Agenda Item: "B-3"

ALASKA DEPARTMENT OF FISH AND GAME

REPORT TO THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

December 2009

Fisheries managed by the State of Alaska since the last council report include those for salmon, scallops, crab and groundfish.

Salmon Troll Fishery (FIGURE 1)

The Southeast Alaska winter troll chinook salmon season opened October 11, 2009. It will remain open through April 30, 2010, or until 45,000 treaty chinook salmon are harvested. The fishery is confined to the waters east of the winter boundary line (surf line) and includes the waters of Yakutat Bay. Latest catch estimates put the harvest at approximately 6,000 fish.

Scallops (FIGURE 2)

Weathervane scallop fisheries in Yakutat, Prince William Sound, Kodiak, Dutch Harbor, and the Bering Sea registration areas opened on July 1, 2009. The Kamishak District of Cook Inlet opened on August 15, 2009. The state has delegated authority over the management of scallops under the existing Fishery Management Plan (FMP). Guideline Harvest Levels (GHL) were established as follows:

Registration Area	Guideline Harvest Level (pounds of shucked meat)	Bycatch Limits (number of crab)		
		Tanner Crab		King Crab
Yakutat				
Area D	**160,000**	**NA**		**NA**
District 16	**25,000**	**NA**		**NA**
Prince William Sound	**20,000**	**11,400**		**NA**
Cook Inlet	**14,000**	**98,000**		**60**
Kodiak				
Northeast District	**75,000**	**217,000**		**7**
Shelikof District	**170,000**	**25,000**		**96**
Southwest District[1]	**25,000**	**12,000**		**50**
Semidi District		***Exploratory Area (by Commissioner's Permit)***		
Alaska Peninsula		***Closed for 2009/2010 season***		
Dutch Harbor	**10,000**	**10,000**		**10**
Bering Sea	**50,000**	**260,000**	***C. bairdi***	**500**
		300,000	***C. opilio and hybrids***	
[1] **Commissioner's Permit required**				

The southern portion of the Shelikof District closed to commercial fishing on August 10, 2009 when the GHL was attained. The fishing season for weathervane scallops in that portion of Registration Area E (Prince William Sound) located between 147° 00' W long. and the longitude of the Cape Saint Elias lighthouse 144° 35.9' W long., and north of Kayak Island closed to commercial scallop fishing at 12:00 noon September 26, 2009 when it was anticipated that the GHL would be realized. Further information is available on the department's website at: http://www.cf.adfg.state.ak.us/geninfo/shellfsh/scallops/scallophome.php

Aleutian Islands Golden King Crab (FIGURE 3)

The 2009/10 Area O (Aleutian Islands) commercial golden king crab fishery opened August 15, 2009. The total allowable catch (TAC) is 5.985 million pounds. The TAC is apportioned east and west of 174° W longitude. The Eastern IFQ TAC is 2.835 million pounds. Catch to date in this fishery is confidential given the number of buyers.

The Western TAC is 2.835 million pounds, with the IFQ harvest set at 2.55 million pounds. Catch for this fishery is confidential given the number of participants. The golden king crab fishery in the Aleutian Islands remains open through May 15, 2010.

Bristol Bay Red King Crab (FIGURE 4)

The 2009/10 Bristol Bay red king crab fishery opened on October 15, 2009 and will remain open through January 15, 2010. The IFQ TAC for this fishery is 14.4 million pounds. To date, approximately 14.2 million pounds (99 percent) has been harvested.

St. Matthew Island Blue King Crab (FIGURE 5)

The St. Matthew Island blue king crab fishery re-opened on October 15, 2009 for the first time in over 10 years with an IFQ TAC of 1,050,300 pounds. Currently, eight vessels are registered to participate and all catch is being delivered to one processor so harvest information remains confidential. The season remains open through February 1, 2010.

Bering Sea Snow Crab (FIGURE 6)

The 2009/10 snow crab IFQ TAC is approximately 43.2 million pounds. The 2009/10 Bering Sea snow crab fishery opened on October 15, 2009 and will remain open through May 15, 2010 in the Eastern Subdistrict and through May 31, 2010 in the Western Subdistrict.

Bering Sea Tanner Crab (FIGURE 7)

The season for *C. bairdi* open on October 15, 2009 and will close on March 31, 2010. The Bering Sea District Tanner crab stock is managed east and west of 166° W longitude, with a separate TAC for each area. The Eastern IFQ TAC is 1.215 million pounds. The Tanner crab fishery west of 166° was closed due to concerns over high bycatch of sublegal males and associated mortality in the snow crab fishery. To date, there have been about 826,136 pounds (68 percent) taken in the Eastern District.

Central Region Pacific Cod (FIGURE 8 & 9)

Prince William Sound

The Prince William Sound state managed Pacific cod season opened on February 3, 2009, which was seven days after the close of the federal fishery. The GHL is 487,746 pounds, which is 10 percent of the federal Eastern Gulf ABC. New regulations allow the use of longline gear, which opened on March 14, 2009. The fishery closed on March 27, 2009 and total harvest by 19 longline vessels was 704,866 pounds. Since the GHL was reached this year, the GHL will be increased next year to 15 percent of the estimated total allowable harvest of Pacific cod for the federal Eastern Gulf of Alaska Area.

Cook Inlet

The Cook Inlet state managed Pacific cod season opened on January 28, 2009, 24 hours after the close of the federal fishery. The GHL is 2,606,393 pounds. That GHL is calculated as 3.75 percent

of the ABC for the federal Central Gulf of Alaska area. The state waters season closed to pot vessels greater than 58 feet in overall length at 6:00 AM on March 18, 2009 due to attainment of the harvest cap set by regulation for that gear segment. The season closed to other vessels fishing pot gear at noon on March 18, 2009 and then remained open to jig gear until noon September 1 when the parallel season reopened. Consistent with the Cook Inlet Pacific Cod Management Plan, the parallel season for Pacific cod closed at noon October 1 and the state waters season for Pacific cod reopened. The remaining GHL of 305,626 lbs is unallocated among gear types.

Westward Region Pacific Cod (FIGURE 10)

Kodiak Pacific Cod (FIGURE 11)

The Kodiak Area state-waters Pacific cod season opened on February 3, 2009, which was seven days after the close of the federal fishery. The 2009 state-waters guideline harvest level (GHL) is 8.69 million pounds. The GHL is allocated 50 percent to mechanical jig and hand troll gears and 50 percent to pot gear, or 4.345 million pounds each.

The Kodiak Area state-waters Pacific cod fishery closed for all vessels using pot gear on Wednesday, February 18, 2009 with a final harvest of 4.14 million pounds, from 39 vessels. One hundred and seven jig vessels landed about 4.34 million pounds by the end of August. The state-waters Pacific cod season closed on September 1, 2009, and the fishery operated under parallel rules.

The state-waters Pacific cod season in the Kodiak Management area reopened to jig gear at 12:01 p.m. October 3, 2009. The remaining portion of the 2009 state-waters GHL was 200,217 pounds. This GHL was insufficient to allow an orderly fishery for vessels using pot gear. Therefore, the remaining GHL is available for jig gear only. To date there is still 135,000 pounds remaining and six vessels are still actively fishing. Overall, approximately 98% of the state GHL has been harvested

Chignik Pacific Cod (FIGURE 12)

The state waters Pacific cod fishery in Chignik opened by regulation on March 1. The GHL is 6.08 million pounds, with pot vessels targeting 90 percent of that amount (5.47 million pounds). The pot cod fishery closed on April 8 after 13 vessels harvested approximately 5.68 million pounds. There was no jig effort this season. The Chignik Area state-waters Pacific cod fishery management plan allows Pacific cod remaining on the 2009 jig-gear guideline harvest level (GHL) to be taken on or after August 15 by either pot or jig gear.

The state-waters season reopened to pot and jig gear on October 3, 2009 and as of November 13 there has been no effort for Pacific cod in the area. Effective November 14, pot and jig gear limits and vessel size limits were removed as per the management plan until the GHL is achieved or until

the fishery closes on December 31, 2009. A total of 395,000 pounds of the state GHL remains and overall approximately 93% of the total GHL has been harvested.

South Alaska Peninsula Pacific Cod (FIGURE 13)

The Pacific cod fishery for the South Alaska Peninsula opened March 4, 2009, which was seven days after the close of the federal fishery. The GHL is approximately 11.89 million pounds, with 85 percent targeted by pot gear (10.10 million pounds). There were 49 vessels fishing with pot gear, and the fishery closed April 4 after a harvest of about 10.44 million pounds. Twenty-seven vessels using jig gear had harvested about 0.98 million pounds by the end of August. As was the case in Kodiak and Chignik, the department closed state waters and reopened under parallel fishery rules on September 1.

The state-waters season reopened on November 24, 2009 with a remaining GHL of 294,801 pounds. Overall, approximately 97% of the state GHL has been harvested.

Aleutian Islands Pacific Cod

The 2008 state-waters Pacific cod guideline harvest level (GHL) for the Aleutian Islands west of 170° W Longitude was 12.04 million pounds. The GHL was based on 3 percent of the federal BSAI Pacific cod Allowable Biological Cap (ABC) of 176,000 metric tons. The GHL was apportioned so that a maximum of 70 percent (8.43 million pounds) was available prior to June 10 (A-season), and 30 percent (3.61million pounds) with any rollover from the first season available beginning June 10 (B-season).

The A-season opened on March 25 and closed by regulation on April 1 with a total of 1.73 million pounds harvested by 19 vessels. The season re-opened on April 7 with 6.69 million pounds of the GHL remaining. The A-season closed by regulation on June 9, 2009 and immediately re-opened for the B season on June 10, 2009. Approximately 4.2 million pounds were rolled into the B-season, making the GHL about 7.81 million pounds. The B-season closed on August 31 by regulation with only seven vessels participating. Harvest information from the B-season is confidential as only one processor participated. The fleet attributed low effort in the fishery to low prices, somewhat poor fishing, and lack of delivery options. Vessels were restricted to 60 feet or less, which also limited effort. If the federal >60 C/V pot fishery closes we will re-open the fishery, however NMFS does not expect much participation in the >60 C/V pot fishery. It is no longer in regulation that the state will relinquish part of the unused GHL back to the federal fishery.

Southeast Groundfish (FIGURE 14)

The Northern Southeast Inside (NSEI or Chatham Strait) longline fishery and Southern Southeast Inside (SSEI or Clarence Strait) pot fishery closed by regulation on November 15, 2009. Catch in

the SSEI fishery (both longline and pot) was 625,600 round pounds (98.7 percent) of the 634,000 pounds available annual harvest objective. Preliminary catch for the NSEI fishery is 1,071,200 (100 percent) pounds of the 1,071,000 pounds quota.

The directed lingcod fishery and lingcod bycatch in the salmon troll fishery closed by regulation on November 30. These fisheries will re-open on May 16.
Lingcod bycatch in the longline fisheries remains open in all areas of SE except for the Icy Bay Subdistrict.

Preliminary catch is estimated at about 450,000 pounds for the region. For 2009 lingcod catch information, please refer to:
http://www.cf.adfg.state.ak.us/region1/finfish/grndfish/lingcod/lcupdate.php

Pacific cod landings in the directed fishery have increased. Approximately 594,000 pounds have been harvested this year from directed and bycatch fisheries combined.

The directed fishery for demersal shelf rockfish opened on November 16, 2009, in the NSEI and the SSEI with an annual harvest guideline of 25 mt. in each area. There are no landings to date for the fall fishery. This fishery remains open until Dec. 31.
The 2010 winter directed DSR fishery will open on Jan. 5, 2010 in NSEI and SSEI. Plans for a DSR fishery in the SE Outside District will be announced following the IPHC meeting at the end of January. ADF&G cannot estimate DSR harvest in the 2010 halibut fishery until the 2010 halibut quotas are announced. It is anticipated that a SEO DSR opening is unlikely.

Subsistence Halibut (FIGURE 15)
The department's Division of Subsistence has been conducting a federally funded project to develop annual estimates of the number of individuals and their catch under the federally created subsistence halibut program. Results were collected through a voluntary mail-out survey of all holders of subsistence halibut registration certificates (SHARC). The project covered a six-year period from 2003 through 2008, utilizing consistent methods throughout the project. However, due to reduced funding, more limited outreach and follow-up interviewing occurred for 2008.

The Division's Technical Paper, Number 348, reports on their 2008 findings. Briefly, the response rate for 2008 was 63 percent, similar to prior years. There were approximately 5,300 fishermen with an estimated harvest of about 900,000 pounds, 20% below the previous five-year average. As in prior years, the largest portion occurred in Regulatory Area 2C (Southeast), followed by Area 3A (Southcentral).

Over the six years, the greatest changes in the study findings have occurred among tribal SHARC holders in Area 2C. Among this group, the number of SHARCs was down 32% in 2008 compared to the previous 5 year average, while there was a 16% decline in SHARCs for the fishery overall; among tribal SHARC holders in Area 2C, the estimated number of subsistence fishers was down 23% and the estimated harvest declined 35%.

Also over the 6 years, the average weight of a halibut harvested in the subsistence fishery has declined about 23%, from about 24 pounds net weight in 2003 to about 18 pounds in 2008.

Finally, through a grant from NFMS, the project will continue for another year, but continuation of harvest monitoring beyond 2009 is uncertain.

Alaska Board of Fisheries

The Alaska Board of Fisheries is scheduled to meet in Anchorage from February 2-6, 2010 and March 16-20, 2010. Their agenda includes several Pacific cod proposal, as well as others of possible interest.

The proposals that may be of interest to the Council can be found in the November 13, 2009 letter from Board of Fish Chairman Webster.

Figure 1a.	2010 Winter Troll Chinook Salmon Fishery Update						30-Nov
	Data for November 8-14 (week 46)						Catch through Week 46
Troll Year	Permits Fished	Landings	Number of Kings	Catch/ Landing	Average Price	Average Weight (lbs.)	
2010	70	90	727	8.1	$6.20	12.7	5,474
2009	48	62	404	6.5	$7.55	12.4	3,343
5-year ave	61	81	577	7.1	$6.63	12.6	6,919
2010	Week	Permits	Landings	Number	Pounds	Ave Price	Ave Wt.
	42	105	129	1,807	23,319	$5.65	13.0
	43	105	132	1,600	20,942	$5.60	13.2
	44	54	67	572	7,498	$5.64	13.2
	45	65	78	768	9,999	$5.79	13.1
	46	70	90	727	9,200	$6.20	12.7
	47	40	52	397	4,523	$6.99	11.5
	48	14	14	71	902	$7.07	12.9
Regional Totals:		180	562	5,942	76,383	$5.82	12.9

Note: Data is preliminary and based on fish tickets received.

Confidential data omitted

2010	Cumulative Catch and Effort by District and Percentage of Regional Catch						
	District	Permits	Landings	Kings	K/permit	K/landing	% Region
	113	66	237	1,918	29.1	8.1	32%
	110	36	84	1,727	48.0	20.6	29%
	183	26	107	1,076	41.4	10.1	18%
	101	14	23	282	20.1	12.3	5%
	103	7	24	245	35.0	10.2	4%
	108	13	26	148	11.4	5.7	2%
	102	5	6	119	23.8	19.8	2%
	114	10	16	108	10.8	6.8	2%
	106	8	16	93	11.6	5.8	2%
Regional Totals:		180	562	5,942	33.0	10.6	

Figure 1b.

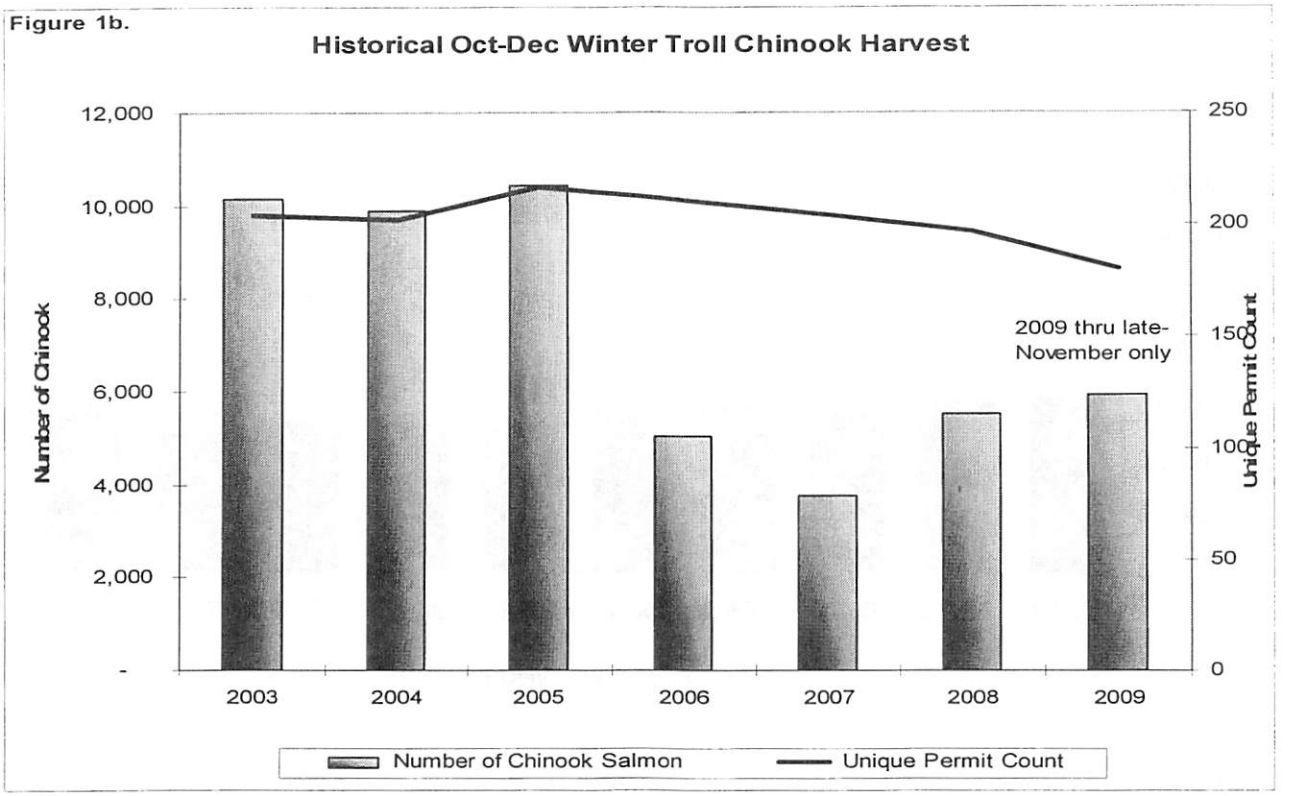


Figure 2.

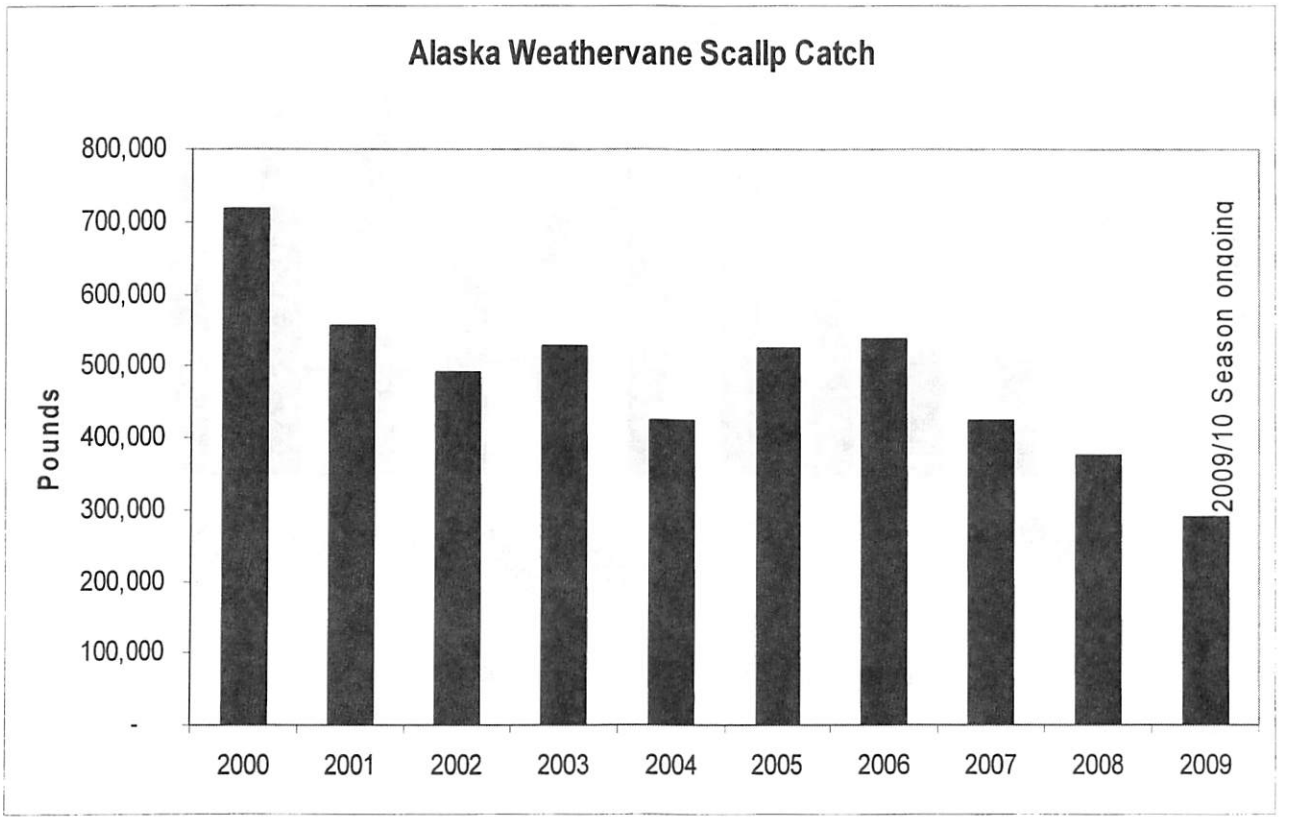


Figure 3.

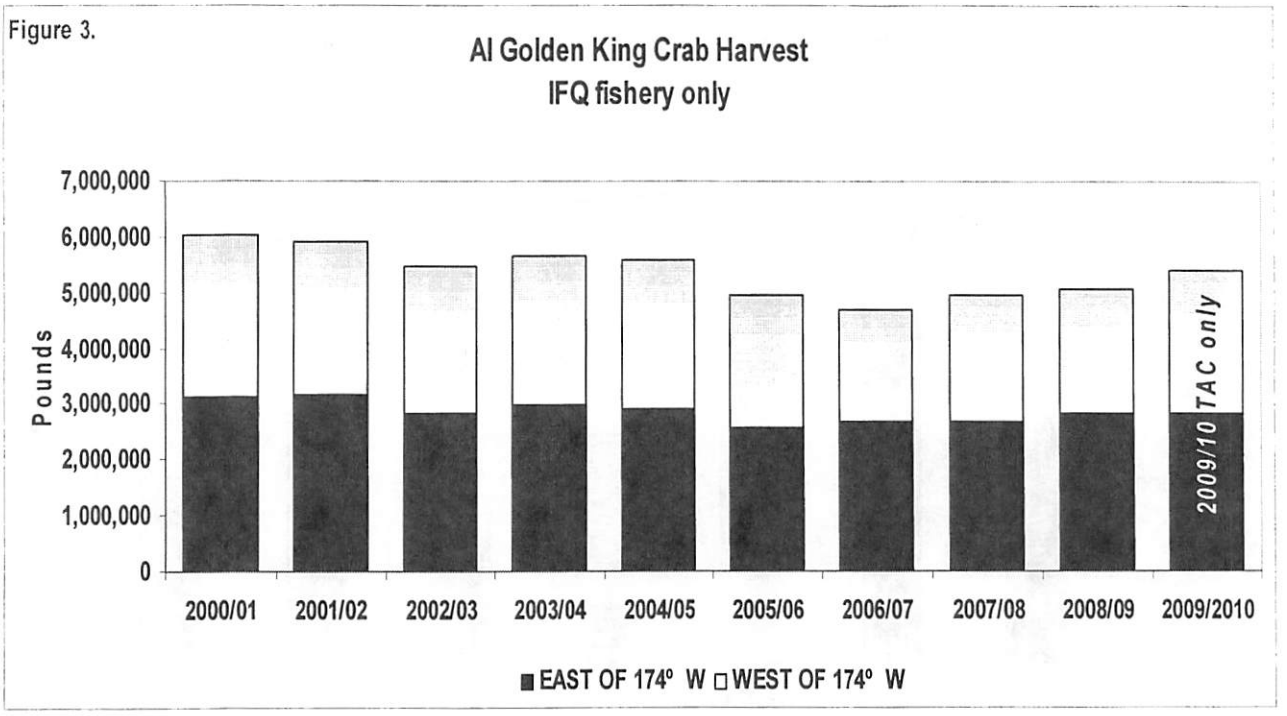


Figure 4.

