

MEMORANDUM

TO: Council, SSC, and AP Members

FROM: Clarence G. Pautzke *CO*  
Executive Director *Sec*

ESTIMATED TIME  
20 HOURS

DATE: February 2, 2000

SUBJECT: Halibut Charterboat Management

**ACTION REQUIRED**

Final action on halibut charterboat GH L and management measures.  
Discussion of an Individual Fishing Quota Program for the halibut charter fleet.

**BACKGROUND**

Final action

In December 1999, the Council approved for public review the analysis for implementing a guideline harvest level (GHL) and management measures to keep harvests under the GHL for the halibut charter fishery in Gulf of Alaska Areas 2C and 3A. It adopted the restructured alternatives as proposed by the staff to simplify the decision-making process and added to the analysis: (1) possession limits as a possible management tool; (2) a 3-year rolling average for determining whether an area GHL is exceeded; (3) an option to apply the GHL as a percentage to the constant exploitation yield (CEY) by area after non-guided sport and personal use deductions are made, but prior to deductions for commercial bycatch and wastage; (4) additional discussion of available baseline economic data for Area 2C; (5) clarification of the participation rate model's application to the bag limit analysis; (6) a suboption to reduce the GHL range of fish by an amount proportionate to a reduction in the CEY; and (7) additional discussion of implementation and enforcement issues.

The public review draft of the GHL analysis, which included revisions addressing # 1 - 5 (above), was distributed on January 14, 2000. The current list of alternatives scheduled for final action (Agenda C-1(a)) and the executive summary (Agenda C-1(b)) are attached. An addendum, which addressed # 6 - 7 and the results of the IPHC halibut stock assessment, was distributed on February 1 and is also attached under Agenda C-1(c). It includes a new proposal for pre-season temporal bag limit changes and a framework for an implementation schedule. A 1995 NOAA General Counsel memo clarifying that State authority to regulate fishing for Pacific halibut in Convention waters is preempted by federal law is under Agenda C-1(d). Comments by the IPHC are attached under Agenda C-1(e). Public comments received are bound separately and identified as Agenda C-1 Supplemental.

## IFQs

The Council requested that a discussion be scheduled at this meeting of changes to the halibut individual fishing quota program which would allow the purchase of IFQs by the charter fleet. Some individuals in the charter industry have also proposed the development of an IFQ program based on charter harvests in lieu of the GHL. Such a program would be based, for example, on fishing history as reported on the State logbooks for the period 1998-1999 (as an initial allocation) and then allow transfers of quota shares across sectors. There is some question as to whether this would be considered a "new" IFQ program or simply a change to the existing program. In any case, the current Congressional moratorium does not preclude the Council from discussion and development at this time. A more detailed proposal for such a program is included in your notebooks under Agenda C-1(f).

Halibut GHL Alternatives for final action in February 2000

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

Alternative 2: Approve management measures to implement the halibut charter guideline harvest level

**ISSUE 1:** Apply GHLs to Areas 2C and/or 3A to trigger management measures as:

Option 1: Fixed percentage annually expressed in pounds.

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

Based on 1998: GHL equal to 18.01% in 2C, 13.85% in 3A.

Option 2: Fixed range in numbers of fish.

Based on 1995: GHL range equals 50 - 62 thousand fish in 2C; 138 - 172 thousand fish in 3A

Based on 1998: GHL range equals 61 - 76 thousand fish in 2C; 155 - 193 thousand fish in 3A

Option 3: Manage GHL as a 3-year rolling average

Option 4: Apply the GHL as a percentage to the CEY by area after non-guided sport and personal use deductions are made, but prior to deductions for commercial bycatch and wastage.

**ISSUE 2:** Implement management measures. None to all of the following management measures 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. Restrictions would be tightened or liberalized as appropriate to achieve a charter harvest below the GHL if a fixed percentage or within the GHL range if a range.

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

**ISSUE 3:** Under varying halibut abundance.

Option 1: Status quo. The GHL fixed percentage varies on an annual basis with area halibut abundance.

Option 2: Reduce area-specific GHL ranges during years of significant stock decline. The following suboptions may be instituted in a stepwise fashion, and/or used in combination.

Suboption 1: Reduce to 75-100% of base year amount when the charter allocation is predicted to exceed a specified percentage (options: 15, 20, or 25%) of the combined commercial and charter TAC.

Suboption 2: Reduce area-specific GHL by a set percentage (options: 10, 15 or 20%). The trigger for implementing the reduction would be based on total harvests 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

or an amount proportionate to the reduction in abundance (indicated by the CEY)

**ISSUE 4: GHL or allocation**

- Option 1: Under a GHL and the current IPHC setline quota formula, halibut not harvested by the charter fleet in one year are rolled into the commercial setline quota the following year.
- Option 2: Unharvested halibut would remain unharvested under a direct allocation to the charter sector.  
Suboption: unharvested halibut banked in a sportfish reserve

**ISSUE 5: Establish a moratorium for the halibut charter industry.**

- Option 1: Establish an area-wide moratorium
- Option 2: Establish a local moratorium  
Suboption: Prohibit new charter licenses upon attainment of the GHL.

**EXECUTIVE SUMMARY****SUMMARY OF SECTION 1**

This analysis for a regulatory amendment assesses the potential economic and social impacts of implementing management measures to limit harvests by anglers in the halibut charter fisheries in International Pacific Halibut Commission (IPHC) Areas 2C (Southeast Alaska) and 3A (Southcentral Alaska). Currently there is no limit on the annual harvest of halibut by anglers utilizing charter boats, lodges, and outfitters. Therefore, the status quo results in an open-ended reallocation from the commercial fishery to a growing recreational charter fishery.

In September 1997, the Council took final action on two management actions affecting the halibut charter fishery, culminating more than four years of discussion, debate, public testimony, and analysis:

Recordkeeping and reporting requirements. The Council approved recording and reporting requirements for the halibut charter fishery. To comply with this requirement, the Alaska Department of Fish and Game (ADF&G) Sport Fish Division, under the authority of the Alaska Board of Fisheries (BOF), implemented a Saltwater Sportfishing Charter Vessel Logbook (SCVL) in 1998. Information collected under this program includes: number of fish landed and/or released, date of landing, location of fishing, hours fished, number of clients, residence information, number of lines fished, ownership of the vessel, and the identity of the operator. This logbook information is essential for the analysis of charter moratorium alternatives. It complements additional sportfish data collected by the State of Alaska through the Statewide Harvest Survey (SWHS), conducted annually since 1977, and the on-site (creel and catch sampling) surveys conducted separately by ADF&G in both Southeast and Southcentral Alaska.

Guideline Harvest Levels in IPHC Areas 2C and 3A. The Council adopted GHLs for the halibut charter fishery, but only for IPHC Regulatory Areas 2C and 3A. They were based on the charter sector receiving 125% of their 1995 harvest (12.76% of the combined commercial/charter halibut quota in Area 2C, and 15.61% in Area 3A). The Council stated its intent that the GHLs would not close the fishery, but instead would trigger other management measures in years following attainment of the GHL. The overall intent was to maintain a stable charter season of historic length, using area-specific measures. If end-of-season harvest data indicated that the charter sector likely would reach or exceed its area-specific GHL in the following season, NMFS would implement the pre-approved measures to slow down charter halibut harvest. Given the one-year lag between the end of the fishing season and availability of that year's harvest data, it was anticipated that it would take up to two years for management measures to be implemented. The Council also scheduled a review of halibut charterboat management for October 2000, though that may change as a result of current actions.

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 were reached, no formal decision by the Secretary was required for the GHL. Therefore, the analysis never was forwarded for Secretarial review.

After being notified that the 1997 GHL analysis would not be submitted for Secretarial review, the Council initiated a public process to identify GHL management measures. The Council formed a GHL Committee to recommend management measures for analysis that would constrain charter harvests under the GHL.

In April 1999, the Council identified for analysis: (1) a suite of GHL management measure alternatives; (2) alternatives that would change the GHL as approved in 1997; and (3) area-wide and LAMP moratorium

options under all alternatives. Recognizing that (1) reliable in-season catch monitoring is not available for the halibut charter fishery; (2) in-season adjustments cannot be made to the commercial longline individual fishing quotas (IFQs); and (3) the Council's stated intent to not shorten the current charter fishing season resulted in the Council designing the implementing management measures to be triggered in subsequent fishing years.

During initial review in December 1999, the Council added: (1) a change in possession limits to the management measures that it would consider to limit charter halibut harvests under the GHL; (2) an option to apply the GHL as a percentage to the CEY by area after non-guided sport and personal use deductions are made, but prior to deductions for commercial bycatch and wastage; (3) an option to manage GHL as a 3-year rolling average. Lastly, the Council deleted an option that would close the charter fishery in-season if the GHL was reached or exceeded. The Council further adopted the restructured alternatives as proposed by staff. The options are not mutually exclusive and may be combined when the Council makes its final decision in February 2000.

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

Alternative 2: Approve management measures to implement the halibut charter guideline harvest level

ISSUE 1: Apply GHLs to Areas 2C and/or 3A to trigger management measures as:

Option 1: Fixed percentage annually expressed in pounds.

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

Based on 1998: GHL equal to 18.01% in 2C, 13.85% in 3A.

Option 2: Fixed range in numbers of fish.

Based on 1995: GHL range equals 50 - 62 thousand fish in 2C; 138 - 172 thousand fish in 3A

Based on 1998: GHL range equals 61 - 76 thousand fish in 2C; 155 - 193 thousand fish in 3A

Option 3: A 3-year rolling average

Option 4: A percentage to the CEY by area after non-guided sport and personal use deductions are made, but prior to deductions for commercial bycatch and wastage.

Under any option, management measures would be triggered 1-2 years after attainment of the GHL, but prior to the start of the charter fishery season for industry stability.

ISSUE 2: Implement management measures. None to all of the following management measures 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. Restrictions would be tightened or liberalized as appropriate to achieve a charter harvest to below the GHL if a fixed percentage or within the GHL range, if a range.

ISSUE 3: Under varying halibut abundance.

Option 1: Status quo. The GHL fixed percentage varies on an annual basis with area halibut abundance. (This is the current GHL approach adopted by the Council in 1997.)

Option 2: Reduce area-specific GHL ranges during years of significant stock decline.

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

Suboption 1: Reduce to 75-100% of base year amount when the charter allocation is predicted to exceed a specified percentage (options: 15, 20, or 25%) of the combined commercial and charter TAC.

Suboption 2: Reduce area-specific GHL by a set percentage (options: 10, 15 or 20%). The trigger for implementing the reduction would be based on total harvests 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

**ISSUE 4: GHL or allocation**

Option 1: Under a GHL and the current IPHC setline quota formula, halibut not harvested by the charter fleet in one year are rolled into the commercial setline quota the following year.

Option 2: Unharvested halibut would remain unharvested under a direct allocation to the charter sector.

Suboption: unharvested halibut banked in a sportfish reserve

**ISSUE 5: Establish a moratorium for the halibut charter industry.**

Option 1: Establish an area-wide moratorium

Option 2: Establish a local moratorium

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

The criteria for an area-wide halibut charter moratorium are:

**Years of participation**

Option 1: 1995, 1996, and 1997 IPHC and CFEC 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 GHF

Option 2: 3 years

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

**SUMMARY OF SECTION 2**

None of the alternatives under consideration would affect the prosecution of the halibut fisheries in a way not previously considered in consultations. The proposed alternatives are designed to improve the long-term productivity of halibut stocks. None of the alternatives would affect takes of listed species. Therefore, none of the alternatives are expected to have a significant impact on endangered or threatened species. None of the alternatives is expected to have an effect on endangered or threatened species.



## SUMMARY OF SECTION 3

The two main criteria that determine if and when the GHLs, as presented in this analysis, will be reached or exceeded are: 1) the status of the halibut biomass and future biomass projections and 2) charter effort and projected growth of harvest. Section 3 provides the baseline data from the 1998 IPHC halibut stock assessment and descriptions of halibut harvests and participation by fishery sector and area from ADF&G statewide harvest surveys that are used in Sections 5 and 6 to prepare the RIR. Lastly, halibut biomass and charter fishery projections as presented to the Council in 1993 and 1997, and as currently updated in 1999, are discussed. **A separate report on the findings of the 1999 IPHC halibut stock assessment and 2000 halibut quotas will be provided prior to final action in February 2000 and will be incorporated into the final analysis prior to submission for Secretarial review.** This report will also include revised biomass projections which will likely modify the current projections of when the GHLs may be reached.

Biology and total removals of Pacific halibut in Areas 2C and 3A

The halibut resource is healthy and total removals are at record levels. The 1998 IPHC stock assessment models show a strong 1987 year-class. No strong year-classes are following, indicating that recruitment and ultimately, biomass, have peaked. Changes for Areas 2C and 3A over the past several years occurred as a result of changes to the stock assessment model more than as a result of biological changes. In the absence of model changes, short-term fluctuations in exploitable biomass, and therefore in quotas, should be small. The final analysis will be revised pending the results of the 1999 IPHC stock assessment.

Landings in 1998 were among the top five highest years, at over 94 million pounds. Halibut harvests in 1998 in Area 2C totaled 12.9% and 75% of total removals for the charter and commercial fisheries, respectively. In Area 3A, those fisheries harvested 9.3% and 75%, respectively, in 1998. Non-guided sport halibut anglers harvested 6.9% and 5.6% in Areas 2C and 3A, respectively, in 1998.

Projections of halibut biomass and quotas in Areas 2C and 3A

In 1993, ADF&G and IPHC staff reported that the coast-wide exploitable halibut biomass declined by 25% from 1988 to 1992, from 359 to 266 million pounds. In 1993, exploitable biomass was declining at about 10% per year. Continued biomass decline was predicted during 1993-97 at annual rates of 9, 7, 5, 3, and 1% per year. Halibut biomass was then predicted to increase from 1998 through 2000 at 1, 3, and 5% per year, respectively, due to increasing recruitment.

The 1997 Council analysis projected that, using an overall exploitation rate of 18% in 1998 and 20% every year thereafter, the expected halibut biomass would decrease by 32%, from an estimated 429 million pounds in 1998 to 292 million pounds in 2008 for the combined Areas 2A, 2B, 2C, 3A, and 3B. The projections had very wide confidence intervals due to environmental conditions. They predicted a substantially slower decline in exploitable halibut biomass than originally estimated in the 1993 report.

Since the development of these projections, the IPHC halibut stock assessment model was modified to account for an apparent 20% decrease in the length-at-age of halibut. The end result of all the changes to the IPHC model is that both halibut biomass and recruitment are considered to be *higher* than that estimated under previous stock assessment. These estimates are a result of changes to the IPHC model and not due to changes in the halibut stock. That is, it was not so much that the halibut stock increased as that the IPHC stock assessment could now detect the level more accurately.

The 1993 and 1997 projections of exploitable halibut biomass were compared with actual levels in 1994-98. Actual levels appear to fall within the projected range for 1997 and 1998 in the 1997 Council analysis and are substantially higher than the 1993 ADF&G and IPHC projections. In fact, the actual exploitable biomass levels in 1997 and 1998 are only slightly above the *expected value* of the 1997 projections. The 1997 projections appear to be appropriate to continue estimating future exploitable biomass levels in the near term.

Halibut quota changes for Areas 2C and 3A over the past several years occurred as a result of changes to the stock assessment model more than as a result of biological changes. In the absence of model changes, short-term fluctuations in exploitable biomass, and therefore in catch limits, should be small. Recruitment represents a small fraction of the exploitable biomass, therefore, has a small annual effect. Increased selectivity over ages 8- to 12-yrs accounts for the majority of biomass added annually to offset natural mortality. The very large exploitable biomass relative to recruitment buffers the population from changes. However, because exploitable biomass has been at a high level, and because recruitment has declined over the past several years, lower exploitable biomass is more probable than higher exploitable biomass for the next five years. Exploitable biomass in Areas 2C and 3A, and therefore quotas, will range from constant over five years to a decline of 3-5% per year.

#### Current charter harvest levels and projected growth

The expected pattern for the halibut charter fishery is continued growth in the number of halibut taken, but little change in average weight. Little change occurred in charter halibut harvest (in pounds) from Area 2C during 1994-96 (an average of 970,000 lb net weight). A 12% drop to 853,000 lb occurred in 1997, followed by a near doubling of harvested biomass (1.77 million lb) in 1998. The 1998 logbook data confirmed this estimate. Two significant changes occurred in the Area 2C halibut charter fishery between 1997 and 1998: 1) the number of halibut harvested increased by 45%; and 2) the average weight of halibut increased by 43%. Less change occurred in the Area 3A halibut charter fishery between 1998 and 1999 than occurred in Area 2C: 1) the number of halibut harvested was approximately the same despite a decrease of 20% in client angler-days; and 2) the average weight of halibut decreased by only 6%.

#### Current charter participation and projected growth

The number of unique active businesses and vessels was consistent for Area 2C, with 397 and 386 businesses and 581 and 588 vessels in 1998 and 1999, respectively. "Active" is defined as having reported bottomfishing effort on the logbook form. Approximately 87% of registered businesses and vessels in both years were owned by Alaska residents as indicated by permanent mailing address. For Area 3A, the number of unique active businesses was slightly higher in 1999 at 434 than 1998 at 422 as indicated by logbook data. The number of unique active vessels was also slightly higher in 1999 at 501 than 1998 at 480. Approximately 96% of Area 3A registered businesses and vessels in both years were owned by Alaska residents as indicated by permanent mailing address.

