WOSTMANN & ASSOCIATES, INC.

Development of a Cooperative Interagency Electronic Fishery Information Collection and Management Program in Alaska
Needs Analysis

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Submitted by
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1 Introduction

Beginning in 1999, representatives of the Alaska Department of Fish and Game (ADF&G) and the National Marine Fisheries Service (NMFS) met to address fishery data acquisition issues. As a result of these meetings the agencies submitted a consensus statement to the North Pacific Fishery Management Council that identified an interest and willingness to pursue the development of a single reporting system for groundfish deliveries. The Pacific States Marine Fisheries Commission (PSMFC) contracted Wostmann and Associates, Inc., a Juneau based Information Technology consulting firm, to undertake a needs analysis and technology assessment, and to provide recommendations on developing an inter-agency commercial fishery harvest data collection system in Alaska. Wostmann and Associates teamed with Natural Resources Consultants, Inc. of Seattle, to assist in the project.

The goal of the project is to provide the requirements for the development of a coordinated, multi-agency, electronic fishery landings data reporting system in Alaska. The primary focus of the project is the groundfish fishery harvest data collection system but information provided in this report is applicable to other Alaska fisheries. The deliverables for the project include the Needs Analysis Report (i.e., this document) as well as a Technology Assessment and Recommendations Report. Information contained in these reports is derived from analysis of interviews with a cross section of agency personnel, processors, buyers, and fishers.

This Needs Analysis Report provides a description of current data collection and management systems employed in groundfish fisheries by the three agencies; the Alaska Department of Fish and Game (ADF&G), the National Marine Fisheries Service (NMFS) and the International Pacific Halibut Commission (IPHC), and presents areas of opportunity to optimize the data collection and management system.

The Technology Assessment and Recommendations Report is a separate document that describes current technologies in use, evaluates potential replacement technologies, and provides specific technical approaches and recommendations to improve the data collection system for groundfish in Alaska.

1.1 Background

Three agencies are involved in harvest data collection and management for groundfish species, Pacific halibut and other finfish, invertebrate and marine plant species in Alaska: the Alaska Department of Fish and Game, the

National Marine Fisheries Service, and the International Pacific Halibut Commission (IPHC). The division of responsibility between them is complex. NMFS collects harvest data for Fisheries Management Plan (FMP) species in the federal Exclusive Economic Zone (EEZ). ADF&G is responsible for harvest data collection for groundfish species taken in state waters, but has responsibility for some fisheries in the EEZ, such as lingcod and black rockfish. ADF&G and NMFS cooperatively manage crab fisheries in the Bering Sea through a Fisheries Management Plan developed by the North Pacific Fishery Management Council. Additionally, ADF&G maintains records of harvest submitted on fish tickets where reporting of harvest may not be required (voluntary reporting by individuals, vessels and processors operating solely in the EEZ). The IPHC is responsible for harvest data collection and management of Pacific halibut in both state and federal waters. Timely and accurate reporting of groundfish harvest information, including by-catch of non-target species, is essential for effective in-season management of fisheries that are constrained by quota and by-catch allocations.

State, Federal, and IPHC regulations require the reporting of groundfish species harvest information by harvesters, buyers and processors throughout Alaska. The data collection and reporting capabilities of the commercial fishing industry vary widely depending upon the sophistication of equipment and the remoteness of the reporting location. Small processors in remote areas may rely completely on ADF&G hard copy paper fish tickets and NMFS hard copy paper reporting forms, delivering them by hand, by fax, or by U.S. mail. Larger volume processors, motherships, and at-sea catcher processors typically enter ADF&G fish ticket data on hard copy forms, but most of the larger shore-based processors use standardized NMFS groundfish harvest reporting software on personal computers that transmits the data electronically by email.

ADF&G, NMFS and the IPHC maintain harvest databases for use in fishery management, research, and regulatory enforcement. Non-confidential harvest information is frequently disseminated to individuals, other federal and state agencies, and international organizations. NMFS and ADF&G are the primary landing data collection agencies in Alaska. IPHC uses ADF&G fish tickets as a key data source for their commercial landings database for Pacific halibut. IT divisions in each agency maintain their own databases, share information with each other, and supply data to managers, stock assessment scientists, researchers, law enforcement, and various other organizations and individuals that are not part of the agencies.

Certain elements of data are confidential to protect individual's rights. It is critical that security measures be in place during data collection, reporting, data entry, database maintenance and dissemination of the harvest data. A

number of different entities both within and outside the data collection agencies have a variety of uses for the harvest data.

Harvesters use their own and share others' in-season harvest data to regulate themselves. They move from one area to another to minimize non-target by-catch that can close a fishery before the target species quota is attained. Community Development Quota (CDQ) and Individual Fishing Quota (IFQ) harvesters use their own harvest data to assure that they do not exceed their allocated quotas. Processors use their own and agency reported in-season harvest information to conduct business-planning strategies.

ADF&G, NMFS and the IPHC monitor the harvest of species in-season in order to take management actions to contain seasonal harvests within directed species and by-catch quota guidelines. These in-season management actions can be both time and area sensitive, and require timely, accurate data upon which to base decisions that can have significant financial implications to the commercial fishing industry.

ADF&G and NMFS also use harvest data to monitor CDQ and IFQ harvests, and to inform the harvesters of their remaining allowable quota for the year. ADF&G and NMFS enforcement divisions use in-season and post-season harvest data to investigate and prosecute violations of fishing and processing regulations; therefore, timely and accurate harvest information is essential.

Stock assessment scientists and agency personnel in all three agencies use in-season and end-of-season harvest data to determine the status of species, project future allowable quotas, produce annual catch and value reports, and assess state and federal taxes. Numerous research studies use harvest data as a component of ecological analyses. The Alaska Commercial Fisheries Entry Commission (CFEC) obtains NMFS, ADF&G, and IPHC catch and value information to verify active limited entry permit status and to report annual volume and value of harvests by species and gear group. The NMFS Restricted Access Management (RAM) division relies on ADF&G Fish Tickets as well as NMFS harvest data to determine individual qualifications for quota shares in fleet reduction programs.

In Alaska, the timely and accurate collection of harvest data is essential to:

- Maintaining effective management of the targeted resources,
- Protecting critical non-target species, including marine mammals
- Evaluating stock status
- Describing economic status
- Projecting future harvests of the commercial fishing industry

ADF&G, NMFS, and IPHC all have separate but, to some extent, co-dependent harvest data collection and database maintenance systems. The three agencies share basic harvest data. Other fishery data collection programs such as voluntary and required logbooks, state and federal observer programs and dockside interviews augment ADF&G, NMFS, and IPHC data. Their existing harvest data systems use a variety of procedures, codes, and equipment. The agencies and other user groups generally agree upon the types of data collected by the reporting systems. However, the system has some overlapping data collection and duplication of effort. It is not well standardized between agencies. There is a desire to improve the speed at which harvest information is transferred to the agencies and made available to the user groups.

Maintenance of harvest records is important to harvesters and processors to prove participation in fisheries for possible future individual quota allocation or limited entry programs. Alaska statue 16.05.690 requires that the first buyer of commercially harvested fish, shellfish, or marine plants complete an ADF&G fish ticket. The fish ticket is a paper, hard copy record providing a variety of information including:

- Vessel name,
- ADF&G vessel number,
- Start date of fishing,
- Port of type of operation,
- Statistical area,
- Partial or complete delivery, species,
- Weight landed,
- Total value paid,
- By-catch overages
- CFEC permit number, CDQ number (if applicable),
- ADF&G processor code and company,
- Landing date,
- Gear,
- Percent of harvest taken by area,
- Landed condition code
- Processing type for at-sea fish tickets
- Price,
- Signature of permit holder and receiving agent

Processors or cash buyers typically fill out the hard copy, fish ticket form that is then signed by both the harvesters and processor/buyer (receiving agent). Copies of the fish tickets are provided to each party and a copy is required to be submitted to ADF&G within seven (7) days of the landing date. ADF&G receives halibut fish tickets and forwards them to IPHC.

Some 25 regional ADF&G offices enter the fish ticket information into a computerized reported system, conduct error and missing data checks, and transmit the data to Computer Services Division at ADF&G Headquarters in Juneau, Alaska. Depending upon the volume of fish ticket submittals at the ADF&G regional offices, this may take from one week to several months for all

fish tickets to be entered electronically and submitted to headquarters. The ADF&G regional offices then send the original hard copy fish tickets to ADF&G Headquarters where they are archived. Approximately 300,000 ADF&G fish tickets are processed this way each year in Alaska. ADF&G makes available both electronic data and copies of fish tickets to other agencies and individuals although these submittals are controlled by strict confidentially regulations.

NMFS is primarily responsible for management of fisheries in the EEZ. The primary focus of the NMFS data collection program in Alaska is on groundfish. Several harvest-reporting systems are operated in Alaska under the responsibility of NMFS, including those used by shoreside processors, catcher vessels, catcher/processors and at-sea processors as well as the Individual Fishing Quota and Community Development Quota programs for Pacific halibut and sablefish.

NMFS requires the collection of a variety of information and reporting by fishers and processors that directly relates to harvest and processing data and augments this data with information about vessel activities and transfer of processed products. Harvesting and processing information is collected via Daily Cumulative Production Logbooks (DCPL) (required of vessels 60 ft or more in length) and/or Weekly Production Reports (WPR). Reported data include a variety of information on groundfish harvests, fishing effort and processing similar to that reported on the ADF&G fish ticket form. The Shoreside Processor's Electronic Logbook Reporting (SPELR) system is an electronic system that facilitates the rapid transfer of federal harvest reports from shoreside processors and some motherships to NMFS via electronic media (eLog). Smaller processors, who may not have electronic reported capabilities, submit hard copy harvest reporting forms by fax or US mail, and NMFS staff enters the data.

In addition to the SPELR reporting system, NMFS operates the sablefish and Pacific halibut Individual Fishing Quota (IFQ) transaction system, which is an electronic reporting system based on a credit-card type transaction procedure conducted at terminals located at the processor locations. It provides real-time updates of IFQ harvest quota totals for each IFQ holder and provides NMFS with near real time accounting of total IFQ harvests by quota holder and for the industry as a whole. However, some sablefish and halibut landing information are reported using both the IFQ credit-card transaction and the SPELR system.

NMFS requires the collection of a variety of information and reporting by fishers and processors that augment the harvest and processing information including Vessel Activity Reports (VAR), Check-in/Check-out Reports, and Product Transfer Reports (PTR). NMFS observers stationed onboard fishing

vessels, motherships, and at shoreside processing plants collect and report additional groundfish harvest, fishing effort, and biological information.

The IPHC relies on the ADF&G fish ticket reporting for harvest data used in management of the halibut resource, and the NMFS IFQ halibut reporting system for data quality checking. The IPHC operates their own program of onboard logbooks and dockside interviews to augment harvest data. Headquartered in Seattle, Washington, the IPHC receives either original, if halibut is the only landed species, or copies, if more species than halibut are reported, of hard copy ADF&G fish tickets directly from the regional offices. Generally, the regional ADF&G offices mail these tickets to the IPHC once or twice a week. The IPHC double enters the ADF&G fish ticket information to assure data logging accuracy. Information reported includes:

- Fish ticket number,
- CFEC permit numbers,
- State processor code,
- Weight landed,
- Weight retained for personal use or later sale
- ADF&G vessel number,
- Landing date,
- Ex-vessel prices,
- Product condition code

The halibut fish ticket records are then computer-matched with IPHC logbook records submitted by the harvesters and maintained separately by the IPHC.

The IPHC also receives the NMFS IFQ data maintained by the RAM division. NMFS transmits this information to the IPHC on a fairly timely basis. IPHC uses the IFQ data for in-season management and replacement of missing landing information on logbook records. The IPHC verifies the information contained in the IFQ and ADF&G fish ticket data, researches discrepancies, makes corrections in their databases, and reports any problems detected to NMFS.

The private commercial fishing industry has initiated several of their own reporting systems that augment the ADF&G, NMFS and IPHC reporting systems. Alaska pollock trawlers report daily catches of prohibited and target species to a private consultant that reports back to the industry by-catch rates and total by-catch quotas achieved in-season on a near real-time basis. This information allows the trawl industry to cooperatively move their harvesting effort from high by-catch rate areas and extend the period of target species harvesting prior to closure due to attainment of seasonal by-catch quotas. As mentioned above sablefish and Pacific halibut fishers maintain logbooks recording a variety of harvest and effort information that is submitted to the both NMFS (sablefish) and the IPHC (halibut). This information can be integrated or used to augment fish ticket and IFQ reported data. The logbook programs have different reporting and submitting requirements depending on vessel size and species.

Although the focus of this project is on groundfish, other components of the commercial fishing industry also report in-season harvest, effort, and catch-per-unit effort information to assist the management agencies in managing the fisheries. Salmon processors and cash buyers often report numbers and weight of salmon landed each day by radio, fax, or telephone to ADF&G, thereby providing ADF&G managers with more timely estimates of harvest and CPUE than that provided by the fish ticket system. Vessels targeting crab often report in-season weight of crab caught, number of pots fished, and number of retained crab per pot by radio or phone daily to ADF&G offices to allow a more timely estimate of quota attainment and give the agency an overall impression of the abundance of legal crab in the fishery.

1.2 Definitions, Acronyms, and Abbreviations

Term	Definition
ADF&G	Alaska Department of Fish and Game
AFA	American Fisheries Act
ATM	DataCard Corporation card swipe terminal
brailer	Large bag used for transferring fish from vessels to processors
BSR	Buying Station Report
Bycatch Overage	The harvest of fish or shellfish by an individual fisher that exceeds the established bycatch, trip, or seasonal quota limits
CDQ	Community Development Quota
CFEC	Alaska Commercial Fisheries Entry Commission
chalking	Undesirable condition in halibut where the flesh of the fish has a noticeable whitening or chalky appearance.
COAR	Alaska Commercial Operator's Annual Report, a yearly buying and processing activity report that processors submit to ADF&G
CPUE	Catch Per Unit Effort
DCPL	NMFS Daily Cumulative Production Logbook
EEZ	Exclusive Economic Zone
eLog	NMFS SPELR system electronic reporting client software
EPA	Environmental Protection Agency
FCP	Floating Catcher Processor
FLD	Floating Domestic Mothership

Term	Definition
H&G	Headed and Gutted
IFP	Inshore Floating Processor
IFQ	Individual Fishing Quota
INMAR-SAT-A	Satellite communications system
INMAR-SAT-C	Satellite communications system
IPHC	International Pacific Halibut Commission
IR/IU	Improved Recovery/Improved Utilization
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System, a program of the EPA
NPFMC	North Pacific Fishery Management Council
Parity Catch Manager	Commercial fishing industry business accounting and management software produced by Parity Corporation
PSC	Pacific Salmon Commission
PSMFC	Pacific States Marine Fisheries Commission
PTR	Product Transfer Report
RAM	Restricted Access Management division of NMFS
RFID	Radio Frequency Identification
RFP	Request for Proposal
RSW	Refrigerated Sea Water
Sea-State Monitoring	Monitoring program for AFA co-op fisheries
Seven Seas	Commercial satellite communications solutions provider
SPELR	Shoreside Processor's Electronic Logbook Reporting system
Standard-B	Intelsat high bandwidth satellite data communications
Stat Area	ADF&G statistical area, generally an area location 1 degree of longitude by ½ a degree of latitude in federal waters. In state waters most stat areas are smaller and irregularly shaped, conforming to coastlines
surimi	Artificial crab product produced from pollock
Tender	A vessel which receives deliveries of fish from catcher vessels, but which delivers the fish to another vessel or shoreside plant for processing.

Term	Definition
VAR	Vessel Activity Report
VMS	Vessel Monitor System
WPR	Weekly Production Report

2 Objectives and Issues

The RFP for this project identified a number of objectives for this needs analysis. The agencies' project team elaborated on the issues during the course of the project. Interviews with agency field staff and with data submitters reinforced these and highlighted additional aspects of the issues. In this section we identify the specific issues with landing reporting that any integrated landing reporting system should attempt to address.

2.1 Duplicate Data Reporting

Processors consistently identified the duplication of reporting as the biggest problem with the current situation. Under the present system data submitters may have to submit the same data on multiple reports to meet the data recording requirements of all three agencies. Information entered in catcher vessel logbooks may duplicate information required on fish tickets and NMFS daily or weekly production reports. Fish tickets and logbooks require much of the same data as is reported on the IFQ reporting system. Information submitted in Alaska Commercial Operator's Annual Report (COAR) and Alaska fish tax reports duplicate much of the information submitted on fish tickets and NMFS reports during the year. The different data collection systems and approaches are the result of differing agency needs and mandates; however, much of the information collected is identical or similar in nature.

The problem of duplicate reporting directly affects the data submitters, increasing the cost and effort needed to report landing and production activities. The cost to the agencies comes from related problems such as error handling and data consistency, and from the erosion of the good will of data submitters due to frustration about what they perceive as a lack of cooperation between agencies.

2.2 Error Rates

The current paper reporting systems offer ample opportunity for data errors, since paper forms cannot check for missing or invalid data when it is initially recorded on the form. Each time the data is copied from one form to another errors may be introduced. Interpretation of handwritten words and values on the paper forms by data entry operators may also result in errors. Additionally, some data values, such as statistical area, are difficult to capture accurately because of the reluctance on the part of vessel operators to reveal the

information to processors. Furthermore, the statistical area is recorded on the landing report significantly later in time than when it is initially determined and therefore it is susceptible to the vagaries of human recollection.

2.3 Timeliness of Data

The current groundfish harvest data collection systems report harvest and processed product data to the management agencies inconsistently. The time needed to receive the information varies depending upon the particular process in which the data is reported, the means of transmission of the data from the submitter to the management agency, and the speed at which the data is entered into the databases.

Managers use fish ticket data, but the time delay from initiation of the fish ticket to its availability on the database has resulted in the emergence of informal reporting systems where specific processors fax buying or production summary reports to management biologists for immediate use in fishery management decisions. These informal methods result in an increase in the data collection effort of both processors and agency personnel.

2.4 Data Entry Burden

Entering the data submitted on paper reports, in particular fish tickets, imposes a significant burden of effort on agency personnel. Unlike most data entry operations where operators key only the data actually written on the form, ADF&G and IPHC personnel do data entry research, and correct missing and invalid data values. Corrections to data made subsequent to initial data entry increase the data entry effort, whether originating from revised reports submitted by processors or data gleaned from logbooks and wheelhouse interviews. Since 90 percent of all fish tickets are submitted for salmon and shellfish the majority of this burden falls on ADF&G staff.

2.5 Inconsistency of Data Notation

The different systems developed independently over time at the different agencies have resulted in different representations of the same information. For example, the NMFS IFQ system, ADF&G, and IPHC all have different codes for the port of landing on landing reports. These coding differences can confuse data submitters, giving them an opportunity to input the wrong

agency's code value when filling out reports. Such errors are usually obvious and correctable, but require additional training for data entry staff.

2.6 Data Consistency Between Systems

Duplicate data collection can result in errors and inconsistent data sets derived from the same harvest activities. Additionally, agency personnel routinely compare landing data to data about the same activities from other sources such as fishing logs and observer reports. ADF&G and IPHC change landing report data in their databases to improve its accuracy, but the changes are not fed back to the data submitters, who retain copies of the original reports, nor are the changes coordinated with the other agencies.

2.7 Accommodation of Actual Activity Sequence

Ideally, all the information necessary to complete a landing report would be available to the data submitters within the agencies' reporting time requirements, and no report would have tighter time requirements than another report upon which it depends. However, in actuality, harvest and processing data becomes available at different times during the flow of the harvest and processing of the product. Under the current system, data submitters have developed accommodation mechanisms to report what harvest data is available within the reporting time period required under regulations and to later correct or append information as it becomes available.

3 Methodology

The methodologies used on this project were ones of Information Gathering, Analysis, and Synthesis. The Information Gathering phase relied heavily on interviews with data submitters and agency personnel, but also involved reviewing system documentation and other materials related to the current landing reporting processes. The Analysis phase used standard IT techniques to examine the tasks and flows of information involved in landing data collection and reporting. The Synthesis phase developed the system vision to conform to patterns observed in the analysis.

3.1 Interview Information Gathering

The Information Gathering phase consisted of interviews with vessel operators, processors, and agency personnel. Through consultations with the agencies and the fishing industry, a cross section of the harvesting and processing industry were selected for interviews. A structured interview technique was used to collect data and process information from these different points of view.

The project team created standard interview forms for data submitters and agency data handlers. The standardized forms were developed to obtain information about the nature of the harvesting, processing or buying operation, the annual volume of reporting conducted for groundfish and other species fisheries, how data are developed during the harvesting or processing operation, the flow of data from its generation through the reporting process, equipment and procedures employed, problems encountered, willingness to change current procedure and/or invest in additional equipment and recommendations on improvements to the current system.

An IT analyst and a fisheries expert conducted the interviews. They conducted interviews in Homer, Kodiak, and Dutch Harbor in person. For interviews with at-sea processors in Seattle and shore-based processors in Juneau, one interviewer was present in person while the other was connected by phone. Each interview took approximately 1 1/2 to 2 hours, and generally followed the order of the questions on the standardized interview form. Not every question was asked during every interview. Rather the questions were used to initiate discussions about the areas of interest with each interviewee describing their operation in their own terms. Questions from each grouping were asked to make sure all areas were covered, but the interview technique

allowed for discussions of other issues that surfaced during the answers to the standardized questions.

3.2 Analysis

From the answers obtained during each interview, the analysts developed user stories that followed the development and reporting of landing and processing information through each interviewee's operation, and identified problems and recommendations. The user stories allowed direct comparisons of processes and procedures between the different harvesting and processing operations. Data flows and key activities were modeled using diagrams. Similar responses to standard questions from different interviewees validated the information gathered. Divergent answers highlighted areas where further investigation was needed.

In addition to agency personnel interviews, we reviewed existing system documentation and procedures. From these sources we identified the flows of data into and between agency systems. Both mainline and alternative flows were considered. The analysts developed a data requirements matrix, which identified data elements and mapped them to agency needs in order to define common sets of data as well as agency specific data and opportunities for consolidation.

3.3 Vision Formulation

The heart of this project was the synthesis of the vision for a system that could be implemented to automate the collection of landing information and meet the agencies' objectives. To create the vision, we relied on our analysis of the data submitter and agency user stories as well as our professional experience to describe a system that would fit the patterns we saw evident in the work flows and data flows, and that would provide the desired benefits. We considered the feasibility of the vision, both from the perspective of integration with existing systems and the likelihood of acceptance by the data submitters. Once we created an initial vision, we relied heavily on feedback from agency personnel to insure that the vision addressed their particular concerns and their overall system needs. Alternatives were examined and less suitable ones discarded until a clear vision, which appeared to be beneficial and feasible, emerged.

4 User Stories

In this section, we examine how a various processors and other data providers use the existing paper and electronic systems to make required reports and to conduct their business. In each case we characterize the operation and describe the workflow for landing fish and reporting the landings as it was related to us through interviews. We also identify where in the flow data becomes available for reporting, and which data requirements introduce delays into the reporting process. In the user stories we describe the flows in text and in a graphical flowchart format which shows both the flow of information and the operational areas participating in the flow.

The user stories are based on interview information. The interviews were focused on the workflows and data flows related to required reporting. We focused our questions on the processor's main groundfish data flows, and did not attempt to capture or document every variation. We did note some information for salmon and shellfish buying. We captured each processor's thoughts and concerns about data quality as well as their suggestions for improving the efficiency and effectiveness of the reporting process.

4.1 Catchers, Buyers, and Processors

This section contains user stories for catcher vessels delivering to shore-based buyers and processors.

4.1.1 Small Processor

This operation is a small processing company that operates a landing facility in a local port but either has the fish custom processed at another processor or ships the fish to their distant home processing facility. The plant handles mainly halibut and some associated by-catch. They do no CDQ processing. The fish are landed at the public port facility, weighed, sorted, re-iced, and packed into boxes and trucked to a local processing facility or to the company's home plant for final processing. They write 300-400 fish tickets per year. During the peak of the halibut season, there can be anywhere from one (1) to eight (8) landings per day. All of the vessels making deliveries are less than 60 ft and are exempt from NMFS logbook reporting and the observer program. All of the vessels are longliners.

Workflow

This situation is somewhat unique because the fish are landed at one port and processed a fair distance away at another port. A representative of the processing company handles the offloads of fish at the local public port facility. The vessel calls in six (6) hours or more ahead of the delivery time and notifies the processor's representative who in turn calls the local NMFS office and notifies them of the delivery schedule. See Figure 1 for the flowchart.

When the catcher vessel arrives at the public port facility, the fisher provides the permit card to the processor representative who imprints it on a blank fish ticket. The vessel's catch, typically gutted fish, is de-iced and unloaded by brailer. Each brailer load of fish is weighed with a hanging electronic scale and then dumped onto a sorting table, where any by-catch is sorted by species and weighed separately. The empty brailer tare weight is also recorded. The fish are sorted by size and grade. The fish are then loaded into to shipping boxes and re-iced. The boxes labeled with the vessel name, species, weight, size and grade, if necessary, and loaded on a truck or into a shipping container. All of the information is also written on a tally sheet.

The processor's representative sends the tally sheets to the processor's office where all information from the dock is entered into a spreadsheet. The by-catch weights are totaled by species and subtracted from the total offload weight to get the target species weight.

The fisher comes to the office and reports the percent harvest by ADF&G statistical area and any at-sea discards. This information is hand written on the fish ticket as is any fish kept for personal use. If halibut have been sorted by size and grade, the number of fish in each category is recorded on the fish ticket but not the weight by category. The price and amount values are determined by the spreadsheet. All the data is hand written on the fish ticket. The processor and fisher conduct the card swipe reporting process and complete and sign the fish ticket and IFQ receipts. If a by-catch overage occurs, the processor records it on the fish ticket, reports it to ADF&G and/or NMFS, faxes a copy of the fish ticket and may issue a check for the ex-vessel value of the by-catch overage to the agency directly.

For internal reporting purposes, the processor fills out a truck or container report that keeps track of each vessel's deliveries by size, grade, and market. The truck or container report is used to fill out the PTR for each shipment. The processor's representative uses the fish ticket information plus feedback from the main plant or from the custom processor to hand

fill out the DCPL, WPR, and the PTRs that are faxed to NMFS. The fish tickets are delivered to the local ADF&G office once a week.

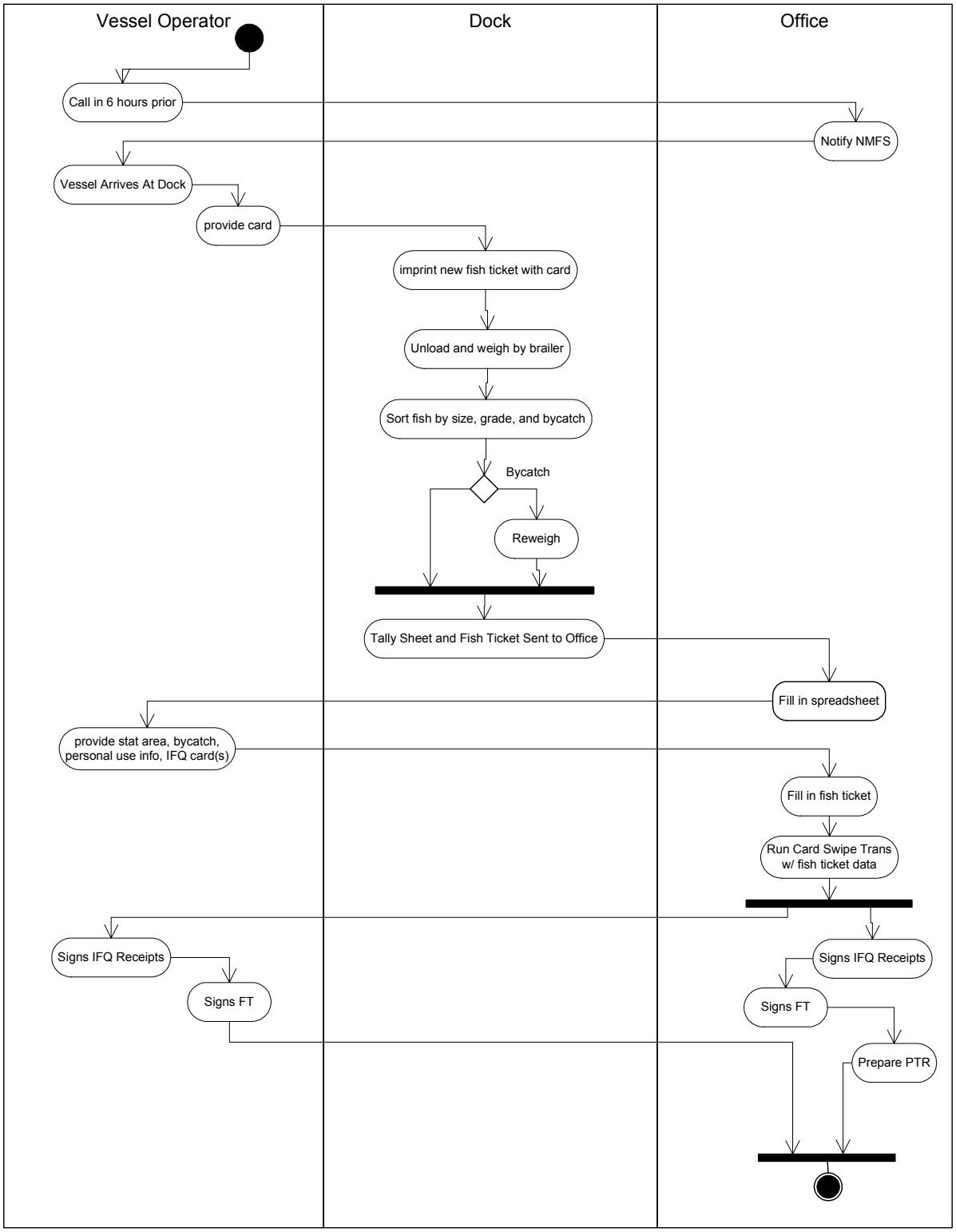


Figure 1

The processor's main office completes the ADF&G COAR report and the Alaska fish tax report.

Any errors in data are corrected on the original copies and faxed to the appropriate agencies.

Data Quality and Issues

Sometimes the custom processor or the main plant shows a slightly different received weight of fish than recorded at the offload. This difference is usually attributed to water loss.

Price and location of the catch are the two most confidential pieces of information.

Problems encountered include the NMFS fax being busy or out of order when trying to send the Weekly Production Reports, fishers not providing the correct IFQ card, and redline problems in sending IFQ information via the card swipe reporting process.

This processor indicated they would be unlikely to use an electronic reporting process as the processor's representative typically faxes hard copies for reporting.

4.1.2 Buying Station

The operation is a remote buying station for a nearby medium-size processing plant. The operation uses a small office at the municipal docks for offloading and trucks the unprocessed fish to the processing plant in a nearby community. The operation is for the convenience of the fishers. The buying station purchases mainly Pacific halibut, sablefish, some other groundfish by-catch, and salmon. The buying station is a relatively small operation but can process up to 20 fish tickets per week during the peak of both the IFQ and salmon fisheries. No observers are present at the buying station and most of the vessels delivering to the buying station do not require observers. They typically deal with smaller, local, catcher vessels (less than 60 ft in length), but on occasion will take deliveries from larger catcher vessels. Most of their deliveries are from long line vessels (IFQ) and drift gillnet vessels (salmon).

The processing company's IT staff who are located in Seattle provide support to the buying station. They are available by phone to provide IT support when needed and they make occasional trips to Alaska to provide support for the VAX system the company uses. The VAX system connects the buying station, processing plant, and Seattle headquarters via a dial-up, phone based, modem network that typically runs at 19.2K.

Groundfish Workflow

If the delivery is an IFQ species, the vessel calls in six hours ahead of time and the buying station representative calls NMFS and notifies them of the delivery. See Figure 2 for the flowchart. When the vessel arrives at the municipal dock, the fish are offloaded using brailers and the municipal dock cranes. The fish are sorted and weighed. They recently started using a "Weightronics" inline scale which can weigh each fish and which produces output totals. Representatives of both the fisher and the buyer typically monitors the offload weights that are hand recorded on a tally sheet at the dock. Halibut are typically (but not always) sorted by size during offload and weights tallied separately by size as the fish are placed into totes. Sablefish are simply loaded into totes unsorted and are weighed later after processing at the processing plant due to the number of size categories and quality grading that is done. Any groundfish by-catch (cod or rockfish, skates, etc.) purchased are also sorted and weighed.

Groundfish offload tally sheets have been developed by the buyer specifically to record the information necessary to fill out the fish tickets. The fisher reports the breakout of the catch by ADF&G statistical area to the buying station manager who fills out the stat area worksheet on the fish ticket. If the landing includes IFQ species the buying station representative runs the IFQ card swipe transactions, using the highest percentage stat area. The fisher provides the permit card for imprinting on the fish ticket, provides at sea discard and personal use retention information, and verifies the weights on the tally sheet. The buying station manager uses the tally sheet to write up the fish ticket, except for sablefish weights and product codes which must wait for data from the processing plant. The buying station manager and fisher sign the fish ticket (whether completed or not). The buying station manager then enters the tally weights into the processor's VAX computer system located at their corporate headquarters in Seattle via a dial-up network connection. This program does no error checking during data entry. The information includes:

- Fisher's Social Security Number
- ADF&G Fish Ticket Number
- Landing Date
- ADF&G Six-Digit Statistical Area (only one are allowed)
- NMFS Reporting Area
- ADF&G Permit Number
- Whether the Offload Species is Taxed or Not

- Species/Condition Code (the processors own unique code that provides combined information on species, landing condition and size category)
- Weight Type (round or dressed)
- Total Weight (hand calculated from dock tally sheet)
- Price (price per pound based on the offload condition)
- Total Value (calculated automatically from total weight and price

After the fish are processed at the plant and the processed weights are entered into the VAX and automatically converted into round weight equivalent, the data is hand entered on the fish ticket by the buying station manager (up to a 2-day delay). The sablefish are kept separate by vessel during the offload, transport and processing. The processor's computer system does not record information about any at-sea discards or personal use retention.

The Buying Station Report is filled out and faxed to NMFS within 2 hours of the landing. This report is sometimes revised by sending in another replacement report if errors are detected or when additional information from the processing plant is available (round weight equivalent sablefish for example).

The NMFS groundfish reporting, eLog Daily Cumulative Production Report and Product Transfer Report, are performed at the processing plant using the electronic system and the processing plant production reports. The Seattle headquarters fulfils the annual ADF&G COAR and Alaska fish tax reporting requirements from their own internal electronic data captured from the electronic settlement sheets and the processing plant production reports.

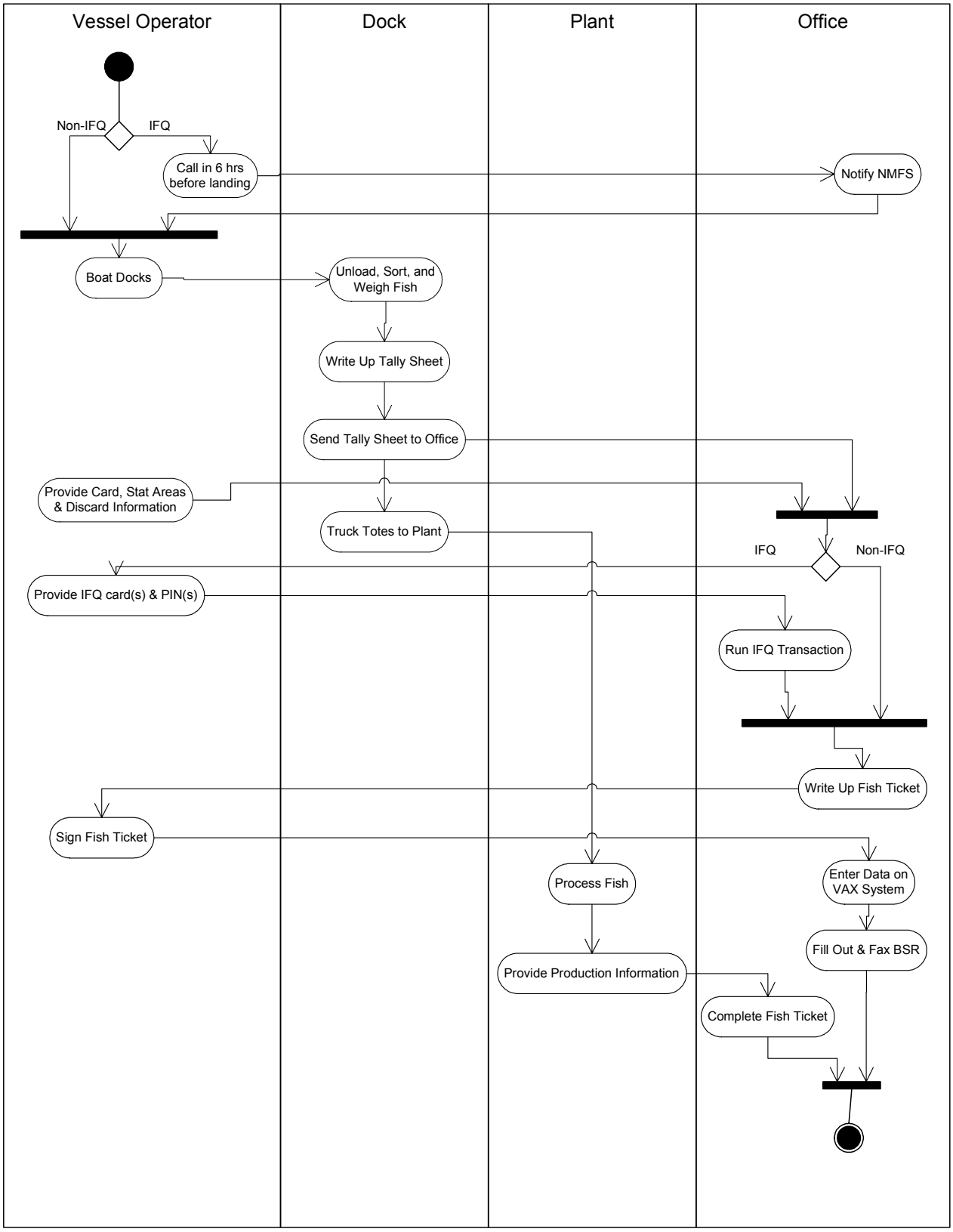

Vessel Operator
Dock
Plant
Office
Non-IFQ
IFQ
Call in 6 hrs before landing
Notify NMFS
Boat Docks
Unload, Sort, and Weigh Fish
Write Up Tally Sheet
Send Tally Sheet to Office
Provide Card, Stat Areas & Discard Information
Truck Totes to Plant
IFQ
Non-IFQ
Provide IFQ card(s) & PIN(s)
Run IFQ Transaction
Write Up Fish Ticket
Sign Fish Ticket
Process Fish
Enter Data on VAX System
Fill Out & Fax BSR
Provide Production Information
Complete Fish Ticket

Figure 2

Salmon Work Flow

The buying station uses mainly tenders to collect salmon on the fishing grounds from the catcher vessels. When tenders are used, they sort the salmon by species and record weights when they are offloading the fish from the catcher vessels. They take periodic samples for weights and counts of fish to generate average weights per fish by species. They hand record this information on a tender offload form developed by the buying station that includes:

- Catcher Boat Name and ADF&G Number
- Species
- Number of Fish (if counted)
- Average Weight of Fish by Species
- Weight of Fish (measured with hanging brailer scales)
- Price per Pound
- Total Ex-Vessel Value of the Landing by Species
- ADF&G Salmon Catch Reporting Area

The tender takes the catcher vessel's permit card and imprints a fish ticket and hand fills out the fish ticket with the necessary information and both the tender and catcher vessel representatives sign the ticket. The tender gives a copy of the fish ticket to the catcher vessel and then delivers the rest of the copies to the buyer at the buying station when the fish are offloaded from the tender.