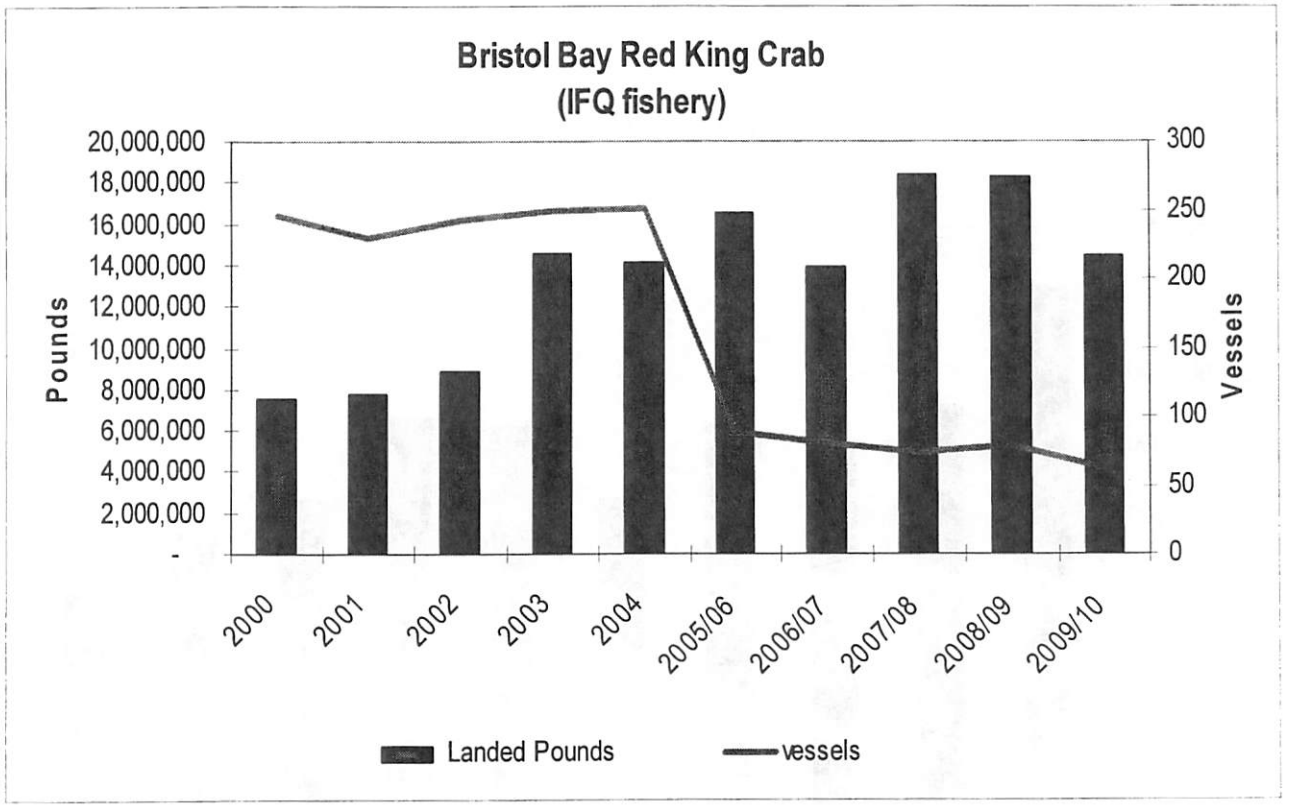


Figure 5.

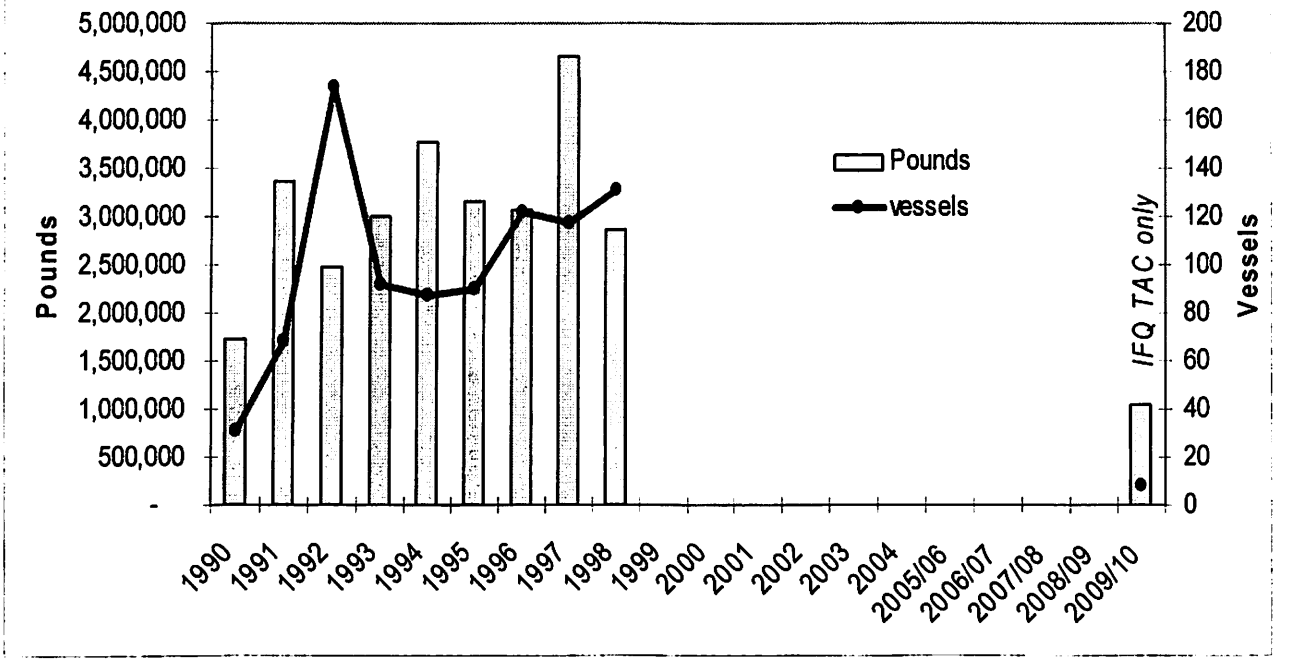


Figure 6.

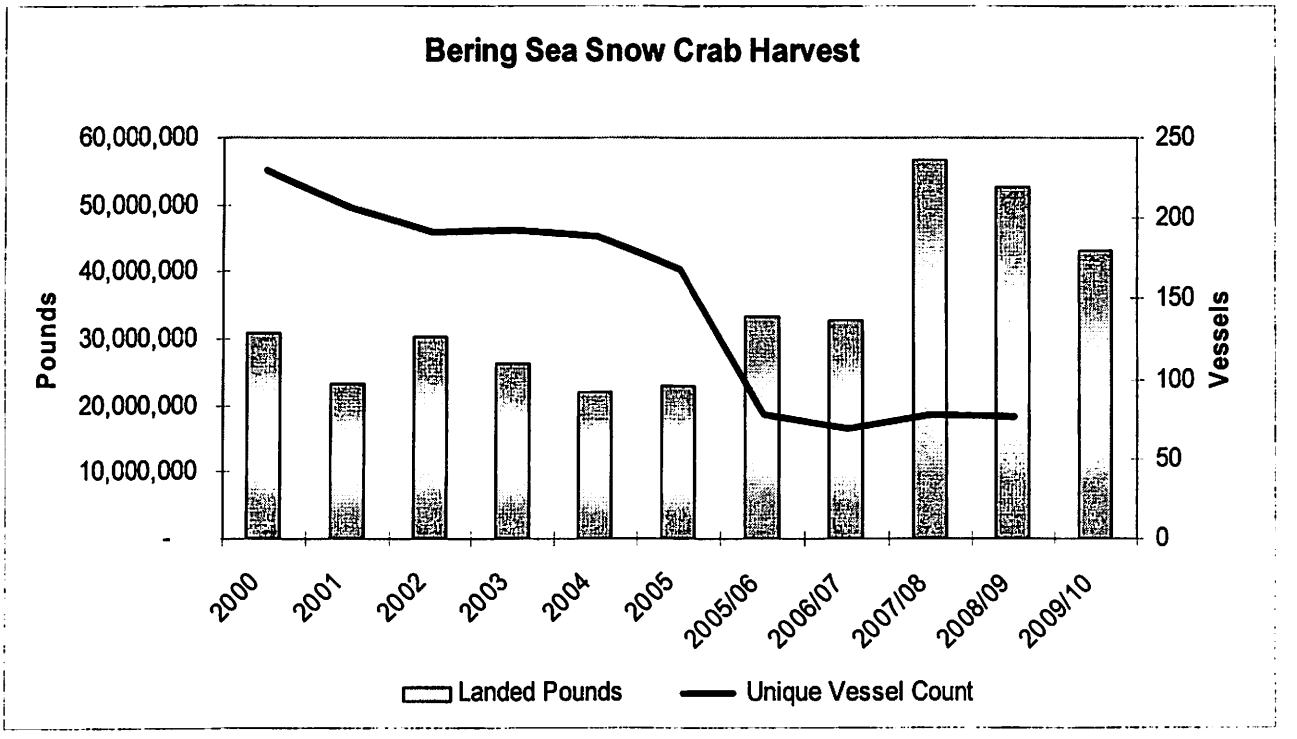


Figure 7.

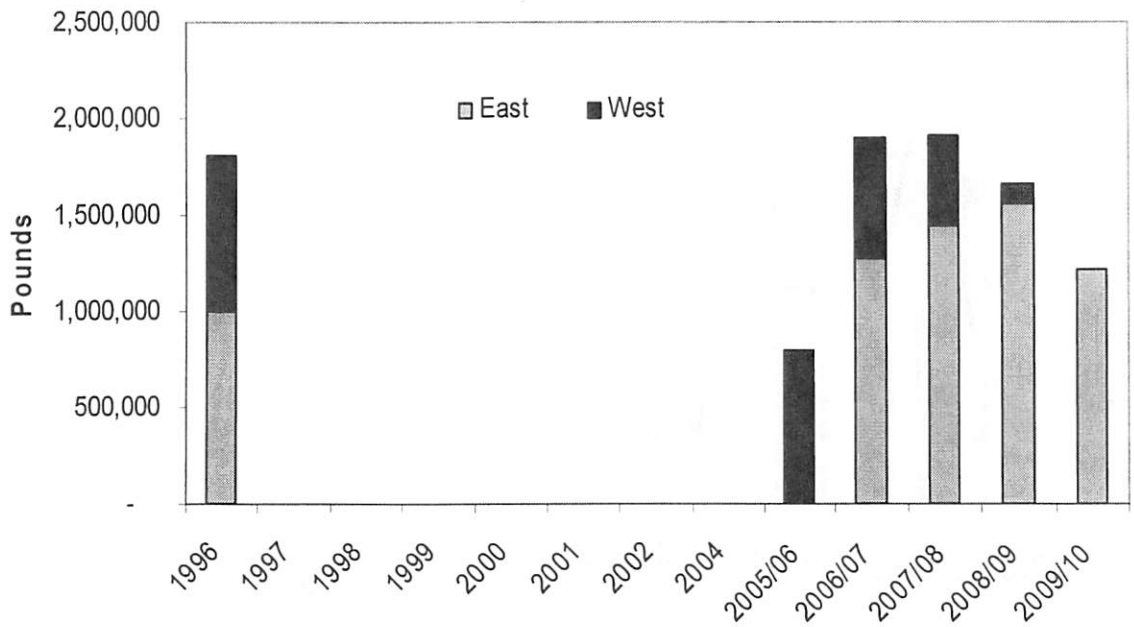

Bering Sea Tanner Crab Harvest
2,500,000
2,000,000
1,500,000
1,000,000
500,000
-
Pounds
East
West
1996
1997
1998
1999
2000
2001
2002
2004
2005/06
2006/07
2007/08
2008/09
2009/10

Figure 8. 2009 harvest guideline, effort, and catch reported for state water fisheries through Nov. 17.

This summary censored for *CONFIDENTIAL reports or records.

Pacific Cod — PARALLEL SEASON / BYCATCH - STATE WATERS

	Cook Inlet Management Area			Prince William Sound		
Gear	Vessels	Landings	Pounds	Vessels	Landings	Pounds
Hand troll	0	0	0	0	0	0
Jigs	0	0	0	0	0	0
Trawl	0	0	0	2	*	*
Longline	56	146	451,913	47	96	188,872
Pots	6	24	88,657	1	*	*
Totals	62	170	540,570	50	*	*
Status	Open			Open		
Federal seasons: Central Gulf	Directed Opened - Closed Jan 1 - noon Jan 27 noon Sept. 1 - noon Oct. 1			Directed Opened - Closed Jan 1 - noon Jan 27 noon Sept. 1 - noon Oct. 1		

Parallel season concurrent with federal waters of the Central Gulf of Alaska (CGOA).

Totals include Pacific Cod bycatch to other directed fisheries e.g. halibut & sablefish.

Pacific Cod — *STATE MANAGED - STATE WATERS

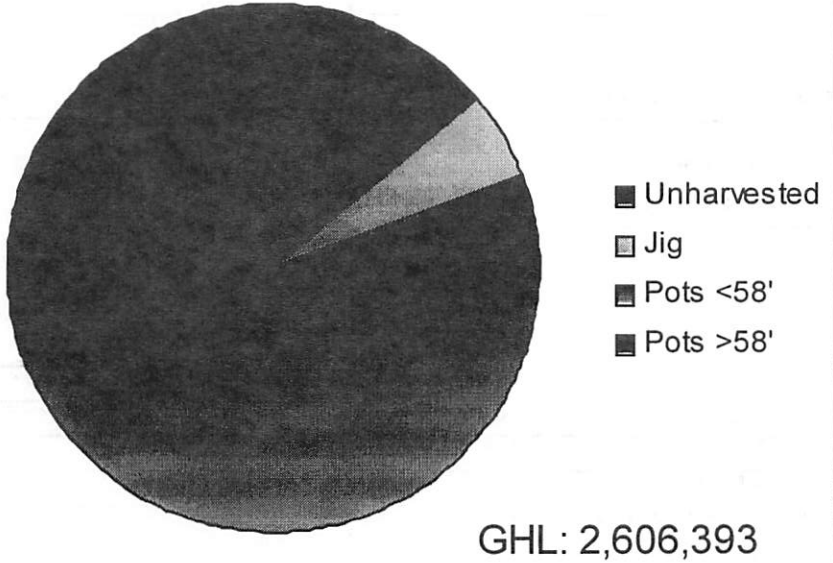
	*Cook Inlet Management Area			*Prince William Sound		
GHL (lb)	2,606,393			487,746		
Gear	Vessels	Landings	Pounds	Vessels	Landings	Pounds
Longline				19	37	704,866
Hand troll	0	0	0	0	0	0
Jigs	12	41	138,960	0	0	0
Pots < 58'	10	138	1,463,127	0	0	0
Pots > 58'	3	20	644,835	0	0	0
Totals	25	199	2,246,922	19	37	704,866
Jigs *Status	noon Jan 28 - Aug. 31 noon Oct. 1 - Open			12:00 noon Feb 3 - 12:00 noon March 27 Closed		
Pots <58', CI only *Status	noon Jan 28 - noon March 18 noon Oct. 1 - Open			12:00 noon Feb 3 - 12:00 noon March 27		
Pots >58', CI only *Status	noon Jan 28 - 6 a.m. March 18 Closed			Closed		
[a]Longline (PWS Only) *Status				12:01 AM March 14 - 12:00 noon March 27 Closed		

*The state managed fishery for Pacific cod opens by emergency order to pot and jig gear under exclusive area registration 24 hours after the initial Federal closure in Cook Inlet and 7 days in PWS.

Includes only directed fishery harvest.

[a]New regulations allowing longline gear for directed state waters Pacific cod in PWS became effective March 14.

Cook Inlet Pacific cod harvest



GHL: 2,606,393

Prince William Sound

Open to jig, hand troll, and pots Feb. 3
Open to longline March 14
Fishery closed March 27, 144% of the quota was harvested by 19 longline vessels.
By regulation the GHL will increase to 15% of the estimated total allowable harvest of Pacific cod for the federal Eastern Gulf of Alaska Area

2009 STATE MANAGED GROUNDFISH
PRELIMINARY PACIFIC COD HARVEST BY FISHERY WEEK

UPDATED: 12/2/2009

	KODIAK			CHIGNIK			SOUTH ALASKA PENINSULA		
Vessels Registered	Total	Pot	Jig	Total	Pot	Jig	Total	Pot	Jig
	146	39	107	13	13	0	76	49	27
2009 GHL	8.69 Million Pounds			6.08 Million Pounds			11.89 Million Pounds		
ALLOCATIONS:	50% Jigs, 50% Pots Pots >58' restricted to 25% of total GHL before Sept. 1 Jigs = 4.345 million, Pots = 4.345 million, >58' pots 2.172 before Sept.1			90% Pots, 10% Jigs Pots = 5.47 million Jigs = .61 million			85% Pots, 15% Jigs Pots = 10.11 million Jigs = 1.78 million		

DATES:	KODIAK Pots Landings	KODIAK Pots Catch	KODIAK Jigs Landings	KODIAK Jigs Catch	CHIGNIK Pots Landings	CHIGNIK Pots Catch	CHIGNIK Jigs Landings	CHIGNIK Jigs Catch	SOUTH ALASKA PENINSULA Pots Landings	SOUTH ALASKA PENINSULA Pots Catch	SOUTH ALASKA PENINSULA Jigs Landings	SOUTH ALASKA PENINSULA Jigs Catch
	Fishery opens 2/03/09				Fishery Opens 3/1/09				Fishery Opens 3/4/09			
2/3-7/09	25	687,872	15	31,265	-	-	-	-	-	-	-	-
2/8-14/09	67	2,135,668	27	45,804	-	-	-	-	-	-	-	-
2/15-21/09	46	1,317,513	29	55,050	-	-	-	-	-	-	-	-
2/22-28/09	Closed 2/18/09		35	102,472	-	-	-	-	-	-	-	-
3/1-3/7/09	-	-	50	127,050	17	926,008	-	-	25	607,248	-	-
3/8-14/09	-	-	38	159,931	15	804,873	-	-	71	2,119,561	-	-
3/15-21/09	-	-	20	59,242	9	232,954	-	-	38	1,310,969	-	-
3/22-28/09	-	-	19	52,963	33	1,372,700	-	-	94	3,035,852	-	-
3/29-4/4/09	-	-	29	149,782	20	1,150,064	-	-	98	3,171,292	-	-
4/5-11/09	-	-	47	319,879	30	1,193,079	-	-	6	200,044	-	-
4/12-18/09	-	-	28	140,085	Closed 4/8/09		-	-	Closed 4/4/09		-	-
4/19-25/09	-	-	61	442,960	-	-	-	-	-	-	5	24,053
4/26-5/2/09	-	-	35	150,149	-	-	-	-	-	-	3	9,764
5/3-9/09	-	-	72	579,058	-	-	-	-	-	-	17	110,508
5/10-16/09	-	-	77	537,104	-	-	-	-	-	-	26	195,057
5/17-23/09	-	-	63	390,260	-	-	-	-	-	-	22	127,930
5/24-30/09	-	-	35	221,440	-	-	-	-	-	-	17	91,603
5/31-6/6/09	-	-	17	74,885	-	-	-	-	-	-	6	21,516
6/7-13/09	-	-	30	224,278	-	-	-	-	-	-	12	79,519
6/14-20/09	-	-	26	204,549	-	-	-	-	-	-	11	76,340
6/21-27/09	-	-	28	162,288	-	-	-	-	-	-	8	58,128
6/28-7/4/09	-	-	16	42,476	-	-	-	-	-	-	6	28,580
7/5-11/09	-	-	7	30,541	-	-	-	-	-	-	5	29,850
7/12-18/09	-	-		Confidential	-	-	-	-	-	-	-	Confidential
7/19-25/09	-	-		Confidential	-	-	-	-	-	-	3	8,881
7/26-8/1/09	-	-		Confidential	-	-	-	-	-	-	7	35,427
8/2-8/09	-	-	3	12,333	-	-	-	-	-	-	5	17,882
8/9-15/09	-	-		Confidential	Jig Allo Roll Open 8/15/09		-	-	-	-	12	35,488
8/16-22/09	-	-	-	-	-	Confidential	-	-	-	-	9	26,689
8/23-29/09	-	-		Confidential	-	-	-	-	-	-		Confidential
8/30-9/5/09	-	-	-	-	-	-	-	-	-	-	5	94,737
9/6-12/09	-	-	Closed 9/1/09		Closed 9/1/09		Closed 9/1/09		-	-	Closed 9/1/09	
9/13-19/09	-	-	-	-	-	-	-	-	-	-	-	-
9/20-26/09	-	-	-	-	-	-	-	-	-	-	-	-
9/27-10/3/09	-	-	Reopen 10/3/09		Reopen 10/3/09		Reopen 10/3/09		-	-	-	-
10/4-10/09	-	-	3	3,669	-	-	-	-	-	-	-	-
10/11-17/09	-	-	4	22,938	-	-	-	-	-	-	-	-
10/18-24/09	-	-	5	17,782	-	-	-	-	-	-	-	-
10/25-31/09	-	-	-	Confidential	-	-	-	-	-	-	-	-
11/1-7/09	-	-	4	21,405	-	-	-	-	-	-	-	-
11/8-14/09	-	-	3	12,327	Gear Lmts Rmvd 11/14/09		Gear Lmts Rmvd 11/14/09		-	-	-	-
11/15-21/09	-	-	-	-	-	-	-	-	-	-	-	-
11/22-28/09	-	-	-	Confidential	-	-	-	-	-	-	Reopen 11/24/09	
11/29-12/5/09	-	-	-	-	-	-	-	-	-	-	-	-
ACCUMULATIVE	138	4,141,053	826	4,442,251 [1]	124	5,679,678	0	0	332	10,444,966	179	1,088,724 [1]
CATCH	(Total combined)		8,583,304		(Total combined)		5,679,678		(Total combined)		11,533,690	

[1] Includes Confidential Harvest Data

Figure 11.

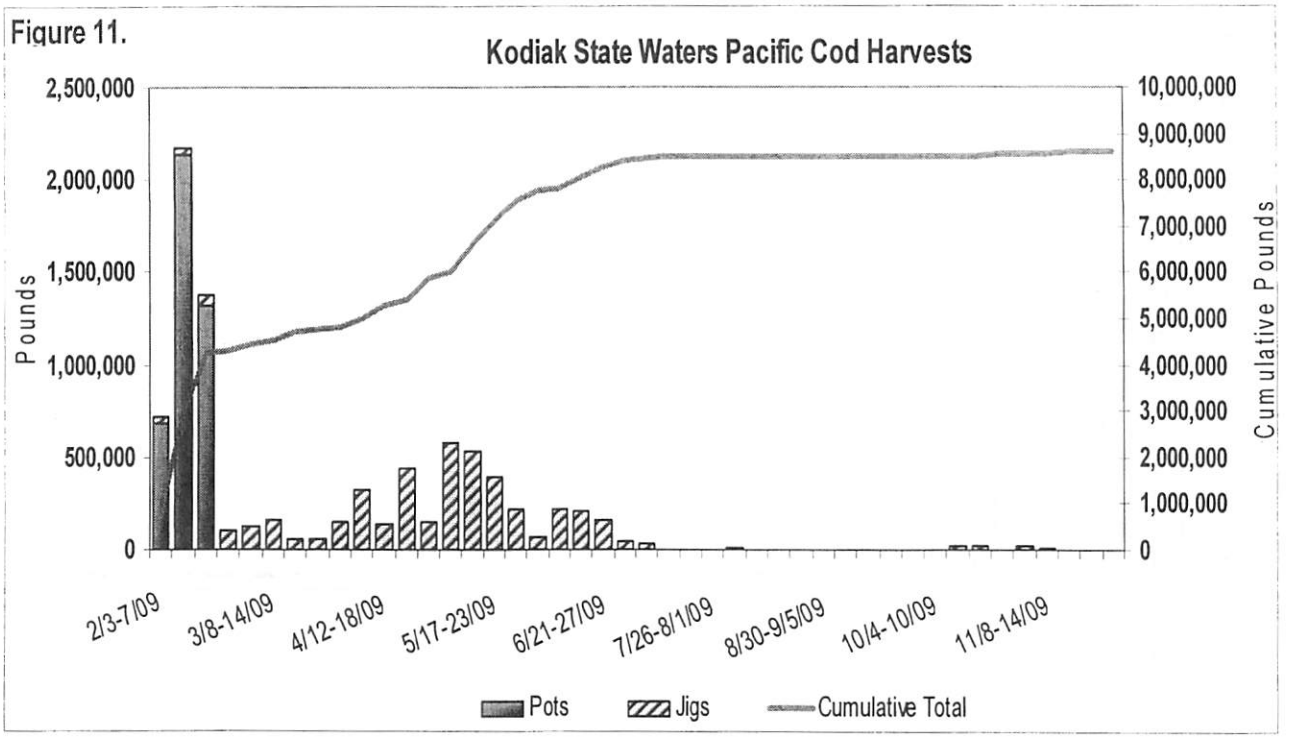


Figure 12.

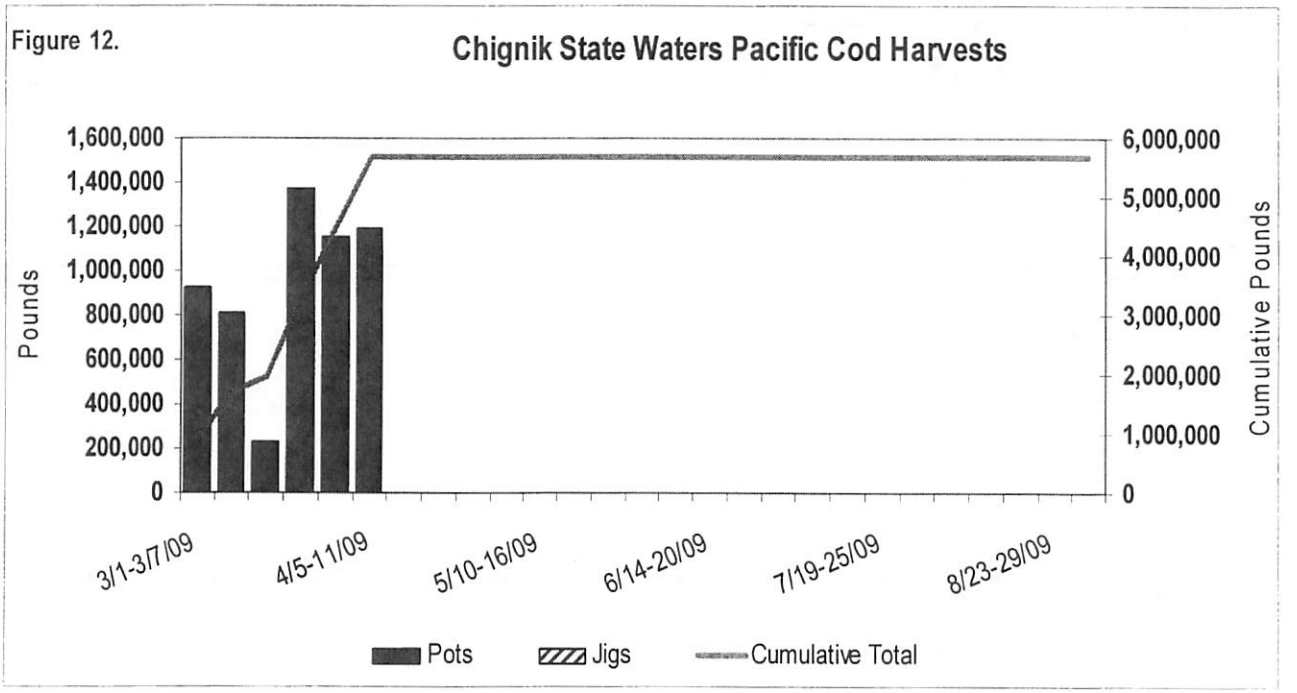


Figure 13.

