



TRADEX

SUPPLY MARKET STUDY – Pacific Halibut Prospects 2008-2010

Market Analysis

April 2008

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1. PREAMBLE

1.1. **Disclaimer**

The information in this report is for informational purposes only. The conclusions herein are forward looking and represent Tradex Foods' best estimate based on current available information. We have used data from sources we believe to be reliable but we can not guarantee that they are complete or accurate. Although we believe the expectations reflected in our forward-looking statements are reasonable, results may vary, and we cannot guarantee future results.

1.2. **Feedback**

Tradex Foods welcomes your feedback about this report and our other market analysis offerings. Should you have a comment or question, please contact us:

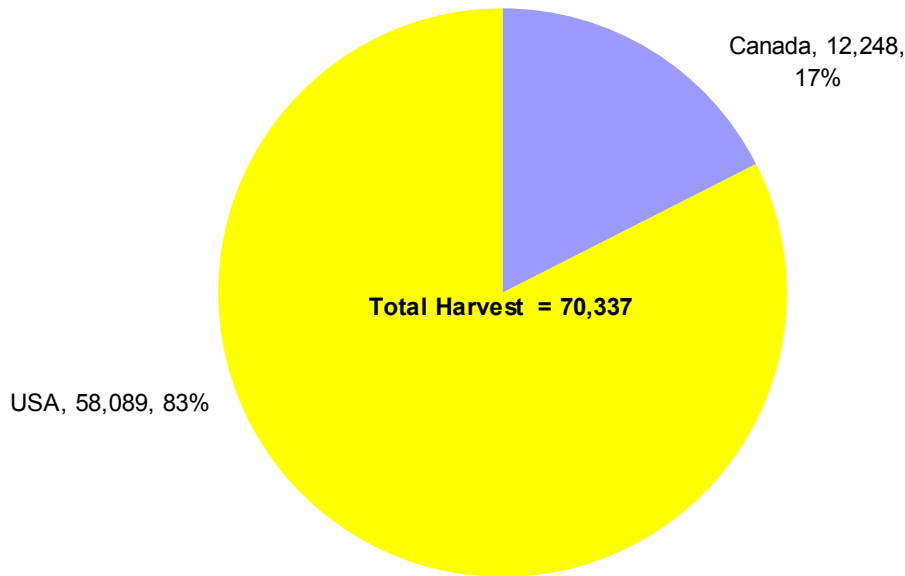
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2. EXECUTIVE SUMMARY

2.1. Introduction

- At the end of 2005, two countries harvested Pacific halibut: Canada and the USA.

Pacific Halibut Harvest by Country, 2005 ('000s of pounds)



- The USA accounted for the bulk of the harvest at 83%.
- This report will cover both the Canadian and US fisheries.

2.2. Management

- The 1923 Convention for the Preservation of the Halibut Fishery of the North Pacific Ocean between Canada and the USA created the International Pacific Halibut Commission (IPHC) – originally named the International Fisheries Commission – to regulate and conserve the Pacific halibut resource.
- After the end of each season the IPHC staff review its scientific studies from the year, as well as catch-effort statistics to determine the health of the stock coastwide and in the various subareas.
- Using this data the IPHC sets quotas and develops policy to address the issues of the day.
- Currently the IPHC creates single year plans. The current year covers the 2008 season.
- Once the IPHC has decided on the quotas for the various management areas, the presiding country's fisheries management organization manages the quota as it sees fit.

- The National Marine Fisheries Service (NMFS) manages the US halibut fishery and the Department of Fisheries and Oceans (DFO) manages the Canadian side.
- The IPHC divides its jurisdiction into the following areas:

Area	Description
2A	California, Oregon, Washington
2B	British Columbia
2C	Southeast Alaska
3A	Central Gulf of Alaska
3B	Western Gulf of Alaska
4A	Eastern Aleutian Islands
4B	Western Aleutian Islands
4C	Pribilof Islands
4D	Western Bering Sea
4E	Eastern Bering Sea

2.2.1. IFQs

- Prior to 1991, Pacific halibut fisheries were managed on a “free access for all” principle.
- In 1991 the Canadian government introduced an individual fishing quota (IFQ) system (call “individual vessel quota” in Canada)
- After the initial success of the new Canadian system, and after its own drastic three-day fishery in 1994, the US government also adopted an IFQ system for its fishery.
- Nonetheless most stakeholders would agree that the fishery now operates in a much more economically and biologically sustainable manner, even if the rewards are divided among fewer fishers.

2.2.2. Sport charter fishery

- In recent years commercial halibut fishermen have lobbied the IPHC to tighten its regulation of the sport charter fishery.
- The commercial fleet complained that the charter sector exceeded its harvest targets:
 - In area 2C (southeast Alaska) by 36% in 2005 and 47% in 2006.
 - In area 3A (central Gulf of Alaska) by 10% in 2006.