If the fish are landed directly by the catcher vessel at the buying station and the buying station manger fills out the fish ticket, the buying station representative fills out the same information recorded on the tender offload forms.

Fish tickets from the buying station are sent to the local ADF&G office once a week. The Seattle office produces the ADF&G COAR report and the Alaska fish tax report.

Data Quality and Issues

The main problems with recording data at the buying station involve fishers failing to sign the fish ticket before leaving the dock and the condition code being left off the landed weight for a species (particularly a problem with halibut that have a variety of condition codes depending upon what the fishers do with the fish at sea). There have been problems with the IFQ card swipe reporting system due mainly to miss-keying data or entering an out of range statistical area. Personal use and discard information is probably the least accurate of the information provided since it relies completely on the accuracy of the fishers since the buying station is not involved in species identification or estimating weights or numbers of fish

discarded or retained for personal use. If errors are detected on fish tickets after they have been submitted, the buying station manager crosses out the errors on his/her copy of the fish ticket, writes in the correct values and delivers a copy of the corrected fish ticket to the local ADF&G office. They then correct their internal electronic settlement report and notify the fisher of the correction, providing him/her a copy of the corrected fish ticket if requested to do so.

The buyer reports little problem with fishers' concern about confidentiality of the data with the possible exception of location of the harvest and price paid for the product.

The buying station occasionally deals with multiple fish tickets on the same landing when fishers deliver cod to one processor and halibut to their buying station although this does not present a significant problem as long as the fisher reports his/her intentions.

The buying station manager reports difficulty getting through to NMFS by fax for the BSR on occasion. The buying station manager would be receptive to an electronic fish ticket program since they are already entering nearly all of the required information into their internal electronic settlement sheet.

They would like to get a fax reply as receipt of their NMFS BSR similar to what occurs with the eLog report.

4.1.3 Small Custom Processor

This operation is a small custom processor. They process mainly Pacific cod, halibut, some sablefish and mixed rockfish. They typically purchase fish from small to medium size catcher vessels, and custom processes the fish to meet specific demands of their wholesale clients. They write about 50 fish tickets per year. They do not have NMFS observers although some of their catcher boats are larger than 60 ft and have 30% observer coverage. They purchase mainly from longline, pot, and jig vessels but occasionally from larger trawl vessels. They are a fairly new operator and may do some salmon in the future. They process on behalf of other processors in the area and for markets out of the area. They occasionally purchase some fish on their own behalf but only rarely. They do not do any CDQ processing. The company has two computers in the main office. They have Internet connectivity but do not use it for reporting. No IT support is available within the company.

Work Flow

For the flowchart see Figure 3. They typically do not purchase any fish from catcher vessels until they receive an order from their market or a request from another processor in the area to process fish on their behalf. They contact vessels fishing the desired species and arrange for the vessels to harvest and deliver a specific amount of the desired species at the required time. If the delivery is an IFQ species, the vessel contacts the processor on the radio or by cell phone in advance and provides a minimum of six hours notice prior to delivery. The processor calls the local NMFS office to notify them of the delivery time of the IFQ fish. IFQ deliveries are only done during daylight hours. During offload, the vessel comes alongside the public dock facility and the fish are brailed off the boat, weighed, and generally sorted by species into totes and reweighed if necessary. Halibut may be sorted, ice and slime removed, and re-weighed inside the factory. The fisher and the processor both maintain a tally of the offload weights and compare their tallies at the end of the weighing to agree on the offload weights. The fish are driven across the dock by forklifts and into the factory for processing.

The fishers bring their permit cards to the office and the processor imprints a fish ticket and hand records the offload weights by species and lists any purchased by-catch. If the vessel is 60 ft or longer, the fisher provides the blue sheets from their NMFS Daily Fishing Logbooks showing any at-sea discards, which are added to the fish ticket. The fisher reports the ADF&G statistical areas from where the harvest was caught. The percent of the catch taken by area is also hand written on the fish ticket. The processor adds the agreed upon price per pound, calculates the total value by species, size and grade, and writes it on the fish ticket. The fisher and the processor sign the ticket, and the fisher retains a copy and departs the dock. If the delivery is an IFQ species, the processor and fisher conduct the card swipe reporting process. The processor checks for by-catch overages, but overages almost never happen since most of the boats land very little, if any, by-catch. If a by-catch overage were to occur, the processor would report it to NMFS and ask for instructions on how to proceed.

Generally all of the fish of a particular species are processed into the same product from a particular delivery but there are some exceptions. The processor enters the vessel identification (name), species, offload weight and price of fish delivered from the fish ticket into their own computer system to produce a settlement sheet for the vessel. This settlement sheet may include deductions for local fish tax, ice, bait, or any other billable service the processor may have provided the catcher vessel. However, not all the information on the fish ticket is captured in the internal company data entry. Permit number, discard information, and statistical areas are

not needed for business reasons and, therefore, are not entered into their internal company electronic settlement sheet.

Generally the fish are immediately processed after delivery and the quantities are small enough that the processed weights and product types are available within 12 hours or less after delivery. Using the information off the fish ticket, the processor starts a Daily Cumulative Production Logbook entry using the NMFS paper forms when a delivery occurs. Once the fish are processed, the processor completes the DCPL filling in the product codes and processed weight. They rarely, if ever, have more than one vessel delivering fish in a day and, therefore, a DCPL is typically for a single delivery. They also enter the weight of fish processed and the product type into their internal computer system that produces an invoice for their clients for their custom processing charges.

In some cases they act as a buying agent for their customers. In these cases they complete a Buying Station Report and send the fish and fish ticket to the customer.

They use the fish ticket and DCPL to fill out a weekly production report that is faxed to NMFS each week. ADF&G picks up the fish tickets once a week. They also fill out an IFQ transfer report anytime they process and ship IFQ species. They fill out Product Transfer Reports. Annually they use their fish tickets, DCPLs and Weekly Production Reports to fill out the ADF&G COAR report and the Alaska fish tax reports.

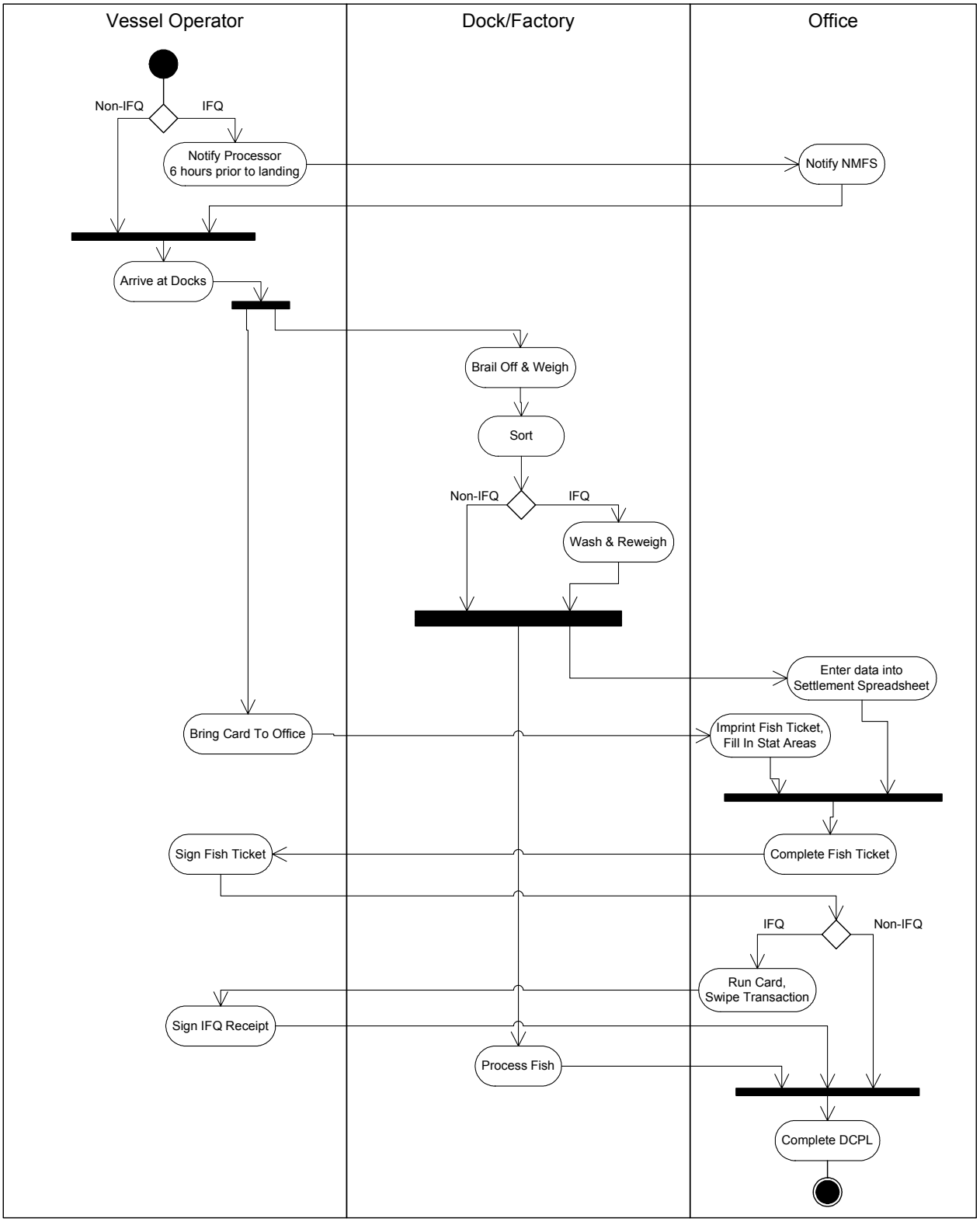

Vessel Operator
Dock/Factory
Office
Non-IFQ
IFQ
Notify Processor
6 hours prior to landing
Notify NMFS
Arrive at Docks
Brail Off & Weigh
Sort
Non-IFQ
IFQ
Wash & Reweigh
Enter data into
Settlement Spreadsheet
Bring Card To Office
Imprint Fish Ticket,
Fill In Stat Areas
Sign Fish Ticket
Complete Fish Ticket
IFQ
Non-IFQ
Run Card,
Swipe Transaction
Sign IFQ Receipt
Process Fish
Complete DCPL

Figure 3

Data Quality and Issues

Data quality issues they raised included the fact the recovery rates used by NMFS for some species are believed to be incorrect. Thornyheads are a problem since NMFS uses a recovery rate of 50% for fillets when the plant experiences no more than a 40% recovery, and thus the extrapolated round weight is probably in error. Other data quality issues include misreading the electronic weight digits on the hanging scales at the dock during offload, but this is generally worked out between the vessel representative and the processor at the time. They believe fishers are accurately reporting the percent of catch by statistical area.

All of the information they record on fish tickets and NMFS forms is considered confidential and they do not share information with any other catcher vessels. They believe all of the information included on the PTRs is contained in their Bills of Lading and would prefer to just keep copies of these instead of the filling out the PTR forms.

Problems they have encountered include no answer on the NMFS fax machine when trying to fax WPRs. The IFQ card swipe system can be difficult to use particularly when fishers land product under multiple onboard permits.

They would be willing to use an electronic fish ticket system and will look into using the NMFS eLog system.

4.1.4 Buying Station/Processor

This is a small processor that handles mainly IFQ halibut and sablefish, Pacific cod, mixed rockfish (as by-catch) and salmon. They go through 200 to 250 fish tickets per year including groundfish and salmon. All of the catcher vessels that they use are less than 60 ft. They do not have NMFS observers and do not process CDQ fish.

Work Flow

IFQ vessels call in at least six (6) hours ahead of their delivery and the processor call NMFS to alert them an IFQ delivery is scheduled. They only take IFQ deliveries during daylight hours. Other groundfish and salmon are handled on a 24-hour basis. See Figure 4 for the flowchart. When the vessel comes alongside the public dock, the catch is offloaded with brailers. The catch is sorted by species, and for halibut and sablefish by size and grade, placed into totes and weighed on platform scales on the dock. The catcher vessel crew and the processor both record and monitor the offload weight tallies and agree on the weights before filling out the fish

ticket. The processing representative imprints the vessel's permit card on a blank fish ticket in the office and records information about the percent harvest by statistical area and any at sea discards, if reported. When the offload is completed, the weights and agreed upon prices are hand entered onto the fish ticket. Both the catcher vessel and the processor representatives sign the ticket. If it is an IFQ species, the processor and fisher conduct the card swipe reporting process in the processor's office, and then the fisher leaves with the vessel copy of the fish ticket. If a by-catch overage occurs, the processor notifies NMFS and/or ADF&G, and faxes a copy of the fish ticket.

In some cases, the processor acts only as a buying station for another processor. When this situation occurs the processor fills out the fish ticket as described above and also fills out a Buying Station Report. The ultimate processor fills out the NMFS DCPLs and WPRs.

For fish they process themselves, after offloading the fish are transferred to the processing factory where halibut are checked for PH (chalking). If chalking is found, a price adjustment may be made on the fish ticket and the fisher informed of the change. For groundfish, the processor starts a DCPL when the fish enters the factory, transfers the information from the fish ticket onto the DCPL, and completes it when the processed weights and products are known. The processor uses the fish tickets and the DCPLs to complete a WPR that is faxed to NMFS once a week. The fish tickets are delivered to ADF&G once a week. The processor submits PTRs for product transfers and IFQ product transfer reports. They also submit their annual ADF&G COAR and Alaska fish tax reports based on information from the WPRs and the fish tickets.

During salmon season, ADF&G calls the processor daily. The processor provides a verbal estimate of the number of salmon by species delivered during the past 24 hrs and the location from which they were harvested.

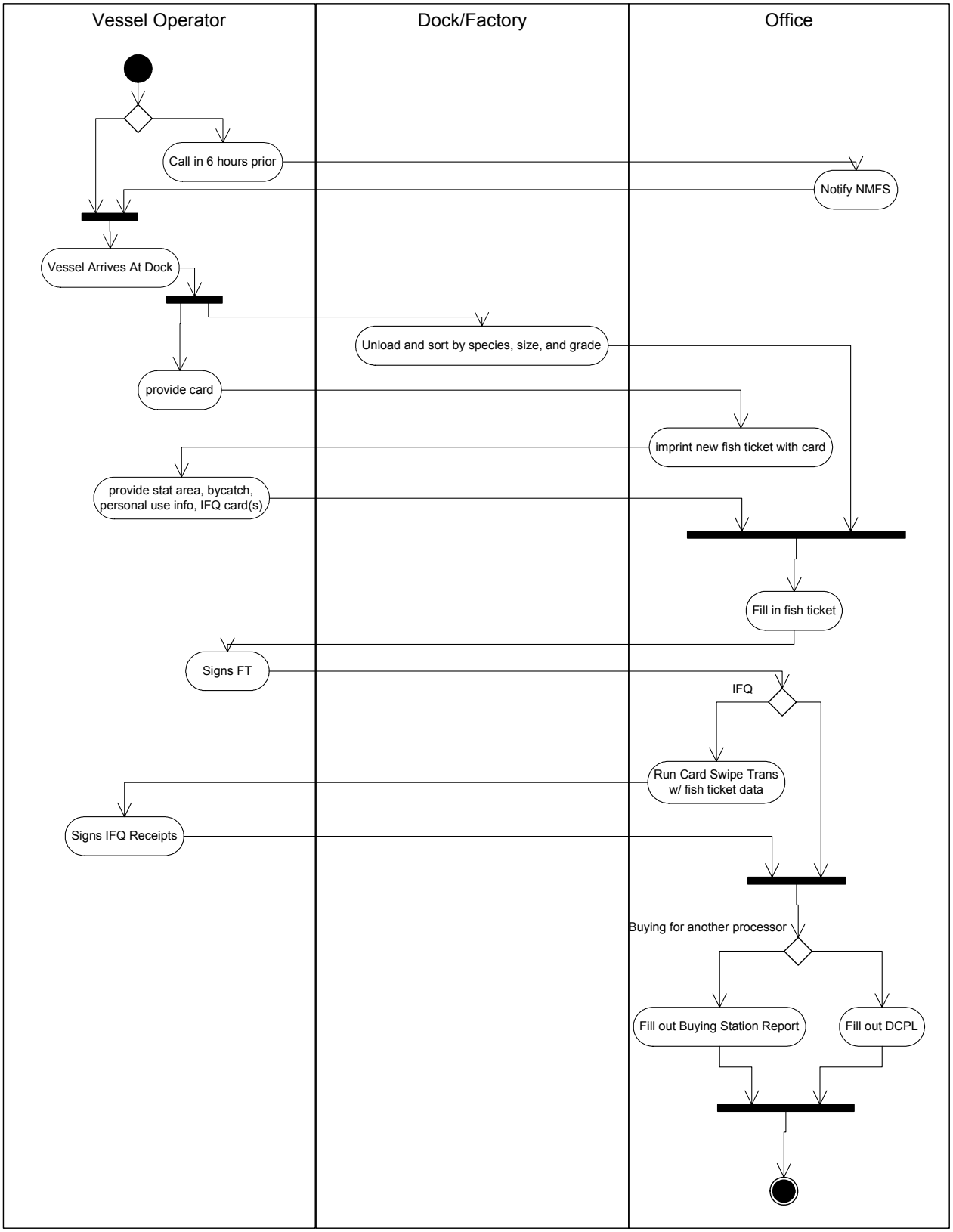

Vessel Operator
Dock/Factory
Office
Call in 6 hours prior
Notify NMFS
Vessel Arrives At Dock
Unload and sort by species, size, and grade
provide card
imprint new fish ticket with card
provide stat area, bycatch, personal use info, IFQ card(s)
Fill in fish ticket
Signs FT
IFQ
Run Card Swipe Trans w/ fish ticket data
Signs IFQ Receipts
Buying for another processor
Fill out Buying Station Report
Fill out DCPL

Figure 4

If any errors are detected in fish tickets or in the NMFS reports, they lineout the mistake, write in the new value, and fax or deliver copies of the corrected reports to the proper agency.

Data Quality and Issues

The processor reports no particular issues with data quality. They rely on the word of the fisher in regards to the location and percent of harvest taken by area, and believe it to be relatively accurate.

The location of harvest and the price paid for the fish are confidential and the processor does not divulge fish ticket information to other fishers.

Problems encountered are mainly with the IFQ card swipe reporting system. Red line errors can occur for various reasons and holding the fisher until a NMFS enforcement person can sign off on the problem is difficult.

The processor reports they would probably not use an electronic reporting system unless it provided convenience to their process. They are comfortable with the current hand-written forms and reports. Reporting does not consume a lot of their time or effort, and they are a small operation.

4.1.5 Small Owner/Operator

The operator is a vessel owner and operates as a buying station from their own vessels using local or distant custom processing facilities owned by others. They are a relatively small-volume operator, writing 100 to 125 fish tickets a year. They only handle Pacific cod caught with pots. The vessels are less than 60 ft and have no observer coverage or by-catch reporting requirements. The buying station does not have NMFS observer coverage or handle any IFQ species.

Work Flow

See Figure 5 for the flowchart. The buyer prepares a fish ticket for the vessel before it arrives at the dock, usually about 4 p.m. They also prepare a buying station report (BSR), and enter the fish ticket number on it.

After the boat arrives, the fish are weighed by a hanging scale when brailed off the vessel, then are sorted into totes. The dock crew calls the office and reports the weights. The totes may go to different processors -- in some cases locally and in other cases to Anchorage or Seward.

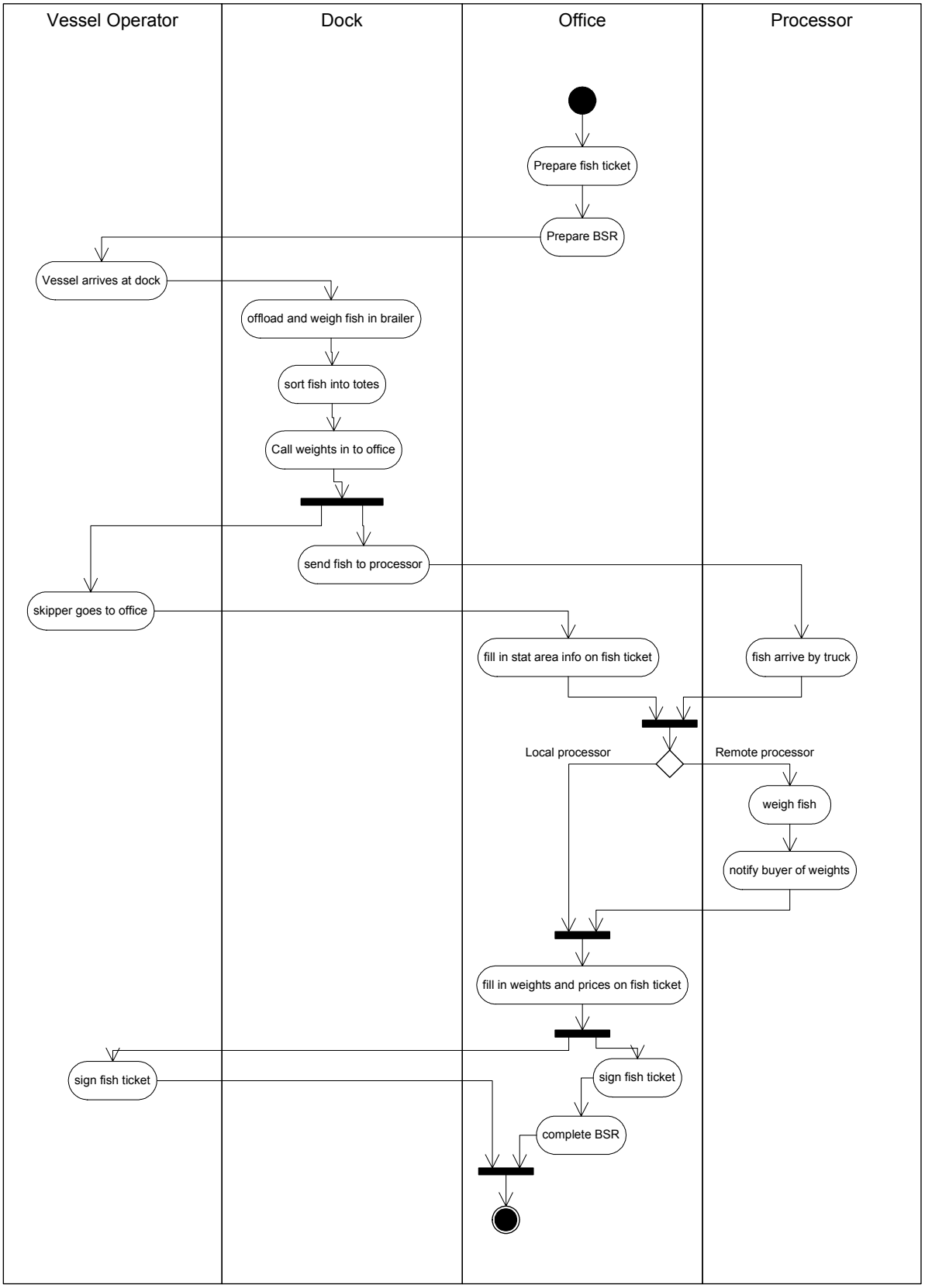

Vessel Operator
Dock
Office
Processor
Prepare fish ticket
Prepare BSR
Vessel arrives at dock
offload and weigh fish in brailer
sort fish into totes
Call weights in to office
send fish to processor
skipper goes to office
fill in stat area info on fish ticket
fish arrive by truck
Local processor
Remote processor
weigh fish
notify buyer of weights
fill in weights and prices on fish ticket
sign fish ticket
sign fish ticket
complete BSR

Figure 5

The skipper comes to the office and provides a permit card, which is imprinted on the fish ticket. The fisher reports the ADF&G statistical areas fished and the percent of harvest taken in each area (typically all harvest is taken in a single area). The weight and price are entered on the fish ticket if the fish are processed locally. If the fish are trucked to a distant processor, that processor re-weighs the fish upon arrival (there may be 1 to 2% water loss during trucking) and calls the total weight back to the buyer, who records this as the weight on the fish ticket and on the BSR. In some cases, the cod are sorted by size and reweighed at the custom processor, and these weights are called back to the buyer, though not necessarily entered on the fish ticket. The owner/buyer signs the fish ticket for both the fisher and the buyer.

The owner/buyer does no NMFS reporting other than the Buying Station Report. Other reporting is done at whatever processor is custom processing the fish.

If an error is detected on the fish ticket or the BSR, or a weight change occurs, the owner/buyer makes the change on their original copy and sends copies of the corrected reports to the proper agencies.

Data Quality and Issues

The owner/buyer reports no problems with data quality with the exception that total target species weights may change between the time the fish is offloaded and the time it finally arrives at the processor, requiring an adjustment to the fish ticket and the BSR. Often the BSR has all ready been faxed before receiving the adjusted weight from the processor.

There are no confidentiality issues since the buyer owns the catcher vessels. They do not report any significant problems with the existing reporting system.

4.1.6 Small Custom Processor with Retail Outlet

The operation consists of a small custom fish processor and retail outlet. The groundfish species handled includes mainly Pacific halibut, Pacific cod, sablefish and mixed rockfish. They have not done salmon in the past, but may do some in the future. No pollock, sole, or crab is processed. The plant does not have NMFS observers and neither do most of the vessels offloading at their facility. They typically deal with smaller, local catcher vessels less than 60 ft in length, but on occasion will take deliveries from larger catcher vessels. Most of their deliveries are from longline and pot vessels with occasional larger trawl and longline vessels. They do some custom processing of fish purchased directly by their clients from the

catcher vessels, and handle landing and processing reporting for some of these clients. They also purchase fish themselves directly from catcher vessels, process it, and then either distribute it to local restaurants, sell it in their own small retail fresh fish shop, or supply it to out-of-town markets.

They write approximately 8 to 10 ADF&G fish tickets per week. They use the NMFS DCPL eLog system and the IFQ card swipe system. They do the ADF&G annual COAR report, NMFS PTRs, and Alaska year-end fish tax report.

They have an internal PC-based computer system in their office with several machines networked together. They have Internet access via a 56K modem with typical speeds around 24K. The phone system uses two satellites to reach the mainland that can result in interruptions of Internet communications. They handle IT support internally with office staff.

Work Flow

See Figure 6 for the flowchart. If a catcher vessel is landing an IFQ species, the vessel calls in by radio or cell phone and the processor provides NMFS six (6) hour notice prior to arrival (in 2003 this is being changed to a three (3) hour notice). If the species being landed does not include IFQ species, the catcher vessel and processor coordinate the offloading time. The catcher vessel pulls alongside the dock next to the processor, and the captain of the boat comes up to the office. He/She imprints his/her permit card on a blank fish ticket and provides any information on at sea discards from the NMFS trawl or longline Daily Fishing Logbook (blue sheets). However, many of the longline catcher vessels delivering to this processor are under the 60 ft length requirement and do not fill out NMFS longline logbooks. Additionally, only on rare occurrences is any discard reported; catches are relatively clean with only landed and purchased by-catch reported. The captain provides information on the ADF&G and NMFS statistical areas from where the catch occurred at the time the permit card is imprinted on the fish ticket.

The vessel crew removes the fish from their hold or from iced totes in their hold, and transfers them into empty totes lowered over the side of the dock by the processor's crew. The vessel captain often assigns someone from the vessel to stand on the dock and verify the loaded tote weights and the tote tare weights as the fish are offloaded. Weights are taken with either a boom mounted electronic scale or platform scales depending upon the volume and type of fish. Halibut are typically weighed on a platform scale and cod on a boom scale. The weights are hand written onto an offload tally weight form created by the processor. Cod are almost always landed as bled, iced fish, and halibut as bled, head on, with

slime and ice. However, once inside the plant the halibut are usually washed, graded by size, headed, and weighed again on platform scales.

Once the fish are completely offloaded, the vessel representative and processor representative compare their offload weights, and in some cases, each signs the other's weight tally sheet. The processor crew then brings the offload weights up to the office where the office staff enters the landed weights by species and condition code into a spreadsheet developed by the processor. In the case of halibut, these weights are the platform weights recorded after sorting by size, washing, heading, and gutting the product in the plant. The processor's internal spreadsheet also keeps track of the vessel's fuel, bait, and ice purchases, as well as the borough fish tax calculation. The spreadsheet creates a settlement sheet for payment to the vessel owner for the delivery. However, only landed and purchased fish are entered into the internal spreadsheet. Other fish ticket or NMFS information, such as statistical reporting area fished, discard species and weights or final processed product types and weights, are not entered or tracked on the spreadsheet.

The spreadsheet information of species mix, condition factor, and landed weight is printed out and used to fill out the ADF&G fish ticket. The previously reported discard and percent of catch by statistical area is added. Then, the captain reviews the completed fish ticket, signs the bottom as do the processors, and takes a hard copy of the fish ticket for his/her records.

If the species landed includes IFQ species, the processor then reports the landing on the IFQ card swipe system. The processor swipes the fisher's card(s), checks their quota account as a check that the proper IFQ permit card is being used, and then enters the data as required by NMFS.

At this point the vessel is free to depart. The fish are further processed and packed for shipment in the processing plant. The information on the final type and weight of products produced is brought up to the office, hand written on another form created by the processor, and also entered into the processor's internally created spreadsheet. The fish ticket information is combined with a print out of the production information from the plant and the vessel's reported discard information (blue sheets), if provided, in order to complete the NMFS DCPL report that is transmitted daily to NMFS via the eLog system by an attached email file.

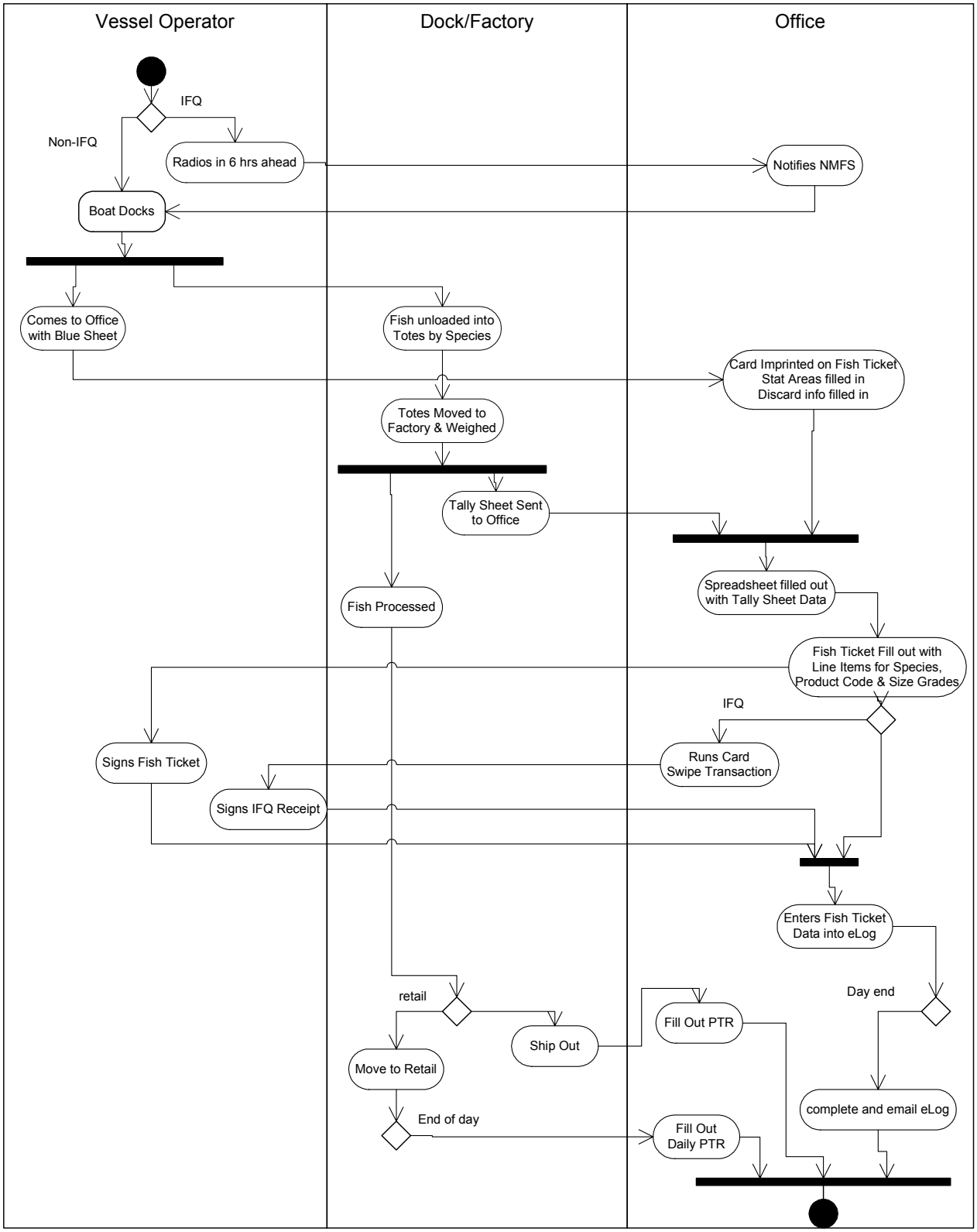

Vessel Operator
Dock/Factory
Office
IFQ
Non-IFQ
Radios in 6 hrs ahead
Notifies NMFS
Boat Docks
Comes to Office with Blue Sheet
Fish unloaded into Totes by Species
Card Imprinted on Fish Ticket Stat Areas filled in Discard info filled in
Totes Moved to Factory & Weighed
Tally Sheet Sent to Office
Spreadsheet filled out with Tally Sheet Data
Fish Processed
Fish Ticket Fill out with Line Items for Species, Product Code & Size Grades
IFQ
Signs Fish Ticket
Runs Card Swipe Transaction
Signs IFQ Receipt
Enters Fish Ticket Data into eLog
retail
Day end
Fill Out PTR
Ship Out
Move to Retail
complete and email eLog
End of day
Fill Out Daily PTR

Figure 6

Internally they use Quickbooks as their accounting software and transfer into it the information from their spreadsheet settlement sheets and their production information for billing and invoicing. Local internal office personnel fill out the yearly ADF&G COAR report and annual fish tax report using the fish tickets and their internal spreadsheet information. Each time the processor transships fish (even if only from the processing plant to their retail store that shares the same building) they must fill out a NMFS Product Transfer Report (PTR). They are now allowed by NMFS enforcement to fill out one PTR per day for movements of fish from their plant to their retail shop.

Data Quality and Issues

The processor reports that they depend upon the catcher vessel to accurately report the percent of harvest by ADF&G statistical area. They have a chart in their office showing the local statistical areas and the fishers point out which areas they caught different percentage of their catch. The processor has no reason to believe this information is inaccurate; however, typically it is reported "off the top of the fisher's head" and not from a logbook record.

The ADF&G conversion factors for back calculation of round weight from the landed condition factor and from NMFS for finished processed weight to round weight equivalence do not appear to be accurate for all sizes and species of fish and for different seasons.

There are problems with the IFQ card swipe system, particular when a red line occurs due to an incorrect permit number being entered that has insufficient quota for the landed weight of the catch. The requirement to hold the vessel and IFQ permit holder until local NMFS enforcement resolves the issue can be burdensome. The processor now runs a balance report for the permit number that they are going to record a landing to ensure that they have the correct permit number and that there is sufficient quota left in the account to cover the landed fish. Calculating the allocation of an IFQ catch and making the reports for multiple permit holders and areas on a single landing can be complicated and time consuming.

Confidentiality concerns are with areas fished, pounds landed, and price paid. Some fishers take better care of their fish than others, and get a higher price that they do not want other fishers to know.

Since a lot of personnel working in the smaller Alaska processing plants have English as a foreign language, they would like a simplified instruction manual for the NMFS and ADF&G reporting processes. They also believe the manuals are written for larger processing plants and sometimes the

instructions are confusing for smaller operators (such as transfer of product to retail sales).

They would be receptive to an electronic fish ticket reporting system similar to the NMFS system, particularly, if the two systems and the IFQ system shared information. Although electronic signatures might be possible, their fishers would more than likely still require a printed fish ticket with signatures to take home. They believe they need a manual backup system based on paper forms for all reporting to be assured of meeting deadlines when and if the phone system is down.

4.1.7 Southeast Processor

The processor is a large volume processor of IFQ sablefish and halibut, rockfish, cod, salmon and king, as well as Tanner and Dungeness crab. They fill out about 300 to 350 halibut fish tickets per year, 100 to 150 sablefish fish tickets, 200 salmon fish tickets, and about 100 crab fish tickets per year. They have no observers and most of the vessels delivering to them are below the 60 ft observer requirement. They handle mainly longline, pot, troll, seine, and gillnet vessels. They purchase fish almost exclusively for their own processing but may act as a custom processor for another processor's product once or twice a year.

They have access to the Internet and an in-house computer network.

Work Flow

The vessel calls in well ahead of time to schedule a delivery. If the delivery is an IFQ species, the processor calls the NMFS RAM division and notifies them of the expected delivery time of the vessel with at least six (6) hours notice. See Figure 7 for the flowchart. IFQ species are only landed during daylight hours. The vessel comes along side the processor's dock and the fish are unloaded with brailers, sorted by species, size and condition factor, and then weighed in totes. The totes have the tare weights printed on the side. Once the fish are sorted, the totes are weighed and the tare subtracted to get the gross landed weight of the catch. The processor's dock crew completes a dock scale sheet that lists the species, condition factor, size and grade, if appropriate, and the list of weights for each. The vessel crew, typically the cook, monitors the weights and sorting for the vessel. Once all the fish are offloaded, sorted, and weighed, the dock scale sheet is taken to the office were the office staff enters the information into a spreadsheet form on the processor's computer.

The fisher brings the permit card (and the IFQ cards) to the office and the fish tickets are imprinted with the permit cards. A separate fish ticket is

made out for each IFQ permit holder and for each NMFS statistical reporting area. The office staff checks the weights on the scale sheet with sums in the spreadsheet form, and then fills in the information on the fish ticket. The office staff uses the spreadsheet form to allocate catch among permit holders for IFQ species and assign by-catch as directed by the fishers. The fisher reports the percent of the fish taken in each NMFS and ADF&G statistical area, and reports any by-catch that was discarded at sea to the fisher for inclusion on the fish tickets.

The fish tickets contain all of the species, size and grade categories, and price. Sablefish must be dressed before reporting weights on fish ticket for determining payment to the fisher. The gross offload weight is written on the fish ticket and later the dressed processed weight is added, the price applied, and the value determined. The fishers sign the fish ticket; the office staff and the fishers conduct the IFQ card swipe reporting process; and the fisher departs with their copy of the fish ticket.