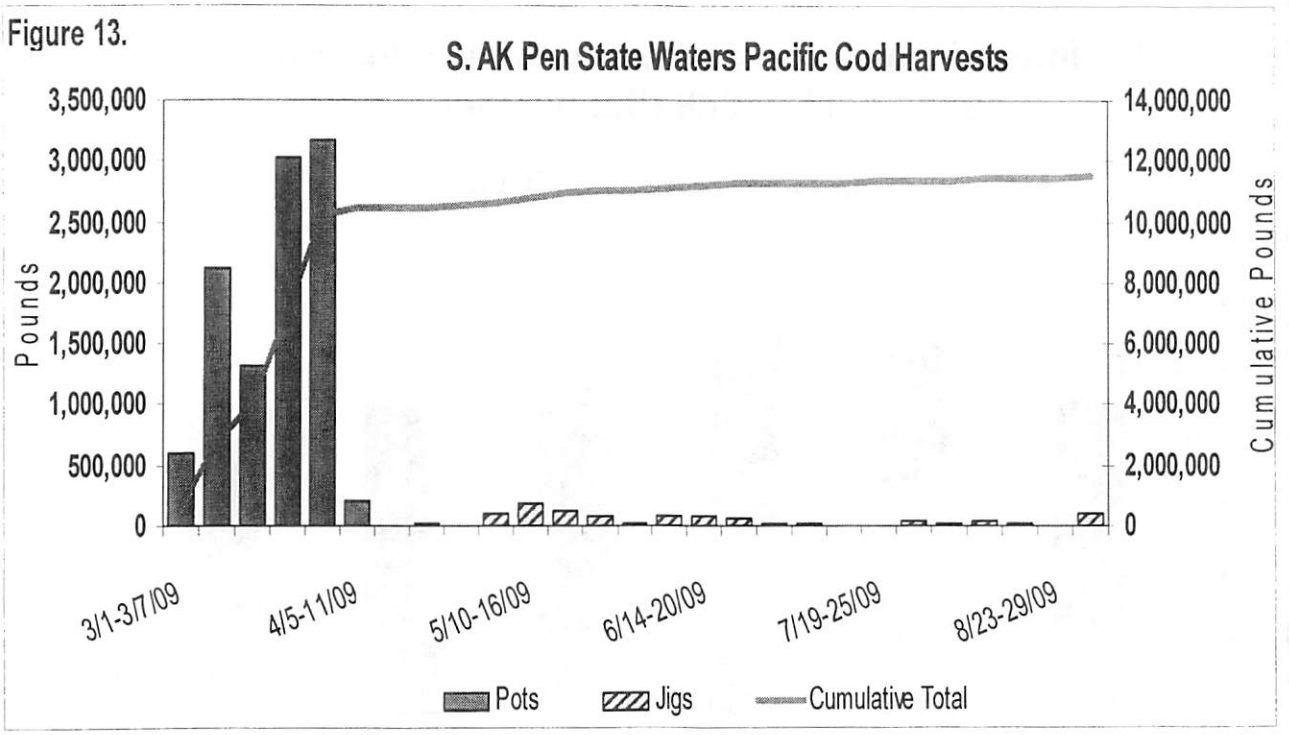
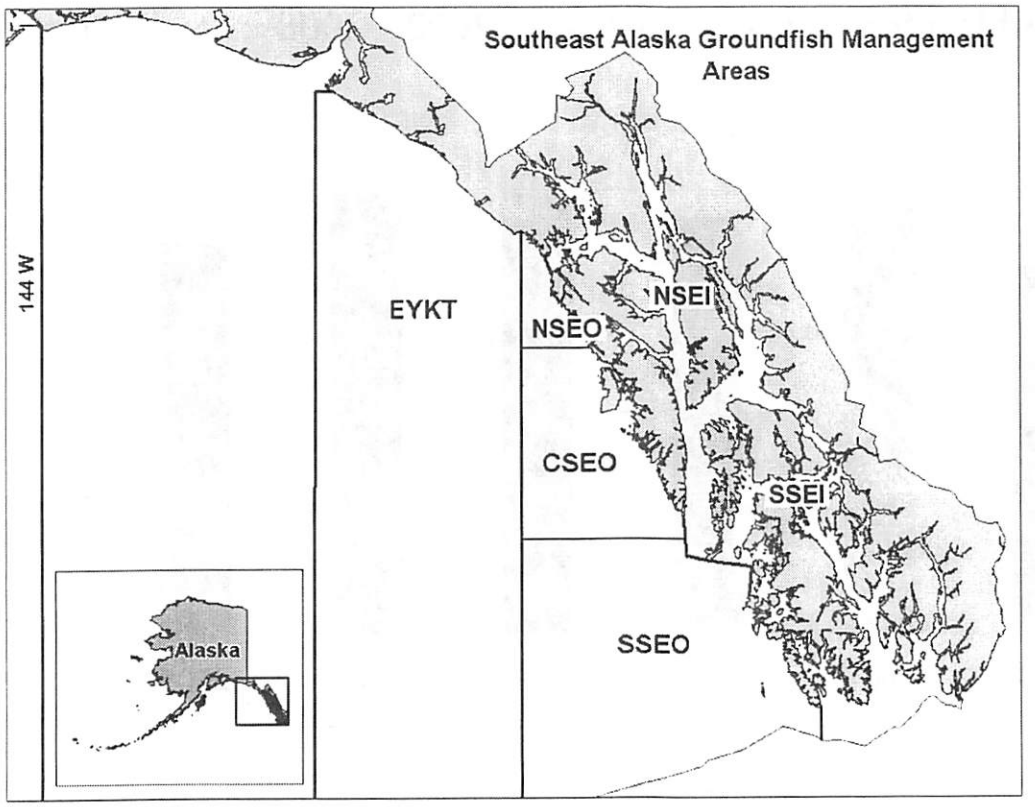
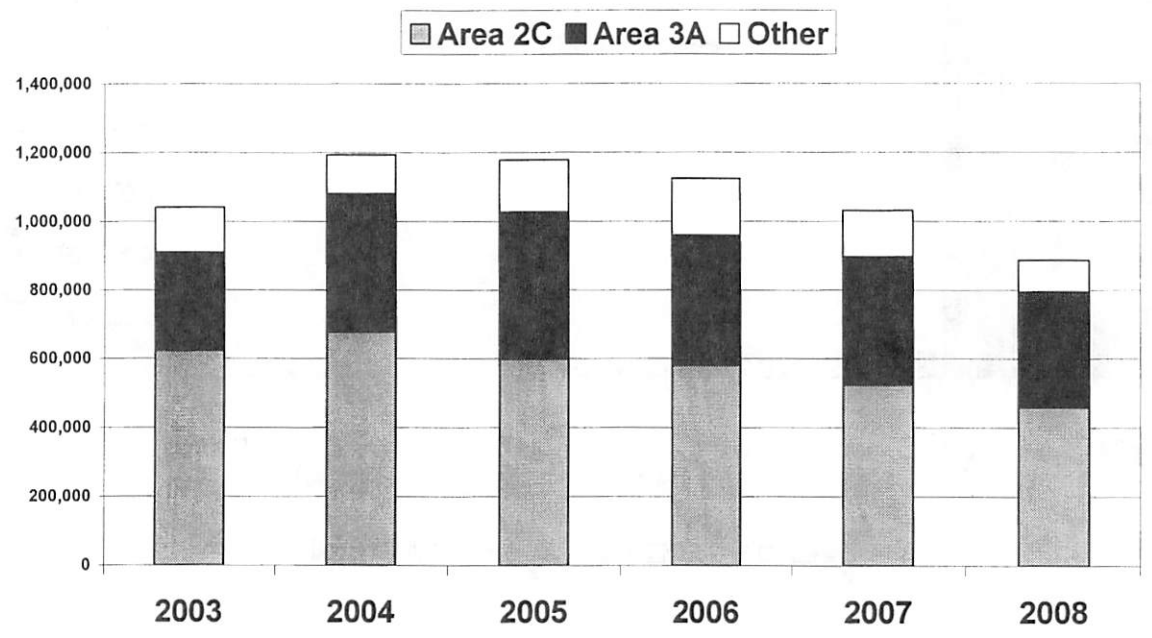


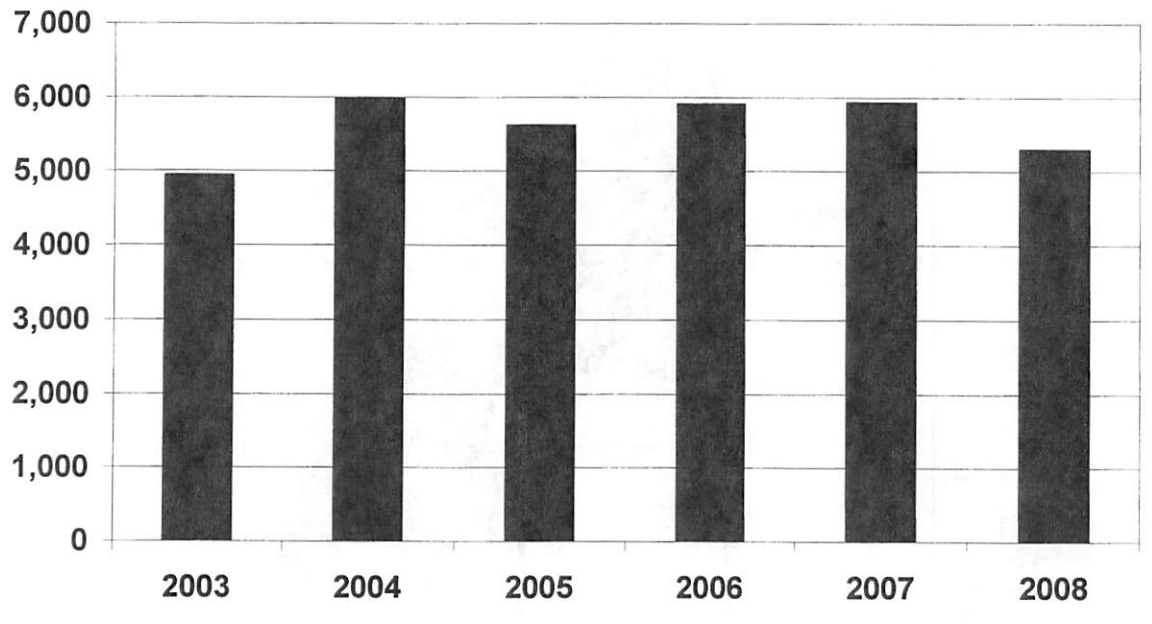
Figure 14.



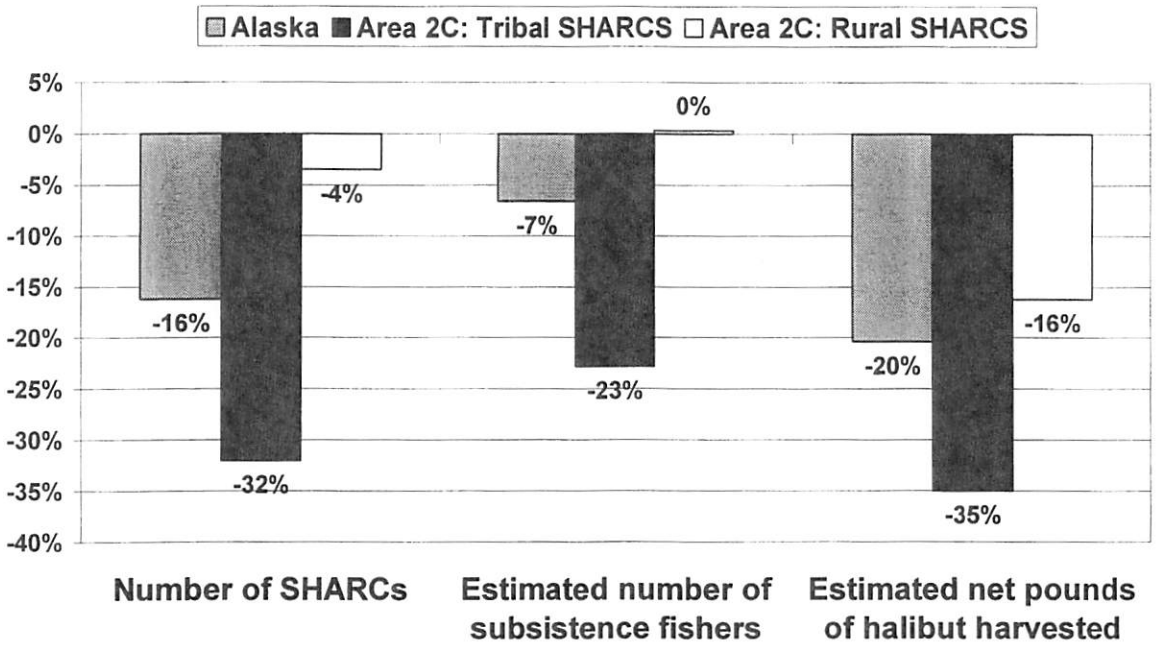
Estimated Subsistence Harvests of Halibut in Alaska, 2003 - 2008 (lbs net weight)



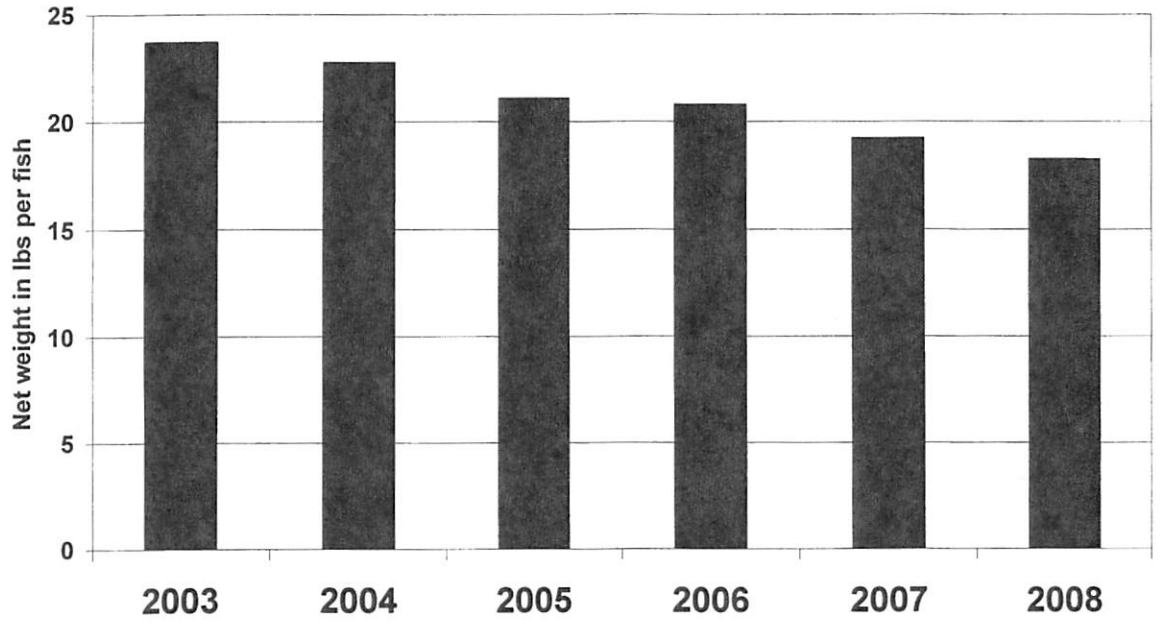
Estimated Number of Individuals Subsistence Fishing for Halibut in Alaska, 2003 - 2008



Alaska Subsistence Halibut Fishery: Changes in 2008 compared to previous 5-year averages



Average net weight of halibut (lbs per fish) in the Alaska subsistence fishery, 2003 - 2008



Area 2C Final 2008 Harvest Estimates Based on the Statewide Harvest Survey

User	Port	MeanWt	No. Fish	Yield (lb)
CHARTER	Ketchikan	18.9	8,309	156,970
	POW Island	9.2	29,412	269,407
	PBG/WRG	22.5	7,232	162,755
	Sitka	16.1	31,641	510,708
	Juneau	11.6	8,517	98,690
	Haines/SKG	11.6	242	2,804
	Glacier Bay	45.3	17,612	797,801
	Area 2C	19.4	102,965	**1,999,135**
PRIVATE	Ketchikan	14.9	11,251	167,235
	POW Island	11.6	11,520	134,182
	PBG/WRG	21.9	12,047	263,871
	Sitka	17.2	6,118	105,384
	Juneau	15.2	12,148	184,340
	Haines/SKG	15.2	209	3,171
	Glacier Bay	31.3	13,003	406,621
	Area 2C	19.1	66,296	**1,264,804**
OVERALL	Area 2C	19.3	169,261	**3,263,939**

Approximate 95% Confidence Intervals for Harvest Estimates (M lb):

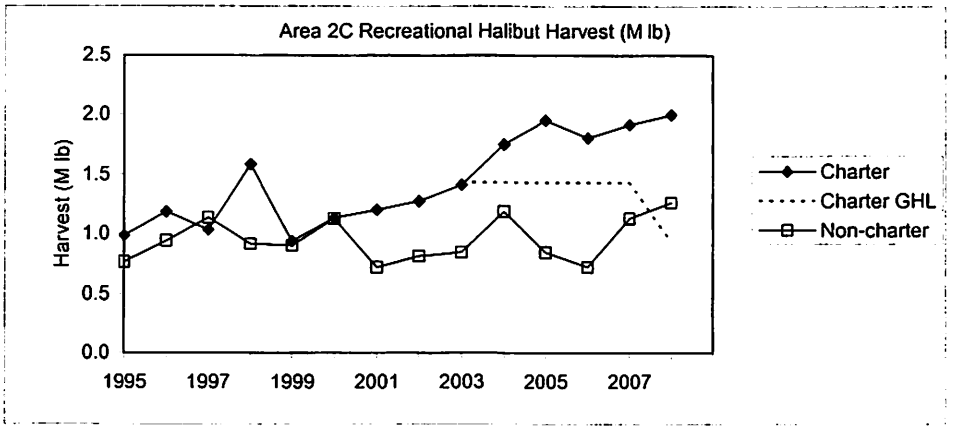
User	PointEst	StdErr	Lower	Upper
Charter	1.999	0.099	1.805	2.193
Private	1.265	0.082	1.104	1.426
Overall	3.264	0.119	3.030	3.498

Comparison of final estimates to October 2008 projections (M lb):

User	Projected	Final	Error(%)
Charter	1.914	1.999	-4.3%
Private	1.169	1.265	-7.6%
Overall	3.083	3.264	-5.5%

Area 2C Harvest 1995-2008

	Charter				Non-charter			Total Sport Harvest		
Year	No. Fish	Avg. Wt.	Yield (M lb)	GHL (M lb)	No. Fish	Avg. Wt.	Yield (M lb)	No. Fish	Avg. Wt.	Yield (M lb)
1995	49,615	19.9	0.986		39,707	19.3	0.765	89,322	19.6	1.751
1996	53,590	22.1	1.187		41,307	22.8	0.943	94,897	22.4	2.129
1997	51,181	20.2	1.034		53,205	21.4	1.139	104,386	20.8	2.172
1998	54,364	29.1	1.584	No GHL	42,580	21.5	0.917	96,944	25.8	2.501
1999	52,735	17.8	0.939		44,301	20.4	0.904	97,036	19.0	1.843
2000	57,208	19.8	1.132		54,432	20.7	1.126	111,640	20.2	2.258
2001	66,435	18.1	1.202		43,519	16.6	0.723	109,954	17.5	1.925
2002	64,614	19.7	1.275		40,199	20.3	0.814	104,813	19.9	2.090
2003	73,784	19.1	1.412	1.432	45,697	18.5	0.846	119,481	18.9	2.258
2004	84,327	20.7	1.750	1.432	62,989	18.8	1.187	147,316	19.9	2.937
2005	102,206	19.1	1.952	1.432	60,364	14.0	0.845	162,570	17.2	2.798
2006	90,471	19.9	1.804	1.432	50,520	14.3	0.723	140,991	17.9	2.526
2007	109,835	17.5	1.918	1.432	68,498	16.5	1.131	178,333	17.1	3.049
2008	102,965	19.4	1.999	0.931	66,296	19.1	1.265	169,261	19.3	3.264



Recent charter regulations:

Year	Regulations in Place
1995-2005	Two-fish bag limit (no size restrictions), no limit on crew retention
2006	Two-fish bag limit (no size limit), state EO prohibiting crew harvest 5/26-12/31.
2007	Two-fish bag limit (1 under 32" eff. 6/1), no crew retention 5/1-12/31 (State EO and Federal Rule)
2008	Two-fish bag limit (1 under 32"), except one-fish bag limit Jun 1-10 (halted by injunction)

Area 3A Final 2008 Harvest Estimates Based on the Statewide Harvest Survey

User	Port	MeanWt	No. Fish	Yield (lb)
CHARTER	CCI	15.6	53,197	830,941
	Homer	15.4	70,670	1,088,159
	Kodiak	20.2	18,120	366,719
	Seward	15.3	35,352	539,491
	Valdez	24.7	8,826	217,980
	Whittier	21.5	7,501	161,252
	Yakutat	38.9	4,442	172,991
	Area 3A	17.0	198,108	**3,377,534**
PRIVATE	CCI	13.8	31,393	434,039
	Homer	13.2	53,822	708,627
	Kodiak	14.0	15,879	222,385
	Seward	10.2	25,542	259,931
	Valdez	14.4	8,578	123,319
	Whittier	19.1	9,548	182,805
	Yakutat	20.9	524	10,973
	Area 3A	13.4	145,286	**1,942,079**
OVERALL	Area 3A	15.5	343,394	**5,319,613**

Approximate 95% Confidence Intervals for Harvest Estimates (M lb):

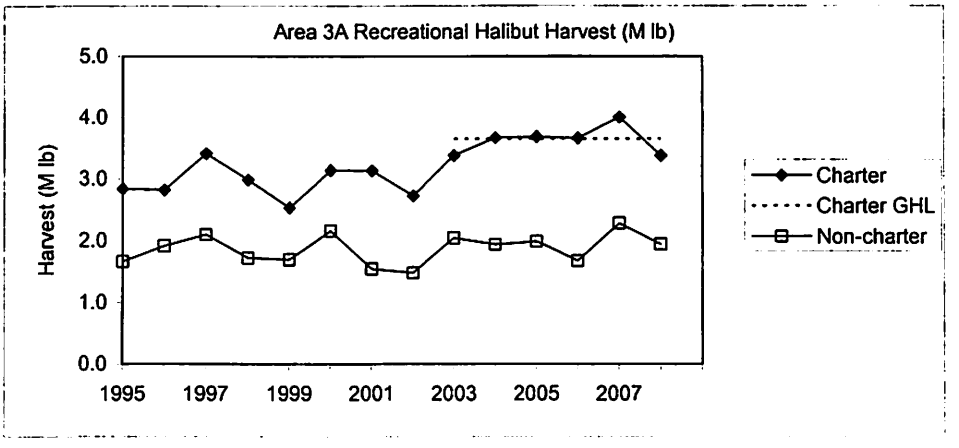
User	PointEst	StdErr	Lower	Upper
Charter	3.378	0.142	3.099	3.657
Private	1.942	0.089	1.768	2.116
Overall	5.320	0.167	4.992	5.647

Comparison of final estimates to October 2008 projections (M lb):

User	Projected	Final	Error(%)
Charter	3.603	3.378	6.7%
Private	2.026	1.942	4.3%
Overall	5.629	5.320	5.8%

Area 3A Harvest 1995-2008

	Charter				Non-charter			Total Sport Harvest		
Year	No. Fish	Avg. Wt.	Yield (M lb)	GHL (M lb)	No. Fish	Avg. Wt.	Yield (M lb)	No. Fish	Avg. Wt.	Yield (M lb)
1995	137,843	20.6	2.845		95,206	17.5	1.666	233,049	19.4	4.511
1996	142,957	19.7	2.822		108,812	17.6	1.918	251,769	18.8	4.740
1997	152,856	22.3	3.413		119,510	17.6	2.100	272,366	20.2	5.514
1998	143,368	20.8	2.985	No GHL	105,876	16.2	1.717	249,244	18.9	4.702
1999	131,726	19.2	2.533		99,498	17.0	1.695	231,224	18.3	4.228
2000	159,609	19.7	3.140		128,427	16.9	2.165	288,036	18.4	5.305
2001	163,349	19.2	3.132		90,249	17.1	1.543	253,598	18.4	4.675
2002	149,608	18.2	2.724		93,240	15.9	1.478	242,848	17.3	4.202
2003	163,629	20.7	3.382	3.65	118,004	17.3	2.046	281,633	19.3	5.427
2004	197,208	18.6	3.668	3.65	134,960	14.4	1.937	332,168	16.9	5.606
2005	206,902	17.8	3.689	3.65	127,086	15.6	1.984	333,988	17.0	5.672
2006	204,115	17.9	3.664	3.65	114,887	14.6	1.674	319,002	16.7	5.337
2007	236,133	16.9	4.002	3.65	166,338	13.7	2.281	402,471	15.6	6.283
2008	198,108	17.0	3.378	3.65	145,286	13.4	1.942	343,394	15.5	5.320



Recent charter regulations:

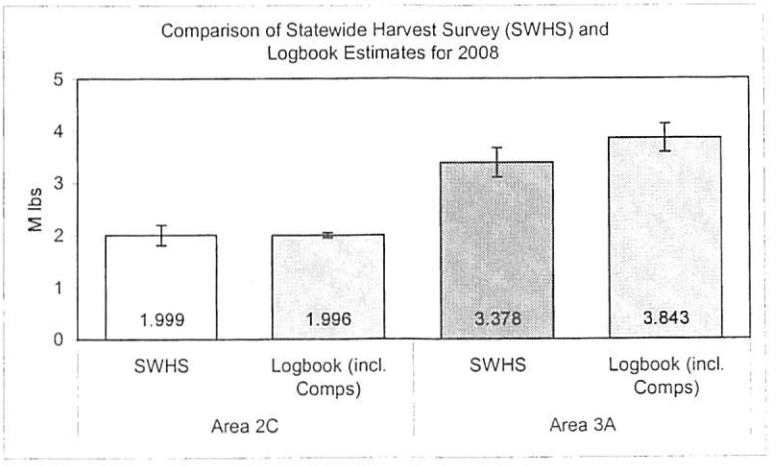
Year	Regulations in Place
1995-2006	Two-fish bag limit (no size restrictions), no limit on crew retention
2007	Two-fish bag limit (no size restrictions), state EO prohibiting crew harvest 5/1-12/31.
2008	Two-fish bag limit (no size restrictions), state EO prohibiting crew harvest 5/24-9/1.