- The IPHC has therefore enacted for the 2008 season the following regulations, some of which are new:
 - Each person is limited to two halibut per day in BC, Washington and Oregon and one halibut per day in California.
 - The maximum number of daily bag limits one person is allowed to possess at any time ranges from one in Washington to three in Oregon.

2.3. Historical

2.3.1. Harvests

- Pacific halibut harvests reached a recent low of approximately 45 million pounds per year in the mid-1990s.
- In 1991 the Canadian government adopted an IFQ management system for its halibut jurisdiction and the USA followed suit in 1994.
- After this change harvests began to rise again, reaching recent peaks of approximately 74 million pounds in 1999 and 2002.
- Harvests are currently on a downward trend, with harvests falling for three consecutive years (and likely another to follow in 2008).

2.3.2. Quotas

- In the early 1990s, prior to the implementation of IFQ management systems, catches were somewhat volatile relative to the quota, straying by up to 10% from the recommended catch.
- But in recent years the halibut fishery has become extremely consistent, catching an average of 98% of its recommended annual harvest.
- Using the historical rate at which the individual area fisheries convert quota into harvest, we will predict future catches with the following adjustments:

Area	Predicted % of Quota
2A	100%
2B	100%
2C	98%
3A	100%
3B	100%
4A	100%
4B	91%
4CDE	86%

2.4. Forecasts

2.4.1. Current plan (2008)

- We project the 2008 commercial halibut catch will be approximately 58 million pounds:

PROJECTIONS FOR COMMERCIAL HALIBUT FISHERIES, 2007-2008					
all figures in '000s of H&G pounds					
Area	Catch/quota factor	2007		2008	
		Quota	Catch	Quota	Proj. catch
2A	1.00	799	762	679	679
2B	1.00	10,089	9,694	7,619	7,619
2C	0.98	8,510	8,343	6,210	6,086
3A	1.00	26,200	25,957	24,220	24,220
3B	1.00	9,220	9,217	10,900	10,900
4A	1.00	2,890	2,775	3,100	3,100
4B	0.91	1,440	1,376	1,860	1,693
4CDE	0.86	4,101	3,833	3,891	3,346
Total		63,249	61,957	58,479	57,643

- These 2008 projections show a 7% decrease from the 2007 harvest, almost identical to the total quota cut announced by the IPHC.

2.4.2. Future plans (2009, 2010)

- Since the IPHC only develops its harvest plans one year at a time, it has not yet published its projected quotas for the 2009 season.
- We will therefore predict 2009 and 2010 catches using visible trends from CEY and historical harvest data.

- Given the following data:
 - Harvests have fallen from a recent high in 2002-2003.
 - CEY biomass has fallen from a recent high in 2002-2003.
 - Using my “period (b)” assumption described earlier, the projected minimum in the identified 14-15 year trend cycle would occur in 2009-2010 from the previous low in 1995 and high in 2002.
- I therefore assume that we are currently seeing the end of period (b) in 2009 and 2010, to be followed by an increase in harvests in 2011 that will mark the beginning of a new cycle.
- Using values from the corresponding periods in earlier cycles, I estimate upcoming harvests will be:

PROJECTED COMMERCIAL HARVESTS 2008-2010		
<i>all figures in '000s of H&G pounds</i>		
Year	Estimated quota	Implied catch
2008	58,479	57,643
<i>Average efficiency 1992-2007</i>		98.2%
2009	54,385	53,423
2010	50,578	49,684

- I expect the 2008 halibut harvest to continue the recent downward trend with a harvest of 58 million pounds.
- Our model projects the current 14-15 harvest cycle will reach its minimum of 50 million pounds in 2010, after which it will begin to rise again in 2011.

