Fishery Data Series No. 07-88

Upper Cook Inlet Personal Use Salmon Fisheries, 2004-2006

by

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and

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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ABSTRACT

From 2004 to 2006 participants in the Upper Cook Inlet personal use salmon fisheries were required to record their harvest and effort on a free permit that was returned to the Alaska Department of Fish and Game after the fisheries closed. Approximately 21,900 permits were issued in 2004 and 2005, but the number of permits issued decreased to approximately 18,500 in 2006. The response rate increased from 82 to 89% during the same period. Returned permits were used to estimate harvest and effort for the Kasilof River set gillnet, Kasilof River dip net, and Kenai River dip net fisheries. Sockeye salmon harvest from 2004 to 2006 averaged 26,964 fish for the Kasilof River set gillnet fishery, 49,203 fish for the Kasilof River dip net fishery, and 228,652 fish for the Kenai River dip net fishery. Most permits were issued to residents of Anchorage followed by residents of the Kenai Peninsula and the Matanuska-Susitna Valley. Most permit holders did not fill their seasonal bag limit and differences in the percentage of the bag limit filled varied most with respect to year and the amount of effort spent fishing.

Key words: Kenai River, Kasilof River, Fish Creek, personal use, dip net, set gillnet, subsistence, sockeye salmon, coho salmon, Chinook salmon, pink salmon, chum salmon, flounder, permit.

INTRODUCTION

Subsistence and personal use (PU) fishing in Cook Inlet has undergone numerous regulatory changes over the past two decades, reflecting the efforts by the state and federal governments and the court system to develop a legal definition of subsistence use (Brannian and Fox 1996). In 1996, most of Cook Inlet was closed to subsistence harvest of salmon. In lieu of subsistence fisheries, four personal use fisheries were opened to all Alaska residents: Fish Creek dip net, Kasilof River set gillnet, Kasilof River dip net, and Kenai River dip net. All of these fisheries target sockeye salmon *Oncorhynchus nerka*, although Chinook salmon *O. tshawytscha*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, chum salmon *O. keta*, and flounder Pleuronectidae are harvested incidentally. All participants in the Upper Cook Inlet personal use (UCIPU) fisheries are required to get a free permit or be a member of a household with a permit. UCIPU permits are household permits that allow all members of the household to fish under the same permit. Completed permits must be returned to the Alaska Department of Fish and Game (ADF&G) following each fishing season. The dip net fishery in Fish Creek was closed during the entire study period because of poor inriver returns. This report presents harvest, effort and other summary information from UCIPU salmon permits issued during the 2004-2006 seasons for the Kenai and Kasilof rivers personal use fisheries (Figure 1).

MANAGEMENT PLANS

All UCIPU salmon fisheries are managed under the provisions of the Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540).

Kasilof River

Inseason management of the set gillnet fishery is the responsibility of the Alaska Department of Fish and Game, Commercial Fisheries Division (CFD). CFD also operates a sonar counter on the Kasilof River. From 1996-2001 the set gillnet fishery was opened and closed by emergency order based on a target harvest range. In 2002, the BOF changed the management plan so that the set gillnet fishery opens and closes by regulation, therefore inseason management is required only if the sonar count and biological escapement goal cannot be met. Inseason management of the dip net fishery is the responsibility of the Alaska Department of Fish and Game, Sport Fish Division (SFD). The dip net fishery also opens and closes by regulation, and inseason management is only required if the sonar count and biological escapement goal cannot be projected.

Kenai River

Inseason management of this fishery is the responsibility of SFD. The fishery opens and closes by regulation, and inseason management by SFD is only required if it is projected that the inriver escapement goal for sockeye salmon will not be met.

FISHING REGULATIONS

Regulations for these fisheries are outlined in 5 AAC 77.015, 5 AAC 77.525, and 5 AAC 77.540. The fisheries are open to Alaskan residents only. A legal dip net is a bag-shaped net supported on all sides by a rigid frame. The net opening may not exceed 5 feet across, and the depth of the net must be at least one-half the net opening. The mesh used to construct the net may not exceed 4.5 inches stretched. Dip nets must be operated by hand. The total annual limit for all UCIPU fisheries is 25 salmon for the head of the household and 10 salmon for each additional household member. There is an annual limit of one Chinook salmon from the Kenai River dip net fishery, and no Chinook salmon can be retained from the Kasilof River dip net fishery. However, there is no annual limit for Chinook salmon caught in the Kasilof River set gillnet fishery.

Kasilof River Set Gillnet Fishery

The legal fishing area is from ADF&G regulatory markers located at the river mouth to ADF&G commercial fishing regulatory markers located approximately 1 mile from the mouth in either direction (Figure 1; Panel A). Additionally, fishing is prohibited more than 1 mile from the mean high tide mark and within any flowing waters of Kasilof River at any tide stage. Only one set gillnet can be operated per permit. The set gillnet has to be attended, by the permit holder or a person named on the permit, at all times it is being used to harvest fish. No set gillnet can be operated within 100 feet of another set gillnet. The gillnet can not exceed 10 fathoms in length, have larger than a 6-inch stretched mesh size, or be more than 45 meshes deep. By regulation, the fishery is open from June 15 through June 24, from 0600 to 2300 hours.

Kasilof River Dip Net Fishery

Dip netting is allowed in the area from regulatory markers located on the Cook Inlet beaches outside of the terminus of the river upstream for 1 mile (Figure 1; Panel B). The dip netting season begins on June 25 and ends on August 7. During this season, dipnetting is open 24 hours a day.

Kenai River Dip Net Fishery

Dip nets can only be used from shore in the area from ADF&G regulatory markers located on the Cook Inlet beaches outside of the terminus of the river upstream to the Warren Ames Bridge (Figure 1, Panel C). The north shoreline is closed to dipnetting from shore between an ADF&G marker located below Main Street in Kenai upstream to ADF&G markers near the Kenai City Dock. This regulation is implemented to minimize erosion to the bluffs below the city of Kenai.

Dipnetting from a boat is only allowed from ADF&G markers located near the Kenai City Dock upstream to the Warren Ames Bridge. The fishery is open from July 10 through July 31, from 0600 to 2300 hours.

OBJECTIVES

From 2004-2006 the objectives of the study were to:

1. Make permits available to Alaskan residents that qualified to participate in upper Cook Inlet personal use fisheries;

2. Estimate participation (household days fished) and harvest for the Kasilof River set gillnet, Kasilof River dip net, and Kenai River dip net fisheries.

METHODS

STUDY DESIGN

All participants in the UCIPU salmon fisheries were required to get a permit or be a member of a household with a permit. Permits were free to residents with valid Alaska sport fishing licenses and were issued by more than 60 vendors and ADF&G offices located in Anchorage, Fairbanks, the Kenai Peninsula, and the Matanuska-Susitna Valley.