2008 Estimated Charter Halibut Harvest Using Logbook Numbers[a]
(based on logbook data as of July 20, 2009)

Area	Port	Mean Wt (lb)[b]	No. Fish[b]	Yield (lb)
Area 2C	Ketchikan	18.9	8,597	162,411
	POW Island	9.2	38,075	348,758
	PBG/WRG	22.5	5,458	122,831
	Sitka	16.1	29,479	475,812
	Jun/Hai/Skgv	11.6	8,009	92,804
	Glacier Bay	45.3	17,520	793,634
	Total	18.6	107,138	1,996,249
Area 3A	CCI	15.6	64,694	1,010,525
	Homer	15.4	83,716	1,289,038
	Kodiak-AKPe	20.2	17,994	364,169
	Seward	15.3	50,701	773,726
	Valdez	24.7	7,036	173,772
	Whittier	21.5	4,573	98,308
	Yakutat	38.9	3,416	133,034
	Total	16.6	232,130	3,842,571

[a] - Estimate includes harvest by crew and "comped" (non-paying) anglers.

[b] - Average weights are presented to the nearest 0.1 lb.



Evaluation of Alaska Charter Logbook Data for 2006-2008

A Report to the North Pacific Fishery Management Council, October 2009

Scott Meyer, Bob Powers
Alaska Department of Fish and Game, Division of Sport Fish, Anchorage
September 21, 2009

Background

The Alaska Department of Fish and Game (ADF&G) Division of Sport Fish initiated the mandatory charter boat logbook program in 1998. The logbook program followed from Alaska Board of Fisheries regulations requiring annual registration of sport fishing guides and businesses, and logbook reporting. The logbook and registration program was intended to provide information on actual participation and harvest by individual charter vessels and businesses in various regions of the state. This information was needed by the Board of Fisheries for allocation and management of Chinook (king) salmon, rockfish, and lingcod, and by the North Pacific Fisheries Management Council (NPFMC or "Council" hereafter) for allocation of halibut.

Since 1998, the logbook design has undergone annual revisions, driven primarily by changing information needs, especially with respect to halibut and rockfish. Halibut data were collected each year during the period 1998-2001, dropped during the period 2002-2005, and resumed in 2006. Additional fields and requirements were added or removed in recent years to help facilitate management and enforcement of the charter halibut fishery. Rockfish data collection was changed to collect information on yelloweye rockfish specifically to address demersal shelf rockfish management issues in Southeast Alaska.

The department was concerned about the quality of self-reported information, especially halibut data that was collected while NPFMC was considering incorporation of the charter fishery into the existing individual fishery quota (IFQ) management system for the commercial fleet. The department conducted an initial evaluation of the 1998-2000 logbook data in September 2001 (Bingham 2001). This evaluation compared Statewide Harvest Survey (SWHS) estimates of harvests of several species with reported harvests from the logbook, and compared logbook data to interview data from on-site sampling in Southeast and Southcentral Alaska. Halibut harvests reported in the logbook were close to the SWHS estimates in 1998 but were substantially higher in subsequent years. Results for other species were variable. Reported logbook harvests of king and coho salmon were higher than the SWHS estimates in Area 2C but comparable in Area 3A. Reported logbook harvests of rockfish and lingcod were usually comparable to the SWHS estimates, but sometimes higher and sometimes lower. Comparisons with onsite interviews indicated that halibut harvest reported in the logbook was close, on average, to numbers reported in interviews. For Southeast Alaska, the halibut harvests reported in logbooks and interviews were within one fish for 90-91% of the trips. For Southcentral Alaska, only 58-74% of the trips were within one halibut, but the percentage increased each year.

ADF&G dropped the halibut reporting requirement beginning in 2002 following passage of a motion by the NPFMC to include charter harvest into the existing IFQ system. The reporting requirement was dropped because the Council decided that initial allocation of quota share would be based on 1998-1999 logbook data, and because the Council stated that the ADF&G logbook could not be used to track IFQ harvest. Federal agencies indicated clearly that they would develop a separate, possibly electronic, reporting system for charter halibut IFQ harvest. The department did not favor continued collection of questionable data for a fishery for which it had no management authority. As a result, no halibut information was collected in the logbook from 2002 through 2005.

The NPFMC rescinded the IFQ motion in December 2005. At that time, the ADF&G Commissioner pledged to resume the halibut reporting requirement, and do it in a manner that improved the quality of the data collected. Measures implemented in 2006 to monitor and improve the quality of logbook data collected included the following:

1. Charter operators were required to report the fishing license number and residency of each licensed angler, as well as the numbers of fish kept and released on a per-client basis.
2. A weekly submission requirement was re-established in 2006 to guard against failure to submit logbooks and to avoid a large data entry crunch at the end of the season. Logbooks have always been required to be completed at the end of a trip, but were not required to be submitted weekly in 2005.
3. The logbook data entry staff increased telephone contacts to charter operators to correct logbook data that was recorded improperly, to request missing data, and to answer questions about how to complete logbooks.
4. Area fishery managers and creel survey and port sampling staff conducted courtesy logbook inspections, particularly during the early part of the 2006 season, to answer questions and help ensure that the new logbook format was being filled out correctly.
5. Creel survey staff in Southeast Alaska and port samplers in Southcentral Alaska began directly counting numbers of halibut and other species harvested whenever possible while conducting charter boat interviews. These counts were made only when all harvested fish of a particular species were available to be counted, i.e., none of the fish had been cleaned at sea or previously offloaded and when counting would not preclude them from another interview. Interviews for which the numbers of harvested fish were counted were designated as verified, while interviews in which the number of fish kept was verbally reported by the charter skipper were designated as unverified. Verification counts were done to facilitate and improve the comparisons between logbook and interview data by reducing uncertainty regarding the number of fish actually harvested.
6. An additional technician was added in Southcentral Alaska to conduct interviews and count (verify) halibut harvest only in the Homer, Anchor Point, Deep Creek, and Seward fisheries. Referred to as the "roving tech," this position was added in 2006 only to increase the percentage of charter trips with verified halibut harvest. This technician also conducted courtesy logbook inspections early in the season.
7. An end-of-season mail survey post card was sent to a random sample of charter clients whose license numbers were listed in the 2006 charter logbook. The purpose of the survey was primarily to establish whether anglers whose fishing license numbers were reported in logbooks did in fact fish on those dates, and secondarily to compare logbook data to the anglers' recollections of the numbers of fish they caught and released. The comparisons were stratified by whether the trip occurred at a port where vessels are routinely encountered OR whether the vessel was sampled by ADF&G creel survey or port sampling technicians.

Measures 1, 2, 3, 5, and 7 above were continued through 2008 with the goal of ensuring integrity in the logbook data and facilitating continued evaluation of logbook data. In addition to follow-up calls by logbook staff, data entry software was redesigned with improved validation and rigorous error checking. The roving tech position was eliminated from the Southcentral Alaska program after 2006 because the data were not substantially different from data obtained by other port samplers.

Purpose of This Report

Following improvements to the logbook program, ADF&G sought to determine whether the quality of logbook data had in fact improved and whether logbook data should be used to monitor and manage charter fisheries. ADF&G provided a report (Meyer et al. 2008) at the April 2008 Council meeting evaluating 2006 charter logbook data. The report included summaries of missing or invalid data, timeliness of logbook submissions, frequency of client fishing license numbers, and comparisons of logbook data to the SWHS, to onsite interview data, to responses from the end-of-season survey, and to creel survey harvest estimates for selected ports. The report on 2006 data also looked at two aspects of the SWHS that may have accounted for differences between harvest estimates and charter logbook harvest numbers: (1) we compared estimates with and without bag limit edits, and (2) compared Cook Inlet estimates using standard and supplemental questionnaires to estimates using only the supplemental survey, as was done in all other areas of the state.

This report builds on the 2006 data evaluation, providing comparisons and evaluation for 2007 and 2008 data as well. Some of the 2006 data have been reanalyzed, either to incorporate corrections or to address inconsistencies in how the data were analyzed the first time. Stakeholders that attended presentations of the 2006 evaluation also suggested additional summaries or analyses, which have been incorporated into this report when analytically possible or not a violation of confidentiality statutes. The report evaluates logbook data for halibut as well as state managed species such as king salmon, rockfish, and lingcod, but focuses discussion on halibut. Data summaries are presented by IPHC Regulatory Area (Figure 1) or by SWHS area. The SWHS areas either approximate or are identical to ADF&G Sport Fish Division management areas (Figure 2).

The specific objectives of this report were as follows:

1. Summarize various aspects of logbook data relating to validity and utility, including the degree of missing or invalid data, frequency of license numbers and youth anglers reported, and the timeliness of logbook submissions.
2. Compare participation and harvest for individual anglers reported in logbooks to data from a post-season survey of charter clients on observed and unobserved vessels (end-of-season survey).
3. Compare reported logbook effort and harvests of Pacific halibut, king salmon, coho salmon, rockfish, and lingcod (numbers of fish) to estimates from the SWHS at the management area and IPHC area levels.
4. Compare annual halibut harvest recorded in logbooks for licensed anglers to those anglers' SWHS responses. The comparison is for single-angler households only.
5. Compare reported logbook effort and harvest at the boat-trip level to verified and unverified data from onsite interviews from ADF&G sampling programs in Southeast and Southcentral Alaska.
6. Compare reported logbook harvest at the port level to creel survey estimates for Ketchikan, Sitka, and Juneau.

Logbook Description and Required Data Elements, 2006-2008

Charter logbooks were issued to licensed businesses only. Each charter vessel was registered when the logbook was issued, and operators were provided registration stickers and statistical area maps. Each logbook contained 50 pages (with pressure-sensitive copies) upon which to record data, along with detailed instructions, including an example of a completed logbook page. The ADF&G phone number was printed on each page in case operators had questions. Pages were perforated and pre-printed with the ADF&G address for mailing. The instructions explained when logbook reports had to be completed and

provided requirements and deadlines for submission. A schedule of logbook due dates was printed inside the front cover of each logbook.

The following information was required to be reported for each calendar day of each vessel-trip during the period 2006-2008:

- Business and guide license number, and guide signature,
- Date of trip: In 2006 this was the date that the fish were offloaded from the vessel (signaling the end of a trip. For a multi-day trip, each day's data would have the date of the last day of the trip. In 2007 and 2008, the calendar date of each day of fishing was reported.
- Port or site where fish were off-loaded.
- Primary statistical areas fished for bottomfish and salmon (maps supplied with logbooks),
- Number of boat-hours fished for bottomfish and salmon,
- Page number (if multiple logbook pages were required),
- License number of all licensed anglers (or "youth" designation for anglers under 16),
- Angler residency of clients (no residency data for crew or comps),
- Designate whether anglers are crew (all years) or comps (2007-2008).
- Record for each angler: numbers of king salmon kept and released that were under and over 28 inches total length; numbers of coho salmon kept and released; numbers of sockeye, pink and chum salmon kept; numbers of halibut, lingcod, pelagic rockfish, yelloweye rockfish, and all other rockfish kept and released; number of salmon shark kept (and released in 2006 only); and numbers of all other species kept (optional field).

Additional fields were only included for some years. The number of rods fished for salmon and bottomfish, and the day number (e.g., 1, 2, 3,...) of a multi-day trip were required in 2006 only. Anglers who were given complimentary fishing trips for free ("comps") had to be designated as such in 2007 and 2008 because these anglers do not meet the state definition of guided anglers. Angler name was added in 2008 to address angler identification issues when license numbers were transposed. The port or community where the trip began and the IPHC area fished were added in 2008 to facilitate federal information gathering and management.

Objective 1 – Data Validity and Timeliness

Statewide, ADF&G issued 2,646 logbooks in 2006, 2,607 logbooks in 2007, and 2,553 logbooks in 2008. Of these, 2,122 were activated (at least one page submitted) in 2006, 2,186 in 2007, and 2,089 in 2008. The percentage of logbooks not used each year ranged from 16-20%.

Based on logbook submission, saltwater sport fishing services were provided by 503 licensed businesses and 1,368 vessels in 2006, 786 businesses and 1,409 vessels in 2007, and 766 businesses and 1,355 vessels in 2008 (Sigurdsson and Powers 2009). Charter operators in Area 2C submitted logbooks for 38,289 days of fishing in 2006, 38,774 days in 2007, and 36,629 days in 2008. Operators in Area 3A reported 27,274 days of fishing in 2006, 28,237 days in 2007, and 25,271 days in 2008. Operators in Areas 3B and 4 combined reported 105-141 days of fishing each year. Statewide, operators reported 65,673 days in 2006, 67,152 days in 2007, and 62,005 days in 2008. The number of charter trips, including trips lasting multiple days, was not calculated for this report.

Reporting Issues:

Seventeen types of logbook reporting issues or errors were tallied from 2006 to 2008 (Table 1). The most common data omission was failure to record the angler type (residency, crew, or comp). This issue improved substantially from 2006 to 2007 and 2008 in both IPHC areas. In Area 2C, there were 1,912 unknown type anglers in 2006, but only 537 in 2007 and 599 in 2008. In Area 3A, the number of omissions steadily decreased from 1,096 anglers in 2006 to 445 anglers in 2008. These numbers are

relatively small compared with the reported number of anglers. For example, angler type was missing for only 0.3-1.6% of Area 2C anglers and 0.3-0.6% of Area 3A anglers during the 3 years evaluated.

The next most common type of data omission was failure to report the number of hours fished for salmon and bottomfish. Missing hours were considered an error when a stat area was reported for bottomfish or salmon and there was no corresponding number of salmon or bottomfish hours, or if no hours were reported for either target category. The missing data represents a small proportion of all records - bottomfish hours were missing for 0.3-0.4% of Area 2C records and 0.4-1.4% of Area 3A records.

Each year operators reported lingcod harvested during the closed season. In Area 2C, the number of days with lingcod reported harvested out of season declined from 196 to 105 during the period 2006-2008 (Table 1). In Area 3A, the number of days varied up and down between 52 and 137. The reported "illegal" harvest ranged from 126-225 fish per year in Area 2C and 54-172 fish per year in Area 3A. It is likely that not all of these lingcod were harvested illegally. The lingcod column is adjacent to the halibut column, and staff discovered through contacts with some experienced operators fishing early in the year that they had mistakenly recorded halibut in the lingcod column. Staff suspected this was the case because of patterns in the numbers of fish kept and released, and because some stat areas were known not to contain lingcod habitat.

Frequencies of all errors or omissions were relatively low when compared to the number of records. As pointed out in the 2006 evaluation (Meyer et al. 2008), the level of errors or omissions decreased markedly compared to 1998-2004 data. During the period 1998-2004, the number of clients that fished was omitted on an average of 17.5% of Area 3A records. With reporting by individual angler, this problem was eliminated. An average of 4.5% of Area 3A records were missing port of landing during the period 1998-2004. That rate was reduced to virtually zero in the 2006-2008 data. While there were a few invalid ports listed (Table 1), they were easy to follow up on and assign to an area. Hours for salmon and bottomfish were missing on 6.8% of Area 3A records during the period 1998-2004, but were missing on only 0.1-0.5% of records during the period 2006-2008. Some errors were eliminated or reduced with redesign of the logbook, but increased follow-up contacts by logbook staff were probably a major reason for the reduction in missing or invalid data. Logbook staff made 3,011 phone calls in 2006, 1,415 calls in 2007, and 2,160 calls in 2008 to charter operators to request clarification or completion of data, and to answer questions. Although the number of calls was not tallied in the earlier years, this represented a substantial increase in efforts to obtain clean data.

Angler Frequencies:

We examined the frequencies of reported license numbers to evaluate the potential falsification of angler-days. The evaluation was based on the premise that most anglers either cannot afford to fish on a charter boat more than a few times per year, or get all the halibut they need in a few trips. The analysis excluded crew and unlicensed youth anglers, but included comps (identifiable as such only in 2007 and 2008).

The number of reported unique client and comp license numbers ranged from 165,137 in 2008 to 181,211 in 2007 (Table 2). More than 99% of licensed anglers fished 5 or fewer days, and 0.1% of anglers fished 10 or more days each year. The maximum numbers of reported days fished by individual licensed anglers were 49 in 2006, and 37 in 2007 and 2008. Some of the larger numbers of days may have been made by crew not reported as such.

We examined the total annual halibut harvest reported for unique licensed anglers, including comps and crew, during 2006-2008 (Table 3). The total number of licensed anglers each year ranged from 165,447 to 181,391. About 29-31% of all anglers harvested zero halibut per year, another 69-71% harvested 1-10 halibut per year and the remaining 0.2-0.5% of anglers harvested more than 10 halibut per year. The average annual harvest per licensed angler was 2.01 in 2006, 1.98 in 2007, and 1.95 in 2008. In 2006, 418 licensed anglers harvested more than 20 halibut, but this number decreased markedly with implementation of ADF&G Emergency Orders restricting crew harvest in Area 3A in 2007 and 2008. The

maximum numbers of halibut harvested by any individual angler were 192 in 2006, 47 in 2007, and 74 in 2008. We presume that anglers that retained large numbers of halibut were mostly crew members that gave their catch to unsuccessful clients.

Following the presentation of the 2006 evaluation, stakeholders requested that we tally the numbers of unlicensed youth anglers reported in logbooks. We did these summaries for 2007 and 2008 only (Table 4). Youth clients made up roughly 5-6% of charter clients statewide, and the proportions were similar in Areas 2C and 3A. The percentage of youth clients declined slightly from 2007 to 2008 in all areas.

Timeliness

The degree of late logbook submission was evaluated by comparing the date received to the due date schedule printed in each logbook. The percentage of logbook pages received after the due date increased each year from 9.4% to 16.1% for Area 2C and from 23.9% to 31.2% for Area 3A (Table 1). Statewide, the percentages were 15.5% in 2006, 20.2% in 2007, and 22.3% in 2008. Of all late logbooks, 73% were received within 14 days of the due date in 2006, compared with 79% in 2007 and 74% in 2008 (Table 5). The maximum number of days late for any logbook record was 203 days in 2006, 233 days in 2007, and 273 days in 2008.

On a suggestion from stakeholders, we examined the degree of late submission by sport fishing business starting in 2007. The majority of businesses submitted some late logbook pages each year (Table 6). In 2007, 722 of 911 businesses submitted late pages. In 2008, 682 of 878 businesses submitted late pages. The majority of businesses, 537 (59%) in 2007 and 492 (56%) in 2008, submitted less than 20% of their pages late each year. There were 29 businesses in 2007 and 23 businesses in 2008 that submitted 100% of their logbook pages late.

Objective 2 – End-of-Season Survey Analysis

Approach:

The primary purpose of the end-of-season (EOS) survey was to establish whether anglers whose license numbers were reported in logbooks actually made a charter trip during the specified period. Secondarily, the survey provided data for comparisons of numbers of fish kept and released reported in logbooks to anglers' recollections of what was caught and released.

Post card questionnaires were mailed to random samples of licensed anglers reported in logbooks as fishing between June 1 and July 31 each year. The questionnaires asked whether the angler made a guided or chartered trip during the period in question, whether they made more than one charter trip during the period, asked the date of their last trip or last day of fishing, and the name of the charter company or vessel on which they fished. It also directed anglers to report the number of halibut, king salmon, rockfish, and other fish they personally kept and released on the last day fished in the period. The questions were worded slightly differently each year to increase the accuracy of the responses. For example, some anglers that responded to the 2006 survey made a distinction between "charter" and "guided" fishing. These anglers commented that they did not make any charter trips but did make guided fishing trips and correctly identified the charter vessel or company. Because the terms "charter"' and "guided" fishing may have different specific meanings for some anglers, the first question was reworded for the 2007 survey to ask, "Did you hire a sport fish charter/guide service..." during the period. For 2008, the question was again modified to ask, "Did you go on a chartered/guided saltwater sport fishing trip..." This was done to obtain a "yes" response from all anglers that made a trip, not just those that paid for (hired) the vessel.

Sample sizes were 16,000 in 2006 and 21,500 in 2007 and 2008. The original mailings were supplemented with 11,129 reminder post cards in 2006, 16,201 reminders in 2007, and 16,259 reminders in 2008 in order to enhance the return rate. The numbers of useable surveys returned were 6,512 in 2006, 7,774 in 2007, and 7,681 in 2008. The overall response rates, calculated excluding undeliverable surveys,

were 42% in 2006 and 37% in 2007 and 2008. Response rates were slightly higher in Area 3A (39-46%) than in Area 2C (34-37%).

The numbers of surveys mailed and results were classified by whether the vessel was considered monitored or unmonitored. Monitored vessels were interviewed or had their catch sampled at least once during each calendar year by ADF&G creel census or port sampling crews. This classification allowed us to compare the integrity of logbook data from remote lodges and ports that were not covered by onsite sampling. In 2006, the EOS surveys were sent to a random sample of anglers whose license numbers were reported in logbooks. Sample sizes for monitored and unmonitored vessels were proportional to the number of days fished. In 2007 and 2008, however, roughly equal numbers of surveys were sent to anglers from monitored and unmonitored boats to try to balance the precision of estimates for each group. The number of surveys sent to anglers that reportedly fished on unmonitored vessels were 3,836 in 2006 (24%), 10,648 in 2007 (50%), and 11,783 in 2008 (55%).

We compared logbook data to EOS survey results for monitored and unmonitored vessels three ways: (1) we tallied the proportions of EOS respondents who said they did not fish on a charter, (2) we compared the percentages of responses with perfect agreement in the numbers of halibut, king salmon, and rockfish reported kept, and (3) we examined the frequency distributions of differences in the numbers of reported fish kept (beginning in 2007). Differences between numbers of fish reported in logbooks and the EOS survey were calculated as logbook minus the EOS survey, so negative differences would indicate that the logbook was lower than what anglers reported.

Results and Discussion:

The overall percentage of anglers that said they did not make a charter trip, even though their license number was reported in logbooks, decreased over the three years (Table 7). Of the useable surveys returned in 2006, 6.8% said they did not make a charter trip during the indicated dates. This rate dropped slightly to 6.2% in 2007, and dropped substantially to 3.9% in 2008. The percentage of anglers that said they did not make a charter trip was consistently higher for unmonitored charter boats. The differences between the monitored and unmonitored percentages were not significant in 2006 ($\chi^2 = 3.53$, df = 1, P = 0.06) or 2007 ($\chi^2 = 1.75$, df = 1, P = 0.19). In 2008, however, the rates were 4.6% for unmonitored vessels and 3.1% for monitored vessels, and the difference was significant ($\chi^2 = 10.14$, df = 1, $P < 0.01$). The percentage of responses that claimed no trip was taken was also higher in Area 3A than in Area 2C each year (Table 8).

There are several potential explanations for respondents saying they did not make a charter trip, even though their license number was recorded in the logbook. It is possible that some charter operators either made up or "recycled" angler license numbers to fabricate angler trips. Assuming, however, that logbooks were filled out for real anglers, another possible reason was that the operator transposed digits in the license number. The department required each angler's name be recorded next to their license number in the logbook in 2008. This allowed us to correct license numbers with transposed digits and re-send surveys to the appropriate anglers. This eliminated most of the invalid license numbers and was probably responsible for the much lower rate in 2008 of anglers that said they did not make a charter trip. As mentioned earlier, another reason some anglers may have reported that they did not make a charter trip in 2006 or a "charter/guide" trip in 2007 and 2008 is that they may define the term "charter" differently than was intended by the survey. In many parts of the country, the term "charter" applies specifically to instances where the entire boat is reserved by a single party. Many of the larger boats in Area 3A operate like "headboats," where each angler pays their own way and strangers fish together. Some anglers may have answered the questionnaires very literally, not considering the trip to be charter/guided unless they specifically paid for it. For example, some anglers may not have been marked as "comps" in the logbook when they should have been. Some anglers may also have fished from boats associated with lodges and not considered it a charter trip because it was part of the lodge package. It is also possible that some of these responses came from anglers who stayed at lodges and participated in "self-guided fishing." Some

anglers did not consider their trip to be guided even though the lodge was required to submit logbooks because they assisted anglers during some portion of the fishing trip. We received questionnaires that said the angler fished with a particular charter or lodge but did not consider it to be a charter/guided trip. Finally, it is also possible that EOS survey respondents claimed they did not fish on a charter as a strategic measure, hoping to minimize the estimate of charter harvest.

The overall percent agreement in reported halibut harvest ranged from 63-67% for Area 2C and 75-77% for Area 3A (Table 9). Agreement was consistently higher for responses involving monitored vessels. For example, in Area 2C the percent agreement for halibut ranged from 71-74% for monitored vessels and 51-63% for unmonitored vessels. The overall percent agreement was higher for king salmon than for halibut, and was highest in 2008 in both areas. Percent agreement for rockfish was similar to that for halibut in Area 2C but higher in Area 3A. There was practically no difference in the percent agreement between monitored and unmonitored vessels for king salmon and rockfish in both areas.

