Dual-permit Fishing Operations in the Cook Inlet Salmon Drift Gillnet Fishery

CFEC Report 14-6N
October, 2014
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Abstract

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This report reviews the Cook Inlet salmon drift gillnet fishery, with an emphasis on identifying and describing the fishing activity of dual-permit operations, where two permit holders of Commercial Fisheries Entry Commission limited entry permits opt to fish together on a single vessel and are allowed to use an additional 50 fathoms of gillnet (200 fathoms total). Historically, two permit holders could fish in tandem from one vessel; however, the maximum amount of net that could be fished from a vessel was the same as that of a single permit holder. This changed in 2008 when the Alaska Board of Fisheries implemented a new regulation for dual-permit operations in the Cook Inlet fishery. In this report, a synopsis of the management of the fishery is provided with a summary of current regulations. Historical harvests, earnings, and participation in the fishery are examined, along with the extent to which dual-permit operations have entered the fishery. Patterns of participation by dual-permit operations are detailed, and a discussion of the data used to track dual-permit operations is included.

Acknowledgements

The authors would like to thank Alaska Department of Fish and Game biologists Patrick Shields and Aaron Dupuis for their extensive work to improve the data on catch reporting in Cook Inlet and for their help in preparing this document.

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Introduction

In 1975, the Commercial Fisheries Entry Commission (CFEC) implemented a regulation that limited the number of commercial fishing permits in the Cook Inlet salmon drift gillnet (S03H) fishery, and set the maximum number at 545 permits.[1] At that time, and continuing through the 2007 season, Alaska Department of Fish and Game (ADF&G) regulations allowed a maximum of 150 fathoms of gillnet gear to be fished from an individual vessel.[2] In early 2008, the Alaska Board of Fisheries (BOF) implemented a new regulation that allows two S03H permit holders to fish concurrently from the same vessel and jointly operate up to 200 fathoms of gillnet.[3] The new 'dual-permit operations' were first present in the fishery in 2008.[4]

The dual-permit option was part of an attempt to restructure the fishery to help make it more financially profitable for permit holders, and to help conserve the resource by reducing active fishing gear. The BOF acted in 2011 to expand the area available to dual operations in the Central District of the Upper Cook Inlet Management Area.

This report examines characteristics of the fishery and provides an assessment of the effects of the new regulations for dual-permit operations. The first section provides a description of the drift gillnet fishery, with a synopsis of the fishery management, and provides figures on harvests, estimated gross earnings, and permit holder participation. The second section examines the extent to which dual-permit operations have participated in the fishery. Details on the data sources used to track dual-permit operations are provided. The final section provides a discussion on dual-permit operations from the perspective of fishery managers and fishermen.

Description of the Fishery

Synopsis of Fishery Management

Although many gear types have been used in Cook Inlet since the inception of commercial fishing, ADF&G has managed a drift gillnet fishery since statehood, and has kept separate catch reporting records for drift gillnet gear since 1966. The fishery is restricted to the Central District in the Upper Cook Inlet Management Area, which includes those waters north of the latitude of the Anchor Pt. light (Figure 1). The allowable fishing areas for drift gillnetting within the Central District vary according to the management plans adopted by the BOF, and are divided into numerous statistical areas (Figure 2).

[1] 20 AAC 05.320 (a) established the maximum number of S03H entry permits at 545. Out of 852 applications, a total of 573 permanent S03H permits were issued through the CFEC adjudications process.
[2] 5 AAC 21.331 (c)
[3] 5 AAC 21.333
[4] Dual-permit operations were first authorized by emergency regulations that were put into place due to time constraints before permanent regulations could be adopted.

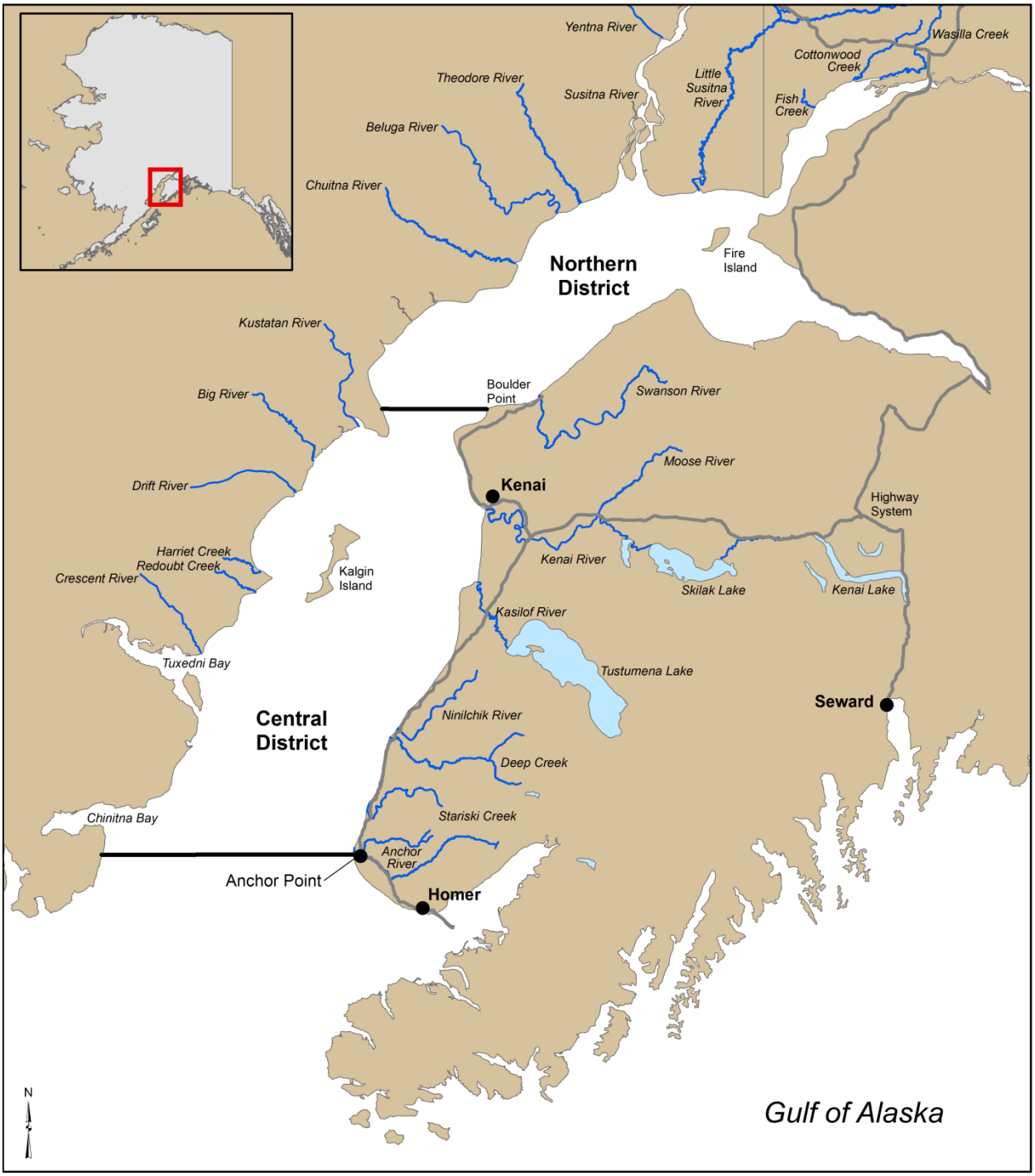

Figure 1. The Cook Inlet drift gillnet fishery is restricted to the Central District of the Upper Cook Inlet management area.

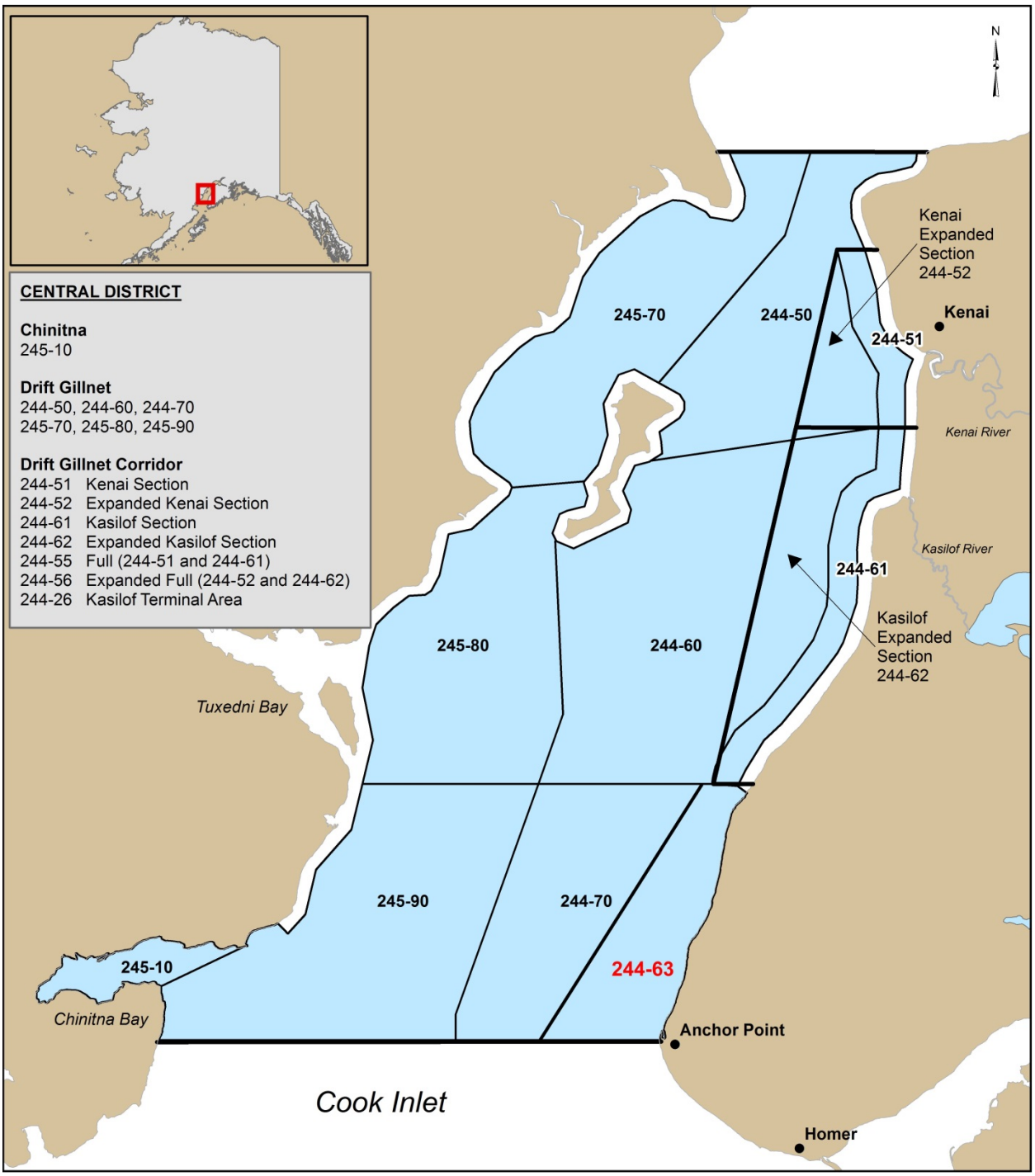

Figure 2. Statistical areas in the Central District for the Cook Inlet drift gillnet fishery. Statistical area 244-63 is a new area implemented in 2014.