3. INTRODUCTION

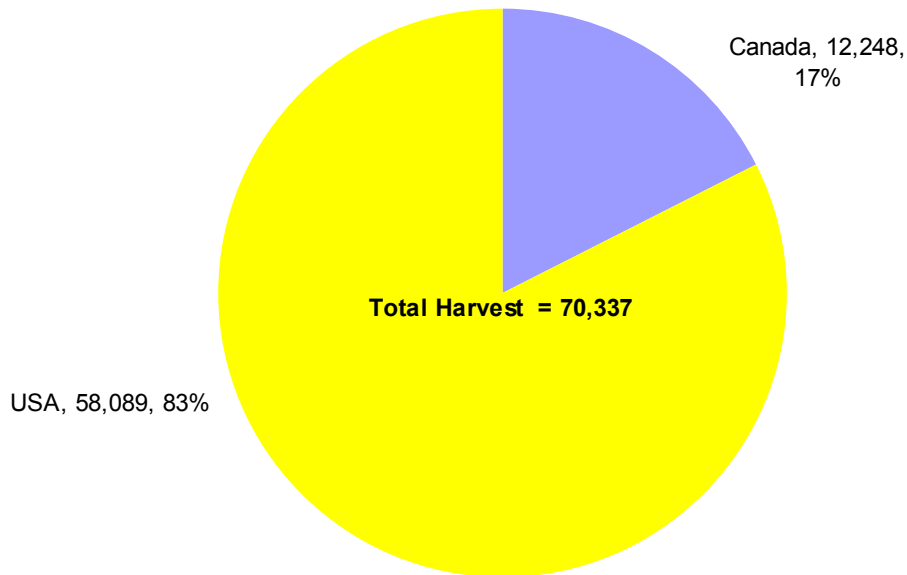
3.1. *Species description*¹

Scientific name:	Hippoglossus stenolepis
Common names:	Pacific halibut, halibut
Maximum length:	267cm
Maximum weight:	363kg
Maximum age:	42 years
Distribution:	Hokkaido, Japan north to the Sea of Okhotsk; Alaska south to Baja California, Mexico

3.2. *Harvests by country*²

- At the end of 2005, two countries harvested Pacific halibut: Canada and the USA.

Pacific Halibut Harvest by Country, 2005 ('000s of pounds)



- The USA accounted for the bulk of the harvest at 83%.
- This report will cover both the Canadian and US fisheries.

4. MANAGEMENT

4.1. Organizations^{3,4}

- In 1923 Canada and the USA signed the Convention for the Preservation of the Halibut Fishery of the North Pacific Ocean.
- This was the first international treaty created to conserve a depleted deep-sea fishery.
- The treaty created the three-month winter offseason that continues today.
- It also created the International Fisheries Commission to govern the fishery, with each country providing two commissioners for a total of four.
- The commission's name has since changed to the International Pacific Halibut Commission (IPHC), and the number of commissioners has increased to three per country, for a total of six.
- The IPHC remains the body responsible for scientific studies of Pacific halibut and for the developing the high-level regulations that govern the fishery, such as quota and season length.
- Once the IPHC has decided on the quotas for the various management areas, the presiding country's fisheries management organization manages the quota as it sees fit.
- For example the advent of the present individual fishing quota (IFQ) management system was conceived and implemented by the respective national fisheries agencies, not by the IPHC.
- The National Marine Fisheries Service (NMFS) manages the US halibut fishery and the Department of Fisheries and Oceans (DFO) manages the Canadian side.

4.2. Process

- After the end of the season the IPHC staff review its scientific studies from the year, as well as catch-effort statistics to determine the health of the stock coastwide and in the various subareas.
- From this assessment the IPHC staff submits its preliminary quota recommendations for the upcoming season, as well as any regulatory changes they feel the commission should review.
- The recommendations are available for public comment prior to the commission's annual meeting in December or January, where final quota and regulatory decisions are made.
- Currently the IPHC creates single year plans. The current year covers the 2007 season.

4.3. Key stock assessment data⁵

- In its annual stock assessment, the IPHC uses “all available data from the commercial fishery and scientific surveys.”
- Output from the assessment include:
 - a) “Total exploitable biomass” is the gross biomass figure. For example at the end of 2007 the total exploitable biomass was approximately 361 million pounds, down from 414 million pounds in 2006.
 - b) “Total available yield” is the biomass available to harvesting after setting aside a sustainable broodstock.
 - c) “Constant exploitation yield” (CEY) is the maximum percentage of the total available yield that fishers can harvest sustainably. This rate is held constant from year to year with minor adjustments. For example at the end of 2007 the total available yield was approximately 69 million pounds, down proportionately with the biomass from 80 million pounds in 2008.
 - d) From the commercial catch and effort statistics, the “catch per unit of effort” (CPUE) an indicator of the health of the targeted stock.
- Prior to 2006 the IPHC conducted individual stock assessments for each area.
- But due to the inherent weakness of this model as fish migrate from western areas to eastern areas, the IPHC began conducting a coastwide assessment in the 2006 offseason.
- It compared the coastwide assessment with the sum of the individual area assessments to qualify its conclusions.
- The CEY rates used for the 2008 quota calculations were:
 - Area 2 20%
 - Areas 3A, 3B, 4A 20%
 - Areas 4BCDE 15%

4.4. Harvest areas

- The IPHC divides its jurisdiction into the following areas:

Area	Description
2A	California, Oregon, Washington
2B	British Columbia
2C	Southeast Alaska
3A	Central Gulf of Alaska
3B	Western Gulf of Alaska
4A	Eastern Aleutian Islands
4B	Western Aleutian Islands
4C	Pribilof Islands
4D	Western Bering Sea
4E	Eastern Bering Sea

- For stock assessment purposes, IPHC often treats areas 4CDE as a single stock.
- DFO manages area 2B, and NMFS manages the remainder.