The high percentages of agreement for rockfish and king salmon, especially in Area 3A, are probably due to smaller fractions of reports with king salmon and rockfish harvest. Although not shown in these tables, the percent agreement was substantially higher for reports in which the anglers indicated in the EOS survey that no fish were caught (zeroes matching zeroes).

Following presentation of the 2006 evaluation at the April 2008 Council meeting, we received requests to summarize the percent agreement by the number of clients on board (classes of 1-6, 7-12, and 13+). The hypothesis was that agreement would be lower for vessel-trips with high numbers of clients. There were too few trips in Area 2C with more than 6 clients to analyze, but for Area 3A, the percent agreement increased with the number of anglers (75-83%)

Plots of the frequency distributions of differences in reported halibut harvest in 2007 and 2008 showed strong modes at zero, corresponding to the percentages of agreement noted above (Figure 3). The maximum difference never exceeded 2 fish because the daily bag limit never exceeded two fish, because logbooks were completed for each calendar day, and because anglers could not report a harvest lower than zero. The minimum differences, however, were -29 fish in Area 2C and -46 fish in Area 3A. The distributions were negatively skewed and similarly shaped in both areas each year. The average differences (absolute values) were larger for unmonitored vessels in both areas each year.

There are several explanations for skewed distributions, or for anglers reporting larger numbers of harvested fish than what was entered in logbooks. Anglers were asked to report fish kept only by them, and only for the last day fished (if they fished more than one day). Large differences could have resulted from anglers reporting for multiple days of fishing, or for multiple members of a household, or for everyone on the boat. It is also possible that some anglers fished on overnight trips and reported their legally retained four halibut (two per calendar day). In these instances, the charter logbook would have had an entry of two fish, because logbook pages were completed for each calendar day. Differences could also arise from recall bias or prestige bias (inflation of reported harvest) by surveyed anglers.

Objective 3 – Comparisons to SWHS Estimates

Approach:

Logbook effort and harvest data were assigned to a SWHS and IPHC area based on the reported port of landing. If the port of landing was unknown or invalid, the SWHS area was assigned based on the vessel's home port or the stat area where fishing occurred. SWHS estimates of effort (angler-days) were compared to logbook data for all anglers on board, including crew and comp (identifiable only in 2007 and 2008). Comparisons also included logbook and SWHS estimates of the numbers of halibut, king salmon, coho salmon, rockfish (all species combined), and lingcod harvested. Although the logbook collects information for pelagic rockfish, yelloweye rockfish, and all other rockfishes, the SWHS gathers these data for all rockfish species combined.

Results and Discussion

Logbook estimates of angler effort were within 5% of the SWHS estimates each year in Area 2C (Table 10). Logbook halibut harvest was consistently higher than the SWHS estimates in both areas, but the discrepancies decreased over time in Area 2C. For all other species except lingcod, the logbook numbers were higher than the SWHS estimates in Area 2C, although the magnitude of differences varied by year without a clear pattern. The Area 2C logbook numbers were within the 95% confidence intervals of the SWHS estimates for effort (all years), for halibut in 2008, for king salmon in 2008, and for lingcod every year (Figure 4).

In Area 3A, reported logbook effort was virtually identical to the SWHS estimates in 2006 and 2008, and about 10% lower in 2007 (Table 10). Logbook numbers were consistently higher than SWHS estimates of halibut and rockfish harvest, and consistently lower than harvest estimates for king salmon. Logbook numbers were higher than SWHS estimates for coho salmon and lower for lingcod in 2006 and 2007, but virtually identical for both species in 2008. With the exception of effort, logbook numbers were outside the 95% confidence intervals of the SWHS estimates in most instances (Figure 5).

Comparisons by SWHS area show that most of the differences between logbook data and SWHS estimates are driven by large differences in the Prince of Wales and Sitka areas in IPHC Area 2C, and in the Prince William Sound-North Gulf and Cook Inlet areas in Area 3A (Figures 6-8). Areas with larger estimates tend to have larger absolute differences, and logbook numbers are usually higher than SWHS estimates. SWHS estimates for lingcod were usually higher than the logbook numbers. Effort and lingcod estimates consistently had the best degree of agreement across areas and years, with logbook numbers usually falling within the 95% confidence intervals of the SWHS estimates.

Among areas in Southeast Alaska, the logbook numbers for halibut were consistently within the 95% confidence intervals of the SWHS estimates in the Ketchikan, Sitka, and Yakutat areas, and consistently outside the confidence intervals in the Prince of Wales area (Figures 6-8). Results for other areas were mixed. In Southcentral Alaska, logbook numbers were consistently greater than SWHS estimates and outside the confidence intervals in the Prince William Sound-North Gulf and Cook Inlet areas. These two areas account for the largest charter harvests among all areas statewide.

Reasons for the discrepancies are still not clear. Any number of reporting errors in logbooks or mail survey questionnaires could account for the discrepancies. Logbook values used for comparisons included effort and harvest by crew and comps. This alone may have accounted for part of the differences in areas and years with substantial crew harvest (mostly in Area 3A in 2006). The effect of including crew and comps would depend on how these anglers report their harvest in the SWHS – if most of it is reported as charter, it would introduce no error into the comparisons. Potential errors in the SWHS responses could be due to recall bias, prestige bias, or strategic bias (deliberate underreporting). Recall, prestige, and strategic bias in SWHS reporting are all potential but unquantified factors. The much lower rockfish harvest estimates in the SWHS could be the result of non-reporting because they were not felt to be important, or possibly because anglers don't realize that the fish they commonly know as "black bass," "red snapper," "rock cod," "kelp bass," etc. are actually rockfish.

Party fishing, or catching "boat limits," is illegal but believed to be a common practice. If some anglers catch more than a legal limit in order to share fish with less successful anglers, charter operators are likely to report only two halibut per angler in the logbook. This could generate a difference if the angler reports the actual numbers in the SWHS. Meyer et al. (2008) looked at the effect of routine bag limit edits made to SWHS responses on harvest estimates. Halibut harvest was re-estimated without bag limit edits and increased by about 7% in both areas 2C and 3A. This brought logbook and SWHS estimates a little closer together, but the pattern of differences among areas was unchanged. Bag limit edits are based on the assumption that anglers recall the number of trips or days fished more accurately than the number of fish they kept – if they report more harvest than a legal bag limit, the record is edited to the bag limit for the

number of days reported. The fact that charter effort estimates compare so favorably between logbooks and the SWHS lends some support to this assumption.

Objective 4 – Comparison of Annual Logbook and SWHS Harvests per Angler

Approach:

This was a new analysis suggested by staff to take advantage of the fact that catches were reported for individual licensed anglers in the logbook. The total number of halibut kept per year was summed for each individual angler license number, and then the license number was matched to SWHS responses that indicated only a single angler in the household fished that year (single-angler household). The difference in the annual harvest reported in the logbook and annual charter harvest reported in the SWHS was calculated as the logbook value minus the SWHS value. This analysis was attempted for the 2008 data only to see what we could learn about recall bias, at least for single-angler households.

Results and Discussion:

A total of 1,908 licensed anglers were matched between logbook and SWHS data, with 847 matches in Area 2C and 1,139 matches in Area 3A (Figure 9). The maximum annual halibut harvest reported for an angler was 23 in the logbook and 21 in the SWHS, and the average was about 2.4 halibut per angler in both data sets. Most anglers harvested fewer than 10 halibut. Differences were distributed fairly evenly around a strong mode at zero. The average differences were -0.19 fish per angler in Area 2C and 0.04 fish per angler in Area 3A. The x-y plots also show that differences were fairly constant and unbiased as a function of the magnitude of harvest.

As described above, differences could be due to either logbook or SWHS survey errors. An important feature of these data, however, is that the differences are roughly balanced. It is difficult to predict how these differences seen here would affect harvest estimates generated from these data. That depends on how the differences are distributed among SWHS estimation strata because data from each stratum has a different expansion factor.

On average, single-angler household harvest data for halibut appear to be consistent with logbook data. Any systematic large differences between logbook harvests and SWHS estimates may therefore be due to problems with multiple angler households. The department is continuing to explore this type of analysis to try to determine reasons for differences between logbook and SWHS harvest estimates.

Objective 5 – Comparisons to Onsite Interview Data

Approach:

ADF&G conducts interviews at major ports throughout Southeast and Southcentral Alaska to estimate effort, numbers of fish harvested and released, catch rates, the spatial distribution of catch, and a number of other statistics. Interviews with charter boats include recording of the vessel's current logbook number, and vessel name. Beginning in 2006, technicians counted the number of fish kept whenever possible. The data from these interviews was matched to logbook data on a boat-day basis using the logbook number and date. Only data for single-day trips was used because in 2006, charter operators recorded the date of the last day of multi-day trips on each logbook page for that trip, and in subsequent years, each calendar day was recorded on a separate page and there was no efficient way to reliably identify multi-day trips.

This analysis included comparisons of reported angler effort (including clients, crew, and comps), numbers of fish harvested, and bottomfish statistical areas. Comparisons were done by Sport Fish Region rather than IPHC area, because that is how interview procedures and data elements were structured. In Southeast Alaska, comparisons were made for halibut, large king salmon (>28"), coho salmon, pelagic rockfish, yelloweye rockfish, other rockfish, and lingcod. In Southcentral Region, comparisons were made only for halibut, pelagic rockfish, all non-pelagic rockfish, and lingcod. Comparisons included

frequency distributions of the differences (logbook minus interview), x-y plots of logbook and interview data for halibut harvest, and comparisons of total logbook and interview halibut harvest for vessel-days where the halibut harvest was verified.

Comparisons were classified by whether the numbers of fish kept were verified by the technician conducting the interview. Technicians were instructed to count the number of fish kept of each species or reporting category (e.g., pelagic rockfish) and record the numbers as verified whenever possible. Fish could not be counted (verified) when cleaned at sea, when the technician was busy with multiple interviews, or when fish were difficult to access (beach launching sites). Halibut comparisons included 599 verified interviews conducted in 2006 only in the Cook Inlet and Seward fisheries specifically to boost the sample sizes ("roving tech" program described in Meyer et al. 2008, page 2). The number of anglers that fished could not be verified since there were no onboard observers.

The comparisons for 2006, which were reported in Meyer et al. (2008), were re-analyzed for three reasons. First, logbook data have been edited since the last analysis as errors were discovered. Second, the harvest verification procedures differed between regions – in Southeast, technicians marked interviews with zero harvest of a species as verified, whereas in Southcentral, they only verified interviews with harvest. Southeast Region data for trips with zero harvest were changed to "unverified" to standardize the analysis. Third, errors were made in the extraction of the 2006 interview data for Southeast, resulting in some potential mismatches of logbook and interview data. Therefore, sample sizes and results vary somewhat from results for 2006 presented in Meyer et al. (2008).

Results:

The total numbers of interviews matched to logbook data in Southeast were 3,035 in 2006, 3,795 in 2007, and 3,802 in 2008. The sample sizes for Southcentral were 1,261 in 2006 (1,860 for halibut only), 1,002 in 2007, and 1,036 in 2008.

The frequency distributions of the differences in effort and harvest reported in logbooks and during interviews all had strong modes at zero, and this was true for verified and unverified interviews in Southeast (Figures 10-11) and Southcentral (Figures 12-13). For most species, the numbers of nonzero differences were small and fairly evenly distributed above and below the modes at zero. Non-zero differences were more frequent in the comparisons with verified interviews, especially the rockfish data. For some species, the differences were quite large in both directions (Tables 11-12). For verified interviews, the differences in reported numbers of halibut kept ranged from -10 to +9 fish per boat-day in Southeast and from -35 to +10 fish per boat-day in Southcentral. The average differences for verified harvests ranged from -0.09 to -0.07 halibut per boat day in Southeast and from -0.21 to 0.03 halibut per boat-day in Southcentral.

Plots of logbook and interview count data for halibut reflect the strong mode at zero; most points fall on the line of agreement. There does not appear to be bias or increase in variance in differences with increasing numbers of fish for either verified or unverified boat-days (Figures 14-15). In some cases, agreement was higher for boat-days with more fish harvested.

In order to assess the net effect of the observed differences, the total halibut harvests reported in logbooks and interviews were compared for all verified boat-days (Figure 16). The high degree of agreement in these counts reflects the small average differences in Tables 11 and 12.

Discussion:

The high degree of agreement between logbook and unverified interview data indicates that charter operators provided similar information in logbooks and interviews. The lower degree of agreement between logbooks and verified interviews (where fish were counted) indicates that either the numbers operators report are sometimes incorrect or creel survey staff sometimes err in counting or recording numbers of fish. Large differences are not as likely to be miscounts on the part of creel survey staff,

especially if the count is larger than the logbook data. The net effect of these differences on reported harvest, even for verified interviews, was proportionally very small.

Objective 6 – Comparison to Creel Survey Estimates

Approach:

Direct expansion creel surveys were conducted each year to estimate harvest of large king salmon (>28"), coho salmon, halibut, rockfish, and lingcod at Juneau, Sitka, and Ketchikan (unpublished estimates, ADF&G Division of Sport Fish, Juneau). The harvest estimates were for the periods 4/24-9/24 (2006), 4/23-9/23 (2007), and 4/28-9/28 (2008). Logbook and interview data were merged to produce a list of vessels and reported ports of landing along with creel survey records showing the harbor sampled. The goal was to only include logbook data for sampled ports and vessels to ensure valid comparisons.

Results and Discussion:

There seemed to be few consistent patterns in the differences between charter logbook harvest numbers and creel survey estimates. With few exceptions, logbook numbers are consistently higher than the creel survey estimates. Logbook and creel survey harvests were close at Juneau in 2006 and 2008, but logbook harvests were higher for all species except rockfish in 2008 (Figure 17). Even though logbook harvests at Sitka were consistently higher than the creel survey estimates, they were higher by a fairly constant proportion.

Logbook reported halibut harvests were within the 95% confidence intervals of the creel survey estimates every year at Juneau and in 2007 only at Ketchikan. Although logbook-reported halibut harvests at Sitka were not within the confidence intervals, they were consistently close to the upper bound.

The reasons for differences between creel survey estimates and logbook data are not fully understood. Because logbook data were subsetted to match the dates, ports, and vessels sampled, incomplete coverage is not a likely explanation. It is likely that the subsetting procedure was imperfect, resulting in logbook data being included from vessels that used ports that were not sampled. Differences may also have been due to sampling variation or other aspects of the creel survey design. Failure to observe and record all vessels missed during interviews could bias the creel survey estimates low.

Summary and Discussion

Data Verification:

In a review of recreational fishery survey methods, a National Research Council committee recommended that "for-hire recreational fishing operations should be required to maintain logbooks of fish landed and kept, as well as fish caught and released," and that all the information should be verifiable (NRC 2006). That recommendation was echoed by a consultant's report to the National Marine Fisheries Service For-Hire Work Group (Chromy et al. 2009). There are obvious advantages of using mandatory logbooks over surveys: (a) the data ideally represent a complete census and can potentially be provided in a timely manner, (b) there are no issues of recall bias by surveyed anglers, and (c) logbooks are more credible with stakeholders leery of sampling and estimation. Logbook data must be regularly verified, especially if there are incentives for guides to over- or under-report.

Few studies have attempted to verify for-hire logbook data. Huntsman et al. (1978) compared logbook data to a dockside creel census. They concluded that harvest estimated in the dockside survey represented 47% to 87% of the harvest reported in logbooks, but that they could not determine which estimation method was more accurate because the true catches were unknown. Hill and Barnes (1998) evaluated the quality of logbook data in California using on-board observers. They were unable to directly compare trip-level data because logbooks were not submitted for every trip, and because they could not match

observer data when vessels made more than one trip per day. Therefore, they compared annual catch rates from logbooks and observer data and found good correspondence for 6 of 10 species studied.

This study approached logbook evaluation from several angles. Total annual harvests were examined at the IPHC management area and state management area level through comparisons with SWHS estimates. Total annual harvests were examined at the port level through comparisons with ADF&G creel survey estimates for Juneau, Sitka, and Ketchikan. Total annual harvest was examined at the level of individual licensed anglers through comparisons with SWHS data from single-angler households. Logbook harvest was examined at the boat-trip level for single-day trips through comparisons with onsite creel survey interviews. A portion of these interviews included counts of fish in an effort to determine, whenever possible, the true number of fish harvested. Finally, logbook data was examined at the angler-day level through comparisons with EOS surveys of clients. The purpose of these surveys was two-fold: to confirm that clients made the charter trip and to compare reported catches for monitored vessels as well as vessels that operate in remote or unsampled locations.

The comparisons generally indicated that logbook numbers were greater than SWHS estimates for species with the largest harvests, such as halibut (Figures 4-5). It is not possible to say, however, whether the logbook numbers or SWHS are more accurate. Interestingly, the logbook effort and SWHS effort estimates are very comparable. This suggests potential estimation problems associated with harvests in the SWHS. The comparison of logbook and SWHS data for individual anglers from single-angler households indicated a high degree of agreement and little bias (Figure 9). This suggests that recall bias may not be a big issue for halibut and points suspicion at the reported harvests from multiple angler households. It may well be that survey respondents from multiple angler households are accurately reporting the number of trips made by other household anglers but not accurately reporting their catches.

Comparisons with interview data showed that logbook data and interview data agree on average (Figures 14-15), and the effect of the differences on total harvest is negligible (Figure 16). If counts of fish made by ADF&G creel survey staff are assumed to be accurate, that would indicate that the majority of logbook data is accurate, at least for the sampled ports. Continued verification (counting of fish) is recommended for interviews whenever possible for periodic evaluation. Counting is also potentially beneficial in that it may alert charter operators to logbook errors and allow them to amend the logbooks prior to submission.

Comparisons with the EOS survey indicated that a small but significant percentage of anglers listed in logbooks claimed they did not make a charter trip. This percentage was reduced from 6.8% in 2006 to 3.9% in 2008. Much of that decrease was attributable to changes in the wording of the questionnaire and the ability to resolve issues with license number transpositions in 2008. The percentages of anglers that claimed they did not make a charter trip were higher for unmonitored vessels but were only significant (with 95% confidence) in 2008, and that year they were relatively low (4.6% vs. 3.1%). There are too many potential explanations for these differences for us to conclude that that charter operators are fabricating angler trips or fabricating more angler-trips at unmonitored locations. Likewise, it appeared that too many EOS survey respondents were reporting harvest for multiple anglers or multiple days for us to conclude from those data that logbooks were under-reporting the numbers of fish harvested.

ADF&G charter logbook is unique in that it requires information to be recorded for each individual angler on the vessel. We know of no other for-hire logbook with this requirement. While this may seem burdensome for boats with large numbers of clients, the comparisons in this report indicate that their data are no less accurate than data from more typical six-pack boats. Having individual angler data is a potentially powerful tool for evaluating bag limits and annual limits for management, and allows for individual angler comparisons against other surveys.

The requirement to record data by angler also makes it more difficult fabricate data. ADF&G was concerned in 2001 about the potential fabrication of angler trips in the earlier logbook data (Bingham 2001). Discrepancies between logbook data and SWHS estimates increased over time as the Council was considering including charter vessels in the IFQ management. The hypothesis was that some charters

were "padding" logbooks to qualify for higher initial allocations of quota share. By 2006, IFQs were no longer under consideration. Instead, the Council was managing the Area 2C and 3A charter fisheries under guideline harvest levels (GHLs) and considering management actions to restrict harvest. The Council was also discussing a limited entry system that included endorsements for carrying a maximum number of clients. While the limited entry discussions may have provided incentive for some minor operators to fabricate trips, there would also have been incentive to under-report harvest to try to keep area harvests within their respective GHLs.

Using Logbook Data for Charter Halibut Management

Since 2006, logbook harvests and SWHS estimates of the numbers of fish harvested have converged somewhat (Figure 18). Convergence or agreement alone does not necessarily indicate accuracy, because the true harvest is unknown. The closer the logbook numbers are to SWHS estimates, the less it matters which is used for management, unless there are other reasons to recommend one over the other. The comparisons in this report indicated that effort reported in logbooks and estimated by the SWHS were comparable. Halibut harvest reported in the logbook was slightly higher that SWHS estimates, but comparisons with verified interviews suggested that logbook numbers, on average, were accurate. The logbook requirement to record angler license numbers and names is probably effective at preventing or minimizing the fabrication of angler-days and harvest. In summary, we do not see any obstacles to the use of ADF&G logbook data for management of the charter halibut harvest in Alaska.

The logbook offers two clear advantages over using the SWHS to estimate charter harvest:

- The logbook data are potentially timelier. Harvest projections based on logbook data are currently available in October, and all logbook data are usually available by February of the following year. Estimates from the SWHS, however, are typically not available until September of the following year.
- The logbook data now provide information on effort and harvest by vessels and individual licensed anglers. These data can or have been used to analyze the potential effects of limiting entry into the halibut fishery, limiting numbers of clients per vessel, or changing bag and annual limits.

ADF&G is planning to implement a scannable charter logbook in 2010 that should significantly reduce data entry time. The goal is to have most of the data entered within a few weeks of the end of the season. Although most late logbooks were less than 14 days late, late submissions could still impede the department's ability to provide timely data summaries or harvest projections, especially if needed within a few weeks of the date that fishing took place. Operators can and have been penalized for late logbooks, but this presents a paradox. If operators discover logbook pages that were inadvertently not submitted, their fear of being fined may deter them from submitting them late. The more aggressively the department pursues enforcement of late logbooks, the more likely late data will not be submitted, which could lead to underreporting of harvest. The department currently allows some late logbook submissions without penalty if accompanied by an explanation.

The use of logbook data for management has one remaining factor to consider. This study compared differences in the numbers of fish harvested between logbooks and the SWHS, the current "approved" data source. Halibut management, however, involves catch limits or harvest guidelines based on harvest biomass and set by IPHC area. The estimates of harvest biomass are made by multiplying average weight by numbers of fish harvested and summing over SWHS or management areas. Therefore, differences in harvest biomass between the logbook and SWHS at the IPHC area level are the result of interactions between the numbers of fish harvested and average weights at the area level. For example, even if logbook and SWHS estimates of the numbers of fish agree, there could be differences in the harvest biomass estimates due to differences in how fish are distributed among areas in the logbook and SWHS.

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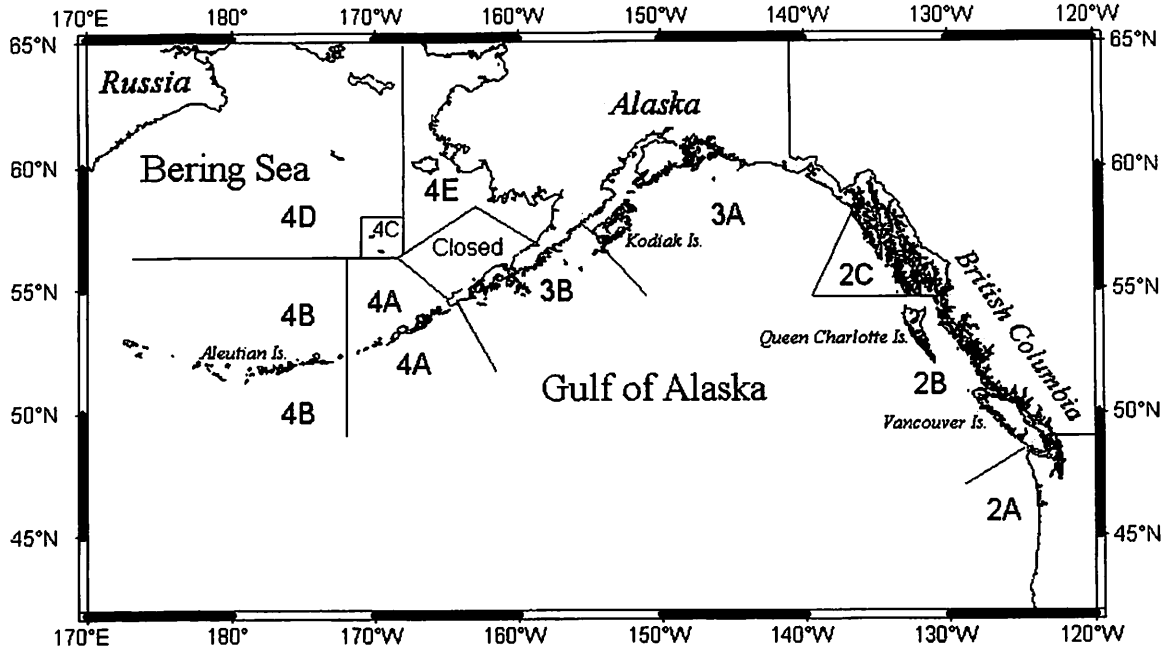

Figure 1. International Pacific Halibut Commission regulatory area boundaries.

