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NMFS

Sustainable Fisheries

Halibut Guided Charter Data Collection

Conceptual Design

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1 Introduction

The International Pacific Halibut Commission (IPHC) has overall responsibility for managing the Pacific halibut resource in Alaska waters. The IPHC sets overall exploitation limits for the resource. The North Pacific Fishery Management Council (Council) has responsibility for advising the National Marine Fisheries Service (NMFS) on policy involving allocations.

The Council has recognized that under current management practices the exploitation of the halibut resource by guided sport fishing charters within the overall Constant Exploitation Yield target set by the IPHC is not limited. The magnitude of the guided charter fishery harvest is significant -- roughly ten percent of the commercial fishery harvest. The guided charter fishery was growing rapidly and the Council determined that the situation amounted to an ongoing reallocation from the commercial fishery to the guided charter fishery. With that determination, the Council began taking steps to manage the allocation to the guided charter fishery. The initial proposed management action is the establishment of a Guideline Harvest Level (GHL) to begin in 2004. If the GHL is exceeded, the Council will consider actions to take in future years. Therefore, accurate and timely reporting of halibut harvests in the guided charter fishery will be needed.

An Individual Fishing Quota (IFQ) program is used to manage the commercial halibut fishery. In addition to the GHL management action, the Council embarked on a policy that would allow the inclusion of the guided charter fishery under the existing IFQ program. Transition to IFQ management of the guided charter industry would not take place before 2006. The existing commercial IFQ program depends heavily on real time electronic reporting of harvests, both through dedicated card swipe terminals located at processor and port locations, and via the Internet. To be successful, guided charter management under the IFQ program would need a system that similarly provides for the acquisition of timely harvest data.

NMFS is responsible for implementing policies recommended by the IPHC and the Council regarding the management of the halibut resource. In early 2003, NMFS engaged Wostmann & Associates, Inc. (WAI) to undertake a systems analysis and conceptual design project for a data collection system to support both the halibut GHL and IFQ management of the guided charter industry. Wostmann & Associates, a Juneau based Information Technology (IT) consulting firm, teamed with Natural Resources Consultants (NRC) of Seattle to survey existing guided charter data collection programs in other jurisdictions, and the data reporting capabilities of the halibut charter fleet in Alaska.

The project was conducted in three phases. Each phase produced a report, and each built on information developed in the prior phase. The first phase was a survey focused on systems and methods used for charter fishery data collection in other jurisdictions. The second phase of the project was an assessment of the data collection and reporting capabilities and constraints in the Alaska guided charter industry. Many of the questions asked and areas explored in this phase resulted from the initial survey and analysis of data collection programs in other jurisdictions. The third phase formulated a conceptual design for the data collection and reporting system, providing a vision of a system that would meet the needs of the IFQ program and that would fit within the constraints of the industry that would report the data.

This document is the product of the third phase of the project. It provides both the conceptual design for a guided charter data collection and reporting program, and recommendations for its implementation.

1.1 Objectives

Management of the halibut guided charter fishery industry is evolving. The North Pacific Fishery Management Council has two potential management programs: the GHM program beginning in 2004 and the IFQ program beginning not before 2006. The overall objective of the Halibut Guided Charter data collection project is to design a data collection program and system to acquire accurate and timely data suitable for either a GHM or an IFQ management program.

Since IFQ management is considered the long-term solution, the system and database would be oriented to support this type of program, but not to the exclusion of the features needed to support the interim GHM management program.

An important objective of the longer-term IFQ program is to develop a system and database that is compatible with the existing commercial IFQ program. It must support the management of quota shares and the transfer of shares within and between the guided charter and commercial sectors.

Enforcement of regulations for guided charter operations is more difficult than for commercial operations because landing activity is not concentrated at processors, is widely dispersed, and includes many remote locations. An objective of the data collection program is to make compliance and accurate reporting as easy and convenient as possible in order to minimize the incidence of improper reporting caused by confusion over requirements. Additionally, the system will need to provide features to make enforcement efforts efficient and effective.



The objective of this report is to provide a narrative description of the conceptual data collection system, to allow stakeholders to visualize the system and understand its features and benefits. With this visualization, discussion and feedback will be more readily focused on key issues. Feedback and input to the decision-making process can be made before system development, allowing for improvement of the design prior to implementation.

1.2 Scope

The scope of this report is limited to the conceptual design of a landing reporting system for the halibut guided charter fishery. It focuses on the data collection and reporting aspects of the system, and the inputs and features for data submitters. While it touches on some areas of data usage, such as management of quota share transfers and data submitter account balances and reporting history, these areas are not fully explored and are outside of the scope of the current effort. As a conceptual design, this report illustrates and discusses major system components and how they will interact with users submitting data. It does not address all the ways the data would be accessed and used from an internal agency perspective.

This project does not furnish a technical design for the system. For example, the data model presented is a logical model. It does not include technical elements such as surrogate keys that allow relational database software to maintain and insure internal consistency. It does not cover issues such as audit trail information storage, or user authentication and authorization mechanisms. Definition of such technical details should be done after all detailed requirements are documented and before software implementation. Nor does this conceptual design define the technical details of integrating with existing NMFS or other agency databases.

This report does not fully specify the detailed requirements for the data collection system. Detailed requirements would result from the analysis of all aspects of the system, including detailed requirements of all user groups and interface requirements for all existing systems that will interact with the data collection system. Such an analysis should be conducted as a part of system development and implementation, but would not normally be done until the decision has been made to go forward with system development. The logbook entry illustrations, web pages, and Interactive Voice Response (IVR) scripts in this document are examples of concepts that can be employed in the data collection system, but they do not constitute the final specification. The requirements specification phase of the project would start with these examples and would add further definition of details and additional usability features.

1.3 Terms and Definitions

The following table defines the terms, abbreviations, and acronyms used in this document.

Term	Definition
IPHC	International Pacific Halibut Commission
NMFS	National Marine Fisheries Service
GHL	Guideline Harvest Level
IFQ	Individual Fishing Quota
WAI	Wostmann & Associates, Inc.
NRC	Natural Resources Consultants, Inc.
IVR	Interactive Voice Response
RAM	Restricted Access Management
ADF&G	Alaska Department of Fish and Game
CFEC	Commercial Fisheries Entry Commission
PDA	Personal Digital Assistant

2 Methodology

This project was conducted in three phases. The first two phases were intended to discover ideas and constraints that would guide the conceptual design process.

The initial phase of this project surveyed data collection systems for guided charter fisheries in other jurisdictions. It identified techniques, concepts, data elements, and ideas that were successful elsewhere; and some that other management organizations identified as worthy of additional development.

The second phase of this project surveyed representatives of the Alaska guided charter industry. It solicited their ideas as well as reporting capabilities and limitations. In addition to ideas offered by the industry, ideas identified in the initial survey as well as concepts known to us from other data collection projects were discussed.

The final phase of this project, resulting in this report, evaluated and developed the ideas identified in the prior phases. This phase of the project organized the ideas and data elements identified in the prior phases. WAI conducted a series of brainstorming meetings with NMFS representatives from Sustainable Fisheries, Restricted Access Management, and Enforcement divisions. The NMFS and contractor team reviewed the ideas and data elements, culled out those found to be infeasible or ineffective, and explored the remaining ones. The result of this process was a set of concepts generally categorized as either highly desirable or possibly useful.

WAI further developed the concepts, producing mockup designs of various data collection system components. These were reviewed with NMFS representatives, whose feedback was incorporated into the descriptions of the design found in this document. Where practical, concepts were simplified and data collection requirements were streamlined to provide the most concise solution to the known system needs.

3 Ideas and Concepts

As a result of reviewing data collection systems in other jurisdictions, soliciting input from the halibut charter fleet, and brainstorming with NMFS personnel, WAI identified a number of key concepts that should be embodied in the data collection system. A number of other ideas were identified that might be implemented, but require further development to determine if they are necessary for the program. Finally, a few important concepts led to significant review and discussion, but were eventually rejected as not applicable to the data collection system.

3.1 Key Concepts

The envisioned data collection system will implement the following features and concepts.

3.1.1 Paper Logbooks

All halibut guided charter operations covered under the program will need to maintain on-board paper logbooks tracking their daily fishing activity. Paper logbooks are a time-tested and proven mechanism for capturing data for reporting requirements and enforcement purposes. NMFS has successfully implemented a number of logbook programs for data collection in Alaska and around the US for many years. Most jurisdictions surveyed during this effort require logbooks for data reporting. Additionally, all halibut guided charter operations are already accustomed to logbook maintenance procedures because of the current requirement to maintain the Alaska Department of Fish and Game saltwater logbook for their charter activities.

Some examples of alternatives to logbooks for reporting landing activity were found in other programs, such as the card-swipe terminals in the commercial halibut IFQ program and the tagging program for bluefin tuna in the Atlantic. However, in these programs regulated buyers participate in the landing reporting, although in a minority of cases the buyer and the seller are the same individual. Since sport-caught halibut retained from charter activities are not subsequently sold, these alternatives are not directly applicable to the halibut guided charter industry. Additionally, even the commercial halibut IFQ program requires logbooks on most vessels, although they are not used for account management.



Despite the continuing advances in communications technology facilitating electronic means of data reporting, the paper logbook continues to provide the most practical and reliable mechanism for Enforcement to use for verifying compliance with fishing and reporting regulations on board fishing vessels, particularly in remote areas of Alaska.

3.1.2 Electronic Reporting

The ability to electronically report fishing activity is also a necessary component of the data collection program. Electronic reporting could include an Internet-based reporting application and a phone-based Interactive Voice Response system. Electronic reporting will allow charter operators to keep their accounts up-to-date in near real time. Keeping account records up-to-date will be an important factor in facilitating the ability to transfer quota share when the IFQ program is in place, and in supporting enforcement of permit provisions.

In some cases, charter operators will not have Internet access or adequate cell phone coverage while at sea and may not be able to electronically report during extended trips. However, reporting will not be required until trips are completed. Many charter operators not only currently have cell phones and high-speed Internet access on shore today, but also rely upon them to successfully conduct their business. Most operators surveyed during this effort indicated they have the capability to report electronically.

Electronic reporting will significantly improve the timeliness of reported data. It will reduce the cost associated with the processing and data entry of paper logbook pages sent in by mail, and the cost of providing account information to charter operators. NMFS already has a number of electronic reporting programs, and is continuing to develop Internet based systems for reporting and other required interactions.

3.1.3 Logbook Page Submission

Completed pages from the on-board logbooks will be submitted to NMFS periodically. This requirement will be supported by pre-printed logbooks containing carbonless copies of each page. At the end of a reporting period, typically one week for many existing logbook programs, the logbook page copies will be detached from the logbook and transferred to NMFS by standard US mail.

Logbook pages received at NMFS will be used to verify electronically submitted data and to enter the logbook data that is not included in

electronic reports. The frequency of logbook page submission can be reduced, potentially to just once at the end of the year, since operators are submitting electronic reports for inseason account management.

3.1.4 No Fishing Reporting

Other jurisdictions have found reports that require accounting for each day of the season improve data quality. If each day requires report information it is easier to identify missing reports than if reporting is only required for days of fishing activity. However, this approach requires two related concepts in order to reduce excessive reporting of no activity.

Checkin/Checkout – A reporting mechanism to checkin for fishing and reporting will relieve the operators from having to report until they begin their season. Until their first fishing day no reports will be made. The initial checkin could be made concurrent with the first report. Thereafter, the operator would account for activity for each day. At the end of their season the operator would checkout, and would not be required to make further reports since they would no longer be fishing. The checkout would be made concurrently with the final report of the season.

In addition, some operators have extended periods in the middle of their season when they do not conduct guided charters for halibut. For these operators a midseason checkin/checkout mechanism is desirable. The midseason checkout would be similar to the end of season checkout, and would be made concurrently with an activity report. The midseason checkin should require a checkin on the electronic reporting system or other direct notification to NMFS prior to the resumption of fishing activity. Some minimum checkout time period would be set to minimize the number of short duration checkouts. This minimum time period would be on the order of five days. Mid-season checkouts for no activity periods would not be mandatory; operators would always be able to report days of no fishing while checked in.

No Fishing Day check box - In the logbook and the electronic reporting mechanisms, an option will be provided to report daily fishing activity as a “No Fishing Day”. No additional data will need to be reported for that day. It is important to note that the “No Fishing Day” reporting option can only be used on days where no effort took place. A day with guided charter activity, even if no halibut were retained, would still need to be logged with angler information.

