

Evaluation of the 2006 ADF&G Charter Logbook

Scott Meyer, Robert Powers, Allen Bingham, Michael Jaenicke, Robert Clark,
Kathrin Sundet, and Dora Sigurdsson
Alaska Department of Fish and Game, Division of Sport Fish, Anchorage
March 24, 2008

Background

The ADF&G Division of Sport Fish initiated a mandatory charter boat logbook program in 1998. The Board of Fisheries adopted 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 vessels and businesses. Information on the amounts and locations of charter activity were needed by the Board of Fisheries for allocation and management of Chinook salmon, rockfish, and lingcod, and by the North Pacific Fisheries Management Council for allocation of halibut.

Since 1998, the logbook design has undergone annual revisions, driven primarily by changes or improvements in the collection of halibut and rockfish data. Halibut data were collected each year during the period 1998-2001, but dropped during the period 2002-2005.

The department was concerned about the quality of self-reported information, especially halibut data collected during a time in which the North Pacific Fishery Management Council was considering incorporating 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. This evaluation compared estimates of halibut, Chinook salmon, coho salmon, rockfish, and lingcod from the Statewide Harvest Survey (SWHS) 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 generally higher than those estimated by the SWHS in both IPHC areas 2C and 3A. Results of comparisons between logbook data and SWHS harvest estimates for other species were variable. Reported logbook harvests of chinook 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 generally agreed with 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 the charter fleet into the existing IFQ system. The reporting requirement was dropped because the NPFMC had determined that initial allocation of quota share would be based on 1998-1999 logbook data, and that the ADF&G logbook could not be used to track IFQ harvest. Federal halibut agencies indicated clearly that they would develop a separate, possibly electronic, reporting system. The department did not favor continued collection of questionable data for a fishery for which it had no management authority. No halibut information was collected in the logbook from 2002 through 2005.

The NPFMC rescinded the IFQ motion in December 2005. At the 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 to improve the quality of logbook data collected in 2006 included:

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. Logbooks have always been required to be completed at the end of a trip, but the deadline for submission in 2005 was October 15 for trips made before September 30 and January 15, 2006 for trips made after September.
3. The logbook data entry staff dramatically increased outreach efforts. The department placed 3,011 phone calls to charter operators to correct logbook data that was recorded improperly, or to request missing data. These calls were intended to improve the data quality and reinforce the idea that the logbook data were important and were being closely scrutinized. In addition, numerous calls were made by charter operators to request clarification of procedures for recording logbook data.
4. Area fishery managers and creel survey and port sampling staff were directed to conduct 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. Whenever possible, creel survey staff in Southeast Alaska and port samplers in Southcentral Alaska began directly counting numbers of halibut and other species harvested when 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). 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 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 was sent to a random sample of 16,000 charter clients whose license numbers were listed in the 2006 charter logbook. The primary purpose of the post card questionnaire was to establish whether information collected from vessels that were observed by creel survey technicians was similar to information from unobserved vessels. Anglers were asked whether they fished on a charter boat in 2006, and if so, were asked to provide the numbers of halibut, king salmon, rockfish, and other fish kept and released. Surveyed anglers were asked to report only those fish they personally kept and released.

Many of the measures that were implemented in 2006 were continued in 2007 and will be implemented in 2008 with the goal of ensuring integrity in the logbook data. The number of courtesy logbook inspections by creel survey and management staff was much lower in 2007 because the logbook design was so similar to the 2006 logbook. In addition, the roving tech position was deleted from the Southcentral Alaska program after 2006 because the data were not substantially different from data obtained by other port samplers.

Objectives

Following completion of 2006 logbook data entry, the department began an evaluation of the quality and reliability of the logbook data. This report summarizes the major facets of that evaluation. The goal of the evaluation was to utilize a number of data analyses and comparisons in order to make a recommendation concerning the use of logbooks as a reporting mechanism for the charter fishery.

The analyses and comparisons undertaken in this evaluation were as follows:

1. Examination of overall data quantity and quality as indicated by the frequency of late, missing, and misreported data.
2. Comparisons of participation and harvest reported in logbooks for individual anglers with mail questionnaires sent post-season to a random sample of charter clients on observed and unobserved vessels (end-of-season survey).
3. Comparison of reported logbook harvests to harvest estimates from the SWHS for Pacific halibut, Chinook salmon, coho salmon, rockfish (all species combined), and lingcod.
4. Comparisons of reported logbook effort and harvest by boat trip to verified and unverified counts of anglers and harvested fish from on-site interviews obtained through creel surveys in Southeast Alaska and port sampling in Southcentral Alaska. This included comparisons with “roving tech” data.
5. Comparisons of reported logbook harvest to creel survey estimates for Ketchikan, Juneau, and Sitka, 2006.

Comparisons of logbook data with SWHS estimates (number 3 above) also raised questions regarding the SWHS study design and methods of data handling. One question that loomed following previous comparison of logbook data and SWHS estimates was whether the procedure used to estimate charter harvest was biased (and that the overall harvest estimate was accurate). The SWHS estimates are obtained using approximately equal numbers of two different survey questionnaires, a standard questionnaire and a “supplemental” questionnaire. The standard survey only requests that catch and participation information be separated into charter and non-charter categories in Area P, or Cook Inlet. The supplemental survey questionnaire requests this breakdown in all areas of the state. All charter responses are combined to estimate the charter harvest in Area P. In all other areas of the state, the charter proportion of harvest is estimated from the supplemental survey, and this proportion is applied to all survey responses. To examine the potential bias in this estimation procedure, charter harvest for Area P was re-estimated for the past three years (2004-2006) using the method used in all other areas, and these were compared to the final estimates already produced.

Another possible concern was that editing of SWHS responses to conform to existing bag limits might bias the harvest estimates. Specifically, responses that include reported harvest that exceeds the daily bag limit are routinely edited to the bag limit, if the difference is small. If the difference is large, the decision of whether to edit is done in consultation with area management staff. All 2006 harvest estimates from the SWHS were re-computed using the raw responses to explore the effect of the bag limit edits.

ADF&G will continue monitoring of logbooks for timely submission, completeness, and accuracy in the coming years. We will also continue to compare logbooks, the SWHS, end-of-season surveys, and onsite creel surveys to investigate the consistency of differences in estimates and evaluate the utility of logbooks to estimate removals by the charter fleet. We are also scrutinizing certain aspects of the SWHS to look for potential sources of bias in estimation of charter harvest.

Throughout this report, data will be summarized either by IPHC Regulatory Area (Figure 1), or by SWHS reporting areas (Figure 2).

Results

Overall Data Quantity and Quality

Over 2,600 logbooks were issued, each containing 50 pages upon which to record charter trip data. Of these, 2,122 logbooks were actually used (at least one page submitted). Logbooks were submitted for 65,575 charter trips in Areas 2C and 3A in 2006; 38,289 trips were logged in Area 2C and 27,286 trips were logged in Area 3A (Table 1). These trips encompassed 150,991 angler-days of fishing effort in Area 2C and 178,857 angler-days in Area 3A. Reported charter halibut harvests were 111,054 fish in Area 2C and 265,533 fish in Area 3A.

A number of common reporting issues or errors were examined. Some of these checks were implemented for the first time in 2006, and by 2007 were incorporated into checking of data at the time of data entry. The most frequent issue was logbooks received after the due date. For trips made between April 1 and October 1, 2006, the due date was at least 8 days after the last day fished each week. Due dates were printed inside the front cover of each logbook. In Area 2C, 3,593 of 38,289 logbook pages (9%) were received after the due date (Table 2). In Area 3A, 6,475 of 27,286 logbook pages (24%) were received after the due date. The delinquency rate varied considerably by SWHS area, from a low of 4% in the Petersburg/Wrangell area to a high of 29% in the North Gulf Coast area (Seward).

Because the logbook submission requirement was changed from a seasonal to weekly requirement, we also examined the degree of lateness for logbook pages returned after the deadline. Fifty-seven percent of late logbooks were received or postmarked within 7 days of the deadline, and an additional 16% were received or postmarked within 14 days (Table 3). Ninety percent of late logbooks were submitted within 35 days of the published deadline. At the extreme, four logbook pages were submitted 203 days after the deadline. The department encouraged timely submission but recognized circumstances sometimes warranted late logbook submission. Staff contacted operators that submitted logbooks more than three weeks late, and repeat offenders were subject to review by Alaska Wildlife Troopers. Logbook data submitted after the January 15 deadline were automatically forwarded to the Alaska Wildlife Troopers unless the operator provided an acceptable justification.

Eighty-eight logbook pages were received for which the reported date fished was after the date the logbook was received by ADF&G (Table 2). These were likely date recording errors by the operators or date stamp errors by ADF&G.

The most common omissions or errors included failure to record the angler type, various types of missing effort or location information, recording of invalid stat areas, recording invalid guide license numbers, and recording lingcod harvest during the closed season (Table 2). While the numbers of records with reporting omissions or errors may seem high, the percentages of affected records are relatively low. Much higher rates of reporting errors were documented in Area 3A logbook data for the years 1998-2004 (internal ADF&G memo). The lower rates of reporting errors in 2006 were probably a result of the courtesy logbook checks in the field and increased telephone outreach by the logbook data entry staff.

There were no missing ports in the 2006 data. In contrast, an average of 4.5% of Area 3A records was missing the port of landing during the years 1998-2004. Charter operators sometimes failed to designate angler type (whether anglers were residents, nonresidents, or crew). Recording angler type may have been a point of confusion among some operators because the residency and crew designations were not mutually exclusive. Angler type was still undetermined, after editing using license file data, for 1,912 anglers in Area 2C (1.3%) and 1,096 anglers in Area 3A (0.6%). This particular error was not only infrequent, but also did not affect reported harvest of any species.

The most common error in effort reporting was failure to record any hours fished for either salmon or bottomfish. Hours of fishing effort were missing for 442 trips in Area 2C (1.1%) and 401 trips in Area 3A (1.5%). In comparison, hours of effort were missing for an average of 6.8% of the Area 3A records in the 1998-2004 logbooks. The number of rods used were missing for only 115 trips in Area 2C (0.3%) and 236 trips in Area 3A (0.9%), compared with an average 3.6% of the 1998-2004 Area 3A records. The 274 records with lingcod reported harvested during closed seasons represented a potential illegal harvest of 326 fish, but other possible explanations include released fish being recorded in the "kept" column of the logbook, other species (such as Pacific cod) being recorded in the lingcod column, or misreporting of the date. The frequencies of other errors were all quite low, ranging from virtually zero to less than 1% each.

We attempted to detect falsification of angler-days by examining the frequency with which client angler license numbers were reported. The premise for this analysis was that most people do not typically hire a charter boat more than a few times per year. We examined the frequency of reported license numbers, excluding crew, but did not find any conclusive evidence of widespread fabrication of fishing license

numbers (angler trips). A total of 176,427 unique license numbers was reported in logbooks. Over 99.1% of fishing license numbers were listed on five or fewer trips and only 84 license numbers (0.05%) reportedly fished in excess of 10 days (Table 4). The maximum number of times a fishing license was listed was 49. One plausible explanation for frequent listing of some license numbers is that the anglers were actually crew members but not listed as such.

Comparison to End-of-Season Survey

A random sample of 16,000 anglers whose license numbers were recorded in charter logbooks were sent post-card questionnaires inquiring about charter fishing activity between June 1 and July 31, 2006 (Figure 3). If they made more than one charter trip during this period, they were asked to report only on the last trip in that period. Information collected included name of the charter boat or business, and the numbers of halibut, king salmon, rockfish, and other fish kept and released. All charter boats in the survey were classified as “observed” or “unobserved.” An observed charter boat was any boat that was interviewed or had its catch sampled at least once during the 2006 season as part of an ADF&G creel survey or port sampling project. The working hypothesis was that correspondence between survey responses and logbook data might be lower for vessels in remote ports. Of the 16,000 surveys, 12,164 (76%) were mailed to clients of observed charter boats.