4.5. IFQs

- Prior to 1991, Pacific halibut fisheries were managed on a “free access for all” principle.
- The IPHC controlled the annual quota, but the competition for fish intensified each year.
- The only other lever of control for the IPHC within the free-access system was to shorten the fishing season.
- In 1975 the halibut season lasted 125 days. In 1984 it lasted 25 days.
- By 1994 in US areas, the season shrank to a frantic, dangerous three days of fishing.
- In 1991 the Canadian government introduced an individual fishing quota (IFQ) system (called “individual vessel quota” in Canada) to:
 - Increase the total value of the fishery by eliminating the “boom and bust” economics of short, intense openings.
 - Reduce stress on the halibut stock by minimizing waste and quota overruns.
 - Improving the safety of those involved in the fishery.
- After the initial success of the new Canadian system, and after its own drastic three-day fishery in 1994, the US government also adopted an IFQ system for its fishery.

- The two governments allocated a fixed percentage of the annual halibut quota to established fishers, with their share based on historical catch data.
- Owners of the quota shares theoretically own them in perpetuity and can sell them if they wish.
- Some consolidation has occurred, as larger players buy smaller quota shares.
- Quota almost immediately became very expensive to buy, erecting a considerable barrier to prospective new entrants.
- Nonetheless most stakeholders would agree that the fishery now operates in a much more economically and biologically sustainable manner, even if the rewards are divided among fewer fishers.

4.6. Sport charter fishery⁶

- In recent years commercial halibut fishermen have lobbied the IPHC to tighten its regulation of the sport charter fishery.
- The commercial fleet complained that the charter sector exceeded its harvest targets:
 - In area 2C (southeast Alaska) by 36% in 2005 and 47% in 2006.
 - In area 3A (central Gulf of Alaska) by 10% in 2006.
- The IPHC has therefore enacted for the 2008 season the following regulations, some of which are new:
 - a) Each person is limited to a single line with two hooks.
 - b) The season runs annually from February 1 to December 31.
 - c) Each person is limited to two halibut per day in BC, Washington and Oregon and one halibut per day in California.
 - d) Minimum size is measured from the tip of the lower jaw (mouth closed), along the line of the pectoral fin, to the extreme end of the middle of the tail.
 - e) Fishers must not alter the fish in any way that prevents the determination of minimum size and/or bag count.
 - f) The maximum number of daily bag limits one person is allowed to possess at any time ranges from one in Washington to three in Oregon.
 - g) Any halibut brought aboard and not immediately returned to sea with a minimum of injury counts towards the fisher's daily bag limit.

- h) No person may possess a halibut while fishing in a closed area.
 - i) No sport caught halibut may be sold, traded or bartered.
 - j) Vessels with species onboard that are destined for commercial use may not possess a sport caught halibut.
 - k) The charter vessel operator is liable for violations committed by his passengers.
- Although the bag limit cuts may have a significant effect on the sport fishing industry, the harvest numbers are small enough that they are unlikely to have a material effect on the projections in this report.

5. HISTORICAL

5.1. Harvests^{7,8,9,10,11}

- The IPHC reports the following landings for Pacific halibut:

COMMERCIAL HALIBUT CATCH BY AREA, 1981-2007				
all figures in '000s of H&G pounds				
Year	WA,OR,CA	BC	AK	Total
	2A	2B	2C-4E	
1981	200	5,660	19,880	25,740
1982	210	5,540	23,250	29,000
1983	260	5,440	32,690	38,390
1984	430	9,050	35,490	44,970
1985	490	10,390	45,230	56,110
1986	580	11,220	57,820	69,620
1987	590	12,250	56,630	69,470
1988	490	12,860	60,990	74,340
1989	470	10,430	56,030	66,930
1990	320	8,570	52,690	61,580
1991	360	7,190	49,540	57,090
1992	437	7,626	51,829	59,892
1993	504	10,628	48,137	59,269
1994	370	9,911	44,449	54,730
1995	297	9,623	33,962	43,882
1996	296	9,545	37,501	47,342
1997	413	12,420	52,365	65,198
1998	460	13,172	56,126	69,758
1999	450	12,705	61,151	74,306
2000	482	10,811	57,012	68,305
2001	680	10,288	59,731	70,699
2002	851	12,074	61,735	74,660
2003	819	11,789	60,533	73,141
2004	877	12,086	59,078	72,041
2005	799	12,246	57,270	70,315
2006	811	11,720	54,124	66,655
2007	762	9,694	51,501	61,957
Average 1981-2007	508	10,183	49,509	60,200
Average 2000-2007	760	11,339	57,623	69,722

- Pacific halibut harvests reached a recent low in the mid-1990s.
- In 1991 the Canadian government adopted an IFQ management system for its halibut jurisdiction and the USA followed suit in 1994.
- After this change harvests began to rise again, reaching recent peaks in 1999 and 2002.
- The fishery is currently experiencing a mini-trough, with harvests falling for four consecutive years, although harvests are not falling to the lows in the mid-1990s.

- The Alaskan areas account for the bulk of the annual Pacific halibut harvest.

5.2. Quotas

- Before analysing the IPHC's 2008 catch recommendations, we must review how closely previous stock assessments indicated eventual actual landings.