Each permit was divided into numbered halves (Appendix A1). Permits were sequentially numbered, and vendors were given known sequences. The top half was a vendor copy which was retained by the vendor and contained the permit holder's contact information, sport fishing license number, and the angler's signature. Vendor copies were returned to the Anchorage ADF&G office periodically throughout the summer using courtesy reply envelopes provided by the Division of Sport Fish. Data from the returned vendor copies were entered into an electronic database periodically throughout the summer.

The bottom half of each permit was a harvest card that was given to the permit holder. The permit holder was required to have this permit in their possession when personal use fishing. Permit holders were also required to record harvest information including fishery, dates fished, and salmon harvest by species immediately upon harvesting a fish. A check box was provided for households that did not fish. All permits, even for households that did not fish, were required to be returned to ADF&G by August 15.

Permit holders who did not return their permits received up to two reminder letters. Reminder letters were mailed to allow an approximately 4-week response period for the previous mailing. Data from returned permits were entered into an electronic database as they were received. In some cases returned permits reported that the household harvested in excess of their seasonal bag limit, fished out of season, were not Alaskan residents, or some other regulatory violation. This information was entered into the database as it was recorded on the permit.

All permit holders who returned their permits before the second reminder letter were considered "compliant" households. Information obtained by permit holders who returned their permits after the second reminder letter was mailed were considered "non-compliant" households. Participation and harvest by non-compliant households was estimated by calculating the mean participation (household days fished) and harvest by species for non-compliant permits that were returned. These were then expanded to include all non-respondents. Total estimates of participation and harvest by species for each fishery were obtained by summing the estimates for the non-compliant households with the information obtained from compliant households.

Occasionally vendors failed to return vendor copies from some of the permits they issued. This resulted in some permit holders returning permits that lacked a vendor copy. The total number of permits issued was estimated by assuming that the response rate (prior to mailing the first reminder letter) among known permits was the same as the response rate among the permits lacking a vendor copy (the "orphan permits"). This response rate was applied to the orphan permits to estimate the total number of permits issued but lacked a vendor copy.

In 2005, the permit was designed such that permit holders were to circle the fishery in which they participated (Appendix A2). Many permit holders did not fill this out correctly which

resulted in a large number of reported harvests for which the correct dip net fisheries were unknown during the dates that the Kenai and Kasilof dip net fisheries overlap (July 10–31). To correct this, a telephone survey was conducted of 150 permit holders with "unknown" data. The proportion of permit holders who fished the Kenai versus the Kasilof was similar (> 2%) between the phone survey sample and the known permit holders. All harvested data from July 10-31 with missing fishery information was assigned a fishery based on the results of the phone survey.

DATA ANALYSIS

Because some vendors did not return all of their permits, the total number of permits issued was estimated as:

$$\hat{N} = \left(o\ \hat{p}^{-1}\right) + M \tag{1}$$

where:

$\hat{N}$ = the total number of permits issued,

o = the number of permits issued and returned by permit holders before the first reminder letter, but with no vendor card (the "orphan permits"),

$\hat{p} = \frac{m}{M} =$ the response rate before the first reminder letter among permits with vendor cards,

m = the number of permits returned before the first reminder letter mailing with vendor cards,

M = the total number of permits with vendor cards.

With variance estimated as:

$$\hat{V}\left[\hat{N}\right] = \left[\frac{o^2 \hat{V}\left[\hat{p}\right]}{\hat{p}^4}\right], \tag{2}$$

where,

$$\hat{V}\left[\hat{p}\right] = \left(\frac{\hat{p}\left(1-\hat{p}\right)}{M-1}\right).$$

The estimated number of permits issued was divided in four groups:

$$\hat{N} = N_{cf} + N_{cz} + \hat{N}_{df} + \hat{N}_{dz}\ , \tag{3}$$

where:

N_{cf} = the number of compliant permits who reported fishing,

N_{cz} = the number of compliant permits who reported they did not fish,

$\hat{N}_{df} = \left(\hat{N} - (N_{cf} + N_{cz})\right)\hat{w}$,

the estimated number of non-compliant permits who reported fishing, and,

where $\hat{w} = \frac{n_{df}}{n_d}$,

n_d = the number of non-compliant households responding to the last reminder, and

n_{df} = the number of non-compliant households who responded to the last reminder and reported fishing.

$\hat{N}_{dz}$ = the estimated number of non-compliant permits who reported they did not fish.

Harvest for each species or participation for each fishery was estimated by the following procedure (with subscripts denoting parameter of estimation deleted for simplicity):

$$\hat{H} = H_{cf} + \hat{H}_{df}; \tag{4}$$

where:

$\hat{H}$ = estimated total harvest or participation;

H_{cf} = harvest or participation reported by compliant permits, and

$\hat{H}_{df}$ = estimated harvest by non-compliant households = $\hat{N}_{df}\,\bar{h}_{df}$

where $\bar{h}_{df}$ = the mean harvest or participation per household for non-compliant households that fished.

$$= \frac{\left(\sum_{j=1}^{n_{df}} h_{dfj}\right)}{n_{df}};$$

h_{dfj} = reported harvest by responding non-compliant household *j*, and

n_{df} = the number of non-compliant households responding to the reminder mailings.

Variance was calculated as (Goodman 1960):

$$\hat{V}\left[\hat{H}\right] = \hat{V}\left[\hat{H}_{df}\right] = \hat{N}_{df}^2\,\hat{V}\left[\bar{h}_{df}\right] + \bar{h}_{df}^2\,\hat{V}\left[\hat{N}_{df}\right] - \hat{V}\left[\bar{h}_{df}\right]\hat{V}\left[\hat{N}_{df}\right], \tag{5}$$

where:

$$\hat{V}\left[\hat{N}_{df}\right] = \hat{V}\left[\hat{N}\right]\hat{V}\left[\hat{w}\right] = \hat{N}^2\,\hat{V}\left[\hat{w}\right] + \hat{w}^2\,\hat{V}\left[\hat{N}\right] - \hat{V}\left[\hat{w}\right]\hat{V}\left[\hat{N}\right], \tag{6}$$

$$\hat{V}\left[\hat{w}\right] = \left(\frac{\hat{w}(1-\hat{w})}{n_d - 1}\right),$$

and

$$\hat{V}\left[\bar{h}_{df}\right] = \left(1 - \frac{n_{df}}{\hat{N}_{df}}\right)\frac{s_{df}^2}{n_{df}}, \tag{7}$$

$$s_{df}^2 = \frac{\sum_{j=1}^{n_{df}} \left(h_{dfj} - \bar{h}_{df}\right)^2}{n_{df} - 1} \quad . \tag{8}$$

Standard errors were the square root of the variance estimates. Permit holders who failed to indicate which fishery they participated in were estimated as "unknown fishery" by the procedure outlined above.