The laws and regulations for the Upper Cook Inlet Salmon Drift Gillnet Fishery can be found in Alaska Statutes[5] and the Alaska Administrative Code.[6] The more prominent rules are summarized in the Upper Cook Inlet Commercial Fisheries Annual Management Report, published annually by ADF&G.[7]

Cook Inlet drift gillnets harvest all five species of Pacific salmon, but the fishery is temporally structured to target sockeye salmon. Current regulations open the fishery on or after the June 19. The season remains open in all of the Central District no later than August 15. Sockeye salmon comprise the largest portion of the harvest, and constitute the greatest proportion of the earnings.

The UCI salmon drift gillnet fishery is one of many fisheries managed by biologists from Region 2 of the Commercial Fisheries Division of ADF&G. The fishery receives intensive management, in part because it occurs close to the urbanized Southcentral Region of the state, including the City of Anchorage. The salmon resource in Cook Inlet is under heavy pressure from many user groups, including subsistence, personal use, sport, guided sport charter, and commercial set and drift gillnet fleets. Each group vies heavily for a share of the salmon resource 'pie', resulting in many allocation issues.

To address orderly management of the fisheries, including fishery allocations and biological concerns, the BOF has developed several salmon management plans for UCI. The plans are specific to various salmon species, rivers, and/or fisheries in UCI. Plans that provide ADF&G with guidance on the management of the drift gillnet fishery include:

Kasilof River Salmon Management Plan (5 AAC 21.365)
Kenai River Late-run Sockeye Salmon Management Plan (5 AAC 21.360)
Upper Cook Inlet Salmon Management Plan (5 AAC 21.363)
Central District Drift Gillnet Fishery Management Plan (5 AAC 21.353)
Susitna River Sockeye Salmon Action Plan

To be successful, biologists must monitor not only the catch and escapement in the fishery, but also adhere to the provisions in each of the management plans. However, even the best management plans cannot fully address all the socio-economic or biological issues that might arise inseason; therefore, the Commissioner of ADF&G, or the Department's designee, retains Emergency Order (E.O.) authority to modify time and areas fished to achieve biological ends, such as escapement goals and other management considerations.

Adding to the complexity of managing the Cook Inlet salmon drift gillnet fishery, salmon run timing and migration routes overlap, and harvests contain a mix of species and individual fish stocks. Although a forecast of run size is projected each year prior to the fishing season, the inseason assessments of run size and run timing have the most bearing on the successful outcome of management goals.

Inseason management depends heavily on the results of the Offshore Test Fishery project (OTF) conducted by ADF&G. The OTF provides a real-time index of abundance of sockeye salmon entering UCI during the season. Together with fishery performance and actual passage data, ADF&G further develops the index of abundance into an estimate of the total sockeye salmon run size into UCI. The accuracy of

[5] AS 16.05. and AS 16.10.
[6] 5AAC 21.310 – 5AAC 21.380.
[7] Shields, Pat. 2013. *Upper Cook Inlet Commercial Fisheries Annual Management Report, 2012*. Alaska Department of Fish and Game, Fishery Management Report No. 13 - 21, Anchorage, Alaska.

the estimates improves as the season progresses, as the cumulative amount of OTF and commercial harvest data becomes available. When the Kenai River sockeye salmon total run estimate falls into the range of a weak run (less than 2.3 million fish), the management plans allow a suite of restrictive management measures to the fishery manager. When the estimate falls mid-range (2.3 million to 4.6 million fish), a more expanded suite of measures becomes available, and the broadest suite are available when the estimate shows a strong Kenai River sockeye salmon run (more than 4.6 million fish) Within each set of measures, however, there is the additional challenge to manage for specific salmon stocks in the harvest. Achieving an accurate accounting of the individual stocks that contribute to the harvest and escapement requires additional stock assessments, including:

Inseason enumeration estimates of escapement to the major drainages of UCI
Analyses of historical fishery catch and effort data
Genetic stock identification (GSI)
Age composition analysis performed inseason on sampling of the catch

Each of these other assessments is dynamic and the results can change markedly from one fishing period to the next. As assessments change, swift alteration in the course of management is sometimes necessary. ADF&G may use its E.O. authority to create additional harvest opportunities if assessments are favorable, and will restrict harvests if assessments suddenly become unfavorable. Closures may also be necessary if minimum escapement objectives are not being met.

At times, species other than sockeye salmon become important to the fishery. When surplus escapement occurs in discrete areas in the Central District, drift gillnetting has been opened for species other than sockeye salmon. In one recent example, the Chinitna Bay subdistrict was opened specifically for the harvest of surplus chum salmon. At other times, shortages of a particular species can impact sockeye salmon harvests. For example, in recent years, low returns of Kenai River Chinook salmon have triggered restrictions on commercial harvests to protect the stocks and closures to the set gillnet fishery on the UCI east side, which in turn has resulted in extra fishing time for the drift gillnet fleet to harvest excess Kenai and Kasilof sockeye salmon.

Fishery Management Specific to Dual-permit Operations

Dual-permit operations are subject to nearly all the same fishing regulations as single-permit drift gillnet operations; however, dual-permit operations are excluded from certain areas within the UCI Central District (see the section 'The Dual-permit Operations; Fishing Area'). Fishery managers have indicated that inseason management decisions are not affected by dual-permit activity in the areas that are excluded from or open to dual-permit operations.

Regulations for Dual-permit Operations in Cook Inlet

2007 - 2008 Alaska Board of Fisheries

The dual-permit option first came out of the 2008 BOF Upper Cook Inlet finfish meeting, which was held February 1 - 12, in Anchorage, Alaska. Proposal #107 sought to allow joint ventures with concurrent fishing from one vessel by two permit holders, and allow up to 200 fathoms of drift gillnet gear.[8] The proposal was reviewed before the BOF committee-of-the-whole. Public comment on the proposal was mixed; members of the public, including several fish and game advisory committees, submitted comments both for and against the proposal. ADF&G was neutral on the proposal. In committee, the Board reviewed the ADF&G staff comments, which reported:

The effects of the proposal if adopted could be to increase the efficiency by co-op permit holders [i.e., dual operations] *by approximately 30% during some fishing periods. The overall effect would depend on how many permit holders took advantage of the* [new] *regulation.*

There was consensus from the committee-of-the-whole to support and carry the proposal. Areas open to dual-permit operations were the so-called 'inlet wide' ADF&G statistical areas in the Central District.[9] Passage of the proposal was backed by testimony that economic conditions were poor in the fishery, and that a dual-permit option could help. Amendments to 5 AAC 21.333 took effect on June 30, 2008 as emergency regulations, and were published in Register 187. Technical changes were subsequently made, and permanent regulations were published in Register 188.

2010 - 2011 Alaska Board of Fisheries

The 2011 BOF Cook Inlet finfish meeting was held February 20 – March 5 in Anchorage, Alaska. Proposal #120 sought to expand areas where dual-permit operations could operate, to include the Kenai and Kasilof Sections, but to exclude the Kasilof River Special Harvest Area.[10] ADF&G was neutral on the proposal. In committee, there was no consensus from the Public Panel, and it was recommended that the proposal be tabled until there was action to revise the Upper Cook Inlet Salmon Management Plan. The action taken by the committee-of-the-whole was to carry both the proposal and a revised management plan which continued the Susitna sockeye salmon stock as a stock of yield concern. As such, the ability to direct drift gillnet effort away from Susitna sockeye salmon was desirable. The BOF reasoned that allowing dual-permit drift gillnet operations to fish in both the Kenai and Kasilof Sections could help obtain that goal. Permanent regulations were published in Register 198.

The combined Kenai and Kasilof Sections are commonly referred to as the 'corridor'. The combination of the Expanded Kenai Section and Expanded Kasilof Section is commonly referred to as the 'expanded

[8] State of Alaska website. Alaska Board of Fisheries. October 24, 2014. <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=02-01-008&meeting=anchorage>

[9] The six statistical areas are: 244-50 , 244-60, 244-70, 245-70, 245-80, and 245-90 . When all six areas are open simultaneously, a separate, all-encompassing statistical area is sometimes used on fish tickets.

[10] State of Alaska website. Alaska Board of Fisheries. October 24, 2014. <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=02-20-011&meeting=anchorage>

corridor'. Both the 'corridor' and the 'expanded corridor' became available to dual-permit operations for the first time by the March 2011 BOF action. [11]

2013 - 2014 Alaska Board of Fisheries

The 2013-2014 BOF Upper Cook Inlet Finfish Meeting was held January 31, 2013 through February 13, 2014 in Anchorage, Alaska. Proposal 129 by ADF&G sought to remove the registration requirement for joint operation of drift gillnet gear.[12] The proposal received public support. Action taken by the committee-of-the-whole carried the proposal. The former registration regulation (5 AAC 21.333(b) has now been repealed.

Data Considerations

Each permit holder is required to renew their CFEC permit on an annual basis. Permit holders provide their name, permit number, mailing address, vessel license number, and area they intend to fish.

ADF&G fish tickets are used to record harvests when the fish are sold, and also record the CFEC permit holder's name, the CFEC permit number, and the license number of the harvesting vessel. In a salmon fishery, it is not uncommon for a single vessel to be used by two permit holders in a season, independent of one another on separate occasions.

The vessel license number entered into the electronic fish ticket database does not always reflect the actual vessel used in the fishery. This occurs when the vessel on the CFEC permit card is not the vessel being fished by the permit holder. It can also occur when errors are made at the time the fish ticket is filled out, or when the ticket is data-entered. For this report (and others) CFEC reviewed the vessel license data on fish tickets, and made corrections where necessary.

Until 2013, ADF&G fish tickets did not have a dedicated space to indicate whether a landing was made by a dual-permit drift gillnet operation, or to identify the second permit holder in a dual-permit operation. However, personnel in ADF&G Region 2 recognized the importance of capturing this data, and widely communicated to processors and fishermen that they should record the second permit number of a dual operation in some fashion somewhere on the fish ticket. [13] Despite these dedicated efforts, the full extent of dual-permit operations was not captured. In many cases when fish tickets were filled out, only one of the two permit holders in a dual operation was written on the ticket; in other cases, permit holders who were known to have fished in a dual-permit operation were not recorded by fish buyers anywhere on fish tickets for the entire season. This situation was most prevalent in the first two years (2008 and 2009) following implementation of dual-permit regulations.

[11] The Corridor is comprised of ADF&G statistical area 244-51 in the Kenai Section and statistical area 244-61 in the Kasilof Section . When both sections of the Corridor are open simultaneously, the statistical area is noted as 244-55 on fish tickets.

[12] State of Alaska website. Alaska Board of Fisheries. October 24, 2014. <www.adfg.alaska.gov/index.cfm?adfg=fisheriesboardmeetinginfo&date=01-31-2014&meeting=uci>

[13] Without a defined space to record the permit number of the secondary permit holder, fishermen and processors were asked to record the number along the margins or on the back side of the fish ticket.

As a result of the ambiguities in identifying dual-permit operations, in 2013 the A-series fish tickets were altered to include a check-box to identify fishery landings made by dual-permit operations, and to add a defined space where the second permit number in dual operations can be recorded. Although 81% of the landings from the 2013 fishery were recorded on the new fish tickets (some old stock of fish tickets continued to be used), and improvements to catch accounting were made, there continued to be anomalies in the data.

In addition to fish tickets, from 2008 through 2013, dual-permit operations were also recorded on an ADF&G vessel registration list that was required by BOF regulations.[14] However, even these efforts likely fell short of capturing the full extent of dual-permit operations, especially during the first two transition years after the regulations were adopted. Sometimes, permit holders misreported the second permit number on the registration list. In other cases, dual-permit operations failed to register altogether. Additionally, some of the vessels and permits that registered do not appear at all on fish tickets. The registration requirement was eliminated by the BOF in 2014, largely in response to the implementation of the new fish ticket design.