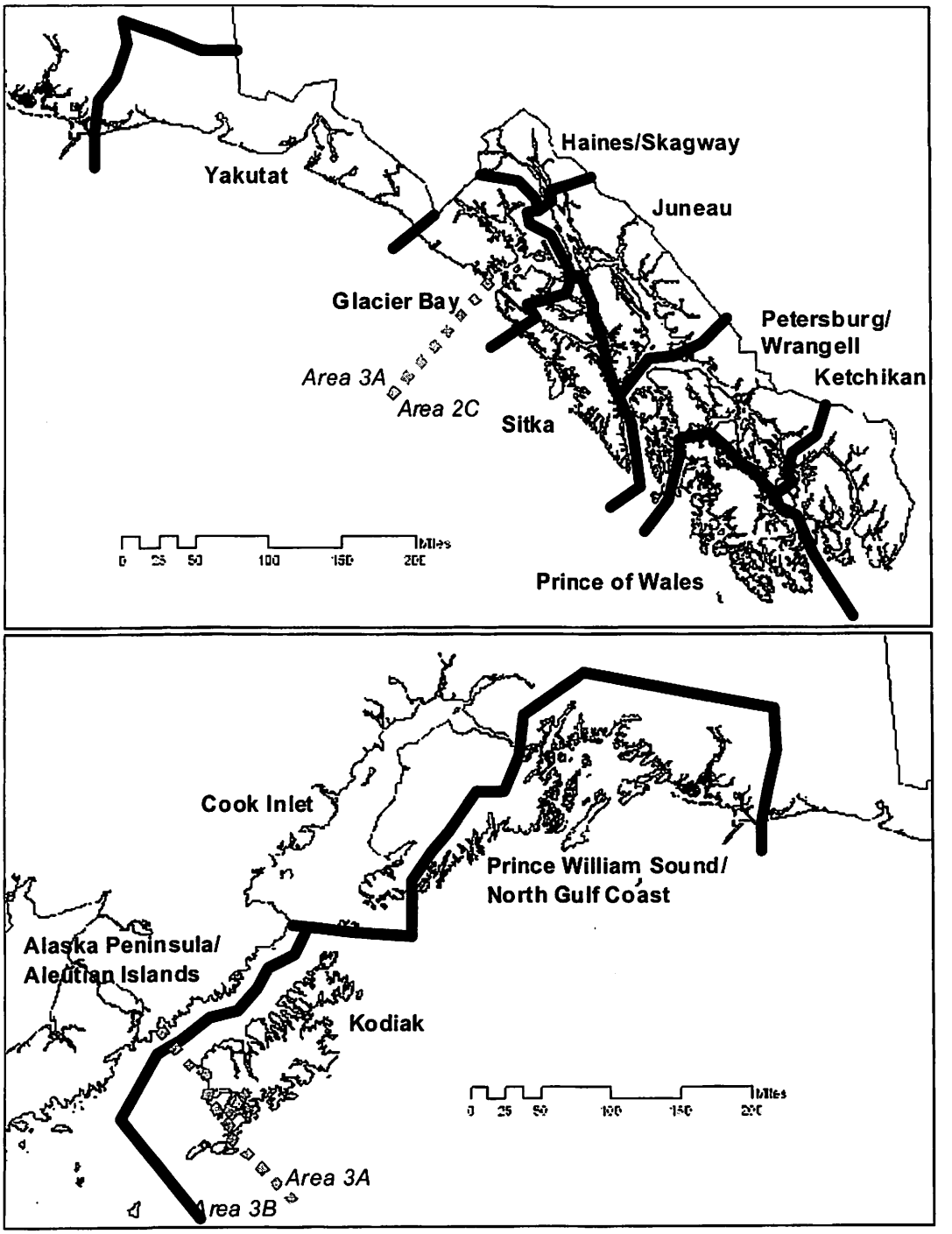

Figure 2. Statewide Harvest Survey areas in Southeast Alaska (upper panel) and Southcentral Alaska (lower panel).

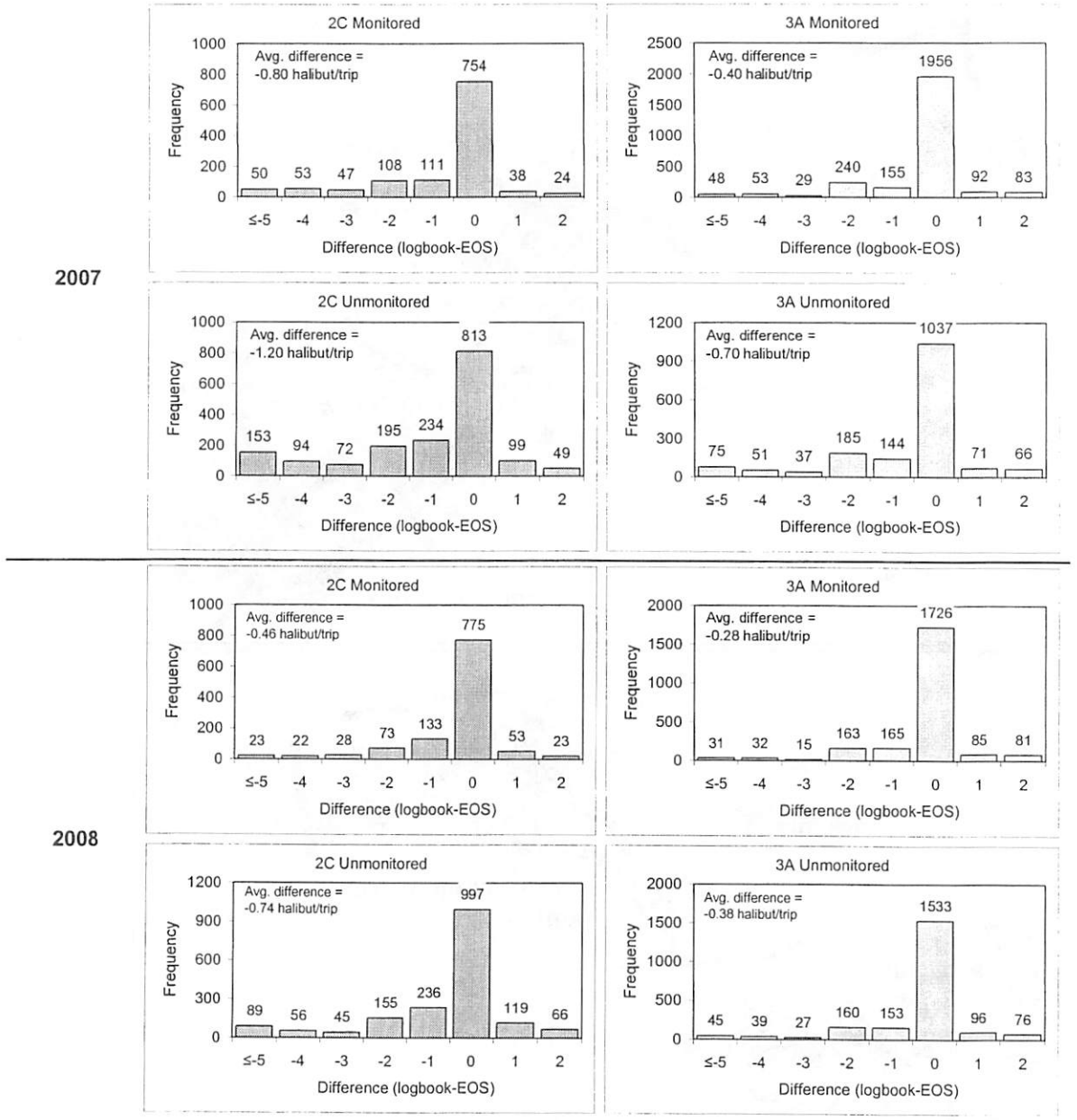

Figure 3. Frequency distributions of differences between ADF&G charter logbooks and end-of-season survey responses in reported numbers of halibut kept by individual anglers. Results are presented for monitored and unmonitored charter vessels in Areas 2C (on left) and 3A (on right), 2007-2008.

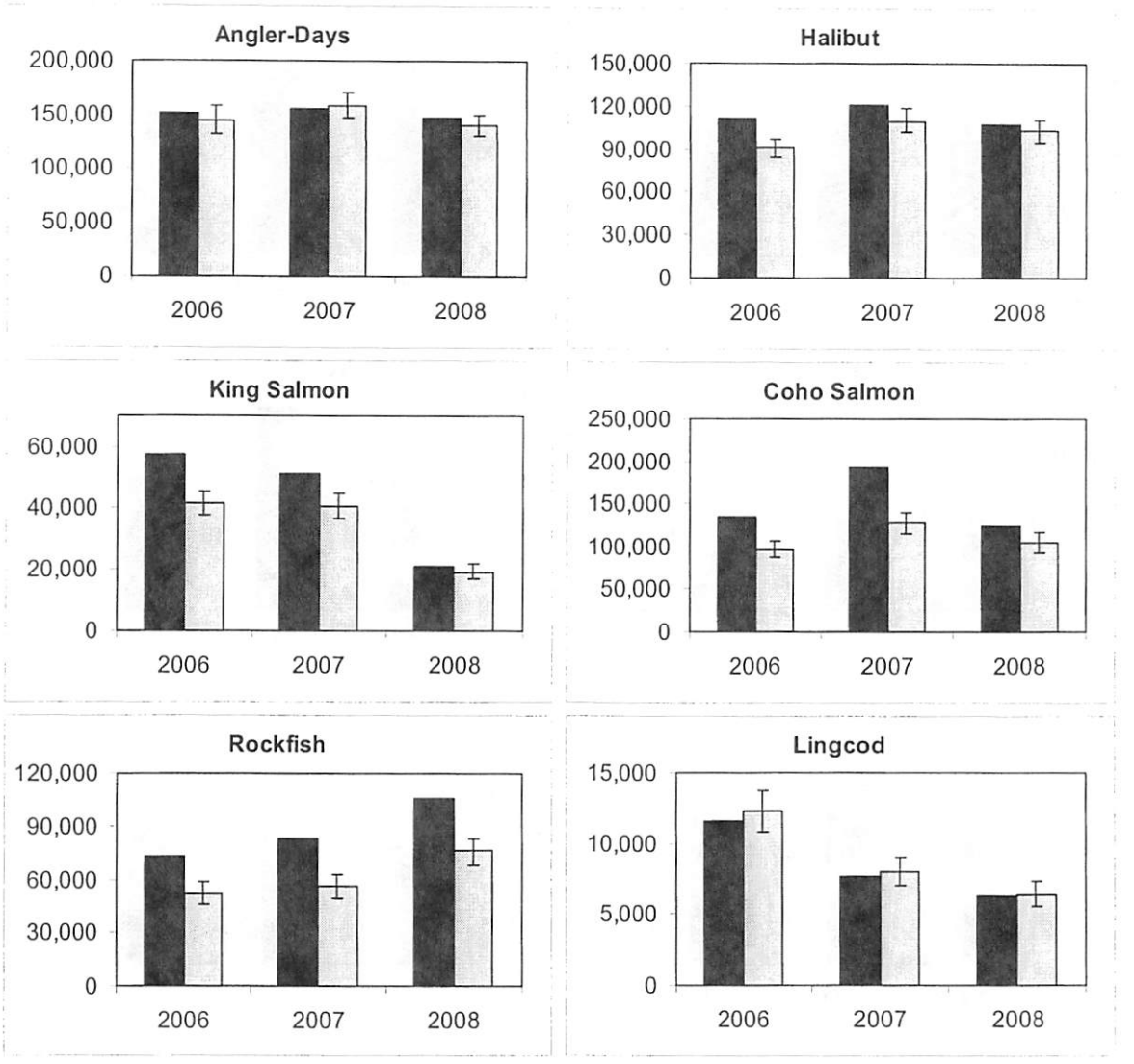

Figure 4. Comparisons of ADF&G charter logbook numbers (dark bars) and SWHS estimates (light bars) of angler effort and harvest (in numbers of fish) of halibut, king salmon, coho salmon, rockfish, and lingcod, in Area 2C, 2006-2008. Vertical bars represent the 95% confidence intervals for the SWHS estimates.

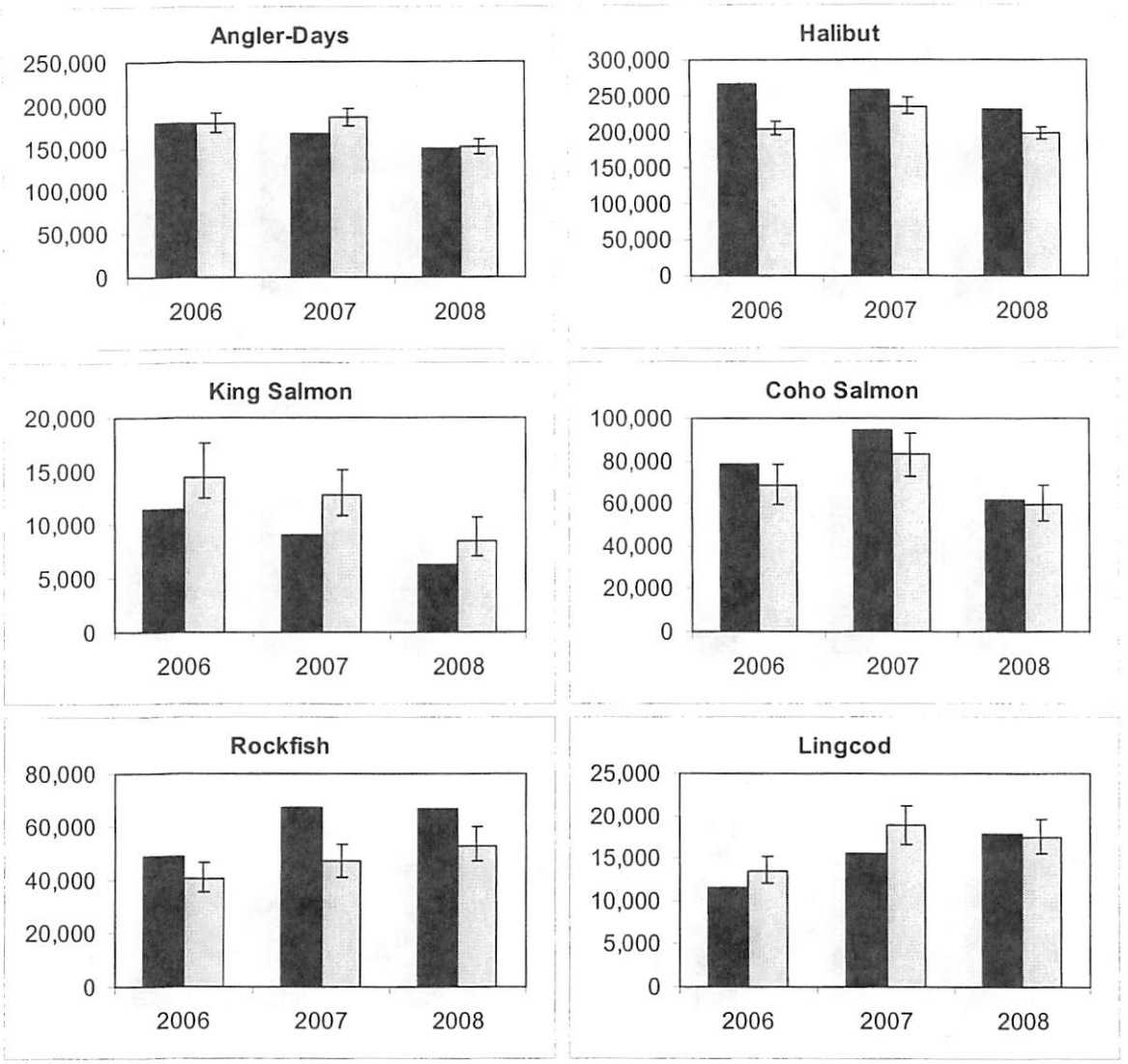

Figure 5. Comparisons of ADF&G charter logbook numbers (dark bars) and SWHS estimates (light bars) of angler effort and harvest (in numbers of fish) of halibut, king salmon, coho salmon, rockfish, and lingcod, in Area 3A, 2006-2008. Vertical bars represent the 95% confidence intervals for the SWHS estimates.

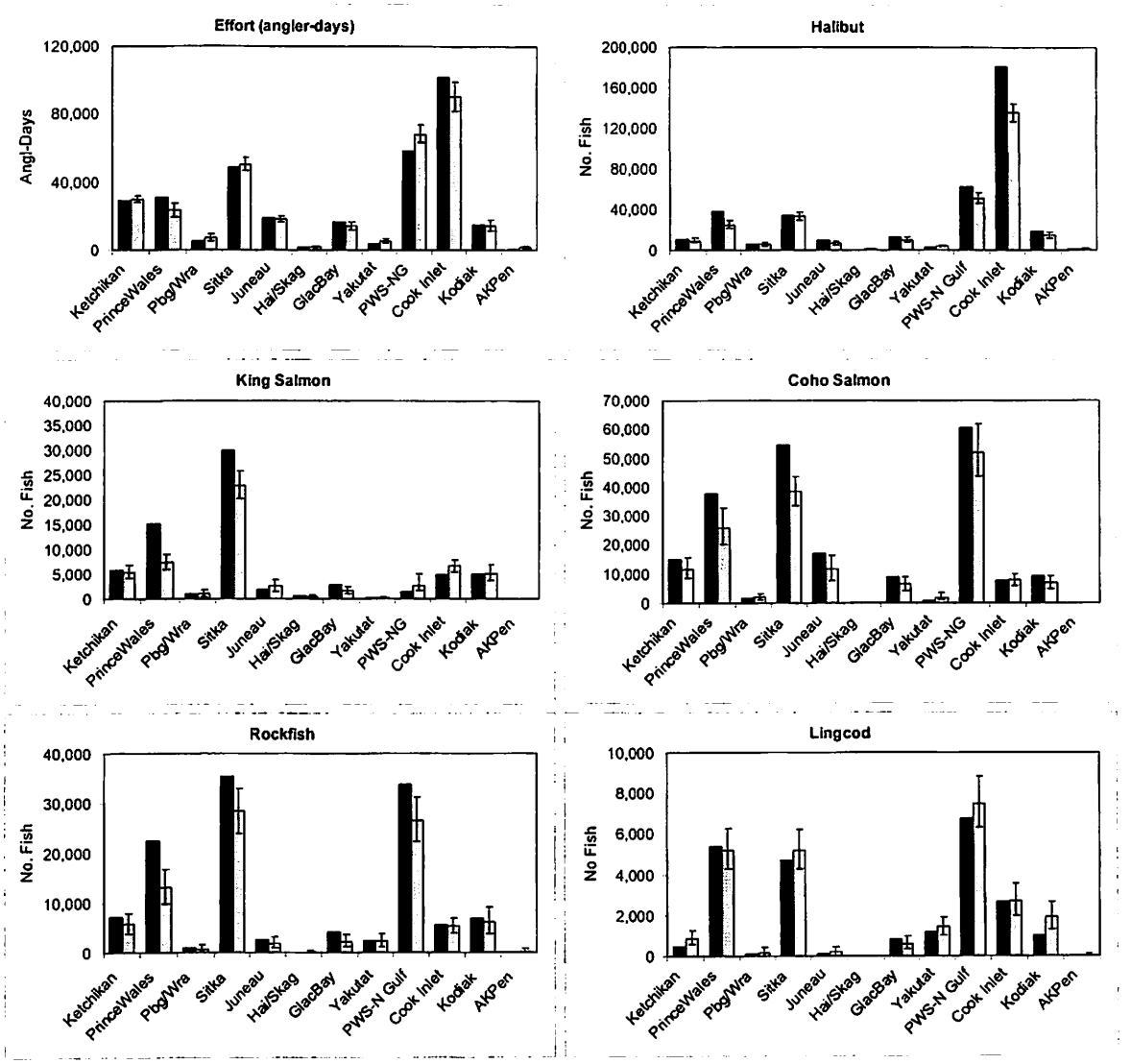

Figure 6. Comparison of 2006 logbook (dark bars) effort and harvest of halibut, king salmon, coho salmon, rockfish, and lingcod with corresponding estimates from the SWHS (light bars), by reporting area. Vertical bars represent 95% confidence intervals for SWHS estimates.

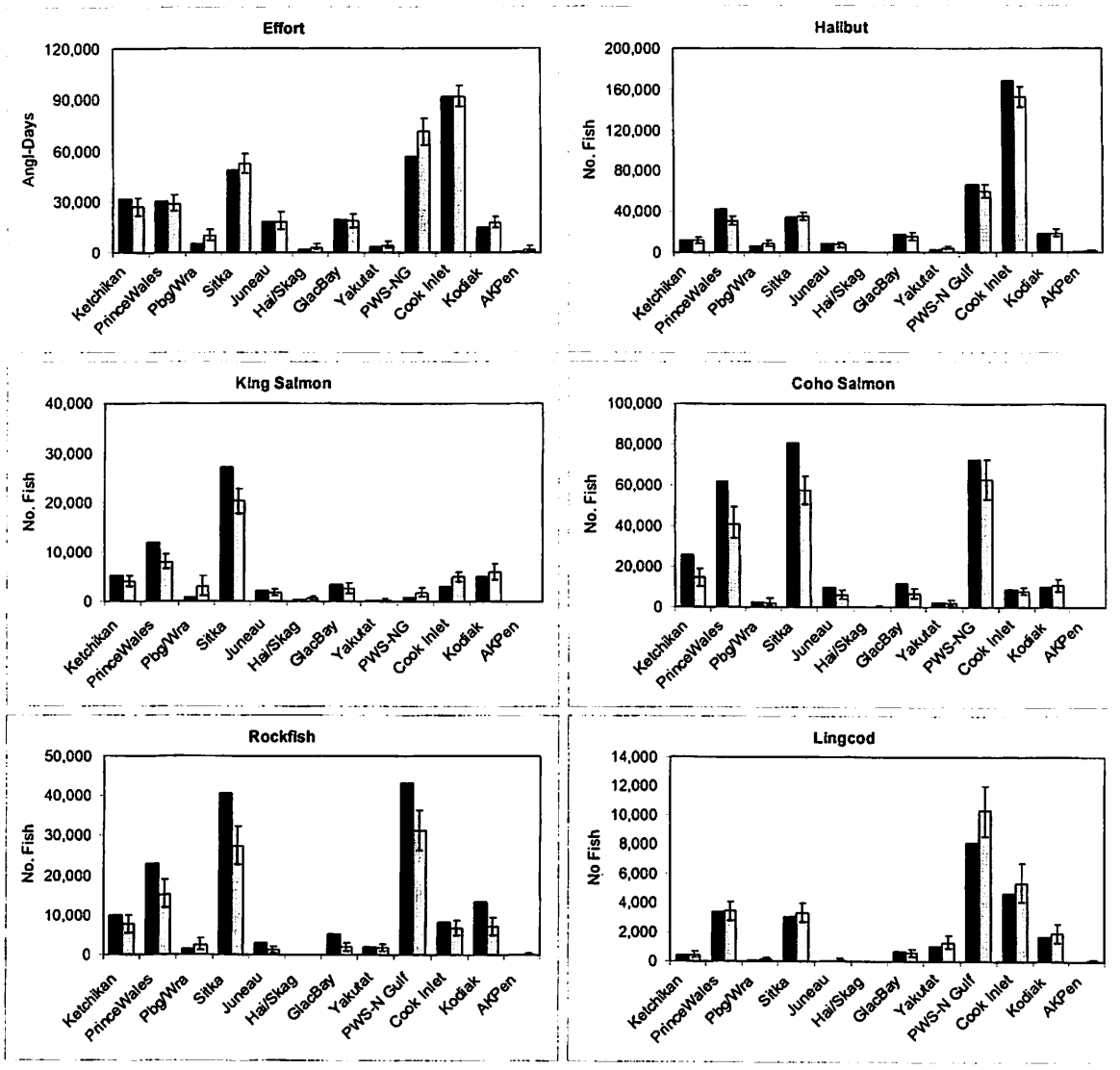

Figure 7. Comparison of 2007 logbook (dark bars) effort and harvest of halibut, king salmon, coho salmon, rockfish, and lingcod with corresponding estimates from the SWHS (light bars), by reporting area. Vertical bars represent 95% confidence intervals for SWHS estimates.

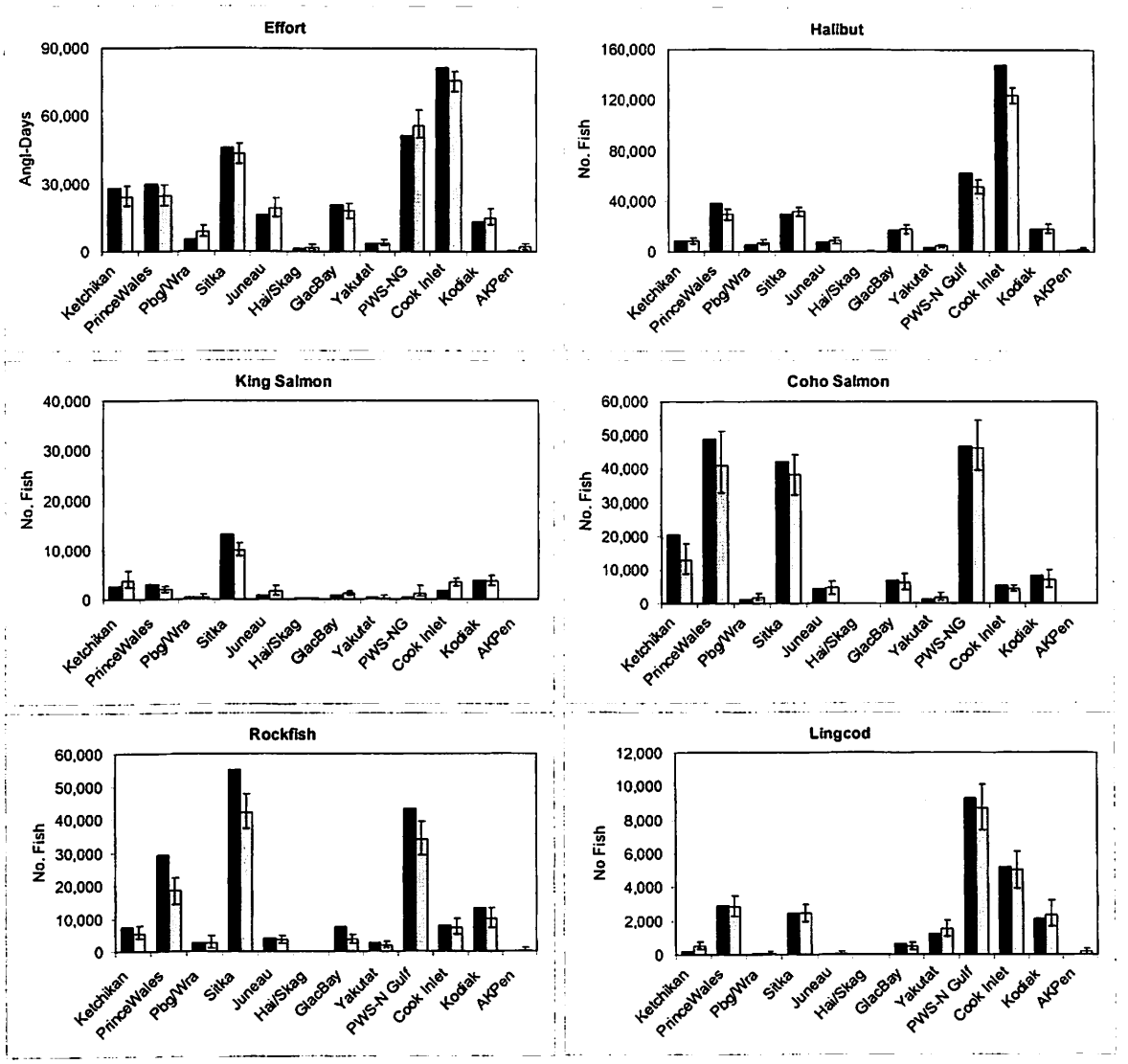

Figure 8. Comparison of 2008 logbook (dark bars) effort and harvest of halibut, king salmon, coho salmon, rockfish, and lingcod with corresponding estimates from the SWHS (light bars), by reporting area. Vertical bars represent 95% confidence intervals for SWHS estimates.