A cursory comparison of businesses and vessels actively participating in the halibut charter industry would indicate that growth is flat, despite only two years of logbook data and the newness of the mandatory logbook requirement. A more detailed examination of active vessels in Section 5, however, identifies approximately 350 of the 1999 vessels as unique to that year (175 in each area). This indicates considerable exit and entry in this fishery between 1998 and 1999.

A total of 2,424 Alaska residents and 37,976 non-residents were Area 2C saltwater (all species) charter clients in 1998. Non-residents comprised between 86% and 100% of clients, with an average of 94% for all. Estimates for 1994-97 are not currently available. A total of 30,255 Alaska residents and 53,519 non-residents

were Area 3A saltwater charter clients in 1998. Non-residents comprised between 56% and 93% of clients, with an average of 64% for all ports in the area.

The 1997 Council analysis provided revised projections of the growth rate of the charter boat industry. Charter removals of halibut (total net weight of halibut) were expected to continue to increase, but at a declining rate. The analysis also stated that the total sport harvest of halibut had been increasing more slowly than prior reports indicated, averaging 6.4% annually from 1990 to 1995. There is considerable variation, however, in growth rates of harvest between fully capitalized locations in Alaska and those that are newly accessible. In addition, while the growth rate of halibut biomass taken in the sport harvest was averaging about 15% at the start of the 1980s, in 1997 it was reported to be substantially lower, about the same as the growth rate of the number of halibut harvested.

The 1997 Council analysis assumed two widely divergent bounds of higher and lower projections of the growth rate of charter boat removals of halibut. In 1995, the charter fishery accounted for 9.2% of the combined commercial/charter catch for all areas. Based on the expected values of halibut biomass discussed above, the analysis translated the 1997 projections of charter growth into charter share of the *total* halibut harvest at right for combined areas. The projected growth rate was 10.2% in Area 2C.

The actual growth rate for the halibut charter and non-charter fishery from 1990-95 was similar to the 6.4% growth rate reported in the 1997 Council analysis. From 1990-95, the combined sport fishery in Area 2C had a growth rate of 7.1%. This analysis updates this information; the average annual growth rate based on SWHS for Area 2C for 1994-98 was actually 10.8%, with wide variance between years. Halibut harvest increased 45% between 1997 and 1998. The 1998 logbook verified this estimate, but the logbook program did not exist in 1997 to verify the 1997 SWHS estimate. It is believed the SWHS may have underestimated charter catch and harvest in earlier years.

The actual growth rate for the halibut charter and non-charter fishery from 1990-1995 did not reflect the linear increase as projected by ADF&G and IPHC in 1993, but was more similar to the 5.4% growth rate reported in the 1997 Council analysis. For 1990-1995, the combined sport fishery in Area 3A had a growth rate of 6.3%. The average annual growth rate based on SWHS for Area 3A for 1994-98 (5.1%) matched the 1997 projection.

In summary, a comparison of projected and actual rates of growth of the charter harvest with the combined charter/commercial harvest in Area 2C indicate that the projections from the 1997 Council analysis appear to reflect actual trends for 1994-98. Still two years shy of the 2000 projections, actual growth is bounded within the lower growth and higher growth projections. Actual growth for 1994 through 1998 in Area 3A appears to best approximate the lower growth rate projections for 2000 from the 1997 Council analysis. Therefore, it is appropriate to continue to use these projections to characterize future growth in the Area 2C charter fishery in the near term.

One of the principal factors in charter growth is directly related to tourism, particularly in Area 2C where nearly all charter clients are non-residents. The number of visitors to Alaska has grown over the past two decades, although the rate of growth has been declining in recent years. Annual growth in visitation averaged 10% between 1989 and 1994, and 12% each year for 1993 and 1994. Between 1994 and 1996, growth slowed to less than 6% per year, and since 1997, to less than 3% per year. The 1998 *summer* season marked Alaska's lowest growth rate in a decade at 1.3%, or about 1.1 million visitors, between May and September 1998. Recent years represent a substantial deviation from the 7.2% average *summer* growth seen since 1989. This slower, decreased rate of growth is predicted to continue for the next two to three years.

Baseline economic data for charter fishery

The monetary contribution that the guided halibut fishery makes to regional economies requires information on angler expenditures, effort (time spent fishing), and the portion of overall expenditures that are attributable to fishing. Information used in this study was primarily derived from a mail survey targeting persons sport fishing on the Kenai Peninsula conducted by Lee et al (1999), and analysis of that data conducted by Herrmann (1999). Alaskan residents tended to take more and longer trips than non-Alaskan residents, but spent less money per day. Alaskan residents also caught fewer halibut per day (1.69) than non-Alaskan residents (2.04).

Angler expenditures

Angler expenditures are divided into fishing and non-fishing categories. Fishing expenses include items such as tackle, charter fees, and clothing. Non-fishing expenses cover daily living and transportation costs of the fishing trip. The expenditures in this analysis are based on information from the 1997 and 1998 fishing years.

Average angler expenditures for Cook Inlet marine sport fisheries

Overall the average daily travel and living expenditures for Alaska and non-Alaska residents were \$44 and \$101, respectively. Fishing costs for Alaska and non-Alaska residents were \$47 and \$138, respectively. The values for Alaska residents were much lower because trips where fishing occurred on private boats and from shore were included in the data as well as charter trips. When the estimates were made for charter trips only, the fishing expenditures for Alaskan (\$141 - the charter itself cost \$128) and non-Alaskan (\$208 - the charter itself cost \$142) residents were closer to being equal.

Effort information from the 1998 and 1999 ADF&G logbooks were then combined with the daily fish expense information. Combining these two sources of information assumes that effort data from one year can appropriately be applied to expenditures from another year. The resulting values indicate that about \$19.3 million were spent as a result of charter boat fishing for halibut in the Cook Inlet off the Kenai Peninsula, during 1998. Of the \$19.3 million, \$4.6 million (24 percent) were spent by Alaskan residents and \$14.7 million (76 percent) by non-Alaskan residents. About 81 percent of the money spent in Alaska was spent within the Kenai Peninsula. Expenditure estimates for 1999 were similar to those for 1998, because effort estimates from the 1999 log books were similar to those in 1998.

Applications to 3A

Average angler expenditures from the Cook Inlet study were applied to area 3A as a whole, but required some broad assumptions regarding characteristics of the area 3A ports. Ports in area 3A that may well have similar characteristics to the Cook Inlet ports are places like Seward. Charter clients can drive to Seward and it offers the similar living opportunities/cost structures to places like Homer. Yakutat, on the other hand, does not fit as well. Clients would be required to fly into Yakutat to fish, and the cost of living maybe higher. These differences mean that applying the Cook Inlet expense structure to Yakutat may yield misleading results. However, overall it is thought to be reasonable to apply Cook Inlet expenses to charter ports in 3A as a whole, since the Cook Inlet ports (and ports similar to the Cook Inlet ports) make up the majority of charter effort in area 3A.

Fishing expenditures in Cook Inlet attributable to halibut charter fishing were \$15.0 million in 1998 (total expenditures were \$19.3 million). In area 3A as a whole, \$18.0 million was spent on fishing expenditures attributable to the halibut charter fishery.

### Applications to 2C

The distribution of clientele residency, between transportation cost to get to the port, reasons for being in the port (vacation versus fishing) are different area 2C and 3A. Each of these factors change the expenditure patterns of charter clients. Because the cost structure of taking a charter trip in area 3A and 2C are thought to be very different, the expenditure information from the Cook Inlet study has not been applied to area 2C.

Some basic information on the cost of a charter trip is presented for area 2C. Those data indicate that the prices paid for a charter trip are higher in area 2C than in 3A. Trips out of Juneau, for example, are reported to cost \$150-\$220 per person (85 percent of the trips are for salmon), with the average trip costing \$180. Half-day trips have been quoted from \$150-\$190 per person, but these trips are likely only for salmon, because of the travel time to reach the halibut fishing grounds. In Petersburg, trips were quoted as costing \$165-\$170 per day.

### Commercial fisheries

Since 1977, the total commercial fishery catch in Alaska has ranged from 16 to 61 million lb. Beginning in 1981, catches began to increase annually and peaked in 1988. Catches have since declined, reaching a low of 44 million lb in 1995. The 70 million lb harvest in 1998 represented an 8% increase over 1997. Bycatch mortality, i.e., the catch of halibut in other groundfish fisheries, is the second largest source of removals from the stock, totaling approximately 13 million lb in 1998.

### Current commercial harvest levels and projected growth

Area 2C has the second largest area commercial halibut TAC in Alaska. Peak area catches occurred in 1988 at 11 million lb. Since the beginning of the IFQ fishery, area 2C halibut harvests have ranged between 7.5 and 10.0 million pounds. During 1999, the 10 million lb quota was landed in 24 ports. Eighteen were located in Alaska and accounted for 96 percent of Area 2C landings. Four were located in Washington state, one in Oregon, and one in Canada. In total, 3,448 separate halibut landings were made by vessels harvesting area 2C halibut in 1999.

Area 3A has the largest area commercial halibut TAC in Alaska. Since the beginning the IFQ fishery, area 3A halibut harvests have ranged between 18 and 26 million pounds. The Area 3A quota peaked in 1988 at 38 million lb. During 1999, the 25 million lb quota was landed in 31 ports. Twenty-three ports were located in Alaska and accounted for over 96 percent of the landings. Five were located in Washington state, two in Oregon, and one in Canada. In total, 3,448 separate halibut landings were made by vessels harvesting area 3A halibut in 1999.

### Current commercial participation

A total of 1,734 persons held quota share (QS) in Area 2C at the end of 1998, down 27% from initial issuance in 1995 (2,386 persons). More than half of Area 2C QS holders hold QS in amounts  $\leq$  3,000 (1998) pounds. The number of shareholders decline with increasing size of QS: 28%, 15%, and 4% hold QS between 3-10 thousand lb, 10-25 thousand lb, and > 25 thousand lb, respectively. The majority of consolidation has occurred in persons holding less than 3,000 pounds of quota. Some consolidation of QS was expected when the IFQ

program was approved. However, the Council did implement measures to ensure that small participants remained in the fishery. Those measures appear to have been successful.

A reduction of about 500 QS holders (about one-third of the initial recipients) has taken place in that class from the time of initial issuance through 1998. The number of persons holding more than 3,000 pounds of halibut quota has tended to remain more stable. However, the overall trend is for the number of persons in the smaller classes to shrink with the larger classes remaining stable or increasing.

A total of 2,348 persons held QS in Area 3A at the end of 1998, down 23% from initial issuance in 1996. Approximately half of Area 3A QS holders hold QS in amounts  $\leq 3,000$  (1998) pounds. The number of shareholders decline with increasing size of QS: 22%, 16%, and 13% hold QS between 3-10 thousand lb, 10-25 thousand lb, and  $> 25$  thousand lb, respectively.

About 82 percent of Area 2C QS holders are Alaska residents who hold about 84 percent of the halibut quota in 2C. The remaining QS is held by residents of 18 other States or Canadian residents. Seventy-six percent of QS holders that were not initially issued QS for halibut are Alaskan residents, as of year-end 1998, with the remaining 24 percent being non-residents. Nearly 15% of Area 2C QS were held by crew members. This indicates a fairly high rate of "buy-in" to the fishery by Alaskan residents. A small amount of acquired QS has been purchased by crewmen.

About 79 percent of Area 3A QS holders are Alaska residents; they held 64 percent of the 3A QS. Washington residents held over 24 percent of the QS, while only accounting for 12 percent of the people holding QS. Oregon residents held over 7 percent of the QS. Seventy-two percent of Area 3A QS held by non-initial recipients of quota are Alaskan residents, with the remaining 28 percent held by non-residents

A total of 836 vessels landed IFQs in Area 2C at the end of 1998. Consolidation has been occurring, with 1998 vessels down 24 percent from initial issuance and 53 percent from 1992. More than half of all vessels participating in the halibut IFQ program landed IFQs in Area 2C. A total of 3,118 landings were made by the vessels operating in Area 2C during 1998. On average, each vessel made about 3.7 landings. The 3,118 landings in Area 2C accounted for approximately 44 percent of all landings in the 1998 halibut fishery.

A total of 899 vessels landed IFQs in Area 3A during 1998, down 47 percent from initial issuance and 53 percent from 1992. Approximately 56 percent of all vessels participating in the halibut IFQ program landed IFQs in Area 3A. A total of 2,919 landings were made from fish harvested in Area 3A during 1998. Area 3A accounted for approximately 41 percent of the number of statewide halibut landings.

Catcher/sellers were the most common type of buyer permit issued in Area 2C. However, only 54 of the 587 catcher/seller permits were used to purchase halibut in 2C. The next largest category was shoreside processors. A total of 128 shoreside processor permits were issued for all of Alaska and 30 permits were used to purchase halibut in Area 2C.

Only 208 of the 859 registered buyer permits were used to purchase halibut in Area 3A during 1998. Most of the buyers that did purchase Area 3A halibut were in the catcher/seller (129 buyers) and shoreside processor (61 buyers) categories. No other category had more than seven active buyers in 1998.

#### Background Economic Information on the Commercial Halibut Fishery

Ex-vessel prices for halibut in the commercial fishery increased statewide from 1992-96. The statewide average price of halibut in 1992 was \$0.98 and increased to \$2.24 in 1996. In 1997 the price dropped slightly

to \$2.15, then fell sharply to \$1.26 in 1998. The large decrease in price for the 1998 fishing year reflected an overall decrease in fish prices that year were at least partially a result of weak Asian economies.

Ex-vessel halibut revenue in areas 2C and 3A were \$12.2 and \$52.3 million, respectively, in 1997. Revenues dropped to \$12.1 million (2C) and \$31.1 million (3A), in 1998. The decrease in revenue was primarily a result of the drop in ex-vessel price, as harvest amounts were fairly stable.

First wholesale prices also decreased from 1997 to 1998. Head and Gut products dropped from \$2.67 per pound in 1997 to \$1.91 in 1998. Overall the average wholesale price per pound across all product forms was \$2.77 in 1997 and \$2.05 in 1998.

First Wholesale revenues were derived from the Commercial Operator Annual Reports. Those data indicate that revenues at the first wholesale level increased from \$76 million in 1995 (the first year of the IFQ program), to \$130 million in 1997. In 1998, revenues declined to \$93 million.

The value of a unit of QS and its standardized value in terms of pounds of fish are reported for 1995-98. These data were derived from the RAM transfer files, and are reported in CFEC's 1999 IFQ study. QS prices increased from 1995-97 and then fell in 1998. This is the same trend that was observed for ex-vessel and first wholesale prices. The mean price of a pound of IFQ in area 2C was \$7.58 in 1995 and \$10.14 in 1998. This is a price increase of about 34 percent. In area 3A the price increased from \$7.37 in 1995 to \$8.55 in 1998, or a 16 percent increase. Therefore the relative IFQ transfer price has increased faster in area 2C than in 3A.

Commercial fishery costs were estimated for the halibut 1996 halibut fleet using an engineering and key informant approach. The results of that study indicated that a total of 132,160 skates were set in 1996, across IPHC areas 2C-4E. The cost of fishing that gear was estimated to be \$2.2 million in setting/retrieving costs, \$0.9 million in fuel, \$0.9 million in bait, and \$0.4 million in gear replacement costs. Processing and shipping costs were also estimated in that study. The costs varied depending on whether the product was sold fresh or frozen and the port the processing occurred. In general, processing costs were assumed to be \$0.30 per pound for fresh halibut and \$0.50 for frozen. Shipping costs varied by port, but the cost of shipping halibut fresh was 4 to 5 times as much as shipping frozen product.

#### SUMMARY OF SECTION 4

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. Section 4 assimilates data and results collected from a number of ongoing studies that shed some light on the current economic characteristics of the commercial and sport charter halibut fisheries. Findings relating to the charter fishery are limited in geographic scope to the Cook Inlet portion of the Kenai Peninsula. This information may sufficiently characterize the Area 3A fishery; however, it is not appropriate to extrapolate these findings to 2C. While the information provides only a fragmented description of the economics of the halibut charter and commercial industries, it helps point out the directional implications of benefits and impacts affected by a GHL and/or moratorium.

#### Demand for commercially caught halibut

Herrmann (1999) reviewed the available literature on demand studies for commercially caught halibut. Applying these results to describe present day conditions is problematic not only because the data relied upon

is dated, but also because of recent structural changes in the fishery, effects of which are difficult to isolate. These include adoption of a quota style management regime and drastic increases in the TAC.

To explain and describe current halibut demand at the exvessel level, Herrmann begins with a simple model for expository purposes and later updates and adapts a demand model from Lin et al. (1988) to generate more reasonable measures of elasticity, and the inverse of price elasticity: flexibility. Price flexibility, that is the relative change in price resulting by a change in quantity, is useful for predicting how quantity changes affect total revenues to harvesters. Herrmann found commercial demand at the exvessel level to be relatively inflexible, meaning that an increase in harvests would be met, all else the same, with a less than proportional decrease in price. This implies that the halibut market is not yet saturated at the exvessel level. However, without better information on operator costs, we cannot conclude that increased total revenues due to increased harvests will translate into a net revenue gain.