3.1.5 Reporting Angler Information

Charter operators will report the names and ADF&G fishing license numbers for all of the anglers who retain halibut. This requirement will provide a mechanism to help insure that charter operators and their clients are abiding by Alaska State sport fishing regulations. It will also provide an additional form of report verification for enforcement purposes. Enforcement staff will be able to use reported names and fishing license numbers to contact anglers as part of investigations in order to corroborate the data reported by the charter operator.

Angler names constitute the charter operators client list, which is considered highly sensitive proprietary data by the charter operators, and will be held confidentially. Addresses and other personal or contact information about the anglers will not be provided in the reported data. Enforcement will be able to look up contact information for the anglers through the ADF&G records for authorized enforcement investigation activity.

The angler names and fishing license numbers will be associated with the retained fish being reported. In cases where a sport fishing license is not required, for example anglers below the age of sixteen, only their names will be associated with their harvests.

3.1.6 Cost Considerations

The guided charter industry will bear the costs of administering the IFQ program through fees. Therefore it is important to note that transferring data entry burden between the operators and NMFS will have no clear advantage to either group. While not a design concept per se, this report focuses on concepts that can reduce overall data entry effort, rather than on those that might minimize it only for the guided charter industry. This concept tends to favor data entry by charter operators because it minimizes transcription data entry errors.

3.2 Noteworthy Concepts

In addition to the key concepts enumerated above, a number of ideas were identified that might be implemented. These ideas would need further development to determine if they are actually critical and necessary for the program, or are possibly desirable enhancements that could be deferred.

3.2.1 Logbooks Associated with Vessels

Except in rare situations where an operator does not use a specific vessel or set of vessels for their charter operations (see section 4.1.1), each logbook could be associated with each combination of operator and vessel. If an operator has multiple vessels, they will have a separate logbook for each vessel.

This concept will permit logbooks to be retained on board the vessel and in turn give Enforcement the ability to determine the vessel's fishing history for the year from the logbook on board.

This scenario will also help reduce data reporting requirements since each logbook will have a unique logbook serial number. If the logbook serial number is associated with both the permit and the vessel at the time the logbook is issued, the need for data reporters to enter both the permit number and the vessel number on the entry lines in the logbook and on electronic reports will be alleviated. Assigning logbooks to vessels is also the approach used for the ADF&G Saltwater charter logbook, and would reduce differences between the programs, which in turn reduces the possibility of confusion on the part of operators.

3.2.2 Consolidated ADF&G/NMFS Logbook

Because all halibut guided charter operators are currently required to maintain the ADF&G saltwater logbook, it would be desirable to the charter industry to be able to enter their halibut reporting information in a single, consolidated logbook along with other species required by ADF&G.

3.2.3 Collecting Angler Signatures

An additional measure of verification that reported fishing license numbers and harvest counts are accurate would be to have the anglers sign the logbook or an associated form next to their fishing license number.

3.2.4 Logbook Instructions

The Logbook should contain instruction pages. These pages should include detailed instructions for filling out the logbook entries, a list of valid port codes, and instructions for accessing and using each of the electronic reporting means.

3.2.5 Mandatory Electronic Reporting

Commercial IFQ permit holders are currently required to report electronically except in rare cases when a permit holder has extenuating circumstances that justify the issuance of a waiver from Enforcement from electronic reporting. A similar requirement for electronic reporting for the guided charter program would be highly desirable to NMFS because this would guarantee timely submission of data and minimal data entry requirements from NMFS staff. Most industry representatives interviewed during this project indicated that they have the capability to do electronic reporting.

3.2.6 User Profiles

The goals of 1) having a system that is simple, easy to use, and requires minimal data input, and 2) having a system with the flexibility to handle all situations are somewhat contradictory. Allowing users to define profiles may resolve this challenge. A profile would specify constant default values for specific fields, such as vessel ADF&G number and port of landing. Once the profile was set the user would not enter these fields. This concept would be particularly beneficial for operators who always use the same boat, always return to the same port, and have relatively fixed business practices.

3.2.7 Online Ordering of Logbooks

An Internet reporting system could include features for ordering additional logbooks or new logbooks for the next season.

3.2.8 Electronic Report Confirmation Number

As a part of the electronic reporting process, a confirmation number can be reported back to operators verifying receipt of each electronic report. The printed logbook will include a field to enter the electronic report confirmation number. This number would provide the submitter with an additional piece of data to indicate that they had submitted the required report. However, the recording of the confirmation number could be problematic for operators who wish to leave their logbook on board their vessel and to make their electronic reports from the tear-out report submission pages. Thus, it might not be desirable to make the confirmation number a required field.

3.2.9 Retained Fish Tally

Even if recording the length of retained fish were needed, this data cannot be required to be recorded in the logbook until just before docking, since it would be unduly hazardous for operators to measure halibut when they are first brought on board. However, it would be feasible to require a tally count in the logbook that would have to be maintained while fishing, and that Enforcement could check during boardings. The tally could be associated with individual anglers.

3.3 Discarded Concepts

The process of surveys and group discussions generated a great number of ideas. Some were obviously unworkable, inefficient, or otherwise flawed and were discarded almost immediately. Several concepts led to significant discussions and further exploration, but were ultimately rejected. Some of these deserve mention, along with the reasons they were discarded.

3.3.1 Tags

The possibility of implementing a tagging program similar to the program in place for the bluefin tuna commercial and recreational fishery in the Atlantic was thoroughly explored, but eventually rejected. The advantages of tags are that they provide a visual indicator of compliance that would be useful for Enforcement checks and for industry self-regulation in busy ports, because all operators would be able to observe the compliance of other operators.

However, this is offset by a number of disadvantages.

- In the blue-fin tuna sport fishery, the fish have a high value and are almost always sold into the commercial market. The sales transaction is a reliable event where the data enforcement can be conducted, and a data card must accompany the tagged fish until the point of sale, where the transaction information is added and the data is submitted. Since sport caught halibut cannot be marketed commercially, there is no transaction that would add data and insure it was reported.
- Therefore, in order to collect data needed for IFQ program administration and enforcement, all the data reporting requirements for the logbook option would still be required. A tag program would not reduce operator data reporting efforts.

- In addition, a tag program would have significant costs for producing and distributing the tags, and would need procedures for dealing with cases of lost or stolen tags.
- Also, tags would have no advantage over other data reporting systems in remote locations away from busy ports.

It was determined that implementing a tagging program for data collection would increase the cost, complexity, and risk of fraud associated with administering the data collection program without providing any additional benefit to NMFS over logbooks and electronic reporting in terms of reporting accuracy or timeliness.

3.3.2 Fill-in Permit Forms

Another alternative to a traditional logbook program that was thoroughly explored was the possibility of issuing permits to charter operators similar to those used by the ADF&G for the personal use red king crab fishery or for deer hunting. The envisioned permits would consist of paper documents containing fields to enter required reporting information for each fish allocated to the permit holder. At the beginning of the year, each charter operator would be issued forms with just enough fields for exactly the number of fish allocated to the operator for the year. They would be required to keep the permit with them while fishing, and to enter the length, date caught, and area for each fish caught before docking on the day the fish was caught. Permit pages would be submitted to NMFS when completely filled in or at the end of the year.

This concept was eventually rejected for the following reasons.

- In order to transfer quota share mid-season, both transfer participants would need to submit all of their completed and unused permits to NMFS. NMFS would have to update the permit holder accounts accordingly and re-issue permits. The new permits would be pre-printed with the number of data entry fields correctly adjusted to account for fish already caught as well as those being transferred to both participants. This processing would require a delay that is likely to be unacceptable to industry.
- For operators who own and/or operate multiple vessels, separate permit documents would need to be issued for each vessel. Since allocations will be made to permit holders irrespective of vessel, distributing the permit documents across vessels could be problematic as the permit holders approach their quotas.

- The personal use style permit by itself does not account for daily fishing activity. Operators could under report simply by not entering data in the pre-printed fields for fish that were actually caught. Enforcement will require a day-by-day accounting of fishing activity when charter boats are operating.
- In order to verify that operators complete their permit documents at the time fish are caught, operators would be required to submit copies of the permit papers regularly (e.g. weekly) and/or be required to electronically report their activities.
- As this option was discussed and mitigations were found for each objection or shortcoming, it became apparent that to satisfy all requirements the permit was morphing into something very much like a logbook.

In the end, the version of the personal use style permit that best addresses these issues is equivalent to an on-board paper logbook complemented by electronic reporting.

3.3.3 Missing Report Notification

Other jurisdictions indicated success in encouraging reporting compliance by sending reminder notifications to charter operators when required reports are not received on time. Providing automatic email notification of missing reports to charter operators was discussed during the conceptual design process, but agency representatives were somewhat skeptical that this feature was desirable or necessary.

3.3.4 Fax Reporting

Reporting by fax was briefly considered in the conceptual design effort. Since a telephone IVR reporting method is considered promising, fax reporting offered no advantages since a data submitter with access to a telephone line for faxing would be able to use the IVR system.

3.3.5 Kiosks in Harbors

To facilitate electronic reporting, electronic kiosks could be setup in harbors used by many guided charter operators. However, kiosks would be expensive to set up and maintain, and have no compelling advantage beyond a slight convenience for a limited number of operators.

3.3.6 Length Data

Capturing the lengths of retained halibut was considered for the data collection program. Length data might be useful biological information and could be used to estimate weight of fish harvested. However, the programs do not require this data for management purposes. Since neither NMFS nor IPHC had an absolute need for this data to be captured, and NMFS is required to minimize the reporting burden for program participants, the requirement for it was dropped from the conceptual design.

3.3.7 Non-retention Data

Many other jurisdictions require reporting of non-landed catch and fishing effort. Typically this is the number of fish caught and released, and frequently number of fish lost to predators. Effort information is in number of hours and number of lines. While this data can be useful in terms of developing an overall picture of the fishery, it is not needed to administer the IFQ program.

3.3.8 Location Reporting By ADF&G Statistical Area

The location of harvest will need to be reported at some level. IPHC regulatory areas are the basic unit of area tracking for stock assessment and management. The commercial IFQ program reports location using ADF&G groundfish statistical areas, from which IPHC areas are derived. For the guided charter industry, many operators are already familiar with ADF&G salmon sportfish statistical areas. Halibut guided charter reporting could use the same statistical areas. This method would align the reporting for the halibut program with the reporting already required in the ADF&G Saltwater charter logbook, and would be a source of data for studies of localized depletion. The IPHC regulatory area can almost always be determined from the statistical area, although the converse is not true. However, the statistical area is not directly needed and would increase data entry effort.

3.3.9 Optical Scanning and Electronic Archival of Logbook Pages

Several other jurisdictions use optical scanning of logbook submissions as a part of their data entry procedure. Scanned pages can be read by character recognition software to reduce data entry requirements, and scanned image files can be stored electronically to reduce the need for

storage and accessibility of paper documents. However, optical character recognition software is imperfect and requires some level of data entry support. At the level of volume of logbook form submissions expected by this program, the advantages would be negligible. Likewise, NMFS personnel believe the ability to retrieve and display electronic images of submitted web pages would be of only limited value.

3.3.10 Reporting By Anglers

Insuring accurate reporting is difficult in a system based purely on self-reporting. A third party participating in the reporting lessens the likelihood that incorrect reports will be made. For guided charter landing reporting the only available third party would be the client angler.

Other jurisdictions use angler reports as a supplemental data source for overall resource exploitation analysis, but we found none that use it as a part of their primary system of collecting and validating charter operator activity data. While it would be attractive to have them provide data that would verify charter operator reports, reporting by anglers would be problematic for a number of reasons. Such reporting would be burdensome for anglers, and lack of compliance would likely be a problem. Since many guided charter clients are from out of state and fish on short-term non-resident licenses, enforcement would be difficult. If the charter operator played a role in collecting the anglers' reports the data collection would be subject to manipulation.

4 Data Collection

The data collection needs for management of the halibut guided charter fishery are similar to those in most other jurisdictions, particularly in respect to traditional data needed for resource exploitation tracking and for data sufficient to effectively enforce regulations. In addition, the IFQ program has additional timeliness requirements to facilitate quota share transfers. Data quality is a primary concern for supporting all of these aspects of the program.

To promote data quality, the data reporting procedures should be:

- Straightforward
- Easy to understand
- Easy to use
- As consistent with existing reporting requirements as is practical

Achieving these goals is difficult because the minimum capability for one sector of the charter industry might represent excessive data entry for another sector. For example, a large tour boat operator conducting week long trips with a large number of clients would not be inconvenienced to record the day of the trip on each day's logbook entry, while for a small boat running day charters having to fill in day of trip information is extraneous and less meaningful since each trip is always only one day. Likewise, a logbook requiring angler information to be entered for each day is not duplicative for day charter operators, but it would be for the multi-day tour boat when the same anglers fish every day of the trip.