COMMERCIAL HALIBUT QUOTAS, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	60,380	59,892	99.2%
1993	54,340	59,269	109.1%
1994	56,950	54,730	96.1%
1995	48,660	43,882	90.2%
1996	48,660	47,342	97.3%
1997	66,200	65,198	98.5%
1998	71,820	69,758	97.1%
1999	74,060	74,306	100.3%
2000	67,500	68,305	101.2%
2001	73,180	70,699	96.6%
2002	74,920	74,660	99.7%
2003	74,920	73,141	97.6%
2004	76,505	72,041	94.2%
2005	71,686	70,315	98.1%
2006	67,710	66,655	98.4%
2007	63,249	61,957	98.0%
Average 1992-2007	65,671	64,509	98.2%
Average 2000-2007	71,209	69,722	97.9%

- In the early 1990s, prior to the implementation of IFQ management systems, catches were somewhat volatile relative to the quota, straying by up to 10% from the recommended catch.
- But in recent years the halibut fishery has become extremely consistent, catching an average of 98% of its recommended annual harvest.
- Given that the IPHC has only just begun with coastwide surveys, it is also important to examine the catch-to-quota performance in the individual areas.

5.2.1. 2A: California, Oregon and Washington

COMMERCIAL HALIBUT QUOTAS, AREA 2A, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	650	437	67.2%
1993	600	504	84.0%
1994	550	370	67.3%
1995	520	297	57.1%
1996	520	296	56.9%
1997	700	413	59.0%
1998	820	460	56.1%
1999	760	450	59.2%
2000	830	482	58.1%
2001	1,140	680	59.6%
2002	1,310	851	65.0%
2003	1,310	819	62.5%
2004	1,480	877	59.3%
2005	789	799	101.3%
2006	819	811	99.0%
2007	799	762	95.4%
Average 1992-2007	850	582	68.5%
Average 2000-2007	1,060	760	71.7%

- Fishers in 2A routinely caught only approximately 60% of the annual quota prior to 2004.
- For the last few years the catch has matched quota almost exactly.
- Since the catch in 2A is minor as a percentage of the all-area halibut catch, we will forego any adjustments and predict that future catches will be 100% of quota.

5.2.2. 2B: British Columbia

COMMERCIAL HALIBUT QUOTAS, AREA 2B, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	8,000	7,626	95.3%
1993	10,500	10,628	101.2%
1994	10,000	9,911	99.1%
1995	9,520	9,623	101.1%
1996	9,520	9,545	100.3%
1997	12,500	12,420	99.4%
1998	13,000	13,172	101.3%
1999	12,100	12,705	105.0%
2000	10,600	10,811	102.0%
2001	10,510	10,288	97.9%
2002	11,750	12,074	102.8%
2003	11,750	11,789	100.3%
2004	13,800	12,086	87.6%
2005	11,658	12,246	105.0%
2006	11,631	11,720	100.8%
2007	10,089	9,694	96.1%
Average 1992-2007	11,058	11,021	99.7%
Average 2000-2007	11,474	11,339	98.8%

- On average the 2B fishery harvests 99-100% of its quota.
- We predict that future catches will be 100% of quota.

5.2.3. 2C: Southeast Alaska

COMMERCIAL HALIBUT QUOTAS, AREA 2C, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	10,000	9,819	98.2%
1993	10,000	11,290	112.9%
1994	11,000	10,379	94.4%
1995	9,000	7,766	86.3%
1996	9,000	8,872	98.6%
1997	10,000	9,920	99.2%
1998	10,500	10,196	97.1%
1999	10,490	10,143	96.7%
2000	8,400	8,445	100.5%
2001	8,780	8,403	95.7%
2002	8,500	8,602	101.2%
2003	8,500	8,410	98.9%
2004	10,500	10,179	96.9%
2005	10,930	10,505	96.1%
2006	10,630	10,374	97.6%
2007	8,510	8,343	98.0%
Average 1992-2007	9,671	9,478	98.0%
Average 2000-2007	9,344	9,158	98.0%

- Both the long-term and short-term averages show that the 2C fishery harvests 98% of its quota.
- We predict that future catches will be 98% of quota.

5.2.4. 3A: Central Gulf of Alaska

COMMERCIAL HALIBUT QUOTAS, AREA 3A, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	26,600	26,782	100.7%
1993	20,700	22,738	109.8%
1994	26,000	24,844	95.6%
1995	20,000	18,336	91.7%
1996	20,000	19,693	98.5%
1997	25,000	24,628	98.5%
1998	26,000	25,698	98.8%
1999	24,670	25,316	102.6%
2000	18,310	19,288	105.3%
2001	21,890	21,541	98.4%
2002	22,630	23,131	102.2%
2003	22,630	22,748	100.5%
2004	25,060	24,602	98.2%
2005	25,470	25,053	98.4%
2006	25,200	24,908	98.8%
2007	26,200	25,957	99.1%
Average 1992-2007	23,523	23,454	99.7%
Average 2000-2007	23,424	23,404	99.9%

- In recent history the 3A fishery has been the largest volume of the various halibut areas, harvesting in excess of 20 million pounds in all but a few years.
- Throughout this time the fishery has converted an average of 100% of its quota into harvest.
- We predict that future catches will be 100% of quota.