We cross-referenced the ADF&G dual-permit registration lists with fish ticket data and investigated all inconsistencies. When possible, corrections were applied to a reconstructed database. ADF&G staff were very helpful in these efforts. However, sometimes the data were simply nonexistent in one source or the other, making cross-referencing and resolution of inconsistencies impossible. Again, this was especially true for the years 2008 and 2009. Some corrections involved making assumptions which are detailed in the forthcoming section *Identifying dual-permit operations*.

Nomenclature

This report will use some specific terms to describe dual-permit operations:

The term *'D' boats* will be used to refer to the vessels used in dual-permit operations.

Collectively, a vessel and permit holder(s) combination (either single-permit and/or dual-permit) are termed *'fishing operations'* or *'operations'*.

Single-permit operation will refer to an individual permit holder fishing a legal unit of gear (up to 150 fathoms of gillnet) from a single vessel.

Dual-permit operation will refer to a unique combination of two Cook Inlet drift gillnet permit holders who fish concurrently from the same vessel and jointly operate up to 200 fathoms of drift gillnet gear. Note that a single vessel can be involved in more than one dual operation if either or both of the dual permit holders change.

The two permit holders on a 'D'-boat will receive separate designations that correspond to what they provided on the ADF&G registration list for dual-permit operations. One permit holder will be referred to as the *primary permit holder,* while his/her dual-permit partner will be referred to as the *secondary permit holder.*

[14] 5 AAC 21.333(b) [now repealed] stated that both permit holders shall register with ADF&G prior to fishing.

ADF&G Registration of Dual-permit Operations and Fish Ticket Reporting

As mentioned, vessels ('D'-boats) and permit holders in a dual-permit operation were required to register with ADF&G, and fish buyers were asked to use fish tickets to document the CFEC permit numbers of both persons in dual-permit operations. ADF&G encouraged all who were considering a dual-permit operation to register, but the registration did not require that the vessel had to fish as a 'D'-boat. The combined data from ADF&G 'D'-boat registrations and ADF&G fish tickets reveal at least four situations that came out of these requirements:

1) A vessel was properly registered as a 'D'-boat, and fish tickets show the vessel did indeed act in a dual-permit operation with two permit holders documented as having made landings, for a portion, or all, of the season. These are referred to herein as *registered dual operations,* or *registered duals.*

2) A vessel was not registered as a 'D'-boat with ADF&G, but fish tickets show two permit holders fished concurrently on the vessel in a dual-permit operation during some portion, or all, of the season. These are referred to herein as *unregistered dual operations*, or *unregistered duals.*

3) A vessel was registered as a 'D'-boat, but there are no landings associated with that vessel in fish tickets, indicating the vessel did not participate in the fishery whatsoever.

4) A vessel registered as a 'D'-boat, but fish tickets show a single permit holder operated the vessel throughout the season. Herein, these are referred to as *dual registered / single operations*. The *dual registered / single operations* can occur under at least two further scenarios:

    a) The two permit holders who registered apparently changed their strategies, but did not de-register themselves and their vessel (not a requirement). The permit holders did not fish together; they each fished the season independently as single-permit operations.

    b) The vessel actually performed as a 'D' boat; however, landings are recorded in fish tickets on one permit only. This is legally permissible, but as such, the fish ticket data fails to adequately capture that it was an active dual-permit operation and that a second permit was in the operation.

Therefore, among the permit holders registered for the 'D' boats, it is possible that either one or both of the permit holders appeared on fish tickets. Three different scenarios occurred in the data:

i. In many cases, both permit holders fished concurrently throughout the season whenever the vessel performed as a 'D'-boat. This is the best-case scenario, and was due to the resolve of the ADF&G Area Management Biologists and fish buyers to get both permits captured in some fashion on the paper fish tickets.

ii. Only one permit holder is noted to have made landings on the 'D'-boat for the entire season. The secondary permit holder never appeared on the operation's fish tickets, although the vessel likely performed in a dual-permit operation because it registered as such prior to the season.[15]

[15] Note that prior to 2013, there was no dedicated space on ADF&G fish tickets for capturing the permit number of the secondary permit holder. Beginning 2013, a space was provided on A-series fish tickets.

iii. Both permit holders are noted on fish tickets, but only one at a time on the 'D'-boat and at different points during the fishing season: the primary permit holder is on fish tickets for the 'D'-boat' on landing #1; the secondary permit holder is on the 'D'-boat's fish ticket for landing #2; etc.

Table 1 illustrates these complexities. In 2012 for example, 66 operations registered 'D'-boats with ADF&G. For 51 of these, fish tickets show both permit holders fishing concurrently. Of the remaining registered operations, fish tickets show 11 boats where the primary permit holder is the sole representative on tickets, and 3 other operations for where the primary and secondary permit holders recorded landings independent of one another on a 'D'-boat at different points in time in the season.

Table 1 also shows 10 additional vessel / permit holder combinations with landings as *unregistered dual operations* in 2012. For each of the ten operations, fish tickets show two permit holders fishing concurrently from a common vessel; however, none of the ten vessels or permit holder combinations appear on the 2012 ADF&G registration list for dual-permit operations.

Table 1. Vessels ('D'-boats) used in dual-permit operations in the Cook Inlet Salmon Drift Gillnet Fishery and the results of ADF&G fish ticket reporting.

		Category of Fish Ticket Reporting			
Year	Total 'D'-boats on ADF&G Registration	'D'-boat Represented by Both Permit Holders Concurrently	'D'-boat Always Represented by a Sole Permit Holder	'D'-boat Represented by Both Permit Holders Independently	'D'-boats in Unregistered Dual-operations
2008	37	9	21	7	0
2009	35 [1]	20	12	2	1
2010	56 [2]	42	9	4	13
2011	66	53	7	6	14
2012	66 [3]	51	11	3	10
2013	61 [4]	52	8	0	15

[1] *One vessel registered twice as two different operations.*

[2] *One registered vessel does not appear in the fish ticket data; therefore, the sum of the categories does not add to this total.*

[3] *One vessel was registered twice when one of the original permit holders emergency transferred his/her permit to another individual. Additionally, the categories do not sum to the total because one boat registered but is not in the fish ticket data.*

[4] *One boat registered twice prior to the season and only the second registration appears in fish ticket data. Additionally, the categories do not sum to the total because a second boat registered but is not in the fish ticket data.*

Identifying dual-permit operations

As outlined above, it is challenging to identify dual-permit operations in the fish ticket data. In addition to the complexities and misalignment of ADF&G 'D'-boat registration lists and fish tickets, the everyday realities of fishing come into play: dual-permit operations can move into and out of the 'D' boat configuration even within a given week of fishing; partnerships can change; permit holders can use more

than one boat; and merely registering a boat as a dual-permit operation does not guarantee that the two permit holders followed through with their initial plans.

To help identify 'D'-boats and unique dual-permit operations, we looked closer at the data for the dual registered/single-permit operations. Recall that two permit holders, a primary and secondary, register for a dual-permit operation. We applied our attention to the secondary permit holder who registered – the person who is never represented on fish tickets with the registered 'D'-boat.

This group of secondary permit holders falls into two categories, the first of which are the secondary permit holders who *never appear in fish tickets for any vessel whatsoever* throughout the season. ADF&G and CFEC employees personally contacted these permit holders to inquire about their fishing activity in each of the years 2010 through 2013. In every case, the permit holder confirmed that he/she was indeed present on the vessel, and that the boat fished as a dual-operation while they were on it.

In the other category, secondary permit holders from 'D'-boat registrations *do* appear in tickets, but *not on fish tickets associated with a registered 'D'-boat*. It is entirely possible the two permit holders who registered a 'D'-boat at the start of the season may have changed their plans. As such, they each fished separate boats and they each filled out separate fish tickets. The registered secondary permit holder was never associated with a 'D'-boat on fish tickets in any fashion.

We applied the following decision rule to determine which vessel and permit holder combinations should be identified as dual-permit operations:

A dual-permit operation is:	1) A boat registered with ADF&G as a 'D'-boat, and both the primary and secondary permit holders recorded fish ticket landings from the boat, either independently or concurrently; or,
	2) A boat registered with ADF&G as a 'D'-boat, and the primary permit holder recorded a fish ticket landing from the boat, and the secondary permit holder verbally confirmed they were onboard; or,
	3) A boat was <u>not</u> registered with ADF&G as a 'D'-boat, but two permit holders recorded concurrent fish ticket landings from the boat

As Table 1 shows, the data is complicated. To identify dual-permit operations, many different scenarios must be considered. While the exact extent of dual-permit operations may be difficult or perhaps impossible to ascertain solely from the data, the above rule defines the dual-permit operations used in this report. The rule is conservative: it excludes the ADF&G registered operations where the secondary permit holder is never confirmed to have been associated with a 'D'-boat landing (either on fish tickets or through direct communication) and instead appears to have made landings only on his/her own vessel. Note that if those same two registered permit holders did indeed fish together on a 'D'-boat (meaning that fish tickets were filled out incorrectly) then this definition would under-estimate the annual number of dual-permit operations.

Table 2 compares the results of the dual-permit decision rule used in this report with a more liberal interpretation that would include the sum of *all* permit holders associated with registered and unregistered 'D'-boats. The second more liberal interpretation would represent an upper bound of

possible dual-permit operations in a year. Note that the annual upper limits may still be under-estimated if fish tickets were filled out incorrectly and failed to capture the full extent of unregistered 'D' boat operations.

Table 2. Comparison of Two Methods of Identifying Dual-permit Operations in the Cook Inlet Salmon Drift Gillnet Fishery.

Year	Defined Dual-permit Vessels	Upper Limit Dual-Permit Vessels
2008	16	37
2009	23	36
2010	67	69
2011	78	80
2012	69	76
2013	68	76

The dual-permit operations defined by the decision rule forms the basis of a reconstructed database used for this report. In the database, there remain extenuating circumstances with the 2008 and 2009 data. Basic harvest statistics are markedly different between the data for dual-permit operations in 2008/2009 and in the subsequent years 2010 – 2013. Dual-permit operations are likely under-represented in 2008 and 2009 to a greater extent than other years, both in the counts of 'D' boats and permits, and in the full accounting of the fish ticket landings made by dual-permit operations.

Because of these issues, only summary information is presented for years 2008 and 2009. For more detailed analyses, this report selectively focuses on the 2010 – 2013 data. The circumstances for selective use of data for dual-permit operations are fully explored in Appendix A.

Participation, Harvests, and Earnings in the Fishery

Methodology

The tables in this report were created from the CFEC gross earnings database, which in turn is derived largely from ADF&G fish ticket data. The data were queried for commercial landings made by S03H permits from 2008 to 2013.[16] For this report, the authors applied a correction process to the data to clean up errors, such as mistakes in the vessel license number, and foremost, corrections made on dual-permit operations. These procedures may result in figures that vary from other reports by CFEC or ADF&G.

Fishery Participation

Table 3 presents participation in the Cook Inlet salmon drift gillnet fishery, with total harvests and revenue, average harvests and average gross earnings, the estimated ex-vessel sockeye salmon price,

[16] 'Commercial landings' are defined as traditional fishing where the product was sold. Excluded are harvests associated with test fishing, personal use, confiscated catches, discards, or any other harvests where the product was not sold.

and the CFEC estimated S03H permit value. From 2000 through 2013, the number of S03H permits with recorded landings ranged from a low of 396 (69% of the total of 570 fishery permits in 2006) to a high of 539 (95% of the total of 569 fishery permits in 2013). The 539 permits in 2013 is an adjusted figure stemming from the reconstructed database; the adjustment accounts for the secondary permit holders in dual-permit operations who participated in the fishery but who were not accounted for in fish tickets, per the previous section *Identifying Dual-permit Operations*.