This section contains the result of developing concepts identified in the project into a high-level design for the data collection system. The design is based on a logbook that would be carried aboard vessels and that would fulfill real-time requirements for recording information about the trip both prior to fishing and prior to landing. Enforcement officials would be able to review the logbook during boardings and dockside checks to insure compliance with reporting requirements and procedures.

The design includes three methods of data submission that provide NMFS with the data needed for administration of the IFQ program. Two electronic means of reporting are envisioned to provide the timely data required for an IFQ program that allows transfers. One is an automated telephone Interactive Voice Response system and the other is an Internet based web reporting system. For each means of data submission, we considered advantages and disadvantages, as well as desirable features. The descriptions for each method have alternatives that

illustrate the range of options that might be considered for the actual data collection system.

4.1 Logbook

As discussed in Section 3.1, it became apparent during the survey of methods in other jurisdictions and the interviews with charter fleet representatives that some form of a logbook program would be the best method for recording the required data. Logbooks are a familiar instrument of data recording and submission for both charter operators and NMFS personnel.

The design of logbooks for the halibut guided charter data collection program must support several objectives. Firstly, the logbook must be easy to use. A key ease of use consideration is minimizing the amount of data needing to be entered, consistent with other program goals. In addition, the logbook should be flexible enough to handle all guided charter situations. To meet ease of use and flexibility objectives multiple logbook formats may be considered.

The other key objectives are to facilitate accurate reporting, and compliance with reporting requirements. The primary considerations for reporting compliance are having sections that must be filled out at designated times. Trip identification information such as date and trip number should be required to be entered before fishing begins. The trip results information such as anglers' names, fishing license numbers, tallies of retained fish, and the port of landing, should be required to be entered before offloading back at the dock. The angler fishing license number will not be required for those who are exempt under ADF&G regulations, such as anglers under the age of sixteen.

Logbook entry lines can be differentiated or generic. Generic or undifferentiated entry lines are all the same. All data about the line must be filled in, and multiple lines may be used for a single day's entry. Figure 1 shows an example of undifferentiated logbook lines. The advantage of undifferentiated lines is flexibility; data can be entered on as many lines as are needed. However, the significant disadvantage to this style of logbook is that it may require considerably more data entry than differentiated line items. Line items are more prone to error since different submitters may or may not use the same techniques to attempt to minimize duplicative entry, such as ditto marks of subsequent lines. Additionally, some data quality improvement techniques, such as no activity indicators, are awkward to implement on undifferentiated lines.

Date	No Fishing	Day of Trip	Trip Number	Vessel	Port	Angler Name	Angler Fishing License Number	Area 2C # of Halibut	Area 3A # of Halibut	Report #
	<input type="checkbox"/>									
	<input type="checkbox"/>									
	<input type="checkbox"/>									
	<input type="checkbox"/>									

Figure 1

Differentiated entry lines, such as the example in Figure 2, can have data, such as the date, already filled in. A no activity indicator for the date could also be provided. The State of South Carolina and the State of Alaska have charter logbooks with this feature, and it has proven successful in identifying and reducing missing reports in those jurisdictions. In addition, repeating data such as anglers fishing license numbers are associated with the single entry item. The advantages of this style of logbook are simplified entry; all data for the date is contained in the blocked entry.

The trip identification information that would have to be entered before fishing is logically separated from the rest of the data in the entry, in this example it is limited to the top line. The disadvantage of this format for entry items is that it lacks flexibility. For instance, the example in Figure 2 does not have provisions for entering data for a second trip on the specified date if the date is preprinted, and it does not have entry space for trips with more than nine anglers onboard. Of course, the number of entries can be expanded in the design of the logbook to allow for the maximums expected. However, this can result in a logbook that is more complex than is needed by many data submitters.

Date	No Fishing	Day of Trip	Trip Number for Day	Vessel	Port	Report #	Number retained	
							Area 2C	Area 3A
	<input type="checkbox"/>							

Angler Name	License #	Fish		Angler Name	License #	Fish		Angler Name	License #	Fish	
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>

Figure 2

An alternative is to provide several logbook formats, which meet the needs of different sectors of the charter industry. A significant portion of the industry operates under the Coast Guard uninspected passenger vessel rules, which limits the number of passengers to six. Therefore, a logbook formatted for nine anglers, covering six clients and three crewmembers, should be suitable for many operators. Supplemental entry lines could be included in the back of the logbook for any situations where the standard format does not provide enough space for data. The supplemental pages could be similar to the differentiated format or could use an undifferentiated format such as that of Figure 1. An alternative format for larger vessels would also be needed. This format could be of the differentiated style with more space for repeating data on entry lines, or it could be of the undifferentiated style.

Since most charter boats operate exclusively in either Area 2C or Area 3A, the logbook pages could have a checkbox to specify the area, and then a single column for number of retained halibut. However, if such a checkbox were implemented, the logbook would have to have clearly defined instructions for logging cases where a trip resulting in fishing in both areas.

Each logbook should have a unique serial number that is printed on each page along with a page number, so that submitted pages can be associated back to the logbook from which they originated. In addition to providing traceability, serial numbers will allow a reduction in data that must be entered since logbooks can be associated with permits and vessels.

4.1.1 Entry Responsibility Identification

In order to facilitate investigation and resolution of problems with logbook entries, the logbook must contain information on the individual making the entry. Although the permit holder will ultimately be responsible for compliance with reporting requirements, the captain of each charter vessel or a member of the crew will be making the required logbook entries. Each logbook entry or page will have data blocks for the name of the individual making the entry and the Coast Guard license number of the charter captain. This information is particularly important to Enforcement.

4.1.2 Entry Timing

To facilitate enforcement of regulations and to limit opportunity for accidental or intentional underreporting, the logbook program should have clear and concise rules for the timing of the entry of data in the logbook. The date, day of trip, trip number for the day, and vessel ID should be filled out before fishing begins. The harvesting angler's name

and fishing license number, along with ticking the check box, could be required to be entered within ten minutes of bringing the fish on board. The port is the only piece of data that could not be required to be filled in until docking.

4.1.3 Logbook Associations

When logbooks are issued they should be associated with a permit and/or a vessel. Issuing logbooks without requiring them to be associated invites abuse since duplicate sets of logbooks can then easily be kept.

The most effective association for a logbook is the permit. Each logbook should be associated with exactly one permit and should contain entries for only that permit. While it might occur that multiple permit holders could take clients out on a single vessel on the same trip, this would be an uncommon situation, and a single logbook to support it would require input of permit information on every logbook entry. With the ability to transfer quota share that the administrative system is expected to support, if multiple permit holders desire to share a trip and not make entries in separate logbooks, they can transfer the necessary quota to one account and make all entries for that one logbook.

Associating logbooks to permits only will allow the system to support permit holders who do not own their own vessel and who wish to borrow or rent multiple vessels over the course of a season on which they fish their permit. While this situation is uncommon, it is possible and should be considered. The main implication of associating logbooks to permits only is that the permit holders will need to include vessel ADF&G number on each log entry, and that logbooks could not be required to remain on vessels. If logbooks are not required to remain with vessels it will be more difficult for Enforcement to view a complete picture of vessel activity over time.

The alternative is to associate logbooks to both a permit holder and a vessel. This assignment simplifies reporting since the permit holder does not have to report the vessel number, as it is already associated with the logbook and can be assumed. A logbook assigned to the vessel is consistent with the procedures used by ADF&G for their saltwater charter logbook, which all halibut guided charter operators are also required to keep. This assignment also fits the situation of most operators, whether they have a single vessel, or have a fleet of vessels — each of which will need a logbook. However, this assignment scheme is less straightforward in some situations. When a permit holder buys a new boat they would need to get a new logbook for that vessel. Renting or leasing additional vessels would also involve acquiring new logbooks.

To minimize adverse impacts on business activity, NMFS must provide easy access to logbooks for operators who need them for immediate use. Additional logbook page forms can be placed on the Internet for download. To provide for associating logbooks to permits the downloadable page forms can also have serial numbers and the permit number can be collected and verified during the download request. Paper copies distributed through harbor offices could also have a serial number, and a permit number mail-in card that could be filled in when the forms are given out.

4.1.4 Consolidated Logbook

Since many charter operators will be making entries in both the halibut guided charter IFQ logbook and the ADF&G saltwater sport fishing charter vessel logbook for the same trip, it would be highly desirable to minimize the amount of overlap in the data reporting between the two logbooks. This consideration would be mitigated further if a consolidated logbook were developed.

However, a number of reasons make developing a consolidated logbook problematic. It would require a high degree of coordination and cooperation between NMFS and ADF&G, at a level that has not been mandated. The Paperwork Reduction Act may prevent NMFS from participating in a joint logbook that captures the level of detail currently captured in the ADF&G logbook. The development of a consolidated logbook would require considerable effort to resolve differences in confidentiality requirements. A consolidated logbook would also generate issues between jurisdictions in the allocation of printing and distribution costs. The management of receiving, editing, and data entering the submitted pages would be complex due to the differing requirements of the agencies for data entry of sport fishing data.

If a consolidated logbook is not practical then the instructions for making entries should be aligned as much as possible to eliminate confusion and error on the part of charter operators.

4.2 Electronic Reporting

Electronic reporting capability will be a key component of the data collection system. Two primary electronic reporting means are envisioned: 1) Internet reporting, and 2) Telephone IVR reporting.

Electronic reporting provides a number of significant advantages to all of the participants in the data collection program including data submitters, NMFS program administrators, and enforcement agents.

Timeliness – The most obvious benefit to electronic reporting is the timeliness of the reported data. Data submitters and NMFS program administrators will have the ability to monitor account balance information in near real time without the delays that would otherwise be associated with the process of mailing and data entering paper forms. With electronic reporting the required reporting time period can be set much shorter than for purely paper report submissions; 1-2 days after the end of a trip would be reasonable. In addition, the time period for submitting the associated logbook pages could be made much longer, from once per month to once per season.

Data Quality – Many potential sources of data errors can be avoided through electronic reporting. Pre-validation of data fields can be performed automatically by either Internet or phone-based reporting methods, eliminating a large class of potential errors related to missing or incorrectly recorded data. Electronic reporting also eliminates the potential for transcription errors that might otherwise be introduced by NMFS data entry clerks misinterpreting or incorrectly entering data from hand written reports.

Reduced Data Entry – Electronic reporting will reduce the amount of data entry that needs to be performed by NMFS staff to support the data collection and reporting program.

Quota Share Transfer – Because transfers of quota share require that account balances of the permit holders be up-to-date, electronic reporting is necessary to support practical turn-around times for in-season transfers.

Account Information Requests – Electronic reporting mechanisms will provide features for data submitters to request their current account information and reporting history either on-line or over the phone.

The main limitations of electronic reporting are that it requires data entry on the part of the charter operators and some level of technical infrastructure for both NMFS and the data submitters. The vast majority of operators have easy access to either the Internet or a telephone at the end of each trip. Electronic reporting also requires appropriate security mechanisms to guarantee the privacy of permit holder account information. These should be included in the detailed requirements specification for the system.

4.2.1 Internet Reporting

Electronic report submission over the Internet is expected to be the most flexible mechanism for data submission in the data collection program. Web applications, including mechanisms for providing for user security and data privacy, have become well-known technologies. NMFS has experience with web based data collection, and an existing technical infrastructure and staff to support the development of an effective and secure electronic reporting program. Additionally, many charter operators are already experienced Internet users and maintain their own web sites and online reservation systems to support their businesses.

A web page will be able to provide the quickest method for submitting the anticipated volume of data. Web pages will also provide convenient access to reporting history and account balance information. The main limitation of web-based reporting is that it requires an Internet connection, which may not be available to all operators at all times. The complimentary phone-based IVR system addresses this limitation since the only technology it requires the user to provide is a touch-tone telephone or a cell phone.

The examples provided in the following sections illustrate electronic reporting with what are expected to be common logbook profiles. The electronic reporting system will take a minimalist approach to data collection; only the minimum real-time data needed for program administration is reported electronically. Additional data recorded in the logbooks may be received by NMFS and data entered on the previously submitted electronic record. The examples show how the use of logbook profiles can further limit the amount of data that needs to be entered. The examples assume that logbooks would be associated with permits only. If they were also associated with vessels the vessel identification data entry would not be required.

4.2.1.1 User Security

Charter operators will be required to log on to the web application in order to submit and query information from the system. The logon will establish a secure user session that will insure that reports can only be made and viewed by authorized users. To access the system, operators will enter either a Logbook Serial Number or a Permit Number along with a private password. Once logged on, they will only be able to submit and view information associated with that specified logbook or permit. Additionally, all data transmissions should be encrypted to eliminate the possibility of unauthorized interception of sensitive data during transmission.