Estimating demand at the consumer level is theoretically possible given the exvessel demand and sufficient information on marketing margins and the price and quantities of the various product forms at the retail level. However, the scarcity of such data precludes accurate estimation of retail level demand.

#### Stated preference (contingent valuation) model for marine sport fishing off of the Kenai Peninsula

The value of a sport caught halibut off of the Kenai Peninsula is the topic of a forthcoming work that relies on data elicited by survey in Lee et al. (1999a). Results of two methodologies will be compared to provide a range for the value of sport caught halibut. These results will not likely be available until early 2000.

#### Participation rate model for recreational halibut fishing off of the Kenai Peninsula

A working paper by Lee et al. (1999b) provides a model that predicts how angler participation changes in response to changes in fishing attributes, such as the cost of the average trip and/or the expected catch and size of halibut and salmon. The results of simulations where price (cost) and catch were varied is presented, as well as elasticity estimates derived from these simulations. Overall, anglers are predicted to respond inelastically to changes in per day fishing costs. For all prices, Alaskans respond more sensitively to price changes than do non-residents. Likewise, changes in halibut catch effect a relatively inelastic response in participation.

#### Angler net benefits

The participation rate model can also be used to estimate the average net benefit to anglers of fishing for halibut, although we can't isolate charter related benefits from all other halibut opportunities. The average Alaskan angler in the Cook Inlet halibut fishery off the Kenai Peninsula realizes \$61 worth of benefits above and beyond their daily costs, whereas non-residents gain \$59 of net benefits on average. These figures are used to arrive at an aggregate measure of net benefits for charter boat clients in the Cook Inlet portion of the Kenai Peninsula fishery given estimates of resident and non-resident effort. In 1998, the combined net benefits are estimated at \$3,603,929. Given annual angler expenditures of \$19,320,943, the total value of this fishery is estimated at \$22,924,872. In order to derive net benefits from the fishery, we would have to subtract the costs associated with providing charter trips. Marginal cost data is not currently available, making it difficult to estimate the net benefits to charter operators.



Quota share prices as proxy for expected net benefits to commercial fishing sector

Though adequate cost data for the commercial sector is not available, a measure of the capitalized net benefits expected by commercial operators can be gleaned from the market price of halibut quota shares. However, even though the price of quota shares can be related to the present value of expected producer surplus, it does not necessarily reflect the accrual of that surplus to quota share holders because only some of these were awarded quota (and hence received a windfall) whereas others purchased it. Therefore, this complicates estimation of total producer surplus.

Expenditure based economic impacts of the Cook Inlet halibut charter fishery to the western Kenai Peninsula

Based on expenditure data collected in the Lee et al. (1999a) survey, input-output (I/O) modeling was performed to gauge the impacts of angler expenditures attributable to the halibut charter fishery on the western Kenai Peninsula. After accounting for the direct, indirect, and induced effects of angler expenditures, the fishery contributes a total of \$22,560,637 worth of sales (output), \$9,259,417 worth of income, and 738 jobs to the regional economy (western Kenai). Note that these jobs are not full-time equivalents, but include seasonal and part-time positions. The economic impacts of incremental changes to halibut catch and the average daily cost of taking a trip are also provided in tabular form.

## SUMMARY OF SECTION 5

Information from ADF&G Sport Fish Division, charter associations, and earlier estimates from ISER indicate anywhere from 450 to 600 'active' charter vessels. In 1998 there were 1,085 vessels which participated in the logbook program with saltwater bottom fish activity (581 in Area 2C and 504 in Area 3A). No attempt was made to determine how many of those were 'full-time' operators. That number increased to 1,108 in 1999 (588 in Area 2C and 520 in Area 3A), with approximately 350 of those vessels being unique to 1999, indicating considerable entry/exit in this fishery from 1998-1999.

Earlier estimates from the 1997 study indicated that 402 'full-time' charter vessels, each operating at 50% load factor (operating 75% of available days at 66% seat capacity) could have taken the 1995 charter fleet harvest. Given the 1998 harvest level (an increase of about 30 % over 1995 levels for total Area 2C and 3A pounds harvested, and 15% increase in total numbers of fish harvested), the estimate of full-time equivalent charter vessels would be between 462 and 522 vessels, without taking into account changes in the average weight of fish harvested.

The alternatives under consideration would qualify between 497 and 694 vessels, if 1998 logbook participation is required. These numbers are substantially less than the numbers actually participating in 1998 and 1999, based on the logbook information. Option 4 only requires participation in any year 1995-1998 and would qualify 2,073 vessels. Allowing supplementary information for qualification (other than IPHC license and/or 1998 logbook) could increase the number of qualifying participants.

The calculations were based on vessel participation history as opposed to individual (owner) participation history. However it is likely that the vessel numbers shown will closely approximate total permit numbers if the Council chooses to base qualification on owner participation history. Nevertheless, this decision is among the most critical with regard to a moratorium, in terms of granting permits to the appropriate recipients and minimizing disruption to the charter fleet in the initial allocation of permits; i.e., in many cases the current owner of a particular qualifying vessel may not be the individual owner associated with the vessel's qualifying catch history.

Although the total harvest capacity of the fleet is difficult to estimate, the currently licensed fleet (based on 1998 logbooks) has a harvest capacity well above the current harvest level, and even the currently active fleet is probably not operating at its maximum capacity. The presence of excess harvest capacity reduces the effectiveness of a moratorium and the ability to predict when it may become constraining on harvest. Only when latent capacity is filled would a moratorium become effective at maintaining harvest within the GHL.

Client demand may be the more effective limiting factor on growth in this industry sector than a moratorium, or a moratorium and quota limit, depending on where the limit is set.

The more restrictive moratorium options being considered may result in an effective moratorium; i.e., along with other management measures, may be effective at keeping the charter fleet within a GHL. This is particularly true if the GHL is set at a level higher than the current harvest level, and/or if it is set at a fixed poundage. A GHL based on a floating percentage, combined with declines in overall halibut biomass, reduce the likelihood of the moratorium's effectiveness; i.e., at low GHL levels, there likely will be excess capacity relative to that GHL under all options.

A moratorium would likely help promote economic stability for existing charter operators, particularly in areas where dramatic increases in participation have occurred recently. However, the issue of who receives the permit will also play an important role in determining future stability. Some of the benefits derived by charter operators from a moratorium would come at the expense of losses to the charter clients in terms of potential price increases for charter trips, which would result in reduced net angler benefits.

The interrelationship, and potential conflicts, between an area-wide moratorium and local level (LAMP) moratoria needs to be considered. An area-wide moratorium may negatively impact the development of fisheries in areas without excess charter effort, without necessarily helping in areas that are already overcrowded. LAMP moratoriums may be more effective at resolving these local area issues, but likely would not be effective relative to attainment of GHL goals.

There is still uncertainty in the accuracy of the logbook reports. The State has recommended a minimum 3-year time series of logbook data to compare with data collected in the statewide harvest and creel surveys.

## SUMMARY OF SECTION 6

Alternative 1, no action, would result in continued unconstrained charter halibut harvests and a *de facto* reallocation of halibut from the commercial sector to the charter sector. This analysis assumes that sport halibut removals will increase by approximately 9 % in Area 2C and 4% in Area 3A for the charter sector and 1 percent in the unguided sector over the next 5 years. If that rate of growth does occur in future years, the ex-vessel gross revenues to the commercial fishery in areas 2C and 3A would decline given an elastic demand curve at the ex-vessel level. Net benefits to consumers of commercially caught halibut would also decline. There is not enough information to discern whether these losses would be offset by the increases in net benefits to charter operators and guided anglers. Nor is there enough information to compare the loss of regional economic activity associated with the commercial sector against the respective gain for the charterboat sector.

Under Alternative 2, the guideline harvest level, by itself, has no management effect on either charter or commercial harvests. The associated management measures are the critical components of the program.

The following general picture of the halibut charter and commercial fisheries was drawn:

- halibut biomasses are at peak abundances, but likely to decline by 3-5% each year in the short-term;
- quotas are likely to remain steady according to the 1998 IPHC stock assessment;
- charter harvests are continuing to increase, but at declining rates;
- commercial quotas decline as charter harvests increase.

Five specific management issues have been identified which conform with the Council's April 1999 suite of alternatives, options and suboptions. This section draws the following conclusions regarding these issues.

**ISSUE 1:** Apply GHLS to Areas 2C and/or 3A to trigger management measures as a fixed percentage annually expressed in pounds or a fixed range in numbers of fish, based on 125% of 1995 or 1998 charter harvests.

In 1997, the Council adopted the GHL based on a fixed percentage based on 1995 charter harvests. This equated to 12.76% of the combined charter harvest and commercial quota in Area 2C and 15.61% in Area 3A (as calculated in 1997). The Council is now considering altering that decision by adopting the GHL as a fixed range of numbers of fish and revising the base year to 1998. This would revise the GHL percentages to a fixed point somewhere between 12.76-18.01% in Area 2C and 13.84-15.61% in Area 3A and set the GHL range between 50 - 76 thousand fish in Area 2C and 138 - 193 thousand fish in Area 3A. To address concerns regarding possible declines in halibut abundance, a set of reduction mechanisms are tied to the fixed range, which are addressed under Issue 3.

In determining whether the base year should be updated, the analysis examined higher and lower growth projections to estimate when the respective GHLS might be reached. From this:

- ADF&G harvest data appear to have exceeded the 1995-based GHL in 1998. Therefore, had the 1997 GHL decision been approved by the Secretary, GHL management measures would be triggered for the next fishing season in Area 2C.
- the projected timeline suggests that under higher growth rates, the charter harvest in Area 2C could reach the 1998-based GHL sometime during 2000 - 2001 and under lower growth rates, sometime during 2003 - 2004.
- Area 3A projections indicate that the 1995-based GHL might be reached sometime during 1999 - 2000 under the higher projection and 2000 - 2001 under the lower projection.
- the 1998-based GHL might be reached during 2000 - 2001 under the higher projection and during 2003 - 2004 under the lower projection.

In summary, the Council could set the percentage or range at any point within the ranges listed above. The obvious allocational impacts are that the higher the GHL is (in pounds or fish) in an area, the greater the allocation would be to the charter sector and the lower the quota assigned to the commercial sector.

The Council also added two options for applying the GHL that may be chosen in combination with either Options 1 or 2 and each other.

**Option 3: Manage GHL as a 3-year rolling average**

The Council's new option to manage the GHL on a 3-year rolling average may result in delaying the imposition of management measures by up to 3 years to generate the average. The Council may instead choose to manage an annual average in the event the GHL is greatly exceeded.

**Option 4:** Apply the GHL as a percentage to the CEY by area after non-guided sport and personal use deductions are made, but prior to deductions for commercial bycatch and wastage.

An addendum will be provided prior to final action which will address the impacts of 2000 quotas, revised biomass projections, and changes to the IPHC procedure for calculating charter/commercial quotas.

Under any option, management measures would be triggered 1-2 years after attainment of the GHL, but prior to the start of the charter fishery season for industry stability.

**ISSUE 2:** Implement management measures, with an option to close the fishery in-season once the GHL is reached.

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• line limits</li><li>• boat limit</li><li>• annual angler limit</li><li>• vessel trip limit</li><li>• bag limits</li></ul> | <ul style="list-style-type: none"><li>• super-exclusive registration</li><li>• sport catcher vessel only area</li><li>• sportfish reserve</li><li>• rod permit</li><li>• possession limits</li><li>• prohibit crew-caught fish</li></ul> |
|---|--|

Of the eleven measures to constrain charter harvests in future years to within the respective GHLs analyzed here, only bag limits and boat limits appear to limit charter harvests.

- the reduction in harvest effected by a bag limit could exceed the actual decrease in halibut that can be kept assuming that effort does not change. This is because effort can be expected to change as anglers react to the change in quality of the average halibut trip. The magnitude of effort change is difficult to quantify and is likely to vary across region according clientele usage patterns.
- boat limits would result in the same amount of halibut being harvested on a trip as the bag limit alternatives, and, in fact, may result in higher harvests under the proposed "collective" or party fishing definition.
- line limits may redirect fishing effort between vessels, but is unlikely to further restrict harvest. A 6-line limit and restrictions of lines to number of paying passengers currently exists in Area 2CA; additional restrictions would limit vessels to a 4-packs or 5-packs. Nearly 90% of Area 2C charters took four clients in 1998, therefore, a 4-line limit may not result in adequate reductions to stay within the GHL. Area 3A charter vessels traditionally fish up to 27 lines. A floating scale for line limits may address traditional fishing patterns on larger sized vessels. A prohibition of fish harvested by crew may result in adequate harvest reduction to keep the harvest within the respective GHLs. Enforcement of lines "fished" would also be difficult.

PUBLIC REVIEW DRAFT

- most charter clients take either two or four halibut in a year. A small percentage of avid anglers exceed that, indicating that annual angler limits will have less impact on total halibut removals compared with impacts on the amount of halibut taken by a few fishermen.
- only 4% of Areas 2C and 3A trips would be affected by limiting a vessel to one trip each day. If an average trip results in an average harvest, then a vessel trip limit may result in a harvest reduction of 4%. Recognizing the overcapacity of the fleet, clients will likely charter on another available vessel.
- superexclusive registration and Sport Catcher Vessel Only Areas may redistribute fishing effort but are unlikely to reduce halibut removals. They may be valid management tools to be included within a LAMP.
- a rod permit program does not exist in Washington or Oregon upon which to model the Alaska halibut fishery.
- The sportfish reserve would nullify the constraining effect of the GHL by reallocating halibut from the commercial sector to the charter sector when the GHL would trigger a reduction.
- possession limits will not be an effective management tool since most fishermen harvest only one or two halibut per year; however, proposed changes would enhance federal enforcement of current possession limits.
- prohibiting halibut harvested by the captain and crew may limit the charter harvest to below the GHL; however, enforcement may be difficult on multi-species charters since it would be in effect for halibut only.

Relative effectiveness of proposed management measures

Proposed measures	no	+	++	+++
line limits				
boat limit				
annual angler limit				
vessel trip limit			--	
bag limits				
super-exclusive registration				
sport catcher vessel only area				
sportfish reserve				
rod permit				
possession limits				
prohibit crew-caught fish				

**ISSUE 3:** Adjust the GHL fixed range of fish under varying halibut abundance.

Adjusting the GHL range during years of low abundance becomes moot if the Council chooses to set the GHL as a fixed percentage. Alternatively, if the Council adopts the GHL as a fixed range (Issue 1 Option 2), then the Council must decide whether and how to apply that range in years of low halibut abundance.

Suboptions 1 and 2 reduce the GHL range at very different levels of abundance. Suboption 1 proposes to reduce a GHL range by 25% when it exceeds 15%, 20%, or 25% of the combined charter/commercial quota during years of varying abundance. The suboption links the combined quota in pounds to the range of fish in numbers. The combined quota triggers levels equate to approximately 3.7, 4.9, and 7.0 M lb in Area 2C and 6.6, 8.8, and 12.5 M lb in Area 3A.

Suboption 2 would not trigger reductions in the range until total harvests had been reduced by 42-70%, depending on the Council's preferred alternative. Three choices would be used in a 3-step process to reduce the GHL range, depending on the base year. Proposed total removal trigger levels are 4, 6, and 8 M lb for Area 2C and 10, 15, and 20 M lb for Area 3A. The lowest levels match the lowest total removals ever recorded and stocks associated with those levels could be considered depressed. The highest proposed triggers are approximately 20% below 'typical' levels of total removals.

**ISSUE 4:** Determine whether a GHL or allocation

Option 1 is tied to the Council's interpretation that the GHL is a target against which the level of charter harvests are gauged to determine if management measures need to be invoked to further constrain those levels. Under Option 1, the difference in halibut that could be harvested by charter anglers under the GHL and what is annually harvested, would in effect "roll over" to the commercial sector at the start of the season.

Option 2 is distinct from Option 1 in that as an allocation, the commercial sector would not accrue the full benefit of any unharvested GHL halibut in the subsequent year. While the overall CEY will likely be higher because fewer removals occurred, the commercial sector would be constrained by its allocation percentage that will be adopted by the Council.

The next issue under Option 2 to be considered by the Council is whether the unharvested halibut should accrue conceptually in a sportfish reserve. Charter sector proponents of "banking" unharvested fish in such a system have defined the reserve such that unharvested fish would not accrue "pound for pound" in the reserve, but that the sector would get a credit for those unharvested fish when the GHL is constraining on their clients. In summary, a sportfish reserve negates the effects of a GHL by "reallocating" additional halibut to the charter sector when that sector's harvests would exceed the GHL and trigger constraining management measures. This reallocation would be redirected from the commercial quota.

**ISSUE 5:** Establish a moratorium, either area-wide local

Area-wide and local moratorium options were analyzed separately in Section 5. Those conclusions that relate to the GHL are repeated here.