Participation fluctuates for many reasons, including the forecast of salmon run sizes and perceptions of market conditions and ex-vessel prices. Table 3 indicates the lowest number of permits fished was in 2006, coinciding with the lowest total harvest. Permits fished and average gross earnings trended upward beginning in 2009, likely from favorable market conditions and ex-vessel salmon prices. Also, Kenai River Chinook salmon returns in recent years have been low, which resulted in highly restrictive management measures for the set gillnet fishery but liberal fishing time for drift gillnet. This extra time likely resulted in additional participation in the drift gillnet fishery.

Through 2007, the annual number of vessels and permits fished were very similar. Beginning with the first year of the dual-permit option in 2008, the number of vessels became considerably less than the number of permits fished, and the difference increased markedly from 2010 through 2013. Overall, the number of permits in the fishery was highest in 2013. The number of vessels fished also went up over the same period; however, to a smaller degree than the number of permits.

Table 3. Permit holders and vessels participating in the Cook Inlet salmon drift gillnet fishery, with total commercial harvests and gross earnings, average harvests and gross earnings, estimated ex-vessel sockeye salmon price, and estimated S03H permit value, 2000 – 2013.

		Permits fished			Totals		Permit holder averages (adjusted*)			
Year	S03H permits renewed	Un-adjusted	Adjusted* for dual-permit operations	Vessels fished	Commercial Harvest (pounds)	Gross earnings (nominal)	Avg. Harvest (pounds)	Avg. Gross earnings (nominal)	Ex-vessel sockeye price**	CFEC estimated permit value
2000	576	513	513	510	6,414,163	$4,438,593	12,503	$8,652	$0.887	$32,300
2001	574	467	467	466	6,256,255	$3,711,269	13,397	$7,947	$0.655	$22,300
2002	572	409	409	409	12,635,440	$5,686,049	30,893	$13,902	$0.565	$11,700
2003	572	418	418	412	10,891,761	$6,329,162	26,057	$15,142	$0.632	$15,700
2004	571	440	440	435	19,336,476	$11,798,178	43,947	$26,820	$0.694	$20,300
2005	571	471	471	468	17,142,608	$15,251,702	36,396	$32,578	$0.945	$39,300
2006	570	396	396	396	6,125,229	$5,159,160	15,468	$13,028	$1.096	$28,800
2007	570	417	417	415	13,409,028	$12,759,634	32,156	$30,599	$1.027	$29,200
2008	569	426	433	415	7,577,541	$7,823,008	17,500	$18,067	$1.180	$35,200
2009	569	404	416	388	7,758,421	$8,202,181	18,650	$19,717	$1.223	$27,600
2010	569	378	419	353	12,896,974	$19,300,530	30,780	$46,063	$1.750	$31,700
2011	560	462	498	427	21,982,454	$30,378,044	44,141	$61,000	$1.418	$51,700
2012	562	496	530	461	23,684,009	$30,546,478	44,687	$57,635	$1.445	$76,400
2013	569	496	539	473	13,040,140	$25,750,246	24,193	$47,774	$2.250	$83,100

**Adjusted refers to the total number of permits fished, including both permits used in defined dual-permit operations*

***Indicates the CFEC estimated ex-vessel price per pound paid for Cook Inlet drift gillnet sockeye salmon delivered in the round, in nominal dollars. 2013 data is preliminary. Harvest data is restricted to commercial catches. Excluded are harvests from test fishing, personal use, confiscated, or harvests taken but not sold.*

Fishery Harvests Summary

Upper Cook Inlet salmon runs vary in number by species and from year to year, and annual harvests vary accordingly, although external factors do come into play (weather, fishery allocations, etc.). From 2000 through 2013, harvests in the fishery ranged from a low of 6.1 million pounds (2006) to a high of 23.7 million pounds (2012). ADF&G manages the fishery according to abundance, and when necessary restricts the amount of time and area open to fishing, which directly influences annual harvests. All salmon species are reflected in the annual totals, but sockeye salmon represent an average 84% of the commercial harvest. Since 2000, the largest UCI sockeye salmon run was in 2011, with an abundance estimate of 8.6 million fish.

Fishery Earnings Summary

From 2000 through 2013, total gross earnings in the fishery ranged from a low of $3.7 million in 2001, to a high of $30.5 million in 2012 (nominal dollars). Average gross earnings in 2001 were lowest as well, at only $7,947 per permit holder. Average gross earnings were highest in 2011 at $61,000 per permit holder. The averages use the adjusted annual number of permits fished (the adjustments account for the secondary permit holders in defined dual-permit operations).

Average gross earnings reflect the combined influences of number of permit holders in the fishery with ex-vessel salmon prices and size of the harvest. For example, the average gross earnings in 2001 were the lowest over the time period, because the ex-vessel price for sockeye salmon was relatively low at $0.655 per pound, the participation rate was 81% (467 out of 574 permits), and the commercial harvest was a relatively low 6,256,255 pounds.

The Dual-Permit Operations

When viewing results in this section, readers are advised of the selective use of data for dual-permit operations. This report presents only summary information for the 2008 and 2009 data, and selectively focuses on the 2010 – 2013 data for more detailed analyses of dual-permit operations (see the section *Identifying Dual-permit Operations* and Appendix A for more explanation).

Fishing Area

The areas open to dual-permit operations have changed over time. From 2008 through 2010, the only areas open to dual-permit operations were the so-called 'inlet wide' ADF&G statistical areas in the Central District. Neither the Kenai Section nor the Kasilof Section were open to dual-permit operations from 2008 through 2010. For any weeks in which fishery openings were exclusive to the Kenai and/or Kasilof Sections, no fishing could be done by a dual-permit operation.

Regulations changed in 2011, when the Kenai and Kasilof Sections became available to dual-permit operations. In the combined Kenai and Kasilof Sections, a narrow stretch of water offshore of the Cook Inlet eastside is referred to as the 'Corridor'. The eastside shore itself is reserved for the operation of set gillnets. In the same sections, the 'Expanded Corridor' has the same shoreward boundary, but encompasses a broader seaward swath of water than the 'Corridor' (now commonly known as the 'Narrow Corridor').

Permits Renewed vs. Permits Fished

CFEC regulations require that permits be renewed each year. If a permit is not renewed for two consecutive years, it can be cancelled. Although permits must be renewed, they do not have to be fished. It is important to note that permit holders may have actively fished, but may not have recorded landings on their permits. This can occur if the permit holder simply fails to catch any fish,[17] or if a dual-permit operation is recorded on one permit only. *In this report, the number of permits fished includes permits that were confirmed to have been in the fishery as part of a dual-permit operation per the decision rule found in the report section 'Identifying dual-permit operations'*.

Vessels ('D'-boats)

From 2008 through 2013, dual-permit operations were required to register their vessel ('D'-boat) with ADF&G prior to fishing. On the fishing grounds, regulations require 'D'-boats to display their CFEC license plate number followed by the letter 'D'. When dual-permit operations dissolve, they are required to strike the 'D' from the side of the vessel. Changing in and out of the 'D'-boat configuration can and does occur inseason. In fact, management actions commonly dictate whether fishermen decide to fish as a dual-permit operation or not. For example, in 2010 ADF&G held a fishery opening in the Kasilof Section only. Because regulations at the time prohibited 'D'-boats in that section, a dual-permit operation would have needed to reconfigure back to a single-permit operation to fish in that particular opening.

Over the course of a fishing season, a single vessel might be the platform for more than one combination of dual-permit operators, as permit holders are free to change partnerships. As such, the number of 'D'-boats in a year is often different than the number of individual dual-permit operations. For the same reason, the number of dual-permit operations is not necessarily half of the number of permit holders.

When fishing in the 'D'-boat configuration, there can be more mechanical demands on the vessel. The longer length of net (200 fathoms) adds additional strain when retrieving or towing the net, especially while fishing strong currents and riptides. Table 4 compares characteristics of vessels that fished either full or part-time as 'D'-boats with vessels used only in single-permit operations. Out of a total of 575 unique vessels used in the fishery from 2008 to 2013, 134 were 'D'-boats at some point in time, while 441 were used only as single-permit boats. The 'D'-boats tend to be newer (average year built was 1984), larger (average of 37.7 feet LOA and 14.7 net tons), and with larger engines (average horsepower of 417).

Table 4. Attributes of vessels used in the Cook Inlet salmon drift gillnet fishery from 2008 – 2013.

Vessel attributes	'D'-boats (n = 134)	Never a 'D'-boat (n = 441)
Mean year built	1984	1979
Mean length overall	37.7 feet LOA	34.1 feet LOA
Mean engine horsepower	417 HP	334 HP
Mean net tonnage	14.6 Tons	10.4 Tons

[17] 5 AAC 39.130 requires that all fish caught and kept, whether sold or personal use, be recorded on a fish ticket.

Fishing Operation Types

Table 5 shows three different fishing operation types used from 2008 through 2013 in the Cook Inlet drift gillnet fishery: 1) vessels fished exclusively as single-permit operations for the entire season; 2) vessels that fished exclusively as dual-permit operations for the entire season; and, 3) vessels used as both single-permit and dual-permit operations intermittently in the same season (intermittent single/dual). This last operation type includes many different scenarios, one of which could be a dual-permit operation that disbanded at the conclusion of the sockeye salmon season and continued to fish as a single-permit operation later in the year.

In each year, the number of vessels in dual-permit operations is far surpassed by the number of vessels in single-permit operations. However, the number and percentage of 'D'-boats has increased, from 16 or 4% of the total number of vessels participating in 2008, to 78 (18%) in 2011 and 68 (14%) in 2013. Possible reasons for the increase are discussed later in this report.

Table 5. Fishing operation types in the Cook Inlet salmon drift gillnet fishery; number of vessels by year, 2008 to 2013.

			Dual-permit operations		
Year	Total vessels	Single-permit operation	Exclusively dual	Intermittent single/dual operations	Total
2008*	415	399	1	15	16
2009*	388	365	2	21	23
2010	353	286	4	63	67
2011	427	349	16	62	78
2012	461	392	25	44	69
2013	473	405	16	52	68

** Data is incomplete on the dual-permit operations*

Table 6 presents the same fishing operation types as Table 5, with the annual harvests for each type from 2000 - 2013. Because the option for dual-permit vessels began in 2008, harvests from 2000 to 2007 are by single-permit operations only. After the dual-permit option became available in 2008, and continuing through 2013, the bulk of the annual harvests continued to be made by the exclusive single-permit operations. During the 2010 to 2013 period, the intermittent single/dual operations account for 14% to 27% of the annual harvests, while exclusive dual-permit operations account for 1% to 7%.

Table 7 presents the same three fishing operation types with annual harvests by ADF&G statistical week. Some weeks are aggregated to protect confidential data when the number of vessels or permit holders is low. In any given week, the exclusive single-permit operation group outnumbers and harvests more than the other types. Among dual operations, intermittent single/dual operations typically outnumber and harvest more than the exclusive dual-permit operations (except for a very minor harvest amount in week 25 in 2012). Through the years, 'D'-boats fished only in statistical weeks 25 through 34, which coincides with the sockeye salmon fishery. This suggests that there is some aspect of the sockeye salmon fishery (the volume and fast pace are speculated) where 'D'-boats are advantageous.

Table 6. Fishing operation types in the Cook Inlet salmon drift gillnet fishery; number of vessels and harvests by year, 2000 to 2013.