Logging in with a Logbook Serial Number would establish the identity of the related Permit, Permit Holder, and Logbook. The logbook may have a profile set to provide default values for data such as vessel ID and port of landing. This would be the simplest method for operators who own and/or operate a single vessel and who always operate out of the same port.

Logging in with a Permit Number would require data submitters to explicitly enter all information on reports and queries. This method will allow fleet operators to submit reports for multiple vessels using a single login. It will also allow permit holders without a vessel to login to report on activity conducted using a vessel to which they have temporary access, such as a short-term lease, rental, or loan.

An alternative approach to user security would be to issue login IDs for every user who would be submitting reports. The login ids could be associated with a permit number and possibly the logbook serial number to minimize required data entry. A login ID for every user would facilitate who actually made each electronic report. However, it would require an effort to educate and encourage operators to obtain login IDs for employees who submit electronic reports for them. Otherwise, many would likely give their login ID and password to their employees.

4.2.1.2 Web Application Features

The web application should provide a number of features that support the entry of required reports. In addition to user account management pages for logging in, maintaining personal contact information, and changing a password or requesting a forgotten password, the web application should include a profile setup page to allow users to pre-set data that will always be the same on their reports. A menu page that provides links to navigate to various parts of the system will be needed.

The following sections provide examples of the report entry options. In addition, these selected supplemental areas are addressed in less detail.

- Check-in/check-out
- Account Information/Balance
- Reporting History Summary
- Reporting History Detail

4.2.1.2.1 Daily Activity Reports Menu

The reports menu shown in Figure 3 will display links for all days that have not yet been reported. For each link, an option to report the day as a “No

Fishing" day will be provided. Otherwise, each link will navigate to a Daily Activity Report form for the specified day. This menu may also provide a mechanism to view reports for previously submitted daily activity reports.

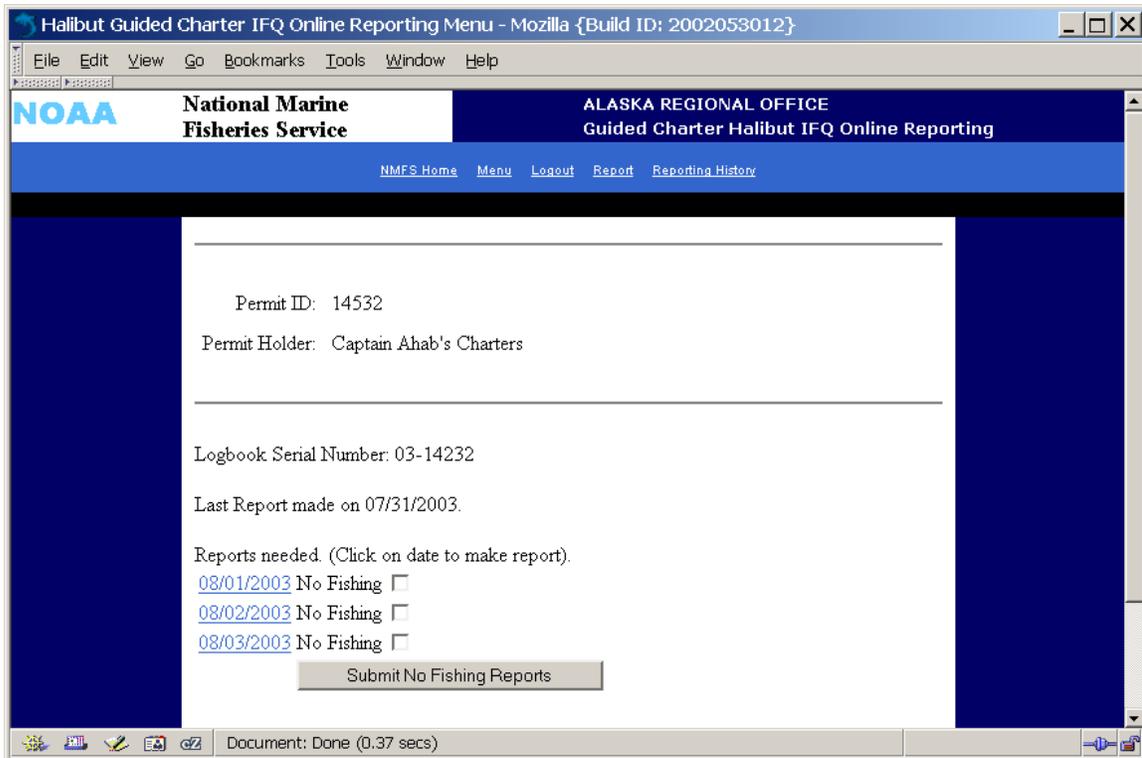
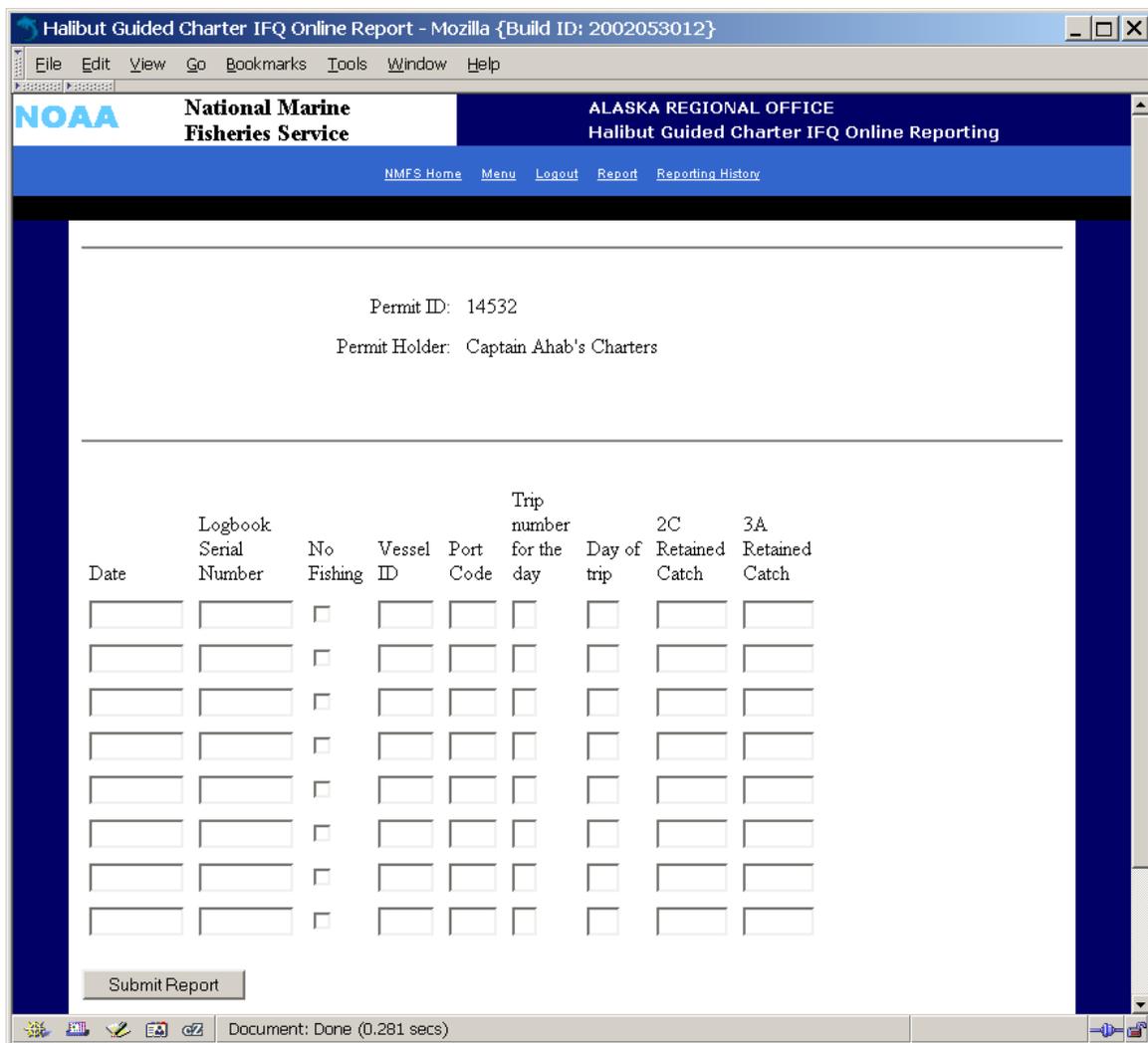


Figure 3

4.2.1.2.2 Full Daily Activity Report

The full daily activity report could include fields to enter trip information, such as the trip number for days with multiple trips, or day number of the trip for multi-day trips, and the basic activity information that includes the vessel ID, port of landing, and catch by regulatory area. The full report assumes the operator logged on with a Permit Number only. If they logged on with a logbook serial number, the entry box for Logbook Serial Number would not apply and would not be visible.



Hallbut Guided Charter IFQ Online Report - Mozilla {Build ID: 2002053012}

File Edit View Go Bookmarks Tools Window Help

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Halibut Guided Charter IFQ Online Reporting

NMFS Home Menu Logout Report Reporting History

Permit ID: 14532
Permit Holder: Captain Ahab's Charters

Date	Logbook Serial Number	No Fishing	Vessel ID	Port Code	Trip number for the day	Day of trip	2C Retained Catch	3A Retained Catch
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submit Report

Document: Done (0.281 secs)

Figure 4

The advantage of the full report approach is that it handles all the data combinations that can be entered in the logbook, and provides the maximum flexibility. The disadvantage of this approach is that it increases the data entry requirements on the operators since they must fill in all data items, even those that do not change from report to report. The following sections address alternatives that would reduce the requirement to enter the unchanging data.

4.2.1.2.3 Logbook Profile Setup

A logbook profile would allow the operator to preset values for data items that are always the same for their reports. For many operators, the vessel ID will always be the same because they own a single boat that they use to run charters. Even in the case of permit holders who have fleets, they could assign their logbooks to specific vessels and set the profiles for those

logbooks to default the vessel IDs. The port of landing is also a constant for many operators and could be set in the profile.

The full report allows and requires the entry of the trip number for the day and the day of a multi-day trip. For operators who do only full day, single day trips these fields are unnecessary and could be marked as such in the profile. The system would then suppress their display.