- The alternatives would qualify between 497 and 694 vessels, if 1998 logbook participation is required. These numbers are substantially less than the numbers actually participating in 1998 and 1999, based on the logbook information. Option 4 only requires participation in any year 1995-1998 and would qualify 2,073 vessels. Allowing supplementary information for qualification (other than IPHC license and/or 1998 logbook) could increase the number of qualifying participants.
- Although the total harvest capacity of the fleet is difficult to estimate, the currently licensed fleet (based on 1998 logbooks) has a harvest capacity well above the current harvest level, and even the currently active fleet is probably not operating at its maximum capacity. The presence of excess harvest capacity reduces the effectiveness of a moratorium and the ability to predict when it may

become constraining on harvest. Only when latent capacity is filled would a moratorium become effective at maintaining harvest within the GHL.

- The more restrictive moratorium options being considered may result in an effective moratorium; i.e., along with other management measures, may be effective at keeping the charter fleet within a GHL. This is particularly true if the GHL is set at a level higher than the current harvest level, and/or if it is set at a fixed poundage. A GHL based on a floating percentage, combined with declines in overall halibut biomass, reduce the likelihood of the moratorium's effectiveness; i.e., at low GHL levels, there likely will be excess capacity relative to that GHL under all options.

#### Administration

To enhance efficiency and ensure that necessary measures are invoked in a timely manner, non-discretionary measures may be enacted such that their implementation occurs automatically upon the charter fleet's attaining or exceeding the GHL by publication of a Federal Register notice. The regulatory amendment would also establish the duration of such management measures and the circumstances upon which such measures would be lifted. To minimize delay of imposition of triggered GHL management measures, the Council could either: 1) select only one management measure that would be triggered if a GHL is attained or exceeded; or 2) select multiple measures that would all be implemented simultaneously.

#### SUMMARY OF SECTION 7

Some of the alternatives under consideration could result in a significant impact on a substantial number of small entities. A more definitive assessment will depend on the alternatives (and specific options such as downstream management measures) selected by the Council. A formal IRFA focusing on the preferred alternative(s) will be included in the final analysis for Secretarial review.

**ADDENDUM**  
**TO THE**  
**PUBLIC REVIEW DRAFT OF THE HALIBUT CHARTER GHL ANALYSIS**

This addendum contains the following changes to the halibut charter GHL analysis:

- Part I. adds a suboption to Issue 3, Option 2, Suboption 2:  
“or an amount proportionate to the reduction in abundance (indicated by the CEY)”
- Part II. updates Section 3.1 to incorporate new biological information from the IPHC 1999 halibut stock assessment
- Part III. updates Section 6.3 by providing additional information from agency staff on implementation and enforcement issues.
- it includes a proposal to add temporal adjustments to bag limits to the list of management measures

Prepared by

Staff

North Pacific Fishery Management Council  
Alaska Department of Fish and Game

February 1, 2000



PART 1: ERRATA, ISSUE 3, OPTION 2, SUBOPTION 2 (p. 197)

ISSUE 3: Under varying halibut abundance.

Option 1: Status quo. The GHL fixed percentage varies on an annual basis with area halibut abundance.

Option 2: Reduce area-specific GHL ranges during years of significant stock decline. The following suboptions may be instituted in a stepwise fashion, and/or used in combination.

Suboption 1: Reduce to 75-100% of base year amount when the charter allocation is predicted to exceed a specified percentage (options: 15, 20, or 25%) of the combined commercial and charter TAC.

Suboption 2: Reduce area-specific GHL by a set percentage (options: 10, 15 or 20%). The trigger for implementing the reduction would be based on total harvests 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

or an amount proportionate to the reduction in abundance (indicated by the CEY)

The bolded text above was added to the trigger levels under Issue 3, Option 2, Suboption 2 but was inadvertently omitted from the public review draft. The language was approved by the Council during its deliberations in December 1999. The intent of the additional trigger level is to link a proportionate reduction of an area-specific GHL range with that of the area-specific CEY determined in the IPHC halibut stock assessment. Staff interprets the time frame to be from one year to the next, i.e., compare the 2001 CEY to the 2000 CEY and adjust the range of fish proportionate to that change in CEY, if the change was negative. A positive change in CEYs would not result in a proportionate increase in the range of fish.

Under this suboption, the GHL range of fish would be adjusted by the decline in CEY. Historical CEYs are presented in Table 1; however, the 1999 CEY reflects the IPHC's current understanding of stock abundance and recruitment. The Area 2C total CEY was reduced by 34% between 1999 and 2000. The Area 3A total CEY was reduced by 40%.

To illustrate its effectiveness, a proportionate reduction to the range of fish by area would be:

For Area 2C, the fixed range of fish associated with the 1995 base year (50 - 62 thousand fish) would be reduced to 33 - 41 thousand fish. This compares to 38 - 50 thousand fish when the combined charter and commercial quota was 6.97 M lb under the 15% suboption, 4.92 M lb under the 20% suboption, and 3.69 M lb under the 25% suboption.

For the 1998 base year, the fixed range of fish associated with the Area 2C 1995 base year (61 - 76 thousand fish) would be reduced 40 - 50 thousand fish. This compares to 46 - 61 thousand fish when the combined charter and commercial quota was 12.52 M lb under the 15% suboption, 8.84M lb under the 20% suboption, and 6.63 M lb under the 25% suboption. A broader discussion of of Suboption 2 is found on p.197 of the public review draft of the GHL analysis.

For Area 3A, the fixed range of fish associated with the 1995 base year (138 - 172 thousand fish) would be reduced to 83 - 103 thousand fish. This compares to 104 - 138 thousand fish when the combined charter and

commercial quota was 5.61 M lb under the 15% suboption, 3.96 M lb under the 20% suboption, and 9 3.6 M lb under the 25% suboption.

For the Area 3A 1998 base year, the fixed range of fish associated with the 1995 base year (155 - 193 thousand fish) would be reduced to 93 - 116 thousand fish. This compares to 116 - 155 thousand fish when the combined charter and commercial quota was 10.01 M lb under the 15% suboption, 7.07 M lb under the 20% suboption, and 5.30 M lb under the 25% suboption. A broader discussion of of Suboption 2 is on p.198.

**Table 1A. Estimated setline CEY, staff recommended catch limits, and catch limits of Pacific halibut by IPHC regulatory area (in thousands of pounds, net weight), 1993 - 1999.**

Regulatory Area	Estimated Setline CEY						
	1993	1994 <sup>1</sup>	1995 <sup>2</sup>	1996	1997	1998	1999
2A	460	490	520	Skipped Between Models	930	1,050	690
2B	9,810	8,320	9,520		15,990	15,380	11,210
2C	10,410	12,660	8,540		11,410	15,480	10,490
3A	23,130	27,020	16,870		33,550	38,710	24,670
3B	4,070	3,580	3,660		11,490	30,990	26,830
4A						11,110	8,420
4B	Area 4	Area 4 =	Area 4 =		Area 4 =	10,210	6,710
4CDE	5,590	5,000	5,920	25,290	13,280	9,800	
<b>Total</b>	<b>53,470</b>	<b>57,070</b>	<b>45,030</b>		<b>98,660</b>	<b>136,210</b>	<b>98,820</b>
Regulatory Area	Staff Recommendation						
	1993	1994	1995	1996	1997	1998	1999
2A	460	500	450	520	700	820	690
2B	9,810	9,500	8,500	9,520	12,500	13,460	11,210
2C	10,410	12,000	8,500	9,000	10,000	11,800	10,490
3A	23,130	26,000	20,000	20,000	25,000	29,570	24,670
3B	4,070	4,000	3,700	3,700	9,000	16,300	13,370
4A	2,020	1,800	2,000	1,950	3,000	5,640	4,240
4B	2,020	2,100	1,600	2,310	3,200	5,700	3,980
4CDE	1,520	1,500	2,300	1,660	2,800	3,000	4,130
<b>Total</b>	<b>53,440</b>	<b>57,400</b>	<b>47,050</b>	<b>48,660</b>	<b>66,200</b>	<b>86,290</b>	<b>72,780</b>
Regulatory Area	Catch Limits						
	1993	1994	1995	1996	1997	1998	1999
2A	600	550	520	520	700	820	760
2B	10,500	10,000	9,520	9,520	12,500	13,000	12,100
2C	10,000	11,000	9,000	9,000	10,000	10,500	10,490
3A	20,700	26,000	20,000	20,000	25,000	26,000	24,670
3B	6,500	4,000	3,700	3,700	9,000	11,000	13,370
4A	2,020	1,800	1,950	1,950	2,940	3,500	4,240
4B	2,300	2,100	2,310	2,310	3,480	3,500	3,980
4CDE	1,720	1,500	1,660	1,660	2,580	3,500	4,450
<b>Total</b>	<b>54,340</b>	<b>56,950</b>	<b>48,660</b>	<b>48,660</b>	<b>66,200</b>	<b>71,820</b>	<b>74,060</b>

<sup>1</sup> Average of standard and alternative (conservative) assessments

<sup>2</sup> From 1995 on, CEY based on projected rather than lagged ebio

**PART II: REVISED SECTION 3.1, IPHC UPDATE (p. 30)**

The proposed alternatives in this analysis address an allocation of halibut between the commercial fixed gear and recreational charter sectors. The two main criteria that determine if and when the GHs, as presented in this analysis, will be reached or exceeded are: (1) the status of the halibut biomass and future biomass projections, and (2) charter effort and projected growth of harvest. This section provides the baseline data from the IPHC halibut stock assessment and descriptions of halibut harvests and participation by fishery sector and area that are used in Sections 4 - 6 to prepare the RIR. Lastly, halibut biomass and charter fishery projections as presented to the Council in 1993 and 1997, from the 1999 IPHC stock assessment and as currently updated for the 2000 fishing year, are discussed.

**3.1 Biology and total removals of Pacific halibut in Areas 2C and 3A**

**3.1.1 Method of Quota Calculation (from Clark and Parma 1998, 1999)**

The halibut resource is healthy and total removals were at record levels in 1999, which ranked in the top five highest years at over 98 million lb (Table 3.1). Record high sport fisheries occurred in 1998 and commercial fisheries in 1999. The 1998 and 1999 total removals of halibut off the Pacific coast for all areas by commercial catch, sport harvest, bycatch mortality, personal use and wastage that were used by the IPHC in its stock assessment are presented in Figure 3.1.

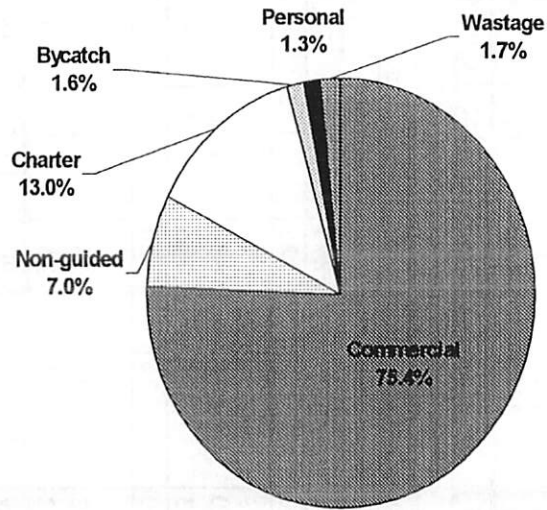
**Table 3.1a. Pacific halibut removals by regulatory area and sector in 1998 (thousand lb net wt.)**

Area	2A	2B	2C	3A	3B	4	Total
Commercial	464	13,139	10,228	25,874	11,346	9,150	70,201
Sport	383	657	2,708	5,176	23	61	8,400
Bycatch Mortality:							
Legal-sized fish	381	108	218	1,490	744	3,645	6,586
Sublegal-sized fish	233	135	143	1,362	730	3,915	6,518
Personal Use	15 <sup>1</sup>	300	170	74	20	162	741
Wastage:							
Legal-sized fish	3	53	51	155	57	46	365
Sublegal-sized fish	4	378	180	580	290	176	1,608
<b>Total</b>	<b>1,483</b>	<b>14,770</b>	<b>13,698</b>	<b>34,711</b>	<b>13,210</b>	<b>17,155</b>	<b>94,419</b>

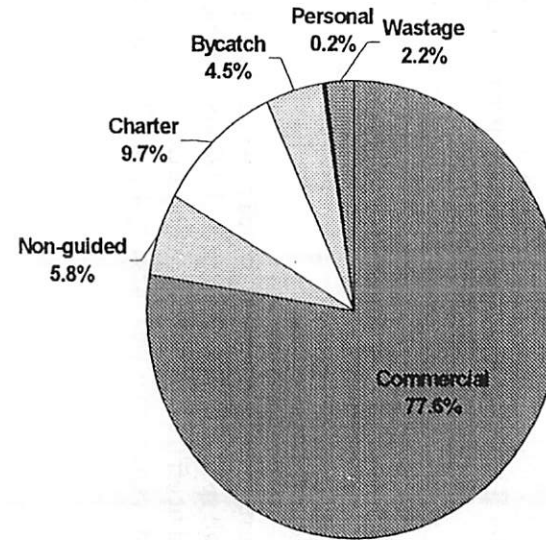
**Table 3.1b. Pacific halibut removals by regulatory area and sector in 1999 (thousand lb net wt.)**

Area	2A	2B	2C	3A	3B	4	Total
Commercial	446	12,732	10,202	25,287	13,873	11,878	74,418
Sport	338	1,582	1,830	5,243	22	108	9,122
Bycatch Mortality:							
Legal-sized fish	380	110	230	1,600	880	3,460	6,660
Sublegal-sized fish	234	94	123	1,287	786	3,712	6,236
Personal Use	15	300	170	74	20	170	734
Wastage:							
Legal-sized fish	6	38	72	101	69	107	393
Sublegal-sized fish	2	330	162	421	253	155	1,323
<b>Total</b>	<b>1,421</b>	<b>15,186</b>	<b>12,789</b>	<b>34,013</b>	<b>15,903</b>	<b>19,590</b>	<b>98,886</b>

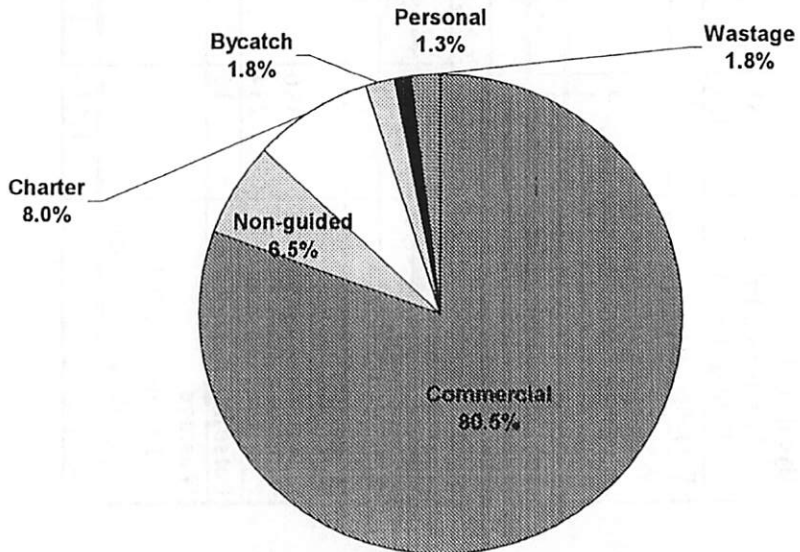
Removals of Pacific Halibut in Area 2C, 1998



Removals of Pacific Halibut in Area 3A, 1998



Removals of Pacific Halibut in Area 2C, 1999



Removals of Pacific Halibut in Area 3A, 1999

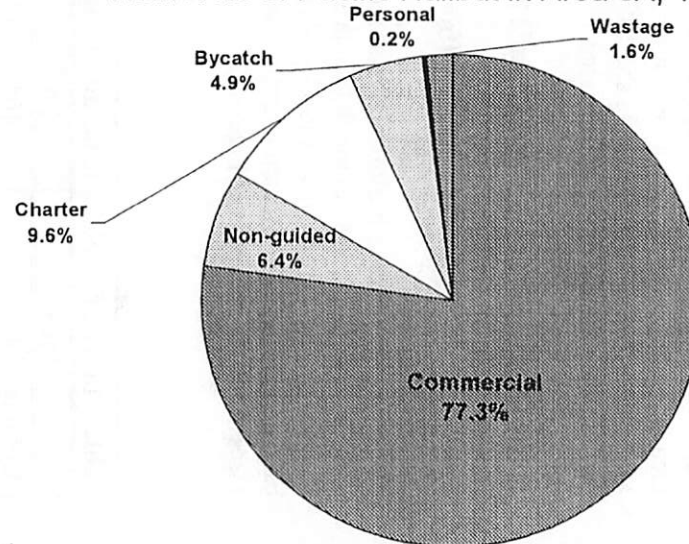


Figure 3.1. Pacific halibut removals in Areas 2C and 3A, 1998-99.

