limit | • sportfish reserve |
| • vessel trip limit | • rod permit |
| | • bag limits |

Alternative 5: Implement a moratorium.

(Could be applied to Alternatives 1, 2, or 3, with or without Alternative 4.)

Option 1: Area-wide moratorium

Option 2: Local moratorium

Suboption: Prohibit new charter licenses upon attainment of the GHL.

Moratorium Criteria:

Years of participation

Option 1: 1995, 1996, and 1997 IPHC licenses and 1998 logbook

Option 2: 2 of 3 years (1995-97) plus 1998 logbook

Option 3: 1 of 3 (1995-97), plus 1998 logbook

Option 4: license or logbook in any one year (1995-98)

Owner vs Vessel

Option 1: owner/operator or lessee (the individual who has the license and fills out logbook) of the charter vessel/business that fished during the eligibility period (based on an individual's participation and not the vessel's activity)

Option 2: vessel

Evidence of participation

- mandatory:
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Option 2: allow upgrades in southeast Alaska (certified license can be transferred to similar sized vessel)

Transfers

will be allowed

Duration for review

Option 1: tied to the duration of the GHL

Option 2: 3 years

Option 3: 5 years (3 years, with option to renew for 2 years)