RESULTS

PERMITS ISSUED AND RETURNED

The numbers of permits issued for UCIPU fisheries were similar during the first 2 years of this study with an estimated 21,910 (SE = 2) permits issued in 2004 and 21,905 (SE = 1) permits issued in 2005 (Table 1). In 2006, the number of permits issued decreased to an estimated 18,563 (SE = 1). The percent of permits returned increased from 82% in 2004 to 89% in 2006. On average, 61% of permit holders returned their permits voluntarily, 19% were returned after the first reminder letter, and 8% were returned after the second reminder. Approximately 21% of the households that were issued UCIPU permits did not fish (Table 2).

ESTIMATED HARVEST AND EFFORT

Approximately 970,000 salmon were harvested in the UCIPU salmon fisheries between 2004 and 2006. Total harvest was greatest in 2005 (377,271 salmon, SE = 314) and lowest in 2006 (234,391 salmon, SE = 242; Table 3). All five species of salmon were harvested with sockeye comprising the majority (Figure 2). Effort for all fisheries averaged 24,385 household days. As with the harvest, fishing effort was greatest in 2005 (27,253 days fished, SE = 21), and lowest in 2006 (20,543 days fished, SE = 20; Table 3). The Kenai River dip net fishery was the most popular of the UCIPU fisheries, and most of the salmon harvest and effort occurred there (Table 3). Beginning in 2005, participants in the personal use fisheries were allowed to harvest flounder, and the greatest harvest of flounder occurred in the Kenai dip net fishery (Table 4).

Kasilof River Set Gillnet Fishery

During this study, participation in the Kasilof River set gillnet fishery averaged 1,501 household days with a range of 1,272 (SE = 10) household days in 2004 to 1,724 (SE = 5) household days in 2006 (Table 3). Sockeye salmon harvest during the same period averaged 26,964 fish and ranged from 25,417 (SE = 203) fish in 2004 to 28,867 (SE = 91) fish in 2006 (Table 3). Chinook salmon harvests averaged 179 fish but ranged from 87 (SE = 1) fish in 2005 to 287 (SE = 2) fish in 2006 (Table 3).

Sockeye salmon harvest in the Kasilof River personal use set gillnet fishery resulted in exploitation rates ranging from 3.9% of the inriver return in 2004 to 6.3% of the inriver returns in 2005 and 2006 (Table 5). The Kasilof River set gillnet fishery has the shortest season of the UCIPU fisheries. Over 50% of the sockeye were harvested by June 20 which is the median date for this fishery (Figure 3; Appendix B1).

Kasilof River Dip Net Fishery

Between 2004 and 2006, participation in the Kasilof River dip net fishery averaged 4,898 household days with a range of 4,432 (SE = 19) days in 2004 to 5,763 (SE = 10) days in 2006 (Table 3). Sockeye harvest during this period averaged 49,203 fish with the greatest harvest

occurring in 2006 (56,144 sockeye salmon, SE = 113). Harvests of other species were relatively small.

Exploitation rates for sockeye harvest in the Kasilof River personal use dip net fishery ranged from 7.3% of the inriver return in 2004 to 12.2% in 2006 (Table 5). When combined with the exploitation rate for the Kasilof set gillnet fishery, the total sockeye exploitation rate from personal use fisheries in the Kasilof River averaged 15.4% (Table 5). The harvest timing of the Kasilof River dip net fishery was relatively consistent between years. Over half the sockeye harvested were taken by July 15 in 2004 and 2005 and by July 18 in 2006 (Figure 4; Appendix B2).

Kenai River Dip Net Fishery

Participation in the Kenai River dip net fishery averaged 17,392 household days and ranged from 12,685 (SE = 16) household days in 2006 to 20,977 (SE = 18) days in 2005 (Table 3). Sockeye salmon harvest averaged 228,652 fish with a range of 127,630 (SE = 183) fish in 2006 to 295,496 (SE = 273) fish in 2005 (Table 3). Harvests of other species were comparatively small.

Sockeye harvest in the Kenai River dip net fishery resulted in exploitation rates ranging from 7.7% (2006) to 17.1% (2005) of the inriver return (Table 5). The mean exploitation rate was 13.5%, the same as in previous years (Reimer and Sigurdsson 2004). The inseason closings and re-openings of the Kenai River dip net fishery in 2006 likely resulted in the lower participation, harvest, and exploitation rates observed that year (Tables 3 and 5). The median date for Kenai River personal use sockeye harvest was July 20, approximately half way through the typical open season (Figure 5). In 2006, most sockeye were harvested before the inseason closure. Approximately 20% of the sockeye were taken when the fishery re-opened on July 31 and August 3-10 (Appendix B3).

CHARACTERISTICS OF PERMIT HOLDERS

Residency of Permit Holders

Approximately 97% of all UCIPU permit holders resided in Southcentral Alaska (Region II) during each year of the study (Table 6). Less than 3% of the participants lived in the Interior, and less than 1% resided in Southeast. Of the participants from Southcentral, the majority were from Anchorage, followed by the Kenai Peninsula, and the Matanuska-Susitna Valley. The percentage of permit holders from Anchorage was relatively consistent throughout the study, but there has been an increasing trend in the percentage of participants from Anchorage in the UCIPU fisheries over the last 10 years (Reimer and Sigurdsson 2004).

Anchorage residents were a substantial majority of the participants in the Kenai River and Kasilof River personal use dip net fisheries (Figure 6). They also comprised the majority of permit holders who did not participate in any of the UCIPU fisheries. Residents of the Kenai Peninsula were the predominate participants in the Kasilof River personal use set gillnet fishery in 2004, but participation in this fishery by Kenai Peninsula residents did not differ much from Anchorage residents in 2005 and 2006. Participation in the Kasilof set gillnet fishery by residents of the Matanuska-Susitna valley increased during the study period (Figure 6). Overall, patterns in the residency of participants in the UCIPU fisheries were relatively consistent from 2004 to 2006.

Seasonal Variation

Participants in the UCIPU fisheries were more efficient in 2004 and 2005 than they were in 2006. The average percentage of the bag limits harvested by all Upper Cook Inlet permit holders dropped from approximately 39% in 2004 and 2005 to approximately 29% in 2006 (Table 7).

Over 25% of permit holders did not harvest any of their allowable bag limits during each year of the study, and less than 20% of permit holders harvested the majority of their bag limits (81-100%; Figure 7). The Kasilof River gillnet fishery is the least utilized of all the UCIPU fisheries (Table 3). However, on average, those participants fishing the Kasilof River set gillnet fishery were the most successful and filled over 70% of their bag limits whereas participants fishing the dip net fisheries harvested less than half of what they were allowed (Figure 8).