Each year the IPHC staff assesses the abundance and potential yield of Pacific halibut using all available data from the commercial fishery and scientific surveys. The exploitable biomass (yield) is estimated to set quotas for ten regulatory areas by fitting a detailed population model to the data from that area (Figure 3.2). A biological target level for total removals is then calculated by multiplying a fixed harvest rate—presently 20%—to the estimate of exploitable biomass. This target level is called the “constant exploitation yield” or CEY for that area in the coming year. The CEY therefore changes annually in proportion to the exploitable biomass. Each CEY represents the total allowable harvest (in lb) for that area, which can not be exceeded. The IPHC then estimates the sport and personal use/subsistence harvests and wastage and bycatch mortalities for each area. These are subtracted from the CEY and the remainder may be set as the catch quota for each area’s directed commercial setline (longline) fishery. Staff recommendations for quotas in each area are based on the estimates of setline CEY but may be higher or lower depending on a number of statistical, biological, and policy considerations. Similarly, the Commission’s final quota decisions are based on the staff’s recommendations but may be adjusted for conservation considerations.

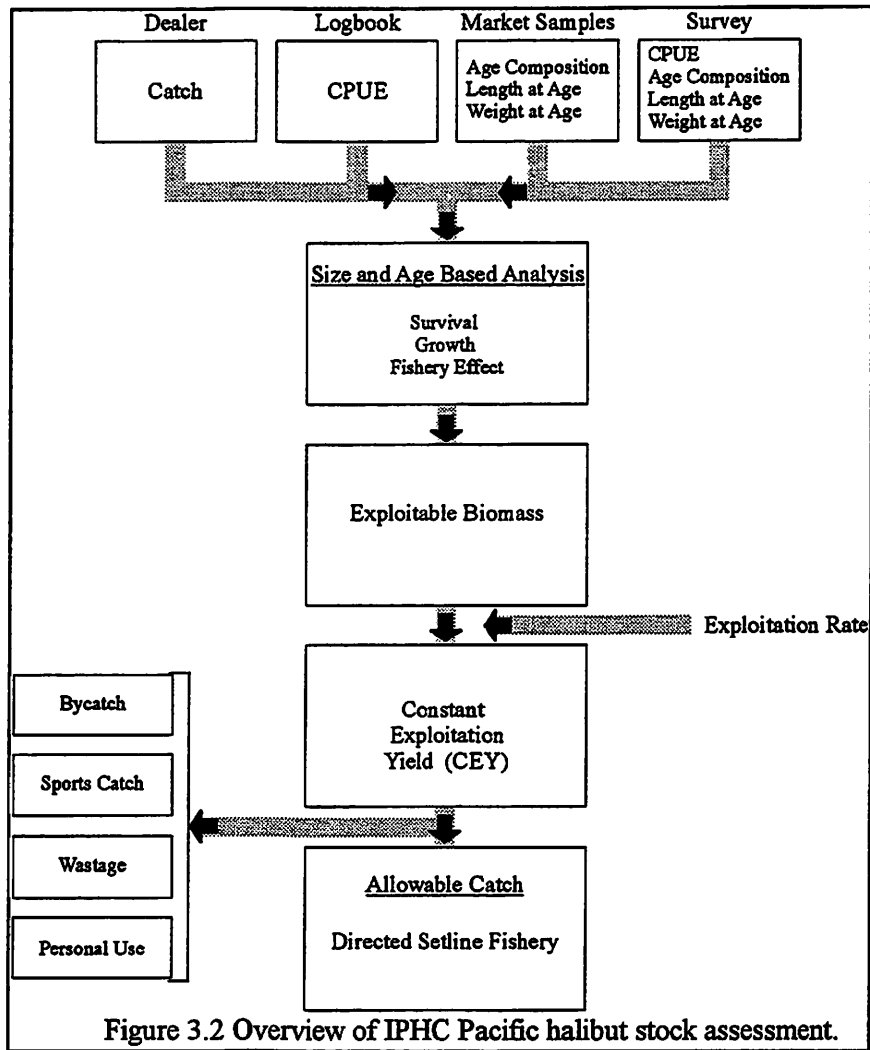


Figure 3.2 Overview of IPHC Pacific halibut stock assessment.

From 1982 through 1994, stock size was estimated by fitting an age-structured model (CAGEAN) to commercial catch-at-age and catch-per effort data. In the early 1990s it became apparent that age-specific selectivity in the commercial fishery had shifted as a result of a decline in halibut growth rates, which was more dramatic in Alaska than in Canada. An age- and length-structured model was developed and implemented in 1995 that that accounted for the change in growth. It also incorporated survey (as well as commercial) catch-at-age and catch-per effort data. The survey data contain much more information on younger fish, many of which are now smaller than the commercial size limit, and are standardized to provide a consistent index of relative abundance over time and among areas.

At first the model was fitted on the assumption that survey catchability and length-specific survey selectivity were constant, while commercial catchability and selectivity were allowed to vary over time (subject to some restraints). The resulting fits showed quite different length-specific survey selectivities in Area 2B and 3A, however, which suggested that age could still be influencing selectivity. To reflect that possibility, the new

model has been fitted in two ways since 1996: by requiring constant length-specific survey selectivity (as in 1995), and by requiring constant age-specific survey selectivity. The age-specific fits generally produce lower estimates of recent recruitment and therefore present abundance, and to be conservative the staff has used those estimates to calculate CEY's.

With either fitting criterion, the abundance estimates depend strongly on the natural mortality rate  $M$  used in the population model. Until 1998, the estimate  $M = 0.20$  had been used in all assessments. This estimate is quite imprecise, and an analysis done by the staff suggested that a lower working value would be appropriate. The value  $M = 0.15$  was chosen and used as a standard, which lowered abundance estimates in the 1998 assessment by about 30%.

The only significant change to the assessment in 1999 was introducing an increase in setline survey catchability, beginning with the 1993 survey data, to account for a change in bait between the 1980s and the 1990s. When setline surveys resumed in 1993 (after being suspended since 1986), chum salmon was adopted as the standard bait, whereas in the 1980s the bait was herring and salmon on alternate hooks. Experiments done within the last year showed that salmon bait catches 50-150% more halibut than herring. Further experiments are planned for this summer in which mixed bait will be compared directly with salmon. In the meantime, a working value of 100% was used in the assessment. This translates to a 33% increase in overall survey catchability after the 1980s. (For every two hooks, in terms of hooks baited with salmon, the survey switched from the equivalent of 1½ hooks to 2 hooks, an increase of one third.)

Increasing survey catchability by 35% in the 1990s to account for the bait change has the effect of reducing the apparent increase in halibut abundance since the 1980s by 25%, but it does not reduce the estimates of 1999 biomass by the same amount because other things play a role, including commercial catch per effort. As a result, the estimate for 1999 for Area 2C decreased by about 20% and for Area 3A decreased by almost 30%.

The addition of the 1999 commercial data can affect the 1999 estimates through the commercial CPUE, the age composition of the catch, and the mean weight at age in the catch. The only sizable effect was a large decrease in the Area 3A estimate caused almost entirely by an ongoing decline in the mean weights. It appeared to have leveled off in the mid-1990s, but it has resumed in Areas 2C and 3A since 1997, reducing biomass estimates in Alaska by a full 20% over the last two years.

When the estimated numbers at age are projected forward to 2000 (using the 1999 mean weights to calculate biomass), the change in the biomass estimate depends on the estimated abundance of all the year-classes in the stock, which at ages 8 to 20 in 2000 will be the 1980 through 1992 year-classes. Generally the year-classes coming into the stock are now weaker than the ones passing out of it, so the projections for 2000 are lower than the 1999 estimates. The drop is bigger in 3A (20%) than in Area 2C (10%) because the assessment shows that recruitment to 3A peaked in 1980 and has been declining steeply, to levels that are now on a par with the mid-1970s. In Area 2C, the 1987 and 1988 year-classes were strong, and the most recent ones appear to be mediocre but not as poor as in Area 3A.

In summary, this year's estimates are substantially lower than last year's because of the allowance for increased survey catchability, lower mean weights at age, and recent declines in recruitment. A change to the data going into the model for 2000 lowered the setline survey catch rates from the 1990s to account for a bait change, which reduced the population estimates by 20-30% in the eastern and central Gulf of Alaska (Areas 2 and 3A). A continuing decline in size at age also affected the estimates in Area 2C and Area 3A. Very low estimated recruitment in Area 3A in recent years implies a rapidly declining biomass in that area, but trawl surveys indicate continuing high abundance of 60-80 cm fish in that area, so more data is need to verify these estimates. However, it does now appear that recruitment has declined from the high levels of 1985-1995. In Alaska (2C and 3A) the cumulative effect is a 35-40% reduction in biomass.

A review of Pacific halibut biology and biomass can be found in IPHC (1998). Further details on the history of IPHC assessment methods and harvest strategy are given below and in a detailed account of the 1997 assessment (Sullivan et al. 1999) (see box below).

#### RECENT CHANGES IN IPHC ASSESSMENT METHODS AND HARVEST POLICY

**1982-1994:** stock size was estimated with CAGEAN, a strictly age-structured model fitted to commercial catch-at-age and catch-per-effort data. Because of a decrease in growth rates between the late 1970s and early 1990s, there were persistent underestimates of incoming recruitment and total stock size in the assessments done in the early 1990s.

Until 1985, allowable removals were calculated as a proportion of estimated annual surplus production (ASP), the remaining production being allocated to stock rebuilding. In 1985 the Commission adopted a constant harvest rate policy, meaning that allowable removals are determined by applying a fixed harvest rate to estimated exploitable biomass. This harvest level is called the Constant Exploitation Yield, or CEY. The fixed harvest rate was set at 28% in 1985, increased to 35% in 1987, and lowered to 30% in 1993.

**1995:** a new age- and length-structured model was implemented that accounted for the change in growth and was fitted to survey as well as commercial catch-at-age and catch-per-effort data. The new model produced substantially higher biomass estimates. In Area 3A this resulted from accounting for the change in growth schedule. In Area 2B, where the change in growth had been much less than in Alaska, it resulted from fitting the model to survey catch-per-effort, which showed a larger stock increase since the mid-1980s than commercial catch-per-effort. Quotas were held at the 1995 level to allow time for a complete study of the new model and results,

**1996:** differences in estimated selectivity between British Columbia and Alaska led to the consideration of two alternatives for fitting the model, one in which survey selectivity was a fixed function of age and the other in which it was a function of length. Spawner-recruit estimates from the new model resulted in a lowering of the target harvest rate to 20%. Quotas were increased somewhat, but not to the level indicated by the new biomass estimates.

**1997:** setline surveys of the entire Commission area indicated substantially more halibut in western Alaska (IPHC Areas 3B and 4) than the analytical assessment. Biomass in those areas was estimated by scaling the analytical estimates of absolute abundance in Areas 2 and 3A by the survey estimate of relative abundance in western Alaska. CEY estimates increased again, and quotas were increased again, but still to a level well below the CEY's.

**1998:** the working value of natural mortality was lowered from 0.20 to 0.15, reducing analytical estimates of biomass in Areas 2 and 3A by about 30%. At the same time setline survey estimates of abundance in Areas 3B and 4 relative to Areas 2 and 3A increased, so biomass estimates in the western area decreased by a smaller amount.

**1999:** setline survey catch rates in the 1990s were adjusted downward to account for the effect of changing to all-salmon bait when the surveys resumed in 1993. This reduced biomass estimates by 20-30%.

### 3.1.2 Current Estimates of exploitable biomass and CEY (from Clark and Parma 1998, 1999 and Gilroy 1999)

The target harvest rate of 20% was chosen on the basis of calculations of stock productivity that used a coastwide average of the estimates of commercial selectivity from the age-specific fit of the model, so the biomass estimates from the age-specific fits are used to calculate exploitable biomass and CEY. Overall the estimated setline CEY is approximately 63 million lb (Table 3.2), down from 99 million lb in 1998 and 136 million lb in 1997.

Area	2A	2B	2C	3A	3B	4A	4B	4CDE	Total
1999 exploitable biomass (from the 1998 assessment)	5.36	61.64	64.00	159.00	138.33	46.11	34.98	58.83	568.25
1999 Setline CEY (from the 1999 assessment)	0.69	11.21	10.49	24.67	26.83	8.42	6.71	9.80	98.82
1999 quota	0.76	12.10	10.49	24.67	13.37	4.24	3.98	4.45	74.06
2000 exploitable biomass (from the 1999 assessment)	4.44	51.06	42.20	94.90	96.80	36.10	35.10	35.10	395.70
Total CEY at 20%	0.89	10.21	8.44	18.98	19.36	7.22	7.02	7.02	79.14
Non-commercial removals									
Bycatch	0.38	0.11	0.23	1.60	0.88	0.58	0.22	2.83	6.83
Sport catch	0.34	1.58	1.83	5.24	0.02	0.10	0.00	0.01	9.12
Personal use	0.00	0.30	0.00	0.10	0.04	0.08	0.00	0.01	0.53
Wastage	0.01	0.04	0.07	0.10	0.07	0.04	0.04	0.04	0.39
2000 Setline CEY	0.54	8.18	6.31	11.94	18.36	6.42	6.77	4.13	62.65
2000/1999 total CEY	0.83	0.83	0.66	0.60	0.70	0.78	1.00	0.60	0.70
2000/1999 setline CEY	0.79	0.73	0.60	0.48	0.68	0.76	1.01	0.42	0.70

### 3.1.3 Analytical estimates of abundance in 1999 (from Clark and Parma 1999)

The IPHC stock assessment shows a strong 1987 year-class. The age- and length-based models show a drop in recruitment after that year-class, but these age-groups (ages 8-10 in 1998) are still estimated imprecisely.

Figure 3.3 shows estimated recruitment at age 8 and total biomass of fish aged 8 and older for both models. The two results are very similar in Area 2C and Area 3A until the last few years. An important change from the 1997 assessment is that in 1998 both the age- and length-specific fits in Area 3A show a downturn in recruitment after the 1987 year-class. The 1997 results showed that the length-specific fit indicated recruitment would continue at approximately the level of the 1987 year-class. The change resulted mainly from the screening and heavier weighting of size-at-age data.

Biomass changes in Areas 2C and 3A have occurred as a result of changes to the stock assessment model more than as a result of biological changes. In the absence of model changes, short-term fluctuations in exploitable biomass, and therefore in quotas, should be small.

Recruitment represents a small fraction of the exploitable biomass, and has a small annual effect. Increased selectivity over ages 8- to 12-yrs accounts for the majority of biomass added annually to offset natural mortality. The very large exploitable biomass relative to recruitment buffers the population from changes. However, because exploitable biomass has been at a high level, and because recruitment has declined over the past several years, lower exploitable biomass is more probable than higher exploitable biomass for the next five years.



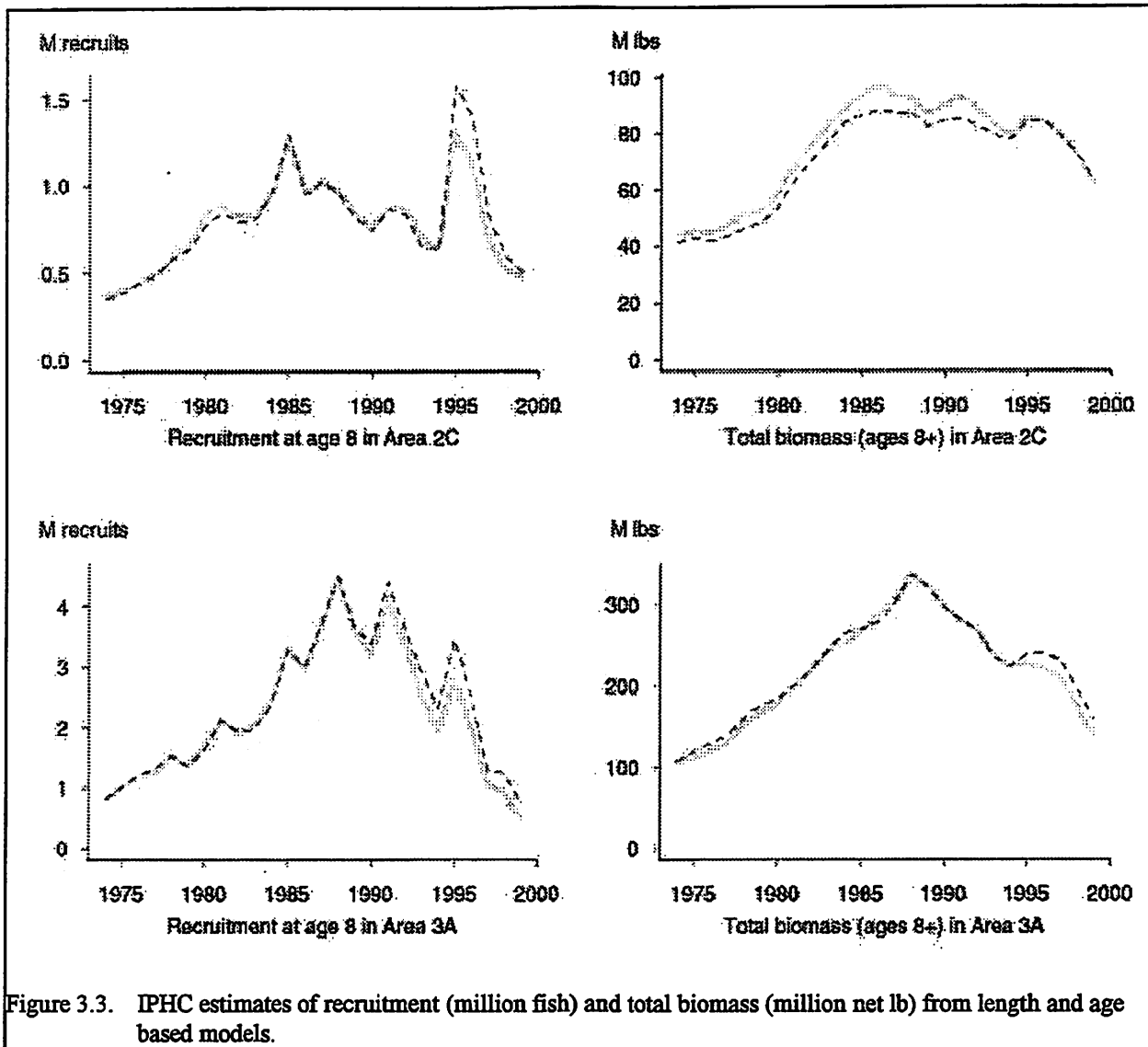


Figure 3.3. IPHC estimates of recruitment (million fish) and total biomass (million net lb) from length and age based models.