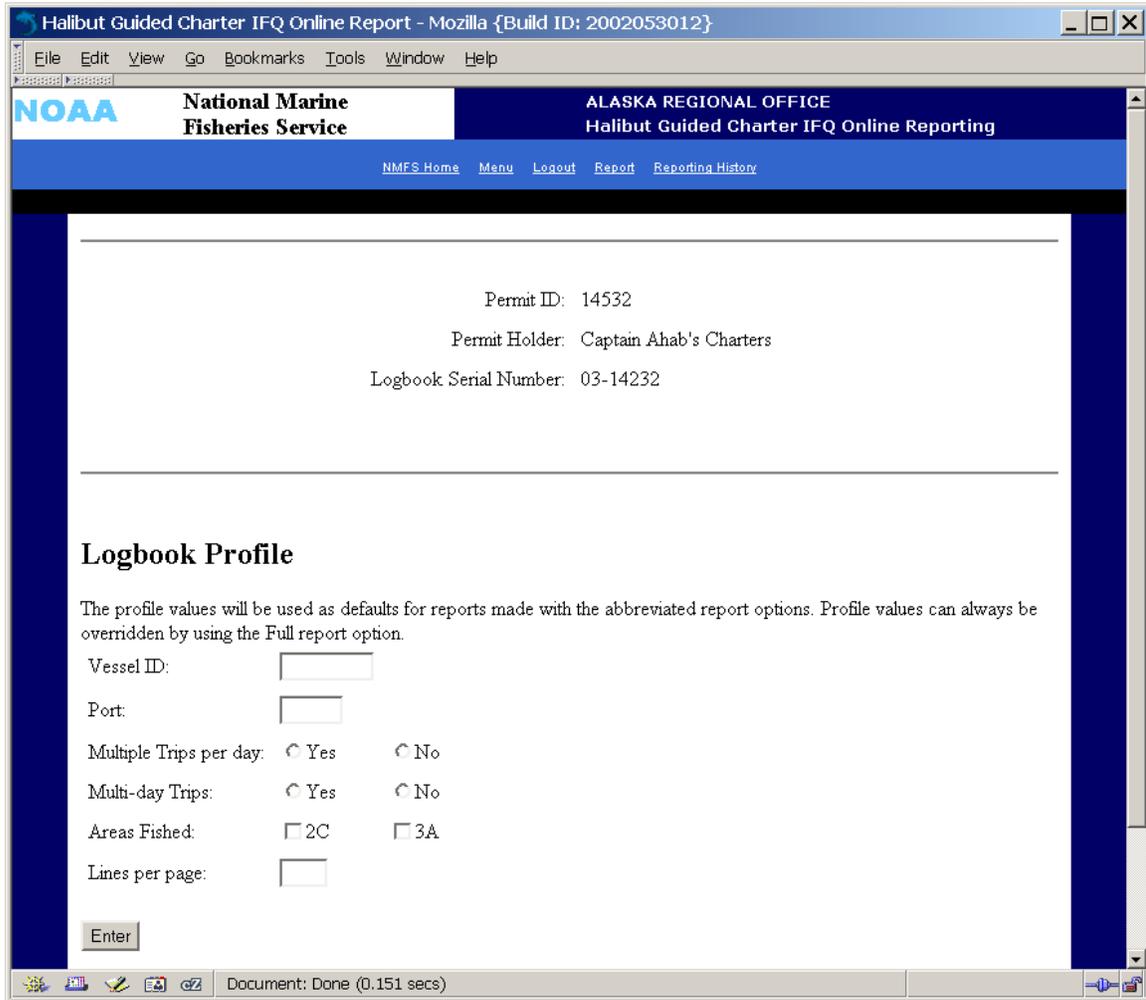


Figure 5

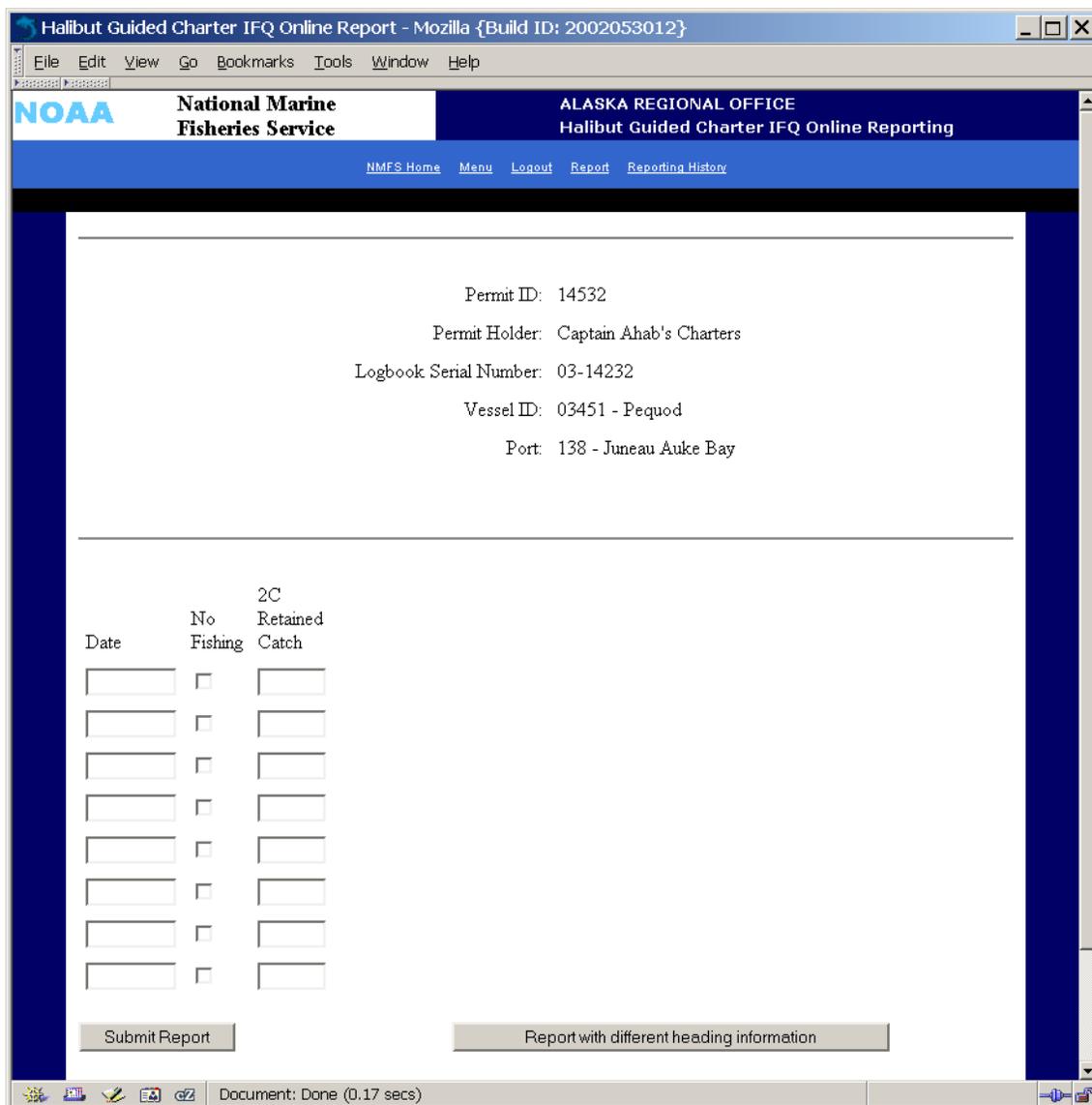
Even if a profile were set for a logbook, the operator would always have the option of using the Full Daily Activity Report format for cases where they changed their normal procedures such as taking a second trip in a day when they normally only do full day trips, or making a landing away from their home port.

4.2.1.2.4 Profiled Daily Activity Reports

The use of profiles can reduce the amount of data the operator must input on the electronic reporting system. The following sections provide examples that illustrate the extent to which the data input can be simplified to fit particular situations.

4.2.1.2.4.1 Single Vessel Operating from One Port

For an operator running full day trips with no overnights, the actual amount of data to input is quite small, only the date and the number of halibut retained, or the incidence of no activity.

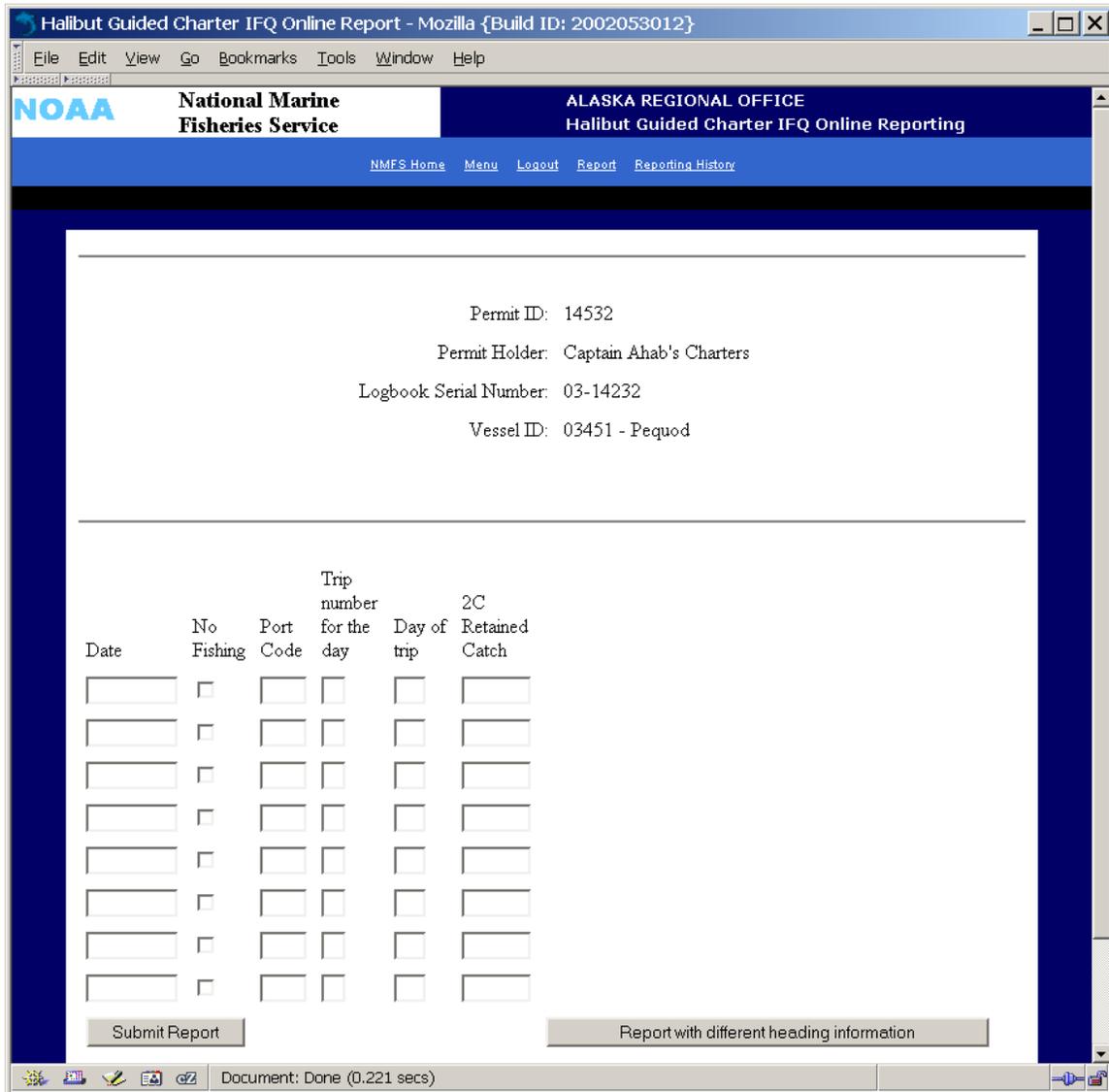


Date	No Fishing	2C Retained Catch
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>

Figure 6

4.2.1.2.4.2 Tour Boat Operating from Several Ports

Tour boats that run multi-day trips and visit a number of ports would have a more comprehensive data entry page, but the profile could still be used to eliminate unneeded fields such as the number of halibut retained in area 2C for vessels that operate exclusively in Southeast.



Halibut Guided Charter IFQ Online Report - Mozilla {Build ID: 2002053012}

File Edit View Go Bookmarks Tools Window Help

NOAA National Marine Fisheries Service ALASKA REGIONAL OFFICE Halibut Guided Charter IFQ Online Reporting

NMFS Home Menu Logout Report Reporting History

Permit ID: 14532
 Permit Holder: Captain Ahab's Charters
 Logbook Serial Number: 03-14232
 Vessel ID: 03451 - Pequod

Date	No. Fishing	Port Code	Trip number for the day	Day of trip	2C Retained Catch
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submit Report Report with different heading information

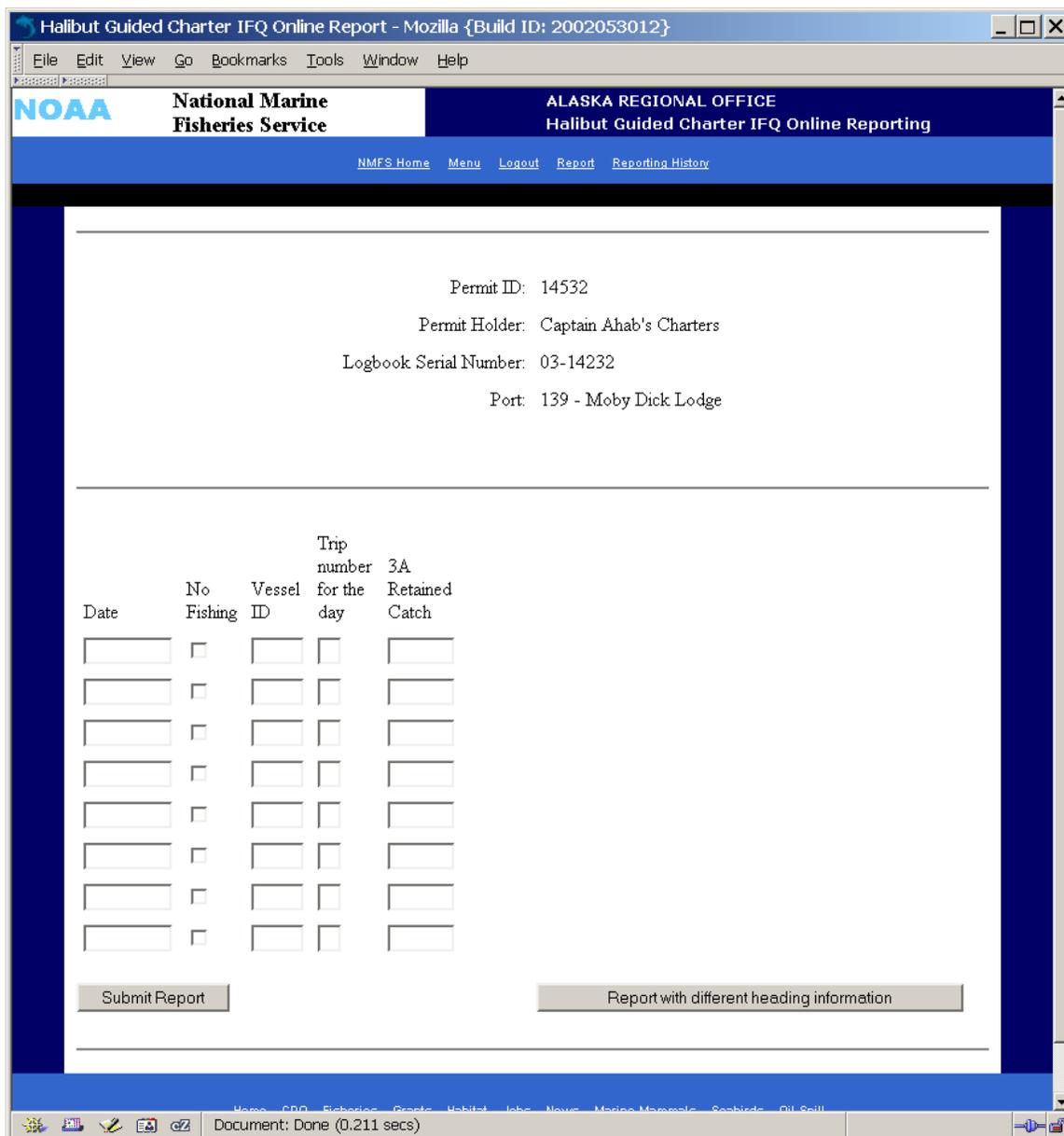
Document: Done (0.221 secs)

Figure 7

The profile for these logbooks would typically specify enough lines to handle the expected trip lengths.