Of all of the salmon harvested in UCIPU fisheries, over 60% came from the Kenai River dip net fishery each year whereas less than 30% were typically harvested from the Kasilof River fisheries (Figure 9). However, in comparison to the first 2 years of the study, the percentage of salmon harvested from the Kasilof River fisheries nearly doubled in 2006, when there were inseason closures to the Kenai dip net fishery.

Household Size

Permits were most commonly issued to two-person households from 2004 to 2006 (Table 7). While some very large households did obtain permits, households of five people or less obtained 92.9% of the total permits issued during this period (Table 7). For all permits issued, the average percentage of the bag limit harvested did not vary substantially for households of different sizes (Table 7). Likewise, when data were analyzed separately by fishery using data from permit holders who actually fished and participated in only one fishery, there was little variation in the average percentage of the bag limit filled (Figure 10). Overall patterns in the percentage of permits and the percentage of salmon harvested according to household size were remarkably similar between fisheries (Figure 10).

Number of Days Fished/Fisheries Visited

Many permit holders fished multiple days per season although 43.8% of permit holders fished only 1 day (Table 7). Those permit holders who did fish more than 1 day increased their success from 33.2% (SE = 0.2%) of their bag limit for households that fished one day to 78.2% (SE = 0.9%) for households that fished at least 5 days. When data were analyzed separately by fishery for those permit holders that participated in only one fishery, the average percentage of the bag limit filled increased as the effort (days fished) increased for all UCIPU fisheries (Figure 11). People fishing the Kasilof gillnet fishery for 5 or more days were the most successful in filling their bag limits. Though dip netters, in general, increased their success with added days of fishing effort, there was little variation in the average percentage of the bag limits filled between the Kenai and Kasilof dip net fisheries. Overall, the patterns in the percentage of permits, the percentage of salmon harvested, and the average percent of the bag limits filled over multiple days were, again, quite similar between all the UCIPU fisheries (Figure 11).

Few UCIPU permit holders participated in more than one fishery from 2004 to 2006 (Table 7). Of those who participated in two fisheries, 90% fished the Kenai River along with another fishery (most often Kasilof River dip net). Of those who participated in three fisheries, combinations involving the Kenai River accounted for 98.7%. During this study period, fishing in more than one fishery did not appear to have a large effect on the average percentage of the bag limit filled (Table 7).

DISCUSSION

More UCIPU permits were issued during this study than ever before. On average, 20,234 permits were issued each year from 2004–2006 (Table 1). In previous years, the average number of permits issued was 16,491 (Reimer and Sigurdsson 2004). Likewise, the average permit

return rate of 88% during this study was also higher. From 1996 through 2003, the average permit return rate was 86%, and return rates declined during the majority of that period (Reimer and Sigurdsson 2004). The UCIPU fisheries have definitely gained popularity in the last 10 years, although the number of permits issued in 2006 was lower than in 2003, 2004, and 2005 (Table 1; Reimer and Sigurdsson 2004).

With the growing popularity of the UCIPU fisheries, the effort and harvest estimates have also increased. Average total effort during this study was 24,385 days fished (Table 3), whereas Reimer and Sigurdsson (2004) reported an average of 18,761 days fished for the years 1996-2003. With that, the average salmon harvest was substantially higher, averaging 323,273 salmon per year from 2004–2006 compared with an average of 207,543 salmon harvested per year from 1996–2003.

During 2004 and 2005, effort and harvest of sockeye salmon in the Kenai River dip net fishery were the highest they have been in the last 10 years (Appendices C1 and C2). In particular, the greatest effort and sockeye harvest occurred during the 2005 Kenai River dip net season (Appendices C1 and C2). Coho salmon harvests were also highest during the 2004–2006 period, with the greatest harvest occurring in 2004 (Appendix C3). Chinook and chum salmon harvests from the Kenai River dip net fishery were not substantially higher than they were in previous years (Appendices C4 and C5). However, a record harvest of pink salmon was observed in this fishery in 2006 (Appendix C6).

There are fishery related explanations for the increased harvest and effort levels. Interest in the UCIPU fisheries increased during this study as indicated by the numbers of permits issued (Table 1; Reimer and Sigurdsson 2004), and most of the effort occurred in the Kenai River dip net fishery (Table 3, Figure 9). Also, the percentage of permit holders who were issued permits but did not fish was lower than previously reported (Table 2; Reimer and Sigurdsson 2004).

The 2006 Kenai River dip net fishery was atypical. Compared with previous years, effort and sockeye salmon harvest estimates in 2006 were relatively low (Appendices C1 and C2). The sockeye return was late in 2006, resulting in inseason management that closed the fishery on July 21. The fishery was re-opened on July 31, the last day of the legal fishing season. The season then closed but was opened again from August 3–8. Only about 20% of the sockeye harvested that year were taken when the fishery re-opened. Permit holders who would have ordinarily fished the Kenai dip net fishery during the closure either chose not to participate (Table 2) or chose to participate in the Kasilof River dip net fishery (Table 3; Figure 9).

It is not surprising then that the greatest effort and sockeye salmon harvest in the Kasilof River dip net fishery during the last 10 years occurred in 2006 (Appendices C1 and C2). However, harvests of other salmon species in the Kasilof River dip net fishery during this study were not substantially different from previous years (Appendices C3-C6).

Effort, sockeye salmon harvest, and coho salmon harvest in the Kasilof River set gillnet fishery were also higher during this study (Appendices C1-C3). Chinook harvests in the Kasilof River set gillnet fishery were variable and did not differ from previous years (Appendix C4). Throughout the last 10 years, chum and pink salmon harvests in this fishery were always very low (Appendices C5 and C6). The Kasilof River set gillnet fishery is the least popular of all UCIPU fisheries, but participants in this fishery are the most successful in filling their bag limits (Figure 8). This is consistent with the trend observed by Reimer and Sigurdsson (2004) from 1996-2003.

Analysis of UCIPU fisheries indicates that the bag limit exceeds most permit holders' actual harvest (Figure 7). In addition, the current bag limit increases at a faster rate than larger households increase their harvest (Table 7, Figure 10). Most permit holders did not fill their seasonal bag limit although differences in the percentage of the bag limit filled varied with respect to the year of the study and the amount of effort spent fishing (Table 7, Figure 11). Residency trends observed during this study were similar to those reported by Reimer and Sigurdsson (2004). Most permits were issued to residents of Anchorage followed by residents of the Kenai Peninsula and the Matanuska-Susitna Valley, and relatively few permits were issued to Alaskans who did not reside in Southcentral Alaska (Table 6, Figure 6).