### 3.1.4 Halibut biomass and quotas projections in Areas 2C and 3A (NPFMC 1997, Clark and Parma 1999)

Vincent-Lang and Trumble (1993) jointly reported that the coast-wide exploitable halibut biomass declined by 25% from 359 to 266 million lb during 1988 -92, while the sport harvest increased about 40%. In 1993, exploitable biomass was declining at about 10% per year. During 1993-97, biomass was predicted to continued to decline at annual rates of 9, 7, 5, 3, and 1% per year. Halibut biomass was then predicted to increase from 1998 through 2000 at 1, 3, and 5% per year, respectively, due to increasing recruitment (Table 3.3, labeled '1993 Projections'). Commercial harvests were characterized as a function of declining halibut biomass and increasing sport harvest. The 1999 exploitable biomass was projected in 1993 to be 175 M lb. In 1999, IPHC staff estimated it to be 396 M lb.

**Table 3.3. Comparison of 1993 and 1997 projections of exploitable biomass with 1999 IPHC data (millions of lbs).**

Year	1993 Projections <sup>1</sup>		1997 Projections <sup>2</sup>			1999 Biomass <sup>3</sup>
	1993 projections of % biomass change	1993 exploitable biomass projections	1997 expected value	1997 lower bound	1997 higher bound	Actual exploitable biomass
1993	-9	198				456
1994	-7	185				456
1995	-5	175				447
1996	-3	170				454
1997	-1	168				451
1998	1	170	429	295	563	433
1999	3	175	412	270	555	396
2000	5	184	388	260	516	380
2001			363	255	470	365
2002			341	246	436	350
2003			323	233	414	336
2004			311	219	403	323
2005			302	203	402	310
2006			297	189	404	298
2007			293	177	409	286
2008			292	167	416	274

<sup>1</sup>1993 Projections represent exploitable biomass for state of Alaska (Trumble and Vincent-Lang 1993).

<sup>2</sup>1997 Projections represent exploitable biomass for combined Areas 2A, 2B, 2C, 3A, and 3B (NPFMC 1997).

<sup>3</sup>Estimates of actual exploitable biomass based on 1998 IPHC assessment data for combined Areas 2A, 2B, 2C, 3A, and 3B.

<sup>4</sup>Projections represent exploitable biomass reduced by an average 4%.

It now appears likely that coastwide recruitment has declined from the high levels of the 1985-95 period, and size at age is still going down. Thus while abundance in number is still quite high relative to the levels of 1975 or 1980, biomass levels are not as good and the prospect is for a continuing decline as relatively strong year-classes pass out of the stock and relatively weak ones enter (and grow more slowly).

The prospect is worst in Area 3A, but the apparent near-failure of recruitment there may not be real. NMFS trawl surveys indicate a much higher abundance of 8-year-old halibut in Area 3A than the IPHC analytical assessment based on setline data. This is a puzzle, because for legal-sized halibut trawl and setline surveys agree reasonably well on trends in relative abundance, but since 1990 trawl survey catch rates of sublegal halibut have greatly outpaced setline survey catch rates.

Another cause for suspicion is the re-emergence of a retrospective pattern in the Area 3A estimates, with the estimate of exploitable biomass in a given year increasing in each succeeding assessment. This is consistent with an over-estimate of the selectivity of young fish, whose abundance is consequently underestimated initially. The estimate is then corrected in later assessments as the year-class moves through the fishery. In the past this pattern was caused by declining size at age, but size at ages 8 and below has changed very little, so some other factor must be at work. It therefore seems very possible that exploitable biomass in 3A is underestimated and that incoming recruitment will turn out to be no worse in 3A than in 2AB and 2C. But even that would be low by recent standards. Biomass projections for 2000 are predicted to decline by 9% overall, and 14% for Area 2C and 21% for Area 3A. These will likely result in even lower commercial quotas in 2001.

Since the development of the 1993 projections, major changes in our understanding of the status of the halibut stock have occurred. In 1995, a new age- and length-structured model was developed by IPHC to account for an apparent 20% decrease in the length-at-age of halibut. It produced substantially higher biomass estimates. In 1996, revised spawner-recruit estimates resulted in lowering the target harvest rate to 20%. Quotas were increased somewhat, but below the level indicated by the new biomass estimates. In 1997, biomass estimates and quotas increased again, but still well below levels the IPHC model allowed. In 1998, the estimate of natural mortality was lowered from 0.20 to 0.15, reducing biomass estimates in Areas 2 and 3A by about 30%. In 1999, setline survey catch rates in the 1990s were adjusted downward to account for the effect of changing to all-salmon bait when the surveys resumed in 1993, which reduced biomass estimates by 20-30%.

In 1997, Council staff prepared an analysis that differed from the 1993 reports in its projections of future halibut biomass. The 1997 Council analysis projected that, using an overall exploitation rate of 18% in 1998 and 20% every year thereafter, the expected halibut biomass would decrease by 32% between 1998 and 2008, from an estimated 429 to 292 million lb for the combined Areas 2A-3B.

The stock recruitment model used to generate the projections allowed for a great deal of unpredictable variability induced by the environment; thus, the projections had very wide confidence intervals. Regardless, they represented a substantially slower decline in exploitable halibut biomass than originally estimated in the 1993 report. The coastwide schedule used in the 1980s and early 1990s had higher selectivity-at-age among the younger age groups and so would produce higher estimates of exploitable biomass if applied to the present estimates of numbers-at-age (Clark, pers. commun.).

The projections of exploitable halibut biomass made in 1993 (Vincent-Lang and Trumble) and 1997 (NPFMC) are compared with actual levels in 1994-99 (Table 3.3). Estimates of exploitable biomass from the 1999 IPHC assessment are calculated using the coastwide fixed selectivity schedule which was adopted in 1996. Actual levels appear to fall within the projected range for 1997 and 1998 from the 1997 Council analysis. In fact, the actual 1999 exploitable biomass level (396 M lb) is only slightly below its expected value (412 M lb) from the 1997 projections, but is considerably higher than predicted in 1993 (175 M lb).

Over the last 20 years halibut growth and recruitment rates in Alaska have varied widely, apparently because of changes in the environment rather than any effects of fishing. As a result, projections incorporating a reasonable range of values for growth and recruitment success always diverge rapidly from estimates of present stock size, in both directions. The IPHC staff has calculated such projections from time to time for the purpose of evaluating the robustness of alternative harvest rates, but it does not do so routinely because the projections are so variable (Clark, pers. commun. 1999).

Recruitment represents a small fraction of the exploitable biomass and has a small annual effect. Increased selectivity over ages 8- to 12-yrs accounts for the majority of biomass added annually to offset natural mortality. The very large exploitable biomass relative to recruitment buffers the population from changes. However, because exploitable biomass has been at a high level, and because recruitment has declined over the past several years, lower exploitable biomass is more probable than higher exploitable biomass for the next five years.

Exploitable biomass in Areas 2C and 3A are predicted to decline by 14% and 21% respectively between 1999 and 2000. Applying those rates of decline over the next five years, would predict that Area 2C may be as low as 35 M lb by 2003 and Area 3 may be as low as 62 M lb (Figure 3.4). There is no scientific justification to extend next year's projected decline out for five years, it was done to illustrate the range of potential future exploitable biomasses for Areas 2C and 3A based on the information that is currently available. Therefore, the 1997 analysis projections continue to appear appropriate for estimating future exploitable biomass levels in the near term.

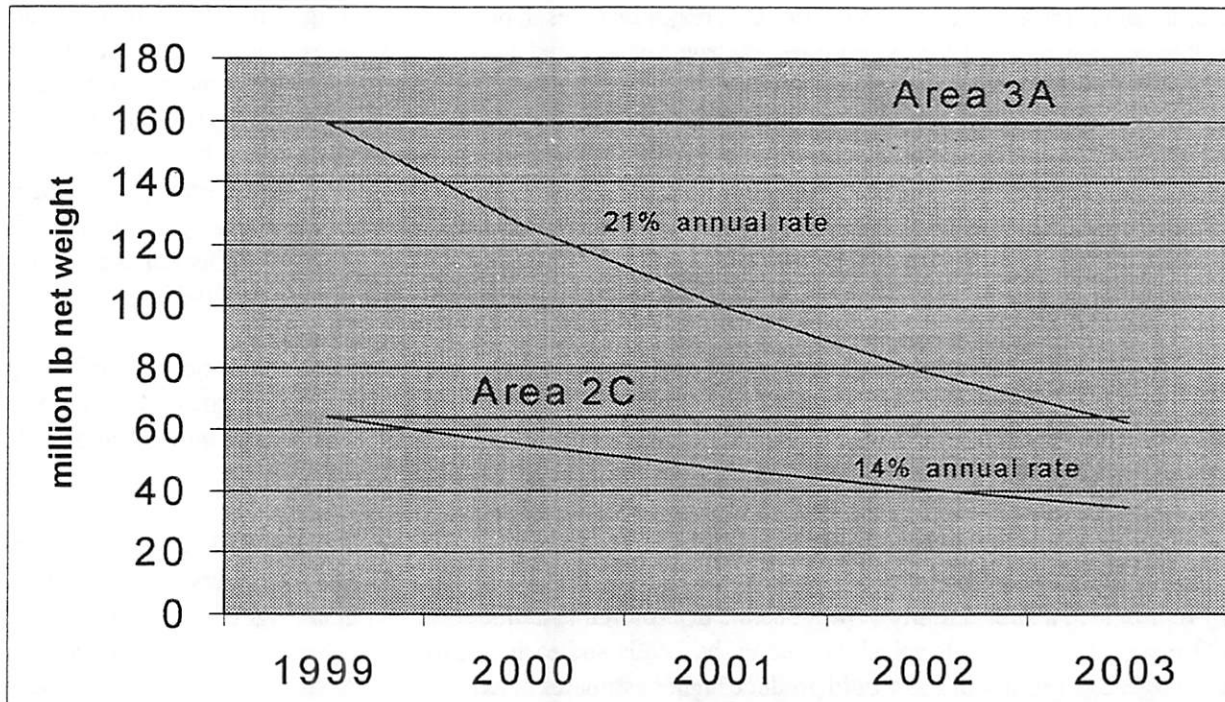


Figure 3.4 Five year projected biomass scenarios under constant and declining assumptions. (14% decline for Area 2C and 21% decline for Area 3A).

### Summary

The halibut resource is healthy and total removals are at record levels, however, recruitment and biomass have peaked. Changes for Areas 2C and 3A over the past several years occurred as a result of changes to the stock assessment model more than as a result of biological changes. The Area 2C quota was set at 8.4 M lb, down from 10.5 M lb in 1999. The 2000 Area 3A quotas was set at 18.3 M lb, down from 24.7 M lb in 1999 (Table 3.4). Quotas should not change appreciably over the next few years (Clark and Parma 1999).

Halibut harvests in 1998 in Area 2C totaled 13.0% and 75% of total removals for the charter and commercial fisheries, respectively. In 1999, charter harvest was 8.0% and commercial harvest was 81%. In Area 3A, those fisheries harvested 9.7% and 78%, respectively, in 1998 and 9.6% and 77% in 1999. Non-guided sport halibut anglers harvested 7.0% in 1998 and 6.5% in 1999 in Area 2C and 5.8% in 1998 and 6.4% in 1999 in Area 3A.

The 1997 projections of halibut exploitable biomass appear to accurately reflect current levels. It would be appropriate to continue to apply those projections in the short term.

Lastly, to illustrate the effect of declining size at age, assume the Council set the GHL at 12% in numbers of fish set during a period of peak halibut abundance (either 1995 or 1998 base year). Further assume that the average weight in the charter catch is about the same as the average weight in the commercial catch. During the mid to late 1990's, commercial catches have averaged about 1 million fish. At 12%, the charter fleet would be awarded 136,000 fish ( $136,000 / (1,000,000 + 136,000) = 12\%$ ) to take in perpetuity. Over the past few years, the average weight of fish ages 10-15 (which constitute the bulk of the catch) is around 25 pounds. In the mid-1970s, the average weight was slightly greater than 50 pounds. Should a return occur to low productivities that were seen in the mid 1970s and with commercial quotas at around 10 million lb (200,000 fish), it is possible that the charter fleet, having been awarded 136,000 fish (using a 1995 base year) would then be allocated 68% of the combined charter/commercial quota.

Table 3.4. Total removals of Pacific halibut (thousands of pounds, net weight) in IPHC Areas 2C and 3A.															
Year	Area 2C			Area 3A			TOTAL	Personal Use	Wasteage	Charter	Non-ch	Sport	Legal-Size Bycatch	Personal Use	
	Catch Limit	Comm Catch	Legal-Size Bycatch	Comm Catch	Legal-Size Bycatch	Charter									Non-ch
1977		3,190	410	72	n/a	n/a	3,672	n/a	n/a	196	n/a	n/a	3,370	n/a	n/a
1978		4,320	210	82	n/a	n/a	4,612	n/a	n/a	282	n/a	n/a	2,440	n/a	n/a
1979		4,530	640	174	n/a	n/a	5,344	n/a	n/a	365	n/a	n/a	4,490	n/a	n/a
1980		3,240	420	332	n/a	n/a	3,992	n/a	n/a	488	n/a	n/a	4,930	n/a	n/a
1981	3,400	4,010	400	318	n/a	n/a	4,728	n/a	n/a	751	n/a	n/a	3,990	n/a	n/a
1982	3,400	3,500	200	489	n/a	n/a	4,189	n/a	n/a	716	n/a	n/a	3,200	n/a	n/a
1983	3,400	6,400	200	553	n/a	n/a	7,153	n/a	n/a	945	n/a	n/a	2,080	n/a	n/a
1984	5,700	5,850	210	621	n/a	n/a	6,681	n/a	n/a	1,026	n/a	n/a	1,510	n/a	n/a
1985	9,000	9,210	200	682	n/a	n/a	10,092	n/a	n/a	1,210	n/a	n/a	800	n/a	n/a
1986	11,200	10,610	200	730	n/a	n/a	11,540	n/a	n/a	1,908	n/a	n/a	670	n/a	n/a
1987	11,500	10,680	200	780	528	n/a	12,188	n/a	n/a	1,989	n/a	n/a	1,590	n/a	n/a
1988	11,500	11,370	200	1,076	377	n/a	13,023	n/a	n/a	3,264	n/a	n/a	2,130	2,130	n/a
1989	9,500	9,530	200	1,559	346	n/a	11,635	n/a	n/a	3,005	n/a	n/a	1,800	2,062	n/a
1990	8,000	9,730	680	1,330	474	n/a	12,214	n/a	n/a	3,638	n/a	n/a	2,630	1,618	960
1991	7,400	8,650	550	1,654	477	n/a	12,091	720	26,600	4,264	n/a	n/a	3,130	1,886	490
1992	10,000	9,820	570	1,668	392	n/a	12,820	370	26,600	3,899	n/a	n/a	2,640	1,513	328
1993	10,000	11,290	330	1,811	361	n/a	13,900	108	20,700	5,265	n/a	n/a	1,920	1,080	328
1994	11,000	10,380	400	1,986	986	1,000	15,244	108	26,000	4,511	1,938	2,553	2,350	1,652	328
1995	9,000	7,760	240	1,751	986	765	11,631	n/a	20,000	4,501	1,662	2,839	1,570	539	97
1996	9,000	8,800	230	1,651	186	715	12,518	n/a	20,000	4,825	1,940	2,885	1,400	587	97
1997	10,000	9,890	240	1,712	183	860	13,737	n/a	25,000	5,641	2,129	3,512	1,550	744	97
1998	10,500	10,230	220	2,708	231	941	12,720	170	26,000	5,176	1,938	3,238	1,490	735	74
1999	10,490	10,202	233	1,920	234	860	12,759	170	24,670	5,242	2,090	3,152	1,595	522	74
2000	8,400						18,310								

Source: IPHC and ADF&G (1994-99 sport harvest)

## **PART III: SECTION 6.3, IMPLEMENTATION AND ENFORCEMENT (p. 200)**

### Implementation Strategies

It is essential that the Council adopt a strategy that is implementable and cost effective, allows for the use of the best available information, and provides for adaptability. Three significant questions exist with regard to implementation of any Halibut Charterboat GHL option currently under consideration by the NPFMC. These are:

- (1) What information will be used to assess harvest?
- (2) How will specific management measures be selected and implemented?
- (3) How should the management objective for harvest be stated?