	Exclusive single-permit operation				Exclusive dual-permit operation				Intermittent single/dual operation				Totals	
Year	Vessels	Pct.	Pounds	Pct.	Vessels	Pct.	Pounds	Pct.	Vessels	Pct.	Pounds	Pct.	Vessels	Pounds
2000	510	100%	6,414,163	100%	0	0%	0	0%	0	0%	0	0%	510	6,414,163
2001	467	100%	6,256,255	100%	0	0%	0	0%	0	0%	0	0%	467	6,256,255
2002	409	100%	12,635,440	100%	0	0%	0	0%	0	0%	0	0%	409	12,635,440
2003	412	100%	10,891,761	100%	0	0%	0	0%	0	0%	0	0%	412	10,891,761
2004	435	100%	19,336,476	100%	0	0%	0	0%	0	0%	0	0%	435	19,336,476
2005	468	100%	17,142,608	100%	0	0%	0	0%	0	0%	0	0%	468	17,142,608
2006	396	100%	6,125,229	100%	0	0%	0	0%	0	0%	0	0%	396	6,125,229
2007	415	100%	13,409,028	100%	0	0%	0	0%	0	0%	0	0%	415	13,409,028
2008	399	96%	7,058,809	93%	1	0%	*	*	15	4%	*	*	415	7,577,541
2009	365	94%	6,927,560	89%	2	1%	*	*	21	5%	*	*	388	7,758,421
2010	286	81%	9,343,156	72%	4	1%	126,897	1%	63	18%	3,426,921	27%	353	12,896,974
2011	349	82%	16,107,360	73%	16	4%	1,083,369	5%	62	15%	4,791,725	22%	427	21,982,454
2012	392	85%	18,623,212	79%	25	5%	1,766,203	7%	44	10%	3,294,594	14%	461	23,684,009
2013	405	86%	10,227,167	78%	16	3%	686,575	5%	52	11%	2,126,398	16%	473	13,040,140

**Confidential*

1) Data is incomplete on the dual-permit operations in 2008 and 2009

2) Harvest data is restricted to commercial catches. Excluded are harvests from test fishing or personal use, confiscated harvests, or other harvests taken that were not sold.

Table 7. Fishing operation types in the Cook Inlet salmon drift gillnet fishery; number of vessels and harvests by ADF&G statistical week and year, 2008 to 2013.

		Exclusive single-permit operation				Exclusive dual-permit operation				Intermittent single/dual operation				Totals	
Year	Week	Vessels	Pct.	Pounds	Pct.	Vessels	Pct.	Pounds	Pct.	Vessels	Pct.	Pounds	Pct.	Vessels	Pounds
2008[1]	25-37	399	96%	7,058,809	93%	1	0%	*	*	15	4%	*	*	415	7,577,541
2009	26-38	365	94%	6,927,560	89%	2	1%	*	*	21	5%	*	*	388	7,758,421
2010	26	73	72%	29,708	61%					29	28%	19,219	39%	102	48,927
	27	176	75%	242,233	66%					56	24%	121,383	33%	234	365,943
	28	243	79%	1,663,589	71%					62	20%	639,415	27%	308	2,328,444
	29	266	80%	3,056,541	74%					63	19%	1,026,157	25%	332	4,131,155
	30	275	81%	2,452,054	73%	4[2]	1%	126,897[2]	1%	62	18%	878,450	26%	341	3,377,500
	31	257	80%	1,400,966	73%					62	19%	505,146	26%	320	1,909,457
	32	190	77%	392,800	67%					57	23%	192,965	33%	248	586,097
	33	83	73%	56,367	67%					30	27%	28,215	33%	113	84,582
	34-37	14	78%	48,898	75%					4	22%	15,971	25%	18	64,869
2011	26	95	74%	31,044	64%	5	4%	2,784	6%	29	22%	14,726	30%	129	48,554
	27	215	77%	228,386	64%	10	4%	20,677	6%	54	19%	110,376	31%	279	359,439
	28	307	80%	572,695	69%	16	4%	57,288	7%	59	15%	196,501	24%	382	826,484
	29	337	81%	4,922,968	74%	15	4%	313,704	5%	62	15%	1,389,759	21%	414	6,626,431
	30	342	82%	7,973,298	73%	15	4%	542,988	5%	62	15%	2,370,272	22%	419	10,886,558
	31	327	81%	1,971,460	74%	15	4%	120,079	4%	62	15%	578,330	22%	404	2,669,869
	32	223	79%	371,614	72%	9	3%	22,005	4%	50	18%	119,057	23%	282	512,676
	33-34	42	70%	30,367	65%	4	7%	3,844	8%	14	23%	12,704	27%	60	46,915
	35-36	5	100%	5,528	100%	0	0%	0	0%	0	0%	0	0%	5	5,528
2012	25	23	70%	2,520	63%	4	12%	890	22%	6	18%	621	15%	33	4,031
	26	121	77%	99,778	67%	12	8%	16,029	11%	25	16%	32,906	22%	158	148,713
	27	295	82%	560,508	73%	23	6%	80,088	10%	42	12%	126,185	16%	360	766,781
	28	365	84%	2,069,916	78%	24	6%	197,901	7%	44	10%	382,224	14%	433	2,650,041
	29	381	85%	10,715,258	79%	23	5%	967,691	7%	44	10%	1,855,567	14%	448	13,538,516
	30	378	85%	4,745,281	79%	22	5%	452,443	8%	44	10%	830,947	14%	444	6,028,671
	31	267	84%	321,963	80%	20	6%	35,120	9%	30	9%	46,966	12%	317	404,049
	32-37	86	77%	107,988	75%	10	9%	16,041	11%	16	14%	19,178	13%	112	143,207
2013	25-26	331	84%	888,340	75%	15	4%	72,507	6%	50	13%	220,353	19%	396	1,181,200
	27	392	86%	1,885,917	79%	15	3%	131,017	5%	51	11%	374,147	16%	458	2,391,081
	28	399	86%	4,740,528	79%	15	3%	294,373	5%	52	11%	953,319	16%	466	5,988,220
	29	389	85%	2,016,662	78%	14	3%	139,541	5%	52	11%	427,829	17%	455	2,584,032
	30	288	84%	374,810	73%	13	4%	34,962	7%	41	12%	103,009	20%	342	512,781
	31	86	87%	117,958	93%	4	4%	2,016	2%	9	9%	7,509	6%	99	127,483
	32	153	80%	106,070	70%	8	4%	12,159	8%	31	16%	32,500	22%	192	150,729
	33-37	44	92%	96,882	93%	0	0%	0	0%	4	8%	7,732	7%	48	104,614

**Confidential*

[1] Data is incomplete on the dual-permit operations in 2008 and 2009.

[2] Total for all weeks 26 through 37.

Harvest quantiles for the dual-permit operations

Table 8 presents harvest quantiles for the vessels in single and dual-permit operations. To calculate the quantiles, the vessels are ranked highest to lowest by their total annual harvest. Then the vessels are classified into ten ranked groups, with each group comprised of approximately the same number of vessels. The number of vessels in the quantiles is less than ten in some years to maintain the confidentiality of harvest data when the number of vessels is low. The average harvest of each quantile group is calculated. Average quantile harvests for dual-permit operations in Table 8 includes the combined harvests of exclusive dual operations and intermittent single/dual operations.

The harvest quantiles from the years 2010 – 2013 are the focus. In all quantiles, vessels in dual-permit operations harvested more than the respective single-permit operations. This is not unexpected given that catch performance is often a function of the amount of gear deployed, and a dual-permit operation has the advantage to legally use 200 fathoms of net, while a single-permit operation is restricted to 150 fathoms (a 1.33 : 1 difference).

Along with average quantile harvests, the table also indicates the differences between the average harvests of dual-permit and single-permit operations, expressed as a ratio. When the ratio (pounds-dual to pounds-single) exceeds 1.33 : 1 (the advantage in length of net for duals), it signifies a greater catch-per-unit-of-effort for the dual-permit operations. As an example, the tenth quantile in 2011 indicates that the average harvest of dual-permit operations was 110,691 pounds, compared to 78,761 pounds averaged by their counterparts in single-permit operations. The ratio of these harvests is 1.4 : 1, suggesting that, on average, the catch-per-unit effort is greater for dual-permit operations than for single-permit operations.

The ratio of average harvest pounds for dual operations to single operations is greater than 1.33 for all quantiles in all years, with two exceptions in quantile 10 in 2012 and 2013. This means dual-permit operations almost uniformly have a greater catch-per-unit-effort, regardless of the quantile. As such, it suggests additional fishing effectiveness of dual-permit operations stemming from the ‘D’-boats beyond the additional amount of gear. The previous section indicates that ’D’-boats are, on average, larger in size and have greater horsepower.

Table 8. Harvest quantiles in the Cook Inlet salmon drift gillnet fishery, by operation type 2008–2013.

		Single-permit Operations		Dual-permit Operations		
Year	Quantile	Vessels	Average pounds	Vessels	Average pounds	Ratio of pounds dual- to single-
2008	1	99	6,307	4	14,543	2.3
	2	100	13,570	4	24,252	1.8
	3	100	19,510	4	33,814	1.7
	4	100	31,264	4	57,074	1.8
2009	1	73	7,257	4	23,134	3.2
	2	73	14,218	5	30,435	2.1
	3	73	18,228	4	34,401	1.9
	4	73	23,140	5	39,308	1.7
	5	73	32,055	5	50,401	1.6
2010	1	28	6,133	6	22,358	3.6
	2	29	16,651	7	35,556	2.1
	3	28	23,352	7	40,310	1.7
	4	29	26,952	6	45,627	1.7
	5	29	30,059	7	50,382	1.7
	6	28	34,028	7	55,801	1.6
	7	29	38,629	6	58,981	1.5
	8	28	43,564	7	62,964	1.4
	9	29	48,095	7	69,711	1.4
	10	29	58,406	7	84,136	1.4
2011	1	34	12,845	7	32,240	2.5
	2	35	29,503	8	52,717	1.8
	3	35	35,622	8	63,378	1.8
	4	35	38,952	8	68,664	1.8
	5	35	42,791	8	74,658	1.7
	6	35	47,738	7	79,024	1.7
	7	35	52,780	8	84,495	1.6
	8	35	57,905	8	89,156	1.5
	9	35	63,681	8	93,274	1.5
	10	35	78,761	8	110,691	1.4
2012	1	39	12,610	6	21,074	1.7
	2	39	27,409	7	49,925	1.8
	3	39	35,081	7	56,046	1.6
	4	39	40,845	7	63,920	1.6
	5	40	44,719	7	73,726	1.6
	6	39	48,431	7	80,547	1.7
	7	39	54,203	7	83,998	1.5
	8	39	59,320	7	89,208	1.5
	9	39	65,151	7	98,218	1.5
	10	40	86,386	7	109,321	1.3
2013	1	40	8,426	6	12,695	1.5
	2	41	14,464	7	25,962	1.8
	3	40	17,975	7	31,334	1.7
	4	41	20,829	7	35,794	1.7
	5	40	22,998	7	41,833	1.8
	6	41	25,126	6	42,873	1.7
	7	40	27,980	7	47,714	1.7
	8	41	30,784	7	51,588	1.7
	9	40	34,831	7	56,115	1.6
	10	41	48,767	7	63,884	1.3

1) The number of quantiles was reduced in 2008 and 2009 to protect confidential data.
2) Data for dual-permit operations is incomplete for 2008 and 2009.
3) Harvest data is restricted to commercial catches. Excluded are harvests from test fishing or personal use, confiscated harvests, or other harvests taken but not sold.

Earnings of the dual-permit operations

Table 9 displays annual harvests, total gross earnings, and average gross earnings for all fishing operation types in the fishery. Average gross earnings are consistently highest for dual-permit operations (both exclusive dual and/or intermittent single/dual), with one exception in 2010.