In the past, public perception with regard to the UCIPU fisheries is that regulatory violations are common (Barrett 2001 a-b; Reimer and Sigurdsson 2004). Reimer and Sigurdsson (2004) discussed that regulatory violations were often recorded on harvest cards between 1996 and 2003. Regulatory violations were also observed during this study. For example, Chinook salmon harvests were reported from the Kasilof River dip net fishery where regulations do not allow retention of Chinook (Table 3, Appendix C4). Also, a small number of permit holders reported harvesting over 100% of their seasonal bag limit (Figure 7). In addition, a few permits holders each year gave out-of-state addresses on the vendor copy of their permit (Table 6).

While the aforementioned regulatory violations display a lack of understanding of personal use fishing regulations by some permit holders, accurate reporting is essential to the accuracy of the estimates, and regulatory violations of this nature are enforced during the fisheries by Alaska Bureau of Wildlife Enforcement (ABWE) officers. More significant problems would occur if large numbers of fishermen were not obtaining permits or failing to return obtained permits. Local ABWE officers indicate that they rarely encounter personal use fishermen who do not have a permit. However, from 1996–2003, Reimer and Sigurdsson (2004) reported a steady increase in the numbers of permit holders who failed to return their Upper Cook Inlet personal use fishing permits. Failure to return this permit is a regulatory violation that could interfere with the ADF&G Sport Fish Division's (SFD) ability to meet project objectives. Fortunately, during this study, compliance in returning permits increased (Table 1). However, concerns that permit return rates may again decrease has prompted the SFD to begin enforcement efforts against permit holders who fail to return their permits. ABWE officers will be issuing citations to those permit holders that received permits in 2005 and 2006 but failed to return their permit either year. The goal of this enforcement action is to make the public more aware of the regulations, the importance of following them, and, ultimately, increase compliance with the UCIPU fishery regulations.

ACKNOWLEDGEMENTS

Thanks to all individuals involved with the success of this project. ADF&G staff who worked as principal investigators included Kristine Dunker, Robert Lafferty, and Kirk Brogdon. Pat Hansen served as project biometrician. In addition, Margie Nussbaum, Diane Novinska, and Sabrina Pulu were charged with entering the data from approximately 20,000 permits per year. In addition, there were over 60 vendors who were responsible for the distribution of Upper Cook Inlet personal use permits. Their help was invaluable, and they deserve many thanks.

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TABLES

Table 1.-Number of Upper Cook Inlet personal use salmon fishery permits issued by year and number of permits returned by mailing and year, 2004-2006.

	Permits Issued [b]		Permits Returned [a]								Permits not Returned [a]	
			Voluntary [c]		Mailing 1		Mailing 2		Total			
Year	Number	SE	Number	%	Number	%	Number	%	Number	%	Number	%
2004	21,910	2	10,653	49%	2,075	10%	5,020 [d]	23%	17,748	82%	3,868	18%
2005	21,905	1	12,760	59%	4,150	19%	2,171	10%	19,081	88%	2,680	12%
2006	18,563	1	11,658	63%	3,632	20%	1,242	7%	16,532	89%	1,996	11%
Avg. (2005-2006)	20,234	1	12,209	61%	3,891	19%	1,707	8%	17,807	88%	2,338	12%

[a] "Permits Returned" and 'Permits not Returned" are based on permits actually received and are not estimates.

[b] "Permits Issued" is an estimate that accounts for "orphan permits." Orphan permit - lacking a vendor copy.

[c] Voluntary households are those that voluntarily returned their completed permits without being mailed a reminder letter.

[d] The hiatus between courtesy reminders was not strictly followed by the mailing service in 2004.

Table 2.-Number of Upper Cook Inlet personal use salmon fishery permits that did not fish, by year, 2004-2006.

	Permits issued		Did not fish	
Year	Number	SE	Number	%
2004	21,910	2	4,001	19%
2005	21,905	1	3,840	18%
2006	18,563	1	4,695	25%
Mean	20,793	1	4,179	21%

Table 3.-Effort and harvest in Upper Cook Inlet personal use salmon fisheries, 2004-2006.

Year	Days Open	Days Fished Est.	Days Fished SE	Days Fished RP	Sockeye Est.	Sockeye SE	Sockeye RP	Chinook Est.	Chinook SE	Chinook RP	Coho Est.	Coho SE	Coho RP	Pink Est.	Pink SE	Pink RP	Chum Est.	Chum SE	Chum RP	Total Est.	Total SE	Total RP
Kasilof River Gillnet																						
2004	10	1,272	10	2%	25,417	203	2%	163	4	5%	58	13	44%	6	1	33%	0	0	0%	25,644	205	2%
2005	11 [a]	1,506	6	1%	26,609	104	1%	87	1	2%	326	5	3%	16	1	12%	1	0	0%	27,039	104	1%
2006	10	1,724	5	1%	28,867	91	1%	287	2	1%	420	16	7%	11	0	0%	6	0	0%	29,591	94	1%
Mean		1,501			26,964			179			268			11			2			27,425		
Kasilof River Dip Net																						
2004	44	4,432	19	1%	48,315	259	1%	44	3	13%	668	21	6%	396	15	7%	90	5	11%	49,513	263	1%
2005	44 [b]	4,500	9	0%	43,151	100	0%	16	1	12%	538	16	6%	658	12	4%	102	2	4%	44,465	103	0%
2006	44	5,763	10	0%	56,144	113	0%	55	1	4%	1,057	15	3%	992	8	2%	105	4	7%	58,353	117	0%
Mean		4,898			49,203			38			754			682			99			50,777		
Kenai River Dip Net																						
2004	22	18,513	35	0%	262,831	583	1%	792	7	2%	2,661	66	5%	2,103	27	3%	387	12	6%	268,774	905	1%
2005	22	20,977	18	0%	295,496	273	0%	997	3	1%	2,512	24	2%	1,806	12	1%	321	2	1%	301,132	275	0%
2006	20 [c]	12,685	16	0%	127,630	183	0%	1,034	3	1%	2,235	15	1%	11,127	37	1%	551	9	3%	142,577	203	0%
Mean		17,392			228,652			941			2,469			5,012			420			237,494		
Unknown Fishery [d]																						
2004	-	1,143	13	2%	13,527	179	3%	99	3	6%	366	25	14%	210	10	9%	25	4	5%	14,227	185	3%
2005	-	270	2	1%	4,520	38	2%	32	1	6%	39	1	5%	40	2	10%	4	0	0%	4,635	38	2%
2006	-	371	2	2%	3,406	34	3%	29	1	6%	47	2	14%	304	16	9%	84	0	5%	3,870	41	3%
Mean	-	595			7,151			53			151			185			38			7,577		
Upper Cook Inlet Personal Use Fisheries Total																						
2004	n/a	25,360	43	1%	350,091	678	1%	1,098	9	2%	3,754	75	4%	2,715	32	2%	502	14	5%	358,158	689	1%
2005	n/a	27,253	21	0%	369,776	311	0%	1,132	3	1%	3,415	29	2%	2,520	17	1%	428	3	1%	377,271	314	0%
2006	n/a	20,543	20	0%	216,047	236	0%	1,405	4	1%	3,759	27	1%	12,434	41	1%	746	10	3%	234,391	242	0%
Mean	n/a	24,385			311,971			1,212			3,643			5,890			559			323,273		

Note: Est. = estimate, SE = standard error, RP = relative precision (RP = (SE*1.96)/Est.), "-" = value can't be calculated due to limitations of the data, n/a = not applicable

[a] Emergency Order No. 2-S-1-05 extended gillnetting from June 24 to June 25 in 2005.