5.2.5. 3B: Western Gulf of Alaska

COMMERCIAL HALIBUT QUOTAS, AREA 3B, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	8,800	8,620	98.0%
1993	6,500	7,855	120.8%
1994	4,000	3,860	96.5%
1995	3,700	3,125	84.5%
1996	3,700	3,662	99.0%
1997	9,000	9,072	100.8%
1998	11,000	11,161	101.5%
1999	13,370	13,835	103.5%
2000	15,030	15,413	102.5%
2001	16,530	16,336	98.8%
2002	17,130	17,313	101.1%
2003	17,130	17,231	100.6%
2004	15,600	15,334	98.3%
2005	13,150	12,992	98.8%
2006	10,860	10,797	99.4%
2007	9,220	9,217	100.0%
Average 1992-2007	10,920	10,989	100.6%
Average 2000-2007	14,331	14,329	100.0%

- The 3B fishery has consistently converted 100% of its quota into harvest.
- We predict that future catches will be 100% of quota.

5.2.6. 4A: Eastern Aleutian Islands

COMMERCIAL HALIBUT QUOTAS, AREA 4A 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	2,300	2,699	117.3%
1993	2,020	2,561	126.8%
1994	1,800	1,803	100.2%
1995	1,950	1,617	82.9%
1996	1,950	1,699	87.1%
1997	2,940	2,907	98.9%
1998	3,500	3,418	97.7%
1999	4,240	4,369	103.0%
2000	4,970	5,155	103.7%
2001	4,970	5,015	100.9%
2002	4,970	5,091	102.4%
2003	4,970	5,024	101.1%
2004	3,470	3,392	97.8%
2005	3,440	3,324	96.6%
2006	3,350	3,260	97.3%
2007	2,890	2,775	96.0%
Average 1992-2007	3,358	3,382	100.7%
Average 2000-2007	4,129	4,130	100.0%

- On average the 4A fishery converts 100% of its quota into harvest.
- We predict that future catches will be 100% of quota.

5.2.7. 4B: Western Aleutian Islands

COMMERCIAL HALIBUT QUOTAS, AREA 4B 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	2,300	2,317	100.7%
1993	2,300	1,962	85.3%
1994	2,100	2,017	96.0%
1995	2,310	1,680	72.7%
1996	2,310	2,069	89.6%
1997	3,480	3,318	95.3%
1998	3,500	2,901	82.9%
1999	3,980	3,571	89.7%
2000	4,910	4,692	95.6%
2001	4,910	4,466	91.0%
2002	4,180	4,080	97.6%
2003	4,180	3,863	92.4%
2004	2,810	2,672	95.1%
2005	2,260	1,932	85.5%
2006	1,670	1,555	93.1%
2007	1,440	1,376	95.6%
Average 1992-2007	3,040	2,779	91.4%
Average 2000-2007	3,295	3,080	93.5%

- As a percentage of quota, catches in area 4B have varied relatively widely, averaging 91% over the longer term and 93% in the shorter term.
- Since there is no identifiable trend within the short term, we will use the longer term average of 91% to predict future catches.

5.2.8. 4CDE: Bering Sea

COMMERCIAL HALIBUT QUOTAS, AREA 4CDE, 1992-2007			
<i>all figures in '000s of H&G pounds</i>			
Year	Total Quota	Total Catch	Catch % of Quota
1992	1,730	1,592	92.0%
1993	1,720	1,731	100.6%
1994	1,500	1,546	103.1%
1995	1,660	1,438	86.6%
1996	1,660	1,506	90.7%
1997	2,580	2,520	97.7%
1998	3,500	2,752	78.6%
1999	4,450	3,917	88.0%
2000	4,450	4,019	90.3%
2001	4,450	3,970	89.2%
2002	4,450	3,518	79.1%
2003	4,450	3,257	73.2%
2004	3,785	2,899	76.6%
2005	3,989	3,464	86.8%
2006	3,550	3,230	91.0%
2007	4,101	3,833	93.5%
Average 1992-2007	3,252	2,825	86.9%
Average 2000-2007	4,153	3,524	84.8%

- Harvests in these remote Bering Sea areas have varied relatively widely against quota, averaging 86% over the longer term.
- We predict that future catches will be 86% of quota.