*Harvest Estimation:* At the present time, several data collection programs are fielded by the Alaska Department of Fish and Game to assess charter fishery performance including:

1. *Statewide Mail Survey.* This mail survey is used to estimate sport fishing and harvest on a statewide basis. Within these estimates are estimates of the charter and non-charter recreational harvest and release of halibut.
2. *Statewide Guide Registration.* This statewide registration program is used to track the number of sport fishing guides and guide business that are operating in Alaska's fresh and marine waters annually. Within this database are the number of businesses and guides that target halibut.
3. *Statewide Marine Logbook.* This logbook provides estimates of recreational effort and harvest on marine charters operating off the coast of Alaska. Included are estimates of halibut harvests and participation by charters in the halibut fishery.
4. *Port Sampling.* This program provides estimates of the average size and age of the recreationally caught halibut in the major ports of landing in Areas 2c and 3A.
5. *Creel Surveys.* The Division uses creel surveys in select areas to estimate recreational effort and harvest. One such survey is used to estimate king salmon harvest in southeast Alaska. This survey also provides partial estimates of halibut harvest. Similar surveys are used selectively in southcentral Alaska and provide partial estimates of halibut harvest.

Each of these programs has strengths and limitations. Creel surveys provide valuable first hand observations of the fishery but they are very expensive and lack full geographical coverage. Port sampling provides biological information and important fishery statistics including areas of landings and fishing effort. but is expensive and does little to help assess total area harvest. The Department's charter logbook program shows great promise but this is a very new program and the need still exists to build a longer time series of data, ground truth it, and evaluate the accuracy of the estimates. The Statewide Mail Survey, a postseason survey, is a long time series data set that provides excellent geographical coverage, is reasonably accurate and cost effective but the estimates of harvest are not available for up to one year after the fishing season in question. In total, the Alaska Department of Fish and Game currently spends about \$300,000 to \$350,000 annually in these programs to collect information on the halibut sport fishery.

Because no specific management program has been in effect for the halibut charter fishery, it should be recognized that none of these assessment programs have demonstrated utility under the allocation/management options under consideration. Until such time as each tool's utility is proven, it will be necessary for harvest estimates to be based on an aggregation of the best available information.

*Management measure selection:* The Council has identified 11 management measures which could be used to adjust harvest in an effort to maintain the charter fishery within the allocation provided under a GHL or other harvest allocation plan. These are: line limits, boat limits, annual angler limits, vessel trip limits, bag limits, super-exclusive registration, sport catcher vessel only areas, sport fish reserves, rod permits, possession limits, and restrictions on retention of halibut by skipper and crew.

One additional measure involves temporally adjusting bag limits pre-season. This option was not considered in the public review draft EA/RIR/IFRA distributed on January 10, 2000. It was generally discussed by the Council during their deliberations of this issue and is being recommended by the state as another management option for Council consideration. Based on the ADFG logbook program, it is estimated that enactment of a one fish bag limit during specific periods of the open season could potentially reduce harvest 1% to 45% in Areas 2C and 3A (Table 6.18). Smaller reductions would be realized by limiting the bag limit to 1 during May and June with larger reductions being realized by limiting the bag limit to 1 during the peak months (June, July, or August) of the fishery (Figures 6.5 and 6.6). A total season restriction of the bag limit to 1 would reduce harvest by about 40% in Area 2C and 45% in Area 3A.

Table 6.18. Estimated percentage of total harvest reduction by month obtained by implementing a 1-fish bag limit in Areas 2C and 3A during 1998 and 1999.

Area	Month	1998	1999
2C	May	2	1
	June	12	10
	July	14	14
	August	10	14
	September	1	1
	Total	39	40
3A	May	5	4
	June	14	13
	July	17	16
	August	7	10
	September	1	2
	Total	44	45

Each of the above management measures will have a different and unique effect on harvest potential. Additional information is provided for different levels of line limits in Table 6.19. This effect will likely vary from area to area and will be influenced by changes in stock abundance. Each tool must be continually evaluated in context of the level of action required, the stock abundance, and the regulatory area. Market factors such as participation levels and willingness to pay for the opportunity to sport fish for halibut will also influence future harvest potential and will need to be taken into consideration when shaping a regulatory strategy.

Determining the best management measure, or combination of measures, to use should be based on the best, most current information available. For this reason, it is preferable to make a list of tools available to managers from which a manager may select one or more of the tools listed. This is the approach used to manage the recreational chinook salmon fishery in southeast Alaska. However, as noted above, final rule making may preclude such flexibility. As such, the measures may need to be periodically evaluated by the Council.

Table 6.19. Estimated harvest reduction by implementing annual limits on anglers fishing from charter vessels

ANNUAL LIMIT	HARVEST REDUCTION (PERCENT)	
	2C	3A*
4	39	25
6	18	15
7	8	10
10	2	6

\* The original calculations were done for nonresidents only. The assumption was made that residents fishing from charter vessels in 3A had the same harvest patterns as nonresidents. Therefore, the harvest reductions in 3A were increased by 1/3 to account for reductions in resident harvest also. Since less than 5% of charter clients in 2C are residents, no changes were made to the original harvest reduction estimates.



ESTIMATED PERCENTAGE OF TOTAL HARVEST REDUCTION, BY MONTH, THROUGH IMPLEMENTATION OF A ONE FISH BAG LIMIT IN 2C DURING 1998 AND 1999

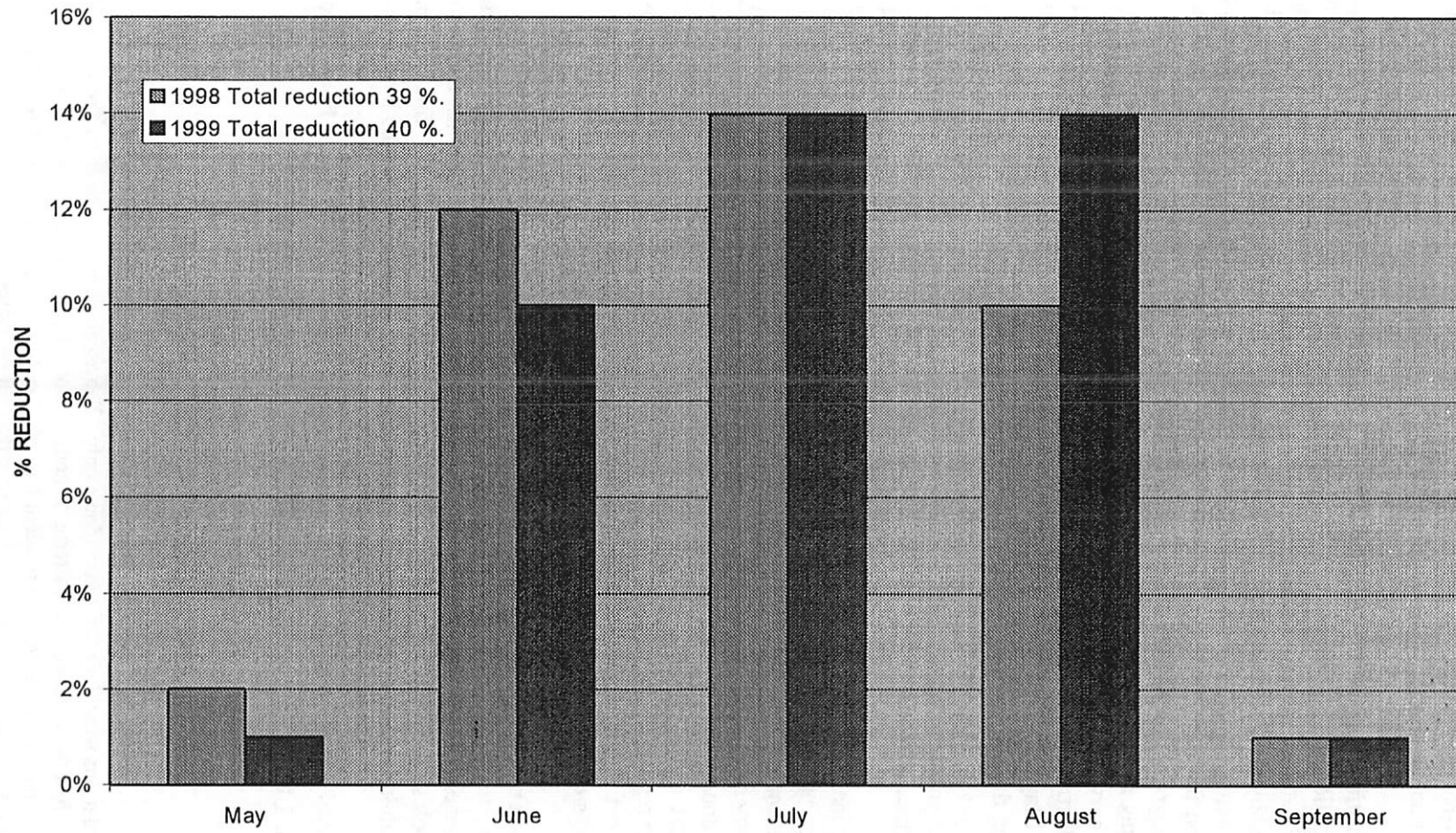


Figure 6.5. Estimated percentage of total harvest reduction, by month, obtained by implementing a 1 fish bag limit in Area 2C, 1998 and 1999.



HARVEST REDUCTION REQUIRED	MANAGEMENT TOOL	ESTIMATED HARVEST REDUCTION POTENTIAL
< 10%	PROHIBIT HARVEST BY SKIPPER AND CREW	3%
10 – 20%	PROHIBIT HARVEST BY SKIPPER AND CREW	3%
	ANNUAL LIMIT OF 6 FISH	18%
	TOTAL	21%
20 – 30%	PROHIBIT HARVEST BY SKIPPER AND CREW	3%
	ANNUAL LIMIT OF 6 FISH	18%
	REDUCE BAG LIMIT TO ONE FISH/DAY IN AUGUST	12%
	TOTAL	33%
30 – 40%	PROHIBIT HARVEST BY SKIPPER AND CREW	3%
	ANNUAL LIMIT OF 4 FISH	39%
	TOTAL	42%
> 40%	PROHIBIT HARVEST BY SKIPPER AND CREW	3%
	ONE FISH/DAY BAG LIMIT FOR ENTIRE SEASON	40%
	TOTAL	43%
<p>Implementation of management tools to achieve harvest reductions from 0 – 20% could take place the season following the overage.</p> <p>Implementation of management tools to achieve harvest reductions above 20% could take place one year following the overage to give charter industry more time to adjust.</p>		
<p>Figure 6.7. Management measure matrix for reducing harvest in Area 2C.</p>		

HARVEST REDUCTION REQUIRED	MANAGEMENT TOOL	ESTIMATED HARVEST REDUCTION POTENTIAL
< 10%	PROHIBIT HARVEST BY SKIPPER AND CREW	8%
10 – 20%	PROHIBIT HARVEST BY SKIPPER AND CREW	8%
	ANNUAL LIMIT OF 7 FISH	10%
	<b>TOTAL</b>	<b>18%</b>
20 – 30%	PROHIBIT HARVEST BY SKIPPER AND CREW	8%
	ANNUAL LIMIT OF 4 FISH	25%
	<b>TOTAL</b>	<b>33%</b>
30 – 40%	PROHIBIT HARVEST BY SKIPPER AND CREW	8%
	ANNUAL LIMIT OF 4 FISH	25%
	REDUCE BAG LIMIT TO ONE FISH/DAY IN AUGUST	8%
	<b>TOTAL</b>	<b>41%</b>
> 40%	PROHIBIT HARVEST BY SKIPPER AND CREW	8%
	ONE FISH/DAY BAG LIMIT FOR ENTIRE SEASON	45%
	<b>TOTAL</b>	<b>53%</b>

Implementation of management tools to achieve harvest reductions from 0 – 20% could take place the season following the overage.

Implementation of management tools to achieve harvest reductions above 20% could take place one year following the overage to give charter industry more time to adjust.

Figure 6.8. Management measure matrix for reducing harvest in Area 3A.

**ESTIMATED PERCENTAGE OF TOTAL HARVEST REDUCTION, BY MONTH, THROUGH IMPLEMENTATION OF A ONE FISH BAG LIMIT IN 3A DURING 1998 AND 1999**

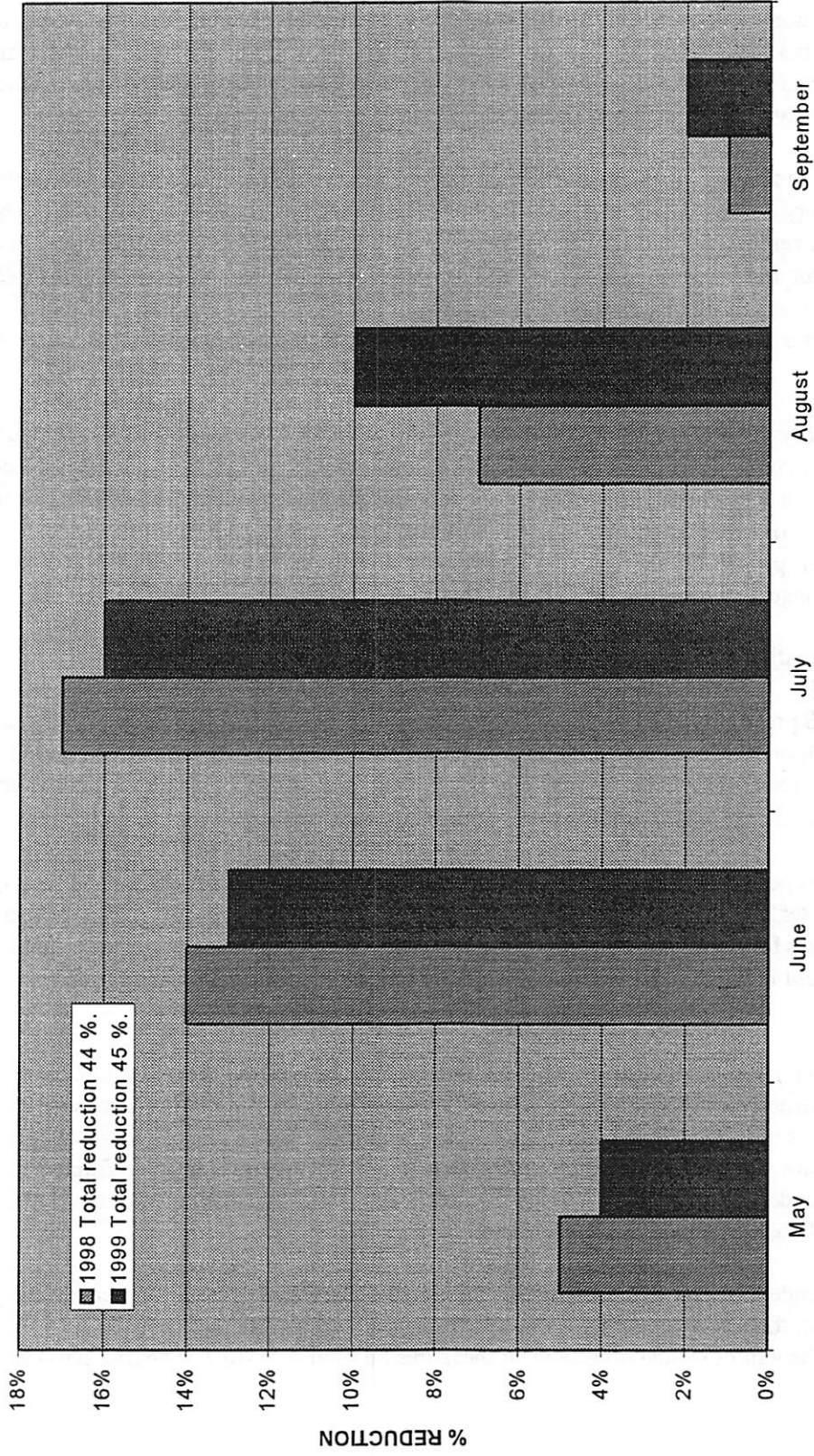


Figure 6.6. Estimated percentage of total harvest reduction, by month, obtained by implementing a 1 fish bag limit in Area 2C, 1998 and 1999.

Framework management matrices depicting how the above management measures could be employed to manage a GHL or other allocation scheme for Areas 2C and 3A are depicted in Figures 6.7 and 6.8, respectively. These matrices are “sample” implementation strategies that show how various measures could be employed to reduce harvest in both areas. They are presented as placeholder frameworks to facilitate discussion, and are not intended as “the” proposed implementation strategy. Different matrices are provided for Areas 2C and 3A to account for differences in fishery performance in the two areas and to remind the public of the Council’s ability to select different management measures in each area.