Following the original mailing, 11,129 more post cards were sent as a reminder mailing to non-respondents. A total of 7,148 post cards were returned, 628 of which were designated undeliverable. That resulted in a total of 6,512 valid returned post card surveys. Of these, 443 respondents (6.8%) said they did not fish on a charter boat between June 1 and July 31, 2006. The percentage of respondents that said they did not fish on a charter boat was slightly higher for unobserved vessels (7.9%) than for observed vessels (6.5%). This difference was marginally not significant ($\chi^2 = 3.53$, $df = 1$, $P = 0.06$).

This left 6,068 responses that could be directly compared to logbook data, 6,059 of which were from Areas 2C or 3A. Emphasis was placed on comparing reported harvest, rather than numbers of fish released, because recall bias was expected to be more of an issue for released fish. Anglers often reported numbers of fish harvested in excess of daily bag limits. Although they were asked to provide information for only themselves and for only their last trip, in many cases anglers reported numbers of fish kept by the entire party or numbers kept for all days of fishing between June 1 and July 31. In the latter case, logbook harvest by these anglers was summed over this period and included in the comparisons to post card responses.

Comparisons were also done separately for observed and unobserved vessels. Sixty-four percent of Area 2C trips (1,386) and 85% of Area 3A trips (3,316) were on observed vessels (Table 5). The percents of agreement in reported halibut harvests were 12-21% lower for unobserved vessel-trips than for observed vessel-trips in Area 2C, Area 3A, and all areas combined (all P values < 0.001). Differences were less pronounced for Chinook salmon and rockfish among areas, ranging from only 3-10%. Reasons for the discrepancies are not yet understood, as we have not yet examined the magnitude or direction of the differences.

To summarize, the primary purpose of the post card survey was to evaluate whether anglers whose license numbers were reported in logbooks actually fished on those boats. Only 6.8% of survey respondents indicated they did not fish on a charter boat, and the rate was not markedly different between observed and unobserved vessels. License numbers recorded in logbooks were either seven digits or six alphanumeric characters. Much of the 6.8% of “non-trips” could be explained by illegible or transposed digits, or errors in data entry. Agreement in numbers of fish reported harvested were generally lower for unobserved vessel trips than observed vessel-trips, but the reason isn’t clear. Discrepancies in the reported harvest could have been due to recall bias on the part of surveyed anglers, surveyed anglers reporting harvest for more than one day, or surveyed anglers reporting harvest by the entire fishing party, rather than just themselves. About one-sixth of angler responses exceeded the two-fish bag limit. Party fishing is reportedly still common statewide, so some discrepancies may have been due to charter operators

reporting two halibut kept per angler when the harvest was unevenly distributed among the clients. The fact that there are differences in angler-specific reported harvest is not necessarily an indictment of the logbook data – there may be angler-specific discrepancies even though the total harvest for the vessel-trip was reported accurately.

Comparisons to Statewide Harvest Survey Estimates

Logbook harvest data were summarized by IPHC area and by SWHS reporting area and compared to harvest estimates from the SWHS. The Area 2C logbook reported harvests of Chinook salmon, coho salmon, halibut, and rockfish were all substantially higher than the final charter estimates from the SWHS (Figure 4). Logbooks were 39% higher for Chinook salmon, 40% higher for coho salmon, 23% higher for halibut, and 41% higher for rockfish in Area 2C, in numbers of fish (Table 6). The reported logbook harvest of lingcod was 5% below the SWHS, and within the confidence interval. The Area 3A logbook reported harvest of coho salmon, halibut, and rockfish all exceeded the SWHS estimate, but the differences for coho salmon and rockfish were relatively smaller than in Area 2C. Although the logbook reported halibut harvest was 30% higher than the SWHS estimate, the Chinook salmon harvest was 21% lower and the lingcod harvest was 14% lower.

Comparisons by SWHS area reveal that the differences in halibut harvest between logbooks and the SWHS are driven by the Prince of Wales area fishery in Area 2C and by the Cook Inlet fishery in Area 3A (Figure 5). Discrepancies in reported harvest vary by area among species. For example, logbook harvest is higher than the SWHS estimates for all species except lingcod in the Prince of Wales area fishery. In the Sitka area fishery, however, the logbook harvest is higher for Chinook salmon, coho salmon, and rockfish, but nearly the same for halibut and lingcod. And in the Cook Inlet area, logbook harvests exceed SHWS estimates for halibut, are lower than the logbook estimate for Chinook salmon, and essentially no different for coho salmon, rockfish, and lingcod. As a general observation, the logbook harvests are higher than SWHS estimates in most areas for coho salmon, halibut, and rockfish, and lower for lingcod. Chinook salmon comparisons are mixed.

Possible explanations for the discrepancies include errors in reporting logbook data as well as errors in the completion of SWHS questionnaires. One partial explanation is that charter operators may have reported harvest in the logbook that was not considered by anglers to be charter, including trips that were offered without compensation. Some charter operators reported to ADF&G staff that they logged all trips, even when some or all of the anglers were fishing for free, primarily to be safe from prosecution for failing to submit a logbook report. Another partial explanation is that charter skippers or crew that responded to the SWHS may have considered their harvest to non-charter under the rationale that they can't guide themselves.

Re-computation of SWHS halibut harvest estimates without bag limit edits increased the estimates for areas 2C and 3A by about 7%. This moderated the differences between logbook harvests a little, but did not change the general outcome of the comparisons.

As described in the objectives section above, there was concern that somehow the use of supplemental survey questionnaire data to estimate the charter proportion could bias the estimates. Since the Cook Inlet harvest estimates are derived from standard and supplemental survey data, they were re-estimated for 2004-2006 using only supplemental survey data as is done in all other areas of the state. Cook Inlet halibut harvest computed using this alternate method was slightly higher for nonresident anglers, lower for resident anglers, and about the same overall (Figure 6). The guided percentage of harvest was generally higher for nonresidents and lower for residents, although there were exceptions to these patterns in some years for some species. In any case, the 2006 guided halibut harvest estimates were virtually unchanged using this alternate method, so it does not appear to cause systematic underestimation of the charter harvest by the SWHS.

Comparisons to On-Site Interview Data

Southeast Alaska

Creel survey crews throughout Southeast Alaska conducted 4,689 charter vessel-trip interviews in 2006. This included interviews conducted at Yakutat, which is located in Area 3A. The ADF&G logbook number was recorded during each interview. Using logbook numbers and dates, 3,929 interviews were matched to a logbook record. These matching interviews represent 10.1% of the 39,089 charter trips taken in Southeast Alaska in 2006. Sitka accounted for the largest number of matching interviews, followed by Gustavus, Yakutat, Elfin Cove, and Craig (Table 7). Of the 760 records that could not be matched, 544 had no matching logbook number on the date of the interview, and 216 were the result of interview data recording errors that were resolved after these comparisons were made.

ADF&G creel survey staff verified the numbers of fish harvested by counting whenever possible, but the numbers of anglers reported fishing and numbers of fish reported released could not be verified. Creel survey personnel were able to verify the harvest for 85-96% of the interviews, depending on the species. The 3,344 interviews for which the halibut harvest was verified (observed and counted by creel survey technicians) represented 8.6% of all Southeast Alaska charter trips.

Counts of anglers and fish reported in the interviews were compared to data reported in the matching logbook records by examining the frequency distribution of the differences, where the differences were calculated relative to the interview data (difference = logbook – interview). Differences were calculated for the numbers of reported anglers (angler-days), as well as large king (Chinook) salmon, coho salmon, halibut, pelagic rockfish, yelloweye rockfish, other rockfish, and lingcod kept.

In all cases, the distributions of differences all had strong modes at zero and differences were usually distributed somewhat evenly on either side (Table 8, Figure 7). Large differences were noted in the reported harvest of some species. For halibut, the differences ranged from -19 to +7 for unverified interviews and from -10 to +10 for verified interviews. Differences equal to or greater than ± 5 were lumped in the figures. There appeared to be slightly more records with differences in the harvest of pelagic and other rockfish among the unverified interviews. This suggests there is some benefit to counting fish during interviews, rather than simply relying on verbal accounts.

Despite the wide range of differences in reported harvest for each species, the average differences were close to zero. The average difference for halibut, for example, was -0.19 fish per boat-trip for unverified interviews and 0.00 per boat-trip for verified interviews (Table 8). When summed over all matching interviews, the effort and harvests recorded in the interview and those reported in the charter logbook agreed very closely (Figure 8).

Comparisons of the distributions of differences in numbers of released fish showed similar patterns to the harvest comparisons. All species had strong modes at zero, and the differences were fairly balanced around zero and essentially negligible (Figure 9). For halibut, the differences in the reported numbers of released fish ranged from -25 to +37, but 94.5% of the interviews were within ± 4 fish, and the average difference was only 0.23 fish per boat trip (Table 8).

Southcentral Alaska

Port sampling staff in Southcentral Alaska obtained 1,423 charter interviews in 2006. The roving tech conducted an additional 644 interviews for halibut data only. Using logbook numbers and dates, 1,261 port sampling interviews and an additional 599 roving tech interviews were matched to a logbook record. These 1,860 matching interviews represent 7.0% of the 26,404 charter trips taken in Southcentral Alaska in 2006. The ports of Homer and Deep Creek accounted for the largest number of matching interviews, followed by Seward and Kodiak (Table 9). No interviews were conducted at Pasagshak Bay or Anton Larsen Bay (Kodiak Island), so these boats were probably intercepted at a Kodiak Harbor. Of the 207 records that could not be matched to a logbook trip, 190 interviews had no matching logbook record and

17 could not be matched for other various reasons. Difficulties in matching were probably due to operators recording a different date on the logbook record, or ADF&G technicians recording an incorrect logbook number with the interview. In some cases, vessels made more than one trip per day and it was not possible to determine which trip the interview corresponded with.

Port samplers were not able to verify as large a percentage of interviews as in Southeast Alaska. Only one technician is assigned to each port, so during peak times of activity they often did not have time to count fish. Sometimes a portion of the catch had been cleaned at sea or offloaded before the technician arrived at the vessel to conduct the interview. In addition, technicians were instructed to verify the catch only when fish were harvested, so none of the trips with zero fish harvested were verified. Nevertheless, the port samplers and roving tech together verified the halibut harvest for 899 of the 1,860 matching charter interviews. The 899 interviews for which the halibut harvest was verified (observed and counted by creel survey technicians) represented only 3.4% of all Southcentral Alaska charter trips.

Differences between the numbers of anglers and fish caught were again calculated relative to the interview data (difference = logbook – interview). Differences were examined for the numbers of reported anglers, as well as the harvest and release of halibut, pelagic rockfish, non-pelagic rockfish (yelloweye + other rockfish), and lingcod kept. No salmon data were collected in the Southcentral region interviews.

The distributions of differences in the number of anglers and reported harvest again had strong modes at zero and differences were usually distributed evenly on either side (Table 10, Figure 10). Differences ranged from -12 to +10 halibut kept for verified roving tech interviews and from -35 to +5 halibut kept for verified port sampling interviews. The average differences, however, were only -0.13 halibut per boat-trip for the roving tech interviews and -0.37 halibut per trip for verified port sampling interviews (Table 10). When comparing pelagic rockfish, non-pelagic rockfish, and lingcod, there were marked differences in the distributions of reporting errors between verified and unverified interviews. For each of these species, nonzero differences were more frequent in the verified interviews. This suggests that when charter operators were interviewed, they tended to record the same numbers in the logbook as they verbally provided the technicians (or vice versa), but these numbers were not necessarily accurate. Some of the smaller differences could also have been due to miscounts by the technicians. Despite these differences, the average differences were still close to zero: -1.06 pelagic rockfish, -0.69 non-pelagic rockfish, and -0.10 lingcod per boat trip. The effort and harvests reported in interviews and recorded in logbooks were nearly equal when summed over all matching interviews (Figure 11).

As was the case in Southeast Alaska, there was also good agreement on average for reported numbers of released fish. All species had strong modes at zero, and the differences were fairly balanced around zero (Figure 12). Of all species, halibut had the highest number of discrepancies. Differences ranged from -50 to +75 fish, but the average difference was only +0.76 halibut per boat trip (Table 11).