[b] Emergency Order No. 2-RS-1-12-05 extended area for dipnetting from June 25 to July 31.

[c] Emergency Order No. 2-RS-1-16-06 closed dipnetting at the mouth of the Kenai River on July 21; Emergency Order No. 2-RS-1-34-06 re-opened dipnetting at the mouth of Kenai River on July 31; Emergency Order No. 2-RS-1-37-06 re-opened dipnetting at the mouth of Kenai River from August 3-10.

[d] In 2005 a follow-up phone survey was conducted to distribute the "Unknown Fishery" harvest between the Kenai and Kasilof fisheries for the dates the dip net fisheries overlapped.

Table 4.-Flounder harvest, standard errors, and relative precision in Upper Cook Inlet personal use fisheries, 2005-2006.

Year	Days Open	Days Fished Estimate	Days Fished SE	Days Fished RP	Flounder Harvest Estimate	Flounder Harvest SE	Flounder Harvest RP
Kasilof Gill Net							
2005 [a]	11	1,506	6	1%	101	1	2%
2006	10	1,724	5	1%	162	2	2%
Kasilof Dip Net							
2005 [b]	44	4,500	9	<1%	322	3	2%
2006	44	5,763	10	<1%	215	2	2%
Kenai River Dip Net							
2005	22	20,977	18	<1%	1,572	5	1%
2006 [c]	20	12,685	16	<1%	1,913	11	1%
Unknown Fishery							
2005	-	270	2	1%	29	2	14%
2006	-	371	2	2%	45	3	13%
Upper Cook Inlet Personal Use Fisheries Total							
2005	n/a	27,253	21	<1%	2,024	6	1%
2006	n/a	20,543	20	<1%	2,335	12	1%

Note: SE = standard error, RP = relative precision (RP = (SE*1.96)/Est.). "-" = value can't be calculated due to limitations of the data, n/a = not applicable

[a] Emergency Order No. 2-S-1-05 extended gillnetting from June 24 to June 25 in 2005.

[b] Emergency Order No. 2-RS-1-12-05 extended area for dipnetting from June 25 to July 31.

[c] Emergency Order No. 2-RS-1-16-06 closed dipnetting at the mouth of Kenai River on July 21; Emergency Order No. 2-RS-1-34-06 re-opened dipnetting at the mouth of Kenai River on July 31; Emergency Order No. 2-RS-1-37-06 re-opened dipnetting at the mouth of Kenai River from August 3-10.

Table 5.-Sockeye salmon exploitation rate by Upper Cook Inlet personal use fisheries, 2004-2006.

	Harvest		Inriver	Explotation Rate		
Year	Dip net	Gillnet	Return [a]	Dip net	Gillnet	Combined
Kasilof River						
2004	48,315	25,417	658,686	7.3%	3.9%	11.2%
2005	43,151	26,609	423,825	10.2%	6.3%	16.5%
2006	56,144	28,867	460,769	12.2%	6.3%	18.4%
Mean	49,203	26,964	514,427	9.9%	5.5%	15.4%
Kenai River						
2004	262,831	n/a	1,663,956	15.8%	n/a	n/a
2005	295,496	n/a	1,731,733	17.1%	n/a	n/a
2006	127,630	n/a	1,650,351	7.7%	n/a	n/a
Mean	228,652	n/a	1,682,013	13.5%	n/a	n/a

Note: n/a = not applicable

[a] Inriver return calculated as total run estimate minus commercial harvest; from Tobias and Willette 2007.

Table 6.-Residence areas for Upper Cook Inlet personal use salmon fishery permit holders by year, 2004-2006.

Area of Residence	SWHS Area [a]	Year 2004	2005	2006
Regional breakdown [b]				
Region 1	A-H	0.1%	0.2%	0.2%
Region 2	J-N,P-T	97.1%	97.0%	96.7%
Region 3	I, U-Z	2.5%	2.7%	2.9%
Out of State/Unknown residence		0.3%	0.2%	0.2%
Total		100%	100%	100%
Region 2 breakdown				
Anchorage area	L	61.1%	61.0%	59.8%
Kenai Penninsula area	P	25.0%	24.5%	26.1%
Matanuska-Susitna Valley area	K	12.1%	12.9%	12.6%
Other Region 2 areas	J,M,N,Q-T	1.8%	1.6%	1.5%
Total		100%	100.0%	100.0%

[a] Statistical areas used in the Statewide Harvest Survey (Jennings et al. 2007).

[b] Region 1 is Southeastern Alaska, Region 2 is Southcentral Alaska, and Region 3 is Interior Alaska.

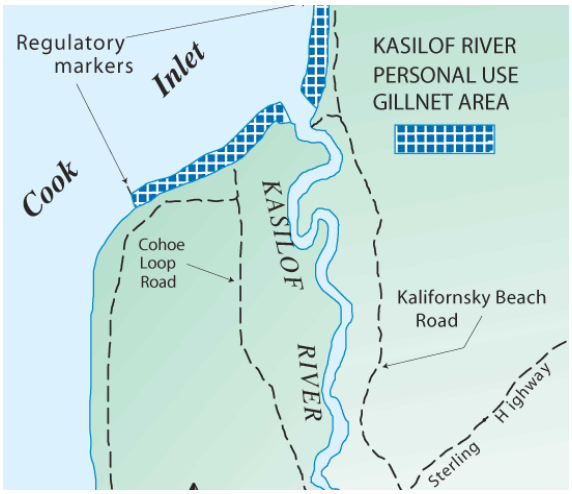
Table 7.-Summary of Upper Cook Inlet personal use permit holders by year, household size, number of days fished, and number of fisheries fished, 2004-2006.