4.2.1.2.4.3 Lodge with Many Skiffs

The profile for a lodge would be set to allow the operator to enter all their activity on one page, assuming that it is all recorded in a single logbook.



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Halibut Guided Charter IFQ Online Reporting

Permit ID: 14532
Permit Holder: Captain Ahab's Charters
Logbook Serial Number: 03-14232
Port: 139 - Moby Dick Lodge

Date	No Fishing	Vessel ID	Trip number for the day	3A Retained Catch
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submit Report Report with different heading information

Figure 8

4.2.1.2.5 Check-in/Check-out

The checkin/checkout form should provide a field to enter the date on which to check in or out, and if logged on with a Permit Number only, an option box to select the Logbook to check in or out. A field for the port of departure would also provide useful information for Enforcement.

4.2.1.2.6 Account Information/Balance

The account information page will display information about the account including the permit number, permit holder's name, and contact information on file. It will also display the original quota allocation, a list of all additions or subtractions to the quota balance from catches reported on daily activity reports or from transfers, and the most current account balance and effective date (last date reported).

4.2.1.2.7 Reporting History Summary

The reporting history summary page will display a list of all report submissions and their type (checkin/out or daily activity report). Each item in the list will include a link to the Reporting History Detail page for the associated report.

4.2.1.2.8 Reporting History Detail

This page will display the information reported by the data submitter on the associated daily activity or checkin/out report in read-only format. It could also include a link to edit the information if it is incorrect. The edit link would display the Daily Activity Report or the Checkin/Checkout Report, as appropriate. It would be pre-populated with the currently reported values. The system would maintain an audit trail of all updates made to previously reported data and certain restrictions would apply to updating previously reported data. For example, permit holders would most likely not be able to alter reported catch numbers on days preceding a completed transfer transaction.

4.2.2 Telephone IVR Reporting

A telephone IVR reporting mechanism will provide an alternative to the Internet-based electronic reporting application. The IVR system will be an automated program using either voice recognition or the touch-tone telephone keypad to provide user input. The system will guide the user through a series of menus using recorded or computer generated voice prompts and replies in order to capture and/or report the same data handled by the Internet-based application.

The capabilities of the IVR system are similar to those of the Internet. IVR reporting has been used successfully by commercial entities, including most banks, and governmental organizations like the State of Washington Employment Security Department for unemployment insurance claims reporting. These organizations provide IVR services such as paying bills or

providing sensitive personal information such as social security numbers over the phone demonstrating that sensitive data input by this means is practical.

Most charter operations have telephone access, and most have cell phones and reasonable cell coverage even while at sea. The phone IVR system will be the most practical electronic reporting method available to operators who may wish to report from onboard their vessel prior to docking.

IVR systems are somewhat more error prone than Internet-based systems, but this can be mitigated to a certain degree through careful scripting, and by encouraging submitters to review their submitted data and to check their account balance frequently. Another potential limitation of this feature is that NMFS does not currently have any IVR infrastructure in place in the Alaska region, nor any existing experience with developing and administering such a system. However, the IVR system could likely be developed through the use of an IVR service bureau with sufficient experience and infrastructure. The outsourced system would interact with the NMFS data collection system through web services.

Another limitation of the IVR system is that reporting large amounts of data may become unwieldy using a telephone keypad. Large operators operating multiple vessels or long multi-day trips will most likely prefer the web application for reporting. The IVR system will be attractive to smaller, single day boat operators who report smaller amounts of data more frequently.

Entry of non-numeric data is also difficult on an IVR system. While small amounts such as single letters or choosing names from lists is possible, non-numeric data entry is unwieldy and should be avoided whenever possible.

Like the descriptions of Internet electronic reporting, we provide examples in the following sections of both minimal and full IVR reporting scenarios. The advantages and disadvantages are similar to the Internet reporting scenarios.

4.2.2.1 IVR Report for Single Vessel Day Trip

The following script provides an example of the questions and associated decision tree that the IVR system would implement in order to capture all the required daily activity report information for a permit holder with a single vessel doing only day trips.

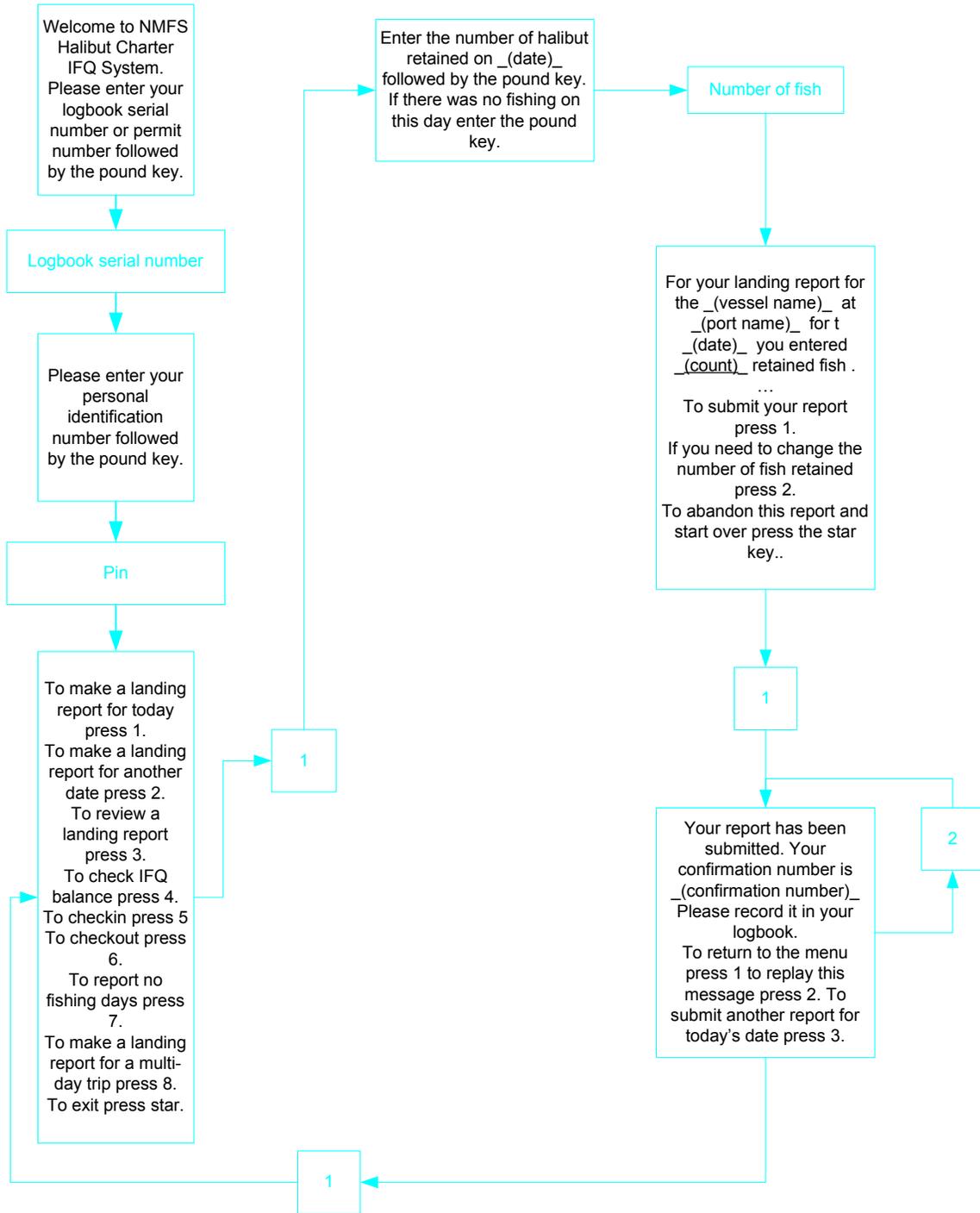


Figure 9

4.2.2.2 IVR Report for Multi-day Tour Boat

Tour boats on multi-day trips would not be required to report until after landing on the last day of the trip. The example shown in Figure 10 illustrates the sequence of inputs for the multiple days of the trip.

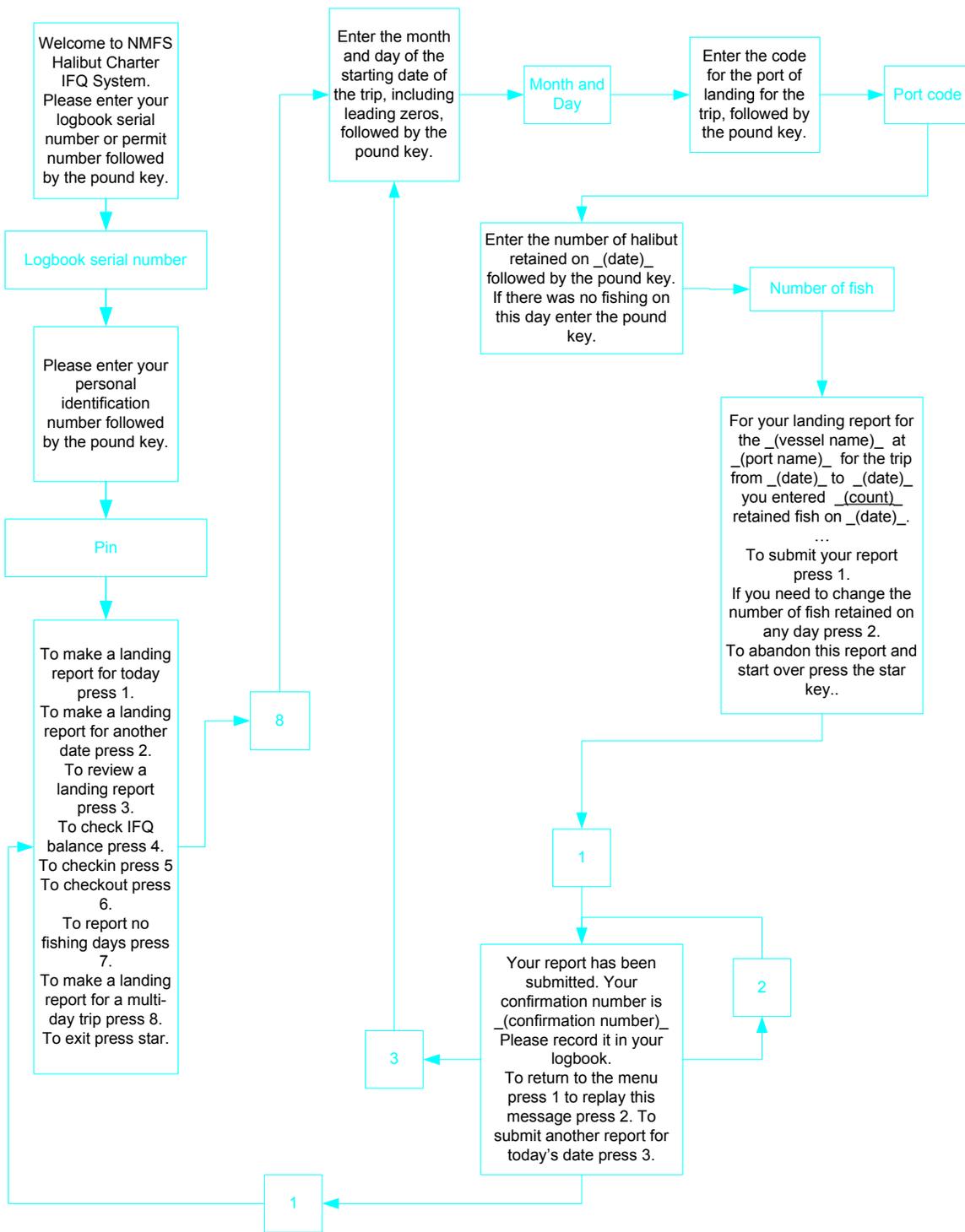


Figure 10

4.2.2.3 IVR Report for Lodge

The following script provides an example of the questions and associated decision tree that the IVR system would implement to capture the required daily activity report information when the operator logged in with their permit number and had multiple logbooks to submit.