For example, the average gross earnings in 2013 were $82,309 for exclusive dual-permit operations and were $79,966 for intermittent single/dual operations. This contrasts with average earnings of $50,062 for single-permit operations. Of note is that average earnings among intermittent single/dual operations are often higher than the earnings for the group of exclusive dual-permit operations. Also, the data indicate that the number of intermittent single/dual operations in a year far surpasses the number of exclusive duals, and so appears to be used to some advantage.

While a dual-permit operation represents the fishing activity of two individuals, the table shows there is *not* a doubling of the average gross earnings over a single-permit operation. Recall that dual-permit operations are not allowed twice the amount of gillnet; they are restricted to just 1/3 more net (200 fathoms total) than a single-permit operation (150 fathoms total).

Further, an *individual permit holder* in a dual-permit operation does not necessarily make half of the earnings shown in the table, for reasons other than the normal law of averages. One reason is the nature of a dual-permit operation as a business arrangement between two fishermen. The arrangement is not necessarily an equal 50:50 sharing between partners. Often, the principal permit holder provides the boat and the gear for the operation, and he/she may also have the preponderance of boat knowledge and fishing experience as well. Anecdotally through personal communications with a small number of fishermen, a 70:30 split of the proceeds appears to be a common arrangement (70% to the principal permit holder: 30% to the secondary permit holder).

Table 9. Cook Inlet salmon drift gillnet fishery annual harvests (pounds), total gross earnings, and average gross earnings from 2000 to 2013, by fishing operation type.

	Exclusive single-permit operation				Exclusive dual-permit operation				Intermittent single/dual operation				Totals			
Year	Vessels	Harvest Pounds	Total gross earnings	Average gross earnings	Vessels	Harvest Pounds	Total gross earnings	Average gross earnings	Vessels	Harvest Pounds	Total gross earnings	Average gross earnings	Vessels	Harvest Pounds	Total gross earnings	Average gross earnings
2000	510	6,414,163	$4,438,593	$8,703	-	-	-	-	-	-	-	-	510	6,414,163	$4,438,593	$8,703
2001	467	6,256,255	$3,711,269	$7,947	-	-	-	-	-	-	-	-	467	6,256,255	$3,711,269	$7,947
2002	409	12,635,440	$5,686,049	$13,902	-	-	-	-	-	-	-	-	409	12,635,440	$5,686,049	$13,902
2003	412	10,891,761	$6,329,162	$15,362	-	-	-	-	-	-	-	-	412	10,891,761	$6,329,162	$15,362
2004	435	19,336,476	$11,798,178	$27,122	-	-	-	-	-	-	-	-	435	19,336,476	$11,798,178	$27,122
2005	468	17,142,608	$15,251,702	$32,589	-	-	-	-	-	-	-	-	468	17,142,608	$15,251,702	$32,589
2006	396	6,125,229	$5,159,160	$13,028	-	-	-	-	-	-	-	-	396	6,125,229	$5,159,160	$13,028
2007	415	13,409,028	$12,759,634	$30,746	-	-	-	-	-	-	-	-	415	13,409,028	$12,759,634	$30,746
2008	399	7,058,809	$7,296,413	$18,287	1	*	*	*	15	*	*	*	415	7,577,541	$7,823,008	$18,851
2009	365	6,927,560	$7,331,712	$20,087	2	*	*	*	21	*	*	*	388	7,758,421	$8,202,181	$21,140
2010	286	9,343,156	$14,011,010	$48,990	4	126,897	$188,123	$47,031	63	3,426,921	$5,101,397	$80,975	353	12,896,974	$19,300,530	$54,676
2011	349	16,107,360	$22,269,953	$63,811	16	1,083,369	$1,497,593	$93,600	62	4,791,725	$6,610,498	$106,621	427	21,982,454	$30,378,044	$71,143
2012	392	18,623,212	$24,037,963	$61,321	25	1,766,203	$2,257,502	$90,300	44	3,294,594	$4,251,012	$96,614	461	23,684,009	$30,546,478	$66,261
2013	405	10,227,167	$20,275,081	$50,062	16	686,575	$1,316,949	$82,309	52	2,126,398	$4,158,216	$79,966	473	13,040,140	$25,750,246	$54,440

**Confidential*
Data is incomplete on the dual-permit operations in 2008 and 2009
Harvest data is restricted to commercial catches. Excluded are harvests from test fishing or personal use, confiscated harvests, or other harvests taken but not sold.

Persistence of dual-permit operations

Table 10 presents a frequency distribution of the number of weeks fished in a season by vessels in dual-permit operations. No 'D'-boat made landings in more than nine weeks out of a possible total 13 weeks of the fishery. Focusing on 2010-2013, the greatest frequencies for weeks fished is four to seven weeks, which is approximately the duration of the sockeye salmon fishery. Conversely, the frequencies are also relatively high for fishing only one week as a 'D- boat'. This suggests that many dual-permit operations can be very short-lived within a season. Recall that dual-permit operations, as defined here, include both exclusively dual and intermittent dual/single permit groups.

Table 10. Frequency distribution of the number of weeks fished by vessels in dual-permit operations in the Cook Inlet salmon drift gillnet fishery, by year 2008 - 2013.

	Number of weeks									
Year	1	2	3	4	5	6	7	8	9	Total
2008*	3	2	3	2	2	3	0	0	1	16
2009*	6	3	1	1	6	4	1	0	1	23
2010	9	5	4	7	10	18	7	7	0	67
2011	10	3	7	11	13	14	17	2	1	78
2012	7	4	2	13	19	10	11	3	0	69
2013	8	9	5	7	13	17	7	2	0	68

**Data is incomplete on the dual-permit operations.*

Table 11 illustrates the patterns of year-to-year participation by 'D'-boats (vessels) and permit holders in dual-permit operations. The data is restricted to the 2010-2013 time period.

Over the entire period, 130 unique vessels recorded landings as a 'D'-boat in at least one year. Their dual-permit participation was either full-time or intermittent. Of the grand total of 130 'D'-boats, 51 participated as a 'D'-boat in only one year, 29 in two years, 27 in three years, and 23 were a 'D'-boat in all four years. Over the same period, 411 other vessels recorded landings in the Cook Inlet drift gillnet fishery, but never did so as part of a dual-permit operation.

Similar statistics are provided for permits with landings recorded in the fishery. Two-hundred forty-four (244) unique permits were used by either a primary or secondary permit holder in a dual-permit operation at least once during the 2010-2013 period. Again, these permits could have been used on a 'D'-boat that fished either intermittently or full-time. Another 304 permits recorded landings in the fishery, but never did so in a dual-permit operation. Of the 244 permits in dual-permit operations, 85 were a part of a dual operation for one year, 62 were two years, 48 were three years, and 44 participated on a 'D'-boat in all four years.

The frequencies can be used to quantify the general persistence dual-permit operations across years. Among the 130 unique 'D'-boats over the 2010-2013 period, 18% (23) persisted for the full four years, while 38% (50/130) participated *at least three years (*the sum of 'D'-boats with four years (23) and three years (27) participation, respectively). In a similar way, 61% (79) of the 'D'-boats persisted for two or more years.

Table 11. Frequency distribution of yearly participation for total unique vessels (left) and total unique permit holders (right) in dual-permit operations in the Cook Inlet salmon drift gillnet fishery, 2010–2013.

Vessels (D-boats)			Permits		
Number of Years in Dual	Year Combination	Number of Vessels	Number of Years in Dual	Year Combination	Number of Permits
1	13-	17	1	13-	22
	12-	10		12-	11
	11-	9		11-	19
	10-	15		10-	33
	Total	51		Total	85
2	13-12-	7	2	13-12-	18
	13-11-	2		13-11-	4
	13-10-	1		13-10-	5
	12-11-	6		12-11-	11
	11-10-	13		12-10-	1
	Total	29		11-10-	23
				Total	62
3	13-12-11-	12			
	13-12-10-	2	3	13-12-11-	26
	13-11-10-	4		13-12-10-	2
	12-11-10-	9		13-11-10-	6
	Total	27		12-11-10-	14
				Total	48
4	13-12-11-10-	23			
			4	13-12-11-10-	49
2010-2013	Total Unique Vessels in Dual-Permit Operations	130	2010-2013	Total Unique Permits in Dual-Permit Operations	244
2010-2013	Total Unique Vessels Never in Dual-Permit Operations	411	2010-2013	Total Unique Permits Never in Dual-Permit Operations	304

The persistence of permits used in dual-permit operations can be quantified similarly. Out of a grand total of 244 permits that fished in dual-permit operations from 2010 through 2013, 20% (49) persisted for the full four years; 40% (97/244) persisted three or more years; and 65% (159/244) fished in a dual operation either full-time or intermittently for two or more years.

Although not shown in the table, a total of 9 permits and 4 D-boats were used in a dual-permit operation in all six years from 2008 through 2013 (recall that data for 2008 and 2009 is incomplete).

Emergency Transfers

If a holder of a limited entry permit is unable to participate in a fishery due to a medical condition or some other unforeseen and temporary hardship, then CFEC regulations allow a temporary transfer of their permit to another individual. Table 12 shows the annual number of emergency transfers (ET) of permits in the Cook Inlet drift gillnet fishery from 2000 through 2013. The table also indicates the number of ETs associated with dual-permit operations (which includes intermittent single/dual and exclusively dual operations). The rate of ET's among dual-permit operations is somewhat higher than for all drift gillnet permits. For example, the rate of ET use in 2013 was 10.6% by permits in dual-permit operations, but was 9.1% for the fishery as a whole.

Table 12. Use of emergency transfer S03H permits in the Cook Inlet drift gillnet fishery, by all fishing operations and by the dual-permit operations, 2000–2013.

	Permits for all operations (adjusted)			Permits for dual-permit operations		
Year	With Landings	Emergency Transfer (ET)	Rate ET	With Landings	Emergency Transfer (ET)	Rate ET
2000	516	44	*8.5%*	-	-	-
2001	470	40	*8.5%*	-	-	-
2002	410	28	*6.8%*	-	-	-
2003	420	25	*6.0%*	-	-	-
2004	440	29	*6.6%*	-	-	-
2005	477	36	*7.5%*	-	-	-
2006	400	18	*4.5%*	-	-	-
2007	418	20	*4.8%*	-	-	-
2008*	433	25	*5.8%*	32	4	*12.5%*
2009*	416	27	*6.5%*	46	4	*8.7%*
2010	419	28	*6.7%*	133	16	*12.0%*
2011	498	44	*8.8%*	152	18	*11.8%*
2012	530	53	*10.0%*	132	13	*9.8%*
2013	539	49	*9.1%*	132	14	*10.6%*

**Data is incomplete for dual-permit operations.*

Residency

Table 13 presents five resident types of permit holders in the Cook Inlet drift gillnet fishery and shows their participation in either single-permit operations (single-) or dual-permit operations (dual-). In Table 13, 'dual-permit operations' collectively includes permit holders who fished in either exclusive dual or intermittent single/dual operations. The resident types are determined by the domicile of the permit holders in each respective year.[18] The table shows that for both single and dual operations, Alaska Rural Locals (ARLs) constitute the largest number of permit holders in all years. Also for both operation types, Alaska Urban Locals (AULs) are the second-largest number in most years.

[18] Explained in detail in CFEC report 14-2, *Changes in the Distribution of Alaska's Commercial Fisheries Entry Permits, 1975 – 2013.*

Table 13. Resident type of permit holders in the Cook Inlet salmon drift gillnet fishery, by operation type and year 2008–2013.