The fish ticket information entered on the processor's spreadsheet form only includes information relevant to the purchase of fish. Fish ticket information such as catch by statistical area, permit number, and discards is not entered into the processor's computer system. Fish tickets may be faxed daily if NMFS or ADF&G are interested in overall harvest against a quota to determine the correct season closure date. However, generally the fish tickets are mailed to ADF&G once a week. If a by-catch overage is detected from a harvest that occurred in State waters, the processor pays the State and deducts the money from the settlement with the fisher, indicating the deduction on the fish ticket. If the by-catch overage occurs in Federal waters, the processor faxes a copy of the fish ticket to NMFS and they collect the payment directly from the fisher.

The fish ticket information and the plant production reports are used to conduct the eLog NMFS reporting. This process typically happens daily, but sometimes if there are deliveries on a Sunday when the office is closed, the eLog reporting may not occur until Monday. The office fills out PTRs, IFQ transfer reports, and uses information from the fish tickets and NMFS reports to do annual ADF&G COAR reports and Alaska fish tax reports.

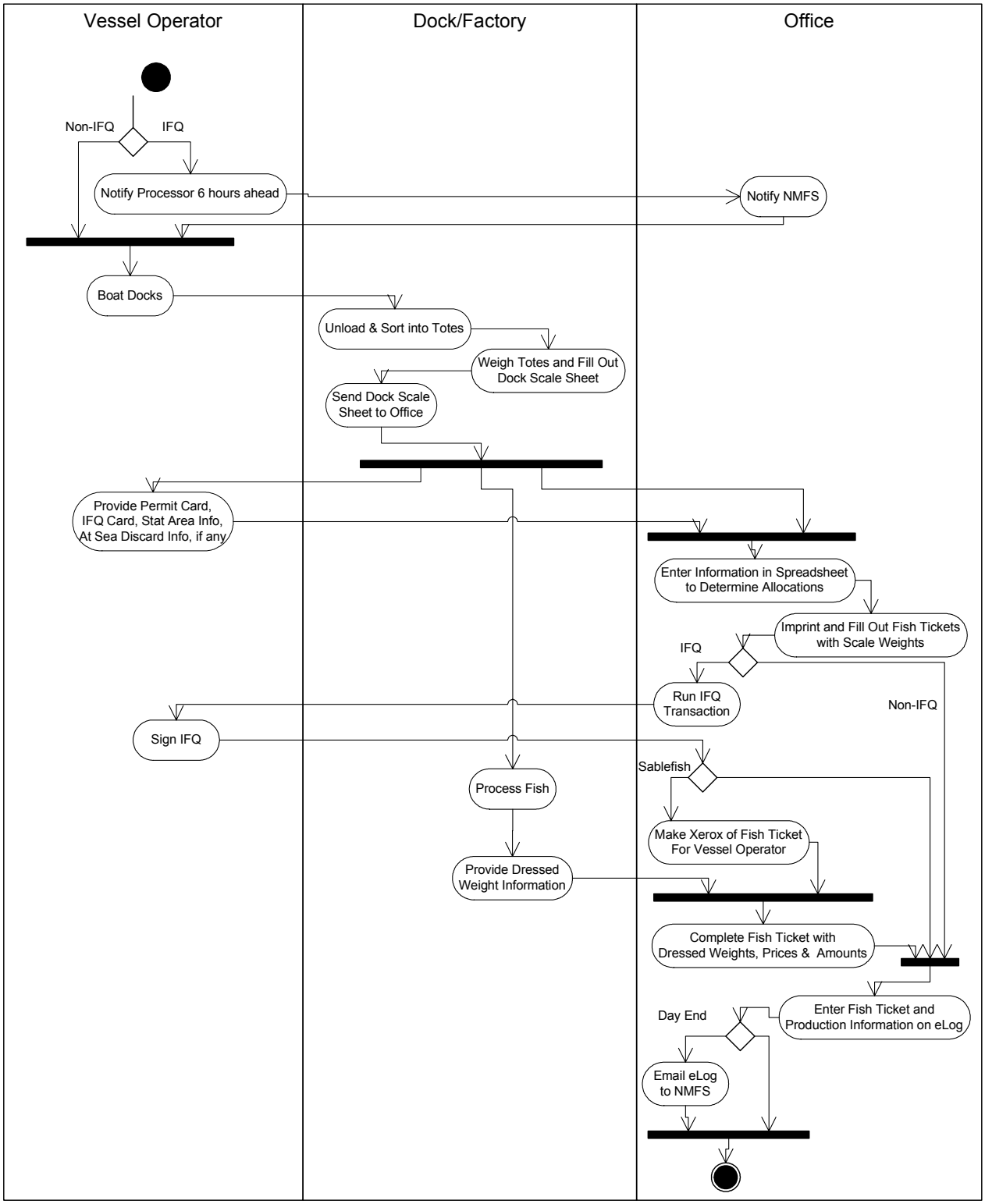

Vessel Operator
Dock/Factory
Office
Non-IFQ
IFQ
Notify Processor 6 hours ahead
Notify NMFS
Boat Docks
Unload & Sort into Totes
Weigh Totes and Fill Out Dock Scale Sheet
Send Dock Scale Sheet to Office
Provide Permit Card, IFQ Card, Stat Area Info, At Sea Discard Info, if any
Enter Information in Spreadsheet to Determine Allocations
Imprint and Fill Out Fish Tickets with Scale Weights
IFQ
Non-IFQ
Run IFQ Transaction
Sign IFQ
Sablefish
Process Fish
Make Xerox of Fish Ticket For Vessel Operator
Provide Dressed Weight Information
Complete Fish Ticket with Dressed Weights, Prices & Amounts
Day End
Enter Fish Ticket and Production Information on eLog
Email eLog to NMFS

Figure 7

Data Quality and Issues

The processor believes the data quality is good. There are some concerns about the different product recovery codes used compared with the actual recovery in the plant depending upon season and species.

Although none of the information on fish tickets is shared among the fishers by the processor, price and total value on the fish tickets is considered highly proprietary information. In the IFQ fishery, the location fished is less proprietary than it used to be under the open access fishery.

Problems encountered with the existing system include multiple reporting of the same information. The two-hour limit to initiate the NMFS reporting process after a delivery can be a problem when the office is closed on Sundays. The back-calculation of round weights from the different product forms and landing conditions can be difficult to do. Determining by-catch overages can also be difficult with all the rapidly changing fishing areas and by-catch quotas. NMFS does not do a timely job of getting information on these changes to all the processors. The permit card, imprinting machine never seems to get the card information firmly and correctly located onto the fish ticket forms. Finally, the reporting process is complicated particularly for newly hired office staff.

The processor would very much like an electronic fish ticket form, particularly if it could handle all the existing information they are entering for their own and the fisher's use as a settlement sheet on the fish ticket, such as size, grade, etc. They would very much like some automated way of doing the condition factor and processing form adjustments to the proper reporting weights, such as headed and gutted sablefish back to round weight.

They would like the system to be able to report directly to ADF&G electronically like the NMFS system does now with either a printed and signed, or printed electronic signature hard copy mailed later as back up.

They would also like a card swipe and pin number set up for the permit cards so the information could be printed out on the fish ticket instead of imprinted.

4.1.8 Medium-sized Processor

This operator is a shore-based, medium-sized processor concentrating mainly on IFQ Pacific halibut and sablefish and some crab and salmon, they do not process any by-catch, which is usually delivered to other local processors and treated as partial deliveries for reporting purposes. They handle about 375 fish tickets per year. They do not have any NMFS observers. The catcher vessels offloading at their facility are a combination of larger vessels with 30% observer coverage to vessels less than 60 ft and exempt from NMFS observers and by-catch reporting. Most of the vessels are longline or pot vessels (halibut and sablefish). They do no CDQ processing.

They use a local commercial computer store for IT support. They use the Parity Catch Manager system to generate settlement sheets and for their own internal accounting purposes.

Work Flow

The vessels report their scheduled delivery times for IFQ landings at least six (6) hours ahead of their delivery, and the processor calls the NMFS RAM division to give them prior notice. See Figure 8 for the flowchart. When the vessel comes along side the processor's dock, the processor staff offload the fish by brailer, sort them by size and condition factor (headed and gutted, slime and ice is the dominant condition code for halibut, but some are head on), and then count and weigh them on a platform scale. The fisher may or may not monitor the offload and tally weights, depending upon the person (about 20% monitor the weights and sign the in-plant tally sheet). The vessel representative goes to the office and provides the permit card for imprinting on a fish ticket, reports the percent of harvest by ADF&G statistical area as well as any at-sea discards, or provides their blue sheets if the vessel is 60 ft or longer. This information is hand written onto the fish ticket. The fisher may sign the blank fish ticket at this point or may wait for the grade, size, and weight information to be recorded.

The processing factory keeps a tally sheet on the weights by species, condition code, and size. Any by-catch that will be discarded (non-purchased fish or crab deadloss) are also identified to species or species group, counted or weighed, listed on the tally sheet, and then loaded back onto the vessel for at-sea discard. Once all the fish to be purchased are weighed, the tally sheet is brought up to the office where it is used to complete the fish ticket. The processor enters all of the information available including numbers of fish and weight by size, condition factor, and grade. In some cases, they may not enter the price and calculate

value by category until after the fisher signs the ticket. The fisher either picks up their copy of the completed fish ticket with the price added later before departing, or they pick it up from their file in the processor's office upon their return from their next trip. Any chalked halibut detected during processing are listed on the fish ticket and a price deduction is noted.

The fisher and office staff report IFQ harvests on the card swipe system after the tally sheet is available. It is common to have multiple permit holders on a single delivery and can be quite complicated assigning quota by permit card. The vessel representative tells them how many pounds came from what stat area.

The fish ticket information is also entered into the processor's Parity Catch Manager system as they have time. That can also record bait, ice, fish tax and other costs deducted from the fisher's settlement sheet. They have a policy of paying the fishers for their catch within three working days of delivery; therefore, the accounting information must be entered within that timeframe.

They have occasional partial deliveries where the halibut or sablefish is offloaded at their processing plant, but the skates and other by-catch are offloaded at another processor. When this occurs, the office staff marks the fish ticket as a partial delivery, and either calls the other processor and gives them the original fish ticket number or the fisher takes the vessel copy of the fish ticket with them to the next processor when they deliver the by-catch for processing.

After the fish are processed in the factory, the foreman delivers the processed product weights by product type and species to the office, where they are entered into their own computer accounting system and the Catch Manager system. The production information and the fish tickets for groundfish are used to fill out each day's NMFS eLog reporting form, which are sent to NMFS as an attached file to an email. The processor does not fill out or maintain hard copies of the DCPL or WPRs. The processor does PTRs and IFQ product transfer reports and submits annual ADF&G COAR and Alaska fish tax reports.

If an error is detected in the fish ticket, they line out the mistake, write in the correct value and fax a copy to ADF&G. They use the eLog system to correct mistakes in the NMFS reporting. The processor's office staff catch by-catch overages and report them to NMFS along with a faxed copy of the fish ticket.

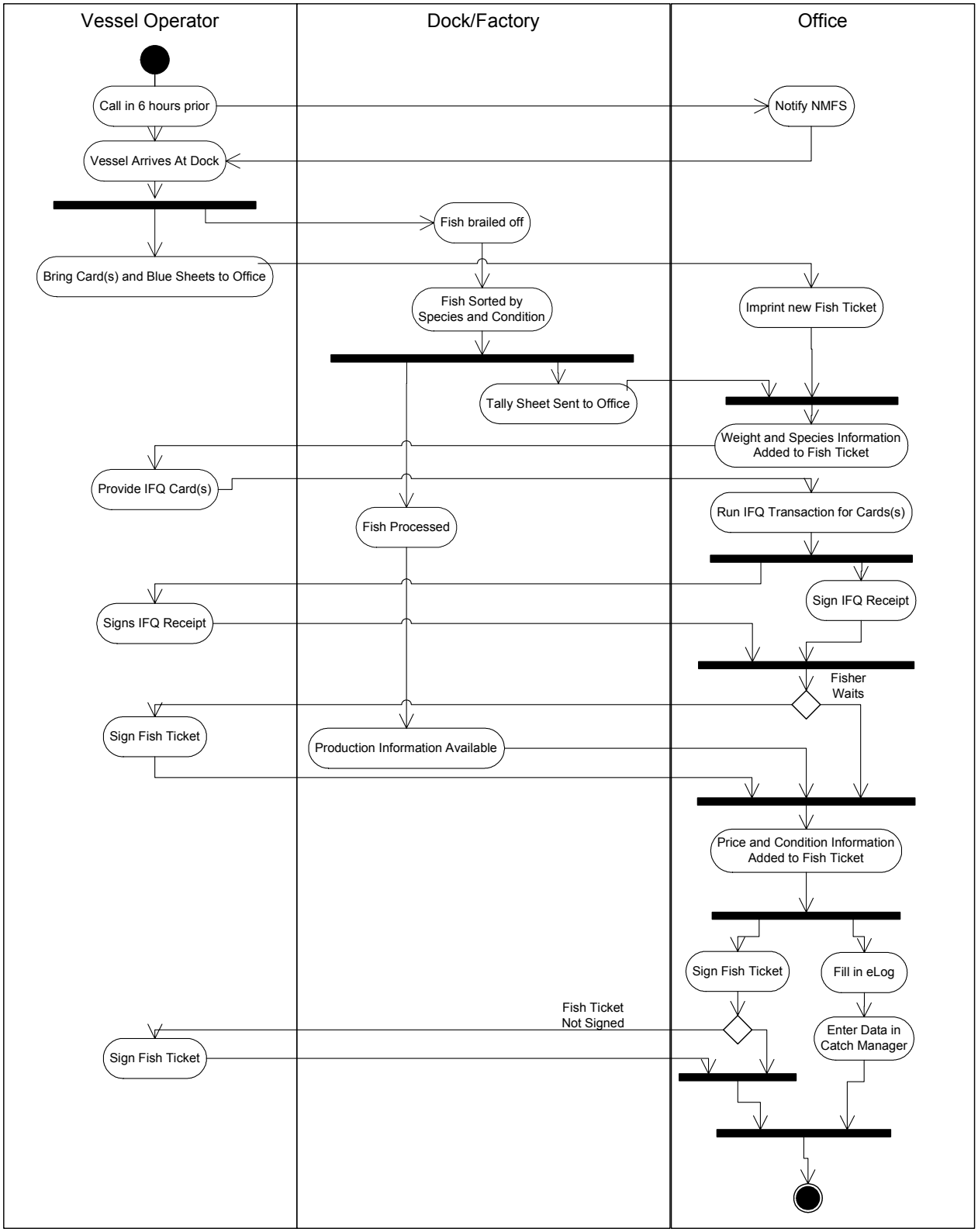

Vessel Operator
Dock/Factory
Office
Call in 6 hours prior
Notify NMFS
Vessel Arrives At Dock
Fish brailed off
Bring Card(s) and Blue Sheets to Office
Fish Sorted by Species and Condition
Imprint new Fish Ticket
Tally Sheet Sent to Office
Weight and Species Information Added to Fish Ticket
Provide IFQ Card(s)
Run IFQ Transaction for Cards(s)
Fish Processed
Sign IFQ Receipt
Signs IFQ Receipt
Fisher Waits
Sign Fish Ticket
Production Information Available
Price and Condition Information Added to Fish Ticket
Sign Fish Ticket
Fill in eLog
Fish Ticket Not Signed
Enter Data in Catch Manager
Sign Fish Ticket

Figure 8

Data Quality and Issues

Data quality issues include the ADF&G permit card not matching the vessel identification number. The fishers sometimes incorrectly record weight instead of numbers or vice versa for discards at sea. The NMFS Daily Fishing Logbook blue sheet information is sometimes hard to read, specifically hand written digits. Sometimes the fishers have a hard time finding their fishing locations on the ADF&G statistical area charts because there are not enough latitude and longitude lines on the charts.

They would like an electronic fish ticket system. They would like it to work with Windows XP and like all the data entry information to fit on one screen. They would also like it to have a feature allowing the back calculation of round weight from headed and gutted and other product forms.

Additionally, they would like NMFS and/or ADF&G to feed back to them information about their annual operations for the preparation of the COAR and Fish Tax reports.

They now provide printouts of what each fisher has landed over the year from their Parity Catch Manager software to assist fishers in income tax preparation. Whatever new system is developed should be able to output data to Catch Manager.

"It would be nice to have a fully integrated IFQ, NMFS, ADF&G electronic reporting system."

4.1.9 Large Processor

The processor is a large operator in the Gulf of Alaska. It is a Seattle-based company. It processes pollock, Pacific cod, mixed flatfish species, and very little quantities of Pacific halibut and sablefish. They typically handle 3 to 5 deliveries a day and 35 or more a week at peak of operations. They only do 3 or 4 IFQ deliveries a year. They have one NMFS observer working at the plant, and most of the vessels delivering to them are either 100% or 30% federal observer coverage vessels. Most of their deliveries are from trawl vessels; although, they do handle longline and pot vessels on occasion.

The processor has a leased line network connected with their Seattle headquarters. They have an ISP connection as a backup. They have a network manager at the plant and IT support in their Seattle headquarters if necessary.

Work Flow

If the landing is an IFQ species, the vessel calls the processor by radio or cell phone six (6) hours ahead of the landing, and the processor notifies the local NMFS office of the expected delivery time of the vessel. Vessels landing other groundfish also check in with the processor by phone or radio to schedule an offload time. See Figure 9 for the flowchart. Pollock, cod and flatfish are pumped unsorted out of the refrigerated sea water (RSW) hold of the vessel into a series of holding tanks were the catch is de-watered and an initial weight is recorded. Brailers may unload halibut, sablefish, and some cod and by-catch if the vessel does not have an RSW tank, but the catch is still offloaded into the holding tanks that are weighed. The catch is then released from the initial holding tanks onto a conveyor system where the fish are sorted by species and for some species by size. The sorted fish are then re-weighed either by inline scales (cod, pollock and flatfish) or on platform scales (rockfish, halibut, and sablefish). The second set of weights is used for reporting purposes. In nearly all cases, the fisher relies on the accuracy of the processor's weights and does not independently monitor the weighing and offloading process.

Upon arrival at the dock, the permit holder typically provides the ADF&G permit card to the offloading supervisor on the dock of the processing plant and they imprint the card on a blank fish ticket. The fisher may sign or not sign the bottom of the fish ticket at this point although most of the processor's regular catcher vessels sign the blank fish ticket. The catcher vessel representative provides the offload supervisor the blue sheets from the NMFS daily fishing logbook indicating at-sea discard, and verbally provides the NMFS and ADF&G statistical reporting areas and the percentage of weight of fish caught in each area, which is noted on the fish ticket.

After the weights are recorded from the second weighing of the sorted fish inside the factory, the printout of the tally of weights by species and size category is stapled to the fish ticket and the blue sheets. The package is delivered upstairs to the main office. In the office, the processor's staff enters the weight and other information into a commercial software product called Catch Manager from Parity Corp.

The Catch Manager system allows the entry of prices of the different species and sizes along with the weights to obtain the total value. It produces a settlement sheet for the catcher vessel that makes deductions for bait, fuel, ice, and the local fish tax. This information is printed out and the processor's office staff hand copies the information from the Catch Manager system settlement sheet onto the previously imprinted fish ticket.

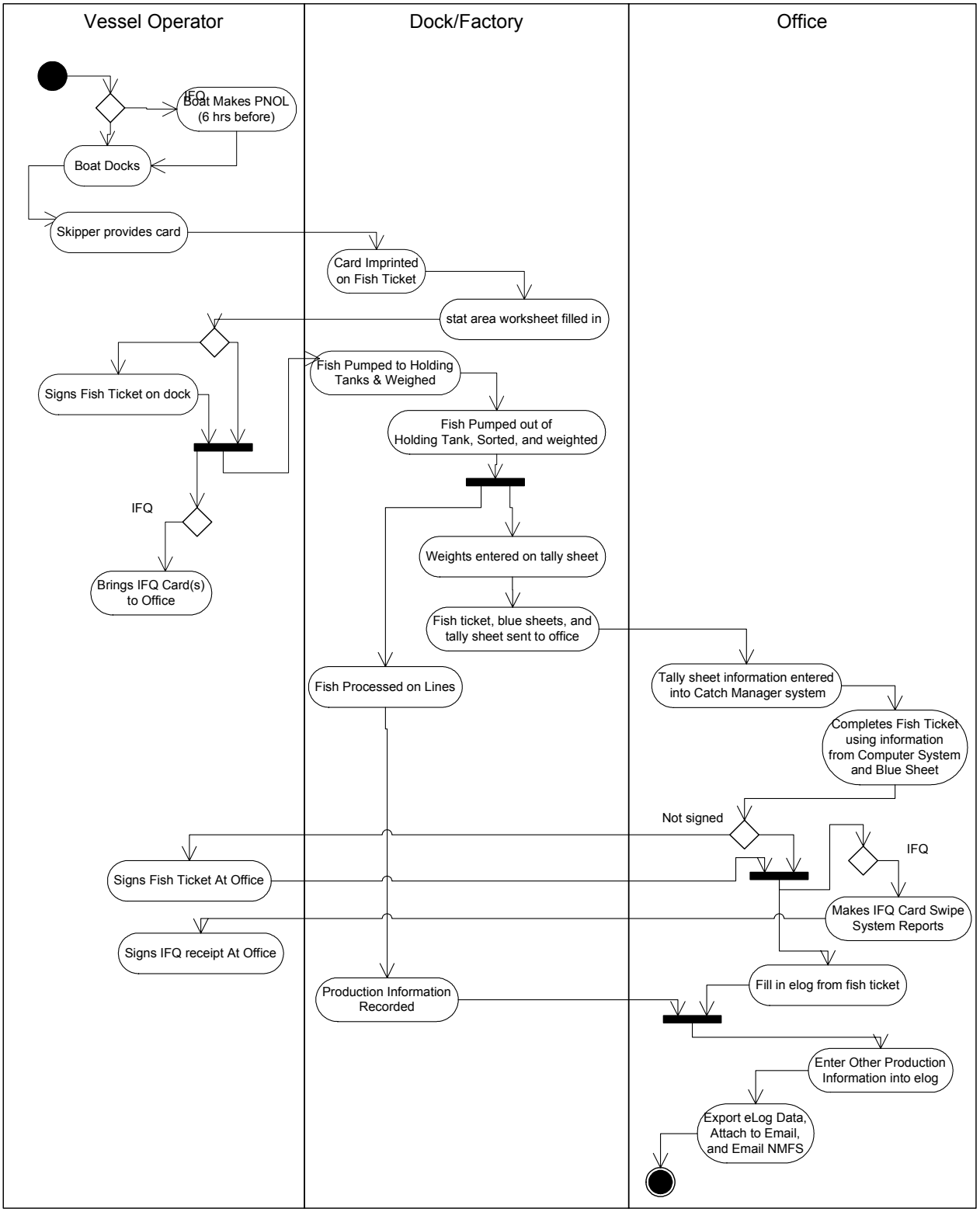

Vessel Operator
Dock/Factory
Office
IFQ
Boat Makes PNOL (6 hrs before)
Boat Docks
Skipper provides card
Card Imprinted on Fish Ticket
stat area worksheet filled in
Signs Fish Ticket on dock
Fish Pumped to Holding Tanks & Weighed
Fish Pumped out of Holding Tank, Sorted, and weighted
IFQ
Brings IFQ Card(s) to Office
Weights entered on tally sheet
Fish ticket, blue sheets, and tally sheet sent to office
Fish Processed on Lines
Tally sheet information entered into Catch Manager system
Completes Fish Ticket using information from Computer System and Blue Sheet
Not signed
IFQ
Signs Fish Ticket At Office
Makes IFQ Card Swipe System Reports
Signs IFQ receipt At Office
Production Information Recorded
Fill in elog from fish ticket
Enter Other Production Information into elog
Export eLog Data, Attach to Email, and Email NMFS

Figure 9

If the catcher vessel representative has not previously signed the fish ticket, they do so at this point while reviewing the weights and prices. If the catcher vessel has already departed when the fish ticket is completed, a copy is put in their file in the office for later pickup. ADF&G picks up the fish tickets once a week from the processor. The processors office staff reviews the landing information for by-catch overages although they rarely occur. If by-catch overages are noted, they report them by phone to the local NMFS office, and fax a copy of the fish ticket if requested. Given the number of areas that might be potentially fished and the different by-catch limits by area and season, determining by-catch overages is somewhat difficult.

For IFQ deliveries, the process is the identical, except the card swipe reporting is done in the office immediately after the fish are weighed and the fish ticket is filled out at the same time.

After the fish are processed, the weights of the different product components are delivered to the office and entered into the company's own proprietary software accounting package. The office staff then re-enters this information once a day into the NMFS eLog reporting system and transmits the data to NMFS via an email with an attached file. The processing plant fills out Product Transfer Reports and the corporate headquarters in Seattle fills out the ADF&G COAR annual report and the Alaska fish tax annual report.

Data Quality and Issues

The processor believes the fishers are accurately reporting both at-sea discard and percent of catch by ADF&G statistical reporting area. The main errors occur when it is difficult to read the fisher's handwriting on the blue sheets.

The fisher can use the wrong IFQ permit card resulting in a red line error on the card swipe system.

The fishers and the processor consider most of the information on the fish tickets confidential. However, many of the vessels coordinate their fishing activities together.

The processor reports few if any problems with either the fish ticket or the NMFS reporting.

They would like whatever new system is developed to be compatible with their existing system that includes Catch Manager and their internal product accounting software. The system should be capable of importing or exporting data.

Most of their catcher vessels have computers onboard and if the NMFS daily trawl or longline logbooks were electronic, they could pass the discard and catch by area information electronically to the processor's office staff.

Since they are required to fill out a lot of paperwork for NMFS to report PTR information, and all the information is available on their computer system and on the bills of lading, the processor would like a way to electronically report the PTR information.

They would be very receptive to an electronic fish ticket reporting form. It would be handy if the program was set up to automatically calculate by-catch overages by area, season, and target species since the rules are somewhat complicated during some times of the year.

4.1.10 Large Processor with Custom Systems

This processor is a medium-to-large size shore based processing operation. They process a variety of seafood including crab, salmon, IFQ halibut and sablefish, pollock, Pacific cod, flatfish, and mixed rockfish. They do about 2,700 fish tickets per year. The highest volumes of fish tickets are handled in January through March and July through September. During the summer salmon season, they may handle up to 20 fish tickets per day compared with one to two tickets per day during the winter months. For groundfish, they have one NMFS observer working at the plant and nearly all of the vessels delivering to them are either 100% or 30% NMFS observer covered vessels. They do not do any CDQ processing.

They have one company IT person based in Kodiak who circulates among the different processing plants in Alaska. Another IT person is based in Cordova, and another is based at the home office in Seattle. Their Internet connections are through ISPs. The larger ports have relatively reliable Internet service, but some remote plants in locations, such as Peterson Point and Togiak, have connections that can be lost for days at a time.

The processor's custom software runs on local servers at each plant. The system is built on an MS Access database using Visual Basic.

Work Flow

Vessels delivering IFQ species call in at least six (6) hours ahead of their delivery arrival and notify the processor, who in turn notifies NMFS of the daylight time of arrival. When the vessel arrives at the dock, the fisher usually signs a blank fish ticket and provides their permit card, which is imprinted on the blank fish ticket form. If the office is open this usually takes

place at the office, otherwise, on the dock. The exception is IFQ deliveries where the fisher may not sign the fish ticket until it is completed. See Figure 10 for the flowchart. The fish are offloaded from the boat using either a pump system from RSW tanks onboard the vessel or by brailer for non-RSW fish and crab. The fish or crab are loaded into hoppers were they are dewatered and batch weights are recorded electronically and printed on a paper tape. The offload foreman fills out a company form called an offload form. The form contains information about the vessel identification, target species, by-catch species, and weight by target species, size, and grade. The offload foreman attaches the offload tally weight to the paper tape and the blue sheets from the vessel to the offload form, and then sends them to the office when the offloading is completed. If the office is open, the foreman calls the office and gets a fish ticket number that is entered on the offload form, otherwise the office staff assigns a fish ticket number to the offload form when it arrives at the office. For IFQ species, crab and salmon, the fisher generally assigns someone from the vessel's crew to monitor the offload weights and sign off on the offload tally sheet.

Inside the factory, the fish are sorted by species and, if necessary, size and grade, and may re-weighed on platform scales (by-catch and target species size and grade). The by-catch weights and weights by size and grade categories are reported on either the original offload sheet or a new offload sheet that also has the vessel identification and fish ticket number. This form is delivered to the office when sorting and weighing are complete. The processor uses their own information on by-catch weights and species composition in filling out the fish ticket and NMFS reporting forms and does not rely on the NMFS observer data for any reporting.

In the office, the information from the offload sheet(s) and the vessel's at-sea discards from the NMFS Daily Fishing Logbook blue sheets are entered into their own proprietary software system that records all of the information required on the fish ticket. The vessel operator provides the office staff the statistical areas fished and percent harvest caught in each area. The company's software system allows the data entry person to pull down menus of species codes and condition/size categories, and choose which ones match the information on the offload sheet. The current prices for the different products are entered for each species. Next, the delivery condition factor, fish size category, and the total weight and value by category for each species is calculated. The office staff loads the blank imprinted and signed (or not) multi-copy fish ticket form into a printer, and the software prints out the information in the standardized ADF&G fish ticket format. The fish ticket number is actually printed on the form by the software from a unique sequence of numbers that have been assigned specifically to that processor.

If the fisher is still present, they sign the fish ticket, if not previously done, and take their copy. Otherwise, the processor places a copy of the completed fish ticket in their file, which is maintained in the office for later pick up. If the delivered species is an IFQ species, the office staff and the fisher do the card swipe reporting when the fish ticket is completed in the office. ADF&G picks up a hard copy of the fish tickets once a week. The company's fish ticket software also allows entry of the settlement sheet information, such as deductions for ice, bait, fish tax, etc., and prints out a final settlement sheet for payment due the fisher. They report any by-catch overages to NMFS and fax a copy of the fish ticket.

Each morning, the processing plant reports the previous 24-hour plant groundfish production (midnight to midnight) to the office. The production is reported by weight of finished products produced by species and product type. The office staff uses the electronic fish ticket information and the plant production reports to report to NMFS daily on the eLog system using a file attached to an email. They do not maintain hard copy DCPL or WPRs. The plant produces PTRs and IFQ transfer reports when products are shipped.

The Seattle headquarters uses the electronic fish ticket information, the NMFS reporting information, and internal company records to produce the annual ADF&G COAR and Alaska fish tax reports.

They report daily crab and salmon production by phone to ADF&G in-season for harvest quota determination. They also report cod and pollock daily near the end of the season to assist NMFS and ADF&G in closing the season upon reaching the quota.

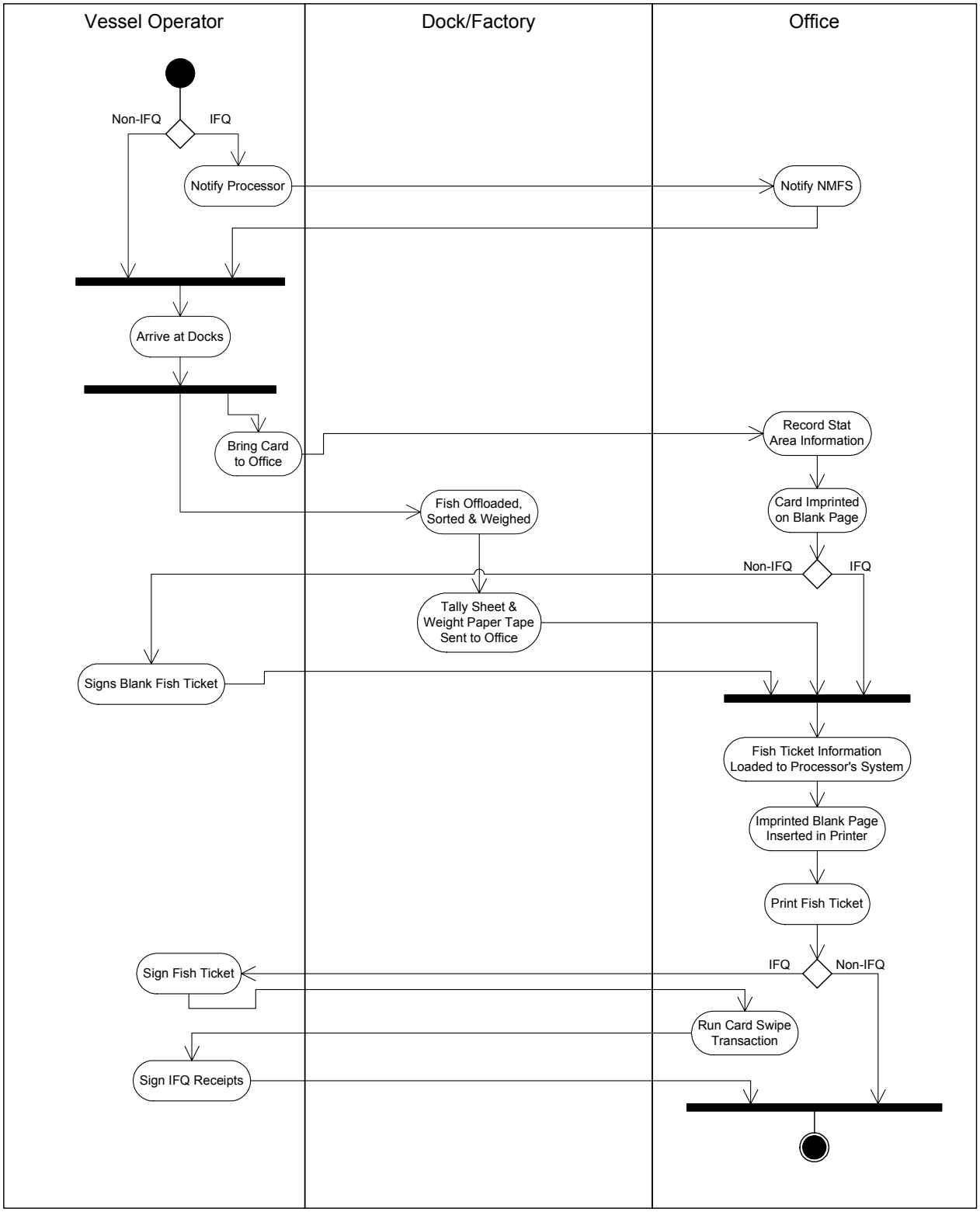

Vessel Operator
Dock/Factory
Office
Non-IFQ
IFQ
Notify Processor
Notify NMFS
Arrive at Docks
Bring Card to Office
Record Stat Area Information
Card Imprinted on Blank Page
Fish Offloaded, Sorted & Weighed
Non-IFQ
IFQ
Tally Sheet & Weight Paper Tape Sent to Office
Signs Blank Fish Ticket
Fish Ticket Information Loaded to Processor's System
Imprinted Blank Page Inserted in Printer
Print Fish Ticket
IFQ
Non-IFQ
Sign Fish Ticket
Run Card Swipe Transaction
Sign IFQ Receipts

Figure 10

Data Quality and Issues

They do not have any particular concerns about data quality; although, they mentioned that for IFQ species the difference between the weights back calculated from the different landing condition factors (halibut) allow the potential for some minor fudging on IFQ quotas. This fudging is not allowed to occur at their plant, but they believe it could happen at other facilities.

All of the data they collect, they consider proprietary. They do not let fishers look at one another's fish tickets.

Most of the problems they have encountered are related to their printing of the electronic fish ticket information on the blank forms. Since the fish ticket forms do not have guide holes along the edges, the printed information will not print in the correct location on the ticket sometimes, and may overlap the imprinted permit card information. Additionally, although rare, sometimes they end up with two pages for a fish ticket and they only have an imprint and signature on one page. They also would have liked for the imprinting machine to retain the alignment holes to properly align the card for imprinting. If for some reason there is a printing error and the imprinted and signed blank fish ticket is damaged, they have to repeat the process with another blank ticket. If the fisher is still present they re-imprint the permit card and have the fisher sign the new fish ticket. If the fisher has departed, they print a new copy of the fish ticket and staple the damaged but imprinted and signed copy to the fish ticket and hope that the fisher returns before the seven-day delivery requirement to ADF&G. (They did not mention what happens if the fisher does not return in time to sign the new copy of the printed fish ticket.)

They occasionally have problems getting through to NMFS on the eLog system via email. Their Internet connection is fairly reliable but they can have satellite connection problems.

They also report that the local ADF&G office may require different information to be reported on the fish ticket; although, they did not provide any examples. They noted that different agency offices had different reactions to their electronically generated fish tickets. They believe that it will be important to the success of any electronic reporting system that everyone agrees on how the information is to be filled out.

They have made a substantial investment in software and hardware development to support their electronic fish ticket reporting process and would like whatever system is recommended to accommodate their system.

They would like to be able to capture some of the electronic reporting information at the dock during the offload. For example, if the dock foreman was able to do a card swipe process similar to that done for IFQ species, then the permit card information could be electronically added to the fish ticket information. The dock foremen could then assign a fish ticket number from the processor's list of numbers and enter the offload weights instead of writing them on an offload form. The in-factory sort and weigh could then be entered into a computer in the factory using the fish ticket information from that offload and all this information transferred directly to the office and be available electronically to their fish ticket reporting form software.

They would like to be able to have NMFS report summaries of their cumulative production for the year.

4.1.11 Very Large Processor

This processor is a high volume processor concentrating on pollock (AFA co-op), cod, and crab. They take deliveries from two cod and two pollock boats a day on average during the peak of the season. They can take up to four or five deliveries of crab each day. They do not do any CDQ or IFQ species. They deal mainly with trawl (cod and pollock) and pot vessels (crab). However, they do occasionally take deliveries of cod from longliners and pot vessels. They have two NMFS observers at the plant and all their vessels are either 100% or 30% NMFS observer covered boats.

They have an internal network in the plant and are connected to their Seattle headquarters by the Internet. They have two people internally who know enough about computers and the network to solve most problems. They can call for help from their Seattle headquarters if necessary. There is no local computer IT support in town. They report that sometimes, if a lot of people are using the Internet, it can be real slow and blowing snow can clog up the satellite dish breaking the connection.

Work Flow

See Figure 11 for the flowchart. The catcher vessels come alongside the processor's dock. The captain or mate brings the permit card up to the office where it is imprinted on a blank fish ticket. The vessel representative indicates the percent of harvest taken by ADF&G and NMFS statistical reporting areas and provides the blue sheets from the vessel's NMFS trawl or longline logbook showing at-sea discards. In the past, the vessel's permit card has not always been imprinted on the fish ticket before the start, or even by the end, of the fish offloading (card was imprinted prior to departure for the next trip) but recent information from ADF&G

enforcement has changed this procedure and cards are now imprinted on a blank fish ticket prior to the start of the offload.

The vessels are offloaded using a pump system extracting cod or pollock from the catcher vessel's RSW tanks. The fish are pumped into a holding tank and dewatered and an initial gross weight is taken. The weights are recorded on a paper tape maintained by the offload foreman. After the initial weight is taken, the fish are moved out of the dewatering tank along a conveyor system were by-catch is sorted and weighed on a platform scale. The offload foreman records the weight and species code recorded on the paper tape. The by-catch is sorted into retained, purchased, and in-plant discard categories. If the in-plant discard is a PSC species or a species that cannot be used for meal, it is loaded back on the vessel for later at-sea discard. The fishing boat does not monitor the offload weights.