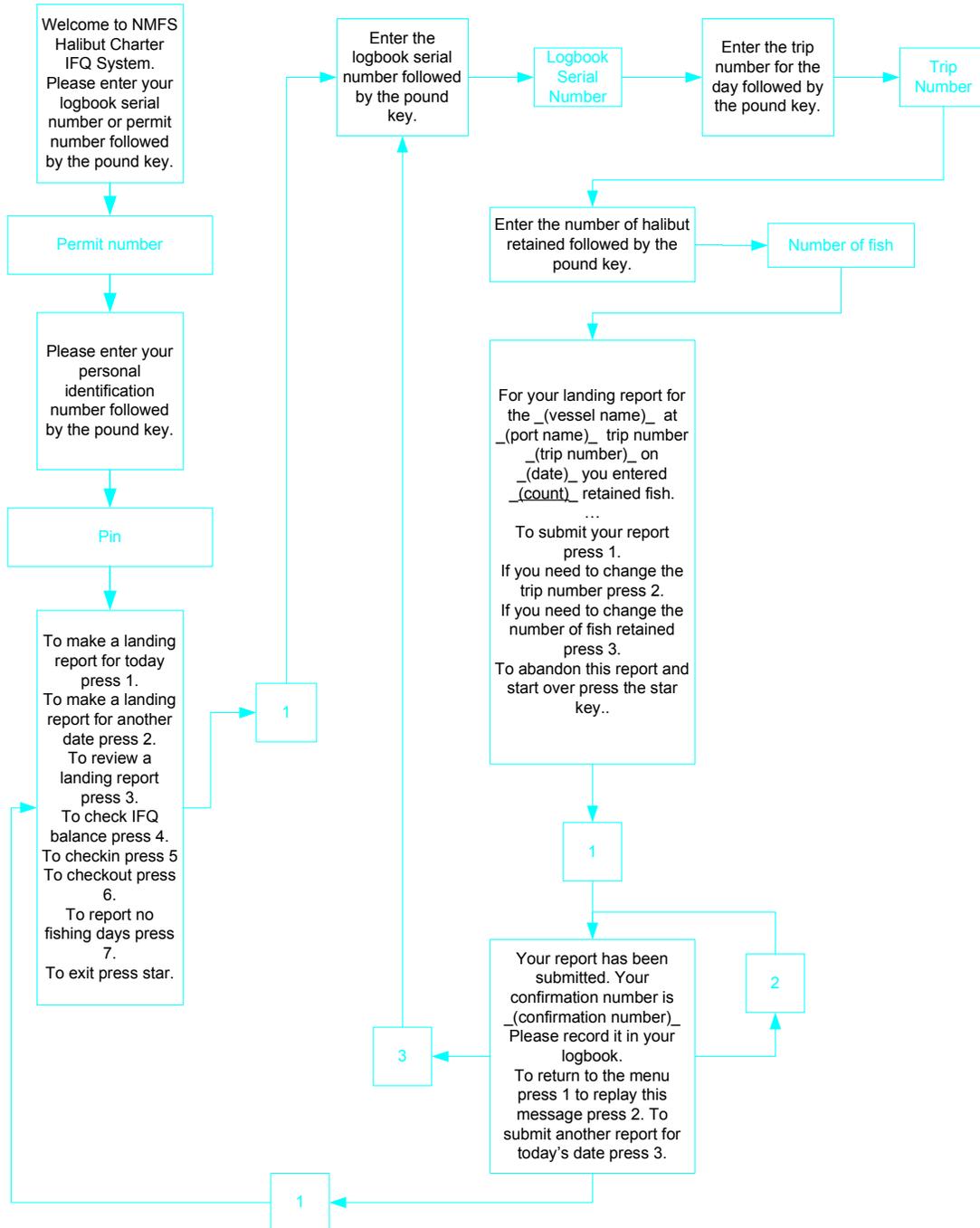


Figure 11

4.3 Paper Reporting and Data Entry

Just as traditional logbook should be the heart of the halibut guided charter data collection system, the time honored method of submitting paper logbook pages by mail or in person will continue to be an important avenue of data collection. Electronic reporting offers many advantages to both NMFS and to data submitters, but a need to receive paper records will remain for the foreseeable future. Even when electronic reports are submitted, the paper copy is important and should be collected. A signed paper logbook form is well established as a legal reporting document. Until court challenges have established that the electronic reports have the same weight as signed paper reports, it will be necessary for operators to submit the paper copy. In addition, not all data required in the paper logbook will have to be entered electronically. The anglers' names and fishing license numbers are not needed in real time, so the electronic reporting methods will not capture this data, but it will be available later if the paper logbook pages are submitted and received.

The paper reporting method has some notable disadvantages. Paper reporting is likely to require interagency cooperation. ADF&G's saltwater charter logbook program requires weekly submission; either by mail or in drop boxes that ADF&G has placed in major harbors. Even if arrangements are not made to allow halibut logbook pages to be deposited in these drop boxes, it is likely that many will be, through confusion and misunderstanding, at least initially.

A significant benefit of electronic reporting is that the frequency at which paper reports must be submitted can be reduced, since NMFS already has the critical data in the electronic reports.

Once paper reports are received by NMFS, they will need to be processed. NMFS has several options for processing the paper copies. Since the most significant data will have been submitted electronically, the paper copies could be filed, and only accessed if questions arose about the reported data. Alternately, the paper copy could be checked against the electronically submitted data, and the additional data on the paper copy could be added to the electronic record.

Two approaches to data entry are available and either would potentially fit the needs of the halibut guided charter data collection system. Casual data entry occurs when clerical personnel enter the data into the system using programs that update the database with the entered data. The clerical personnel can do additional processing, for example researching cases where data is missing, incomplete, or where data previously entered through an electronic report does not match data in the database. The advantages

of casual data entry are that it is familiar to existing personnel, since this is the technique currently in use at NMFS. The disadvantage of casual data entry is that it can introduce data errors since there is no automated mechanism for checking that data is entered correctly.

The other approach is dual key data entry. This is the industry standard where minimizing data entry error rates is an important objective. In dual key data entry, a data entry clerk enters the data from the paper into the system. They are unable to see any data from the record that might already be in the database. After the data entry clerk has completed entering the data, typically in a batch of documents, the paper record is passed to a second data entry clerk. The second data entry clerk also enters the data into the system, and is unable to see the data entered by the first data entry clerk. The system compares the data being entered with that input by the first data entry clerk. Any discrepancies cause the system to stop the entry and prompt the data entry clerk for reentry. The data is accepted only after it has been input twice with the same value. The advantage of dual key data entry is that it is well proven to practically eliminate data entry errors. This requirement may be a more significant factor in the halibut charter IFQ program since in most data collection programs submitters do not have a great likelihood of noticing or caring about data entry errors, whereas under the IFQ program they will both notice and care if an error affects their account balance adversely. The disadvantage of dual key data entry is that a dedicated data entry system or subsystem is required, where the casual data entry system can double as the read and update access for the database.

5 Data Definitions

The purpose of the data collection system is to produce information needed for the administration and enforcement of the Halibut Guided Charter IFQ program. This information is the result of values of data elements and the relationships of data captured in landing reports. The following sections describe the individual data elements and a data model that represents their relationships, from the perspective of the data reporting.

5.1 Data Elements

5.1.1 Permit Number

Under the IFQ program, all guided charter halibut harvests will be made under permit. The permit number will uniquely identify a permit. Permit numbers will be integers of less than 10 digits.

5.1.2 Permit Holder Name

The permits will be issued to individuals or business entities, which will have a name.

5.1.3 Logbook Serial Number

To facilitate ease of identification of reports, each logbook will have a unique serial number. The format of the serial number could be completely sequential, or could contain meaningful sub-fields such as year, in addition to the sequence number. The number will be generated prior to assigning the logbook to a permit, so it will not contain permit or vessel information.

5.1.4 Password

For security on the electronic reporting methods, a password will be required to authenticate users.

5.1.5 Vessel ID

The CFEC issued ADF&G number identifies guided charter boats participating in the fishery. According to CFEC rules all charter vessels are required to have the ADF&G number; therefore, all halibut guided charter vessels will have this number.

5.1.6 Vessel Name

The vessel name is the common name of the boat, and can be directly cross-referenced from the ADF&G number.

5.1.7 Date Being Reported

Each landing report will have a date when the fishing took place. In addition, to facilitate accurate reporting, non-activity days will require an abbreviated report, so a date will be needed for these reports as well.

5.1.8 Checkin Date

While requiring the reporting of non-activity days significantly improves the ability to detect missing reports, it adds reporting burden to the data submitters. In order to minimize the reporting burden, the system will provide the capability to checkin and checkout of reporting. The checkin date will identify the beginning of a period when fishing activity may occur, and reports will be made.

5.1.9 Checkout Date

The checkout date will identify the beginning of a period when no reports will be made.

5.1.10 Port of Landing

The port of landing is the location to which the vessel returned after fishing, where the fish and anglers were offloaded. In most cases this will be the NMFS numeric code for the port. The use of the numeric code facilitates electronic reports, particularly by telephone. The current set of port codes is oriented to commercial reporting; it may require expansion to cover all charter landing locations.

5.1.11 Trip Number for Day

Each day that requires an activity report will also require a trip number for the day. This number identifies and segregates multiple reports that are made for the same day because of multiple trips for that day. This data element will almost always be a number between 1 and 3. We are not aware of any charter operators running more than 3 trips per day on a single vessel.

5.1.12 Day of Multi-day Trip

For trips that last longer than one day, each subsequent day will be identified with a sequential number for that day of the trip.

5.1.13 Angler's Name

To provide for Enforcement needs, the name of each angler who harvested halibut on a charter trip will be required.

5.1.14 Angler's Fishing License Number

The ADF&G fishing license number of each angler who harvested halibut provides Enforcement with additional contact information for anglers that will be useful in investigations. Not all anglers will have license numbers, for example those under the age of sixteen are exempt.

5.1.15 Regulatory Area of Harvest

IPHC management plans and allocations are made using large regulatory areas. The landing reports of numbers of fish must be by these areas. For most operators the regulatory area will always be the same, and can be set to a default value in their logbook profile.

5.1.16 Number of Fish

The minimum data necessary to manage the programs will be the number of fish retained.

5.1.17 Report Confirmation Number

In order to indicate in the logbook that an electronic report has been made, as well as for providing an audit trail of electronic reporting, the system will generate a confirmation number for each electronic report. The number could encode checkout information as well as representing an instance of reporting. The report confirmation number could be recorded in the logbook after making an electronic report, but this would not necessarily be mandatory.

5.1.18 Name of Person Making Logbook Entry

The name of the person who makes the entry in the logbook will be included on the logbook page. This data will not be entered electronically, but could be derived if the electronic login were by person rather than permit or logbook. This information could be data entered after receipt of the paper copies of logbook pages at NMFS.

5.1.19 Coast Guard License Number of Charter Captain

The Coast Guard license number of the captain for the particular trip will be entered in the logbook. This data will not be entered electronically but could be data entered after receipt of the paper copies of logbook pages at NMFS.

5.2 Data Relationships

The groupings of data elements into entities and relationships between data entities provide important information content. Figure 12 shows a high-level data model of the key entities needed for the halibut guided charter landing reports.