Comparison to Southeast Creel Survey Estimates

Logbook data was subsetted by date, location, and vessel before comparing to creel survey estimates. Only those records corresponding to the period April 24-September 24, for ports of landing that were sampled by creel survey personnel, and for vessels that were encountered at least once by creel survey personnel at those locations were included in the calculations of the comparable logbook harvest

The logbook data compared favorably to creel survey estimates for Juneau and Sitka. Logbook harvests for Sitka were consistently higher than the creel survey estimates across all species, but were either within the confidence interval on the creel survey estimate or close to it. Logbook harvests for Ketchikan were substantially higher than the creel survey estimates for halibut and coho salmon, but within the confidence intervals of the large king salmon and rockfish estimates. It was expected that matching of logbook data and creel survey estimates would be difficult due to incomplete coverage of the creel survey and variability in reporting of ports of landings by operators. The poor correspondence of estimates for Ketchikan is not fully understood. One possible explanation is that the sampling intensity is too low so

that harvest at sampled ports and times is not representative. Charter harvest was not evenly distributed among sampling sites. This may have led to interviews being missed due to a mismatch between the sampling schedule and actual return of boats. Another possible explanation is mismatches between the logbook and creel survey coverage, i.e., the actual port of landing was not exactly as reported. For example, some operators that landed at private lodges or other unsampled access points in the Ketchikan area may have reported the port of landing more generally as “Ketchikan.”

Summary and Conclusions with Emphasis on Halibut Reporting

1. The logbook data contained significantly fewer errors than were observed in prior years. Shortening the submission period and boosting the outreach program (courtesy logbook inspections, phone calls from data entry staff) seemed to be effective in reducing the number of logbook reporting errors. A significant percentage of logbook pages were returned late in 2006 (20% more than 20 days late), but this may have been due in part to the change from 2005 in the submission deadline.
2. We were unable to definitively detect falsification of angler trips using frequencies of reported fishing license numbers. There were too many possible explanations, including people on extended fishing trips for a variety of species, anglers fishing for free recorded as clients, or crew recorded as residents or nonresidents rather than crew.
3. About 6.8% of surveyed anglers whose license numbers were recorded in charter logbooks said they did not take a charter trip. There was not a large enough difference between observed and unobserved boats in the percentage of anglers reporting they did not take a charter trip to conclude that operators of unobserved boats were falsifying angler trips. The most likely explanation for the majority of these discrepancies is that they were caused by illegible or transposed digits in the reported license numbers, or keypunch errors by data entry staff. Differences in the harvest reported by clients in the end-of-season survey and harvest reported in logbooks were not necessarily an indictment of the logbook data. Discrepancies could have been due to recall bias on the part of clients, misunderstanding about how to complete the post card questionnaire, and errors in logbook reporting due to party fishing. Angler-specific differences in reported harvest are not crucial if the reported harvest for the boat-trip is reported correctly.
4. The logbook harvest of halibut was 23% higher in numbers of fish in Area 2C and 30% higher in Area 3A than harvest estimated by the SWHS. No clear explanation has yet emerged for these differences, but they are consistent with comparisons made for 1998-2001 logbook data. The discrepancies between logbook and SWHS estimates varied by species, but in general, discrepancies appeared roughly proportion to the magnitude of harvest. Discrepancies are likely due to a number of factors acting in aggregate, rather than a single factor that explains the entire difference. Possible factors include falsification of angler trips in the logbook, reporting of non-charter angler trips as charter in the logbook, skippers and crew reporting their harvest as unguided in the SWHS, charter clients reporting their harvest as non-charter in the SWHS, errors in the application of bag limit edits, and bias in the estimation of the charter harvest in the SWHS.
5. Although there were sometimes large discrepancies between logbook reported harvests and harvests reported or observed in creel surveys, the vast majority of charter trips had no difference and the differences appeared random and close to zero on average. This suggests that even though harvest reported for any one boat-trip may be in error, the total reported charter harvest is not different from what creel survey personnel verified by counting fish. Conclusions regarding logbook accuracy from this comparison are limited by the fact that only about 10% of charter trips in Area 2C and 7% of charter trips in Area 3A were matched to interviews, and that charter operators would be expected to report similar numbers in their logbook when interviewed. The only true onsite evaluation of a logbook would be a logbook inspection made after the logbook was completed, but while fish were still available to be counted.

6. There was good correspondence between halibut harvest reported in logbooks and creel survey estimates for Juneau and Sitka, but not Ketchikan. The comparison for Ketchikan was probably compromised by problems with non-representative sampling or a mismatch in coverage between the creel survey and logbook data.

Discussion and Recommendations

To the extent possible, this evaluation of logbook data incorporated comparisons to independent sources of information, including annual and post-season surveys of charter clients, ADF&G creel surveys in selected ports, and direct onsite creel survey observations including counts of harvested fish at the major ports of harvest throughout areas 2C and 3A. Although there were discrepancies in reported harvest at the individual angler level, there was agreement on average in reported harvest at the boat-trip level. In short, there was no apparent systematic strategic bias in the reported logbook harvest of halibut.

This analysis included limited evaluation of the SWHS estimates. We have so far been unable to identify any definite sources of bias in the SWHS, but that evaluation is continuing. It is possible that the SWHS estimate of overall halibut harvest (charter + non-charter) is accurate, and that there is bias in the procedures used to estimate the charter proportion. At this point, we don't recommend that the non-charter harvest be obtained by subtracting the logbook harvest from the total harvest from the SWHS. This would result in estimates of unguided harvest that are too low, based on charter/non-charter ratios seen in onsite surveys.

Using the logbook estimates of charter harvest for management offers some clear advantages. Logbook data are presumably a complete census of halibut harvest, subject only to reporting errors. More importantly, logbook harvest data can potentially be tabulated as the season progresses. Harvest, or at least a very accurate projection of harvest, could be made available by October, in time for stock assessment and discussion of management alternatives for implementation the following season. Based on this evaluation, we conclude that logbooks could be used to manage the charter removals of halibut.

Adoption of logbooks as the preferred charter harvest monitoring tool by the North Pacific Fishery Management Council will present a problem with respect to management of annual harvest. Specifically, the Council will have to address the mismatch between the reported harvest and the allocation options that were all calculated using past SHWS estimates of charter harvest. Logbook harvests were consistently higher than SHWS estimates for all years in which halibut were reported in the logbook. Options to address this mismatch include revision of allocation options, either through recalculation using recent logbook harvest, or through negotiation.

Applying average weights by SWHS area to logbook numbers results in 2006 charter harvest estimates of 2.094 M lb in Area 2C and 4.691 M lb in Area 3A. These harvest estimates are 16% and 28% higher than the respective harvest estimates based on the SWHS. The discrepancy in weight between the Area 2C logbook and SWHS estimates (16%) was smaller than the discrepancy in numbers of fish (23%), due to differences in the distribution of harvest among ports. The largest difference in numbers was in the Prince of Wales area (13,298 more fish in the logbook), which had an average weight of only 9.7 lb, well below the 18.9 lb average for Area 2C.

We recommend continued application of measures to maintain logbook data quality and accuracy, including logbook outreach (phone calls and inspections of charter logbooks), surveys of charter clients, and verification of charter harvest by direct observation and counting of harvested fish. ADF&G will continue to monitor logbooks for timely submission, completeness, and accuracy in the near term. Additional years of comparison between logbooks, SWHS, end-of-season surveys of charter clients, and onsite creel surveys will be conducted to investigate the consistency of differences in estimates and evaluate the utility of logbooks to estimate removals by the charter fleet.

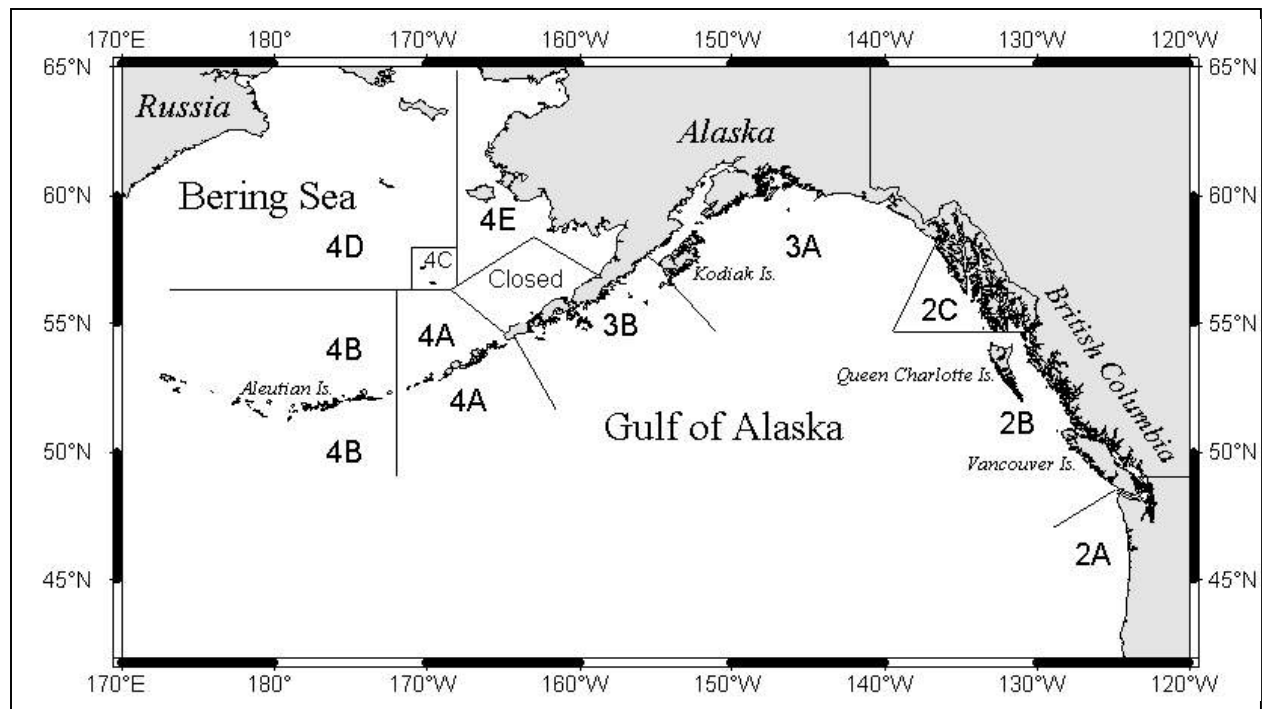


Figure 1. International Pacific Halibut Commission regulatory area boundaries.