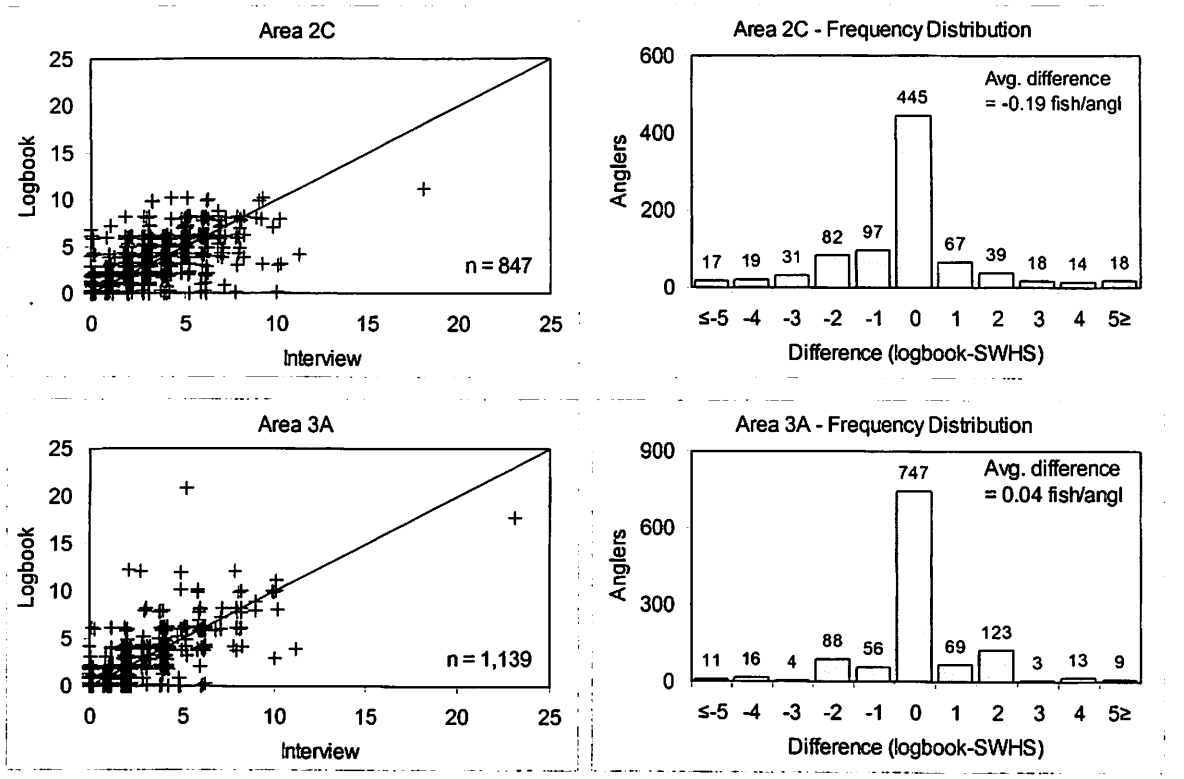

Figure 9. Comparisons of annual halibut harvest reported in ADF&G charter logbooks and in the SWHS for individual licensed anglers that fished in Areas 2C and 3A in 2008. The points in the x-y plots are jittered up to 0.25 from their true values to show overlapping observations. Diagonal lines in the x-y plots represent perfect agreement between the logbook and SWHS.

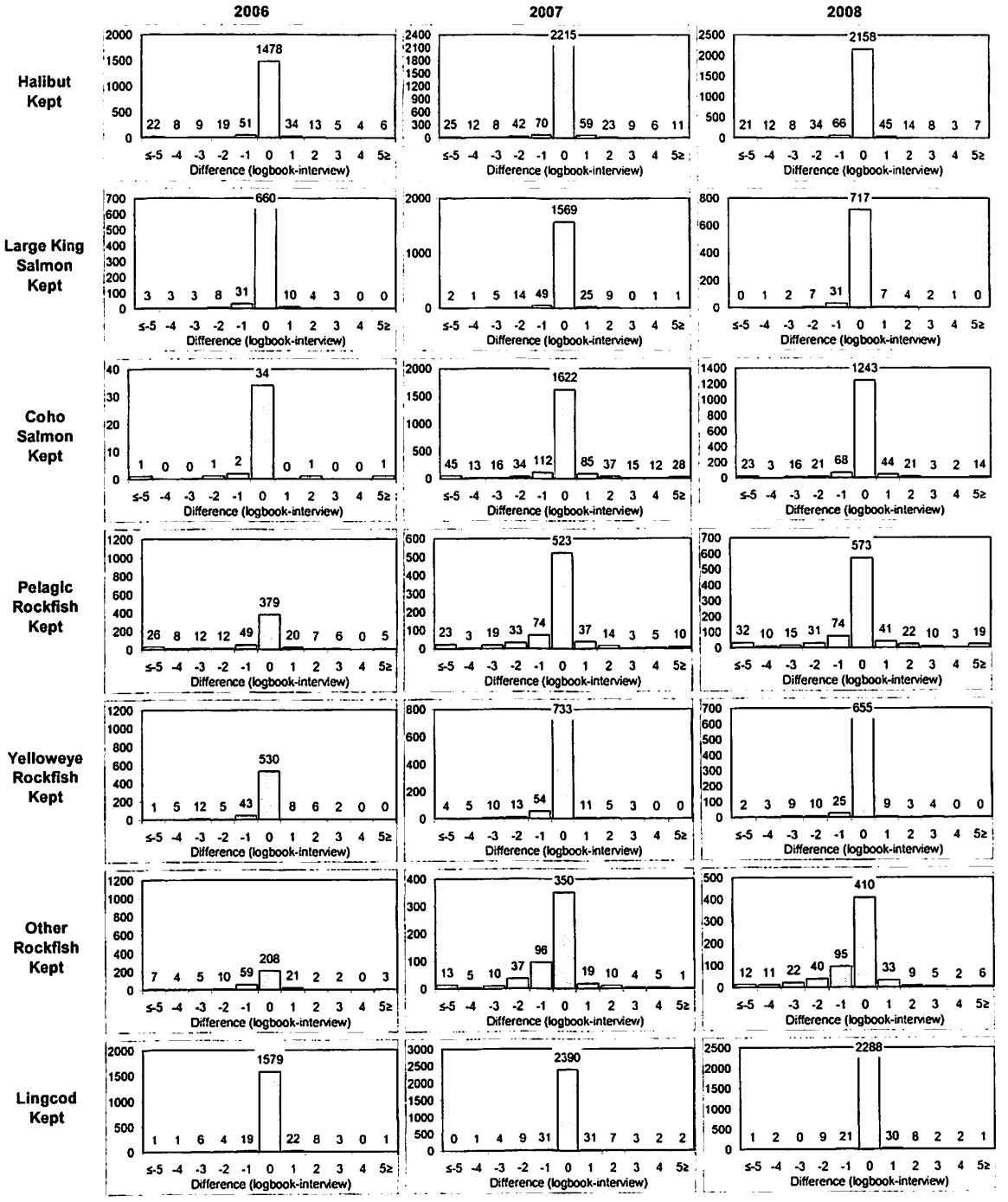

Figure 10. Frequency distributions of the differences in effort and harvest reported for single-day boat-trips between logbooks and verified creel survey interviews in Southeast Region, 2006-2008.

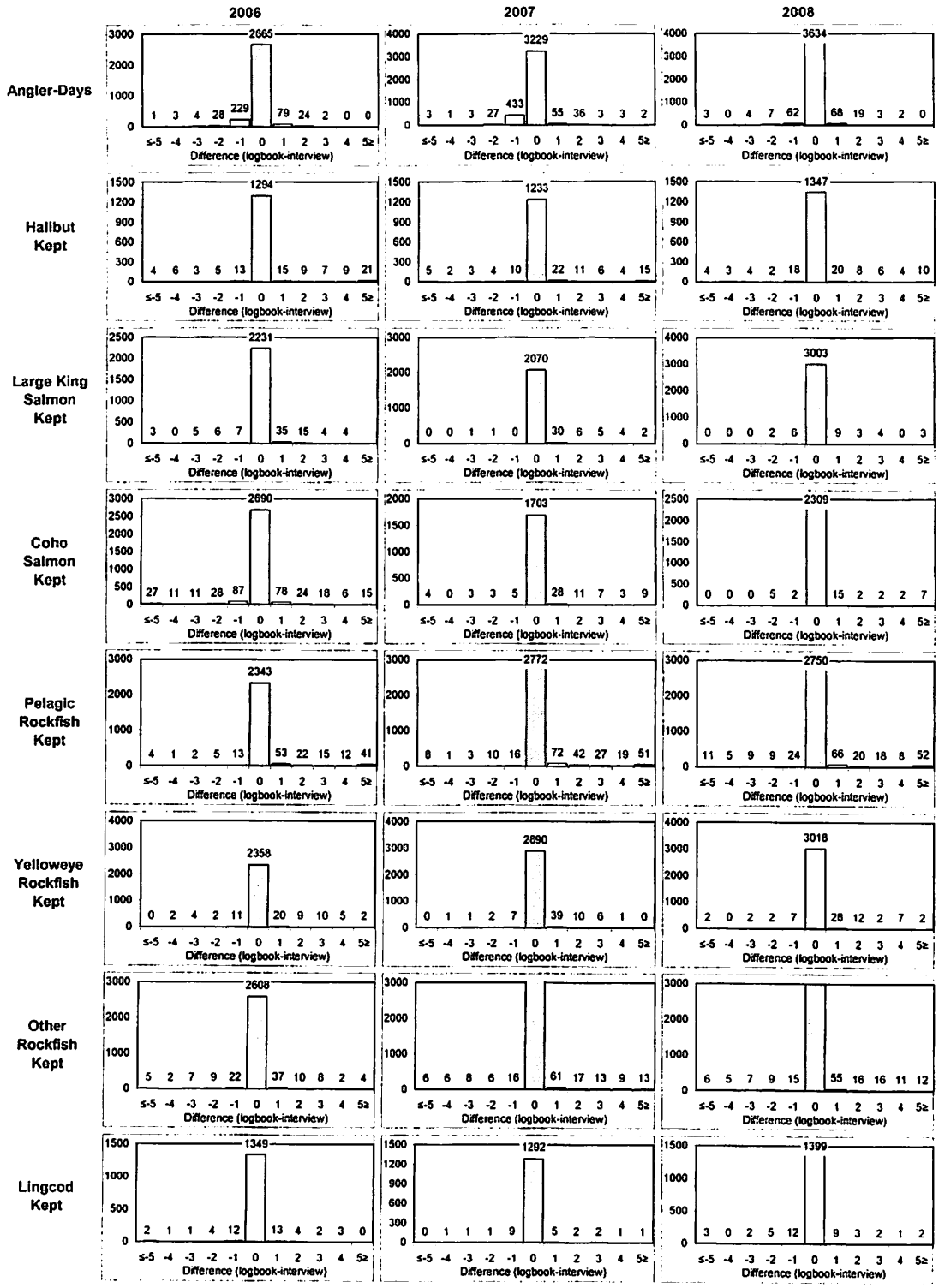

Figure 11. Frequency distributions of the differences in effort and harvest reported for single-day boat-trips between logbooks and unverified creel survey interviews in Southeast Region, 2006-2008.

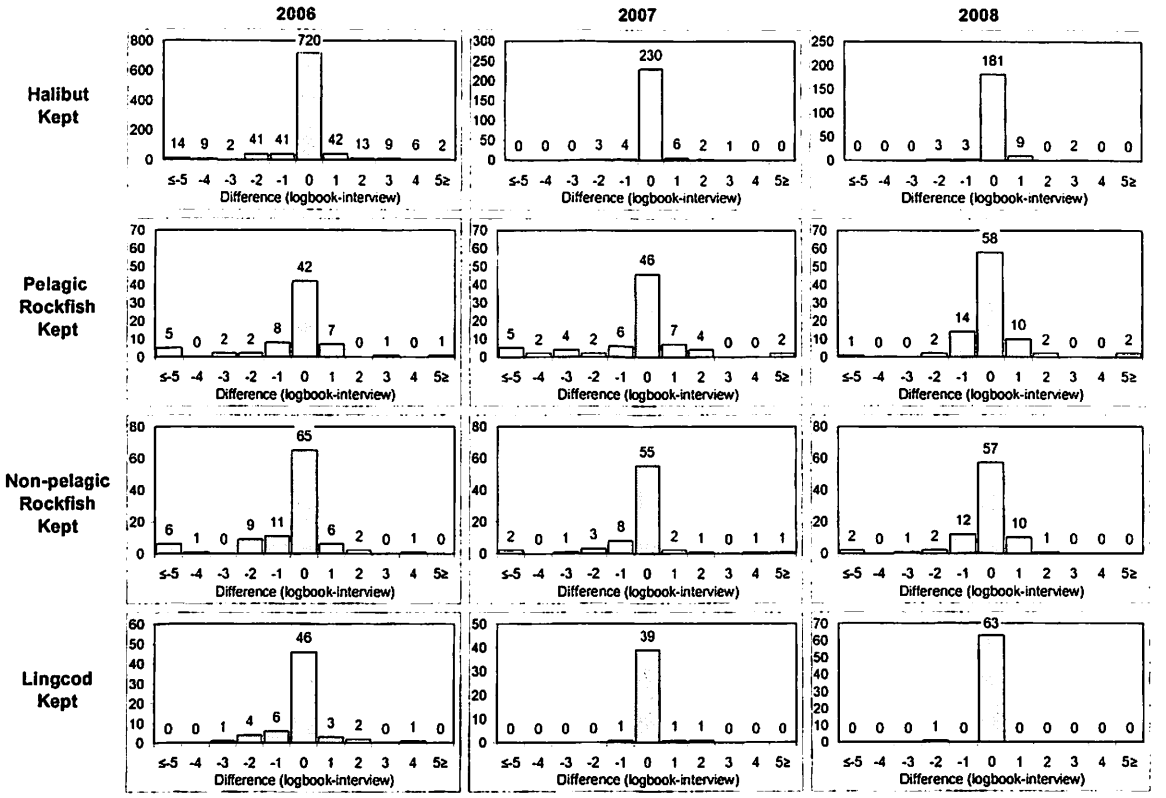

Figure 12. Frequency distributions of the differences in effort and harvest reported for single-day boat-trips between logbooks and verified creel survey interviews in Southcentral Region, 2006-2008.

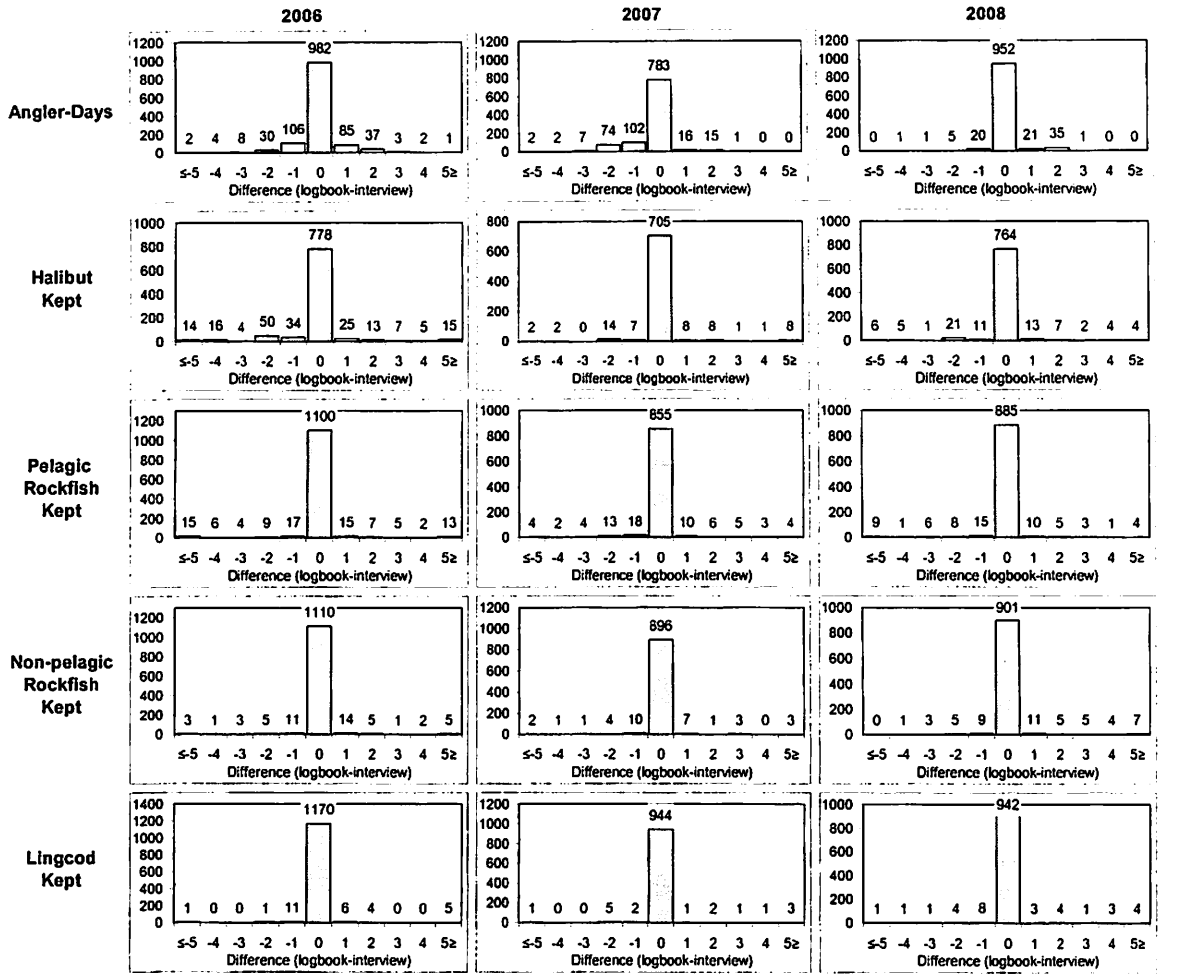

Figure 13. Frequency distributions of the differences in effort and harvest reported for single-day boat-trips between logbooks and unverified creel survey interviews in Southcentral Region, 2006-2008.

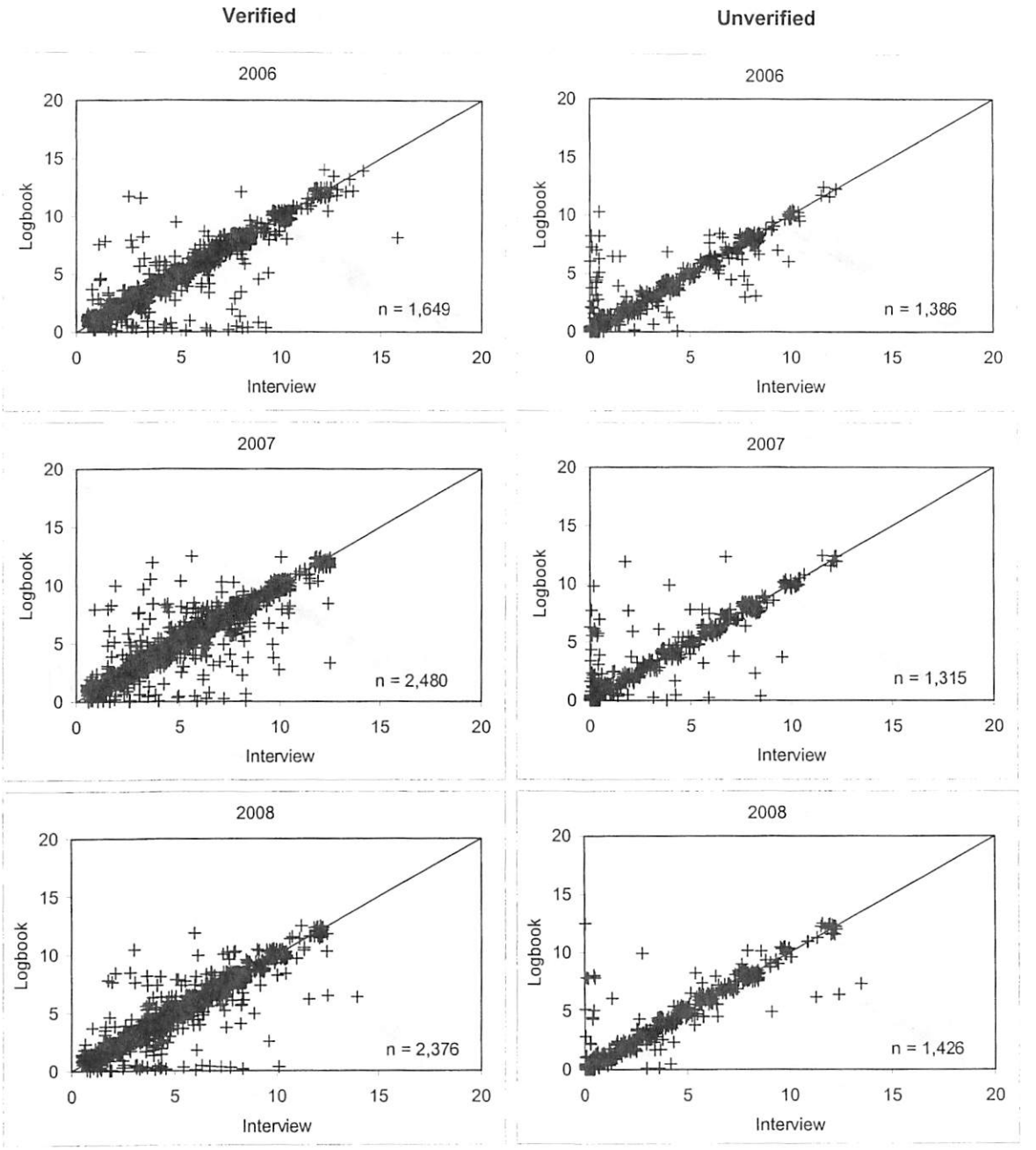

Figure 14. X-Y plots of numbers of halibut harvest reported in charter logbooks and ADF&G creel survey interviews for single-day boat trips in Southeast Alaska, 2006-2008. Data are shown for verified (left) and unverified (right) interviews. Plots are jittered to reveal overlapping observations.

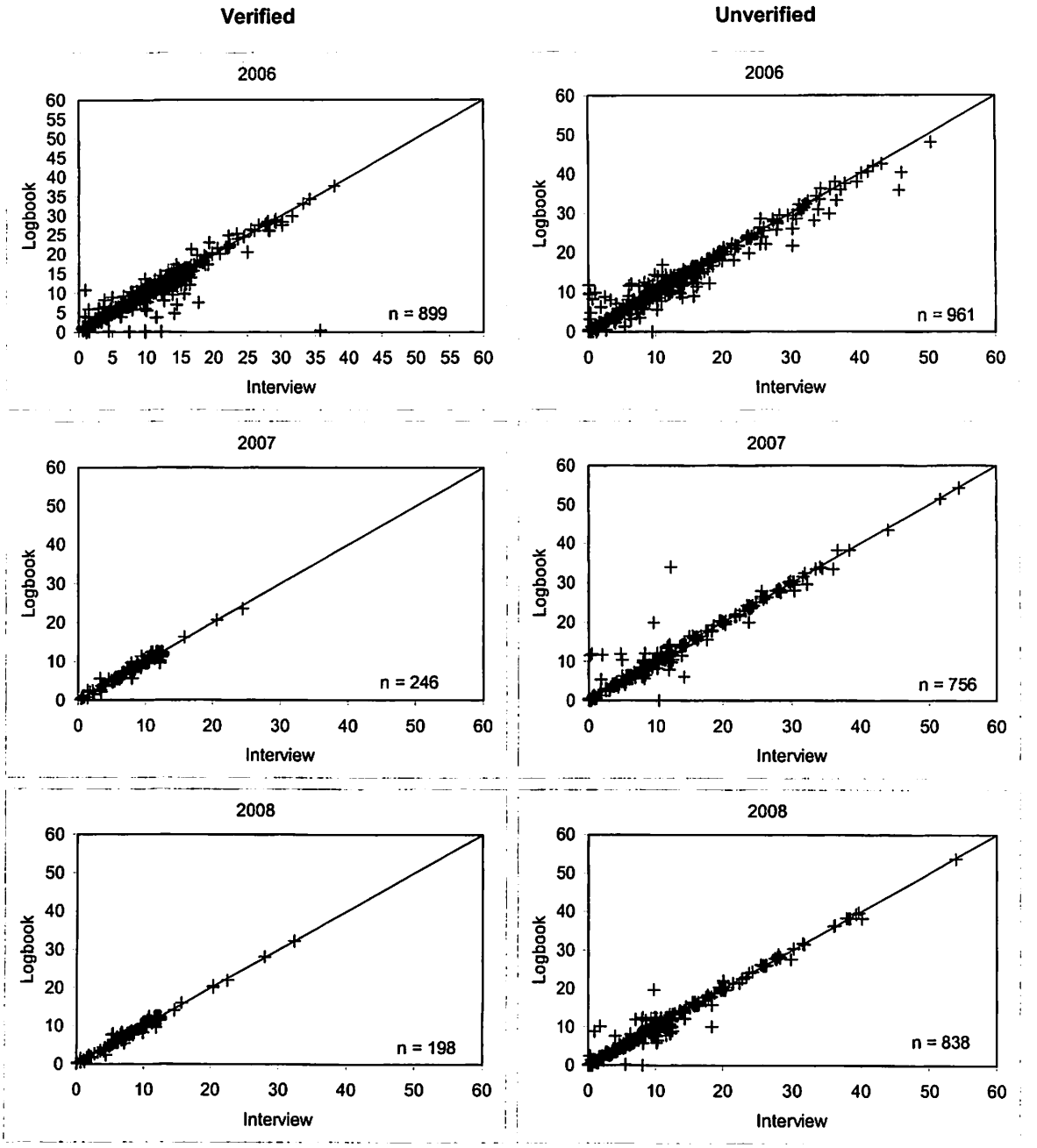

Figure 15. X-Y plots of numbers of halibut harvest reported in charter logbooks and ADF&G creel survey interviews for single-day boat trips in Southcentral Alaska, 2006-2008. Data are shown for verified (left) and unverified (right) interviews. Plots are jittered to reveal overlapping observations.