The potential harvest reductions presented in the matrix were calculated based on performance statistics of the halibut charter fishery during 1998 and 1999. Various factors, such as changes in halibut stock abundance, local area plan management, and changes in fleet behavior or clientele to imposed regulations, could affect the realized harvest reduction potential. For example, if halibut stock size was to decrease as speculated by the IPHC, effects of an annual limit or reduced daily bag limit are likely to be less than noted. Also, the management measures in each harvest reduction category may not be independent and therefore may not be additive.

*Structure and Stability of the Management Objective for Harvest:* A management objective for harvest should be stated in such a manner as to take into account the management precision of the assessment program. Stating the objective in the form of a range can provide for this acknowledgment. In addition, the more stable the management objective for harvest is the more likely the objective will be achieved. An annually shifting allocation has a high probability of requiring annual adjustments that are small enough to be beyond the precision of the management tools and ability to evaluate.

#### Timing of Implementation

Currently the ADFG provides the IPHC a preliminary estimate of that year’s sport harvest in December based on logbook, creel survey, and port sampling information. The IPHC uses this estimate to project the harvest in the sport fishery for the next year. At the end of the next year, ADFG provides a final estimate of the previous year’s sport fishery based on the results of the statewide mail survey.

NMFS identified that perhaps as little as six weeks may be needed (dependent upon staff availability) between public notice of charter harvests exceeding the GHL (e.g., December) and public notice to implement triggered management measures for a non-discretionary decision by the NMFS Regional Administrator (mid-February). Such a process would utilize a closed framework action based on an analysis of the proposed action (this EA/RIR/IRFA).

Alternatively, an open frameworked action whereby the RA exercises his discretion in selecting to implement a triggered management measure(s) may be as long as 4 months (e.g., April). In this case more time is needed for notice for public comment and final notice (the 30 day comment may be waved to reduce the time needed to 3 months) (March). A trailing regulatory amendment may be required in the open framework process if sufficient time has rendered the analyses obsolete to the time of his decision or staff must develop the rationale for his decision in choosing from numerous measures.

The Council has intended a desire to minimize disruption to the charter industry. In this case a one year notice may be desirable. In this case, triggering a management measure the following season may meet industry needs. This has the benefit of basing management measures on final estimates of charter harvest.

## Enforcement

*Enforcement issues:* Enforcement is a key component of any fishery harvest management scheme. The NMFS, USCG, ADPS, and ADFG all report that they do not have enforcement programs specifically directed at the recreational charter fishery. Instead, enforcement occurs on an opportunistic basis. All agencies agreed that some level of additional enforcement would be needed under a GHL system, depending upon the allocation and implementation scheme adopted. Also, the decision to allocate additional enforcement to this program would properly entail an evaluation of the public interest in doing so, versus the trade offs in doing less enforcement somewhere else.

Staff discussed GHL enforcement issues, especially the implications of activating the various measures like line, bag, and trip limits. Although a state enforcement officer was not present, the other agencies essentially reported that additional enforcement resources would not be forthcoming to support this program.

Having said that, there are characteristics of the recreational charter fishery that suggest a different and lesser level of enforcement may be needed to ensure an adequate level of compliance with the program. Several characteristics of the fishery differentiate it from other fisheries and work to the advantage of regulators:

- a. The recreational charter boat fishery operates in the public eye. Requiring operators to prominently post GHL control measures like bag limits and line limits onboard charter boats would help to promote compliance. The state could further support this by requiring those businesses selling sport-fishing licenses to do the same.
- b. The recreational charterboat fishery is highly competitive. And while there are some operations in isolated locations, many boats tie up and operate in close proximity to other charter boats. It is reasonable to expect that those operators who are following the rules would be quick to notice another operator seeking to "steal" customers by offering a better trip with higher bag or rod limits.
- c. Charterboat operators are required to have a current Coast Guard license to operate. One of the conditions of the license requires the operator to comply with *all* federal regulations. Charter boat operators potentially risk losing their Coast Guard license if they violate federal fisheries regulations. It is reasonable to conclude that because of the nature of the Coast Guard license, inferring a trust and responsibility to the licensee, as well as the double jeopardy implications, charter boat operators would likely have a higher rate of compliance with GHL measures than might otherwise be expected. --

These three factors, along with the current system of opportunistic enforcement may provide a level of compliance sufficient to ensure the GHL measures have the desired effect in controlling the fishery.

The Coast Guard has taken the position that where the above does not hold true, if there is sufficient public interest and concern in the conduct of the recreational charter fishery, it could respond by shifting effort from other areas to focus on the charter fleet. A highly publicized focus operation, of short duration, may have sufficient impact to raise compliance back up to an acceptable level, while only requiring a modest shift of enforcement effort. These operations could be done periodically through the region and season, under an overall strategy of raising compliance to an acceptable level. This approach is different from one that attempts to identify the law enforcement resources necessary to check all fishery participants or apprehend all violators.

## Summary

In summary, staff discussed the importance of implementation and enforcement of whatever the Council chooses as its preferred action. Staff identified the lack of an appropriate and effective management measure to implement once an area GHL is reached. As a solution, ADF&G staff identified a pre-season temporal adjustment to the bag limit as a new management measure for Council consideration. A question arose as to whether the Council could take action on such measures that are not explicitly included in the public review analysis in February, although the appropriate data was included in the analysis. Since: (1) this proposal is being circulated prior to the February Council meeting and will be presented and discussed during the staff presentation of this agenda item; and (2) the public will have the opportunity to comment on the proposal and all other aspects of the GHL analysis during : (a) final action in February; and (b) during the public comment period associated with publication of the proposed rule once the regulatory amendment package is submitted to the Secretary, it is the staff recommendation that the Council may consider this new measure during final action at February meeting.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration

Office of General Counsel  
P.O. Box - 21109  
Juneau, Alaska 99502-1109

AGENDA C-1(d)  
FEBRUARY 2000

December 4, 1995

MEMORANDUM FOR: North Pacific Fishery Management Council

THROUGH: Lisa Lindeman  
Alaska Regional Attorney *Lisa Lindeman*

FROM: Jonathan Pollard *Jonathan Pollard*  
Attorney-Advisor

SUBJECT: State regulatory authority over the Pacific halibut fisheries

QUESTION PRESENTED:

Is State authority to regulate fishing for Pacific halibut in Convention waters preempted by the Convention Between the United States and Canada for the Preservation of the Pacific Halibut Fishery of the Northern Pacific Ocean and the Bering Sea ("Convention") and the Northern Pacific Halibut Act, 16 U.S.C. §§ 773-773k?

BRIEF ANSWER:

Yes. State authority to regulate fishing for Pacific halibut in Convention waters is preempted by federal law. The Convention and the Northern Pacific Halibut Act amount to comprehensive and pervasive federal regulation of, and a dominant federal interest in, direct and uniform regulation of the Pacific halibut fishery in Convention waters.

SHORT DISCUSSION:

A preemption question requires examination of Congressional intent. First, Congress explicitly may define the extent to which its enactments preempt State laws. Second, preemption may be inferred through Congress' occupation of a given field to the exclusion of State law. Such an inference may be drawn when --



the pervasiveness of federal regulation precludes supplementation by the States, or

the federal interest in the field is sufficiently dominant, or

the object of the federal law and the character of the obligations imposed by it reveal the same purpose.

See Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Commission, 461 U.S. 190, 204 (1982). The Supreme Court repeatedly has held that where Congress has exercised exclusive jurisdiction over a general and inclusive area of activity, the very delegation of regulatory power to an administrative agency will supersede any State action over that area. See Ray v. ARCO, 435 U.S. 151, 157 (1978); Bethlehem Steel v. New York Labor Relations Board, 330 U.S. 767 (1947). Such a comprehensive arrogation of governmental powers nullifies looser or stricter direct State regulation of the subject matter. See Ray v. ARCO, 435 U.S. 151 (1978); Huron Portland Cement v. Detroit, 362 U.S. 440 (1960).

Finally, even where Congress has not entirely displaced State law in a particular field, State law is preempted to the extent that it actually conflicts with federal law. Such a conflict will be found when --

it is impossible to comply with both State and federal law, or

the State law stands as a obstacle to the accomplishment of the purposes and objectives of Congress.

See Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Commission, 461 U.S. 190, 204 (1982).

Although the Convention and the Halibut Act do not expressly preempt State laws directly regulating the Pacific halibut fishery in Convention waters, the Convention and the Act amount to a pervasive scheme of federal regulation occupying the field to the exclusion of all State laws that are not identical to the federal regulations. Article I of the Convention states that all



fishing for Pacific halibut in Convention waters (including State waters) is prohibited except as expressly provided in the Convention. Further, persons may fish for Pacific halibut only in accordance with the Convention and the approved regulations of the International Pacific Halibut Commission. The Commission has broad authority to adopt regulations to develop and maintain the stocks of Pacific halibut pursuant to Article III of the convention. Article I, paragraph 2, states that each "Party" (the United States and Canada) may establish additional regulations governing the taking of Pacific halibut that are more restrictive than those adopted by the Commission.

The Halibut Act implements the Convention, and provides that the Secretary of Commerce has general responsibility to carry out the Convention and the Halibut Act, and that the regional fishery management councils may develop Pacific halibut fishery regulations that are in addition to, and not in conflict with, Commission regulations. Council regulations can be implemented only with the approval of the Secretary of Commerce.

Taken together, the Convention and the Halibut Act and implementing Commission and federal regulations constitute a comprehensive and pervasive regulatory scheme that completely occupies the field of Pacific halibut fishery regulation, including research, open and closed areas, gear limitations, quotas, allocation and more. Furthermore, this conclusion is also supported by the possibility of collision between Pacific halibut fishery regulations adopted by Alaska, Washington, Oregon and California and those adopted by the Commission and the federal government. When State regulations could affect the ability of the federal government to regulate comprehensively and uniformly or presents the prospect of interference with the federal regulatory power, then State law will be preempted even though collision between State and federal law may not be an inevitable consequence. Scheidewind v. ANR Pipeline Co., 485 U.S. 293, 310 (1988); Northern Natural Gas Co. v. State Corporation Commission of Kansas, 372 U.S. 84, 91-92 (1963).

In conclusion, States have no authority to directly regulate aspects of the Pacific halibut fishery in Convention waters that have been preserved by the Convention and the Halibut Act to the exclusive regulatory jurisdiction of the Commission, the regional

fishery management councils and the Secretary of Commerce<sup>1</sup> - such matters as research, designation of open and closed areas, gear limitations, quotas, and allocation of fishing privileges. Consequently, States have no regulatory authority in this area to which the regional fishery management councils and the Secretary of Commerce may defer.

Of course, every State law that has some indirect effect on the regulation of the Pacific halibut fishery within Convention waters is not preempted. Cf. Metropolitan Life Insurance Co. v. Massachusetts, 471 U.S. 724, 753-756 (1985). However, State regulations that directly regulate matters that Congress intended the Commission, the regional fishery management councils and the Secretary of Commerce to regulate are preempted within Convention waters.

cc: Jay Johnson  
Steve Pennoyer  
Eileen Cooney

---

<sup>1</sup> Compare section 306(a)(3) of the Magnuson Act, 16 U.S.C. § 1856(a)(3), which provides that a State may not directly or indirectly regulate any fishing vessel outside its boundaries, including waters of the EEZ, unless the vessel is registered under the laws of that State. Here Congress actually preserved a regulatory role for the States in the comprehensive federal fishery regulatory scheme implemented by the Magnuson Act. See also the Pacific Salmon Treaty Act, 16 U.S.C. §§ 3631 - 3644, and the Interjurisdictional Fisheries Act, 16 U.S.C. §§ 4101 - 4107, which both provide a regulatory role for the States. Neither the Convention nor the Halibut Act preserve any regulatory role whatever for the States, even within State waters.

COMMISSIONERS:

RICHARD J. BEAMISH  
NANAIMO, B.C.  
RALPH G. HOARD  
SEATTLE, WA  
KATHLEEN PEARSON  
SKIDEGATE, HAIDA GWAI  
STEVEN PENNOYER  
JUNEAU, AK  
ANDREW P. SCALZI  
HOMER, AK  
JOHN SECORD  
VANCOUVER, BC

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA  
AND THE UNITED STATES OF AMERICA

February 2, 2000

DIRECTOR  
BRUCE M. LEAMAN

AGENDA C-1(e)  
FEBRUARY 2000

TELEPHONE  
(206) 634-1838

FAX:  
(206) 632-2983

Dr. Clarence Pautzke, Executive Director  
North Pacific Fishery Management Council  
605 West 4th Avenue, Suite 306  
Anchorage, AK 99501-2252

RE: February 2000 Meeting - Agenda Item C-1 Halibut Charter GHL

Dear Clarence:

The staff of the International Pacific Halibut Commission has reviewed the January 10, 2000 draft of the EA/RIR/IRFA for the proposed Guideline Harvest Level (GHL) management plan for Areas 2C and 3A under consideration by the North Pacific Fishery Management Council (Council). We recognize that the primary goal of the proposal is to allocate the harvest of halibut between the commercial and guided sport fisheries in Areas 2C and 3A, which is within the Council's jurisdiction. As such, we have no recommendation for a preferred option. However, we are concerned with the effectiveness of the GHL. We find that the proposal intersects with our management of the fishery and resource, which leads us to highlight five areas of concern.

**(1) Stock Projections.** The halibut resource has been declining since the late 1980s, when biomass was at historically high levels. Although biomass in Areas 2C and 3A has declined three and five percent annually, respectively, since the 1980s, in more recent years the rate of decline has ranged from 10 to 15 percent. The EA/RIR uses projections of stock decline of 3 to 5 percent, which we believe is too conservative for the short term. A more reasonable assumption would be 10 to 15 percent. The implication for the Council is that GHL adherence may be required sooner than is believed.

**(2) A Preferred Decision-Making Process for Allocation.** We believe that a proper decision making process for allocating halibut among users should include full allocation of all removals. All user groups should participate in conservation. User groups should be held accountable for removals under their control. Attached, you will find a chart depicting our preferred decision-making process for the Council to consider. Under such a process, which is predicated on an effective monitoring and enforcement program for a GHL, personal use and bycatch mortality are subtracted from the total available yield. The Commission would decide upon a combined catch limit for sport and commercial users after discussing recommendations from the staff, Conference Board, and the Processor Advisory Group. The Council would allocate between the sport and commercial sectors according to a GHL or other type of catch sharing plan. (The asterisk next to the GHL Split box is simply to note that a split which incorporates non-guided sport would use different percentage values than are in the present EA/RIR.) This is similar to the process shared by IPHC and the Pacific Fishery Management Council for allocations in Area 2A. We suggest the Council consider such an arrangement for Area 2C and 3A if it decides to explicitly allocate among sport and commercial groups.

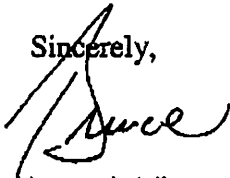
**(3) Effectiveness of Proposed Management Measures.** The EA/RIR contains discussion about eleven management measures available to constrain the sport catch with a GHL and effectiveness of such measures. We agree that only bag limits and possibly prohibiting vessel crews to catch halibut are the only meaningful measures available, and the actual impact of reducing the annual bag limit will likely result in greater reductions than are needed. However, if fishing effort increases in response to lower bag limits, the savings projected from lower bag limits may not be fully realized. Most of the other measures, e.g., boat limits, possession limits, line limits, angler limits, will result in redistributing effort or have little effect due to the few fishing trips conducted by individual harvesters. Also, we find the concept of a sport fish reserve to be biologically unsound: uncaught fish in one year are not available in subsequent years at the same level of productivity. We recommend the Council consider measures that are more effective at achieving its management goals, such as allowing the bag limits to change by time of year.

**(4) Enforcement.** We are very concerned about the need for large increases in enforcement required by the GHL program given the difficulty NMFS Enforcement has had in meeting IFQ enforcement goals. Management measures imposed on the guided sport fishery to constrain the catch within a GHL would require additional enforcement to ensure compliance, yet there is no assurance given in the EA/RIR that such enforcement would occur. The EA/RIR only discusses NMFS access to State data, but we believe that on-water enforcement is even more critical to achieving success with a GHL. We recommend that the Council require an enforcement plan which seeks verification of catches and accountability of harvesters before adopting a GHL plan for Areas 2C and 3A. Also, IPHC would need assurances of an appropriate enforcement and monitoring plan to ensure that catches do not exceed catch limits.

**(5) GHL Management.** We have identified two issues which we wish to bring to the Council's attention. First, we recommend that GHL management be conducted in terms of weight and not numbers of fish. This would be consistent with our management and assessment procedures. It is also the way all other halibut removals are counted. A simple conversion from weight to numbers of fish could be constructed from data on average weight for industry monitoring and compliance. Second, we would advise against choosing alternatives with rolling averages, such as the 3-year rolling average in Alternative 2, Issue 1, Option 3. Rolling averages have a high potential for over-harvest, thus creating a conservation problem.

A member of our staff will be attending the meeting and will be available to address questions the Council may have on these recommendations.

Sincerely,



Bruce M. Leaman  
Executive Director

cc: IPHC Commissioners