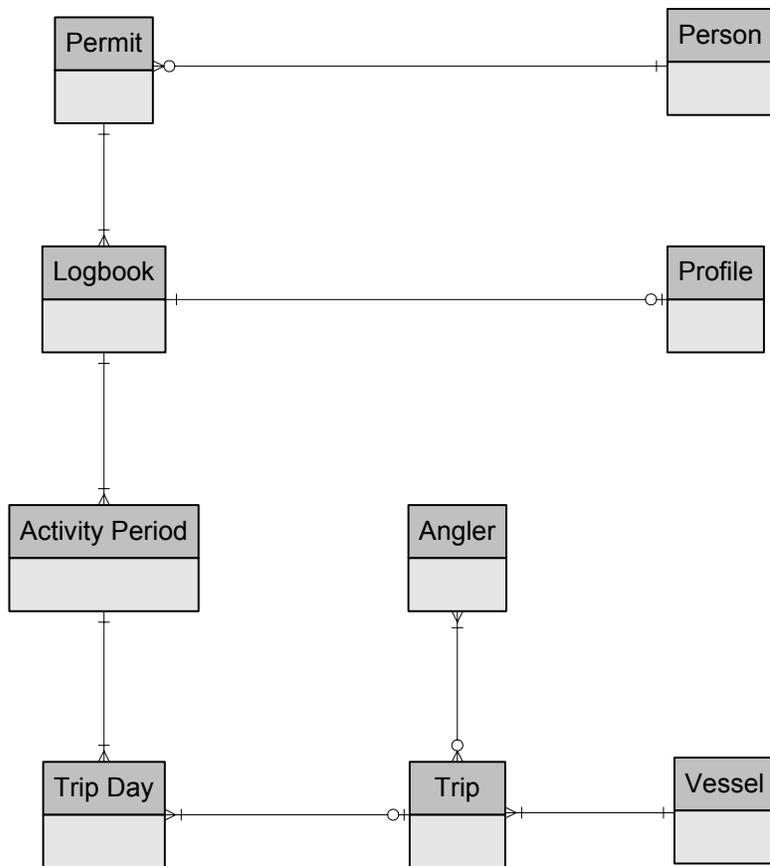


Figure 12

5.2.1 Person

Each permit will be associated with a person who can be contacted in regard to issues about the permit and activity conducted under its authorization. The existing NMFS core database has a rich structure for holding person and contact information such as mailing address elements and phone numbers. While not every person in the database will have a guided charter permit, each permit will have a person.

5.2.2 Permit

The permit data entity will contain information about the permit such as the number of fish in the quota. Each permit may be associated with one or more logbooks.

5.2.3 Logbook

The logbook date entity will provide an association of the physical logbook to the data entities in the database. The associating data element will be the logbook serial number. From the serial number the permit can be determined through the data relationships since each logbook will be associated with exactly one permit. The logbook data entity can contain profile information if the user sets a profile.

5.2.4 Activity Period

The activity period data entity will be the anchor point for logbook entries. The activity period record will contain the checkin and checkout dates for the period of activity. Reports will be required for each day in the activity period, and will create at least one trip day record for each day within an activity period checked in date range.

5.2.5 Trip Day

The trip day data entity will record the activity for a particular day. It will contain the date for the day, and a flag for indicating no activity. Multiple day records may be created for the same date, in cases where multiple trips take place on that date.

A trip day data entity with the no activity flag set to true is a No Trip Day. In this case it must be the only day record for that date, and will have no associated trip record.

The trip day record is the central data entity in a logbook entry. It will contain the number of fish harvested, and will associate days to trip records. The trip day record will contain data about the number of fish harvested in each area. It will be associated with zero or one trip records. It will contain the day number of the trip if is associated with a trip record. In cases where the trip is not a multi-day trip, the day number will always be one, indicating the first day of a single day trip. The trip day record will also contain the name of the person who made the logbook entry and the Coast Guard license number of the charter captain if this data is entered after NMFS receives the paper logbook pages.

5.2.6 Vessel

The existing NMFS core database contains vessel information that can be accessed and cross referenced by ADF&G number. The vessel data entity



will be used to associate a trip activity record with a vessel, and to validate that each ADF&G number entered actually refers to a vessel record.

5.2.7 Trip

The trip data entity will group trip days for multi-day trips. For single day trips there will be a one-to-one correspondence of trip with trip day. The trip record will also associate anglers to trips. Each trip record will be associated with one vessel and one or more angler records.

5.2.8 Angler

The angler data entity will contain the ADF&G sport fishing license number of the angler. These records will be associated with trips.

6 Data Usage

6.1 Program Administration and Transfer Management

The primary use of the data collected and reported to the system will be for the administration of the halibut guided charter IFQ program. The main functions of the IFQ program that will depend on the data collected are tracking harvests against quotas, and transferring quota share between permit holders.

In order to track harvests against quotas, the IFQ program will make use of the following reported data elements and entities:

- **Permit Number** – The quotas being tracked are associated directly with Permits identified by Permit Number.
- **Date Being Reported** – Quotas are time-specific (annual). Harvest against a quota must be tracked by day in order to support quota share transfer at a specific point in time.
- **Harvest** – Harvests and quota balances will be reported as number of fish. The internal management system will probably track quotas in pounds, since the IPHC allocations are made by weight and transfers between the guided charter and commercial IFQ systems will have to use weight as the unit of measure. The system will convert numbers of fish to weights based on conversion factors determined by the IPHC.
- **Regulatory Area** – The allocations of quota are made based on IHPC regulatory area, so the tracking of harvests must include this information.

In order to implement a transfer of quota share, all data must be reported from both transfer participants up to the date of transfer in order to accurately calculate each participants remaining quota share before and after the transfer. The electronic reporting methods will support the transfer process since they will allow operators to insure that their reporting is completely up to date. However, the electronic system will not provide an automatic means of doing transfers. Decision-making and approval are beyond the scope of the electronic data collection system, and will need the direct participation of NMFS personnel.

6.2 Enforcement Information

The other key purpose of the data collection system is to provide enough information to Enforcement agents to be able to effectively enforce the halibut guided charter regulations.

Enforcement agents will have access to submitted paper logbook pages to support investigations of historical activities. Agents will also have access to web-based reports, providing up-to-date information about all electronically reported information. Enforcement currently plans to employ Personal Digital Assistant (PDA) devices in the field. Reported data could be downloaded into the PDAs and compared to logbook data while on board vessels during field checks.

The following data elements will be needed for Enforcement to be able to verify that operators are abiding by the regulations of the guided charter IFQ program.

- **Permit Number** – Account balances are tracked by Permits identified by Permit Number. Enforcement will require Permit Number in order to check current account balances.
- **Logbook Serial Number** – the Logbook Serial Number will tie electronic reports to logbooks. The Logbook Serial Number will be related to the appropriate Permit. Access to report history information can be requested using the Logbook Serial Number.
- **Checkin Date and Checkout Date** – The checkin and checkout dates will be used to determine periods of operation when operators must be keeping records and making reports.
- **Angler Name and Fishing License Number** – The names and fishing license numbers will allow Enforcement to contact anglers to check their recollection of trip results with the charter operator's reporting. The fishing license number will allow Enforcement to identify the individual anglers through ADF&G data, provided that appropriate data sharing arrangements are in place. This identification of anglers could be used in a survey of all anglers to identify possible reporting fraud, or for individual contacts in investigations of specific cases.
- **Name of Person Making Log Entry, Charter Captain Coast Guard License Number** – The name of the person who actually makes the logbook entry and the license number of the operator or hired skipper who was the captain for the trip will allow Enforcement to contact the appropriate individuals if the specific circumstances of a logbook entry need to be investigated.

- **Vessel Id, Date, Trip Number, Number of Fish by Area, and Port** – The primary log entry data fields will be used during field checks to confirm that reporting conforms to regulations.

6.3 Data Submitter Account Information

The data collection system will provide account information to the data submitters. Account information will be made available as supplemental functions to the electronic reporting mechanisms. These supplemental functions will provide account balance information and reporting history information.

In order to provide these functions, the data collection system will make use of the following data elements:

- **Permit Number** – Account balances are tracked by Permits identified by Permit Numbers.
- **Permit Holder Name** – Permit Holder Name will be displayed to verify that account information being displayed is associated with the correct person.
- **Password** – A user password will be used to provide security in order to restrict display of account balance information to authorized persons only.
- **Logbook Serial Number** – the Logbook Serial Number will tie electronic reports to logbooks. The Logbook Serial Number will be related to the appropriate Permit Holder so that Permit Holder information does not need to be reported separately. Access to report history information will be requested using Logbook Serial Number or Permit Number accompanied by a Password.
- **Vessel ADF&G Number** – Vessel ADF&G Number will be used to uniquely identify the Vessel associated with the logbook entries and associated electronic reports.
- **Vessel Name** – Vessel Name will be displayed to verify that the report history information being displayed is associated with the correct vessel.
- **Report Confirmation Number** – The Report Confirmation Number will be displayed in report history information to allow data submitters to reconcile their records with the electronically reported information on file.
- **Date, Area, Number/Length of Fish, Trip Number, and Port** – The primary log entry data fields will be provided and summarized to show activity and reconcile records.

6.4 Fishery Resource Management Information

The collection of statistical data to support fishery resource management and biological research is not a primary focus of the data collection program. Significant consideration has been given to restricting the required data elements to just those necessary for quota management, transfers, account status reporting, and enforcement.

However, any management data collection system generates information that may be useful in management decision-making, or may indicate that additional research is needed. The information on the number of halibut harvested by regulatory area may be useful to the IPHC to supplement their other data collection programs. Also, information such as the numbers of vessels and successful anglers may provide information useful in determining the size and value of the halibut guided charter industry. It can also be used in evaluating the program efficacy.

7 Conclusions

This project investigated the means of data collection in guided charter fisheries in other jurisdictions. Based on the findings of that investigation, WAI concluded that a logbook is the most practical instrument of data recording for the halibut guided charter fishery. The survey of the charter fleet indicated that electronic reporting by phone or Internet is feasible for industry, provided the data volumes are reasonably small. The conceptual design phase of this project has identified the data that is needed for program management and enforcement. It also identified a minimal set of data that can be collected electronically, that supports the aspects of the program needing very timely data, and that would minimize the reporting burden on charter operators.

The system envisioned in this conceptual design will provide the data necessary, and with the required timeliness, for NMFS Restricted Access Management program to manage an IFQ program for the halibut guided charter industry, including up to date harvest data needed for quota share transfers. The system and logbook concepts described will provide NMFS Enforcement with the data needed to ensure compliance with regulations.

WAI believes that the system described in this conceptual design can be built, and will meet all stakeholders' needs. Based on our familiarity with NMFS systems and technical infrastructure, WAI believes that a system based on the conceptual design described in this report would be feasible to be built with the current NMFS information technology infrastructure. The web-based reporting means could be implemented using the existing web application infrastructure. NMFS currently supports modem banks for receiving commercial IFQ data from card swipe terminals. The computer telephony interface required for an IVR system would be similar to that existing level of processing. Alternately, IVR reporting could be processed at an IVR service bureau, interfacing in real time with the NMFS database through the use of web services. Electronic reporting would not only provide the timeliness of data needed for program management, but would also reduce costs compared to paper only system with data entry because of the significantly reduced amount of data entry that NMFS would have to process. Since industry will bear costs of the IFQ program through fees, the advantages of both the data quality of self entered data and the reduced fee costs are significant.

The conceptual data collection system would provide an effective means for guided charter operators to report their landing activity. However, like all self-reporting systems it is subject to intentionally inaccurate reporting on the part of unscrupulous operators. While the design has features to reduce non-reporting,

the detection of incorrect reporting requires an additional source of data. The halibut harvested in the guided charter fishery are not sold; so commercial buyers would not provide this data source.

The anglers themselves could provide an additional source of reporting, but requiring anglers to report all harvests with charter operator information would be burdensome, and full compliance would be difficult to achieve. Angler reports would be another self-reported data source, with the attendant data accuracy problems. Individual anglers are involved in few trips and harvests, so the opportunity to use education to improve their compliance and data quality would be low. Enforcement would be difficult, since individual anglers are geographically dispersed after the fact. Enforcement of mandatory reporting by anglers and reconciling their reports would divert enforcement effort away from the primary participants in the fishery. Using angler reported data is probably not feasible for maintaining IFQ quota accounts, but survey data from anglers could be used to identify and assess any aggregate levels of underreporting on the system.

If NMFS elects to move forward with system development based on this conceptual design the next steps would be the definition of a software development project plan covering the development team, detailed specification of the development, test, and production environments and migration procedures, test and acceptance procedures, and plans for industry participation in the development effort. A detailed requirements specification should be developed, based on the conceptual design and detailed business rules, processing requirements, data definitions, and reporting. This specification would need to consider the overall context of the guided charter IFQ program, not only the data collection aspects covered by the conceptual design, but the data usage requirements of NMFS RAM division and Enforcement, as well as the detailed infrastructure interface requirements.



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