5.3. Conclusion

- Using the historical rate at which the individual area fisheries convert quota into harvest, we predict future catches with the following adjustments:

Area	Predicted % of Quota
2A	100%
2B	100%
2C	98%
3A	100%
3B	100%
4A	100%
4B	91%
4CDE	86%

6. CURRENT PLAN (2008)

6.1. Commercial quotas

- In mid-January the IPHC announced the following recommended catch levels for the 2008 fishery, in '000s of H&G pounds¹²:

Area	Total 2008 Quota
2A	1,220
2B	9,000
2C	6,210
3A	24,220
3B	10,900
4A	3,100
4B	1,860
4CDE	3,890
Total	60,400

- Note that these figures include sport catch allocations with the commercial allocation.

6.2. Projected catch^{10,12,13}

- We project the 2008 commercial halibut catch will be:

PROJECTIONS FOR COMMERCIAL HALIBUT FISHERIES, 2007-2008					
all figures in '000s of H&G pounds					
Area	Catch/quota factor	2007		2008	
		Quota	Catch	Quota	Proj. catch
2A	1.00	799	762	679	679
2B	1.00	10,089	9,694	7,619	7,619
2C	0.98	8,510	8,343	6,210	6,086
3A	1.00	26,200	25,957	24,220	24,220
3B	1.00	9,220	9,217	10,900	10,900
4A	1.00	2,890	2,775	3,100	3,100
4B	0.91	1,440	1,376	1,860	1,693
4CDE	0.86	4,101	3,833	3,891	3,346
Total		63,249	61,957	58,479	57,643

- These 2008 projections show a 7% decrease from the 2007 harvest, almost identical to the total quota cut announced by the IPHC.

- Quota left in the water occurs mainly in the more distant northwestern fisheries: the western Aleutian Islands and the Bering Sea.

7. FUTURE PLANS (2009, 2010)

- Since the IPHC only develops its harvest plans one year at a time, it has not yet published its projected quotas for the 2009 season.
- We will therefore predict 2009 and 2010 catches using visible trends from CEY and historical harvest data.

7.1. Historical harvests

- As quoted earlier in the report, here are the harvests from 1981-2007:

COMMERCIAL HALIBUT CATCH BY AREA, 1981-2007				
<i>all figures in '000s of H&G pounds</i>				
Year	WA,OR,CA	BC	AK	Total
	2A	2B	2C-4E	
1981	200	5,660	19,880	25,740
1982	210	5,540	23,250	29,000
1983	260	5,440	32,690	38,390
1984	430	9,050	35,490	44,970
1985	490	10,390	45,230	56,110
1986	580	11,220	57,820	69,620
1987	590	12,250	56,630	69,470
1988	490	12,860	60,990	74,340
1989	470	10,430	56,030	66,930
1990	320	8,570	52,690	61,580
1991	360	7,190	49,540	57,090
1992	437	7,626	51,829	59,892
1993	504	10,628	48,137	59,269
1994	370	9,911	44,449	54,730
1995	297	9,623	33,962	43,882
1996	296	9,545	37,501	47,342
1997	413	12,420	52,365	65,198
1998	460	13,172	56,126	69,758
1999	450	12,705	61,151	74,306
2000	482	10,811	57,012	68,305
2001	680	10,288	59,731	70,699
2002	851	12,074	61,735	74,660
2003	819	11,789	60,533	73,141
2004	877	12,086	59,078	72,041
2005	799	12,246	57,270	70,315
2006	811	11,720	54,124	66,655
2007	762	9,694	51,501	61,957
Average 1981-2007	508	10,183	49,509	60,200
Average 2000-2007	760	11,339	57,623	69,722

- I note two 14-15 year trends, each with relatively similar minimum and maximum values:

- a) From the minimum in 1981 (25 million lbs) to the peak in 1988 (74 million lbs) to the minimum in 1995-96 (44-47 million lbs).
- b) From the minimum in 1995-96 (44-47 million lbs) to the peak in 2002-03 (73-74 million lbs) to the present downward trend in harvests.
- A 14-15 year trend as described by (a) and (b) suggests 2009-2010 will represent the terminal valley of period (b) with harvests of 45-50 million lbs.

7.2. CEY estimates^{14,15,16,17,18}

- In its annual stock assessments the IPHC calculates the CEY of the halibut biomass, or the maximum volume that fishers can harvest sustainably.
- The IPHC often sets quotas below its CEY estimates to be conservative, but may sometimes set quotas equal or greater than the CEY estimates.
- The CEY biomass figures are based on an assumed harvest rate – for example 20% in 2003.
- Although the IPHC does change its CEY rates occasionally, I have taken previous rates as given, and have assumed that the current rate will continue for the period covered by this report.
- Here are the IPHC's CEY biomass estimates for 2003-2008:

TOTAL CEY BIOMASS ESTIMATES BY AREA, 2003-2008									
<i>all figures in '000s of H&G pounds</i>									
Year	2A	2B	2C	3A	3B	4A	4B	4CDE	Total
2003	1.29	11.32	9.11	34.22	29.19	11.22	7.76	10.82	114.93
2004	1.80	15.80	17.00	30.00	15.70	3.50	2.80	3.40	90.00
2005	1.56	13.10	14.90	32.90	12.60	4.50	2.30	7.20	89.06
2006	1.71	13.73	13.73	32.18	9.00	3.80	1.35	5.40	80.90
2007	0.93	6.75	8.25	35.20	17.20	5.80	2.85	6.15	83.13
2008	0.94	5.12	6.50	28.96	14.80	4.26	3.03	5.69	69.30

Note: Prior to 2006, IPHC used an area-specific model for estimates
From 2006 onward, IPHC used a coastwide model for estimates

- These figures illustrate that the halibut biomass has fallen since its recent high in 2002-2003.