Once all of the fish are sorted and the gross weight and by-catch weights are recorded, the offload foreman brings the tally weights to the office where the weights are entered into the processor's own computer software program. The by-catch and in-plant discard weights are subtracted from the gross offload weight to obtain the target species weight. If information on weights of target species by product form and size categories is available from the processing plant, this information is entered into their computer system, the prices entered to get value, and the information is entered on the fish ticket. Otherwise, the office staff waits for this information from the plant (can take up to 24 hours) before completing the fish ticket. For cod, the office waits until processing begins in the factory before filling in the fish ticket in order to know whether the fish is going to a salt process, fillets, or meal. The species, weight, price, and value information is entered on the fish ticket by product type and size category along with the at-sea discard weights or numbers of animals taken from the vessel's Daily Fishing Logbook blue sheets.

If all of the information is available while the vessel is at the dock, a representative of the vessel signs the fish ticket; otherwise, the office staff typically has them sign the ticket on their next port call that is always within the seven-day fish ticket delivery period. The fish ticket is filled out by hand from a printout of the processor's weight and value information, and the vessel's blue sheets. Not all of the information needed on the fish ticket is entered into the company's computer system (i.e. percent harvest by statistical area and at-sea discards). The office staff reviews the fish ticket for by-catch overages. They notify NMFS enforcement and fax them a copy of the fish ticket if one occurs. ADF&G picks up the fish tickets once a week. If they need to correct a fish ticket they do a line through of the error, write in the correct value, fax it to ADF&G, and put a copy in the vessel's folder in their office.

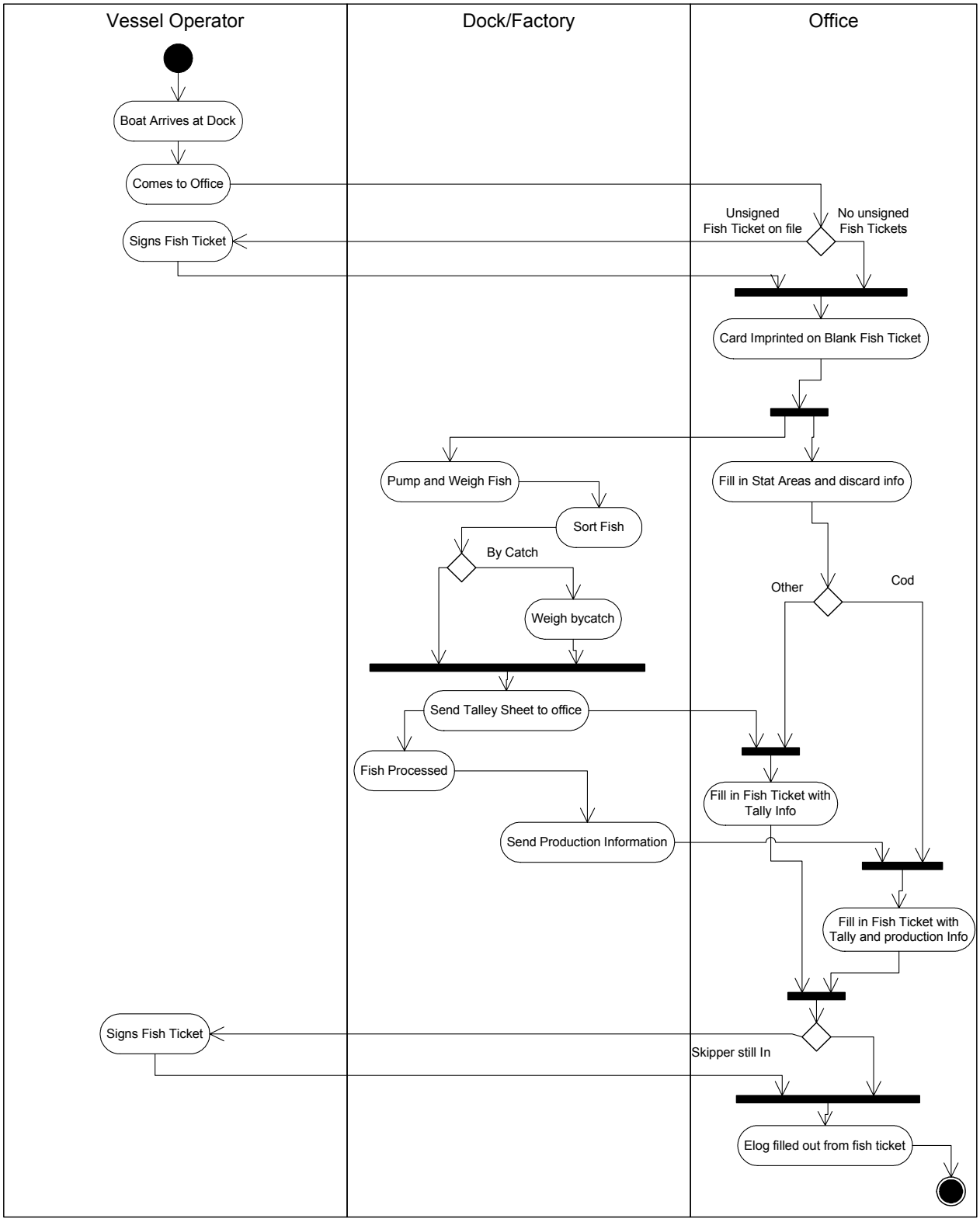

Vessel Operator
Dock/Factory
Office
Boat Arrives at Dock
Comes to Office
Signs Fish Ticket
Unsigned Fish Ticket on file
No unsigned Fish Tickets
Card Imprinted on Blank Fish Ticket
Pump and Weigh Fish
Fill in Stat Areas and discard info
Sort Fish
By Catch
Other
Cod
Weigh bycatch
Send Talley Sheet to office
Fish Processed
Fill in Fish Ticket with Tally Info
Send Production Information
Fill in Fish Ticket with Tally and production Info
Signs Fish Ticket
Skipper still In
Elog filled out from fish ticket

Figure 11

The plant production information is reported daily before noon covering the previous day's production. The plant runs 24 hours per day, but the office is only open 10 to 12 hrs per day. Therefore, the production information from midnight to midnight is delivered to the office first thing each morning. The production information (round and finished weight) is broken out by vessel delivery and then summed across product categories, sizes, and species. Each morning the office staff takes the previous day's production information and fills in the remaining information on the fish tickets and reports the information on the NMFS SPELR eLog system (email with attached file). The local office also produces about 1,500 PTRs per year. See Figure 12 for the flowchart of the DCPL.

The plant production information is sent via Internet to the Seattle headquarters each day. Copies of the fish tickets are mailed to the Seattle office and are re-entered into their computer system to generate the settlement sheets for the vessels. The Seattle office uses the fish ticket and plant production information to generate the annual ADF&G COAR and Alaska tax reports.

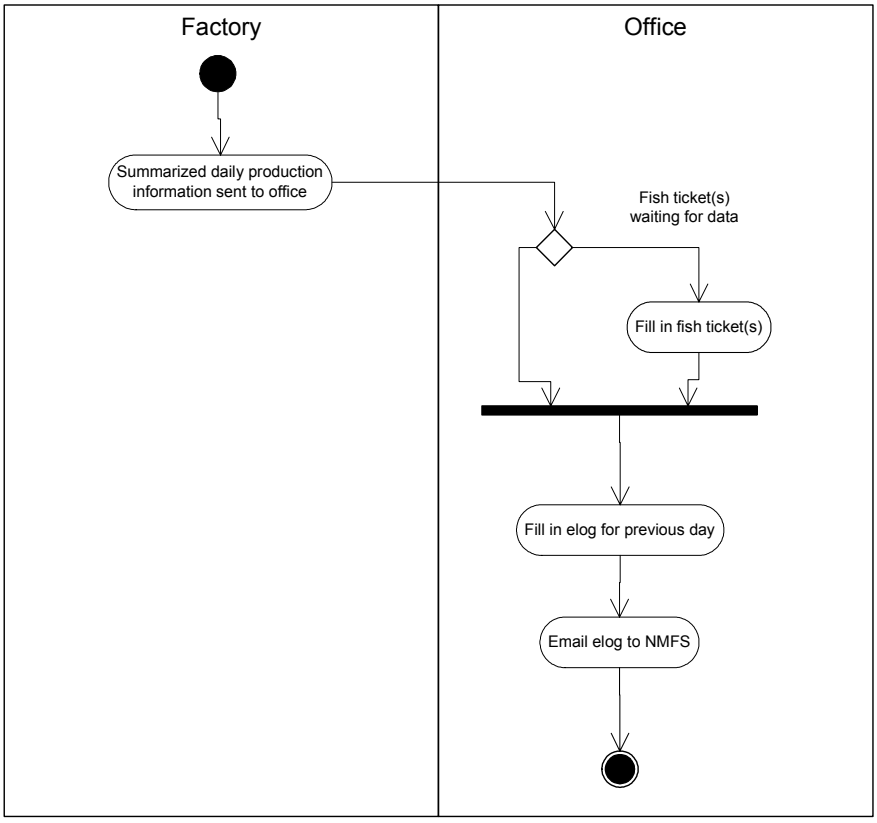


Figure 12

The work flow is similar for crab, except that the crab are offloaded by brailer, and sorted prior to weighing to exclude dead loss and any by-

catch. Both the dead loss and retained crab are weighed and reported on the fish ticket along with the necessary effort and harvest area information. The crab fish ticket if always filled out and signed prior to the vessel departing for the next trip.

Data Quality and Issues

They do not see any real problems with the data quality.

Occasionally, the blue sheets from the vessel do not get delivered from the vessels to the office before the vessel gets away on their next trip. They usually have time to capture the information on the next port call and add it to the fish ticket before it gets picked up by ADF&G.

They have had some problems with statistical area code changes over the years but that has not been a problem recently.

Under high volume crab fisheries, they sometimes are not able to complete all the reporting necessary for up two days after a delivery.

Data reporting is a full time job for two people at their plant.

Price and weight landed are proprietary; however, they do not let anyone look at another vessel's fish tickets including the NMFS observers. They will provide landed weight information off a fish ticket to an observer but they will not provide price, value, or size/grade breakout.

They complain that PTRs are redundant since they keep Bills of Lading for all shipments out of the plant.

Any electronic fish ticket reporting system should allow for 4 digits for price per pound for fish, i.e., $0.0000.

They would like to have the system output data into a custom format that they could use for their internal accounting process.

They would like an electronic PTR reporting process that would allow Bill of Lading information as the reporting information.

4.1.12 Very Large Automated Shore side Processor

This processor is a high volume producer processing mainly AFA Coop pollock, Pacific cod and crab (king and Tanner). They handle only one (1) to five (5) deliveries of IFQ species (sablefish and halibut) a year. They take three (3) to four (4) deliveries of pollock, cod, and crab per day from mid-January through the end of April. They do very little processing in May through June, and then do three (3) to four (4) deliveries of pollock and

cod again from June through mid-November, and finally Bristol Bay red king crab in November.

IFQ deliveries are variable with a maximum of four deliveries per day from May through October. They have two full time NMFS observers during the pollock seasons and nearly all of their boats have either 100% or 30% NMFS observer coverage. Only the small IFQ boats are exempt. Most of the groundfish vessels delivering to this plant are trawlers; however, they occasionally take deliveries from longliners and pot boats. They are not currently doing CDQ deliveries, but they have done so in the past and may do so in the future.

They have a sophisticated in-plant information management system, which includes electronic integration with some of the scales, and an RFID system with cards and terminals mounted on forklifts. The system is their own custom software written in Visual Basic and C++, running on a SQL Server 7 database.

They have two IT support staff at the plant, and five at their corporate offices in Redmond.

A T1 leased line provides Internet connectivity to the corporate WAN in Redmond, Washington. WAN and Internet outages occur occasionally, but are short lived. A satellite link provides the T1 service, which can be disrupted if they get a heavy snowfall from the south or east that fills up the dish.

Work Flow

See Figure 13 for the flowchart. The processor requires each catcher vessel delivering to their plant to complete a proprietary harvest reporting form prior to offloading. Vessels making regular deliveries to the plant fill out the form while fishing at sea. Vessels making infrequent deliveries to the plant are required to fill out a blank form at the dock and submit it to the offloading foremen before offloading can begin. There are no exceptions to this rule. The information on the form outlines under what permits the harvest was attained, haul or set-by-set, information on date, time and detailed location of the harvest, and other information that relates to the quality of the fish (RSW temperature records and tank loading schedules). There are two main purposes for this information. First, the plant wants to be sure that prior to offloading the groundfish or crab have been harvested legally both from a permit and time/area standpoint. This information is particularly important for vessels that may be making deliveries from harvests in both the Gulf of Alaska and the Bering Sea, and from near sea lion protection areas. Secondly, they want to ensure that the fish is of high quality and has not been held onboard for too long or under poor holding

conditions. In the case of crab, the form also records the number of pots fished to assure the class of vessel is within ADF&G pot limits.

When the delivery vessel comes along side the dock, the offload foreman takes the reporting form from the catcher vessel representative and thoroughly checks the information to make sure it is complete and accurate. Once the information on the form is approved, the foreman signs the form, attaches the vessel's Daily Fishing Logbook blue sheets (groundfish) or ADF&G logbook (crab) forms, and imprints the permit card on a blank fish ticket. Next, they begin offloading the vessel. The fish ticket is not signed by the catcher vessel until all the information needed for the ticket is complete, even if this means the ticket is not signed until the next delivery if it occurs within the seven-day fish ticket reporting period (typical of pollock trips).

For pollock and cod, the plant employs a system that pumps the fish out of the catcher vessel's RSW tanks and into a Phillips Scale double-hopper de-watering, sorting, and weighing system. Before the offload begins, the dock crew sets up the pump hopper system with vessel identification information. The first hopper that the fish are pumped into de-waters the fish. They then pass along a conveyor system where a quick initial by-catch sort is performed, and into a second hopper where an initial gross landed weight of the target species is taken.

The sorted by-catch is separated into purchased fish (rockfish, skates etc.) and in-plant discards (including prohibited species), and placed in totes with marked tare weights. Forklift operators place the totes on platform scales, read the weights, subtract the tare weights, and using an onboard RFID reporting system, enter the vessel identification, by-catch species code, and total weight that is printed out on a paper tape and electronically transmitted to the office computer.

This system is custom designed for the specific plant but checked by ADF&G and the NMFS observers to assure proper weights are being recorded. The system requires the offload personnel to key in the vessel identification number and a target species code. The weighing system produces a paper tape print out of the target species hopper weights. Using a wireless RFID reporting system, it transfers the vessel identification, species, and weight information directly to the computer system in the main office.

After the initial sort and weighing of the target species, the fish may go through a second sort and re-weighing to divert fish for different processing forms (such as sorting damaged fish for delivery to the meal plant). If any by-catch is detected in the second sort, it is sorted by species and

weighed. The weights are again printed out and transmitted up to the office computer with the vessel identification number attached. The weights of the target species by processing type are also printed out and electronically transmitted to the main office with the vessel's identification number attached. The pollock, cod, and crab fishers rarely have anyone verify the offload weights. Prior to the vessel departing, the in-plant discard that cannot be processed (jellyfish, salmon, etc.) is loaded back onto the vessel, which discards it a sea during their next fishing trip.

A similar operation is used for crab except the crab is brailed from the vessel, sorted for dead loss and by-catch species and then weighed in the Phillips hoppers.

The IFQ vessels give the plant a six (6) hour notification prior to arrival. The plant only takes deliveries during the day and notifies NMFS of the scheduled arrival of the vessel with at least six (6) hours notice. IFQ species are offloaded using a brailer, sorted by size and condition, washed, headed, and then weighed. The scales used for IFQ weighing are not electronically integrated with the plant's computer system. Once the weights are recorded, one of the plant personnel brings the fish ticket and the logbook information to the office. The office staff completes the fish ticket from a print out of the weights transmitted from the plant. The catcher vessel representative and office staff complete the card swipe reporting process. Sometimes the IFQ fisher will verify the offload weights but typically not.

Once all the groundfish are weighed and recorded in the plant, the plant foreman brings the paper work up to the office. The paper work consists of the imprinted (but not signed) fish ticket, the proprietary landing reporting form, the NMFS blue sheets (or ADF&G crab logbook forms), the paper tapes from the Phillips scales, the by-catch/discard weights, and in some cases the vessel's trawl logbook. The office staff enters the information from the proprietary landing report form, the vessel logbook forms (blue sheets or crab logbook), and/or their trawl logbook into their own computer program. They access the by-catch, in-plant discard, gross target weight, and net target weight by product type from the computer. The office staff enters the price per pound for each product and size (this actually occurs automatically and they only verify the prices are correct). This information is combined to provide a print out in an identical format of the information necessary to complete the fish ticket. The office staff then prints out the information and hand copies the information onto the fish ticket.

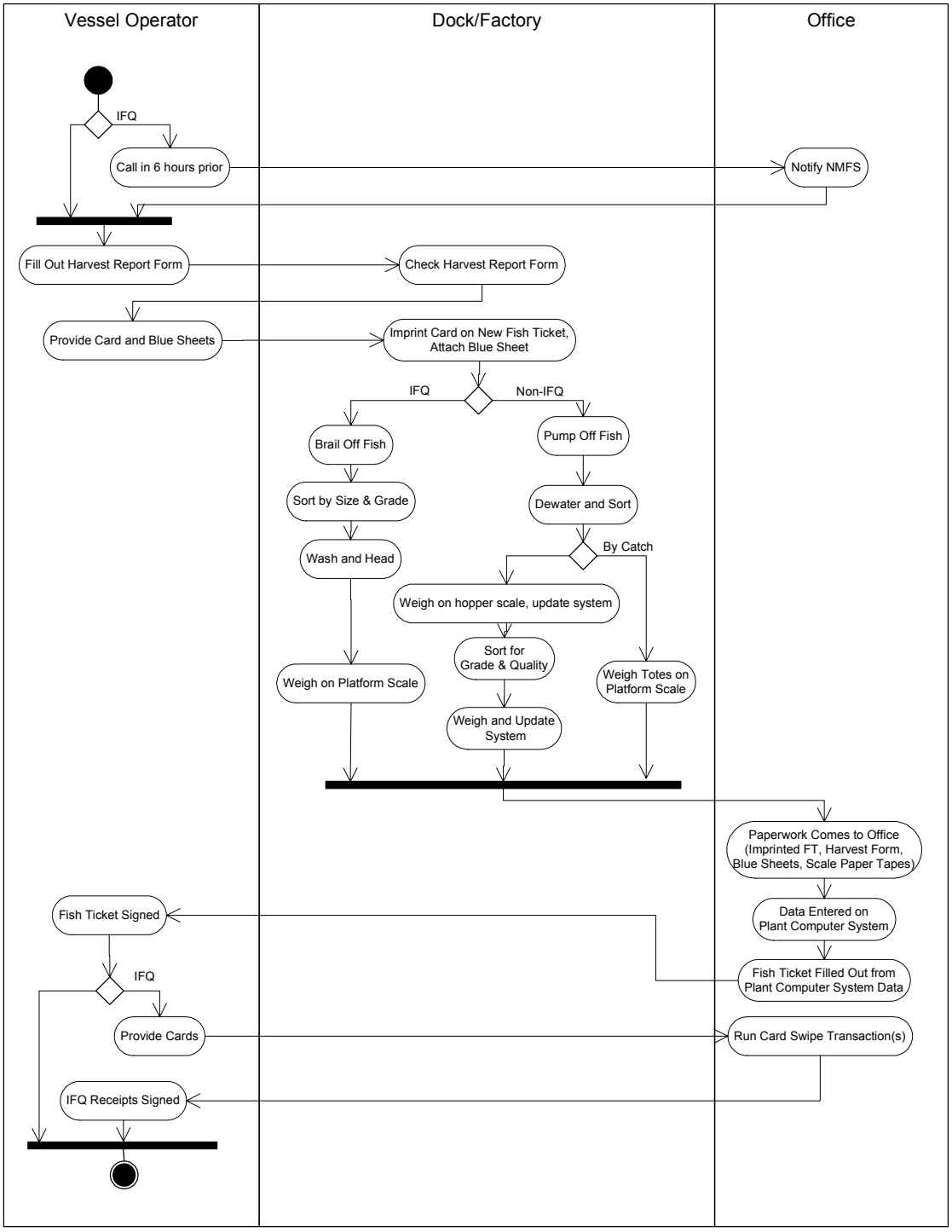


Figure 13

If the catcher vessel is still in port, a representative from the vessel comes to the office and signs the completed fish ticket; otherwise, the fish ticket is held until the vessel returns on its next rotation, and the ticket is signed before the seven-day delivery period to ADF&G. If corrections need to be made to the fish ticket, they use a line out and re-enter procedure on the

hard copy and adjust their electronic file. If the ticket has already been picked up by ADF&G, they fax them a copy of the corrected ticket and place a copy in the fisher's file.

The office staff uses their proprietary computer plant production accounting system to print out the necessary information for the NMFS eLog reporting system at the end of each day. The information is re-entered into the SPELR program and sent to NMFS as a file attached to an email. They use the eLog correction procedure to update every NMFS daily report with the previous days final product production information. They also do the PTRs. The same information is electronically transferred to their Seattle headquarters where the ADF&G COAR report and the Alaska fish tax reports are done annually. Their proprietary system also produces daily AFA coop required reports that are transmitted to Seattle where the records are combined with the other members of the coop and updated reports on quota remaining are transmitted daily back to the plants, who inform the catcher vessels. Although harvest data is shared among the catcher vessels and processing plants, information on plant production is confidential.

Data Quality and Issues

The processor believes the data quality is very good. They believe the use of their proprietary landing reporting form assures accurate estimates of the hail weights on the landing and the locations from where the fish or crab were caught. Recording the proper statistical area of harvest is extremely important under the Steller sea lion protection program.

Occasionally, a plant person will accidentally enter an incorrect vessel identification or species code into the RFID system, but this is always pretty obvious and caught by the offload foreman or the office staff.

In the past, they have had scale problems but this new system has proven very reliable.

Among the AFA vessels and shore plants, very little information on pollock harvest is proprietary. They are harvesting fixed quota and share information on productive fishing grounds, roe yields, sex distribution, and fish size. However, information about the products produced by the plant is completely confidential in terms of sharing with competitors in the co-op.

In the cod, crab, and IFQ species fisheries, the catcher vessels and the processor consider nearly all of the information on the fish tickets confidential.

Problems that occur include the fact that the final plant weights of target species directed into the different product forms are never available until

the day after the eLog report has been filed for the deliveries conducted during the same day. They report their best guess at what weight of the fish are going to be processed into what product form on the day of delivery, and then correct the report the next day when they have the actual final tally on weights of fish processed into different products. Predicting weights of products being produced is particularly a problem in a high-volume plant where processing for one or more product forms may get backed up, and the fish are directed to an alternative product form or if the fish loose some quality and need to be redirected into a lesser value product, i.e., fillet to surimi, or surimi to meal. The result of this problem is that the plant submits an eLog correction report for virtually every day of production.

CPUE is not recorded on the fish ticket for crab fisheries, but is important to them. This information is considered proprietary data.

They would like to be able to print the fish ticket directly from their proprietary system instead of hand recording the information.

They would like to be able to formulate a data file from their proprietary system that could be read directly into the eLog system for reporting instead of having to re-enter it from a print out of their own information.

They would also like to have a delay of about 24 to 36 hours in reporting the eLog information until they have all the final weights from the plant.

They would like to have a method that would allow the catcher vessel representative to swipe his groundfish permit card (similar to the IFQ card) through their on-the-dock RFID system and transmit the information up to the office just as the weights are handled. Perhaps the fishers would have a pin-code number that they would enter to verify their identity.

Additionally, they would like whatever system is developed to be adaptable to their own system with the capability to input and output data.

They would like to get fairly real-time regional plant production reports back from NMFS in a timely manner for their own operation strategy. They would not expect to get a plant-by-plant report. However, if NMFS could report the metric tons of roe, surimi, pollock fillets, meal, cod fillets, cod H&G, salt cod, etc., that is produced by day or week for the whole region (Bering Sea or Gulf of Alaska), it would be very helpful in planning what to produce the next week.

They believe NMFS should be capable of a more timely harvest and by-catch reporting turnaround. Right now the industry volunteers the necessary data and pays for a private individual to analyze patterns in by-

catch, so the fleet can self-direct fishing operations in-season to minimize by-catch and maximize target species season length. If there were daily electronic reporting of harvests from the catcher processor and catcher boat fleets, NMFS could do this automatically and put the information on a web site for review or transmit it back to the plants.

They are exploring "smart card" technology to better follow the flow of fish from the catcher vessel through the plant. This technology should be considered in the future.

They would like an electronic form of the PTR that is produced off their electronic bill of lading information instead of the manual reports.

Finally, while not directly part of this project, they would like some changes in the rules on handling prohibited species at shore plants. They had been providing processed salmon taken as by-catch in the pollock fishery to a food bank program. However, after they head and gut the salmon, they are not allowed by law to process the head and guts into meal since the species is prohibited and no part of it can be used in their commercial "for-profit" process. They also cannot give the head and guts back to the catcher vessel without grinding it into the required small size for at-sea disposal of fish processing waste. Grinding the head and gut would make it almost impossible to handle. So, they stopped the salmon food bank program and deliver the whole, unprocessed salmon back to the catcher vessel for at-sea discard, which is legal under the law.

4.1.13 Very Large Shore side Processor

This processor is a large, shore-based, seafood processor handling mainly pollock, Pacific cod, Pacific halibut and sablefish. They do not do any CDQ fisheries. They typically handle 3 to 5 fish tickets per day, and a maximum of 8 to 10 per day in some seasons. They range between one and two NMFS observers depending upon the volume of fish being handled. Most of their boats are either 100% or 30% NMFS observer covered vessels. They take deliveries from mainly trawl and some longline vessels.

They have a corporate WAN, which connects the PC network in their office to their Seattle headquarters. It provides better Internet service than the local ISP. They have one person in Seattle that offers IT support, but no local support. One problem they have is blowing snow that causes the satellite dish to lose its signal; otherwise, the Internet connect is good.

They have custom software they use to manage their business, written in Lotus Approach. It is being replaced by new custom software written in MS Access, but this system has not been deployed.

Work Flow

If the species being landed is an IFQ species, the vessel calls ahead with enough lead time for the processor to provide the six (6) hour notification to the local NMFS office. Otherwise the vessel comes in when full; however, there is a rotation schedule for the high-volume fisheries like Pollock that is dictated by the plant manager. See Figure 14 for the flowchart. If the vessel arrives when the office is closed, the dock offload foreman gets the permit card from the vessel and imprints a blank ADF&G fish ticket, which the vessel representative signs and fills in the percent of catch by ADF&G and NMFS statistical areas. If the office is open, the skipper goes to the office with their card and the tally sheet from the dock foreman. The office staff imprints the card on the blank fish ticket and fills out the fish ticket from the tally sheet. Then, the skipper signs the fish ticket.

Pollock are pumped from the vessel's refrigerated sea water tanks (RSW) to dewatering tanks on the dock, an initial sort occurs (out-plant sort) particularly if the fishing vessel did not have an observer onboard, and then the fish are weighed with an in-line scale. There may be a second sort of the fish in the plant (in-plant sort). However, this may be the only sort if the observer, if aboard the vessel, did not need the fish sorted during offload. Pollock and cod fishers typically do not monitor the offload weights. IFQ fishers may monitor the offload weights and keep their own tally sheet.

The target species weights are recorded on a paper tape printed out by the in-line scale and summed after the last weight is recorded. By-catch is typically weighed on a platform scale and is usually a very minor part of the catch. The by-catch weights and numbers (salmon and crab) are hand recorded by species on a form in the factory by the plant personnel. The blue sheets from the vessel's Daily Fishing Logbook showing at sea discards are stapled to the fish ticket and the target and by-catch species tally weights, and then hand delivered to the office.

The same process is followed for Pacific cod and IFQ species, except that the fish are brailed off the boat and a total weight of all fish offloaded is recorded. The fish are then sorted by species and size (in-plant sort) and any by-catch is weighed and noted on the plant tally form. For those species were size makes a difference in price, the different size groups are re-weighed (either in-line scale for cod or tote, and platform scales for IFQ species), and their weights are recorded on the plant tally form. If size

categories are not an issue (cod during some seasons for example), then the weights of the sorted by-catch by species are recorded on the plant tally form, and later, in the office they are subtracted from the total offload weight to get the target species offload weight. If the halibut have not been washed, and headed and gutted by the vessel prior to offloading (this is a plant policy that fishers should do this beforehand) then the fish are headed, gutted, and washed in the plant before weighing.

If the landed species is an IFQ species, the fisher then goes to the office. The office staff fills out the fish ticket by hand from the plant tally sheets, calculates the percent catch by area as reported by the fisher, and conducts the card swipe reporting processes. They usually divide the landing between one (1) and four (4) IFQ permit cards, but in some cases, the vessel has as many as twelve (12) cards. The fisher instructs the office staff on how to break out the landing weights among multiple cards. The fisher then signs the IFQ receipts. If the landed species is not an IFQ species, the fisher has usually departed by the time the paper work arrives at the office.

One person takes the paperwork (imprinted and signed fish ticket, plant tally sheets, and vessel's Daily Fishing Logbook blue sheets) and completes the fish ticket entering the offload weights by species, condition factor, and the price and value of the fish. The at-sea discards are added to any plant discards (by-catch sent back out to sea for disposal) and the retained by-catch weights by species are recorded. The office staff checks the fish ticket information for by-catch overages (very rare event), and reports them to NMFS if they occur (nobody could remember having to report a by-catch overage in the past few years).

A copy of the completed fish ticket is then given to the fisher, if the catcher vessel is still at the dock, or placed in their file in the office for later collection. A copy of the fish tickets are picked up once a week by ADF&G, and another copy (processor's copy) is transferred to another office staff person that then waits for the processing plant to provide their daily production records (typically not entered on the fish ticket). This person then compares the reported weights of fish offloaded during the day as reported by each vessel's fish tickets with the daily production of different seafood products to ensure they make sense. Then they fill out the eLog NMFS report on the computer. Once completed, they send the eLog report to NMFS as a file attached to an email.

Some of the fish ticket information (purchased species weights, sizes, prices, and vessel identification information) and daily plant production information is entered into their own company software system that provides an accounting of the settlement sheet for each catcher vessel's

delivery, and keeps track of plant production. The plant fills out PTRs, but their Seattle headquarters does the ADF&G COAR report and the Alaska annual tax reporting using their online accounting information.

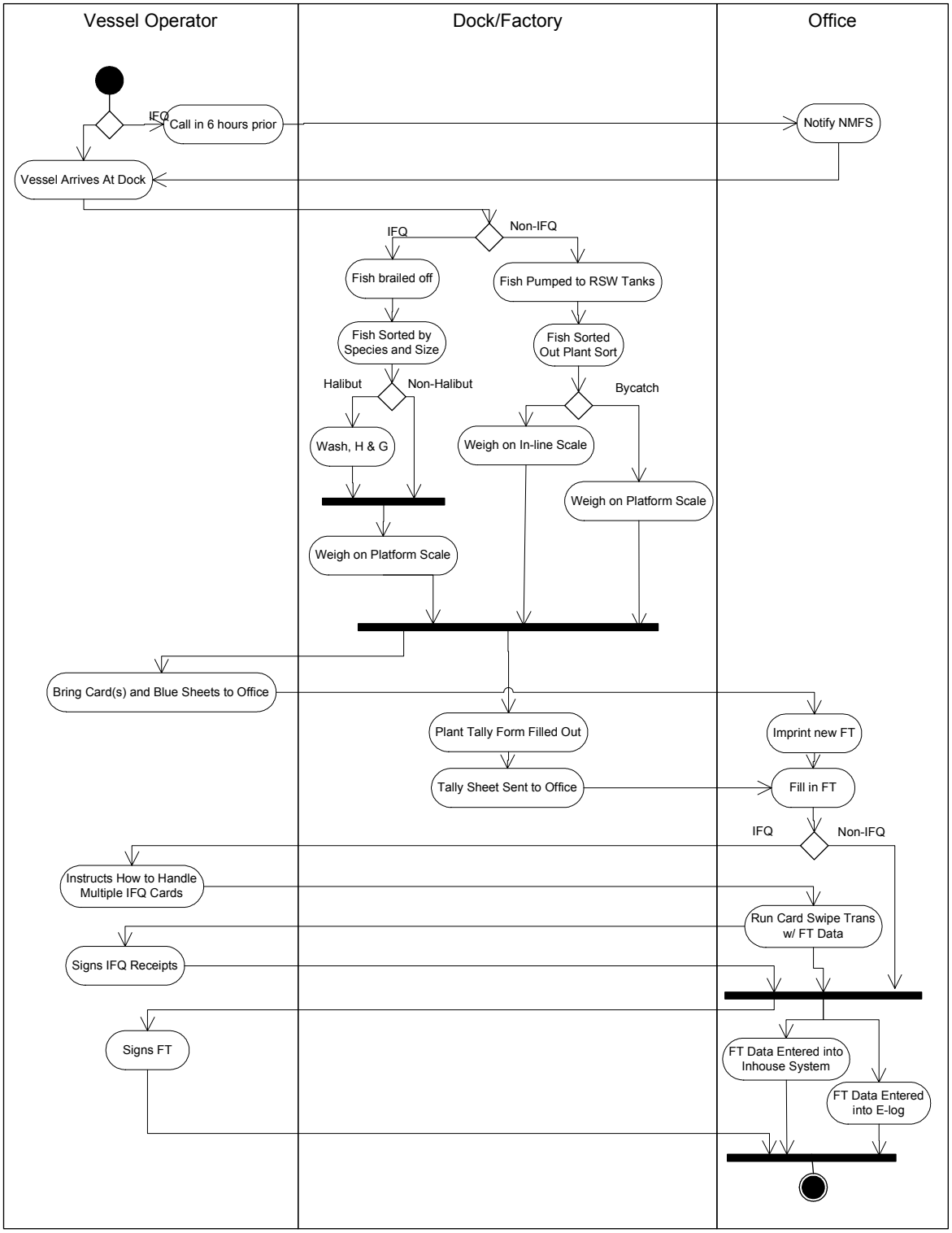


Figure 14

Data Quality and Issues

If any errors are made in the fish tickets, the office staff usually catches them before they have gone to ADF&G and makes a simple lineout correction on the ticket before sending. Otherwise they make the correction on their copy of the ticket, and fax a copy to ADF&G and put a copy in the fisher's file kept in their office.

Typical data problems include the forklift driver entering an incorrect boat identification record on the plant tally sheet for an offload or the salmon numbers in the observer's records not matching the numbers indicated on the plant tally sheet.

Sometimes it is difficult to make out the information on the fisher's logbook sheets (blue sheets), or the fisher enters pounds instead of numbers for crab and salmon.

Confidential information is mainly money earned per delivery and areas fished. They do not discuss fish tickets with other fishers; although, the AFA vessels readily exchange information among themselves on pollock harvest locations.

They do not feel they have good definitions of what is the start date/time of an offload, what is the stop date/time of an offload, and when a delivery is complete.

Some of the vessels use Ocean Logic's trawl log system and it would be nice if that could produce the blue sheet discard information and catch by statistical area information they need for the fish ticket report.

They would like an electronic fish ticket reporting system if it was flexible in what could be entered on the ticket for their needs, such as fish size and grade categories. They would also like it to be able to output data in a format that their internal accounting and production software could use.

4.2 Tenders and Floating Processors

4.2.1 Salmon Buying Tender Operation

This operator processes Bristol Bay salmon on processing vessels located in Bristol Bay. The company employs from approximately six to 12 tenders each year depending on numbers of sockeye salmon harvested. Tender vessels are located on the fishing grounds, typically associated with one or more of the Bristol Bay fishing districts (Nushagak, Naknek/Kvichak, Egegik, and Ugashik). Tenders are used to weigh and transfer salmon from the

fishing vessels to the processor. They process approximately 3,000 to 5,500 ADF&G Fish Tickets per year in their Bristol Bay salmon operations. They maintain shore-based offices in Naknek and Dillingham, but their headquarters is located in Seattle.

Overall there are approximately 1,900 drift gill-net permits and 1,040 set gill net permits in Bristol Bay. Salmon fishing in Alaska in regulated, in part, by limited entry of permits to each management area.

Processing vessels can communicate via cell or satellite phone. However, communications can fail. Modem connections are slow: 2400 baud, therefore expensive to send data at $1 to $3 per minute. Most electronic communication is email rather than sending data files

Most tenders do not have means to communicate electronically, although some do have email connections.

Electronic data entry on the tenders and the generation of electronic fish tickets (either on the tenders or on the processors) would be useful to them if this approach could eliminate or reduce the expense of using a helicopter to transport fish tickets from the processor to the Naknek shore office. However, they were concerned that some or most of the tenders would not be able to enter data electronically or that this process would require an additional person on the tender. They noted that such a system would have to be very simple, similar to the electronic cash register system used by fast food restaurants, with icons and simple procedures.

It appears possible that they could transmit electronic data from the fish tickets to ADF&G directly once the data are entered into the computer in Naknek. Fish ticket data are routinely entered by the processor for their own use. These data could be transmitted (or delivered via disk) to ADF&G (King Salmon), along with the hardcopy original fish tickets with signatures. This process would not be beneficial to the processor but it could reduce data entry time by ADF&G personnel in Anchorage.

They noted that all major salmon processors maintain computer databases similar to theirs, as do many smaller processors. Electronic data transfer during the fishing season may be a problem in some areas due to cost or lack of connections.

Work Flow

Salmon fisheries are solely managed by ADF&G, no reports are made to NMFS. An ADF&G fish ticket must be completed for each delivery to a salmon purchaser. The ADF&G fish ticket in Bristol Bay is different from the general salmon fish ticket or the salmon troll fish ticket used elsewhere in the state. See Figure 15 for the flowchart.

Salmon fishers catch their fish within one of five fishing districts (including special harvest areas) and deliver their catch to a tender approximately once per day. A brail is used to transfer fish between the vessels. Each brailer load of fish is weighed onboard the tender and this weight is recorded on the fish ticket by the tender. Multiple brailer weights are typically recorded and the sum of these represent the landed catch weight for that vessel's delivery. During the primary fishing period, when both sockeye and chum salmon are harvested, the tender does not record species composition at the time of offloading from the catcher vessel. Sometimes the number and weight of Chinook salmon is identified on the fish ticket. Fish are not counted on the tender, but the average weight of 10 fish is typically recorded by the tender each day or for each tender load of fish.

Both the tender and the permit holder are required to sign the fish ticket, which indicates the permit holder is in agreement with the total weight offloaded and any species sorting that might have been done at the time of the offload. However, sometimes the permit holder is not present for the entire offloading period and may not notice that the tender forgot one brail of fish. The permit holder may contact the office to make the correction before the fish ticket is sent to ADF&G.

The tender delivers the salmon to a barge where the fish are processed. Here the fish are weighed and counted by species and the percentage and weight of chum salmon is determined (typically a low percentage, e.g. <5%). Values are kept separate for each tender load so that species composition can be recorded later on the fish tickets attributed to that specific tender load. Total weight of product is also recorded. This information is recorded on a paper form developed by the company. This information (chum percentage, average weight by species) along with the ADF&G fish tickets are picked up by helicopter approximately once per day from the processing barge and delivered to the office in Naknek.