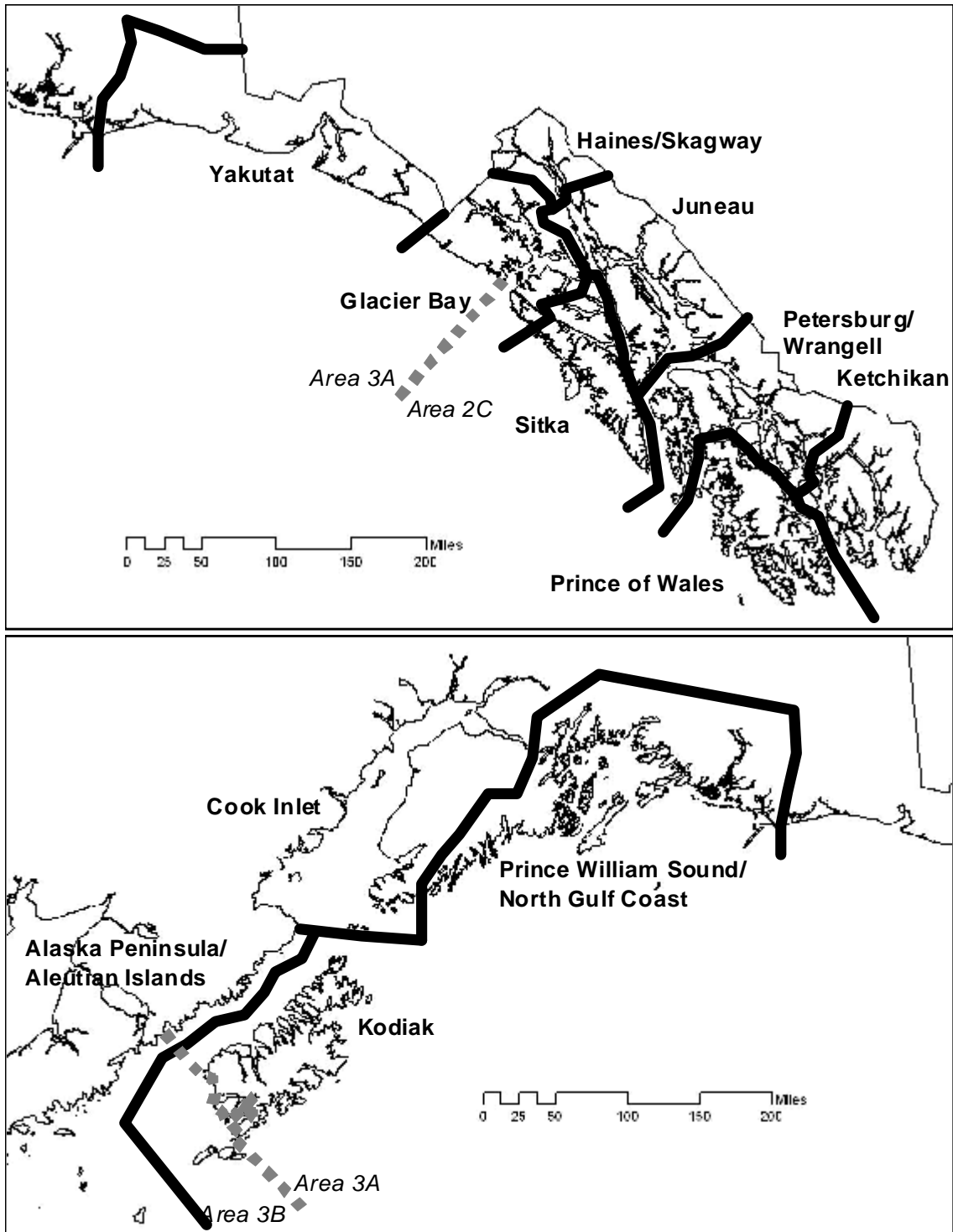


Figure 2. Statewide Harvest Survey areas in Southeast Alaska (upper panel) and Southcentral Alaska (lower panel).



2006 License #: 6454791

2006 SALTWATER CHARTERED SPORT FISHING SURVEY
ALASKA DEPT. OF FISH AND GAME, SPORT FISH DIVISION, 333 RASPERRY RD. ANCHORAGE, ALASKA 99518

Did you hire a sport fish charter service to conduct saltwater sport fishing in Alaska between June 1, 2006 and July 31, 2006? YES NO

Did you go on more than one charter trip during this time period? YES NO

Date of last trip within this period: _____
Date

Name of company you chartered with OR the name of the vessel you fished on:

_____ OR _____
Charter Company Name Vessel Name

PLEASE WRITE IN THE NUMBER OF FISH KEPT AND THE NUMBER RELEASED FOR THE ABOVE DATE FISHED. RECORD ONLY THOSE FISH YOU PERSONALLY KEPT AND RELEASED.*

HALIBUT		KING SALMON		ROCKFISH		OTHER FISH	
KEPT	RELEASED	KEPT	RELEASED	KEPT	RELEASED	KEPT	RELEASED

(Please return by February 7, 2007)

Dear Alaska Angler,

The Alaska Department of Fish and Game is interested in knowing about saltwater chartered fishing trips that occurred between June 1 and July 31, 2006. Even though you may have fished more than once on a chartered fishing trip, we are interested in your most recent trip within that time frame. Many households will receive more than one survey, please complete and return all surveys.

This survey is not intended to be used as an enforcement tool but rather to determine the value and accuracy of the statewide saltwater logbook program designed for the sport fish charter industry. Due to the timing of this survey, we realize that accurate recall may be difficult, so please provide us with your best recollection of what you "personally" caught and kept. Do not include those fish "provided" to you by the captain or other anglers.

The Alaska Department of Fish and Game, Division of Sport Fish appreciates the time that you'll take to fill out this short survey. Please return your survey by February 7, 2007. Your response will remain confidential. Feel free to contact us if you have any questions:

sfguides@fishgame.state.ak.us

- * The number of fish KEPT is the number of fish that were landed and retained.
- * The number of fish RELEASED is defined as the number of fish that were legally hooked and deliberately let go.



Figure 3. End-of-season post card survey (and instructions) sent to a random sample of 16,000 charter clients listed in 2006 logbooks.

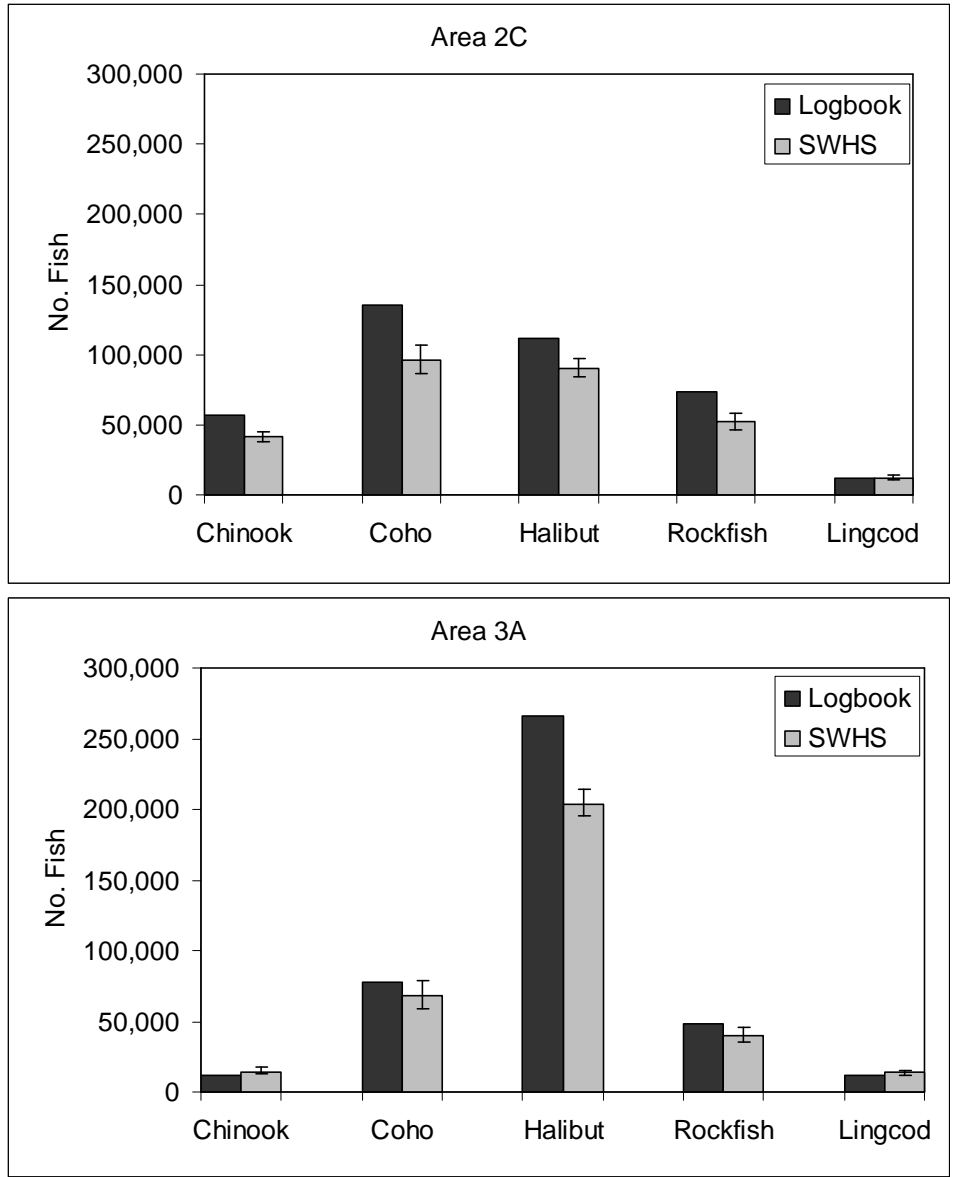


Figure 4. Comparison of logbook reported harvests of chinook salmon, coho salmon, halibut, rockfish, and lingcod to charter harvest estimates from the ADF&G statewide harvest survey for IPHC Areas 2C and 3A, 2006. Vertical error bars represent 95% confidence intervals for the SWHS estimates.

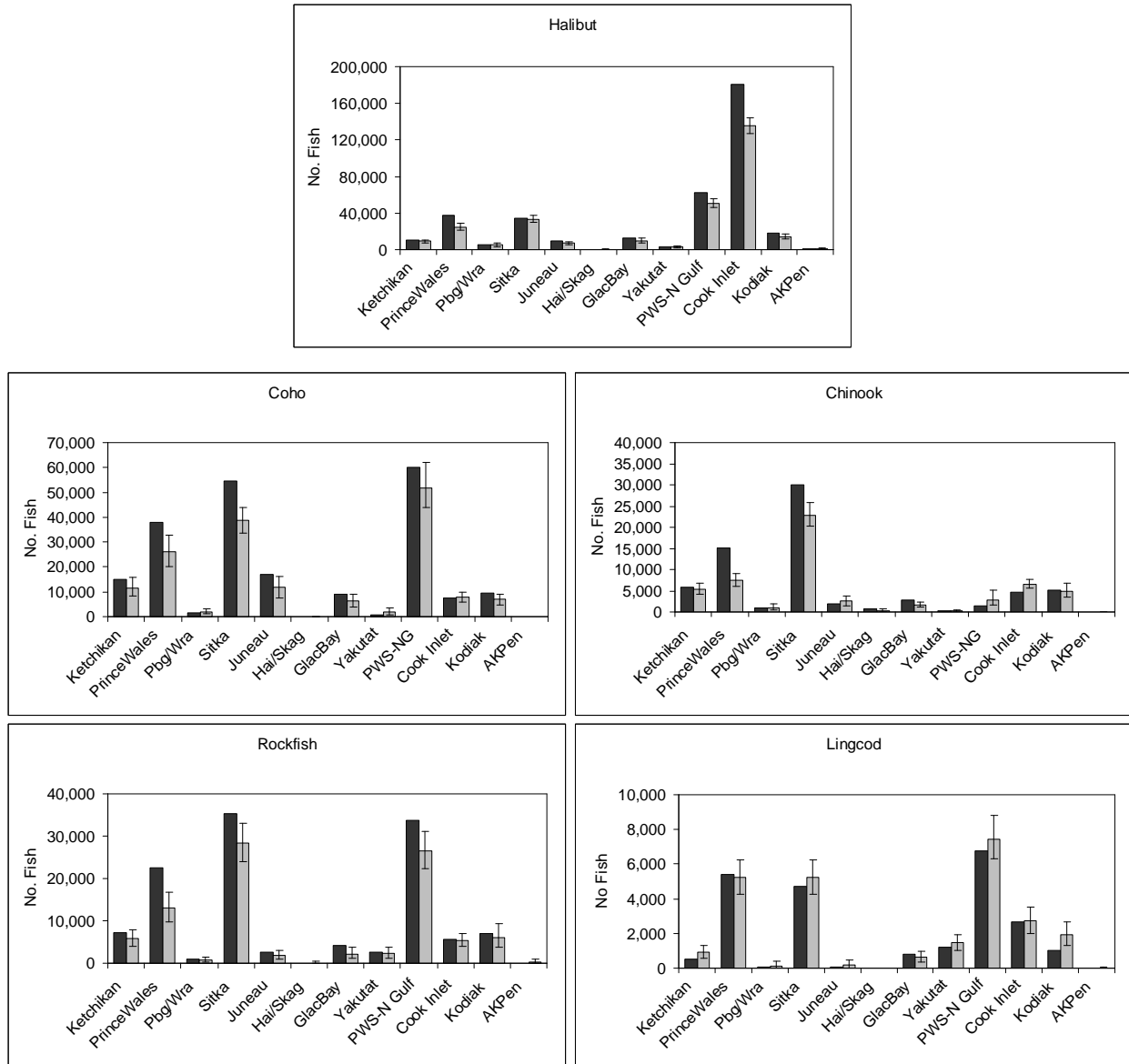


Figure 5. Comparisons of logbook reported harvest and harvest estimates from the statewide harvest survey (SWHS) by reporting area, 2006. Vertical error bars represent 95% confidence intervals for the SWHS estimates.