	% of permits	% of total harvest	Average % of bag limit filled	SE (% of bag limit filled)
Year				
2004	35.1	36.9	38.6	0.3
2005	35.1	38.9	39.7	0.3
2006	29.8	24.2	29.6	0.3
Total	100.0	100.0		
Number of household members [a]				
1	15.3	8.8	37.0	0.4
2	33.1	27.6	38.5	0.3
3	16.5	16.0	34.8	0.4
4	18.7	21.6	34.2	0.3
5	9.3	12.6	33.6	0.5
6	3.9	6.4	35.0	0.7
7+	3.2	7.0	37.1	0.8
Total	100.0	100.0		
Number of days [a]				
0	25.8	0.0	0.0	0.0
1	43.8	46.4	33.2	0.2
2	19.2	30.2	48.7	0.3
3	7.1	13.6	65.5	0.5
4	2.6	5.9	72.8	0.7
5+	1.5	3.9	78.2	0.9
Total	100.0	100.0		
Number of fisheries fished [a]				
0	25.8	0.0	0.0	0
1	68.1	89.2	75.5	0.2
2	5.7	10.4	65.9	0.6
3	0.4	0.4	71.9	1.8
Total	100.0	100.0		

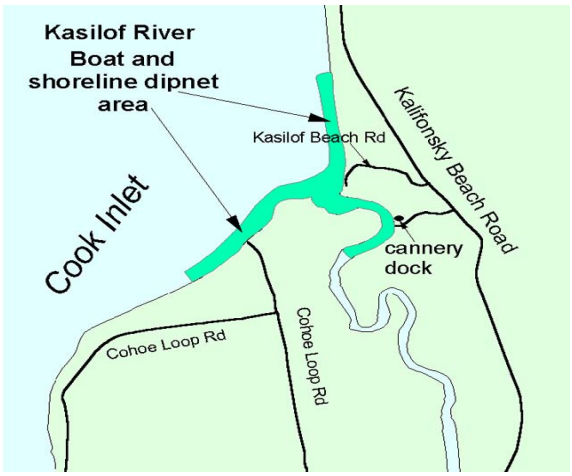
[a] For all permits and years combined

FIGURES

Panel A



Panel B



Panel C

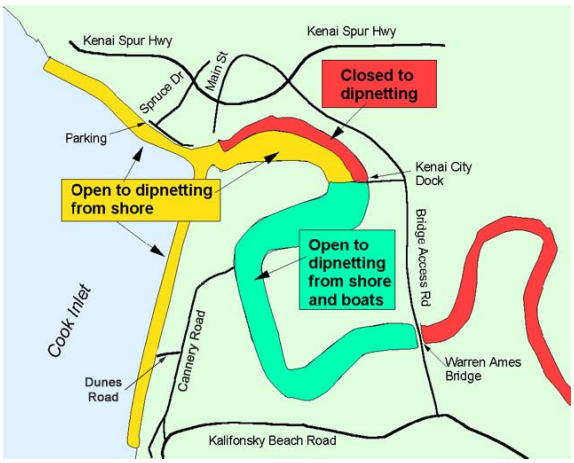
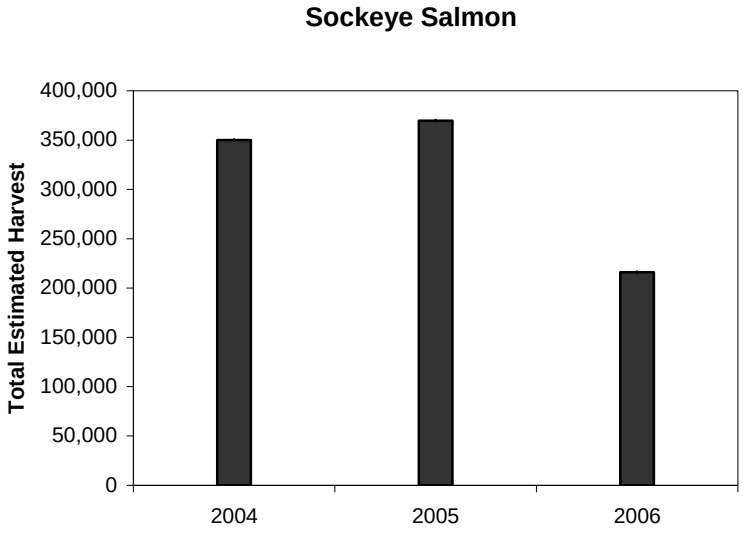
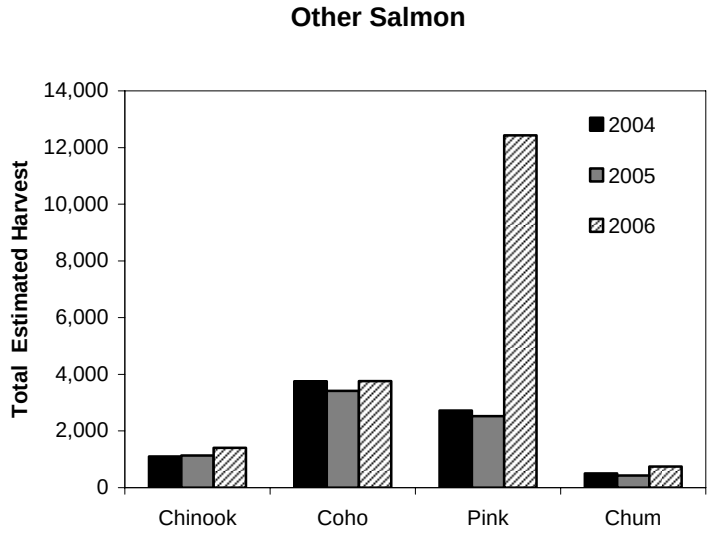


Figure 1.-Upper Cook Inlet personal use salmon fisheries: Kasilof River set gillnet fishery (Panel A), Kasilof River dip net fishery (Panel B), and Kenai River dip net fishery (Panel C).