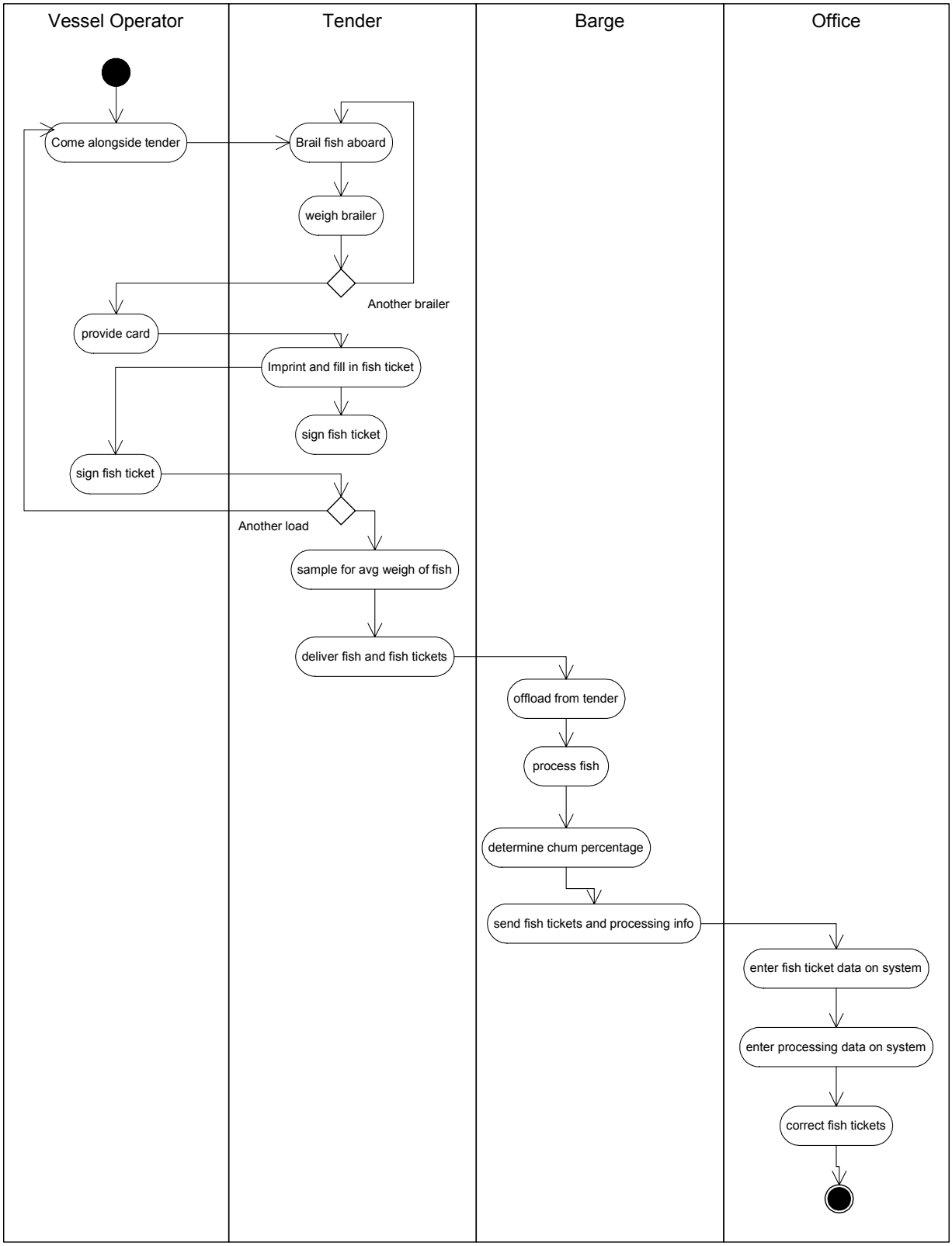

Vessel Operator
Tender
Barge
Office
Come alongside tender
Brail fish aboard
weigh brailer
Another brailer
provide card
Imprint and fill in fish ticket
sign fish ticket
sign fish ticket
Another load
sample for avg weigh of fish
deliver fish and fish tickets
offload from tender
process fish
determine chum percentage
send fish tickets and processing info
enter fish ticket data on system
enter processing data on system
correct fish tickets

Figure 15

At the office, the fish tickets are checked for errors, such as incorrect sums of brailer weights or recording the wrong fishing district or date. Office staff enters the information from each fish ticket into a company developed computer program. They also enter the processing vessel's estimate of chum percentage by tender delivery into the computer program in order to calculate species composition. They then write the final total weight and number of each species on the original fish tickets. Price is not shown on the fish ticket. Once per week the fish tickets are hand delivered to the ADF&G Office in King Salmon. ADF&G may conduct some initial spot checking of fish tickets in King Salmon. Tickets are flown to another ADF&G office where they are keypunched, primarily after the completion of the 5 to 6 week Bristol Bay salmon season.

Essentially all fish ticket data, along with product information, are entered into an electronic database program developed by the processor. This requires approximately three individuals. These data facilitate production of a report that is sent to ADF&G (daily reporting by species numbers and weight harvested by river area or special harvest area and gear type). They also uses the information entered into their computer system from the fish tickets and the species composition information entered from the paper copy of the report from the processing barge to calculate payments due to fishers and tenders.

Data Quality and Issues

Reported harvest areas are accurate unless a careless typographic error is made when completing the fish ticket on the tender. This is easily caught and corrected during error checking by the processor. Vessels must deliver fish before switching to a new statistical area and they must wait 48 hours before resuming fishing after switching statistical areas, so there is no problem associated with allocation of deliveries to multiple areas.

Weights are accurate. There is a strong incentive for fishers and processors to maintain accurate weights. However, sometimes a tender may not add individual brailer loads accurately. This is caught by the processor's office. Tenders may calculate average weight from 10 salmon, but final average weight provided to ADF&G is based on weight and fish counts for the entire tender load determined at the processor.

Chum percentage (the percent of total delivered catch weight that is chum salmon) is estimated at the processor and is fairly accurate, but it is a very small component of the total catch. Some smaller processors may not use methods that are as accurate as this processor's approach. However, there is a strong incentive for fishers and processors to maintain accurate species composition, since chum are worth much less than sockeye

salmon. Chum percentage is calculated for each tender load and not by each individual catcher vessel offload. All the fish tickets for the different catcher vessel offloads making up each tender load are later corrected for the percent of chums by the office staff. For example, if the chum percentage for a particular tender load of salmon is calculated as 1.5% onboard the processor, then the office staff go back through all the fish tickets associated with that specific tender load and change the species composition by weight to 98.5% sockeye salmon and 1.5% chum salmon. They then take the average weight calculated of sockeye and chum salmon determined from the processor and divide this into the weight of sockeye and weight of chum salmon onboard the vessel to derive the number of salmon of each species caught and represented by that fish ticket. The catcher vessel captains do not again sign the fish ticket verifying the species composition of their offload. ADF&G has a rule imposed on the processors that they don't want chum salmon listed on a fish ticket if the weight is less than 4 lbs (the smallest possible average size of an individual chum salmon). In cases were the chum salmon percentage in the tender load is very low and/or the total landed weight recorded on a fish ticket is low, the back calculation of the weight and number of chum salmon on a fish ticket could be less than one fish weighing less than 4 lbs. In those cases, the office staff enters no chum weight or number of fish on the fish ticket. Although a relatively rare occurrence, this can result in a minor underestimation of chum salmon harvested for that tender load.

They have no problems with data forms. They simply noted that they must process many salmon fish tickets—many more than they process in groundfish fisheries. They handle 3,000 to 5,500 fish tickets in a season in their Bristol Bay salmon operations.

Relatively few errors are identified. The Naknek office checks the fish tickets for statistical area, summing of individual brailer weights, and date

Confidentiality is not an issue for this operation. Fishers generally know who is catching what and where. These are relatively small fishing districts (compared to high seas fisheries) where fishers can observe hauls by other vessels.

4.2.2 Floating Processor

This is a high volume floating processor operation processing mainly AFA coop pollock. They handle about 20 fish tickets per week during the pollock season. The vessel has been used in the past to process Togiak herring and salmon and it has a crab processing line onboard but at the

present time it is only processing pollock. They process pollock from the Bering Sea but also do some non-coop pollock from the Gulf of Alaska. They do not do CDQ or any IFQ species. They have one or two NMFS observers onboard depending upon the season and all of their trawl delivery vessels have either 100% or 30% observer coverage.

They have one person on the vessel that handles electronics including computers. They have access to IT help by phone from their Seattle office. They have their own phone system attached to a shore facility that uses satellite communications via the Internet and direct phone link to their Seattle office. They report good reception but somewhat slow on the Internet connection.

Work Flow

The catcher trawler comes alongside and the captain boards the processor, providing the permit card and Daily Fishing Logbook at-sea discard blue sheets to the office staff. They imprint the card on a fish ticket and the captain reports the percent of catch by ADF&G and NMFS area that is entered on the fish ticket. The pollock are pumped out of the RSW hold on the catcher vessel, the catch is placed into dewatering tanks, then onto a conveyor sorting system where by-catch is sorted and the pollock are weighed on in-line scales. All of the by-catch except prohibited species is weighed and then sent directly to the onboard meal plant. Once the catch has been sorted and weighed, the paper tape print tally of the weights is brought up to the office on the processor and the pollock and by-catch weights, price and value are entered on the fish ticket. Boat identification, target catch weight and date of delivery are entered into their own onboard computer system. The fish ticket is then signed by the captain who retains a copy and the catcher vessel departs. The catcher vessel does not monitor the offload weights. There are virtually never any by-catch overage problems, but if there were, the processor would report it to the local NMFS enforcement office and fax them a copy of the fish ticket. There are virtually no mistakes on the fish tickets made before they leave the processing vessel, but if there were, they would use a simple lineout procedure, write in the corrected value and fax a copy of the corrected fish ticket to the local ADF&G office.

Once a week, copies of the fish tickets are delivered to the local ADF&G office by boat. Copies of the fish tickets are faxed to the processor's Seattle headquarters where the catcher vessel settlement sheets are completed and the AFA coop reporting is conducted. Daily, the onboard office enters the previous 24 hr production information into the NMFS eLog reporting system and sends the information as an attached file to an email. The NMFS data reported is completely self generated, they do not

rely on any NMFS observer data. Any errors on the eLog reports (rare) are handled with the eLog correction procedures.

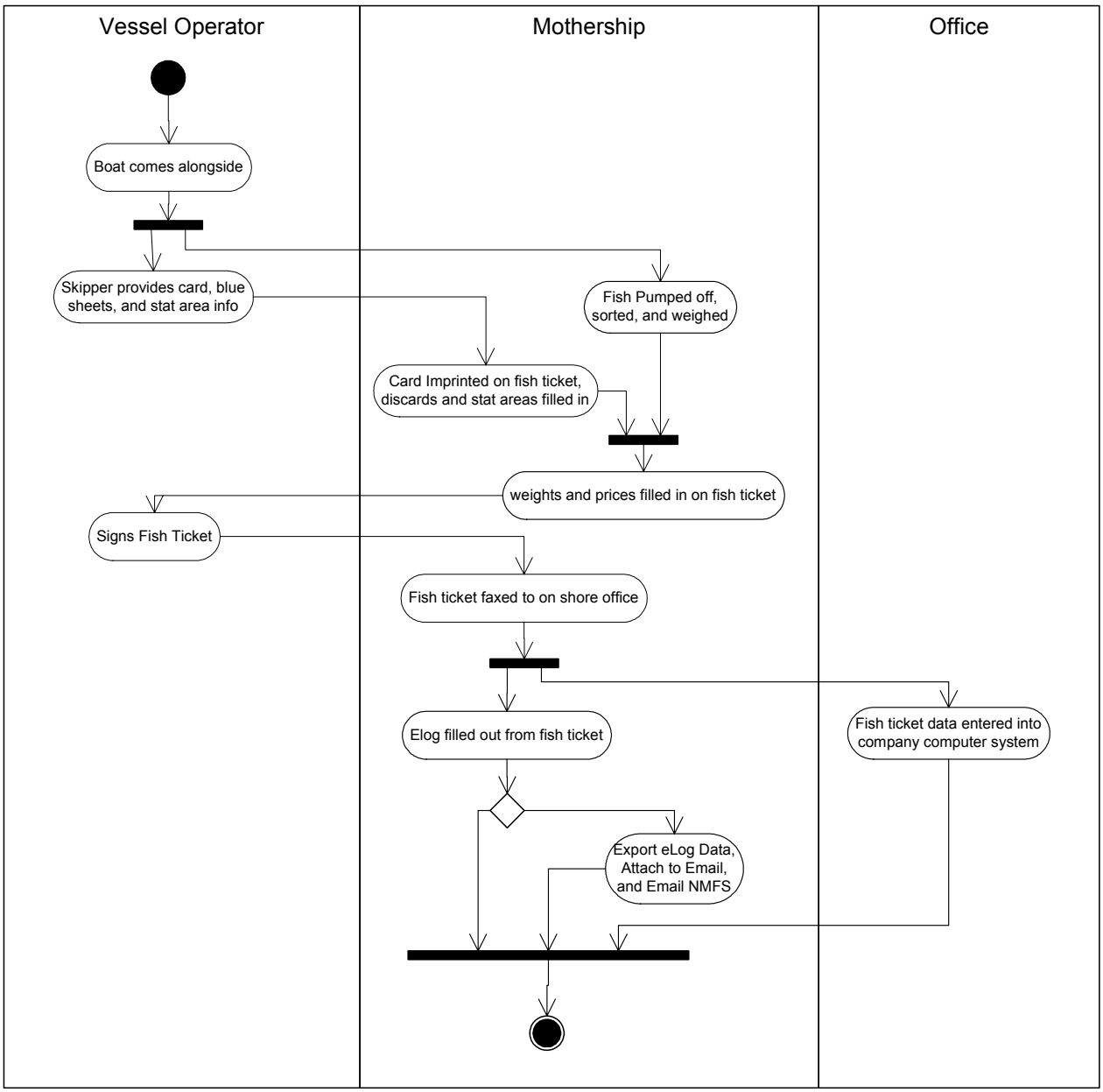


Figure 16

The onboard landing and production information is emailed to the Seattle office periodically. The Seattle office handles the annual ADF&G COAR, Alaska fish tax and AFA coop reporting.

The catcher vessels often deliver the NMFS reporting pages of their trawl Daily Fishing Logbooks to the processor, which mails them to NMFS enforcement once each quarter.

The processing vessel fills out PTRs as containers are loaded and shipped.

Data Quality and Issues

There are virtually no confidentiality issues since the catcher vessels and processor are operating in an AFA coop where all the harvest and value information is shared among vessels.

Problems encountered are mainly poor weather that can delay the delivery of the fish tickets on a weekly basis.

They would like an electronic fish ticket data entry and reporting system with signed hardcopies as a backup. This would allow them to transmit the fish ticket information daily to ADF&G via the Internet similar to the NMFS data and follow weekly, or as weather and boat schedules permit, with the hardcopy backups.

4.3 At Sea Processors

4.3.1 Small Catcher Processor

This is an at-sea harvesting and processing operation operating two freezer/longliners and a freezer/trawler. In addition to participating in open access groundfish fisheries (cod, rockfish, flounders and Atka mackerel), they harvest and process IFQ sablefish and halibut. They previously participated in CDQ fisheries but do not do CDQ at this time. The vessels are required to have 30% NMFS observer coverage. They do a fish ticket for each delivery for each vessel. The processor has up to 7 PC computers on each vessel, primarily to run various electronics. They also have printers. They do not have email or Internet access onboard, but it is technically possible. They noted that some electronic communication methods are quite slow (e.g., mini-M: 4,800 baud rate). Other data communication methods are available, such as Seven Seas, and Standard-B. However, they believe these Internet connections can be very expensive.

Work Flow

The process is quite similar for both the longliners and trawler. The captain or mate fills in the NMFS trawl or longline Daily Cumulative Production Logbook or the IFQ logbook at the start of each longline set or trawl tow. The necessary information on start location and time is hand entered on the reporting form. When the longline or trawl net is brought onboard the vessel the round weight of the catch is estimated by the captain or mate. The fish are transferred to the onboard processing deck where the catch is

sorted and processed. The number or weight of discard is estimated in the factory. The factory maintains a logbook with two forms designed by the company: a Production Form and a Species Composition Form. The larger vessels may rely solely on observer data for species composition for filling out the DCPL when observers are onboard. Daily production and species composition data (hard copy) are transferred from the processing deck to the captain at end of each day or early next morning. Most hauls are not reported discretely; rather the data represent a blend of multiple hauls that occurred during the day. The round weight catch is then back-calculated from production weights using product recovery values of the target species and retained by-catch and discards weights or numbers estimated from either observer data or reported from the processing deck.

The captain or mate enters production and species composition data into a company developed Microsoft Access database. The database facilitates completion of NMFS Daily Cumulative Production Logbook (DCPL) and Weekly Production Report. Thus, electronic data are used to generate hardcopy data forms.

The NMFS Weekly Production Report is faxed (or telex if fax is down) to the company's Seattle office. The Seattle office transfers the Weekly Production Report by hand to a new Weekly Production Report form and this is mailed to NMFS after the data are checked for errors. Discrepancies are discussed with vessel, so errors in the vessel's copy of the logbooks can be corrected if needed (not a common occurrence).

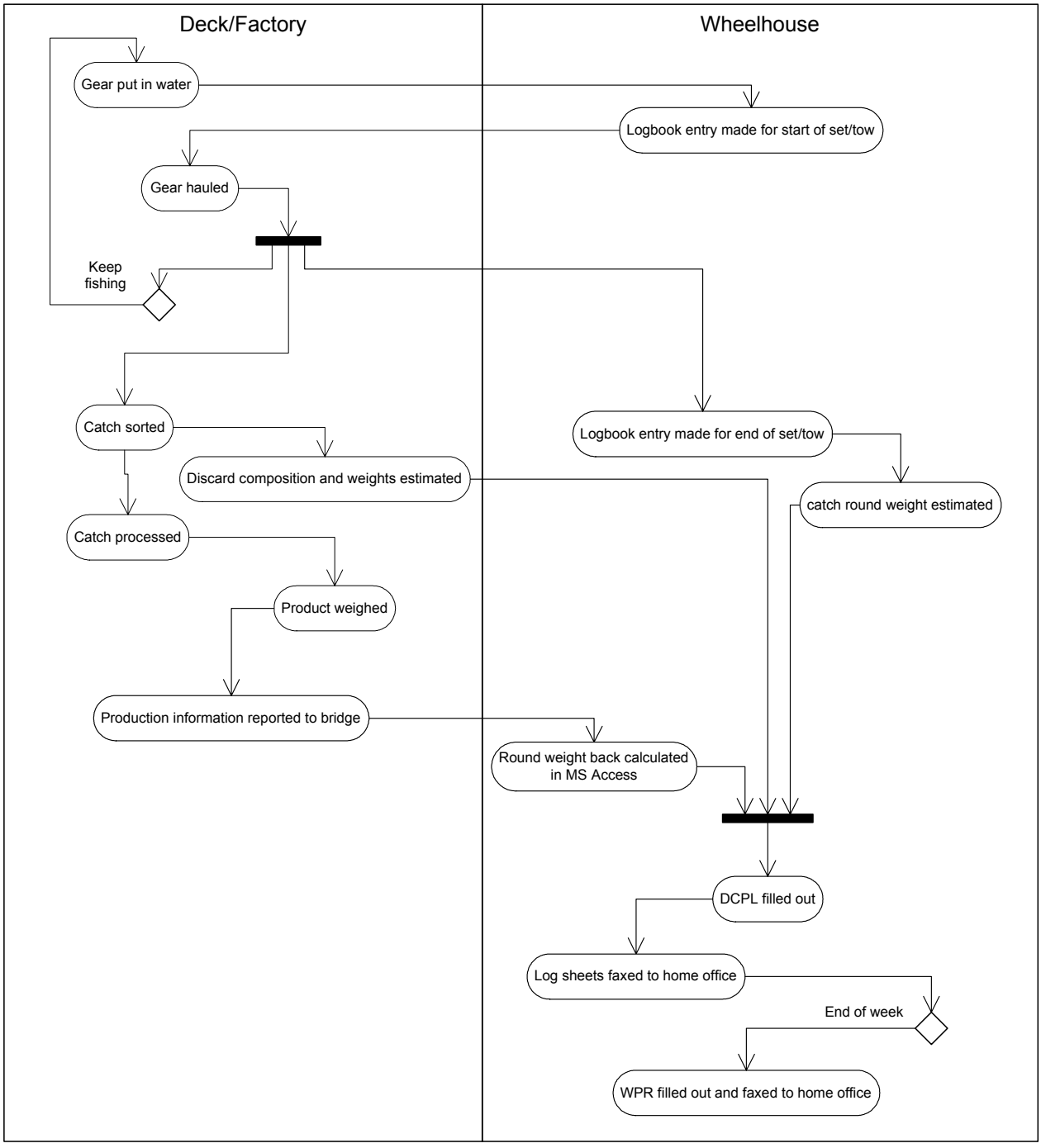


Figure 17

The processor's Seattle office completes ADF&G fish tickets for each landing, based largely on the NMFS Weekly Production Reports, which are then mailed to ADF&G within 7 days of the landing. A unique fish ticket is completed for each species group (e.g., groundfish, IFQ sablefish and halibut) and for each offload to a distinct buyer (e.g., shoreside plant, Western Pioneer or Sea-Land vessel, etc.). The Seattle office estimates the

weight of catch taken from ADF&G statistical areas based on the general NMFS reporting areas in which the vessel operated during the week. However, generally the weekly catch is evenly divided among the ADF&G areas in which the vessel operated and there is no information available to the Seattle office on the exact quantities of fish taken in a particular ADF&G statistical area or information that a particular area was actually fished.

IFQ logbooks are maintained on board the vessels for IFQ harvests (e.g., sablefish and halibut). The vessels harvest primarily sablefish but also land some halibut. Detailed data are collected for IFQ fisheries, including latitude, longitude and production for each set. Since only two species are involved recording such detail is possible.

At the end of a fishing trip, the captain must give prior notice of landing, including an estimate of product to be offloaded via radio. If product is transferred to a vessel the notice of landing must be 24 hrs prior to offload, whereas only 6 hrs advance notice is needed if offloading at a dock. No offloading is done between 6 PM and 6 AM in order to allow fishery officers to be present, if they choose.

When offloading product, the IFQ data are key punched into the ATM card swipe system by the captain. If the ATM is broken or not available, then IFQ data forms are completed manually and delivered by hand to the NMFS RAM agent. IFQ data entry may take considerable time, typically 3 to 4 hrs for the processor's vessels because they have relatively large harvests compared to other IFQ vessels. It once it took 6 hrs for IFQ data entry of a particularly complicated trip. The captain receives a signed copy (by NMFS agent) of the delivery report before being allowed to leave port. If the ATM is used, then the balance left on the permit holder's IFQ is immediately provided to the captain. An IFQ permit holder must be onboard the vessel whenever IFQ species are harvested and landed.

A copy of the IFQ logbook is faxed to the processor's Seattle office and they fill out an ADF&G fish ticket for each delivery by hand. The fish ticket contains the same data as IFQ landing report, except the fish ticket may include ancillary groundfish species, as well. Since the captain is required to indicate the latitude and longitude of each haul or set in the IFQ logbook, the IFQ landings by ADF&G statistical area are more accurate.

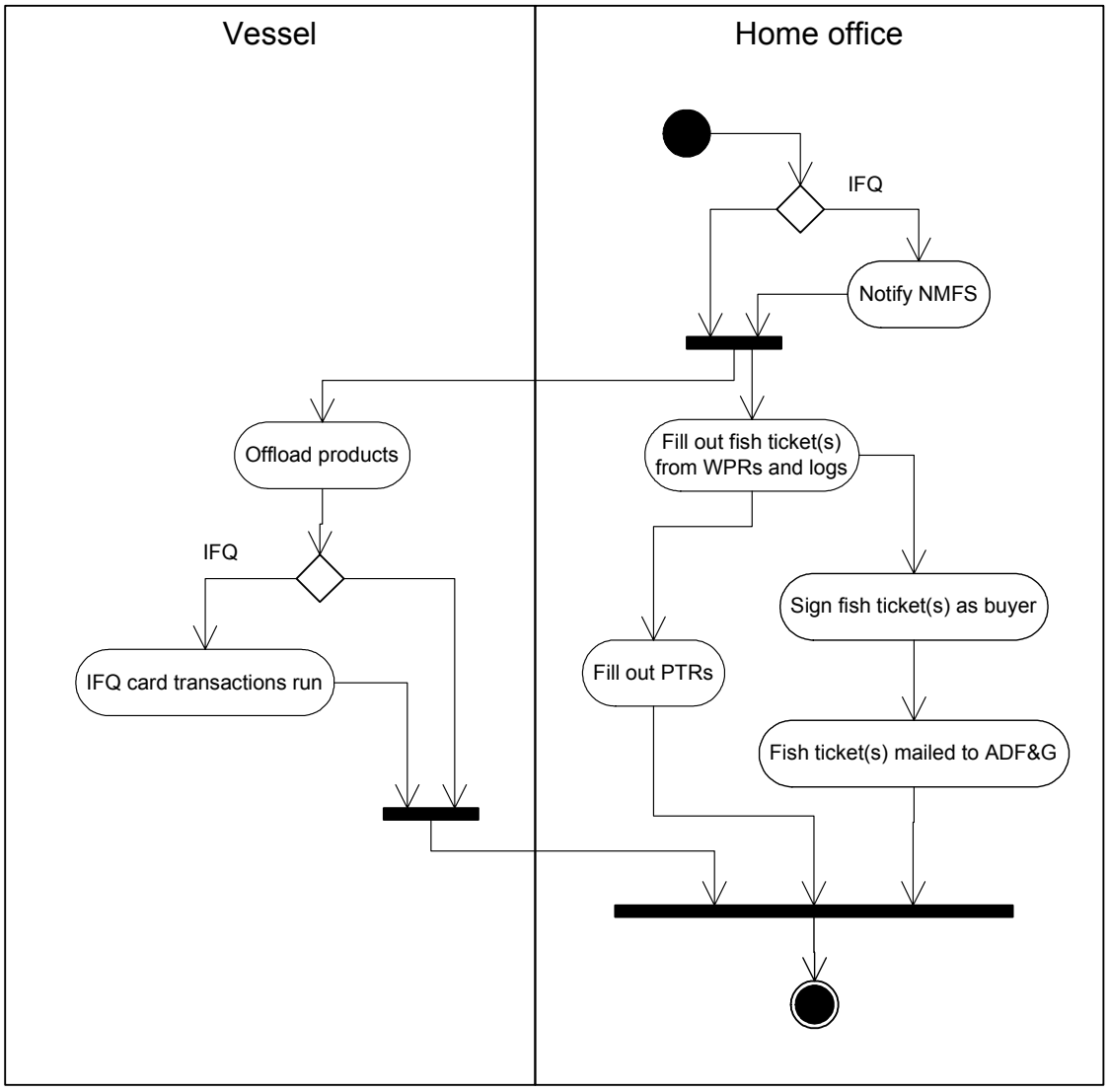


Figure 18

The processor operates two vessels that harvest sablefish under one IFQ permit. Thus, the two vessels must maintain good communication to insure the IFQ is not exceeded for a specific statistical area. Generally this is not a problem.

The processor sometimes delivers fish to Bellingham, WA. Upon leaving Alaska, they must file a Vessel Clearance Report (via phone or radio), including an estimate of product onboard. They also complete a Vessel Activity Report, which they believe is redundant with the Daily and Weekly Production Reports.

An ADF&G fish ticket is completed by the Seattle office for deliveries outside of Alaska and mailed to ADF&G. They note that some vessels might complete a Washington State fish ticket instead. Sometimes vessels might

complete both Washington and Alaska fish tickets, which could lead to overestimation of harvest.

The Seattle office completes annual ADF&G COAR and Alaska fish tax reports using their own in-house production accounting information, fish tickets and WPRs.

Data Quality and Issues

Harvests by NMFS statistical areas are highly accurate because the areas are large and the NMFS requires the vessel to check-in and check-out as the vessel moves among NMFS reporting areas. Harvests by ADF&G statistical areas are much less accurate because ADF&G areas are small and a fishing trip may span many ADF&G statistical areas. Data are generally not recorded in sufficient detail to allow accurate estimation of harvest by ADF&G statistical areas, with the exception of the IFQ species.

Round weight harvests are estimated either visually by the captain, mate or observer or by back calculating from the weight of the finished product using the product conversion factors. Overall the processor is encouraged that various production and harvest data estimates match as well as they do given the complexity of data reporting requirements.

One problem identified is species composition data based on observer versus their own estimates. They noted that the NMFS observer might not sample species composition in every haul even though species composition may vary significantly from one haul to the next. Thus, when the observer data is compared with production data, there can be discrepancies. For example, a fishery may require 100% retention of cod. The observer estimates 20 metric tons of cod, but the back-calculated round weight of cod from cases actually produced is only 17 metric tons. Comparison of numbers suggests 3 tons were discarded, when they were not.

They believe species identifications for targeted species are excellent, even for rockfish, because each species may have a different value. Non-target species such as skates and sculpins are generally lumped into specified categories, although the NMFS observer identifies these species.

Relatively few large errors are identified. The current system allows the Seattle office to compare various estimates of harvest and production versus the actual product sold, which serves as a check on accuracy. If a discrepancy is found, the Seattle office contacts the vessel. Maybe twice per year, ADF&G will call regarding data entry on a fish ticket. For example, the fish ticket may specify species 120, i.e., flatfish, as required by NMFS, however, ADF&G wants flatfish to be identified to an individual

species level. ADF&G has never questioned them about the fairly equal distribution of harvest among ADF&G statistical areas on the groundfish fish tickets.

There is significant redundancy between ADF&G Fish Tickets and NMFS DCPL, and IFQ reporting system, and Vessel Activity Report. The processor records the same data multiple times by hand, e.g. factory foreman completes factory log, captain enters these data into ACCESS database, then hand copies values to NMFS DCPL and Weekly Production Report. The Weekly Production Report is faxed to Seattle Office, who copies data to a clean Weekly Production Report, generates an ADF&G Fish Ticket primarily from data on the NMFS Weekly Production Report. For the IFQ fishery, the vessel records data in IFQ logbook, then types data into ATM (or manual Form), and then transfers much of the same information to the Seattle Office who completes an ADF&G Fish Ticket.

Since the information on harvest weight by ADF&G statistical area is not accurately reported in the open access groundfish fishery (both trawl and longline), they believe that essentially all the information necessary for the ADF&G fish ticket could be derived from the weekly production reports sent to NMFS. Since they are catcher/processors, there is no issue about needing the ADF&G fish ticket to verify the weight and species transfer between the catcher and processor. They believe the main purpose of the ADF&G fish ticket data is to assess the State of Alaska landing tax on the vessel and this information could be derived from the NMFS weekly production reports.

Generally, confidentiality is not an issue for this operator, although they would not want their records to be made available to the public, who might try to use data against them somehow. Fishers often know where each other are fishing and they often share information.

However, longliners tend to be more "paranoid" compared with other fishermen about their activities because typically only one longliner can work in a given area. Catcher boats can be furious when a processor tells other fishers where his catch occurred.

They stated that electronic data collection would not work well in the factory due to the abilities of the personnel and the general work environment. Most factory foremen are not well suited to data entry, especially correcting data after entry into a database. The factory is described as "organized chaos." Also, most captains are not well suited for electronic data entry. Captains are hired for their ability to catch fish, not for data collection and data entry. Thus, any electronic system must be fairly simple to use.

They expressed other concerns with electronic reporting:

- Would electronic data reporting cause fishing to stop if the system failed,
- Electronic reporting needs a paper log in case of electronic failure,
- Data entry may become cumbersome and lead to greater effort, especially for captains and crew that are not familiar with data entry,
- Data corrections may take a long time to fix, whereas it takes seconds to make a correction on hard-copy,
- They felt that they should be able to make edits to electronic data at anytime prior to shipment to NMFS without some data entry time-stamp or recording of data changes. Only after data sent to NMFS should data corrections be recorded. Otherwise, the government may look at data corrections and use information against fishers somehow.

Electronic data entry has some possibilities, but seeing is believing. Fishers would need to be shown that it works for them and that it would not hinder fishing. Linkage of an electronic database that would allow the captain to calculate harvest value would be an asset, since they carefully follow the species composition and overall value of the harvest using Access database program in order to meet market demands and optimize their fishing strategy.

4.3.2 Midsized Catcher Processor

This operation has two freezer/longliners that targets many species and two freezer/trawlers that target mostly cod. They participate in open access groundfish fisheries, and in CDQ fisheries. On occasion, they will act as a mothership, receiving cod-end transfers from a catcher boat, but this is somewhat rare. They do not participate in IFQ fisheries. They fish the Bering Sea, Gulf of Alaska and Aleutian Islands, but the longliners fish primarily in the Bering Sea. Much of their product is offloaded in Dutch Harbor where it is sold and transported to many areas of the world. The vessels are large (~160 ft), therefore, they are required to have 100% NMFS Observer coverage.

Typically, only 2 or 3 people onboard may be capable of using computers (mate, captain, engineer). Trawlers are generally better with computers than longliners.

INMAR-SAT-A is used to communicate electronically, but this system is outdated. INMAR-SAT-A breaks down once per year and all data

communications including email and fax are down until the system is fixed (typically an onboard the boat problem). INMAR SAT-A problems are on a system that is no longer manufactured and difficult to fix. Eventually they will upgrade to INMAR SAT-C, but it is expensive to upgrade and airtime is still expensive. They expressed concern that failure of electronics can inhibit the NMFS observer from sending his data, and that this failure can stop fishing. Electronic data reporting will not work in the factory because the foreman is generally not capable of entering data.

They do not have Internet access on the boat. Their current INMAR SAT-A system transmits an email and any attachment as a data package to a commercial marine network company that then converts it into a regular email and attachment and puts it on the Internet sending it to the Seattle Office. Faxes are sent directly to the Seattle Office fax machine from the vessel. They noted that the Vessel Monitor System (VMS), another electronic reporting system in use during some seasons, is expensive to use ($5/day). Thus, they would not be willing to pay for electronic reporting unless it could be shown that it is cost effective for the vessel.

Work Flow

Vessel completes a Vessel Activity Report when it travels north to the Alaska fishing grounds simply reporting its destination. The same report is completed when it travels south at the end of season; however, then the product type, species, and volume and destination are noted on the form. These forms must be submitted whenever the vessel crosses out of or back into the U.S. Exclusive Economic Zone (EEZ) 200 nm off U.S. shores. Typically, the vessels travel north and south once each year.

The vessels complete a US Coast Guard Notice of Arrival form when they get to Alaska. Before setting the gear, the vessel faxes the Check In form directly to NMFS, at the end of a fishing trip they then fax a Check –Out form to NMFS listing the time and position at completion of fishing. This form must be submitted within 24 hrs of the end of the fishing trip and can result in a fine if not received by NMFS within the 24 hrs. If the NMFS fax is broken, then the Check In/Check Out form is faxed to the company's Seattle Office, who then faxes the form to NMFS and follows up with phone calls to provide a reason if the Check Out form was not sent within the 24 hr period. Problems arise with a vessel ends a trip on a weekend (Friday night for example) and the NMFS fax is down. By the time they fax the Check-Out form to their Seattle office and the Seattle office contacts NMFS it is Monday and they are over their 24 hr limit. Another problem is that the vessel has no way of knowing whether NMFS has successfully received their fax from sea. They suggest that a return receipt fax from NMFS would be

helpful to show NMFS enforcement that NMFS actually received the Check Out form.

During fishing, within an hour of so of bringing the catch onboard, the captain estimates total round weight of fish, as well as estimated weight of pollock and cod, as required. In H& G (head and gut) fisheries, pollock and cod weights can be difficult to estimate especially when targeting flatfish. Observer data to estimate total weight can be used (not mandatory), but observer data may not accurately reflect actual species composition because they sample only a portion of catch. The operator recommends the captain record his own total weight data on NMFS Daily Cumulative Production Logbook (DCPL) when possible rather than relying on the Observer data. They note that columns for rock sole and yellowfin sole IR/IU (Improved Recovery/Improved Utilization) will be added to DCPL next year (January 2003).

As the fish are processed in the factory, the foreman keeps track of what goes into each plate freezer. This is accomplished with a simple data form (hand-written) that includes the plate freezer number, species, product code, product size, and tally of boxes of product frozen. Trawlers have in-line scales, but these scales are only used for CDQ fisheries because they are too fragile and expensive to operate. However, both the longliners and trawlers have product scales that assure the weight of product in the freezer boxes is fairly constant, thus the number of boxes processed is directly related to product weight produced and round weight can be back calculated using product recovery codes. However, NMFS believes there is enough difference in the back calculation of round weight from product weight when the range of size of individual fish is great that it is difficult to back calculate an accurate round weight equivalent. They mentioned that some Catcher/Processors don't have constant weights per freezer box and weigh and stamp each box with the different weights, which complicates back calculation of round weight even further.

At the end of the day (usually midnight), the production information from the factory is carried to the wheelhouse. The Mate typically completes the DCPL shortly thereafter. Discard information may come from NMFS observer or the captain may make visual estimate based on species composition of catch. The captain's estimate of prohibited species discard is believed to be reasonably accurate. If fishing stops for a day or more, then this is recorded on the DCPL. The DCPLs are mailed to the Seattle Office once per quarter, and the Seattle Office checks the forms briefly for completeness and mails them to NMFS enforcement.

The NMFS Weekly Production Report (WPR) is completed onboard at the end of each week. The captain relies on the DCPL to complete this form.

Some vessels use computer spreadsheets to help them produce weekly data from the DCPL. Typically, trawlers use computers, whereas the longliners do not. They noted that WPRs do not have to separate harvests within and outside Sea Lion conservation areas, but DCPL forms must keep such harvests separate. The vessel may fax the WPR to the company's Seattle Office or send an electronic copy (attached email) via INMAR SAT-A. This electronic copy looks identical to the NMFS Weekly Production Report.

Upon the Seattle Office receiving the WPR, they review it for errors or omissions (visually only, since no error checking is built into the spreadsheet). If a minor mistake is found that does not affect production or discard values, the office makes the correction, e.g., herring recoded as number rather than pounds. If a mistake is found that alters the production or discard values, then the office contacts the vessel and asks them to correct the problem. This occurs infrequently. After review, the Seattle Office prints out their electronic form or copies the faxed copy of the WPR from the vessel to NMFS (on Wednesdays). The electronic copy of the WPR is not emailed to NMFS but could be. They prefer to use the fax when sending documents to NMFS because the fax machine maintains a record of when reports were faxed to NMFS and electronic transmission of the WPR via email does not provide a receipt of delivery at this time like the shore-plant reporting software does.

This processor rarely needs to complete an ADF&G fish ticket because they typically operate outside state waters while fishing for species that do not require a fish ticket. ADF&G fish tickets are completed whenever the vessels participate in CDQ fisheries or when they act as a mothership (rare).

The fish ticket is completed onboard, using data from the NMFS DCPL. The fish ticket is delivered to Dutch Harbor or Kodiak when the vessel next arrives in port, anywhere from two weeks to one month after catching and processing the fish . For CDQ fish harvested outside state waters, they hand-write "outside state waters" on the fish ticket since there is no box on the fish ticket to record this information.

Since they infrequently fill out ADF&G fish tickets, their captains and mates have complained that the instructions for filling out the tickets are confusing. However, they believes the distribution of harvest weight among ADF&G statistical reporting areas reported on the ADF&G fish tickets is fairly accurate when their boats are harvesting CDQ fish, but may be less accurate when they are receiving a cod-end from a catcher vessel.