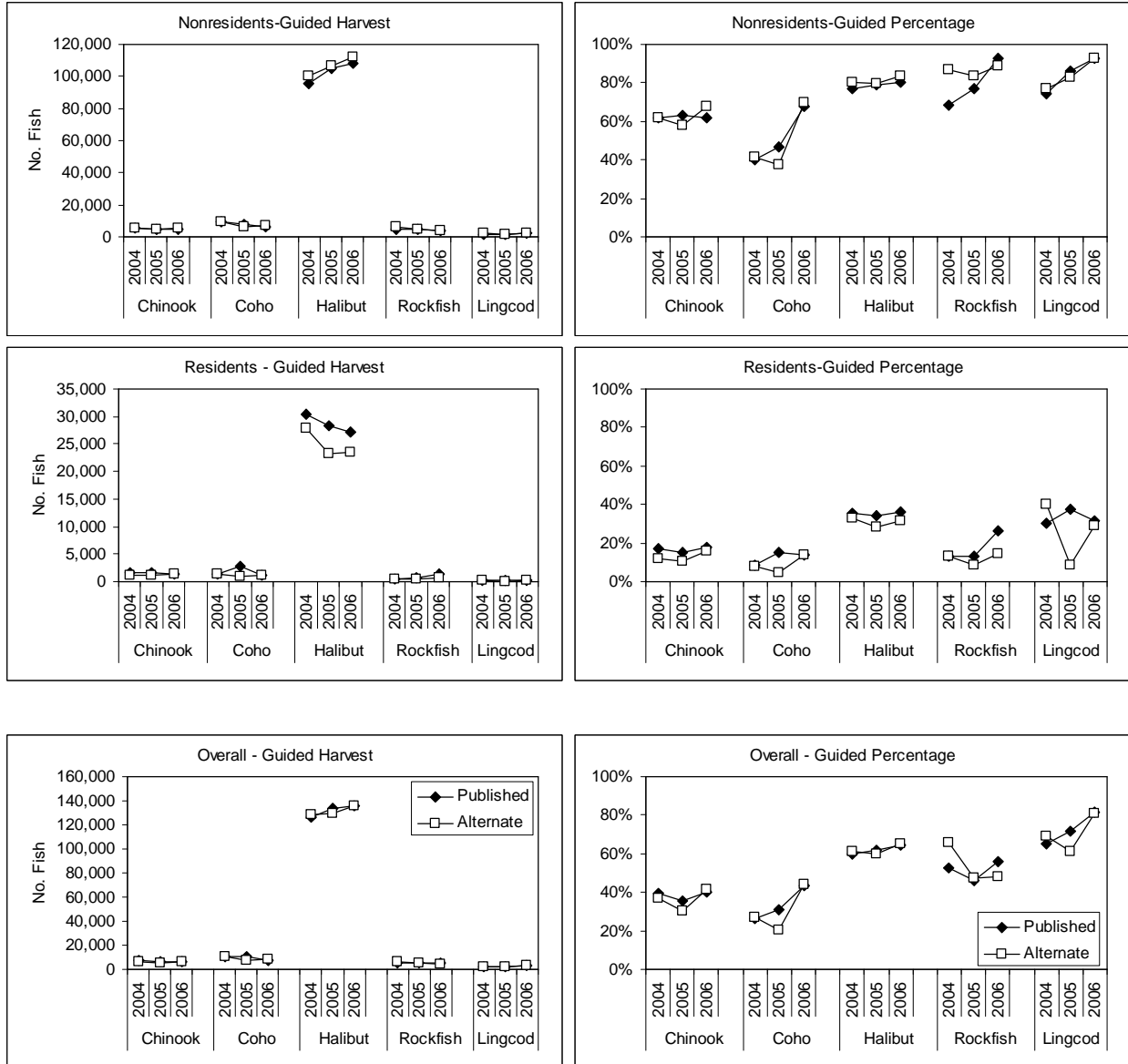


Figure 6. Comparisons of published Cook Inlet area charter harvest estimates (solid diamonds) with alternate estimates (open squares) computed using the charter proportions estimated from only supplemental surveys, as is done in all other areas of the state. Panels on the left show differences in the guided harvest estimates, and panels on the right show differences in the guided percentage of harvest by nonresidents, residents, and the overall fishery.

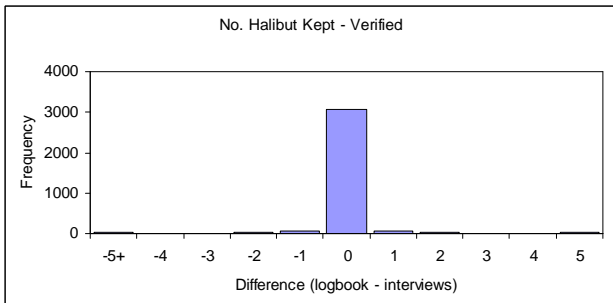
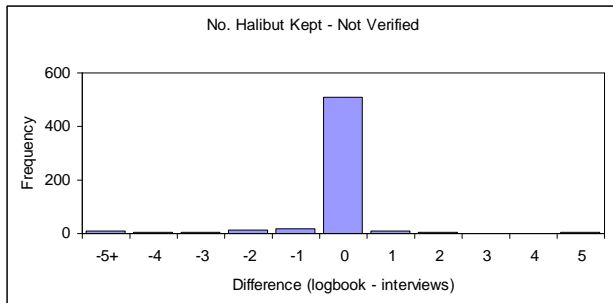
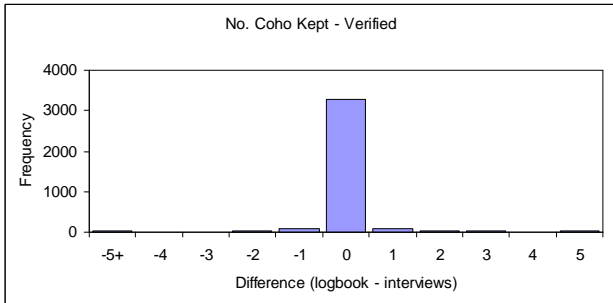
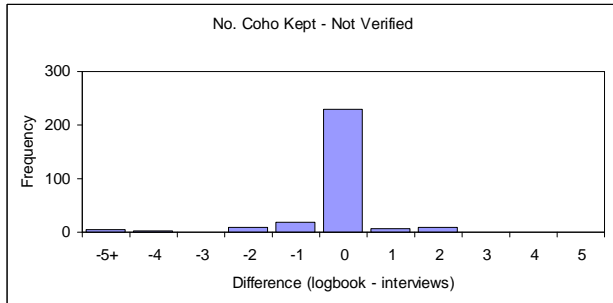
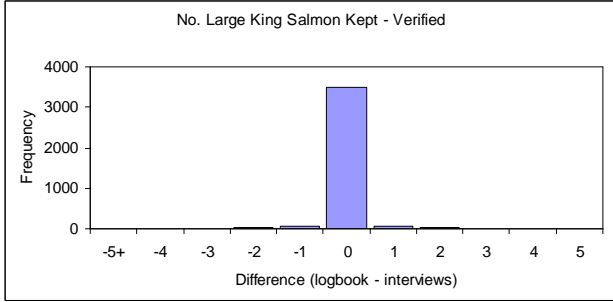
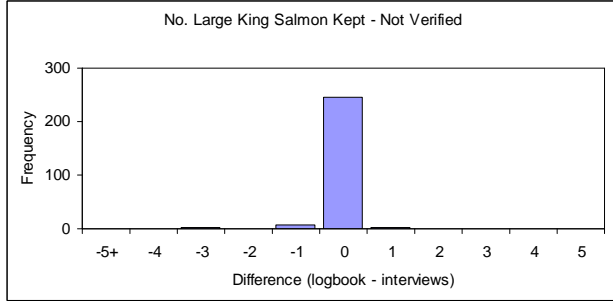
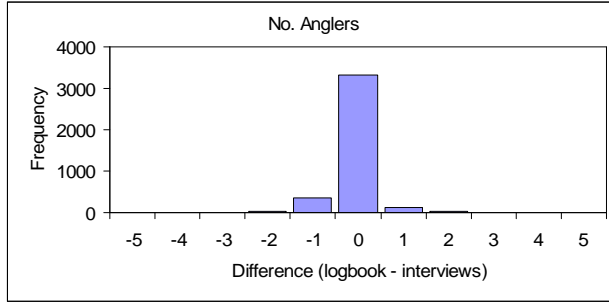


Figure 7 (page 1 of 2). Frequency distributions of the differences in effort and harvest between verified and unverified creel survey interviews in Southeast Alaska, 2006.

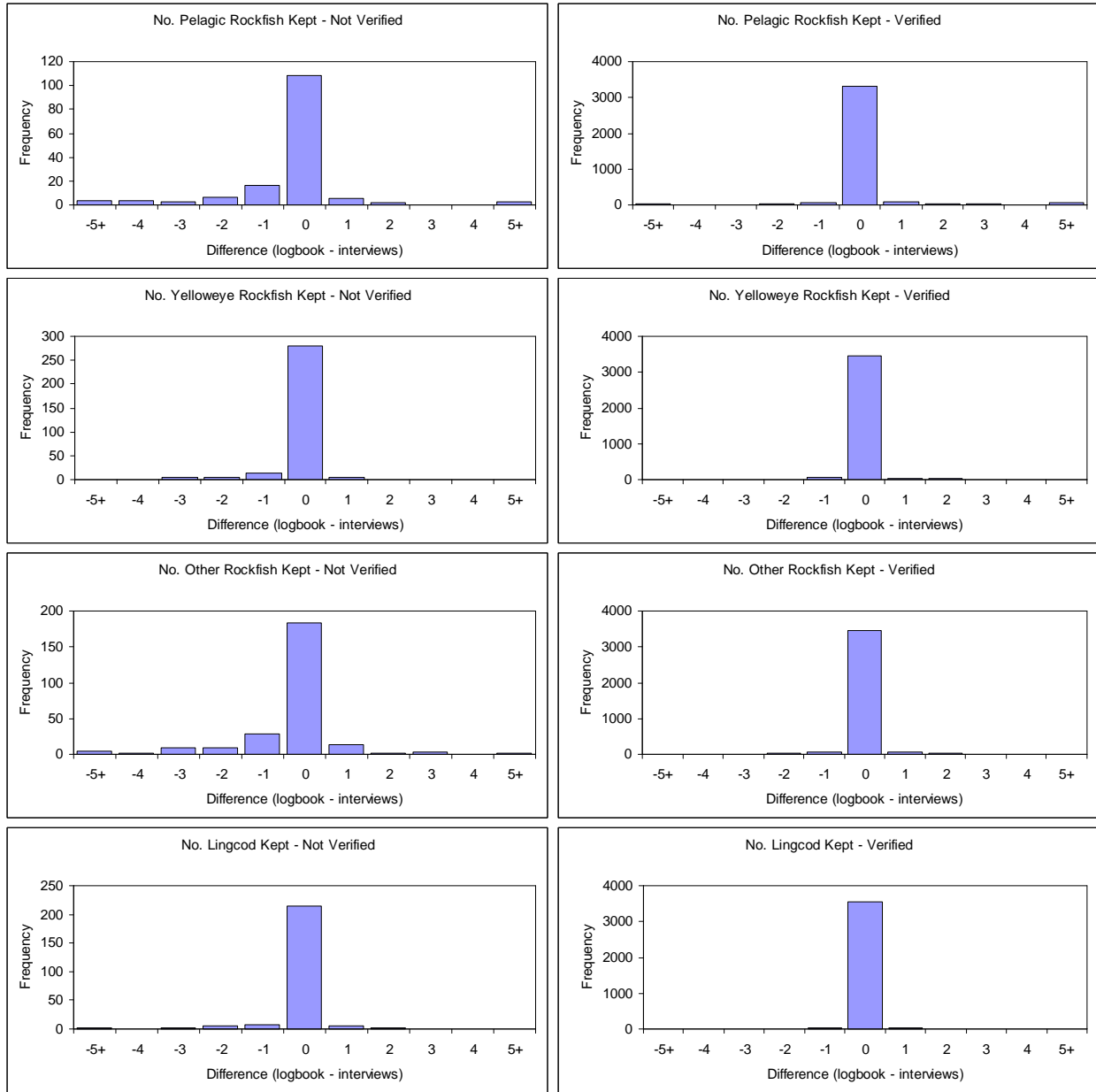


Figure 7 (page 2 of 2).