Year		Alaska Rural Local (ARL)	Alaska Rural Non-local (ARN)	Alaska Urban Local (AUL)	Alaska Urban Non-local (AUN)	Non-resident	Totals
2008*	Single-	152	9	124	2	114	401
	Dual-	22	0	4	0	6	32
2009*	Single-	147	6	105	4	108	370
	Dual-	29	2	11	0	4	46
2010	Single-	106	5	90	3	82	286
	Dual-	78	4	25	1	25	133
2011	Single-	137	5	98	3	103	346
	Dual-	90	4	33	1	24	152
2012	Single-	163	9	111	5	110	398
	Dual-	77	4	24	1	26	132
2013	Single-	168	8	115	7	109	407
	Dual-	72	3	21	2	34	132

**Data is incomplete for dual-permit operations.*
Local residents are those who reside adjacent to the Cook Inlet management area, including persons who reside in Anchorage.

Latent permits

ADF&G fish ticket data indicate that in some years a substantial number of permits have not been used in salmon fisheries, especially in the previous decade. Table 14 presents historical fishery participation in four salmon drift gillnet fisheries in Alaska: Southeast, Cook Inlet, Prince William Sound, and Alaska Peninsula. It shows the annual rate of latent permits as well as the recent 6-year average latency for each fishery. The 6-year average corresponds with the timeframe when dual-permit operations were allowed in the Cook Inlet fishery (2008 – 2013).

The number of participating permits for Cook Inlet includes those in the dual-permit operations identified with the decision rules found in this report (section *Identifying dual-permit operations*). The Cook Inlet fishery had the second-highest single-year latency rate (31% in 2006) among the fisheries, and the highest 6-year average latency rate (17%). This sizable pool of latent S03H permits could have been the basis for forming some of the dual-permit operations.

In recent years, the rate of latent permits has dropped significantly in all four of the fisheries. At the same time, ex-vessel prices for salmon have trended upward statewide. Because increased ex-vessel prices are a common denominator among the fisheries in Table 14, it suggests that price improvement is driving the across-the-board increases in participation and the concomitant reduction in latent permits. However, latent permits for Cook Inlet have decreased to a greater degree than the other three fisheries. The six-year decrease for Cook Inlet is 19% (latency of 24% in 2008 dropping to 5% in 2012), while 12% for Southeast, 4% for Prince William Sound, and 2% for Alaska Peninsula.

Table 14. Total permits and permits not fished (latent) in the Southeast, Cook Inlet, Prince William Sound, and Alaska Peninsula salmon drift gillnet fisheries, by year 2000 – 2013.

	Southeast (S03A)			Cook Inlet (S03H)			Prince Wm. Sound (S03E)			AK Peninsula (S03M)		
		Latent			Latent			Latent			Latent	
Year	Total Permits	No.	Pct.	Total Permits	No.	Pct.	Total Permits	No.	Pct.	Total Permits	No.	Pct.
2000	480	58	12%	577	64	11%	541	15	3%	161	5	3%
2001	482	49	10%	574	107	19%	541	19	4%	160	23	14%
2002	482	91	19%	572	163	28%	540	21	4%	160	48	30%
2003	477	102	21%	572	154	27%	540	30	6%	160	51	32%
2004	478	130	27%	571	131	23%	540	27	5%	161	44	27%
2005	478	110	23%	571	100	18%	538	36	7%	162	42	26%
2006	477	119	25%	570	174	31%	538	46	9%	162	35	22%
2007	476	89	19%	571	154	27%	537	35	7%	162	37	23%
2008	475	83	17%	571	138	24%	537	30	6%	162	32	20%
2009	474	68	14%	570	154	27%	537	26	5%	162	21	13%
2010	474	52	11%	569	150	26%	537	18	3%	162	20	12%
2011	474	32	7%	569	71	12%	537	24	4%	162	18	11%
2012	474	30	6%	569	39	7%	537	15	3%	162	29	18%
2013	473	22	5%	569	30	5%	536	11	2%	162	29	18%
Recent six-year average	474	48	10%	570	97	17%	537	21	4%	162	25	15%

Table 15 reviews latent S03H permits which re-entered the fishery in the years 2008 to 2013. It shows both the overall number which re-entered and those which re-entered into dual-permit operations. The table also presents the frequency distribution of the number of years that permits were latent prior to entering into a dual-permit operation.

Latent permits are defined herein as those that were not used in the fishery in the year(s) previous to the one in question. Permits that were *not* latent, meaning they were fished the previous year, are summed in the '0' column in the table. Alternately, permits that were latent only for the immediate year prior are summed in the '1' column; permits latent for two continuous years prior are '2'; and so on. The permits that were latent for five or more years before fishing in a dual-permit operation are '5+' in the table. The incidences for each period are relatively small; for example, prior to being fished in a dual-permit operation in 2012, four permits had been latent for a period of five or more years.

The data show a somewhat greater rate of permits re-entered into dual-permit operations than for the fishery as a whole. For example, in 2010, 43 previously latent permits re-entered the Cook Inlet drift gillnet fishery, a rate of 10% (43 out of a total of 419 permits fished). Of the 43 previously latent permits, 28 re-entered into dual-permit operations, which represented 21% of the permits that fished in dual permit operations in that year (28 out of the total of 133 permits in dual-permit operations). The re-entry into dual-permit operations suggests that the dual-permit option may have impacted participation in the Cook Inlet salmon drift gillnet fishery beyond what might be explained by improvements in ex-vessel prices and harvests.

Table 15. Permits (S03H) fished in the Cook Inlet salmon drift gillnet fishery with the number and percentage of re-entered latent permits; and permits fished in dual-permit operations with the number and percentage of re-entered latent permits, and the number of years latent prior to being a dual-.

	All S03H			Dual-permit operations			Number of years latent prior to participating in a dual-permit operation					
Year	Permits fished	Latent permits reentered	% total of permits fished	Permits fished	Latent permits reentered	% total of permits fished	0	1	2	3	4	5+
2008*	433	48	11%	32	11	34%	21	3	3	1	2	2
2009*	416	31	7%	46	8	17%	38	1	3	2	1	1
2010	419	43	10%	133	28	21%	105	11	4	4	5	4
2011	498	90	18%	152	27	18%	125	6	5	2	1	13
2012	530	37	7%	132	7	5%	125	1	1	1	0	4
2013	539	17	3%	132	6	5%	126	2	2	0	1	1

**Data is incomplete on the dual-permit operations.*

Discussions with Permit Holders

A small sample of Cook Inlet drift gillnet permit holders were interviewed to help the authors with a better understanding of dual-permit operations. The interviews provided details on the functioning of 'D' boats, and some of the perceived advantages and/or disadvantages of dual-permit operations.

Permit holders universally agreed that the decision to enter into a dual-permit operation depends on individual circumstances. Some of the circumstances mentioned included the availability of a good partner, processor support of dual-permit operations, dynamics within an exclusive fishing-group, weather and tide conditions, vessel and gear capacities, family fishing, and inseason fishing dynamics.

All permit holders said that finding a good partner is paramount to forming a dual-permit operation. A match of personalities is preferred, but more important is efficient teamwork that maximizes the harvest. Efficient teamwork can be measured differently, depending on the operation. Being able to pick fish quickly from a gillnet was commonly cited as an especially valuable asset. Forming a partnership with a young person wanting a start in the fishery was mentioned by some as desirable, as was finding a partner with other seasonal employment which meshed well with the sockeye salmon season.

Processor support for dual-permit operations appears to be important to permit holders. During periods of exceptionally high harvests, processors sometimes establish boat limits. A boat limit can effectively penalize a 'D' boat with two permit holders onboard unless a processor establishes a separate, greater limit for the 'D' boats.

In many salmon fisheries, fishermen find it advantageous to cooperate and share information within an exclusive fishing group. It is not uncommon for group members to share information to maximize the

harvest for all members of the group. As dual-permit operations generally have more gear in the water, they may not be able to respond as quickly to changes in fishing conditions. Permit holders expressed that individual group support for 'D' boats is an important consideration for dual-permit operations.

Because strong currents and riptides are common in Cook Inlet, a 'D' boat must be fished more conservatively. This is especially important when drifting a gillnet on the boundary line of an allowable fishing area, or when the area is relatively small and crowded with fishing boats. These situations call for a 'D' boat to be at least 'moderate' in size with at least 'moderate' engine horsepower; the hydraulics should be able to withstand the strain from the additional shackle of net, and the gillnet reel should be of a larger size with a level-wind feature.

Fishing in Cook Inlet is often family-oriented with family members serving as crew. A family operation might be reluctant to enter into a dual-permit operation with a second permit holder because it could displace a family crew member. On the other hand, acquiring a second permit within the family allows a dual-permit operation to consolidate benefits within the family, and can provide a good launching point for young permit holders to enter the fishery while closely supervised by their parents. The mean age of a S03H permit holder was 48.9 in 2002 but since then has steadily decreased to 47.2 years in 2013; this is somewhat counter to the trend of increasing age of permit holders statewide.[19]

Inseason circumstances often necessitate fishing both in and out of the 'D' boat configuration. However, interviewees stated it is not easy to do so. It can take several hours to disengage and store the fourth shackle of net, which discourages an operation from frequently fishing as a 'D'-boat in an ad-hoc manner. It tends to focus a decision to fish exclusively as either a single- or dual-permit operation for at least an entire fishery opening.

Some of the potential disadvantages to a dual-permit operation that were mentioned included: not having the right partner, or not finding a partner who is willing to work hard; there are more ways to get in trouble or damage gear when deploying extra net in harsh weather or in areas with large rip tides; the negative perceptions from the rest of the fleet (i.e., the haves vs. the have-nots); and "scratch fishing" in periods of low fish abundance when the extra net and permit holder is not as much of a benefit. One permit holder mentioned a specific circumstance where a dual-permit operation would not be an advantage: fishing during the coho season. Coho fishing is much slower than sockeye salmon fishing, and, at least in his case, only one individual picks fish from the net. In that scenario, a dual-permit partner is not necessary and would reduce the profits of the primary permit holder. Coho fishing is also more oriented to the near-shore where a shorter length of net is commonly used. In that setting, the additional shackle of net brought by a dual-permit operation could be more than unnecessary - it might even cause problems.

It was stated that success of a given dual-permit operation depends on the operation being advantageous to both partners. It was further expressed that maintaining a dual-permit operation over the long term depends on there being *significant* economic advantages for both partners.

[19] *Changes in the Distribution of Alaska's Commercial Fisheries Entry Permits, 1975-2013.* CFEC Rpt 14-2

Discussions with the ADF&G Area Management Biologist

The ADF&G Commercial Fisheries Area Management Biologist (AMB) has extensive experience with the Cook Inlet salmon drift gillnet fishery, both before and after the advent of dual-permit operations in the fishery. In a telephone interview with CFEC personnel, a number of salient observations on the fishery and dual-permit operations were provided.

In 2008, the BOF passed the regulation allowing drift gillnet dual-permit operations in Cook Inlet. Part of the regulation specified that dual-permit operations must register with ADF&G. Unfortunately, compliance in 2008 was not complete; some dual-permit operations didn't register. ADF&G required registration to occur in Homer, Soldotna, or Anchorage. It required both permit holders to sign and provide their permits, and indicate which permit holder is the primary person in the operation. Each ADF&G area office maintained separate entries in a common spreadsheet database. ADF&G then shared this registration with processors. Processors were asked to indicate on the fish ticket if a landing was made by a dual-permit operation. This was a problem, because the ticket didn't contain a lot of extra space. Sometimes, processors embossed the second CFEC fishery permit card on the paper fish ticket; other times the second permit serial was merely written in the margin by the processor. ADF&G staff went to a lot of trouble to edit the individual fish tickets to make sure secondary permits from a dual-permit operation were recorded, but it was also clear that compliance by the processors was lacking.

Persons associated with a 'D'-boat could change during the year. If a new combination of persons became associated with a D-boat, they were required to register with ADF&G. There were no requirements to "de-register" the former configuration of permit holders. In this way, some boats appeared on the registration list more than one time in a year, with different persons associated with it.