Additionally, since they only take occasional at sea deliveries, the captain of the catcher vessel usually doesn't sign or review the ADF&G fish ticket information. Their vessel, acting as a mothership, fills out the fish ticket indicating the vessel name and ADF&G permit number and the weight and species of the delivery. They radio this information to the catcher vessel who approves the weight. They may never see each other again during the season and probably don't have anyway at sea to exchange paperwork.

Occasionally, product is delivered to Bellingham. However, an ADF&G fish ticket is not completed since the fish were harvested outside state waters (NMFS forms are completed). They were not sure whether a Washington State fish ticket is filled out or not but doubted it since the fish have already been processed on board their vessels.

Data Quality and Issues

Harvests by NMFS statistical areas are accurate because the areas are large. CDQ harvests require area-specific reporting and are generally accurate, but not always because ADF&G statistical areas are so small. When acting as a mothership and receiving a codend, the accuracy of the statistical area is dependent on the reporting by the catcher vessel.

Weights brought on board are reasonably accurate, but can be complicated for H&G boats where a variety of species are harvested. The processor recommends that their vessels use the captain's estimates of species composition and weight rather than observer values, so as to maintain consistency in reporting. Species identification is considered accurate.

Some data fields on the forms are confusing to them, especially when they switch from a catcher/processor to a mothership. Confusion arises because they rarely operate as a mothership and some data fields take on a different meaning. Data fields causing confusion include date landed, processor code, vessel name. They would like to see a field that identifies catch within or outside state waters.

Relatively few large errors are identified. The Seattle Office checks the WPRs before faxing the reports to NMFS. Minor corrections are corrected in Seattle, but the vessel makes corrections involving production values.

Some problems encountered in the DCPL form include the following:

- The longline DCPL has so much information on it now that it is difficult to read when faxed by the vessel.

- By regulation a DCPL should be filled out for every day of the year for each permitted vessel. Often times the captain forgets to fill in blank forms for non-active days during and after the season. When this happens the page numbers on the DCPL are not consecutive for each day of the year. However, NMFS has not complained about this as yet.
- The trawl hauls or longline/pot sets made by a vessel are supposed to be consecutively numbered throughout the year as well. Sometimes these can get off if a mistake is made (duplicate haul number). Additionally, the observers keep a separate tally of the haul or set numbers for each trip, so after the first trip of the year, the observer haul or set number no longer matches the vessel haul or set number in the DCPL which makes it difficult for the observer and captain or mate to relate information on a haul by haul or set by set basis. It would be a good idea to have the observers record haul and set numbers the same way the boat does it on the DCPL.
- The observers use different species codes in their reporting than the vessel uses on the DCPL and Weekly Production Reports. It would be nice if everybody used the same species codes.
- Beginning this year, both the trawlers and longliners will be filling out two separate DCPLs, one for within sea lion protection areas and another outside sea lion protection areas. They suggested it might be helpful to add a column for this designation on the DCPL as well as a column for inside and outside 3 nm for ADF&G fish ticket and tax reporting. The trawlers also have to keep separate catch reports of harvests inside and out side the red king crab savings area.

They mentioned no real problems with the weekly production report, except that the Target Species Code box for primary and secondary is actually recording the species the vessel intends to harvest next week not the current trip. Sometimes the vessel is not sure what they will be targeting or they list the current week's targets. Also the box at the bottom for discards is not always long enough to report all the species discarded during the week (particularly a problem for longliners).

There is redundancy between ADF&G Fish Tickets and NMFS DCPL. The vessel records the same data multiple times by hand, e.g. factory foreman completes factory log, the captain enters these data into their spreadsheet database (trawler only), then hand copies values to NMFS DCPL and WPR. The WPR is faxed or sent electronically via an attached email to the company's Seattle Office, who either copies the data to a clean WPR form or checks the data and prints it out of a spreadsheet that duplicates the WPR and faxes it to NMFS. The vessels generate an ADF&G Fish Ticket primarily from data listed on the NMFS WPR and they hand deliver or mail these to ADF&G on their next port call. The CDQ reporting (logbook) duplicates a lot of the information on the DCPL, WPR and ADF&G fish ticket.

Since the information on harvest weight by ADF&G statistical area is not necessarily accurately reported in the open access groundfish fishery (both trawl and longline), they believe that essentially all the information necessary for the ADF&G fish ticket could be derived from the WPRs sent to NMFS. Since they are catcher/processors, there is no issue about needing the ADF&G fish ticket to verify the weight and species transfer between the catcher and processor. They believe the main purpose of the ADF&G fish ticket data is to assess the State of Alaska landing tax on the vessel and this information could be derived from the NMFS WPRs.

Additionally catcher/processors and motherships are required by NMFS to fill out an Alaska Commercial Operator's Annual Report that outlines all their taxable harvests in Alaska and is submitted to ADF&G at the end of each year. All of the fish ticket landing information, including species, product form, landed weight and exvessel value, location of harvest by ADF&G stat area is reported on this form. The ADF&G stat areas could be determined from the DCPL either by adding a column where the fisher enters the stat area code or automatically using the start latitude and longitude for each haul or set (if the DCPL were available electronically).

They have some concerns regarding confidentiality. Presently, they allow Sea-State Monitoring to receive their observer data and Weekly Reports.

Onboard databases must have a password so that relief captains and others cannot gain access to data from previous trips.

If the DCPL were entered electronically and transmitted to NMFS on a more regular basis, they would want to know that rules were in place to assure that other fishers or companies could not gain access to their precise fishing locations.

4.3.3 Large Factory Trawler and Longliner

The operation is a large volume at-sea catcher processor operation utilizing two large factory trawlers and a freezer longliner. They harvest and process AFA pollock, cod and CDQ pollock, cod and occasionally cleanup CDQ halibut. The trawlers make about 14 trips per year and the longliner about 10 trips per year resulting in about 35 to 40 ADF&G fish tickets per year. They produce fish tickets for each delivery. All their vessels are 100% NMFS observer coverage vessels and during AFA pollock the trawlers have two NMFS observers onboard. They fill out NMFS trawl and longline logbooks, DCPLs, WPRs, PTRs, CDQ halibut reports (card swipe reporting), AFA reports, ADF&G COAR reports, Alaska fish tax reports, and EPA NPDES annual reports.

The vessels uses Inmarsat to send emails and connect with the Internet but the speed is slow and it is expensive. However, if electronic reporting would allow them to forego faxing reports it might result in a net savings. They have little or no IT support onboard the vessel with the exception of members of the crew who just know a little about computers. They have one person in their Seattle office that is also self-taught and has other duties.

Work Flow

On board the trawlers, each trawl tow is treated separately. The cod end of the net is emptied into onboard RSW holding tanks. The fish are dewatered coming out of the tank and pass over an in-line flow scale that records a total landed weight of the trawl tow. The in-line scale produces a paper tape printout of the total weight of the tow. The fish then are sampled by the NMFS observer and the by-catch species composition and weight is estimated. Even though the vessel's crew sorts out all of the by-catch prior to processing and has an actual weight of by-catch by species, the vessel records the NMFS observer estimates as their official number and weight of by-catch for their NMFS reporting to assure consistency with the NMFS observer reporting. Some by-catch is processed and retained onboard for sale, but the rest is ground and discarded at sea.

Once the entire catch from a trawl haul is weighed and transferred into the factory for processing, the NMFS observer brings the in-line flow scale weight for the haul and the observer's extrapolated by-catch weights up to the mate who subtracts the by-catch weight from the total landed weight to get the target species weight that is then entered into the start of the DCPL record for the haul. This must be done within two hours of the completion of the tow, which can cause problems at times. The mate also

enters the round weight of pollock harvested by statistical area into a spreadsheet that keeps track of the vessel's AFA quota harvest by area and season. This information is sent electronically to the Seattle office either from the ship or at the next port call.

The longliner has a similar workflow, except that some by-catch is released and its weight estimated.

The factory reports daily the weight of products produced from the target and retained by-catch species by product type. This information is combined with the DCPL information to generate the Weekly Production Reports, which are faxed weekly to NMFS and the company's Seattle office. The vessel often has to complete multiple WPRs in a single week, one set for CDQ fisheries, one set for AFA quota fisheries and separate ones within each of these categories by NMFS three-digit statistical area and crab savings area. DCPLs are mailed into NMFS once a quarter and copies are sent to the company's Seattle office. If errors are discovered revised reports are submitted. One of the factory trawlers attempted to use the eLog NMFS daily reporting system but the software was unreliable and has yet to be replaced by NMFS.

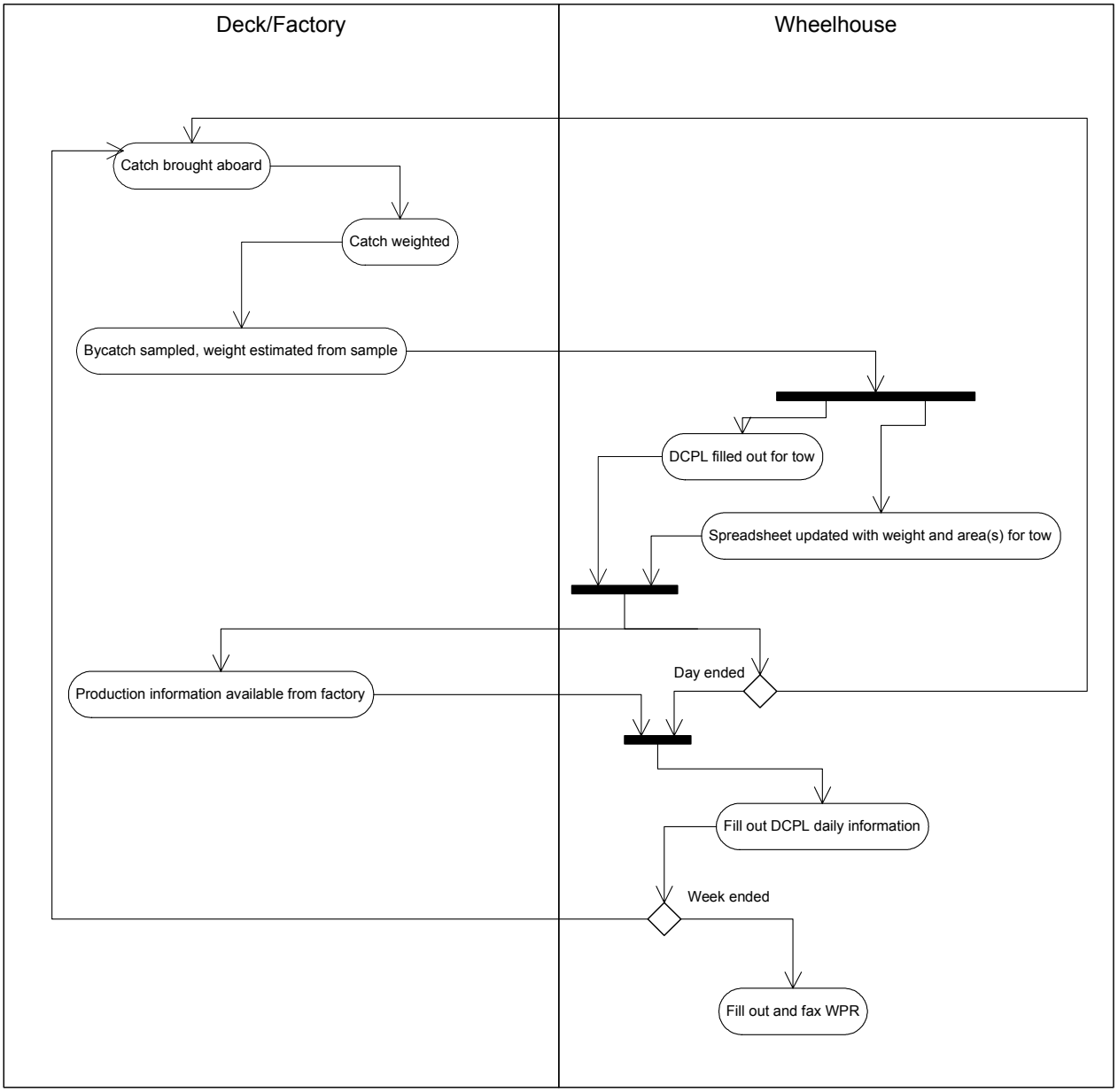


Figure 19

Each vessel fills out fish tickets for each delivery of product. Fish tickets are filled out separately for CDQ and AFA quota fisheries and by separate ADF&G statistical areas within the CDQ fisheries. Fish tickets are filled out with the vessel as the processor, and no price data. The fish ticket information includes discard species and weights and retained species product codes and finished product weights but not prices. The fish ticket information is derived from the DCPLs and the WPRs. PTRs are filled out at the same time using the same data.

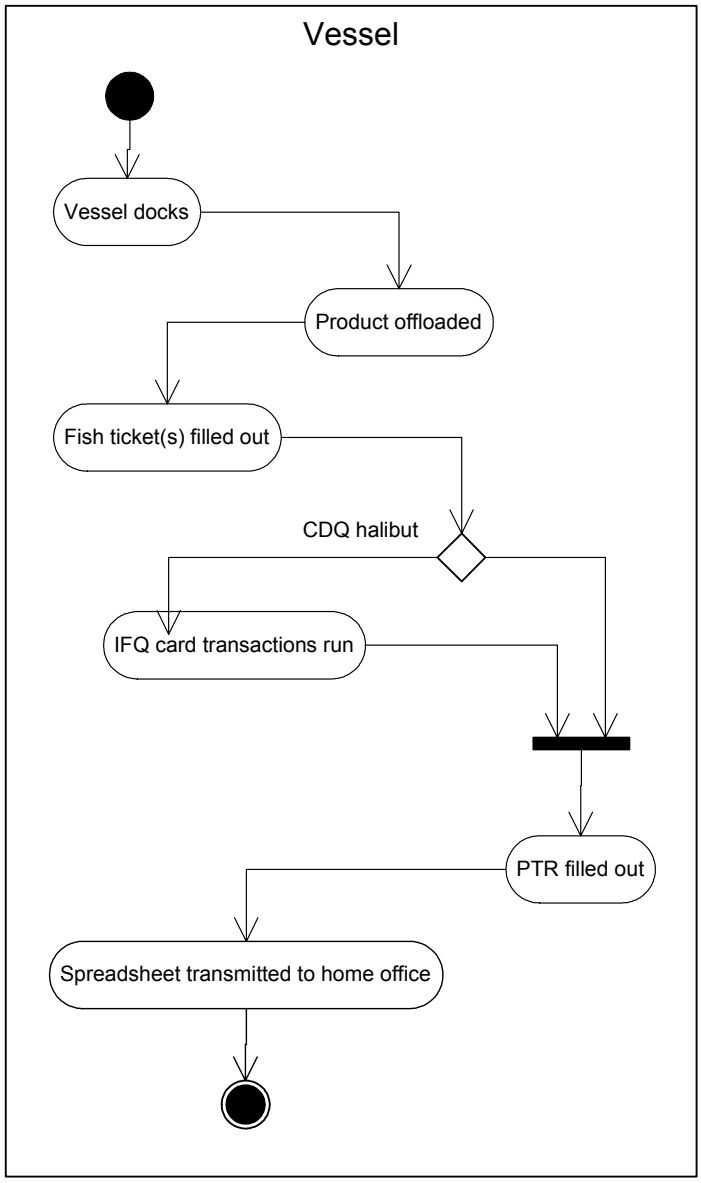


Figure 20

The Seattle office uses the DCPL, WPRs and their internal records to fill out the ADF&G COAR report, Alaska fish tax information (using product price information supplied by ADF&G) and an annual EPA report on fish waste discharges for the NPDES permit.

Data Quality and Issues

Data quality is dependent upon the accuracy of the in-line flow scale that is calibrated each trip and by-catch estimation is dependent upon the accuracy of the observer's sampling program. There are always some discrepancies between the landed target species round weight and the factory production reports but these are usually minor. There are also some

miscounting of the number of cases of products produced that result in differences between the factory production values and the PTR reports, but again these are minor. Sometimes there are species identification problems between what the observers come up with and what the vessel crew believes they have actually caught. The company has several people on the vessels looking for data recording errors and the Seattle office checks the data as well.

Since the vessels are mainly involved in AFA pollock harvest, the volume of catch is public information; however, the location of the catch and the products produced are confidential.

Problems include multiple entry of fish tickets and WPRs because of the all the fishery and area separate reporting requirements. They also have had problems with the eLog reporting software failing. The NMFS server that receives the eLog is sometimes down.

They don't always know that NMFS has received their weekly WPRs. Sometimes it looks like the fax has gone through but NMFS calls the Seattle office and says they never received the report. The Seattle office typically just faxes them a copy of the missing report.

They made the following suggestions for improvements:

- Integrate all the reporting into a single electronic format, including the NMFS trawl or longline logbook, the DCPL, the WPR, the fish tickets, the PTRs and the annual ADF&G COAR and Alaska fish tax reports and maybe even the EPA NPDES report.
- Provide training seminars on the new software at Fish Expo and provide telephone support for answers to questions.
- Make the reporting an attached compressed file to an email instead of having to report over the Internet because of the slow speeds on the boats.
- Allow the program to export data in a format the company can use.

4.4 Agencies

In addition to processors and other data submitters, we interviewed agency personnel who work with the landing data, both to enter it into agency systems and as users of the data.

4.4.1 ADF&G

ADF&G is the most decentralized of the agencies. We interviewed personnel in field offices in Homer, Kodiak, and Sitka, as well as at headquarters in Juneau. The field offices do all of the fish ticket data entry. They often collect fish tickets in person at local processors, others are received via US mail. Fish tickets are typically sorted by port code, gear type, or sometimes by processor. They are allowed to accumulate, although some offices do their data entry more frequently than others. The cycle time for fish tickets can exceed six weeks in some locations. The fish tickets are data entered in batches on a client/server system whose database resides at headquarters in Juneau. Network connections from field offices can be slow, but are fairly reliable. However, the State has been slow to upgrade network equipment and some offices are running with networks using quite old Token Ring technology.

ADF&G staff believe the current reporting and collection process is fairly error prone. Common problems include data submitters writing incorrect data values for codes, omitting data or signatures, writing illegibly, and sometimes adding or omitting zeroes on weight data. Stat areas reported are frequently found to be incorrect when compared with logbook data. Staff can introduce errors during the data entry process, although they have various procedures for double-checking their work, to catch their own mistakes as well as those of the data submitters. Whenever possible they correct data values, and they research problems with the data submitters when necessary.

ADF&G staff in the regional offices agreed that an electronic landing reporting system which data submitters would use to make landing reports, and which would validate data as it was entered, would greatly reduce their data entry burden and would reduce the number of errors on landing reports, particularly administrative errors and errors of omission. They could then spend more time conducting wheelhouse interviews, observing offloads, sampling, comparing landing data to other data sources such as logbooks, and checking data for valid but illogical data values which require a knowledgeable individual to detect.

ADF&G field staff believe that an integrated landing system would need to overcome some issues. ADF&G and NMFS have made significant efforts to align data code values. The agencies would need to make a commitment to keeping them aligned. They pointed out that agencies ask for a lot of data from processors, an electronic system should help reduce processors' efforts to report if it is to be successful.

4.4.2 IPHC

The IPHC does not issue forms for collecting landing data. Instead, they enter halibut data reported on ADF&G fish tickets into their system, and use NMFS IFQ system landing reports for landing data validation. They are more narrowly focused than the other agencies, being interested only in halibut. IPHC uses the fish ticket data, CFEC license data, and their own extensive port sampler and logbook data to build a database that provides information for stock assessment and harvest summary reporting. IPHC has no in-season management or enforcement responsibilities, therefore the receipt of fish ticket data is not time sensitive .

IPHC finds that not all desired data is written on all fish tickets. Vessel ADF&G numbers may be omitted, or wrong when incorrect CFEC cards are imprinted on fish tickets. They also find that stat areas and condition codes are frequently reported incorrectly. Because of this the IPHC logbook data is used to determine stat areas. The stat areas reported on fish tickets are used only when logbook data is unavailable. However, the logbook stat area information, which they consider more accurate, is not fed back to ADF&G's fish ticket database.

IPHC currently receives landing data electronically from Washington, Oregon, and British Columbia, as well as NMFS IFQ landing data.

IPHC staff believe that for an integrated system to be successful it will need to have methods to validate data and it will need to incorporate protocols for the correction to data errors that are identified by the multiple agencies.

4.4.3 NMFS

NMFS has the most sophisticated existing reporting systems. Most IFQ landings are reported with the card swipe terminal system. Since 2000, most shoreside processors have used the NMFS electronic reporting client to submit daily production reports. The electronic reporting system replaced a manual daily production logbook and weekly production reports which were submitted by fax. NMFS field staff estimate that 70 percent of the processors and 95 percent of the groundfish landings are reported with the electronic reporting client. Staff like the electronic reporting system. They believe it gives accurate data in a very timely manner. The electronic reporting system allows submitters to amend previously submitted reports. NMFS usually requests submitters to do so if corrections are needed, rather than making the correction directly to their database. NMFS Enforcement uses ADF&G fish tickets for IFQ enforcement

and other investigations. They prefer to have signed paper documents due to the nature of their work. NMFS staff also use fish ticket data to document catch history and participation in fisheries.

While they believe that the existing reporting systems are effective, NMFS staff note that some aspects of the systems contribute to errors. The IFQ card swipe system accepts data that registers as problems. NMFS enforcement personnel must investigate each occurrence. Many of them are the result of administrative error on the part of the data submitter, but still require effort on the part of NMFS to resolve. By-catch overage calculation on the part of the processors is complicated and error prone. Stat area reporting is believed to be inexact. The stat area reported might not be the actual area where the harvest occurred, but one close to it. In other cases the wrong are may be reported due to a data entry error such as transposing digits. In some cases fishers intentionally do not identify the precise harvest location. Data about what program fishing is conducted under is sometimes omitted or entered incorrectly. The IFQ terminals are old, and the manufacturer no longer supports the technology.

NMFS staff believe that an integrated electronic system could be helpful in reducing administrative errors. However, they believe that field staff will always be able to detect errors which would not be noticed by the system, for example under-reporting by a processor when boats have been seen making deliveries, the type of error which may result from misplaced decimal points.

5 Data Flows and Definitions

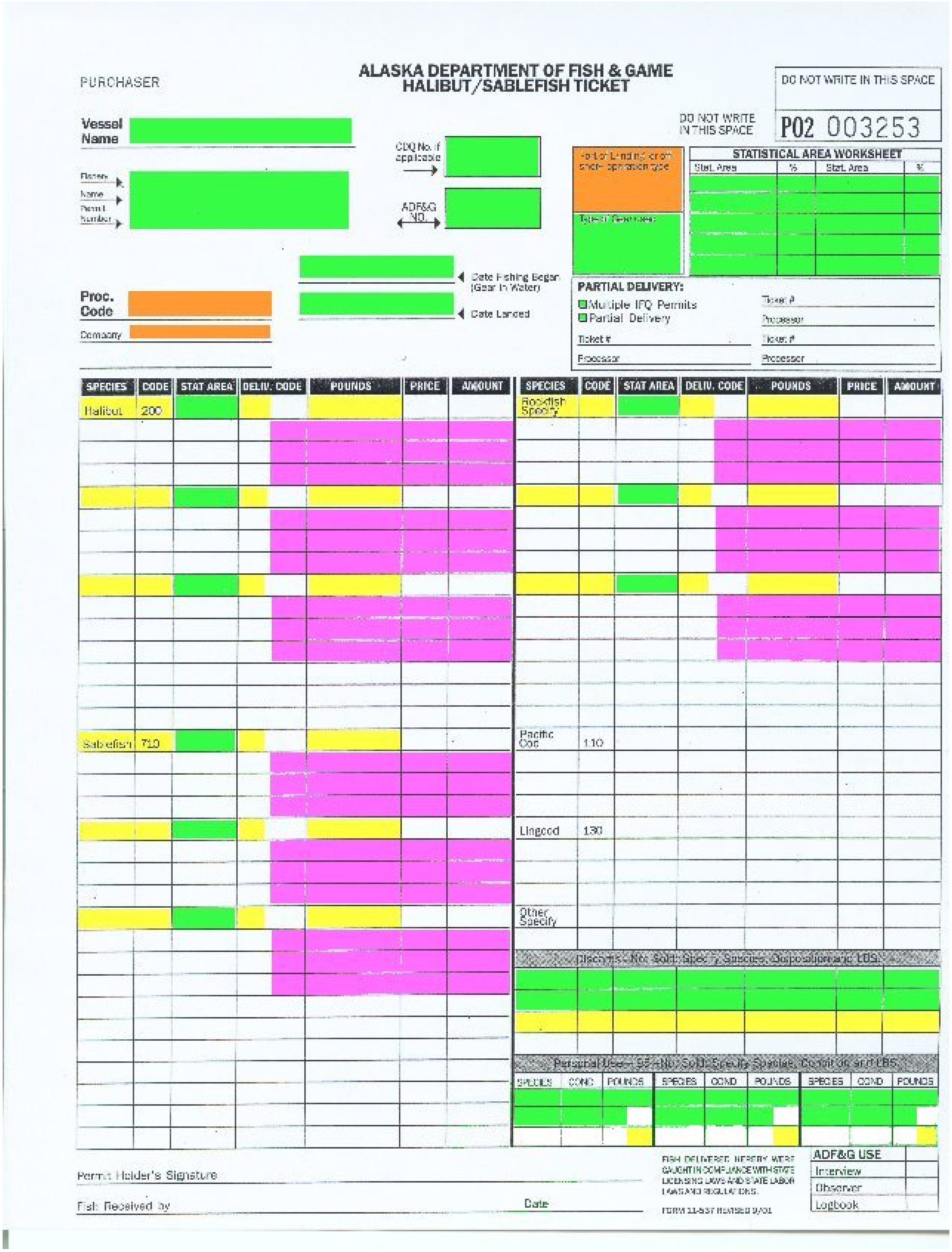
The user stories illustrate the typical progression of data and fish through the processor's operation. Although each processor has their own workflow the similarities are apparent. From these the representative states of data collection can be determined. The shore based and at-sea processors have quite different orders and timings of capturing the data used in landing reports.

The data elements in agency systems, which use the landing data as input, provide a check that all necessary data has been defined. Data elements in those systems, which are not directly present in the landing reports must either be derived from other data or input by the agency.

5.1 Shoreside Processing Data and Reporting Flow

Shoreside processors generally use the fish ticket as a working document, or in some cases, use their own document or system, which closely parallels the fish ticket in terms of data collected. That is, the fish ticket is used for business purposes, tracking the landing information in addition to being the required reporting document. This system has a number of advantages for data collection. The data is the primary tracking data, and so is of the highest quality the work process can provide. For example, scale weights on fish tickets are very carefully recorded and checked. Being a working document is also advantageous because it is a part of the processing workflow, not just an additional reporting burden.

For most shore-based processors the landing data recorded on fish tickets are populated in identifiable stages. Figure 21 shows a representative Alaska fish ticket, color-coded to represent these stages.



PURCHASER

ALASKA DEPARTMENT OF FISH & GAME
HALIBUT/SABLEFISH TICKET

DO NOT WRITE IN THIS SPACE

DO NOT WRITE IN THIS SPACE

P02 003253

Vessel Name

CDQ No. if applicable

ADF&G NO.

Fishery
Name
Permit Number

STATISTICAL AREA WORKSHEET

Stat. Area	%	Stat. Area	%

Type of Gear used

Date Fishing Began (Gear In Water)

Date Landed

Proc. Code

Company

PARTIAL DELIVERY:
Multiple IFQ Permits
Partial Delivery
Ticket #
Processor
Ticket #
Processor
Ticket #
Processor

SPECIES	CODE	STAT AREA	DELIV. CODE	POUNDS	PRICE	AMOUNT
Halibut	200					
Sablefish	710					

SPECIES	CODE	STAT AREA	DELIV. CODE	POUNDS	PRICE	AMOUNT
Rockfish Specify						
Pacific Cod	110					
Lingcod	130					
Other Specify						

Discards - Not Sold: Specify Species, Disposition and LBS.

Personal Use - 95 - Not Sold: Specify Species, Condition and LBS.

SPECIES	COND	POUNDS	SPECIES	COND	POUNDS	SPECIES	COND	POUNDS

Permit Holder's Signature

Fish Received by

Date

FISH DELIVERED HEREBY WERE CAUGHT IN COMPLIANCE WITH STATE LICENSING LAWS AND STATE LABOR LAWS AND REGULATIONS.

FORM 11-537 REVISED 9/01

ADF&G USE
Interview
Observer
Logbook

Figure 21

Initial processor supplied data

The processor specific data is available before the landing begins. It is highlighted in orange on Figure 21.

Vessel operator supplied data

The vessel operator can provide general landing data once the vessel docks. Some processors collect this data before the offload begins. Others collect it in parallel with offload activities. This data is not dependent on landing activities and can be provided immediately. It is highlighted in green on Figure 1. In addition to the fish ticket data illustrated, the IFQ card data is also a part of the vessel operator supplied data.

Landed weight and state data

The results of the offload are available as data as soon as the offload completes. This data includes information about the state of the fish offloaded. That is, the physical form of the fish where different states indicate that different product recovery rates would need to be used to calculate the round weight or net weight. This is in contrast to the existing delivery and product codes, which contain other information in addition to the physical state of the fish. Some of the data is invariant, such as the species of both targeted species and retained by-catch. Weight data is measured. This information about the physical delivery is required both for reports and for the business relationship between the catcher and the processor, whether it is a business-to-business relationship or an employee-to-business relationship. The time to acquire landed weight and state data is much longer than for the initially supplied data. Landing reporting must wait until it is completely available.

The landed weight and state data is highlighted in yellow on Figure 1. Combined with the data provided in earlier stages it is all that is necessary for the IFQ landing report.

Disposition data

In some cases, the landed weight and state data is all that is needed to complete the business transaction between the buyer and seller. The price can be set and the value of the landing calculated. However, in most cases, some processing is required before the transaction can be completed. The disposition of fish in processing often has an effect on the price paid to the fisher. For example, fish being turned into fillets are more valuable than fish being ground into fishmeal. In other cases, determinations must be made which would take too much time during the landing operation, such as chum

percentage determination for salmon landings. The settlement data is often not available for hours, or even days, after the landing is complete. Ancillary products are also noted in the settlement data since they affect the value of the landing.

The disposition data combined with data provided in earlier stages represents the remaining data currently collected in landing reports. It is highlighted in magenta on Figure 21.

Buying Station data

For shore-based processors, data flows from the landing report data to the production data. In some cases it passes through an intermediate form, the Buying Station Report. The Buying Station Report is merely a vehicle that gives the processor the same information as if the landing were made at their facility.

Production data

Much of the data required for NMFS Daily Cumulative Production Logs and Weekly Production Reports, whether reported on manually or electronically, is derived from landing data and may be supplemented with additional processing data, which may not be recorded on landing reports. For the most part, production data aggregates the information from multiple landing reports and provides information on the products produced from these landings.

5.2 At-Sea Processing Data and Reporting Flow

In contrast to shoreside processors, at-sea processors do not use landing reports as a working document. Instead, they use production data as their main activity tracking mechanism. Landing reports are made at the time of landing the finished products from an entire trip. All data required to complete the landing report is at that point available. The data is derived from onboard production data. The smaller at-sea processors, in particular, do not measure scale weights of the fish before processing. They rely on scale weights of processed products, and calculate landed round weights using the processed product weights and product recovery rates. For at-sea processors the landing data does not flow to produce the production data because the production data was already determined.

5.3 Landing Data Dictionary

This section defines the individual data elements that make up the existing landing reports. The elements are fields that are specified on the fish ticket forms and are collected with the IFQ card swipe system. Additionally, we identified data that is submitted on landing reports, but which does not have a specific field. It is written in other fields, or in the margins. This marginalia must be taken into account in the design of an automated system. The identifying information comments, weight and state comments, size/grade description, and primary/ancillary indicator have been added to existing elements to handle marginalia.

Individual data fields that represent more than one piece of information can be problematic for automated systems. Humans understand these compound data fields, but they are inefficient for computer systems to use in sorting, selecting, and decision-making. The delivery code or product code is the only compound field present in the landing data reports. It encodes information about the condition of the fish as well as the disposition of the fish. For example, codes 01, 41, 86, and 98 all refer to whole fish. The condition is the same, but the disposition of the fish is different (01 - no disposition specified, 41 - destined for meal, 86 - donated to a food bank because it is a prohibited species, and 98 - discarded at sea.) This data would be better represented by two fields: one for condition of the fish and one for processing disposition. The disposition code in the following tables represents the disposition information currently encoded in the delivery code.

In many cases on an electronic system, one element can be determined by other fields by either making a calculation or looking a value up in a table. The "derived from" column in the following tables indicates elements that might not have to be provided in a landing report because they could be derived from other data that is provided.

Data elements are color-coded in Figure 21, to highlight when in the shoreside data flow the information is available.

Landing Identifying Information

The identifying information applies to the landing as a whole, and uniquely identifies it.

Element	Type	Description	Derived From	Remarks
ADF&G Number	num(5)	The ADF&G issued vessel identification number		

Element	Type	Description	Derived From	Remarks
		number.		
Vessel Name	char(30)	The name of the vessel making the landing.	ADF&G Number	
CFEC Permit Number Fishery Number	char(5)	The 4 or 5 character CFEC fishery identification number.		
CFEC Permit Number Id Number	char(6)	The unique CFEC permit identification number. The last character contains a check digit of the id number and fishery number.		
CFEC Permit Resident Flag	char(1)	A flag indicating whether or not the permit holder is an Alaska resident.	CFEC Permit Number Id Number, CFEC Permit Year	
CFEC Permit Vessel Name	char(16)	The name of the vessel associated with the permit.	CFEC Permit Number Id Number, CFEC Permit Year	The permit vessel name does not necessarily need to match that of the landing vessel. However, the landing vessel must be of the same category or a smaller category.
CFEC Permit Vessel ADF&G Number	num(5)	The ADF&G issued vessel identification number of the vessel associated with the permit.	CFEC Permit Number Id Number, CFEC Permit Year	The permit vessel number does not necessarily need to match that of the landing vessel. However, the landing vessel must be of the same category or a smaller category.
CFEC Permit Limited Entry File Number	char(6)	The file number for limited entry permits. Other permits do not have a file number.	CFEC Permit Number Id Number, CFEC Permit Year	
CFEC Permit Fishery Name	char(16)	The abbreviated CFEC fishery name.	CFEC Permit Number Id	

Element	Type	Description	Derived From	Remarks
			Number, CFEC Permit Year	
CFEC Permit Holder Name	char(16)	The permit holder's full name.	CFEC Permit Number Id Number, CFEC Permit Year	
CFEC Permit Year	num(2)	The year the permit is valid in.		
CFEC Permit Card Seq	char(3)	The number of times the card was issued or reissued. The last character contains a check digit of the seq number and permit year.		
CFEC Permit SSN	num(9)	The social security number of the permit holder	CFEC Permit Number Id Number, CFEC Permit Year	
CFEC Permit Year of Birth	num(2)	The year of birth of the permit holder	CFEC Permit Number Id Number, CFEC Permit Year	
ADF&G Processor Code	char(6)	The ADF&G assigned unique processor identifier. The last character is a check digit.		
Processor Year	num(2)	The year the processor id is valid for.		
Processor Company Name	char	The name of the processor.	ADF&G Processor Code	
CDQ Number	num(2)	The community development quota identification number		
Landing Port	char(3)	The ADF&G alphanumeric port		

Element	Type	Description	Derived From	Remarks
		code.		
Date Fishing Began	Time stamp	The date when the gear first went in the water for the trip.		
Date of Landing	Time stamp	The date the landing was started.		
Fish Ticket Number	char(9)	The ADF&G assigned unique identification number for the landing report. The first character is a fish ticket type indicator and the second two are a year designator.	System	The year component of the fish ticket number is a form year. It does not necessarily have to match the landing year.
Gear Code	char(3)	The ADF&G alphanumeric port identifier. This data element can also contain FCP, FLD, or IFP.		
CFEC Permit Holder Sig Date	Time stamp	The date the permit holder signed the landing report		Absence of data can indicate that the signature has not been seen.
Processor Rep Name	char	The name of the employee or representative of the processor who prepared and signed the landing report.		
Processor Rep Sig Date	Time stamp	The date the processor's employee or representative signed the landing report.		Absence of data can indicate that the signature has not been seen.
Partial Delivery Flag	char(1)	A partial delivery reason indicator, identifying that the reason for the partial delivery is that multiple landings are being made to different processors.		

Element	Type	Description	Derived From	Remarks
Multiple IFQ Permits Flag	char(1)	A partial delivery reason indicator, identifying that the reason for the partial delivery is that the landing is being made on multiple IFQ cards, each requiring a separate fish ticket.		
Discard Report Indicator	char(1)	For federally managed fisheries, provides a way to indicate whether the discard report blue sheets were received, and if not, why not.		
Dewatered	char(1)	Indicates whether or not the catch was actively dewatered.		Herring specific
Comments	char	A place for the processor or fisher to add comments or information that would be provided as marginalia on a paper landing report.		

IFQ Landing Identifying Information

The IFQ identifying information applies only to landings of IFQ species. It identifies the IFQ specific information needed for the IFQ transaction.

Element	Type	Description	Derived From	Remarks
IFQ Permit Number	num(6)	The IFQ quota share permit identifier.		
IFQ Cardholder ID	num(6)	The NMFS person id that identifies the cardholder. This can be the permit holder or a hired skipper.		
IFQ Cardholder PIN	char(4)	The cardholder's password for IFQ		

Element	Type	Description	Derived From	Remarks
PIN		transactions.		
Card Vessel ADF&G Number	num(6)	Hired skipper authorized vessel number		If the cardholder is the permit holder the card vessel ADF&G number is blank
Registered Buyer Number	char(9)	The NMFS federal registered buyer identifier.		
IFQ Port code	num(3)	The numeric NMFS port code	Landing Port	
Fishery Type	char(1)	An indicator for the IFQ system as to whether the landing is in a ling cod or salmon fishery	CFEC Permit Number Fishery Number	

IFQ Landing Transaction Result Information

The IFQ transaction result information stores the result of the IFQ landing transaction. None of this data is provided by the landing report, rather it is provided by the IFQ system as the result of making an IFQ landing.

Element	Type	Description	Derived From	Remarks
Stat Area	char(6)	ADF&G statistical area		This provides the relationship between multiple landing weight and state line items which can be consolidated on one IFQ transaction
Species	char(3)	Numeric species code, ex. 200 = halibut		
Area	char(2)	IPHC Regulatory area for the Pacific Halibut Fishery, ex. 3A, 2C.		
Tran Date Time	Time stamp	The date and time recorded on the IFQ host system for the transaction.		

Element	Type	Description	Derived From	Remarks
Tran Number	char(8)	The transaction identification number generated on the IFQ host system.		
Round Weight	num(12)	The final weight for the landing transaction calculated by the IFQ host system, with all deductions applied. This is round weight for sablefish, and net weight for halibut.		
Gear Desc	char(30)	The name of the gear associated with the gear code.		
Port Desc	char(20)	The name of the port associated with the port code.		
Permit Holder Name	char(35)	The name of the permit holder associated with the permit number		
Return Code	char(3)	The return code from the IFQ landing transaction. Zeros indicate no error, 001 indicates successful transaction with redline error.		

Statistical Area Allocation Information

The stat area allocation information is used to allocate landing weight and state information to stat areas.

Element	Type	Description	Derived From	Remarks
Stat Area	char(6)	ADF&G statistical area		
Percentage	num	The percent of the landing that was caught in the given stat area.		