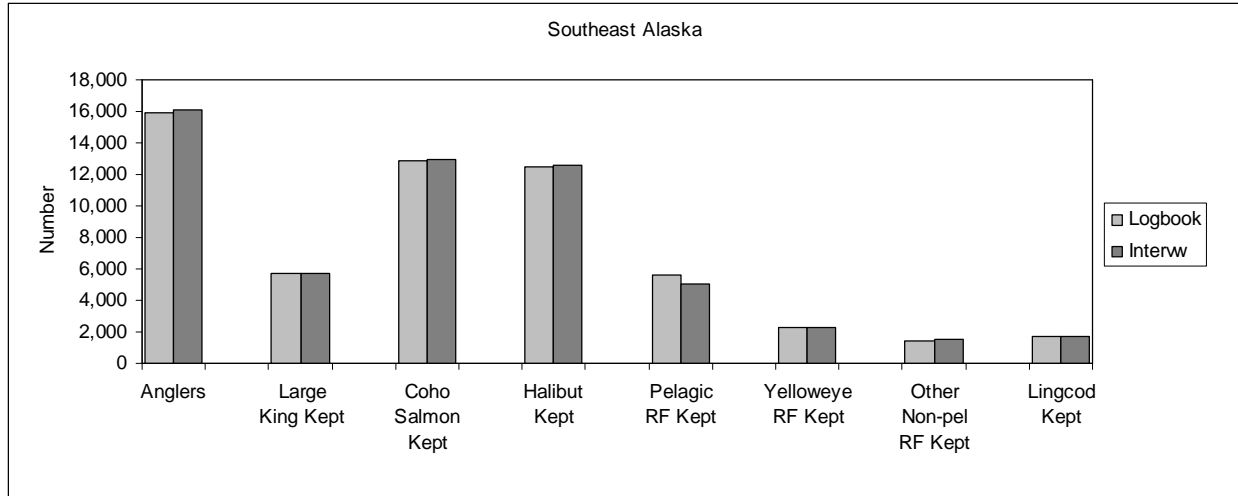


Figure 8. Comparison of total effort (anglers) and harvest reported in charter logbooks (light bars) and recorded during 3,929 matching creel survey interviews in Southeast Alaska, 2006.

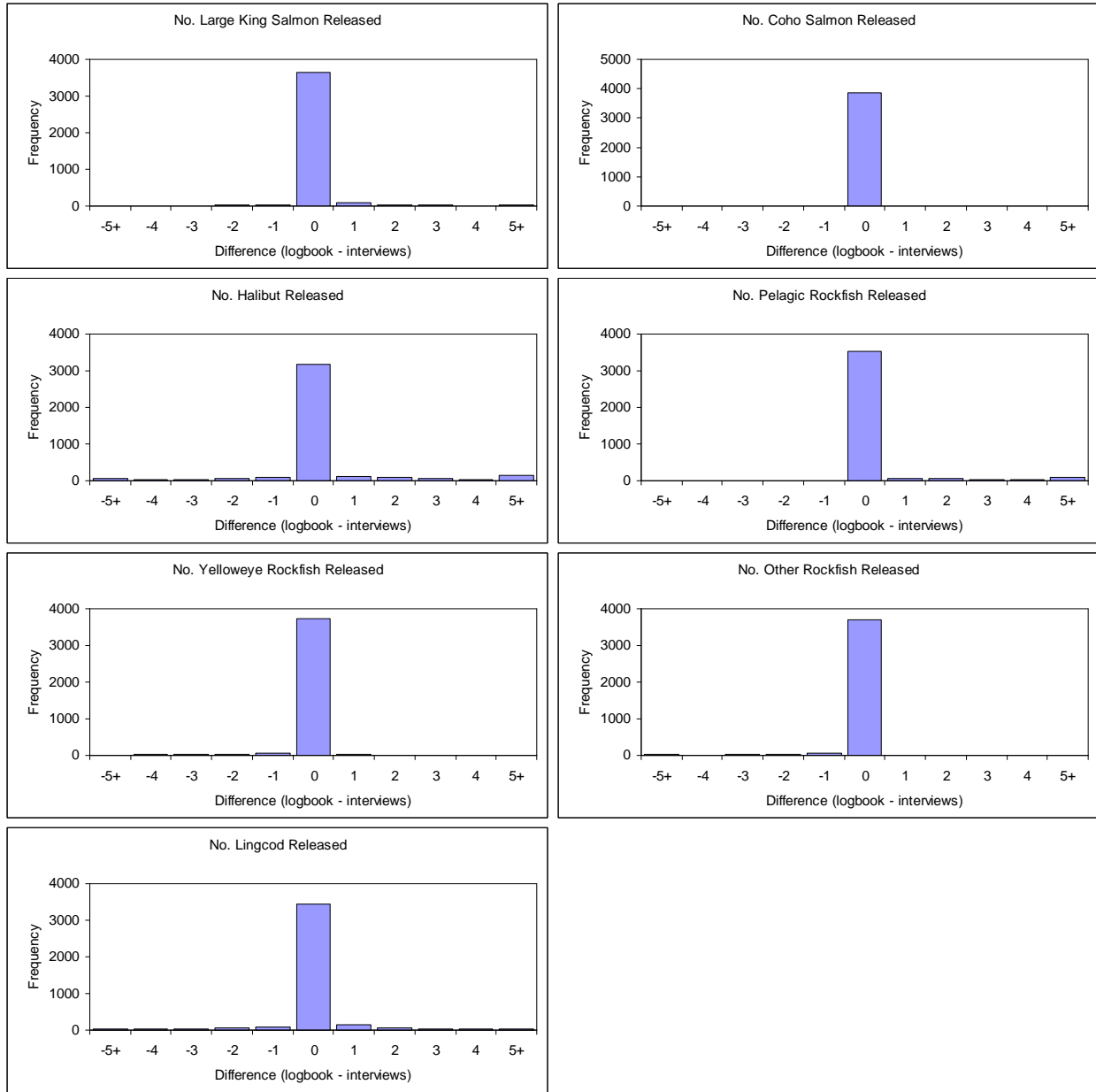


Figure 9. Frequency distributions of the differences in numbers of fish reported caught and released in interviews and logbooks, by species, in Southeast Alaska in 2006.

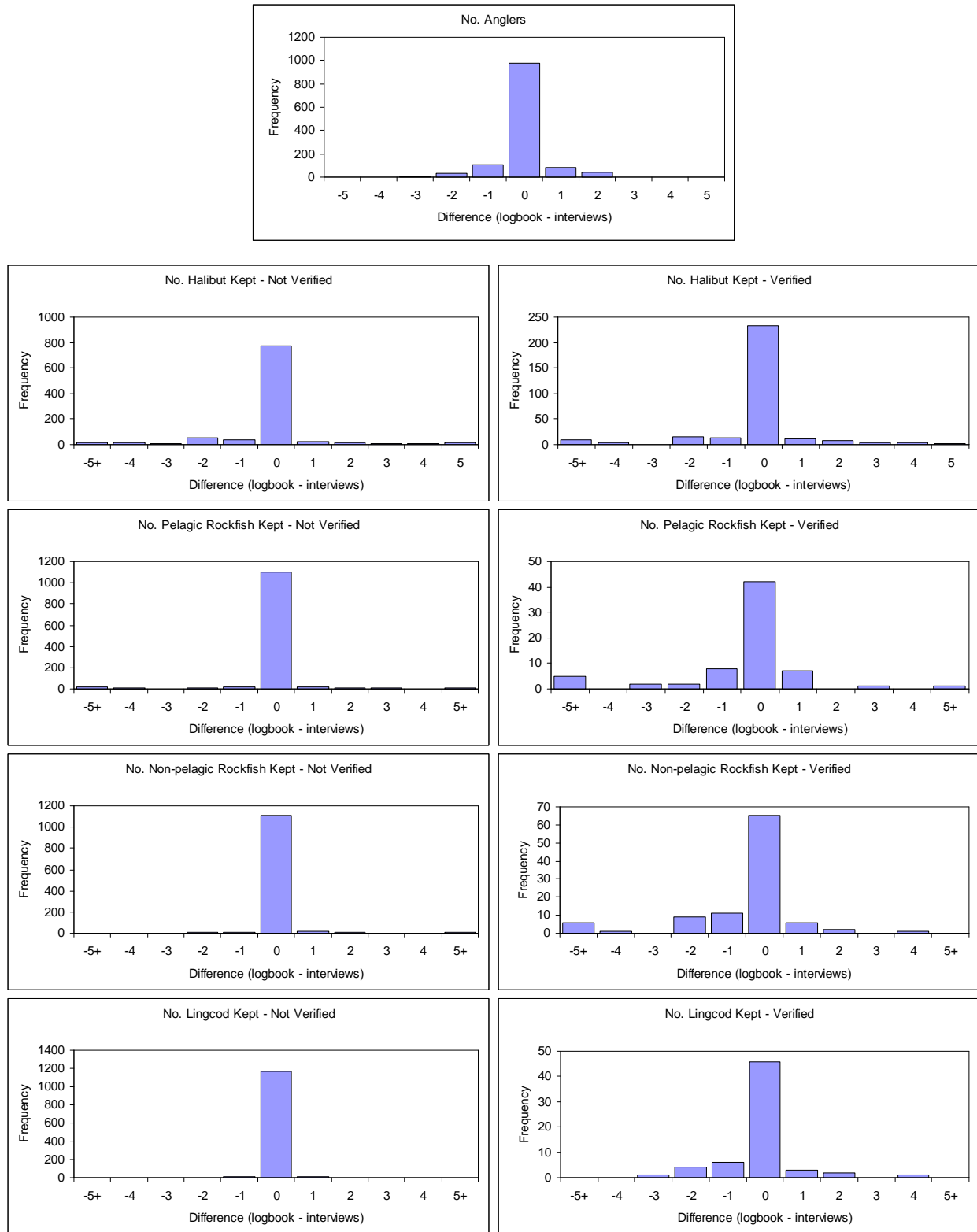


Figure 10. Frequency distributions of the differences in effort and harvest between verified and unverified port sampling interviews in Southcentral Alaska, 2006.