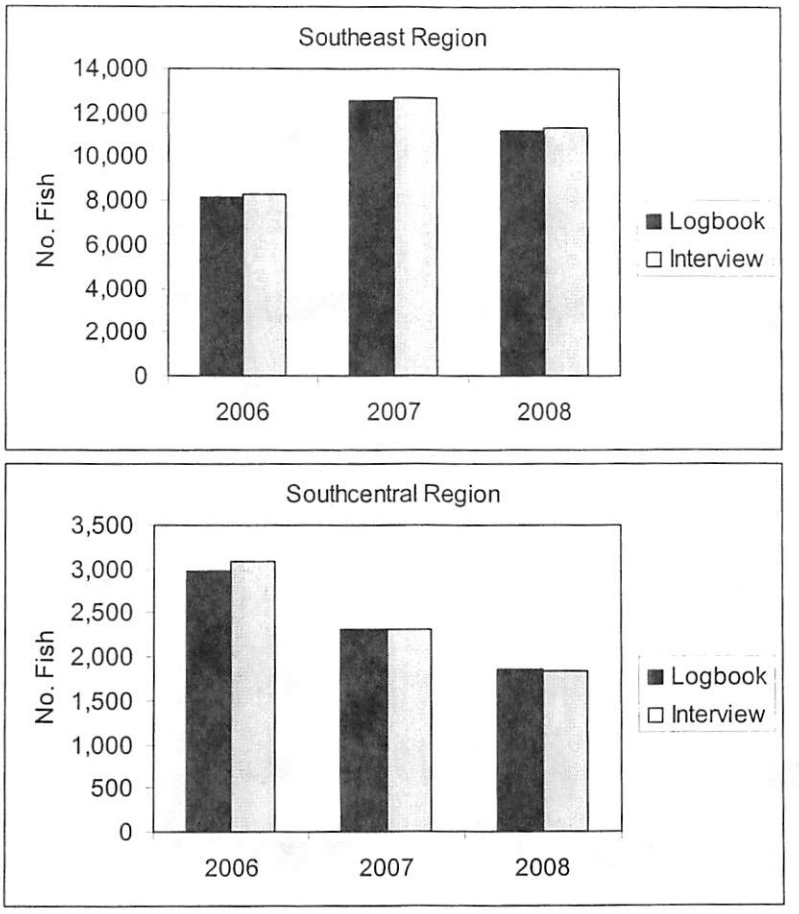

Figure 16. Comparison of total halibut harvest reported in charter logbooks and verified ADF&G creel survey interviews in Southeast and Southcentral Alaska, 2006-2008. The variation in numbers of fish from year to year reflects changes in the number of interviews where halibut harvest was verified, rather than changes in total harvest by the charter fleet.

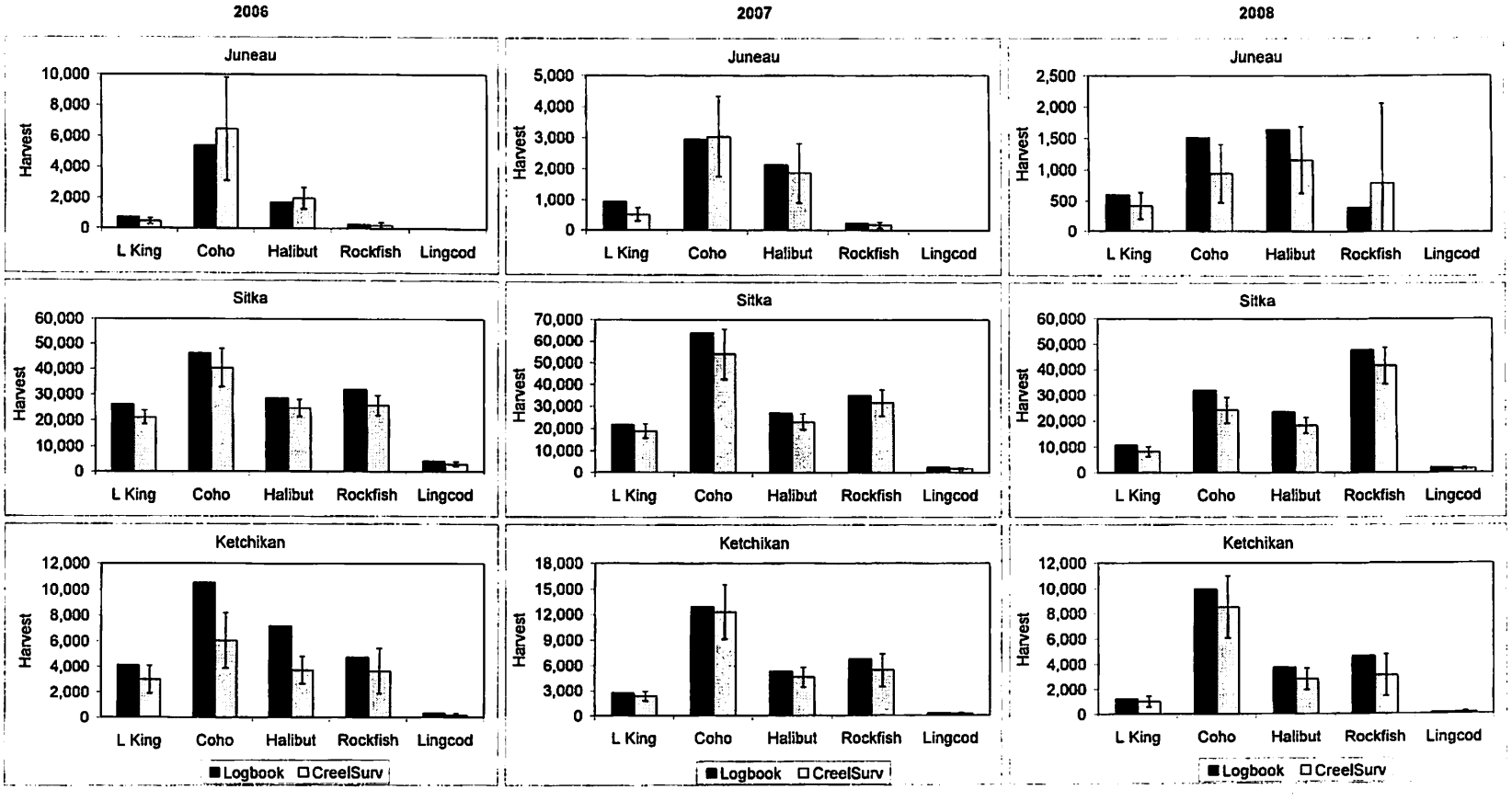

Figure 17. Comparison of 2006-2008 charter logbook and creel survey estimates of charter halibut harvest at Juneau, Sitka, and Ketchikan. Vertical bars represent 95% confidence intervals for SWHS estimates.

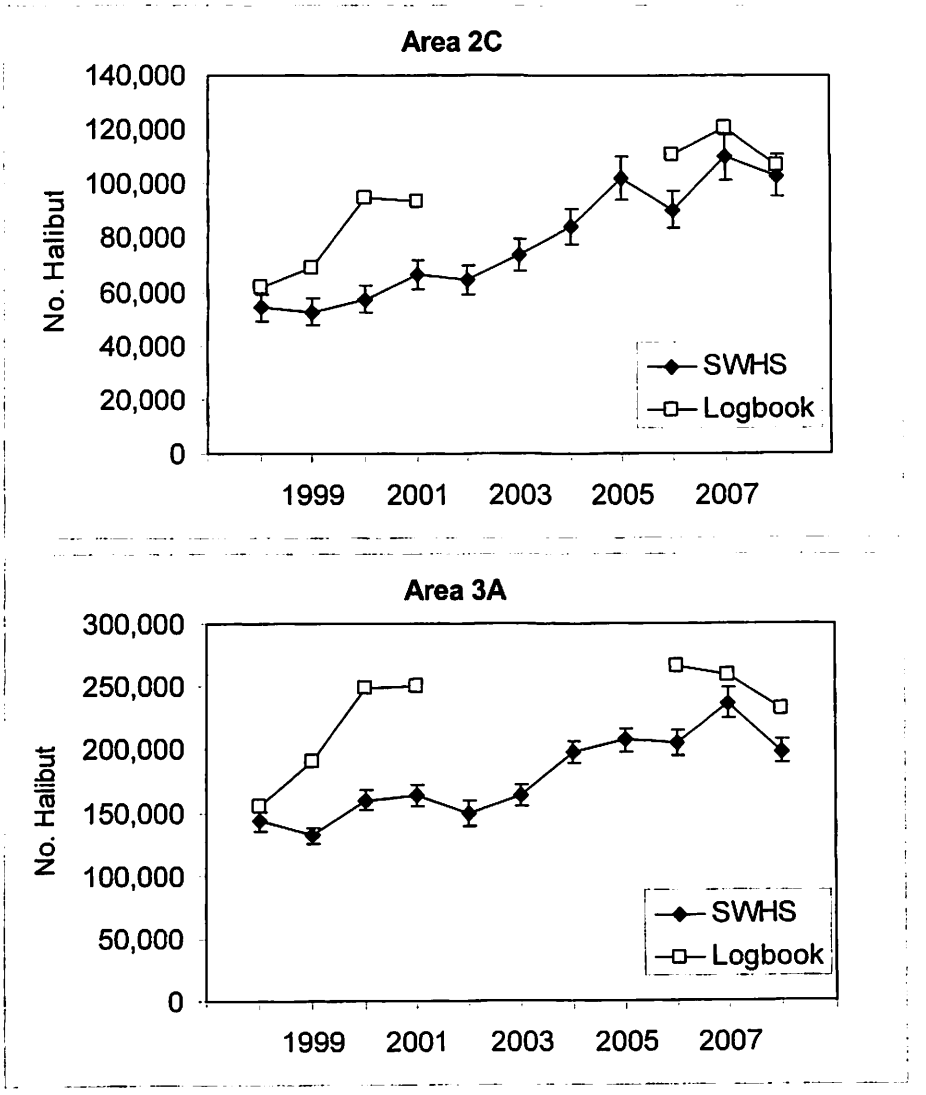

Figure 18. Comparison of numbers of halibut reported harvested in ADF&G charter logbooks with SWHS estimates, 1998-2008. Halibut data were not collected in logbooks from 2002 to 2005.

Table 1. Charter logbook reporting issues and errors, 2006-2008.

Reporting Issue or Error	Area 2C			Area 3A			Areas 3B, 4			Statewide (excluding unkn. areas)		
	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
No. records (=days)	38,289	38,774	36,629	27,274	28,237	25,271	110	141	105	65,673	67,152	62,005
Records received after printed due date	3,593	5,199	5,898	6,511	8,301	7,874	50	63	41	10,154	13,563	13,813
- Percent of records received after due date	9.38%	13.41%	16.10%	23.87%	29.40%	31.16%	45.45%	44.68%	39.05%	15.46%	20.20%	22.28%
Reported date fished was after date received	23	83	68	64	31	14	1	0	0	88	114	82
Invalid or unknown port	22	1	7	0	5	1	0	0	0	22	6	8
Invalid guide license number	1	4	0	3	7	0	0	0	0	4	11	0
Unknown angler type (res, nonres, crew)	1,912	537	599	1,096	615	445	10	0	0	3,018	1,152	1,044
Salmon stat area reported but salmon rods missing[a]	70	--	--	30	--	--	0	--	--	100	--	--
Salmon stat area reported but salmon hours missing	242	212	110	138	79	14	0	0	0	380	291	124
Salmon effort reported but no stat area provided	3	9	7	10	0	7	0	0	0	13	9	14
Invalid salmon stat area recorded	3	1	1	5	7	0	4	0	0	12	8	1
Bottomfish stat area reported but btmfish rods missing[a]	33	--	--	109	--	--	0	--	--	142	--	--
Bottomfish stat area reported but btmfish hours missing	117	139	116	375	343	98	3	3	3	495	485	217
Bottomfish effort reported but stat area missing	10	15	14	5	6	36	0	0	0	15	21	50
Invalid bottomfish stat area recorded	11	10	3	37	10	0	0	0	0	48	20	3
No rods reported for salmon or bottomfish[a]	40	--	--	33	--	--	0	--	--	73	--	--
No hours reported for salmon or bottomfish	230	210	146	129	61	25	0	0	0	359	271	171
No stat area reported for salmon or bottomfish	5	62	108	10	45	72	0	1	0	15	108	180
Records with lingcod harvest reported out of season	196	113	105	78	137	52	0	0	0	274	250	157
- Number of lingcod reported harvested out of season	225	132	126	101	172	54	0	0	0	326	304	180

[a] - no rod information collected in 2007 or 2008.

Table 2. Frequencies of angler license numbers (client and comp only) by the number of days fished reported in ADF&G charter logbooks, 2006-2008.

	Frequency of License Numbers by Year		
No. Days	2006	2007	2008
1	119,874	121,717	110,265
2	23,839	24,361	21,437
3	18,045	18,941	17,743
4	9,296	9,588	9,378
5	4,075	4,830	4,863
6	967	1,085	873
7	292	351	301
8	118	152	129
9	42	67	57
10+	126	119	91
	176,674	181,211	165,137

Table 3. Frequencies of angler license numbers (client, comp, and crew) by the number of halibut reported kept in ADF&G charter logbooks, 2006-2008. Percentages are rounded to the nearest 0.1%.

	2006		2007		2008	
Halibut Kept	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	54,755	30.7%	52,252	28.8%	48,241	29.2%
1-10	122,461	68.8%	128,661	70.9%	116,866	70.6%
11-20	447	0.3%	453	0.2%	299	0.2%
21-30	105	0.1%	17	<0.1%	30	<0.1%
31-40	75	<0.1%	4	<0.1%	3	<0.1%
41-50	55	<0.1%	4	<0.1%	6	<0.1%
51-60	44	<0.1%	0	0.0%	1	<0.1%
61-70	33	<0.1%	0	0.0%	0	0.0%
71-80	23	<0.1%	0	0.0%	1	<0.1%
81-90	16	<0.1%	0	0.0%	0	0.0%
91-100	19	<0.1%	0	0.0%	0	0.0%
101+	48	<0.1%	0	0.0%	0	0.0%
	178,081		181,391		165,447	

Table 4. Numbers of unlicensed youth angler-days reported in ADF&G charter logbooks, by IPHC area, 2007-2008.

	2007			2008		
IPHC Area	No. Youth Angler-days	Total Angler-days	% Youth	No. Youth Angler-days	Total Angler-days	% Youth
2C	8,290	155,020	5.3%	7,144	147,284	4.9%
3A	9,806	166,970	5.9%	7,991	149,896	5.3%
3B-4	18	525	3.4%	11	331	3.3%
	18,114	322,515	5.6%	15,146	297,511	5.1%

Table 5. Numbers of ADF&G charter logbook reports submitted on time and overdue, and percentages and cumulative percentages of late logbooks by week, 2006-2008.

No. Days Late	2006 n	2006 Percent Late	2006 Cumulative % Late	2007 n	2007 Percent Late	2007 Cumulative % Late	2008 n	2008 Percent Late	2008 Cumulative % Late
On time	55,519	0%	0%	53,589	0%	0%	48,192	0%	0%
1-7	5,817	57%	57%	8,490	63%	63%	7,841	57%	57%
8-14	1,632	16%	73%	2,219	16%	79%	2,413	17%	74%
15-21	777	8%	81%	1,017	7%	86%	1,121	8%	82%
22-28	651	6%	87%	638	5%	91%	819	6%	88%
29-35	288	3%	90%	367	3%	94%	461	3%	92%
36-42	177	2%	92%	245	2%	96%	290	2%	94%
43-49	122	1%	93%	148	1%	97%	223	2%	95%
50-56	102	1%	94%	91	1%	97%	145	1%	96%
57+	586	6%	100%	348	3%	100%	501	4%	100%
	65,671			67,152			62,006		

Table 6. Frequencies of businesses by the percentage of their ADF&G charter logbook pages submitted late, 2007-2008.

Percentage of Pages Late	Number of Businesses 2007	Number of Businesses 2008
0	189	196
>0 - 10%	195	170
>10 - 20%	152	126
>20 - 30%	97	100
>30 - 40%	83	85
>40 - 50%	53	42
>50 - 60%	36	51
>60 - 70%	33	36
>70 - 80%	16	18
>80 - 90%	21	19
>90 - <100%	7	12
100%	29	23
	911	878

Table 7. Numbers and percentages of anglers that responded to the ADF&G end-of-season survey and reported whether they took a charter trip during the period June 1 – July 31. Results are shown for trips reported in logbooks of monitored (Mon) and unmonitored (Unmon) charter boats.

Response	2006			2007			2008		
	Mon	Unmon	Total	Mon	Unmon	Total	Mon	Unmon	Total
Reported no trip	326	117	443	238	241	479	112	189	301
Confirmed trip	4,703	1,366	6,069	3,857	3,438	7,295	3,447	3,933	7,380
Total	5,029	1,483	6,512	4,095	3,679	7,774	3,559	4,122	7,681
Percent reported no trip:	6.5%	7.9%	6.8%	5.8%	6.6%	6.2%	3.1%	4.6%	3.9%

Table 8. Numbers and percentages of anglers that responded to the ADF&G end-of-season survey and reported whether they took a charter trip during the period June 1 – July 31. Results are shown by IPHC area.

Year	Response	IPHC area			Total
		2C	3A	3B-4	
2006	Reported No Trip	92	350	2	443
	Confirmed trip	2,170	3,889	9	6,069
	Total	2,262	4,239	11	6,512
	Percent reported no trip	4.1%	8.3%	18.2%	6.8%
2007	Reported No Trip	124	352	3	479
	Confirmed trip	2,932	4,346	17	7,295
	Total	3,056	4,698	20	7,774
	Percent reported no trip	4.1%	7.5%	15.0%	6.2%
2008	Reported No Trip	98	199	4	301
	Confirmed trip	2,909	4,462	9	7,380
	Total	3,007	4,661	13	7,681
	Percent reported no trip	3.3%	4.3%	30.8%	3.9%

Table 9. Percentage agreement between ADF&G charter logbooks and the end-of-season survey in reported numbers of halibut, king salmon, and rockfish kept by individual anglers. Results are shown for trips on monitored and unmonitored vessels in IPHC areas 2C and 3A, 2006-2008.

				Percent Agreement by Species		
IPHC Area	Year	Monitored Category	No. Trips Compared	Halibut	King Salmon	Rockfish
Area 2C	2006	Monitored	1,386	72%	70%	74%
		Unmonitored	784	51%	67%	67%
		Total	2,170	65%	69%	72%
	2007	Monitored	1,185	71%	70%	73%
		Unmonitored	1,709	57%	67%	72%
		Total	2,894	63%	68%	72%
	2008	Monitored	1,130	74%	83%	70%
		Unmonitored	1,763	63%	85%	72%
		Total	2,893	67%	84%	71%
Area 3A	2006	Monitored	3,316	78%	92%	87%
		Unmonitored	573	66%	89%	84%
		Total	3,889	76%	92%	87%
	2007	Monitored	2,656	80%	92%	85%
		Unmonitored	1,666	69%	90%	78%
		Total	4,322	75%	92%	82%
	2008	Monitored	2,298	79%	95%	84%
		Unmonitored	2,129	76%	94%	83%
		Total	4,427	77%	94%	84%

Table 10. Comparison of logbook and SWHS estimates of charter effort (angler-days) and harvest of halibut, king salmon, coho salmon, rockfish, and lingcod (in numbers of fish) in IPHC areas 2C and 3A, 2006-2008.

		Area 2C			Area 3A		
Estimate	Year	Logbook	SWHS	Logbook Percent Difference	Logbook	SWHS	Logbook Percent Difference
Angler-days	2006	150,991	144,172	5%	178,832	178,200	0%
	2007	155,020	157,910	-2%	166,970	185,343	-10%
	2008	147,284	139,874	5%	149,896	150,431	0%
Halibut	2006	111,054	90,471	23%	265,801	204,115	30%
	2007	120,535	109,835	10%	258,274	236,133	9%
	2008	107,138	102,965	4%	232,130	198,108	17%
King	2006	57,337	41,107	39%	11,370	14,442	-21%
	2007	51,122	40,445	26%	9,047	12,837	-30%
	2008	20,911	19,041	10%	6,256	8,467	-26%
Coho	2006	135,173	96,273	40%	78,010	68,360	14%
	2007	193,091	127,531	51%	94,164	83,329	13%
	2008	124,042	104,743	18%	61,710	59,596	4%
Rockfish	2006	73,045	51,847	41%	48,807	40,306	21%
	2007	82,833	56,024	48%	66,917	47,057	42%
	2008	105,618	76,008	39%	66,817	52,727	27%
Lingcod	2006	11,575	12,237	-5%	11,595	13,542	-14%
	2007	7,609	8,008	-5%	15,574	18,880	-18%
	2008	6,288	6,394	-2%	17,777	17,525	1%

Table 11. Sample sizes (n), and minimum, maximum, and average differences between numbers of anglers and fish reported harvested in logbooks and verified and unverified onsite interviews in Southeast Alaska, 2006-2008. Differences are calculated as the logbook value minus the interview value, and the unit of measurement is number of angler-days (effort) or fish (harvest) per boat-trip.

		Verified			Unverified		
Subject	Measure	2006	2007	2008	2006	2007	2008
Effort[a]	n	--	--	--	3,035	3,795	3,802
	Min	--	--	--	-5	-5	-5
	Max	--	--	--	3	5	4
	Average	--	--	--	-0.06	-0.09	0.01
Halibut	n	1,649	2,480	2,376	1,386	1,315	1,426
	Min	-9	-10	-10	-12	-8	-18
	Max	9	8	7	10	10	12
	Average	-0.09	-0.07	-0.08	0.11	0.08	0.05
Large king salmon	n	725	1,676	772	2,310	2,119	3,030
	Min	-6	-5	-4	-5	-3	-2
	Max	3	9	4	4	11	10
	Average	-0.08	-0.03	-0.04	0.02	0.04	0.01
Coho salmon	n	40	2,019	1,458	2,995	1,776	2,344
	Min	-6	-24	-13	-19	-6	-2
	Max	9	20	27	20	24	11
	Average	0.03	-0.12	-0.05	-0.03	0.09	0.03
Pelagic rockfish	n	524	744	830	2,511	3,021	2,972
	Min	-20	-25	-20	-12	-20	-21
	Max	19	19	16	25	20	25
	Average	-0.53	-0.28	-0.3	0.21	0.23	0.19
Yelloweye rockfish	n	612	838	720	2,423	2,957	3,082
	Min	-9	-8	-6	-4	-4	-9
	Max	3	3	3	6	4	6
	Average	-0.15	-0.15	-0.09	0.03	0.02	0.02
Other rockfish	n	321	550	645	2,714	3,245	3,157
	Min	-9	-11	-20	-10	-16	-25
	Max	15	5	21	12	12	23
	Average	-0.3	-0.44	-0.39	0.01	0.04	0.04
Lingcod	n	1,644	2,480	2,364	1,391	1,315	1,438
	Min	-5	-4	-5	-5	-4	-10
	Max	5	12	12	4	6	7
	Average	0	0.01	0.01	0	0.01	-0.01

[a] – effort data was not verifiable.

Table 12. Sample sizes (n), and minimum, maximum, and average differences between numbers of anglers and fish reported harvested in logbooks and verified and unverified onsite interviews in Southcentral Alaska, 2006-2008. Differences are calculated as the logbook value minus the interview value, and the unit of measurement is number of angler-days (effort) or fish (harvest) per boat-trip.

		Verified			Unverified		
Subject	Measure	2006	2007	2008	2006	2007	2008
Effort[a]	n	--	--	--	1,260	1,002	1,036
	Min	--	--	--	-7	-6	-4
	Max	--	--	--	5	3	3
	Average	--	--	--	-0.03	-0.24	0.06
Halibut	n	899	246	198	961	756	838
	Min	-35	-2	-2	-14	-10	-12
	Max	10	3	3	12	22	10
	Average	-0.2069	0.01	0.03	-0.12	0.08	-0.06
Pelagic rockfish	n	68	78	89	1,193	924	947
	Min	-50	-15	-7	-27	-10	-42
	Max	10	9	5	30	23	8
	Average	-1.06	-0.69	-0.01	-0.04	-0.01	-0.13
Non-pelagic rockfish	n	101	74	85	1,160	928	951
	Min	-13	-7	-9	-6	-5	-4
	Max	4	12	2	27	15	49
	Average	-0.69	-0.14	-0.26	0.05	0.01	0.14
Lingcod	n	63	42	64	1,198	960	972
	Min	-3	-1	-2	-6	-5	-7
	Max	4	2	0	10	14	8
	Average	-0.1	0.05	-0.03	0.03	0.02	0.02

[a] – effort data was not verifiable.