7.3. Conclusions

- Given the following data:
 - Harvests have fallen from a recent high in 2002-2003.
 - CEY biomass has fallen from a recent high in 2002-2003.

- Using my “period (b)” assumption described earlier, the projected minimum in the identified 14-15 year trend cycle would occur in 2009-2010 from the previous low in 1995 and high in 2002.
- I therefore assume that we are currently seeing the end of period (b) in 2009 and 2010, to be followed by an increase in harvests in 2011 that will mark the beginning of a new cycle.
- Using values from the corresponding periods in earlier cycles, I estimate upcoming harvests will be:

PROJECTED COMMERCIAL HARVESTS 2008-2010		
<i>all figures in '000s of H&G pounds</i>		
Year	Estimated quota	Implied catch
2008	58,479	57,643
<i>Average efficiency 1992-2007</i>		98.2%
2009	54,385	53,423
2010	50,578	49,684

- Note that this is an estimated commercial quota, which does not include sport allocations in areas 2A and 2B.
- Note also that I have estimated quotas and then multiplied them by the average rate at which the fishery has converted its quota into harvests over the last 15 years (98%).
- I expect the 2008 halibut harvest to continue the recent downward trend with a harvest of 58 million pounds.
- Our model projects the current 14-15 harvest cycle will reach its minimum of 50 million pounds in 2010, after which it will begin to rise again in 2011.

8. APPENDIX

8.1. Acronyms

AK	Alaska, USA
BC	British Columbia, Canada
CA	California, USA
CEY	Constant Exploitation Yield
CPUE	Catch per Unit of Effort
DFO	Department of Fisheries and Oceans
GOA	Gulf of Alaska
H&G	headed and gutted
IFQ	Individual Fishing Quota (US equivalent of IVQ)
IVQ	Individual Vessel Quota (Canadian equivalent of IFQ)
NMFS	National Marine Fisheries Service
OR	Oregon, USA
WA	Washington, USA

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- ¹ <http://fishbase.org/Summary/SpeciesSummary.php?id=514>
 - ² <http://www.iphc.washington.edu/halcom/commerc/tables/2005breakdown.htm>
 - ³ <http://www.iphc.washington.edu/halcom/history/treaty1923.htm>
 - ⁴ <http://www.iphc.washington.edu/HALCOM/pubs/pamphlet/1IPHCHistoryPage.pdf>
 - ⁵ <http://www.iphc.washington.edu/halcom/research/sa/papers/sa07.pdf>
 - ⁶ IPHC staff. (2007, January). 2007 Regulation and Catch Limit Proposals, *Discussion of IPHC management options for the 2007 sport charter fishery in Alaska*. Section 11.1.2.
 - ⁷ 1992-2003: <http://www.iphc.washington.edu/halcom/commerc/catchbyreg.htm>
 - ⁸ 2004: <http://www.iphc.washington.edu/halcom/pubs/annmeet/2005/bluebook/Bluebook2005.pdf>
 - ⁹ 2005: <http://www.iphc.washington.edu/halcom/pubs/annmeet/2006/bluebook/2006BBfinal.pdf>
 - ¹⁰ 2006: <http://www.iphc.washington.edu/halcom/pubs/annmeet/2007/bluebook/iphcbb07.pdf>
 - ¹¹ 2007: <http://www.iphc.washington.edu/HALCOM/pubs/annmeet/2008/bluebook/bluebook08.pdf>
 - ¹² <http://www.iphc.washington.edu/HALCOM/newsrel/2008/nr20080122.htm>
 - ¹³ <http://www.iphc.washington.edu/halcom/newsrel/2007/nr20070123.htm>
 - ¹⁴ 2008: <http://www.iphc.washington.edu/halcom/research/sa/papers/sa07.pdf>
 - ¹⁵ 2006-2007: <http://www.iphc.washington.edu/halcom/research/sa/papers/sa06.pdf>
 - ¹⁶ 2005: <http://www.iphc.washington.edu/halcom/research/sa/papers/sa05.pdf>
 - ¹⁷ 2004: <http://www.iphc.washington.edu/halcom/research/sa/papers/sa04.pdf>
 - ¹⁸ 2003: <http://www.iphc.washington.edu/halcom/research/sa/papers/sa03.pdf>