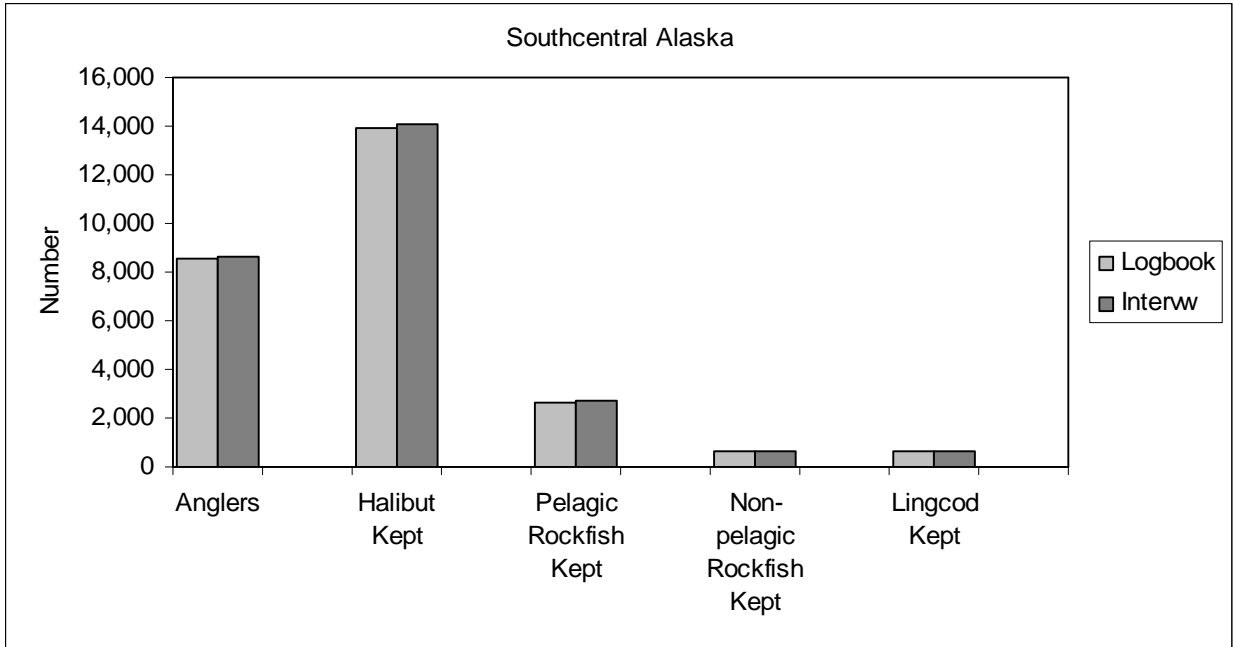


Figure 11. Comparison of total effort (anglers) and harvest reported in charter logbooks (light bars) and recorded during 3,929 matching creel survey interviews in Southcentral Alaska, 2006.

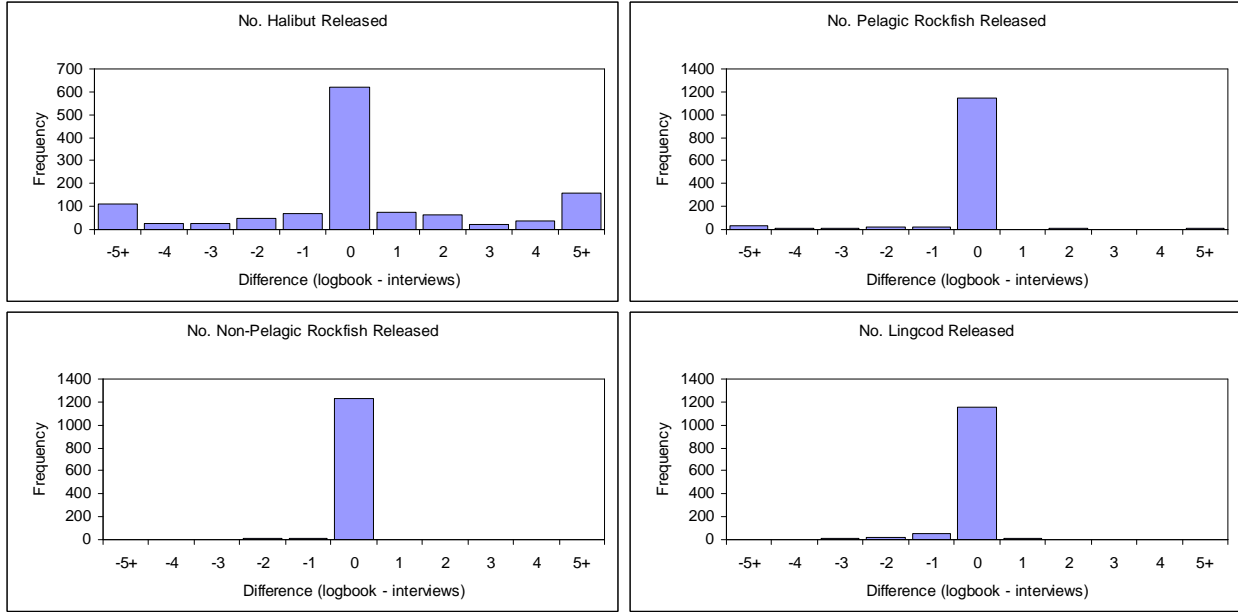


Figure 12. Frequency distributions of the differences in numbers of fish reported caught and released in logbooks and interviews, by species, in Southcentral Alaska in 2006.

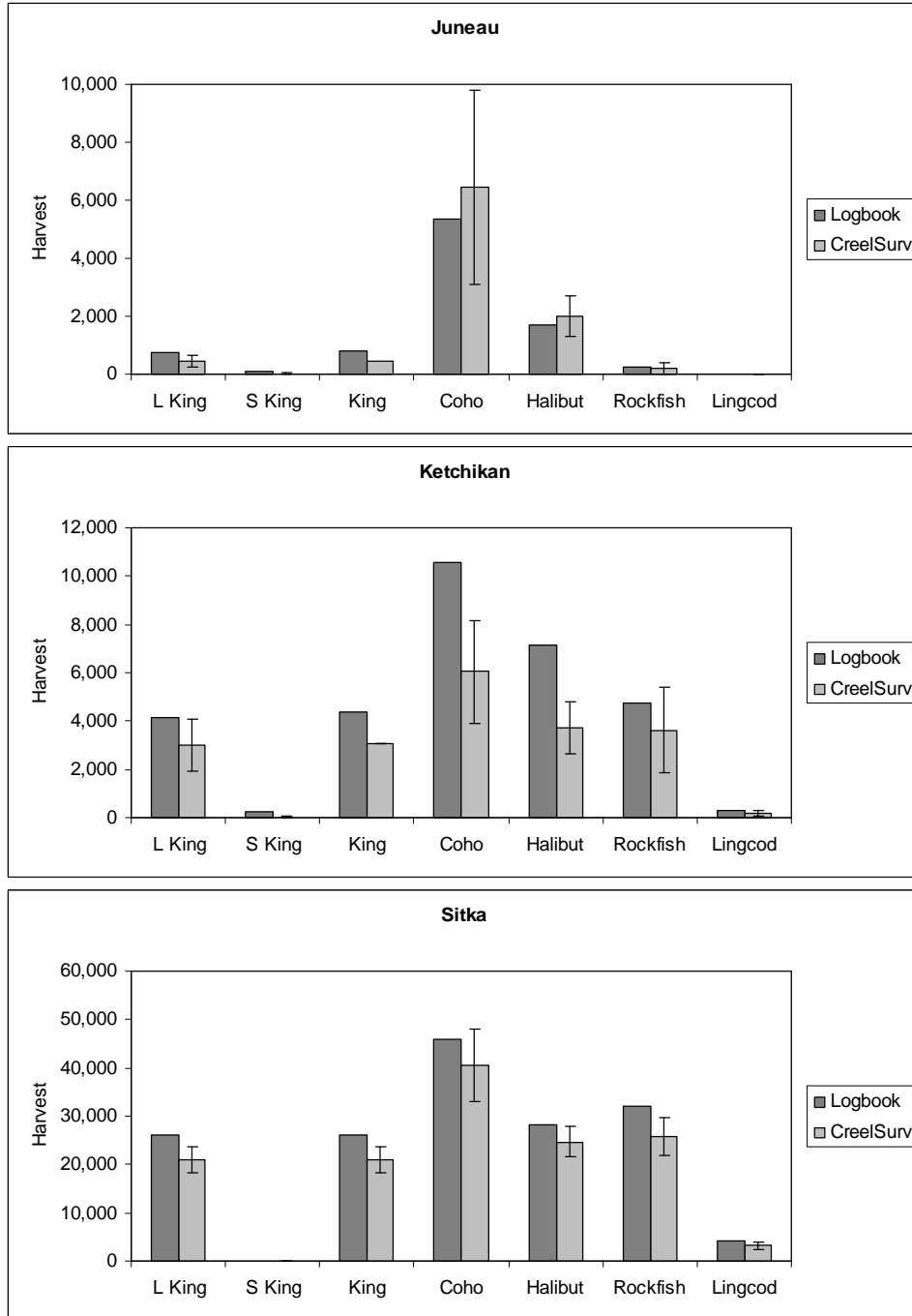


Figure 13. Comparisons of logbook harvests and creel survey harvest estimates for Juneau, Ketchikan, and Sitka, 2006.

Table 1. Summary of effort and harvest data for the 2006 charter logbook.

SWHS or IPHC Area	Records (= trips)	Harvest by Species					
		Angler-Days	Halibut	King Salmon	Coho Salmon	Rockfish	Lingcod
Ketchikan	7,404	29,553	10,940	5,803	15,051	7,182	505
POW	8,335	30,900	38,079	15,162	38,055	22,512	5,409
Pburg/Wra	1,401	5,469	5,514	960	1,647	1,045	74
Sitka	12,140	48,415	34,454	30,029	54,490	35,438	4,701
Juneau	4,476	18,700	9,392	1,880	16,985	2,594	74
Hai/Skag	510	1,842	97	639	10	29	0
Glac. Bay	4,023	16,112	12,578	2,864	8,935	4,245	812
Yakutat	800	3,558	3,368	273	657	2,448	1,186
PWS-NGC	8,408	58,721	62,848	1,338	60,276	33,771	6,746
Cook Inlet	14,695	101,582	180,999	4,710	7,676	5,640	2,654
Kodiak	3,306	14,751	18,318	5,049	9,354	6,932	1,008
Alaska Pen.	175	636	779	2	65	92	1
Area 2C	38,289	150,991	111,054	57,337	135,173	73,045	11,575
Area 3A	27,286	178,857	265,817	11,370	78,010	48,807	11,595

Table 2. Summary of major reporting issues and errors in the 2006 charter logbook.

Reporting Issue or Error	Area 2C								Area 3A					AP	
	Ketch	POW	Pbrg	Sitka	Jun	H/Ska	GlaBy	2C Tot	Yak	PWS	NGulf	CInlet	Kod		3A Tot
No. records (=trips)	7,404	8,335	1,401	12,140	4,476	510	4,023	38,289	800	2,769	5,639	14,694	3,306	27,286	176
Records received after printed due date	833	737	60	870	528	62	503	3,593	49	417	1,629	3,683	697	6,475	86
Date fished after date received	5	3	2	6	2	1	4	23	0	9	20	35	0	64	1
Invalid port	0	0	22	0	0	0	0	22	0	0	0	0	0	0	0
Invalid guide license number	0	0	0	1	0	0	0	1	0	0	1	2	0	3	0
Unknown angler type (res, nonres, crew)	381	564	28	575	138	20	206	1,912	68	159	285	456	119	1,096	19
Salmon stat area reported but salmon rods missing	29	6	2	16	8	4	5	70	1	4	18	5	2	30	0
Salmon stat area reported but salmon hours missing	68	20	10	74	48	5	17	242	1	38	74	15	10	138	0
Salmon effort reported but no stat area provided	1	0	0	1	1	0	0	3	1	2	3	4	0	10	0
Invalid salmon stat area recorded	1	0	0	1	1	0	0	3	0	0	5	0	0	5	4
Bottomfish stat area reported but bottomfish rods missing	5	4	9	2	5	0	8	33	3	14	3	79	8	109	2
Bottomfish stat area reported but bottomfish hours missing	14	19	23	9	20	0	32	116	13	53	22	253	33	376	4
Bottomfish effort reported but stat area missing	1	2	0	5	0	0	2	10	0	0	4	1	0	5	0
Invalid bottomfish stat area recorded	5	0	0	5	0	0	1	11	0	0	15	15	7	37	0
Both salmon and bottomfish rods missing	22	30	4	48	5	0	6	115	1	4	43	90	98	236	1
Both salmon and bottomfish hours missing	50	146	8	178	26	0	34	442	3	10	105	153	130	401	2
Records with lingcod harvest reported out of season	3	4	2	141	14	0	44	196	0	29	11	24	2	78	0

^a - Legend to Areas:

Ketch=Ketchikan, POW=Prince of Wales Island, Pbrg=Petersburg/Wrangell, Jun=Juneau, H/Ska=Haines/Skagway, GlaBy=Glacier Bay, Yak=Yakutat, PWS=Prince William Sound, NGulf=North Gulf Coast, CInlet=Cook Inlet, Kod=Kodiak, AP=Alaska Peninsula and Aleutian Islands.