There have been some inconsistencies with fish tickets vs. registration lists. As noted in previous sections, some dual-permit operations have been noted on tickets, but not on registration lists. ADF&G discussed this with the Upper Cook Inlet Driftnet Association in attempts to get people to comply with the regulations. Some instances of failing to register were referred to the Alaska Department of Public Safety, Division of Wildlife Troopers. Beginning with the 2014 season, registration with ADF&G was no longer required. Dropping this requirement was justified when fish tickets were altered to contain a space that would allow easy recording of both permits when D-boats record landings.

It was especially common for a 'D'-boat to change status even within one week during the years 2008-2010. As an example: on a Monday, the fleet might fish in inlet-wide statistical areas, and 'D'-boats were allowed to participate. Then for Wednesday, a separate opening was established for only 'the corridor'. Since 'D'-boats were not allowed to use 'the corridor' from 2008 through 2010, those wanting to fish the Wednesday opening would have converted to the single-permit / single-gear configuration. On Thursday, if inlet-wide statistical areas opened back up, some boats would convert back to the 'D' configuration and resume as a dual-permit operation. The back-and-forth nature of 'D' boats to conform to the openings was part of the reason the BOF decided to allow 'D' boats into 'the corridor' in 2011.

In general, dual-permit operations have not posed a concern for management of the fishery. Catches from 'D'-boats do not represent a large enough difference to influence management decisions,

especially on a CPUE basis. Moreover, on a permit holder basis, many in the dual-permit operations were already experienced fishermen who performed better than the rest of the fleet on average.

Conclusions and Summary

In the BOF process, when proposals are reviewed which seek to change a regulation for restructuring a salmon fishery, the BOF follows a protocol which includes input from CFEC. Beyond that process, CFEC strives to follow-up and assess the impact that the new regulations might have on the fishery. This report reviews the activities of dual-permit vessels and permit holders associated with dual operations in the Cook Inlet drift gillnet fishery, which the BOF allowed beginning 2008.

At the time of the writing this report, data on dual-permit drift gillnet operations is available for 2008 through 2013. Due to the quality of the data, the number of dual-permit operations may be under-counted, and the landings and harvests attributed to dual-permit operations will likely be under-represented. This is primarily due to catch accounting at the ADF&G fish ticket level; fish tickets over the 2008-2012 period did not contain a dedicated means to identify landings by dual-permit operations, and did not have a defined space to capture the second permit involved. As a result, fish ticket data from 2008 to 2012 falls short of capturing the full extent of dual-permit operations. ADF&G staff and the authors of this report corrected many of the shortfalls in the data. The reconstructed database used for this report significantly improves upon the raw fish ticket information, but still likely under-represents dual-permit operations, especially for the first two years of the new regulations in 2008 and 2009.

New A-series ADF&G fish tickets became available for the 2013 season, and now include both a check-box to identify landings made by dual-permit operations and a space to record the permit number of the secondary permit holder. The data indicates that 81% of the 2013 landings were recorded on the new tickets; some landings continued to be recorded on old forms of fish tickets. The quality of data collection in 2013 improved somewhat, but problems persisted. The data in Table 1 reveals that in 2013, there were no incidences where each of the permit holders from registered dual operations recorded landings independent of one another, which is an improvement over previous years. However, there were still 8 registered ‘D’-boats represented in fish tickets solely by the primary permit holder, one of which verbally confirmed that the secondary permit holder was present and fishing alongside of the primary. Moreover, there were 15 ‘D’-boats in 2013 that recorded landings concurrently by both permit holders, but did not register their vessel with ADF&G prior to fishing.

Participation by permit holders trended upward in the Cook Inlet drift gillnet fishery as a whole over the 2008 to 2013 time period. The number of dual-permit operations expanded at a rate above the general increase in participation in the fishery.

Since the advent of dual-permit operations in 2008, there has been a reduction in the number of vessels relative to the number of permits fished. The reduction in vessels and gear was anticipated when the BOF initially allowed dual-permit operations. The ‘D’ boats used in dual-permit operations tend to be newer and larger, and with more engine power than their single-permit counterparts. Skippers indicate the larger size and increased engine power are often necessary when operating the additional complement of gear. Ownership of such a vessel might be part of the basis for forming a dual-permit operation.

Dual-permit operations are dynamic in nature, forming and disbanding according to personal arrangements by the partners. Regulatory circumstances inseason also play a role in the participation of dual-permit operations, as some areas in Cook Inlet are restricted to single-permit operations only. These circumstances likely contribute to the fact that most D-boats participate as intermittent single/dual operations, switching from fishing as a dual-permit operation during part of the season to a single-permit operation at other times. From 2010 through 2013, the annual average gross earnings of intermittent single/dual operations tend to be greater than earnings for the group of boats that fished exclusively as a dual-permit operation.

Over the four seasons from 2010 through 2013, 24% (130 out of 541) of the unique vessels in the fishery participated at least once in a dual-permit operation. Of the 130 'D'-boats, 61% (79) persisted for at least two years as a dual over that period, and 18% (23) vessels persisted as a dual-permit operation for all four years.

The residency of the permit holders in the fishery as a whole and for those in dual-permit operations continues to be predominately Alaska residents local to the Cook Inlet area.

Emergency medical transfers (ETs) are used in dual-permit operations to a somewhat greater extent than in the fishery as a whole. In some cases, permits obtained through ETs are named to family members who normally serve as crewmen on a vessel, enabling a family unit to operate as a dual-permit operation.

The basis of a dual-permit operation is often a business arrangement between the two fishing partners. Interviews with fishermen indicate a variety of partnering: partnering with a time-tested fellow gillnetter, or with a young 'greenhorn', or with a family member are all commonly done. A dual-permit operation may tally less harvest per permit holder on average than a single-permit operation, but a dual-permit operation likely has other positive economic factors, such as reduced overhead from the common use of boat and gear.

That the use of dual-permit operations is expanding in the fishery is testament to real and tangible benefit(s) of fishing in a dual-permit operation.

Appendix A. Selective Use of ADF&G Fish Ticket Data for Dual-permit Operations

As reported in the section *Identifying dual-permit operations*, the secondary permit holders who registered with ADF&G for the years 2010 through 2013 but who never appeared in fish ticket records were contacted to inquire about their participation in dual-permit operations in those years. Their verbal confirmation was used to document their participation in the reconstructed database used for this report. This provided reasonable assurances on the extent of dual-permit operations identified for those years. In contrast, we do not have the same level of confidence in the accounting of dual-permit operations for the years 2008 and 2009, for the following reasons.

First, we note the data for 2008 and 2009 indicates a higher percentage of registered secondary permit holders who never appear in fish tickets whatsoever: 43% in 2008 (16 out of the 37 registered) and 31% in 2009 (11 out of the 35 registered). It begs the question, "Why register with the intention of fishing, yet not follow through to fish at all in the entire season?" That question remains unanswered, as this set of secondary permit holders were not interviewed. On its face, it is likely that some did fish, and some may have fished in dual operations as documented in the ADF&G dual-permit registrations. However, the extent to which this occurred is unknown.

Additionally, Table A1 provides the number of 'D'-boats from the ADF&G dual registration lists, and provides counts of unique vessels used in dual-permit and single-permit operations, as documented on fish tickets. The table also provides basic statistics on the number of fish ticket landings made by each operation type. The data corresponds to the July 1 through August 14 timeframe in each year, which roughly corresponds to the seasonal sockeye salmon fishery.

The figures indicate that dual-permit operations in 2008 fish tickets represent only 43% (16/37) of the total 'D'-boats registered by ADF&G in that year. Similarly, fish tickets contain only 66% (23/35) of the 'D'-boats registered in 2009. By contrast, 'D'-boats in fish tickets for 2010 - 2013 outnumber the respective 'D'-boats registered in those years. This is due to a significant number of *unregistered dual operations* in addition to the *registered dual operations*.

That a relatively large percentage of fishermen went to the trouble to register in 2008 and 2009, yet apparently did not follow through to fish at least once in a dual-permit operation may be explained in part by ADF&G's encouragement for drift fishermen to register if they thought they might at some time fish in a dual-permit operation. However, for the combined reasons above we believe this does not adequately explain the full extent of misalignment between the registration lists and fish tickets. Rather, we hypothesize that an unknown number of dual-permit operations in 2008 and 2009 went completely un-recorded in fish tickets. We believe this was largely due to the fact that the regulations were new, and fish buyers were not accustomed to filling out fish tickets that indicate two permit holders.

The basic summary statistics in Table A1 raise further questions on the confidence in the data for dual-permit operations in 2008 and 2009. The number of landings per 'D'-boat in the 2008 season ranged from 1 – 8, with a mean of 4.7 landings, and the mode was just one landing for the entire season. Similarly in 2009, the number of landings per 'D'-boat ranged from 1 – 12; the mean was 4.9, and the mode was just one landing for the entire season. These statistics changed markedly in subsequent years. For example, in 2013 the number of landings per 'D'-boat ranged from 1 – 22; the mean was 10.6, and the mode was 12.

Table A1. Registered/unregistered dual and single-permit operations in the Cook Inlet salmon drift gillnet fishery, with basic statistics on the number of landings made by year, 2008 – 2013.

Year	ADF&G Registered 'D'-boats	Dual-permit vessels in fish tickets, both registered and unregistered	Mean Number of Landings	Range	Mode	Total Single-Permit Boats	Mean Number of Landings	Range	Mode
2008	37	16	4.7	1 - 8	1	413	7.0	1 - 27	6
2009	35	23	4.9	1 - 12	1	385	7.6	1 - 15	7
2010	56	67	7.3	1 - 13	8	348	10.0	1 - 24	9
2011	66	78	11.7	1 - 20	13	405	13.4	1 - 27	16
2012	66	69	11.9	1 - 20	13	433	12.4	1 - 24	14
2013	61	68	10.6	1 - 22	12	453	12.8	1 - 25	14

Specific to the data on the means, there was a significant difference (t-test $P < 0.001$) between the mean for aggregated 2008/2009 data and the mean for the data aggregated from 2010 through 2013. Both the single-permit operations and the dual-permit operations showed a significant difference, meaning the amount of landings was less for everyone during the 2008 and 2009 fishing seasons and suggesting that fishing was just not as good in those years (see Table 3 in this report).

Irrespective of high or low total harvests by all boats, Table A1 shows dual-permit operations most commonly made just a single landing (mode = 1) in 2008 and again in 2009. However, dual-permit operations most commonly made eight landings (mode = 8) in 2010. In 2011 and 2012, they most commonly made 13 landings apiece. In 2013, the figure was 12 landings apiece. The statistical mode shows a marked and substantial difference on dual operations between 2008/2009 and 2010-2013. In contrast, single-permit operations most commonly made six landings in 2008 and seven landings in 2009. Expressed as a ratio, the contrast in the statistical modes is 6:1 (single:dual) in 2008 and 7:1 (single:dual) in 2009. In subsequent years, landings between single and dual operations are much more equivalent. In 2013 for example, the mode for landings made by single-permit operations is 14, while the mode for landings made per dual-permit operations is 12, giving a ratio between the two of approximately 1 : 1.2. These statistics suggest that for both 2008 and 2009, some unknown number of fish tickets were not recorded as dual-permit operations, but were recorded as single-permit operations instead. Likely, this was due to the fact that fish tickets at that time had no dedicated space to record that the landing was the result of a dual-permit operation or the second permit involved.

For all the above reasons we have a lack of confidence in 2008 and 2009 data for dual-permit operations, both in fish tickets and the reconstructed database. Therefore, only the years from 2010 through 2013 are selectively utilized for analyses in this report.