Trip Report Relationship Information

A single trip may result in multiple landing reports, due to selling to multiple processors or having more than one IFQ permit. The trip relationship information identifies other landing reports that are for the same trip.

Element	Type	Description	Derived From	Remarks
Ticket Number	char(8)	ADF&G fish ticket or landing report number of the related landing.		
ADF&G Processor Code	char(6)	The processor with which the related landing was made.		This may be the same processor as the landing report is with.

Landing Weight and State Information

The landing weight and state information represents line items on the landing report.

Element	Type	Description	Derived From	Remarks
Species Code	char(3)	The numeric code identifying the species of fish being landed.		
Species Description	char	The name of the species of fish associated with the species code.	Species Code	
Size/Grade Desc	char	The size and grade information the processor uses when sorting fish prior to weighing during the landing.		This is an optional sub-categorization of species.
ADF&G Stat Area	char(6)	The ADF&G statistical area.	Statistical Area Allocation Information	This data element can be derived, or provided directly, overriding the derived information.
IFQ Regulatory Area	char(2)	The regulatory area for IFQ landings.	ADF&G Stat Area	This data element can usually be derived from stat area. However, certain stat areas are bisected by

Element	Type	Description	Derived From	Remarks
				regulatory area boundaries. It would be highly desirable to align area boundaries to eliminate ambiguity in the system.
Condition Code	char(2)	The numeric code indicating the physical state of the fish at the time of weighing during the landing.		
Weight	num	The weight for the line item, in pounds. For fish being offloaded this would be a measured weight, for at-sea discard information it could be an estimated weight.		For halibut, IPHC regulations require this to be the scale weight at the time of offload.
Ice/slime included flag	char(1)	A flag indicating whether or not the weight includes ice and slime. IFQ landings use this information in final weight calculations for deductions from quotas.		
Number of Fish	num	1-999,999,999		This is the number of fish, or animals in the case of non-fin fish species.
Effort	char	For some non-groundfish fisheries the fish ticket collects effort information for each line item. Depending on gear type it can be number of pulls, number of tows, or hours.		
Remarks	char	On paper fish tickets processors can include marginalia, an electronic system must		

Element	Type	Description	Derived From	Remarks
		provide space for such commentary. This element provides that for the line item.		
By-catch Overage Indicator	char	When a by-catch overage is determined the line item or items that are affected would be split into line items that represent the overage and remainder line items that are not part of the overage. This data element would indicate the overage items.		
Roe Percent	num	The estimated row percentage at the time of delivery.		Herring specific
Number of Kelp Blades	num	The number of blades of kelp for herring roe on kelp.		Herring specific

Landing Disposition Information

The landing disposition information represents sub-line items associated with weight and state line items on the landing report. Each weight and state line item would need at least one disposition information line item.

Element	Type	Description	Derived From	Remarks
Species Code	char(3)	The numeric code identifying the species of fish being landed.		In most cases species code would be inherited from the landing state and weight information, but it is needed for disposition in cases such as Bristol Bay salmon where the initial landing does not sort chums.
Disposition Code	char	A code indicating what is being done with the portion of the		

Element	Type	Description	Derived From	Remarks
		with the portion of the fish represented by the line item. This could indicate the product the fish was processed into, such as fillets, fishmeal, and roe. It could also indicate dispositions which were other than being processed such as reloaded on vessel for discard at sea, reloaded on vessel as retained catch for IFQ,		
Product Designation Code	char(1)	An indicator of whether the product is a primary, ancillary, or reprocessed product.		
Number of Fish	num	The number of fish, or animals, represented by the line item.		This information is not normally required for groundfish reporting, but is used for reporting some at-sea discards. It is collected in salmon and some shellfish fisheries.
Weight	num	The product weight represented by this line item.		
Price	money	The price per pound of the fish dispositioned on this line item.		
Amount	money	The total amount for the disposition line item	Weight multiplied by Price	
Remarks	char	Comment information about the line item.		
Roe Percent	num	The estimated row percentage after processing.		Herring specific

5.4 Intermediate Landing Data Consolidation

The landing data serves as input to the production data flow, where processing information is created. In some cases the landing data is consolidated before being input to the production data flow.

5.4.1 Buying Station Report

The NMFS Buying Station Report consolidates the data on one or more landing reports. The processor's representative who makes the landing report creates these reports.

BSR Header

Field	Landing Data Section	Element	Remarks
Name of Buying Station	Landing Identifying Information	Processor Company Name	This could be a user attribute
Original/Revised checkbox			User provided
Operator or Manager Name			This could be a user attribute
Management Program			User provided
Management Program Number			User provided
Delivery Date Time			User provided
ADF&G Number			This could be a user attribute
Vehicle License Number			This could be a user attribute
Gear Type	Landing Identifying Information	Gear Code	
Federal Reporting Area			User provided
Trawl Gear Area			User provided
Associated Processor Name			User provided
Associated Processor ADF&G Processor Code			User provided

Field	Landing Data Section	Element	Remarks
Associated Processor Federal Fisheries Permit Number			User provided
Associated Processor Federal Processor Number			User provided

BSR Catcher Vessel Delivery Information

Field	Landing Data Section	Element	Remarks
Catcher Vessel Name	Landing Identifying Information	Vessel Name	
ADF&G Number	Landing Identifying Information	ADF&G Number	
Discard Report Indicator			User provided
Fish Ticket Number	Landing Identifying Information	Fish Ticket Number	The fish ticket number provides a reference to all the landing report data not specifically collected on the buying station report form
Species Code	Landing Weight and State Information	Species Code	Note: Species Code and Species Weight would need a repeating group if more than one species is present on the source landing report.
Species Weight	Landing Weight and State Information	Weight	Aggregated weight of all line items for the same species.
Groundfish Delivery Weight	Landing Weight and State Information	Weight	Aggregated weight of all species codes on the fish ticket, excluding discards and retained

Field	Landing Data Section	Element	Remarks
			and retained.

BSR Discards and Disposition

Field	Landing Data Section	Element	Remarks
Species Code	Landing Weight and State Information	Species Code	
Product Code	Landing Disposition Information	Disposition Code	Only discard disposition codes would map to discard/disposition data
Daily Total Weight	Landing Disposition Information	Weight	
Daily Total Number	Landing Disposition Information	Number of Fish	

5.5 Data Mappings to Agency Needs

The data elements that are available in a landing report can be mapped to the data currently captured in ADF&G, NMFS, and IPHC databases. If a data element in the agency database does not map to an element in the landing report data dictionary it would need to be derived by the agency system or input later by agency personnel.

5.5.1 ADF&G Fish Ticket Database

The ADF&G fish ticket is the central document for landing reports. The ADF&G fish ticket database fields map well to the landing report data

elements, but some fields are added by agency personnel and would need to be derived or input later.

TICKET_BATCH

Field	Landing Data Section	Element	Remarks
OFFICE_CODE			
BATCH_YEAR			
BATCH_NUMBER			
TICKET_START			
TICKET_END			
USER_ID			
DATE_KEYED			
PROOF_DONE			
COMMENTS			
DATE_CREATED_VERIFIED			
PUBLISHED			
DATE_PUBLISHED			

TICKET_HEADER

Field	Landing Data Section	Element	Remarks
OFFICE_CODE			ADF&G Database specific key information
BATCH_YEAR			ADF&G Database specific key information
BATCH_NUMBER			ADF&G Database specific key information
SEQ_TICKET_NUMBER			ADF&G Database

Field	Landing Data Section	Element	Remarks
			specific key information
PERMIT_YEAR_SEQ_CHECK_DIGIT	Identifying information	CFEC Permit Card Seq	Last character
TICKET_YEAR			
PRE_PRINT_TICKET	Identifying information	Fish Ticket Number	
TICKET_TYPE	Identifying information	Fish Ticket Number	First character
PORT_CODE	Identifying information	Landing Port	
PERMIT_FISHERY	Identifying information	CFEC Permit Number Fishery Number	
PERMIT_SERIAL_NUMBER	Identifying information	CFEC Permit Number Id Number	Except for last character
PERMIT_CHECK_DIGIT	Identifying information	CFEC Permit Number Id Number	Last character
PERMIT_YEAR_SEQ	Identifying information	CFEC Permit Card Seq	Except for last character
PERMIT_YEAR_SEQ_CHECK_DIGIT	Identifying information	CFEC Permit Card Seq	Last character
ADF&G_NUMBER	Identifying information	ADF&G Number	
PROCESSOR_CODE	Identifying information	ADF&G Processor Code	All except for last character
PROCESSOR_CODE_CHECK_DIGIT	Identifying information	ADF&G Processor Code	Last character
GEAR_CODE	Identifying information	Gear Code	
DATE_FISHING_BEGAN	Identifying information	Date Fishing Began	

Field	Landing Data Section	Element	Remarks
	information	Began	
DATE_LANDED	Identifying information	Date of Landing	
INTERVIEWED			
STAT_WEEK			
LOGBOOK			
PARTIAL_DELIVERY	Identifying information	Partial Delivery Flag	
MULTI_IFQ_PERMITS	Identifying information	Multiple IFQ Permits Flag	
CDQ_CODE	Identifying information	CDQ Number	
LAST_USER_ID			ADF&G Database specific information, could be special value.
DEWATERED	Identifying Information	Dewatered	Herring specific
PERIOD			Herring and salmon specific
TENDER_ADFG_NUM			Salmon specific
DAYS_FISHED			Shellfish specific
INITIAL_TICKET_NUM			Shellfish specific
INITIAL_PROCESSOR_			Shellfish specific

STAT_WORKSHEET

Field	Landing Data Section	Element	Remarks
OFFICE_CODE			ADF&G Database specific key information

Field	Landing Data Section	Element	Remarks
BATCH_YEAR			ADF&G Database specific key information
SEQ_TICKET_NUMBER			ADF&G Database specific key information
STAT_AREA	Statistical Area Allocation Information	Stat Area	
PERCENTAGE	Statistical Area Allocation Information	Percentage	

PARTIAL_DELIVERY

Field	Landing Data Section	Element	Remarks
OFFICE_CODE			ADF&G Database specific key information
BATCH_YEAR			ADF&G Database specific key information
SEQ_TICKET_NUMBER			ADF&G Database specific key information
PARTIAL_DELIVERY_TICKET	Trip Report Relationship Information	Ticket Number	
PARTIAL_DELIVERY_PROCESSOR	Trip Report Relationship Information	ADF&G Processor Code	

TICKET_ITEM

Field	Landing Data Section	Element	Remarks
OFFICE_CODE			ADF&G Database specific key information
BATCH_YEAR			ADF&G Database specific key information
SEQ_TICKET_NUMBER			ADF&G Database specific key information
ITEM_NUMBER			ADF&G Database specific key information
HARVEST_CODE			
SPECIES_CODE	Landing Weight and State Information	Species Code	
STAT_AREA	Landing Weight and State Information	ADF&G Stat Area	
DELIVERY_CODE	Landing Weight and State Information, Disposition Information	Condition Code, Disposition Code	Splitting of compound field may need to be propagated to this database.
PRICE	Disposition Information	Price	
WHOLE_POUNDS			
POUNDS	Weight and State Information, Disposition Information	Weight, Weight	Use disposition level if available, otherwise parent weight and state level.
AMOUNT	Disposition Information	Amount	

Field	Landing Data Section	Element	Remarks
ANCILLARY_PRIMARY	Disposition Information	Product Designation Code	
HARVEST_AREA			
CODED_COMMENT			
MGT_AREA_CODE			
NUMBER_EACH			
GROUNDS_WEIGHT	Weight and State Information	Weight	Herring specific. This is the weight delivered to the tender.
NUMBER_OF_KELP_BLADES			Herring specific
ROE_PERCENT	Disposition Information	Roe Percent	Herring specific
GROUNDS_ROE_PERCENT	Weight and State Information	Roe Percent	Herring specific
NUMBER_OF_FISH	Weight and State Information	Number of Fish	Salmon and shellfish specific
EFFORT	Weight and State Information	Effort	Shellfish specific
BED_CODE			Shellfish specific
MANAGEMENT_DISTRICT			Shellfish specific

Note: Harvest code could be derived by the system in some cases such as by-catch overage, where the by-catch overage indicator in the weight and state information would provide the needed information. Disposition code could also be used to determine some values such as discarded catch.

5.5.2 IFQ Landing Transaction

The IFQ Landing transaction data is completely provided by the landing report data.

OSIFQLandingStruct

Field	Landing Data Section	Element	Remarks
LogonId			System parameter
Password			System parameter
TransactionType			Constant
AtmSerialNumber			Could be a constant
SoftwareVersion			System parameter
ProcessorId	IFQ Landing Identifying Information	Registered Buyer Number	
VesselId	IFQ Landing Identifying Information	ADF&G Number	
GearType	IFQ Landing Identifying Information	Gear Code	Derive from alphanumeric gear code
FisheryType	IFQ Landing Identifying Information	Fishery Type	
WeightMeasurement			Always P for pounds
PortNumber	IFQ Landing Identifying Information	IFQ Port code	
PermitNumber	IFQ Landing Identifying Information	IFQ Permit Number	
IfqId	IFQ Landing Identifying Information	IFQ Cardholder ID	
PIN	IFQ Landing Identifying Information	IFQ Cardholder PIN	
CardVesselId	IFQ Landing Identifying Information	Card Vessel ADF&G Number	
Species	Landing Weight and	Species Code	

Field	Landing Data Section	Element	Remarks
	State Information	Code	
FishTicketNumber	Identifying information	Fish Ticket Number	
StatArea	Landing Weight and State Information	ADF&G Stat Area	
Area	Landing Weight and State Information	IFQ Regulatory Area	

ProductCatchStruct

Field	Landing Data Section	Element	Remarks
ProductCode	Landing Weight and State Information	Condition Code	
IceSlimeIncluded	Landing Weight and State Information	Ice/slime included flag	
SoldWeight	Landing Weight and State Information	Weight	
RetainedWeight	Landing Weight and State Information	Weight	Retained weight is identified by a landing line item with a delivery code of 87.

ORIFQLandingStruct

Field	Landing Data Section	Element	Remarks
ErrorCode	IFQ Landing Transaction Result Information	Return Code	
DateTime	IFQ Landing Transaction Result Information	Tran Date Time	
Area	IFQ Landing Transaction Result Information	Area	
IfqCatchTransNumber	IFQ Landing Transaction Result Information	Tran Number	
FinalRoundWeight	IFQ Landing Transaction Result Information	Round Weight	This is round weight for sablefish, but contains net weight for halibut.
GearDescription	IFQ Landing Transaction Result Information	Gear Desc	
PortDescription	IFQ Landing Transaction Result Information	Port Desc	
CompanyName	IFQ Landing Transaction Result Information	Permit Holder Name	

5.5.3 IPHC Fish Ticket Data

The IPHC database combines fish ticket data with data provided by IPHC logbooks and CFEC license data. The landing report could electronically provide the fish ticket data for this database.

ldTicket

Field	Landing Data Section	Element	Remarks
Catcde			Not used for commercial and IFQ landings
Dlrcde			IPHC dealer code cross-referenced from Landing Identifying Information - ADF&G Processor Code
Docno			CFEC license data cross-referenced from Landing Information – ADF&G Number
Grcde			Not used
Liccde			Determined from license table by matching Landing Information – ADF&G Number, CFEC Permit Number Fishery Number, and CFEC Permit Number Id Number
Lickey			DB key information
Lnddate	Landing Identifying Information	Date of Landing	
Lndkey			DB key information
Logcde			Created later by matching landing report with logbook information

Field	Landing Data Section	Element	Remarks
Logkey			DB key information
Loglckno			Created later by matching landing report with logbook information
Ntnno			Constant
Ntrdate			System provided
Pkrflg			Packer flag will be hand edited after the data import. Seldom used.
Prtcde			IPHC port code cross-referenced from Landing Identifying Information - Landing Port
Srccde			Constant
Steblkno			N/A
Stedlrcde	Landing Identifying Information	ADF&G Processor Code	
Stegrno	Landing Identifying Information	Gear Code	
Steno			Constant
Stepmtno	Landing Identifying Information	CFEC Permit Number Fishery Number, CFEC Permit Number Id Number	
Steprtcde	Landing Identifying Information	Landing Port	
Sttasncde			
Tkthdr	Landing	Fish Ticket	First 3 characters

Field	Landing Data Section	Element	Remarks
	Identifying Information	Number	
Tktkey			DB key information
Tktno	Landing Identifying Information	Fish Ticket Number	All but first 3 characters
Tktyr	Landing Identifying Information	Processor Year	
Trbno			Tribe number is updated by hand after data entry. For Alaska this only applies to Metlakatla.
Ttlprc			Total price is calculated by summing Landing Disposition Information - Amount
Ttlwgt			Total net weight is derived from ldTicketWeight table, taking into account weigh deduction percentage.
Vslno	Landing Identifying Information	ADF&G Number	
Vslnolen			Derived from ADF&G Number
Wgtded			Weight deduction percentage is determined from the Landing Weigh and State Information – Condition Code and Ice/Slime Included Flag
Tktdate	Landing Identifying Information	Date of Landing	

Field	Landing Data Section	Element	Remarks
	Information		

ldTicketCatch

Field	Landing Data Section	Element	Remarks
Catdate			Not used
Catkey			DB key information
Catwgt			
Statarea			IPHC stat area cross-referenced from Statistical Area Allocation Information – Stat Area
Tktkey			DB key information
Wgtpct	Statistical Area Allocation Information	Percentage	

ldTicketStatArea

Field	Landing Data Section	Element	Remarks
Stearecde	Statistical Area Allocation Information	Stat Area	Statistical Area Allocation Information – Stat Area
Stesubcde			Used if stat area is a salmon stat area
Sttkey			DB key information
Tktkey			DB key information
Wgtpct	Statistical Area	Percentage	

Field	Landing Data Section	Element	Remarks
	Allocation Information		

ldTicketWeight

Field	Landing Data Section	Element	Remarks
Ctgno			
Ctgprc	Landing Weight and State Information	Price	
Ctgwgt	Landing Weight and State Information	Weight	
Tktkey			DB key information
Wgtkey			DB key information
Wgtded			

5.5.4 NMFS Electronic Reporting

The NMFS Shoreside Processor Electronic Log Reporting client transmits data to the Electronic Reporting host application system, satisfying the reporting requirements for the Daily Cumulative Processing Log and the Weekly Production Reports. Much of the data necessary for daily electronic reporting is available in landing reports or Buying Station Reports.

W_SL_RPT

Field	Landing Data Section	Element	Remarks
processing_plant			5 digit Federal Processor Permit Id. Could be a user attribute.
xmit_id			System provided

W_CLIENT

Field	Landing Data Section	Element	Remarks
processing_plant			5 digit Federal Processor Permit Id. Could be a user attribute.
ADF&G_processor_permit	Landing Identifying Information	ADF&G Processor Code	Always the same for a given processing plant
representative			User attribute
phone_number			User attribute
fax_number			User attribute
inmarsat_number			Not used
email_address			User attribute

W_SL_DAILY_ACTIVITY

Field	Landing Data Section	Element	Remarks
processing_plant			Same as header
activity_date			User or system provided
no_production_flag			User supplied

Field	Landing Data Section	Element	Remarks
no_deliveries_flag			User supplied
observers_on_site			User supplied
deleted_flag			System use

W_SL_DAILY_PRODUCT

Field	Landing Data Section	Element	Remarks
processing_plant			Same as header
activity_date			User or system provided
fmp_area_code			User supplied
species_code			User supplied
product_type_code			User supplied
product_code			User supplied
weight			User supplied
deleted_flag			System use

The daily product information refers to production data that cannot be directly derived from landing report data.

W_SL_DELIVERY

Field	Landing Data Section	Element	Remarks
processing_plant			Same as header
activity_date			User or system provided
vessel_ADF&G	Landing Identifying Information	ADF&G Number	

Field	Landing Data Section	Element	Remarks
	Information		
trip_start_date	Landing Identifying Information	Date Fishing Began	
state_proc_code	Landing Identifying Information	ADF&G Processor Code	
port_code	Landing Identifying Information	Landing Port	
buying_station_flag			User supplied
buying_station			User supplied
bs_received_date			User supplied
discard_report_flag	Landing Identifying Information	Discard Report Indicator	
disc_rpt_missing_code			User supplied
deleted_flag			System use

W_SL_DELIVERY_FISH_TICKET

Field	Landing Data Section	Element	Remarks
processing_plant			Same as header
activity_date			Same as header
vessel_ADF&G	Landing Identifying Information	ADF&G Number	
trip_start_date	Landing Identifying Information	Date Fishing Began	
fish_ticket_number	Landing Identifying	Fish Ticket Number	

Field	Landing Data Section	Element	Remarks
	Information		
skipper_cfec_permit	Landing Identifying Information	CFEC Permit Number Fishery Number, CFEC Permit Number Id Number, CFEC Permit Year, and CFEC Permit Card Seq	
fed_gear_code			Derive from state_gear_code
state_gear_code	Landing Identifying Information	Gear Code	
management_program	Landing Identifying Information, IFQ Landing Identifying Information	CDQ Number, IFQ Permit Number	Derive from these two data elements. If neither is present then the user may input AFA Co-op, Research Program, or Exempted Fishery.
account_number	Landing Identifying Information, IFQ Landing Identifying Information	CDQ Number, IFQ Permit Number	If management program is AFA Co-op, Research Program, or Exempted Fishery then user supplies the account number
deleted_flag			System use

W_SL_DELIVERY_PRODUCT

Field	Landing Data Section	Element	Remarks
processing_plant			Same as header

Field	Landing Data Section	Element	Remarks
activity_date			Same as header
vessel_ADF&G	Landing Identifying Information	ADF&G Number	
trip_start_date	Landing Identifying Information	Date Fishing Began	
fish_ticket_number	Landing Identifying Information	Fish Ticket Number	
sequence_number			System determined
stat_area_code	Landing Weight and State Information	ADF&G Stat Area	
species_code	Landing Weight and State Information	Species Code	
product_code	Landing Weight and State Information or Landing Disposition Information	Condition Code, Disposition Code	
price	Landing Disposition Information	Price	
reporting_area_code			Derive from stat area
weight	Landing Weight and State Information or Landing Disposition Information	Weight	
psc_count	Landing Weight and State	Number of Fish	

Field	Landing Data Section	Element	Remarks
	Information		
halibut_mortality			Only used for CDQ
deleted_flag			System use

5.5.5 Data Element Usage Cross-Reference

The following table summarizes the mapping of data elements to agencies who use the data.

Landing Data Section	Element	ADF&G	IFQ	IPHC	NMFS
Landing Identifying Information	ADF&G Number	X	X	X	X
Landing Identifying Information	Vessel Name				
Landing Identifying Information	CFEC Permit Number Fishery Number	X		X	X
Landing Identifying Information	CFEC Permit Number Id Number	X		X	X
Landing Identifying Information	CFEC Permit Resident Flag				
Landing Identifying Information	CFEC Permit Vessel Name				
Landing Identifying Information	CFEC Permit Vessel ADF&G Number				
Landing Identifying Information	CFEC Permit Limited Entry File Number				
Landing Identifying Information	CFEC Permit Fishery Name				
Landing Identifying Information	CFEC Permit Holder Name				
Landing Identifying Information	CFEC Permit Year				X
Landing Identifying Information	CFEC Permit Card Seq	X			X
Landing Identifying Information	CFEC Permit SSN				

Landing Data Section	Element	ADF&G	IFQ	IPHC	NMFS
Landing Identifying Information	CFEC Permit Year of Birth				
Landing Identifying Information	ADF&G Processor Code	X		X	X
Landing Identifying Information	Processor Year			X	
Landing Identifying Information	Processor Company Name				
Landing Identifying Information	CDQ Number				X
Landing Identifying Information	Landing Port	X	X	X	X
Landing Identifying Information	Date Fishing Began	X			X
Landing Identifying Information	Date of Landing	X		X	
Landing Identifying Information	Fish Ticket Number	X	X	X	X
Landing Identifying Information	Gear Code	X	X	X	X
Landing Identifying Information	CFEC Permit Holder Sig Date				
Landing Identifying Information	Processor Rep Name				
Landing Identifying Information	Processor Rep Sig Date				
Landing Identifying Information	Partial Delivery Flag	X			
Landing Identifying Information	Multiple IFQ Permits Flag	X			
Landing Identifying Information	Comments				
Landing Identifying Information	Discard Report Indicator				X
Landing Identifying Information	Dewatered	X			
IFQ Landing Identifying Information	IFQ Permit Number		X		X
IFQ Landing Identifying Information	IFQ Cardholder ID		X		
IFQ Landing Identifying Information	IFQ Cardholder PIN		X		
IFQ Landing Identifying Information	Registered Buyer Number		X		
IFQ Landing Identifying Information	IFQ Port code		X		
IFQ Landing Identifying Information	Fishery Type		X		
IFQ Landing Transaction Result Information	Stat Area		X		

Landing Data Section	Element	ADF&G	IFQ	IPHC	NMFS
IFQ Landing Transaction Result Information	Species		X		
IFQ Landing Transaction Result Information	Area		X		
IFQ Landing Transaction Result Information	Tran Date Time		X		
IFQ Landing Transaction Result Information	Tran Number		X		
IFQ Landing Transaction Result Information	Round Weight		X		
IFQ Landing Transaction Result Information	Gear Desc		X		
IFQ Landing Transaction Result Information	Port Desc		X		
IFQ Landing Transaction Result Information	Permit Holder Name		X		
IFQ Landing Transaction Result Information	Return Code		X		
Statistical Area Allocation Information	Stat Area	X		X	
Statistical Area Allocation Information	Percentage	X		X	
Trip Report Relationship Information	Ticket Number	X			
Trip Report Relationship Information	ADF&G Processor Code	X			
Landing Weight and State Information	Species Code	X	X	X	X
Landing Weight and State Information	Species Description				
Landing Weight and State Information	Size/Grade Desc			X	
Landing Weight and State Information	ADF&G Stat Area	X	X	X	X
Landing Weight and State Information	IFQ Regulatory Area		X		
Landing Weight and State Information	Condition Code	X	X	X	
Landing Weight and State Information	Weight	X	X	X	X
Landing Weight and State Information	Ice/slime included flag		X	X	

Landing Data Section	Element	ADF&G	IFQ	IPHC	NMFS
Landing Weight and State Information	Number of Fish	X			X
Landing Weight and State Information	Effort	X			
Landing Weight and State Information	Remarks				
Landing Weight and State Information	By-catch Overage Indicator				
Landing Weight and State Information	Roe Percent	X			
Landing Weight and State Information	Number of Kelp Blades	X			
Landing Disposition Information	Species Code	X	X	X	X
Landing Disposition Information	Disposition Code	X			X
Landing Disposition Information	Product Designation Code	X			
Landing Disposition Information	Number of Fish				X
Landing Disposition Information	Weight	X		X	X
Landing Disposition Information	Price	X		X	X
Landing Disposition Information	Amount	X		X	
Landing Disposition Information	Remarks				
Landing Disposition Information	Roe Percent	X			

6 Envisioned Solution

Based on the work and data flows described in the user stories and the data requirements modeled in the data definitions, a system can be envisioned that addresses many of the problems identified with the current situation and that would provide significant benefits to both the agencies and their constituents.

6.1 Opportunities

The shore based processing sector provides the greatest opportunity for integrating and automating the collection of landing and production information. Most shore based processors and many buying stations have existing computers and Internet connections that could be used for reporting. Their interest in and willingness to use an electronic reporting system is high. An electronic reporting system could reduce their paperwork, address reporting timing issues in a systematic manner, automate some of the tedious calculations that they currently do, and reduce error rates.

In contrast to shore based processors, at-sea processors have a very different flow of reporting data. While many have computer systems onboard their vessels, their electronic communications channels to the Internet are more limited and much more expensive to use. A solution tailored for the at-sea data flow would be difficult to use for shore based processors. However, since the data required for landing reports is completely available at the end of their processing flow, reporting it electronically could and should be accommodated in the vision system.

Automating data capture on catcher vessels offers to improve the quality of one problematic data element, the statistical area. It also simplifies and improves the quality of at-sea discard reporting. Electronic logbooks are not yet common on catcher vessels. While they will no doubt become more common as time passes, it may be a long time before they are common on smaller catcher boats. However, since some initiatives to employ electronic catcher vessel logs are already underway, using them as part of the landing report input should be a planned enhancement. Electronic logbook data could be used to generate statistical area worksheets and statistical area information for weight and state line items on the landing report.

6.2 Benefits to be Realized

The system envisioned should provide significant benefits to both agency personnel and processors. Management biologists would have an improved source of data for in-season management since the validated, submitted data in the integrated reporting system could be used almost immediately for harvest status reports. Enforcement personnel could also benefit from more timely data, and from an improved ability to view changes and corrections made to landing reports. Agency staff would be relieved of a significant data entry burden. They would spend less time identifying and correcting administrative errors.

As the primary data submitters, processors would have less paperwork to complete to satisfy required reporting. Duplicate entry of data for Fish Tickets, IFQ Landing Transactions, Buying Station Reports, and Daily Cumulative Processing Logs would be reduced or eliminated. Tedious calculations would be automated. The system would prevent many common administrative errors. Data exchange from catcher vessel electronic logs could eliminate effort to record statistical areas and at-sea discards.

Fisheries management is a dynamic area of endeavor. The specific data needed and required for reporting changes with revisions of statues and regulations. The envisioned interagency system will serve as a focal point, keeping the different agencies data collection efforts aligned to avoid confusing, conflicting, or redundant reporting requirements on the data submitters. An electronic system is by its nature easier to modify in response to change than a manual system based on paper forms that must be distributed to submitters. It will also provide a platform on which to build additional data capture subsystems as they may be identified in the future.

6.3 System Vision

This section presents a conceptual model of the system that could be built. The model is modular rather than monolithic. All envisioned components are represented, but not all would be needed for the system to operate and provide benefits. While the landing reports would be very similar to fish tickets, the system vision introduces the concept of an initial landing report. This would contain the identifying information and offload scale weights and could be completed at the end of the offload. Additional disposition data would be added to the submitted initial report later, as it becomes available.

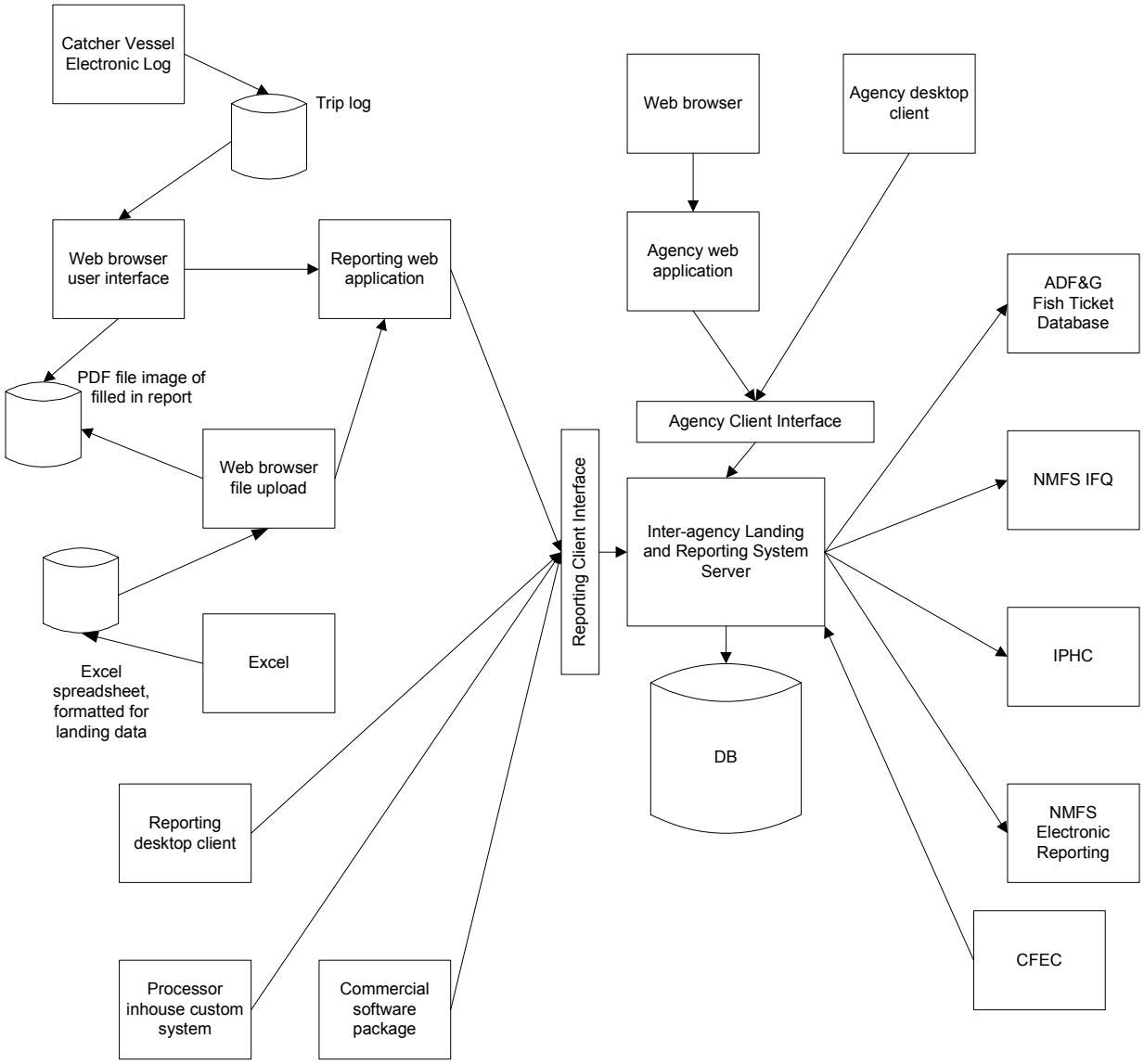


Figure 22

6.3.1 Database

The landing reporting system database is not envisioned as a database of record. Rather, it would function as a staging area for data, which would ultimately be stored in agency databases. However, the landing reporting database could be used by agency personnel for both near real time summary reports and for longer-term electronic reporting usage summaries.

The database would store several types of data. The core of the data would be landing reports. The landing reports would contain data needed

for both the ADF&G fish ticket landing reports and the NMFS IFQ landing reports. The database would also store Buying Station Reports, which are primarily summarizations of landing reports. This data would likewise be derived from landing reports but would be stored separately in order to handle cases where it needed to be supplemented with information from paper fish tickets. The database would also store NMFS electronic reporting Daily Cumulative Production Log data. This data would be derived from the landing reports and buying station reports. However, the data would also need to be stored separately because processors might need to supplement it with data from landings reported on paper fish tickets, and would need to input production data. The NMFS electronic reporting section of the database would store the same data that is stored on the NMFS electronic reporting client.

The database would maintain change history information for all data in the database. Change history information would show the data changed, the date and time of the change, and the identification of the user who made the change.

6.3.2 Integrated Landing Reporting System Server

All access to the database would be done through the central server. It would manage all input client and output system interfaces. The server would enforce consistent business rules across all clients. It would also manage all user authentication and permissions.

6.3.3 Reporting Client Interfaces

Processors and other data submitters have varying degrees of IT sophistication and capability. In order to meet their differing needs a number of client reporting interfaces should be supported.

Web Browser Client

For processors and buying stations with Internet connections, a web browser client would provide an easy to use landing reporting interface. No additional software would need to be installed on their computers. The web browser client would allow them to create a landing report with the vessel operator's permit card, add initial data such as stat area worksheet, add weight and state data, and add disposition data. IFQ landing transactions could be requested for IFQ species. A PDF file of the landing report would be downloaded and printed for card imprinting and signatures. Landing reports could be selected from a list to generate Buying Station Reports or NMFS eLog reports. Buying Station Reports and

eLog reports could also be created and updated with information from landings done on paper fish tickets.

Spreadsheet/Web Browser Upload Client

A variation of the web browser client would be a spreadsheet landing report that could be filled in with report data and then uploaded via the web browser client. This process would allow data to be entered even if the submitter's Internet connection was not available. The uploaded data would be used to populate the database, which could then be accessed by the web browser client to perform other functions such as generating Buying Station Reports and submitting NMFS daily reports.

Desktop Client

Desktop client software would be installed on the submitter's PC. They could create and edit landing reports using the software, and would upload the reports to the landing reporting system database. It would also be able to print landing reports for card imprinting and signatures. Like the web browser interface, it could accept files from a catcher vessel electronic logbook for use in generating stat area worksheets and discard information.

The desktop client software would be similar to the NMFS Electronic Reporting client, and would have many of the same features for daily production reporting in addition to the landing report functions.

The desktop client has advantages in terms of performance and tolerance of short network outages. However, it would be a more complicated option than the web-browser client because it would require software to be installed on submitters PCs with the accompanying configuration issues. It would also require a more sophisticated mechanism authenticating users for generating and storing landing report ID numbers to use, and for validating permit cards. The mechanism for handling electronic logbook input would need to be more complex because of the need for keeping sensitive detail information confidential.

System Interface Client

The same upload interface that the desktop client would use to transfer reports to the integrated landing system server could be used by other systems to submit landing reports. The server interface would be defined using standard Internet protocols and would be a published, open interface. Third-party software could be written to the specification published by the agencies. It would use the interface to upload landing reports. The third-party software could be custom systems that processors

might already use to run their business, modified to support the published interface. Commercial software could also use the interface.

6.3.4 Agency Client Interfaces

In an ideal world, the integrated landing reporting system would feed data into the agency systems in a manner where those systems could be used for all agency needs. However, in actuality, some agency users would need direct access to the integrated reporting system. The agency user clients would display the entire change history of landing reports, which is a feature that would not necessarily be available to report submitters. Agency users would be able to enter landing reports received on paper to populate the automated system with data collected in manual mode. They would also do limited data entry for landing reports generated on the system, recording the receipt of signed paper copies. This would allow the system to determine when signed copies are missing. Agency users would also be able to initiate data transfers to their agency systems, in cases where such transfers are available, on demand. Agency users would be able to run in-season summary reports on landing information in the database.

Web Client

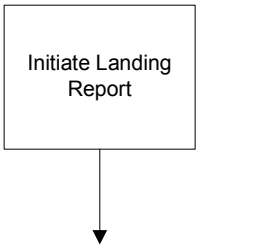
A web client would allow agency users to view and update landing reports from their web browser. Landing reports received on paper could be data entered.

Desktop Client

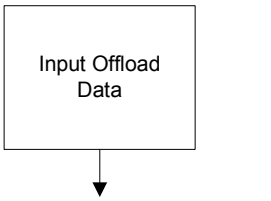
A desktop client would allow agency users to checkout and download one or more landing reports with which to work. They would be able to check back in changed landing reports. They would also be able to download groups of reports without checkout for display and summary reporting. Landing reports received on paper could be entered and uploaded.

6.4 System Data Flow

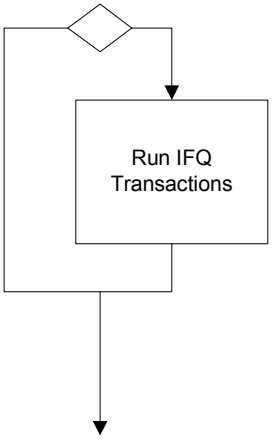
The following diagram illustrates the main reporting flow of the envisioned system. It does not show all variations and report correction flows, but describes the main processing.