Table 3. Frequency of logbook pages submitted late (postmarked or received after the published deadline).

Number of Days Late	Number of Logbook Pages	Percent	Cumulative Percent
1-7	5,817	57%	57%
8-14	1,632	16%	73%
15-21	777	8%	81%
22-28	651	6%	87%
29-35	288	3%	90%
36-42	177	2%	92%
43-49	122	1%	93%
50-56	102	1%	94%
57-203	588	6%	100%
	10,154		

Table 4. Frequency of reported angler-trips by license number, 2006 charter logbook.

No. of Trips Reported	Frequency of License Numbers	Percent	Cumulative Percent
1	119,649	67.82%	67.82%
2	23,833	13.51%	81.33%
3	18,018	10.21%	91.54%
4	9,305	5.27%	96.81%
5	4,077	2.31%	99.12%
6	966	0.55%	99.67%
7	289	0.16%	99.84%
8	119	0.07%	99.90%
9	41	0.02%	99.93%
10	46	0.03%	99.95%
11	22	0.01%	99.96%
12	11	0.01%	99.97%
13	21	0.01%	99.98%
14	5	0.00%	99.99%
15	6	0.00%	99.99%
16	4	0.00%	99.99%
17	2	0.00%	99.99%
18	2	0.00%	99.99%
19	1	0.00%	99.99%
20	2	0.00%	100.00%
21	0	0.00%	100.00%
22	2	0.00%	100.00%
23	1	0.00%	100.00%
24	0	0.00%	100.00%
25	0	0.00%	100.00%
26	0	0.00%	100.00%
27	2	0.00%	100.00%
28	0	0.00%	100.00%
29	0	0.00%	100.00%
30+	<u>3</u>	0.00%	100.00%
	176,427		

Table 5. Percent agreement in reported harvest between end-of-season post card survey responses and logbook data for observed and unobserved vessels. Observed vessels were defined as those that were either interviewed or had harvest sampled at least once during the 2006 season as part of ADF&G creel survey or catch sampling programs.

Area	Observed/Unobserved	Number of Trips Compared	Percent Agreement		
			Halibut	Chinook Salmon	Rockfish
Area 2C	Observed	1,386	72%	70%	74%
	Unobserved	784	51%	67%	67%
Area 3A	Observed	3,316	78%	92%	87%
	Unobserved	573	66%	89%	84%
All Areas (2C, 3A, 3B, 4A)	Observed	4,702	76%	86%	83%
	Unobserved	1,366	57%	76%	74%

Table 6. Comparisons, by IPHC regulatory area, of 2006 logbook-reported harvest of Chinook salmon, coho salmon, Pacific halibut, rockfish (all species combined), and lingcod to charter harvest estimates from the ADF&G statewide harvest survey (SHS).

IPHC Area	Species	Logbook	SHS	Percent Difference Relative to SHS
Area 2C	Chinook	57,337	41,107	39%
	Coho	135,173	96,273	40%
	Halibut	111,054	90,471	23%
	Rockfish	73,045	51,847	41%
	Lingcod	11,575	12,237	-5%
Area 3A	Chinook	11,370	14,442	-21%
	Coho	78,010	68,360	14%
	Halibut	265,817	204,115	30%
	Rockfish	48,807	40,306	21%
	Lingcod	11,595	13,542	-14%

Table 7. Numbers of matching interview and logbook records by port and month for Southeast Alaska, 2006. Port names are as reported in the charter logbook.

Port	Month					Total
	May	Jun	Jul	Aug	Sep	
AUKE BAY	20	47	61	36	12	176
BAR HARBOR	0	0	1	0	0	1
BARTLETT COVE	39	0	0	0	57	96
CEDARS LODGE	0	1	0	0	0	1
CLOVER PASS	0	9	10	13	5	37
CRAIG	5	51	75	53	2	186
CRESCENT HARBOR	0	6	1	6	0	13
ELFIN COVE	44	122	119	93	16	394
FISHERMANS BEND	1	1	0	1	0	3
GUSTAVUS	0	163	190	140	9	502
JUNEAU	0	4	2	6	0	12
KETCHIKAN	8	43	32	53	31	167
KLAWOCK	1	32	59	29	6	127
KNUDSON COVE	12	51	17	24	14	118
LOG CABIN RESORT	0	0	1	0	0	1
PETERSBURG	4	21	25	49	1	100
SALMON LANDING	7	10	13	17	9	56
SEA OTTER SOUND	0	1	0	0	0	1
SEALING COVE	0	7	4	0	0	11
SHELTER ISLAND	0	1	0	1	0	2
SITKA	118	424	399	422	53	1,416
SPRUCE MILL NEW FLT	4	4	6	5	7	26
STATTER HARBOR	2	8	4	1	0	15
THOMAS BASIN	4	4	5	7	3	23
WHALE PASS (POW)	0	1	0	0	0	1
WRANGELL	5	11	14	12	0	42
YAKUTAT	17	101	82	110	92	402
Total	291	1,123	1,120	1,078	317	3,929

Table 8. Frequency distributions of differences between logbooks and matching Southeast Alaska creel survey interviews in the reported numbers of anglers and fish released and harvested in 2006. The upper table shows frequencies of differences in reported numbers of anglers and fish released, and the lower table shows the distributions of differences in harvest for unverified (N) and verified (Y) interviews.

Difference	Anglers	Released Fish						
		Large King	Coho	Halibut	Pelagic RF	Yelloweye	Other RF	Lingcod
-5+	1	4	2	73	0	8	23	23
-4	5	3	1	29	0	30	14	15
-3	6	6	0	37	0	33	17	23
-2	41	17	3	62	0	37	41	57
-1	362	37	7	91	0	63	69	100
0	3,334	3,647	3,861	3,183	3,535	3,726	3,712	3,431
1	107	101	18	131	54	16	11	135
2	33	34	6	93	47	2	9	59
3	3	21	8	52	28	2	9	26
4	1	13	2	29	34	1	4	22
5+	2	38	13	141	95	3	12	30
Total	3,895	3,921	3,921	3,921	3,793	3,921	3,921	3,921
Min	-5	-16	-20	-25	0	-6	-13	-16
Max	5	14	34	37	20	8	12	32
Average	-0.07	0.11	0.03	0.23	0.3	-0.09	-0.06	0.04

Difference	Harvested Fish													
	Large King salmon		Coho salmon		Halibut		Pelagic rockfish		Yelloweye rockfish		Other rockfish		Lingcod	
	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
-5+	1	7	5	32	9	33	4	27	0	1	5	9	1	2
-4	0	4	2	10	6	13	4	13	1	6	2	6	0	3
-3	3	5	1	11	4	14	3	14	4	14	9	6	1	9
-2	1	21	8	32	12	26	6	17	5	6	9	18	5	6
-1	6	50	18	101	20	58	16	58	13	49	28	68	7	33
0	246	3,481	229	3,284	508	3,059	108	3,300	279	3,454	184	3,453	215	3,560
1	3	51	7	88	7	61	5	85	5	41	13	60	5	43
2	1	24	9	30	3	23	2	36	0	16	1	19	2	14
3	0	12	1	19	2	12	0	28	1	14	3	10	0	8
4	0	5	0	13	2	14	0	13	0	8	0	6	0	6
5+	0	0	1	20	4	31	3	51	0	4	1	11	0	1
Total	261	3,660	281	3,640	577	3,344	151	3,642	308	3,613	255	3,666	236	3,685
Min	-5	-6	-16	-19	-19	-10	-12	-25	-4	-9	-10	-9	-1	-7
Max	2	4	9	20	7	10	16	25	3	5	15	12	2	5
Average	-0.07	0.00	-0.17	0.01	-0.19	0.00	0.31	0.10	-0.10	0.01	-0.32	0.01	-0.07	0.01

Table 9. Numbers of matching interview and logbook records by port and month for Southcentral Alaska, 2006. Port names are as reported in the charter logbook. The upper table shows matches for the standard port sampling interviews, and the lower table shows matches for the “roving tech” interviews.

Port	Month					Total
	May	Jun	Jul	Aug	Sep	
Regular Port Sampling Interviews:						
ANCHOR POINT	13	22	23	15	0	73
ANCHOR RIVER	0	2	0	0	0	2
ANTON LARSEN BAY	0	0	3	0	0	3
DEEP CREEK	4	130	90	54	0	278
HOMER	38	89	76	70	1	274
KODIAK	0	27	79	95	18	219
NINILCHIK	0	11	12	4	0	27
PASAGSHAK BAY	0	0	0	1	0	1
SEWARD	0	84	94	77	9	264
VALDEZ	0	36	37	14	0	87
WHITTIER	5	16	9	3	0	33
Total	60	417	423	333	28	1,261
“Roving Tech” Interviews:						
ANCHOR POINT	-	6	39	26	-	71
DEEP CREEK	-	56	77	43	-	176
HOMER	-	38	101	55	-	194
NINILCHIK	-	4	10	7	-	21
SEWARD	-	41	53	43	-	137
Total	-	145	280	174	-	599

Table 10. Frequency distributions of differences between logbooks and matching Southcentral Alaska creel survey interviews in the reported numbers of anglers and fish released and harvested in 2006. The upper table shows frequencies of differences in reported numbers of anglers and fish released, and the lower table shows the distributions of differences in harvest for unverified (N) and verified (Y) interviews.

Difference	Port Samp	RovTech	Released Fish			
	Anglers	Anglers	Halibut	Pelagic RF	Nonpel RF	Lingcod
-5+	2	1	110	36	2	5
-4	4	0	27	6	1	4
-3	8	4	29	12	1	10
-2	30	7	50	16	6	17
-1	106	43	69	23	14	49
0	982	505	623	1,143	1,231	1,151
1	85	24	74	4	3	14
2	37	11	62	7	1	5
3	3	4	23	4	0	1
4	2	0	36	0	0	0
5+	1	0	158	10	2	5
Total	1,260	599	1,261	1,261	1,261	1,261
Min	-7	-5	-50	-40	-10	-23
Max	5	3	75	20	6	22
Average	-0.03	-0.03	0.76	-0.30	-0.02	-0.07

Difference	Harvested Fish								
	Roving Tech Halibut	Port Sampling Halibut		Pelagic rockfish		Nonpelagic rockfish		Lingcod	
	Y	N	Y	N	Y	N	Y	N	Y
-5+	5	14	9	15	5	3	6	1	0
-4	6	16	3	6	0	1	1	0	0
-3	2	4	0	4	2	3	0	0	1
-2	26	50	15	9	2	5	9	1	4
-1	28	34	13	17	8	11	11	11	6
0	486	778	234	1,100	42	1,110	65	1,170	46
1	31	25	11	15	7	14	6	6	3
2	5	13	8	7	0	5	2	4	2
3	6	7	3	5	1	1	0	0	0
4	3	5	3	2	0	2	1	0	1
5+	1	15	1	13	1	5	0	5	0
Total	599	961	300	1,193	68	1,160	101	1,198	63
Min	-12	-14	-35	-27	-50	-6	-13	-6	-3
Max	10	12	5	30	10	27	4	10	4
Average	-0.13	-0.12	-0.37	-0.04	-1.06	0.05	-0.69	0.03	-0.10