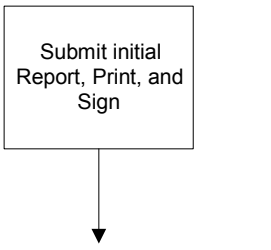
The landing report is initiated when the vessel arrives at the dock. The vessel operator provides their permit card, statistical area(s) fished, and discard information. In cases where the landing occurs at night, the report could be initiated before the vessel arrives and the vessel operator's information could be added later.



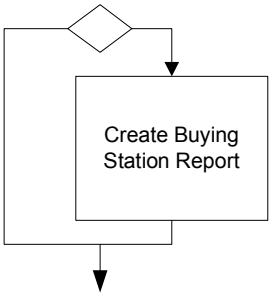
The weight and state data of the offloaded catch is entered as soon after the completion of the offload as is practical. The weight data is the offload scale weight.



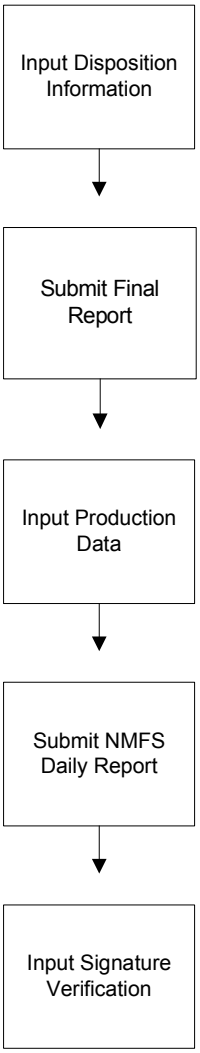
If the landing includes IFQ species, the IFQ landing transaction is executed. IFQ specific information such as the IFQ permit card number and PIN is entered. If the landing is for multiple IFQ permits the landing report can be split into multiple landing reports, one for each IFQ permit. The IFQ transaction process takes the permit information entered and the landing information previously input for the landing report and runs the needed IFQ transactions according to the statistical areas and delivery codes. The data is passed through to the IFQ system. Transaction receipts are printed and signed.



The landing report is submitted as an initial report, is printed, and is signed. In cases where the disposition information is known at the time of offload, this data can be entered before printing and signing. Signed copies are mailed to ADF&G. In some cases, this step is the end of the process, e.g., for shellfish.



If the landing is at a Buying Station, the Buying Station Report is created from the landing report or reports. It is printed so that a hardcopy can travel with the fish to the processing location.



When the fish have been processed and the disposition information is available, it is added to the landing report.

The landing report is submitted as a final landing report.

Production data needed for NMFS electronic reporting is entered into the system.

NMFS electronic reporting report is generated from landing reports, selected buying station reports, and production data. The report is submitted. This step transfers the data to the NMFS Electronic Reporting system.

ADF&G receives signed hardcopies. Receipt and signature verification information is data entered. Verified landing reports are transferred to ADF&G Fish Ticket database

6.5 Functions

The integrated landing system would provide functions for data submitters to submit landing reports, to submit buying station reports, to submit NMFS production reports, and to get summary reports of the data they have submitted. Agency users would have functions to display and update reports, and to view summary reports of activity.

6.5.1 Landing Report Functions

Processors and other data submitters would use landing report functions to make landing reports.

- Create a new initial landing report. The vessel operator would provide their CFEC permit card and personal identification number (PIN). They

could fill in the stat area worksheet and discard information although in some cases the stat area worksheet is not completed until the fish are weighed.

- Create a new initial landing report with electronic catcher vessel logbook data. The vessel operator would provide a diskette with an export file from their electronic logbook. The file would be used to fill in stat area worksheet and discard line items.
- Edit an initial landing report.
- Void an initial landing report. The system would not allow a report to be deleted. The void serves the function of a delete, but the voided record is retained. This process provides a better view of activity, and prevents reuse of the landing report numbers.
- Split an initial landing report for multiple IFQ cards.
- Submit an initial landing report. This would be the event notifying the agencies of the landing. All weight and state information would have been input at this point, and any changes to that information subsequent to the submission would become amendments.
- Print an initial landing report. Print would not be available until submitted as an initial report.
- Submit IFQ landing report(s) from a landing report, initial or submitted.
- Display IFQ balances. This step would be a pass through to the IFQ system balance inquiry.
- Print IFQ landing report receipts from a landing report.
- Submit a landing report.
- Print a submitted landing report.
- Amend a previously submitted landing report. For a landing report that has been submitted as final any change would be an amendment. For submitted initial landing reports only changes to the header information and weight and state information would be amendments.
- Display a list of initial and/or submitted landing reports. This function could be used to identify landing reports that are in need of final submission and which might be overdue.
- Enter a landing report that was done on paper. This allows the submitter to get the information into the database, so that its data can be used in

the NMFS electronic report, and it can be included in summary reports such as the COAR information report.

6.5.2 Buying Station Report Functions

Buying stations would use these functions to create Buying Station Reports from landing reports entered on the system.

- Generate a draft Buying Station Report from a list of initial and/or submitted landing reports.
- Edit a draft Buying Station Report.
- Void a draft Buying Station Report.
- Submit a Buying Station Report.
- Print a Buying Station Report.

6.5.3 NMFS Electronic Reporting Functions

The NMFS electronic reporting functions provide the same capabilities as the existing electronic reporting client, except that the user does not have to enter the delivery information since it is picked up from the landing reports entered on the system.

- Generate a draft Daily Cumulative Production Log from a list of initial and/or submitted landing reports, and Buying Station Reports.
- Edit a draft Daily Cumulative Production Log. This allows the user to correct the report, and allows for adding landings that were not done with the electronic system.
- Report day of inactivity.
- Void a draft Daily Cumulative Production Log.
- Submit a Daily Cumulative Production Log.
- Print a Daily Cumulative Production Log.

6.5.4 Summary Reporting Functions

Summary report functions for data submitters allow them to get their data back in electronic format, and to get summary reports of their activity.

- Download a single landing report as a comma separated values file. This would facilitate importing the landing report into a spreadsheet or database.
- Download a summary report for COAR preparation. This would allow the user to get summary data of buying and production activity needed for the Commercial Operator's Annual Report.

6.5.5 Agency User Functions

Agency users would have functions to manage data on the system, to generate summary reports for management and enforcement, and to enter landing reports into the system.

- Display a landing report with its change history.
- Capture information about the receipt of landing report paper copies that submitters printed from the system to sign and send. The landing report would be updated with date received and signature as seen on the paper copies. This process would be abbreviated data entry from the hardcopy and would serve to close the loop on the receipt of signed documents.
- Update a landing report. Updates could be amendments, which the submitter would see if they displayed the report, or corrections, which would not be visible, for such things as changing stat areas.
- Enter a landing report that was received as a paper fish ticket. In some cases the processor may have already entered the report(for example if landing report was done on paper at a Buying Station, then entered into the system at the processor). In that case, the hardcopy received and signature seen data would be captured.
- Display a Buying Station Report with its change history.
- Update a Buying Station Report.
- Display a Daily Cumulative Production Log.
- Update a Daily Cumulative Production Log.
- Display summary reports. These would be reports useful to in-season managers and enforcement personnel such as activity by species, activity by processor, and activity by vessel.

- Display landing reports with problems. Problems are conditions where the system should allow the data to be input, but where it is somehow invalid, such as a revoked permit number.

6.6 Features

The integrated landing system would provide users many features, including the following.

- Provide an interactive statistical area worksheet. This worksheet would capture the same data as is written on fish ticket stat area worksheets, either pounds or percentages, but the system could then automatically calculate and apply the percentages to the stat areas on line items.
- Provide an average fish weight worksheet. (The system could specify the number of fish to be weighed to establish the average.) This average number could be used to fill in the number of fish column by back calculating from the total weight of the line item. The specifics of this could be used to insure compliance with regulatory requirements.
- On dropdown lists, present the most frequently used choices first. Track what the user uses most frequently.
- Provide a dropdown list for vessel ADF&G number, which the processor could customize to list only those vessels in their fleet.
- Provide a feature to allow a comprehensive landing report to be prepared, and then have it split, if necessary, for multiple CFEC permits and IFQ permits. Allow the split to be by selectable criteria: equally, by percentage, drive one quota to zero, etc. Provide by-catch allocation to the resulting reports that gives the most favorable treatment to the fishers.
- Provide State and Federal by-catch overage calculations that give the most advantageous result to the fisher and processor. Split line items into overage and non-overage line items, and mark the overage items.
- Provide change history for each part of the landing report and line item. This history will allow agency personnel, but not end users, to see each change, perhaps as a crossed out line. Show agency users the changes that a landing report has gone through in its lifetime. This history would include the User ID of the individual who made the change, and the timestamp of when the change was made.
- Detect which landings need IFQ reporting, and provide a button or other easy way to initiate the IFQ landing transactions. Differentiate

sablefish that is state managed and not subject to IFQ reporting from federally managed sablefish. Most detection can be done by CFEC permit fishery. The C61A – Chatham Strait; C61C – Clarence Strait; C4CE, C5AE-DE and C9CE – Prince William Sound fisheries are state managed.

- Derive ADF&G harvest codes from landing report data.
- The system will provide three levels of validation: field validations which must be passed before data is able to be captured, sanity checks which alert the user that data is questionable but which can be overridden, and problem determinations which allow the data to be entered but marked as a problem and which notifies agency personnel of the problem. Field validations would enforce rules for such things as required input, valid range for numeric data, and valid values for code table data. Sanity checks would provide warnings on values such as number of pounds a vessel typically lands, giving a warning if the value is outside a range determined by historic reporting.
- Printing of Fish Ticket type landing report documents to allow card imprint and signature capture.
- Printing and reprinting of IFQ receipt documents to allow signature capture.
- Provide dropdown lists for all coded fields, so that users cannot enter an invalid code.
- For summary reporting, match vessel IDs and dates to associate multiple landing reports as a trip.
- Provide amount totals, with by-catch overage details, so the processor does not have to tabulate amounts separately. Optionally allow them to input deduction line(s) to allow bait sales, fuel sales, and other deductions to be included in total calculations.
- Log when a submitter attempts to create an initial landing report and fails due to validation errors, and record the errors that caused the failure.
- Provide data submitters the ability to create a template landing report with range checks for various fields. These checks would be used to provide custom sanity checks. This feature would be an advanced one that could be used, but would not be required.
- Provide recovery download capability to allow desktop client users to recover their data if their disk failed.

6.7 Agency System Interfaces

Each of the agency systems that require landing data would need to provide a system interface that the integrated landing system could use to transfer data. While the landing reporting system would be interactive, allowing the processors to submit data in near real time, the agency systems vary in their need and capability to handle real-time input. The landing reporting system would provide for impedance matching, controlling the data flow into the system's records at the rates those systems require and can accept it. Each system interface would need to accept new data records, processing them for the receiving system as each agency desires. The landing reporting system would manage the propagation of corrections to previously submitted reports, notifying the agency systems, and passing the updated data according to the specifications for each agency system. Each agency system does not require each data element that the integrated system would capture. The agency system interfaces would process only data elements they need, and would not be notified about changes to data elements they for which they have no interest.

6.7.1 IFQ Landing Reporting

The IFQ Landing Reporting system is a real-time client/server system. The existing client is a card swipe terminal and a web-based client, which is in development. The integrated system would communicate as another client, allowing the data submitter to use the data entered on their landing report to run the IFQ landing transaction. The data submitter would request the IFQ transaction once they had entered all offload data. The IFQ system transaction response would be passed through to them. The response data, as well as input data, would be used to create the IFQ landing receipt.

The existing IFQ card swipe and web clients do not have the capability to update an existing landing report. If data elements used in IFQ reporting were amended on the integrated system, the changed data would be captured in an update log along with information identifying the original transaction. The IFQ system would need to be enhanced to process the update log. Processing could be automatic, based on business rules, or could be user driven, where an agency user views each log record and decides what to do about the changed data.

6.7.2 NMFS Electronic Reporting

The NMFS Electronic Reporting system is a distributed system. The client allows data submitters to enter data for reports. Data is transferred to NMFS as a file, where it is entered into the database with a batch process. The batch process produces a response file for the client. The integrated landing system would act as an additional client with the data submitter initiating the transfer of NMFS electronic reporting data . It would be highly desirable to modify the database load to be a real-time process, so that problems could be immediately reported back to the integrated landing system, and hence to the data submitter.

The existing electronic reporting client allows data submitters to amend previously submitted reports. The integrated system will have to know when amendments to landing reports change data submitted as a NMFS electronic report. The changed report could be automatically resubmitted, or the integrated system could mark the record as needing to be resubmitted and allow the data submitter to initiate the amended report transfer.

6.7.3 IPHC Database

The IPHC system is batch updated weekly with data transfers from the NMFS IFQ system. Fish tickets are manually input on a less frequent basis. The integrated landing system would allow the detailed landing report data to be transferred automatically on the same weekly basis. Transfers would be scheduled to initiate automatically, and could also be executed on demand. The IPHC system will receive a major upgrade in the near future. Its interface to the integrated landing system could be designed to take full advantage of the integrated landing system.

If data elements used in the IPHC database were amended on the integrated system, the changed data would be captured in an update log along with information identifying the original record. The IPHC system would need to be enhanced to process the update log. The amended records could be transferred by the same weekly process as new data. Processing could be automatic, based on business rules, or could be user driven, where an agency user views each log record and decides what to do about the changed data.

6.7.4 ADF&G Fish Ticket Database

The ADF&G database stores fish ticket data for groundfish, shellfish, salmon, and herring. Fish tickets are data entered in batches after they are received by the agency. In some cases, data entry occurs soon after receipt; in other cases, batches are accumulated before data entry. The integrated landing system would allow automatic transfer into the ADF&G database. Landing reports could be batched for entry, and entry could be initiated automatically based on time, or on demand by agency personnel. If records were to be transferred individually this could be part of the same process where the agency user updates report with signature seen indicator.

The Fish Ticket Database interface will need the capability to process changed records. The records could be written to a log that is reviewed by agency personnel before the updated record is written to the Fish Ticket database, or the system could write the updated record to the database automatically.

6.7.5 CFEC Database

The CFEC database stores and manages permit and vessel information. The integrated landing system will need up to date information on permits and vessels to validate input and to derive addition data where practical. The CFEC interface will need to provide permit data to allow all the permit card information to be looked up from the permit number and vessel data to allow the vessel name to be looked up from the ADF&G number.

6.8 Degraded Mode

The envisioned system depends on technology infrastructure that may not be available at all locations where landings are made, and that can experience service outages at locations where it is normally available. For that reason a manual method of reporting must be provided.

6.8.1 Processors in Remote Locations

The existing paper systems should be maintained for use in remote areas, which lack electronic data communications services. The landings in these locations represent a very small portion of both the number of landings and the gross weight of fish landed. Current procedures should be adequate to handle this activity.

- Fish tickets received from remote locations would be entered into the integrated system by ADF&G personnel, or by IPHC personnel for halibut fish tickets. The integrated system would transfer these reports to the agencies' systems using the normal system interfaces.
- IFQ landing reports for remote locations would be made using the existing manual report procedures. When agency personnel enter the associated fish tickets into the integrated system, they would not be used to generate IFQ landings since these would have already been made with the manual procedures.
- NMFS reporting would be done using the paper Daily Cumulative Production Logbook and Weekly Production Report, as is done today in remote locations.

6.8.2 Exceptions and Outages

Processors who normally use the integrated landing system will still have to contend with occasional exceptions and service outages.

- Exceptions could occur where the processor receives fish with a paper fish ticket, for example from a remote buying station. The processor would be expected to enter the fish ticket data into the integrated system. It could then be used for the processor's daily reporting, and would be included in the processors summary reports for COAR data.
- The spreadsheet file upload capability in the envisioned system provides some relief from system outages. The processor would enter the landing report information in a formatted spreadsheet provided by the system. It could be printed and signed as the initial landing report. When the system became available the processor would upload the spreadsheet. The data would be used to create and load an initial landing report. The processor would have to write the landing report identifying number on the paper copies, which would be submitted like the normal paper documents produced by the system for signatures. The spreadsheet data entry capability would not provide as extensive validations as the direct data entry, but would still prevent many common data entry errors and omissions.

6.9 Agency Workflow Changes

The system described in this section will affect the way many agency personnel do their jobs. ADF&G personnel will be most affected, and will see most of the benefit. They will see a significant reduction in the number of

paper fish tickets and landing reports that must be checked and data entered. They will receive the signed paper copies of electronically generated landing reports, and will use the integrated landing system to record the receipt of the reports, and the presence of required signatures. The rest of the data will already be on the system. For landing reports and fish tickets received on paper, they will use the integrated landing system to do the data entry. ADF&G users will continue to use their existing system for summary reports and to analyze historic data., but they should see an improvement in the timeliness of the data. In-season management biologists may elect to use the integrated system for summary reports once they see the ability of the system to capture accurate data quickly.

IPHC staff will also see a reduction in their data entry activities. For landings reported on the integrated system the IPHC system would receive Alaska fish tickets electronically, similar to the way Washington and Oregon fish tickets are received. Since some of the IPHC data requires human interpretation, they will need to review the data on their system and make the necessary inputs. For landings reported using paper fish tickets IPHC staff will data enter the landing information on the integrated system.

NMFS personnel will see the least change with the new system. The electronic reporting database and IFQ system will receive data similar to the way it does today, although with less effort on the part of the submitters. NMFS fishery managers, like their ADF&G counterparts, may elect to use the integrated system for producing summary reports.

7 Challenges

7.1 User Management Challenges

A significant challenge for any large, complex, networked system is that of user management. The challenges of user management are not related to the subject matter with which the system deals, in this case fishery harvest and landing data. Rather, they are related to the management of user information, authorization of users to perform specific functions, authentication of users, and organization of user groups. Challenges needing to be addressed include:

- **Creation of User IDs:** If the system creates a unique ID for each user then the user must remember that ID and the system must be able to handle forgotten IDs. Using email addresses as User IDs is a common tactic to avert this challenge, but that requires all users to have a unique email address.
- **Management of User Accounts:** A decision on who can add, modify, and disable user accounts will need to be made (i.e., data submitters or only agency users).
- **Password Security Requirements:** Are periodic password changes required? What does a user do if they forget their password? If User IDs are email addresses, then forgotten passwords can be emailed presuming that this provides adequate security.
- **Management of Authorizations:** User groups and roles are commonly used to manage authorizations. Do processors have groups of users who can see and modify each other's data? Do agency users have roles that segregate them to their specific agencies' data and interfaces?
- **Tracking of users and user groups:** A decision will need to be made regarding how to track users and user groups and what information needs to be tracked.

7.2 Agency Coordination Challenges

An inter-agency system by nature introduces challenges relating to coordination of activities between the agencies. Specific challenges relate both to what users from each agency can do on the system, and how data and codes are managed:

- **System Development and Support Team:** Since no single agency will own the system it will be a challenge to develop a strong IT team to support the development effort and the system once it is developed. While contract development expertise can provide the bulk of the development staff resources, the close ties of the integrated system with the agency systems make it advisable that the agency IT groups have a presence on the development and support team. Likewise, a user team made up of representatives of the three agencies will be needed to address policy and procedure issues that the system must handle.
- **Data Access:** Can agency users see portions of the data submitted that relate only to other agencies reports, but do not relate to their own?
- **Data Elements**: Some data elements are modify the meaning of others, but are not present on all systems. For example, the Ice and Slime indicator is collected for IFQ landings, but not on fish tickets. This field makes having a consistent definition of weight on all systems complicated. The system could be simplified if it were eliminated.
- **Modifications to Landing Reports:** Rules for agency personnel and data submitters making updates and corrections to landing reports will have to be decided. The vision supports data submitters making amendments to previously submitted reports, agency users updating reports on the integrated landing system, and agency personnel making changes on their own systems. In the first two cases the updates would be made to the integrated landing reports, where all agencies would see the changes. In the last case, where agencies update their own data sets, other agencies would not see the changes. Both updating schemes are needed; therefore, the challenge will be defining the rules and making sure they are followed.
- **Alignment of ADF&G stat areas and NMFS or IPHC regulatory areas:** Can the boundaries of ADF&G stat areas and NMFS or IPHC regulatory areas be aligned? This would facilitate efficient inter-agency reporting.
- **Change Management Challenges:** Of the agencies' personnel, ADF&G IT staff who support the Fish Ticket Database and operational staff who data enter fish tickets will be the most affected if the integrated system is developed. Need to make use of their experience, not have them resist.
- **System Changes:** Changes to the existing agency systems would be necessary to handle unusual situations that are currently handled informally. Would these changes break the automated system or be flagged? For example, the Metlakatla halibut fishery does not require IFQ or CDQ permits or reporting. However, no information exists on the current fish tickets, which the system could use to unambiguously identify these

landings. Additionally, in some cases, the fish tickets for this fisher are filled out and submitted without imprinting a CFEC card. Since the integrated system will require a CFEC card, it might be necessary to create a specific CFEC fishery for use in this case.

7.3 Regulatory Challenges

Most existing regulations of the respective agencies were written before an integrated interagency electronic system was conceptualized. ADF&G is recognized as having the lion's share of the burden; it is understood that the integration will be crafted from the starting point of ADF&G's needs.

- **Modification of current regulations:** Individual entity regulations will need to either be modified to allow for electronic reporting or interpreted to comprehend an electronic system. For example, regulations refer to the step in the paper process where the card must be imprinted on the fish ticket to verify the processor's identity. In the integrated system the processor could be authenticated by password when generating an electronic document. If that fulfills the intent of the requirement, the regulations would need to be changed accordingly.
- **Agreement to share data:** A data sharing agreement will need to be negotiated between the parties. This agreement could address which agency makes corrections to respective data as well as the timing and the notification procedures of such changes or updates.
- **Initial Landing Report Concept:** Regulations currently do not support the concept of initial fish tickets, which will be necessary as the IPHC requires "scale weight at time of offload" rather than later calculated weights. The envisioned system depends on the notion of an initial report that can be submitted shortly after the offload is complete, and a final report that contains the disposition information about the fish and economic data.
- **Requirements for Future Regulations:** The need to continue paper reporting requires that the regulations be crafted so that they are neutral as to which system, paper or electronic, is used for reporting. In the interest of simplifying and maintaining the consistency of the reporting system, encourage using the electronic system.
- **Reporting Timeliness:** Regulations concerning time requirements for reports should be adjusted to best support the ability of the system to capture data in real time, the desire for timely data, and the physical processes involved. In particular, landings that occur outside of business hours may need different time requirements for some reporting elements since it is known that the office staff prepares reports during working normal hours.

- **Single Statistical Reporting Areas:** The multiple promulgation of regulations that would create a single set of statistical reporting areas is possible. However, it is viewed by the respective agencies as unnecessarily cumbersome and awkward. The three agencies currently make the necessary conversions and adjustments to accommodate their respective information data requirements.
- **Previously Submitted Data Download:** Confidentiality regulations may need to be changed, or interpretations made, to allow processors to receive data they have previously submitted. This is necessary for the download of a spreadsheet file containing a landing report just submitted, and for downloading summary reports for use in preparing the COAR.
- **Change of Reporting Timing For At-sea Processors:** The envisioned system would not collect timely data from at-sea processors because current regulations require landing reports from them only when product is offloaded. This is in contrast to shoreside processors, where the landing report occurs between the harvest of the fish and the processing of the fish. Once the system is in place, if at-sea processor data is desired with the same timeliness then regulations would be needed to require more frequent reports.

7.4 Confidentiality Challenges

The confidentiality of harvesting data is protected under several federal laws: the MSFCMA, by statute, protects industry reported data. Additionally, the Trade Secrets Act, The Privacy Act, and specific exemptions in the Freedom of Information Act protect various facets of industry reported data.

While there is no question of the proprietary character of data transmitted directly from the industry representative, either vessel, buying station or processor, to the agency pursuant to the "voluntary" data reporting program (50 CFR 679.5); there continue to be challenges to the NMFS observer collected data. An industry – agency agreement between NMFS and members of the commercial fishing industry to treat the observer data as proprietary has been honored even as the technology for recording and reporting catch has become more sophisticated.

Under Alaska Statute (AS) 16.05.815, ADF&G fish tickets are considered documents of landing, harvest and sale, and are protected from unauthorized disclosure. This information is available to taxing, child support, and fisheries enforcement agencies.

The International Pacific Halibut Commission is an international entity, and its work product and data are not subject to U.S. law. The IPHC treats ADF&G

fish ticket data in the same manner as ADF&G does. It is proprietary and only turned over to the reporting permit holder or the CFEC although individual fish tickets are provided to NMFS Enforcement on request.

Some NMFS observer data is authorized for release under 50 CFR (k 679.50.) It must be blended with industry data to protect its privacy. With the development of the integrated electronic data system, care should be taken to preserve the original character of the data and so maintain the integrity of its proprietary treatment.

7.5 Agency to Data Submitter Challenges

Some challenges are the result of having the data submitter doing the primary data entry for the system.

- **Error Handling:** The integrated system can detect many errors and problems with input data. The agencies must decide what data to accept regardless of input problems. This decision will allow the submitter to actually make required reports even if some data, such as permit information, is invalid. Alternately, the agencies must provide exception-handling procedures for the submitters so they can handle the problem. Failure to do so would provide needless incentive for users to fail to report.
- **Encouraging Use of the Electronic System:** Since the existing paper reporting system must remain in place for submitters who lack the means to report electronically, the agencies must insure that rules for using the integrated system do not provide incentive for continuing to use the paper system. In addition, fishers who are used to signing a blank fish ticket at the beginning of the offload and then leaving may resist the requirement of the integrated system that the landing report be signed at the end of the offload.
- **Reporting Enhancements:** The integrated system will have the capability of supporting reports that are not currently required. For example, the paper fish ticket system has no provisions for processors to pre-notify the agencies about landings. The integrated system could easily support this provision by creating a landing report for a vessel before docking. The need for such a report should be weighed against the incentive it would provide to processors to continue using the paper system if they did not want to make additional reports.
- **Error Correction:** Reporting the wrong vessel ADF&G number is a common problem. The integrated system will display back the vessel name to the data submitter. The challenge will be to determine if that is sufficient to improve the situation.

- **Display of Reports:** Since data submitters will be able to display reports they have made, it will be important to determine whether any data changes made by agency users need to be hidden from them (for example, stat area corrections).
- **Missing Data:** Since the integrated system should be built to work with actual industry practices, it will be a challenge to handle situations where expected data is not available. For example, a generic species code for salmon may be needed to support reporting in Bristol Bay, where determining chum percentages at tenders during offloads is impractical and the actual species determination is made during processing.

7.6 System Challenges

Some challenges emerge when the vision system is considered.

- **Familiarity to Users:** The ADF&G staff who currently data enter fish tickets are familiar with the Fish Ticket Database system. It will be a challenge to make the data entry portion of the agency user interface similar to the Fish Ticket Database data entry windows, to minimize retraining requirements.
- **The use of cards and pins in an online system:** In addition to making regulatory changes required, the agencies need to consider the implications and effectiveness of cards and pins. The credit card industry long ago determined that the identifying number was sufficient for financial transactions (for example, the number given over the phone when ordering from mail-order companies). We determined in the interviews that the IFQ cardholders provide their PIN codes to processors.
- **Confidentiality:** Electronic catcher vessel log confidentiality becomes an issue if the data is passed to the processor in electronic form on a diskette. The file, or some of the data, may need to be encrypted. Stat areas derived from this data may need to be hidden from the processor as well.
- **Validation:** The vision provides for validation sanity checks. Since sanity checks warn the user, but do not prevent data entry, they must be carefully constructed. If sanity checks issue warnings too frequently, they will be ignored -- even when warning of a real problem. If they are not tight enough, then real problems go through without comment.
- **Interface:** The vision provides for an interface that allows data submitters' custom systems to submit landing reports. Since unique landing report identification is imperative, a scheme is needed to prevent the processor's system interface from using duplicate identifiers.

- **Integration:** With the non-integrated systems currently in place, inconsistencies can result from many causes including non-reporting. The integrated system does not provide for this issue since all reporting about a particular landing is done from the same source data. Missing report detection features can identify things such as landing report signature pages which are never received, but this may not provide the same level of missing report discovery as can be had in the existing system with careful research.
- **Up Time:** The system will need to provide 24X7, or perhaps 18X7 service, with on-call technical support.

8 Conclusion

Based on the information we gathered from processors and agency personnel, and on our professional experience, we conclude that an integrated landing reporting system could and should be built. None of the implementation challenges that we have identified appear to be insurmountable. The system envisioned and described in this report would resolve many of the negative aspects of the current situation. The envisioned system would have general benefit for all parties, and has identifiable benefits to specific participants in the landing data collection process. Such a system is technically feasible. Interviews with data submitters show that Internet connectivity is common enough to be used as a reporting channel. We address specific technology issues and recommendations in the accompanying Technology Alternatives report.

The data gathering agencies would see significant benefits from the envisioned system. Data entry efforts would be greatly reduced, since the data entered online by the data submitters would be fed electronically into the various agency systems. Data checking and correcting efforts would likewise be reduced because the validations on initial data entry would prevent many common data errors. In-season management and enforcement personnel would have easier access to more timely data. The envisioned system agency client interfaces would give them visibility to the raw landing data along with its change history sooner than fish ticket data is currently available. This capability would replace the existing informal system of faxing copies of fish tickets or making telephone reports of estimated harvests.

Implementation of the envisioned system would include additional alignment of data codes between agencies, but would allow for differing codes where alignment would be burdensome. Data consistency between agencies would be improved due to the reduction in errors that are corrected independently. The envisioned system provides for common correction of reporting errors, particularly corrections made by data submitters. At the same time it allows for agency specific revision of data. Once in place, the envisioned system will help keep agency reporting requirements aligned by providing a focal point for where the changes will be made.

The envisioned landing reporting system would provide processors and other data submitters with benefits they would recognize. This recognition would promote adoption of the system. The most notable benefit for data submitters would be a reduction in redundant reporting. The envisioned system would allow them to enter data for a landing report similar to a fish ticket. The system would use that data to generate the fish ticket, the delivery and discard portion of

NMFS daily production reporting, and for IFQ species the IFQ landing report. The envisioned system, with its notion of the offload data being distinct from the disposition data, would conform more closely to shore based processors' workflows than the current fish ticket which does not clearly distinguish weight and state data at the time of offload from disposition data, which is the result of processing.

The envisioned system would reduce error rates by eliminating legibility errors, preventing invalid codes being entered, and prompting for confirmation of unusual data values. It would also automate some of the tedious and error prone calculations in landing reports such as by-catch overage calculations and allocating landing weights among multiple IFQ permits. Although the data collecting agencies should make every effort to align their data code values, in cases where it is not possible, the envisioned system would mask this issue from the data submitters, giving them one set of codes to use and automatically translating them when feeding data to the agency systems of record. The envisioned system would provide data submitters with summary data reports, both of individual landings as files they could import into their own systems and spreadsheets, and aggregated summaries which could be used in preparation of COAR reports.

The envisioned system would provide all these benefits to shore-based processors. While at-sea processors' workflow would not allow them to realize benefits related to initial reports, they would benefit from the other aspects of the system. This is particularly true if their production data systems could interface with the reporting system, thus eliminating transcription of data between their custom system and the landing reporting system.

The envisioned system would not immediately solve all identified problems with landing reporting. The accuracy of statistical area information is consistently recognized as a problem area. Statistical area is not determined as a part of the landing process. It is determined when the fish are caught, is remembered, and is reported later when the catch is landed. The envisioned system would improve stat area reporting only to the extent that all stat areas reported would be valid ones, but not necessarily more accurately reported than with the current system. However, the envisioned system would be positioned for future improvements which would affect data quality of stat area reporting, since it could readily be interfaced with electronic catcher vessel logbooks that would record catch location at the time of harvest.

Finally, we believe the envisioned system would benefit all users of the fishery resources because it would provide resource managers with more timely and accurate data, helping them to manage to guideline harvest levels more effectively, allowing fishers to fish more efficiently.

Appendix A Acknowledgements

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Al Didier	PSMFC	Portland
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Jessie Gharrett	NMFS	Juneau
Heather Gilroy	IPHC	Seattle
Ken Hansen	NMFS	Kodiak
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Matt Moir	Alaska Pacific Seafoods	Kodiak
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Bob Olson	Jubilee Fisheries	Seattle
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Appendix B Interview Forms

Data Submitter Interview Instrument

This instrument is intended to aid analysts in acquiring and documenting an understanding of the capabilities and limitations of those entities who submit ADF&G and NMFS landing reports. It is divided into six categories of questions, to help guide the discussion through the general topics which must be covered. During interviews, respondents frequently answer more than one question as they discuss and elaborate on a particular topic. This instrument should be used as a guide to make sure all questions are addressed, but answers may be recorded as the respondent provides them.

Identification

These questions identify the data submitter, the type of operation, and the size in terms of number of reports submitted.

1. What is the name of your operation?

2. What aspect of commercial fisheries are you involved in?

3. What reports do you make to fishery management agencies?

4. How many Fish Tickets do you write annually, per week in season, and daily (high average)?

5. How many IFQ ATM reports do you write annually, per week in season, and daily (high average)?

6. Do you write production logs for NMFS?

7. How many observers does your operation have?

Work Flow

These questions help determine the data submitter's work flow. This information is used to put the data flow in context of the overall fishing or processing operation.

8. What is the sequence of steps of catching, landing, and/or processing fish in your workflow, the generic sequence?

9. What are the normal variations?

10. What variations are time dependent (I.e. occur due to processing during the middle of the night vs. business hours)?

11. How many times in the process do you weigh the fish? Which weights are used for which reports? Do you do anything different for different species?

12. What can go wrong?

13. How is by-catch handled?

14. How do you account for by-catch overages?

Data and Reporting Flow

These questions determine the data capture operations which occur during the process. This is the main information that needs to be gathered, but it should be closely related to the work flow.

15. What information about the work flow do you capture in order to manage your work (I.e. you use the information for your business, rather than just to report because you have to)?

16. Who in your organization fills out and submits ADF&G and NMFS reports?

17. Who captures the information initially on the dock?

18. In the sequence of your work flow how do you capture data for and make ADF&G and NMFS reports?

19. What is the sequence of steps for making ADF&G Fish Ticket reports?

20. What is the sequence of steps for making NMFS halibut and sablefish IFQ/CDQ reports?

21. What is the sequence of steps for making other NMFS reports?

22. At what point in your work flow do you have all the data needed to make the ADF&G and NMFS reports? What happens between that point and when the reports are actually made?

23. What differences in the reporting sequences occur because of time considerations (I.e. occur due to processing during the middle of the night vs. business hours)?

24. What extent, if any, do you use fishery agency reports you have prepared as the source of data for other reports to the same or other agencies?

25. What by-catch data do you capture, whether for reporting or other reasons?

26. Do you make corrections to previously submitted reports? How are corrections made?

27. Do you submit information to ADF&G and/or NMFS, or do you provide it to someone else who makes the reports (I.e. a processor)?

28. To what extent do you already capture the data needed for required reports electronically in your own business systems?

Data Quality and Sensitivity

These questions focus on the quality of the reports and the data itself, identifying data elements which have potential data quality problems, and identifying data which submitters consider sensitive or which otherwise deserves special attention.

29. What can go wrong in making reports?

30. What data fields on reports are most likely to be inaccurate? Why?

31. What business constraints make meeting record keeping and reporting requirements impractical?

32. What things happen which subvert the reporting process (not because of dishonesty, but because of practical considerations? For example, catcher boat skippers sign blank fish tickets for motherships because it is impractical to transfer paperwork back and forth at sea.)

33. Given that all the data asked for needs to be collected, what is inefficient, frustrating, or confusing about the current reporting forms?

34. What data do you capture which must be duplicated in reports to different agencies?

35. What data do you have to provide which you consider proprietary and would prefer others not be able to see? What proprietary data is now exposed to others as a result of the reporting process?

36. Do you need to get the data you submit to the agencies back in the form or reports or summaries? If you need to get the data back today, do you have any problems getting it due to agency confidentiality requirements?

Suggested Improvements

These questions solicit improvement suggestions from the data submitters' perspective. It should be emphasized that we are looking for changes to the process, not changes to the reporting requirements.

37. Given that the data is needed, what suggestions could you make for collecting the data more efficiently and effectively?

38. How could catch and landing data be reported in a more real-time manner?

39. If you are a fisherman, would you be willing to capture data about each catch, particularly if the captured data could be used to streamline the landing reporting process and perhaps keep some data confidential, for example location?

40. What data do you report that you would like to later be able to download electronically for your own business reasons?

41. How willing would you be to enter data electronically rather than on paper? Electronic data entry could be a web site, a PC application provided to you which you would run on your own computer, or an electronic interface which your own business system could use to automatically submit reports.

42. What would be impediments to electronic data capture and reporting?

43. If an electronic reporting alternative required you to print out reports on paper and sign them what problems would you foresee with that requirement?

44. Would you be willing to purchase computer hardware and software in order to use an electronic reporting alternative? How much of an investment would you be willing to make?

Communications and Technological Considerations

These questions are intended to determine the technological infrastructure which might be available to use for automating data capture and reporting.

45. Do you use any form of electronic data capture? If so, what hardware and software do you use?

46. Do you transfer reports to NMFS electronically? How does this work?

47. Do you have an existing Internet connection which could be used to make electronic reports to ADF&G and/or NMFS? How fast and reliable is your Internet connection?

48. What other electronic communications channels do you have which could be used for transferring report data to ADF&G and/or NMFS (I.e. ATM, fax, phone, etc)? How reliable are these connections? What would be the drawbacks of using them.

49. What IT support do you have for creating and modifying software, troubleshooting automated communications, and automating data flows?

Agency Field Office Interview Instrument

This instrument is intended to aid analysts in acquiring and documenting an understanding of the capabilities and limitations of the processes used in agency field offices to acquire and process landing reports. It is divided into six categories of questions, to help guide the discussion through the general topics that must be covered. During interviews, respondents frequently answer more than one question as they discuss and elaborate on a particular topic. This instrument should be used as a guide to make sure all questions are addressed, but answers may be recorded as the respondent provides them.

Identification

These questions identify the field office.

50. What is the name of your operation?

51. What aspect of commercial fisheries management are you involved in?

Work Flow

These questions help determine the respondent's work flow. This information is used to put the data flow in context of the overall activities.

52. What is the sequence of steps of receiving, scrubbing, data entering, correcting, and using reports in your workflow, the generic sequence?

53. What are the normal variations?

54. What can go wrong with the paper fish ticket and logbook process?

55. What can go wrong with the data entry process?

56. How important is timeliness in data entry process?

Opportunities

These questions determine how the front line agency workers believe the system could be improved.

57. If you were not spending time correcting errors on submitted reports what could you be doing to improve the accuracy and effectiveness of the data the reports are intended to capture?

58. What could be done to reduce the number of corrections to reports, that is, what could be done to make the incoming data more accurate?

59. What has kept an integrated NMFS and ADF&G system from being developed in the past?

60. What problems do you see with the way NMFS collects data vs the way ADF&G collects data?

61. What effect would it have if with an integrated reporting system all agencies were held to the highest current standard of confidentiality (i.e. ADF&G's)?

Communications and Technological Considerations

These questions are intended to determine the technological infrastructure that might be available to use for automating data capture and reporting.

62. What electronic communications and software do you use?

63. What Internet and long distance network applications and systems work well at your location?

64. What other electronic communications channels do fishermen and processors have which could be used to transfer data reports to you.

65. What IT support do you have for creating and modifying software, troubleshooting automated communications, and automating data flows?

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