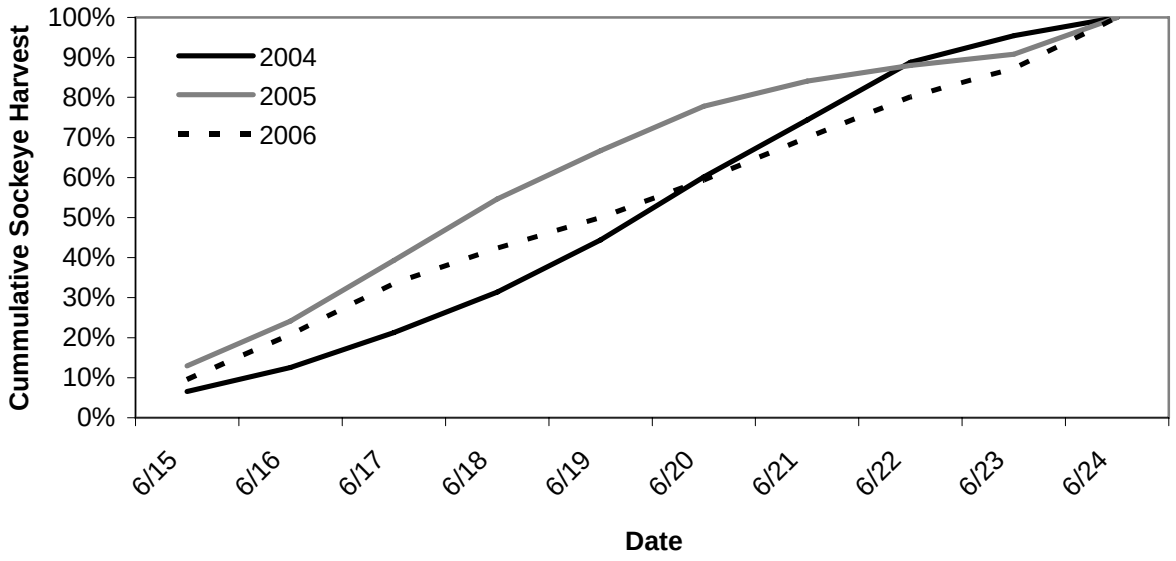


Note: All standard errors are less than ± 700.



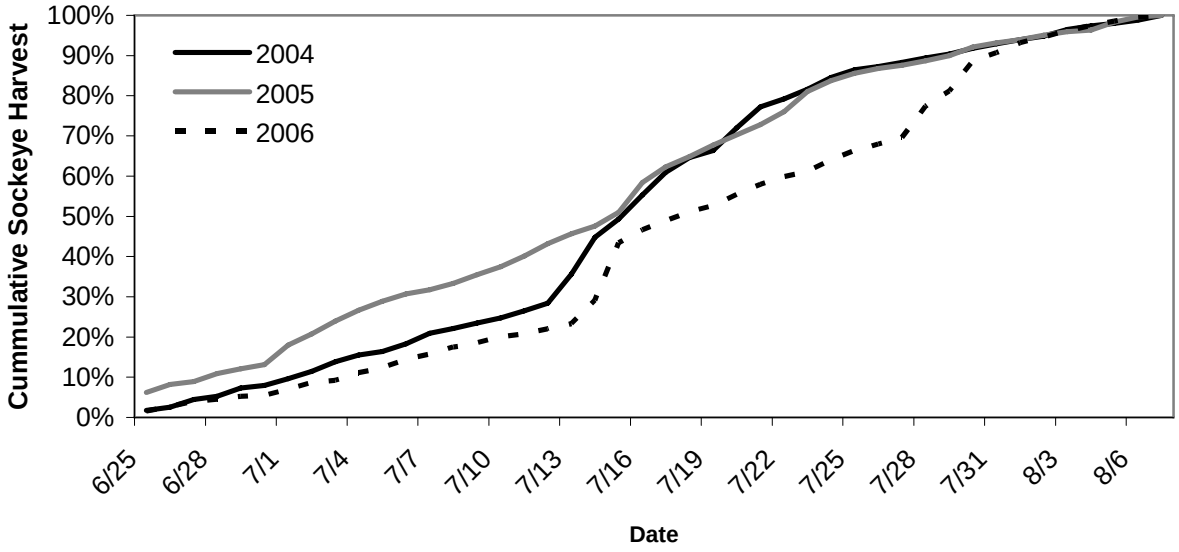
Note: All standard errors are less than ± 75.

Figure 2.-Total estimated salmon harvest for all Upper Cook Inlet personal use fisheries combined. Top figure shows harvest of sockeye salmon, and the bottom figure shows harvest for all other salmon species. Note the difference in the y-axis scales.



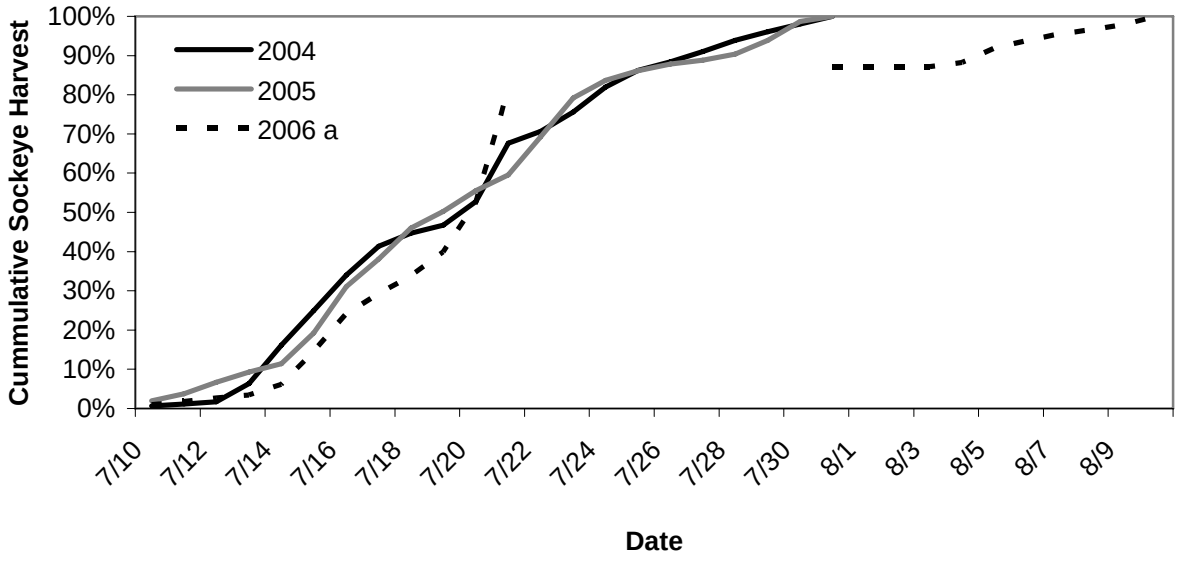
Note: Total harvest of sockeye salmon by day is listed in Appendix B1.

Figure 3.-Cumulative harvest timing for sockeye salmon during Kasilof River personal use set gillnet fishery, 2004-2006.



Note: Total harvest of sockeye salmon by day is listed in Appendix B2.

Figure 4.-Cumulative harvest timing for Kasilof River personal use dip net fishery, 2004-2006.



Note: Total harvest of sockeye salmon by day is listed in Appendix B3.

[a] The break in the 2006 cumulative sockeye harvest data is due to an emergency order closure of the dip net fishery. See Appendix B3 for details.

Figure 5.-Cumulative harvest timing for sockeye salmon during Kenai River personal use dip net fishery, 2004-2006.

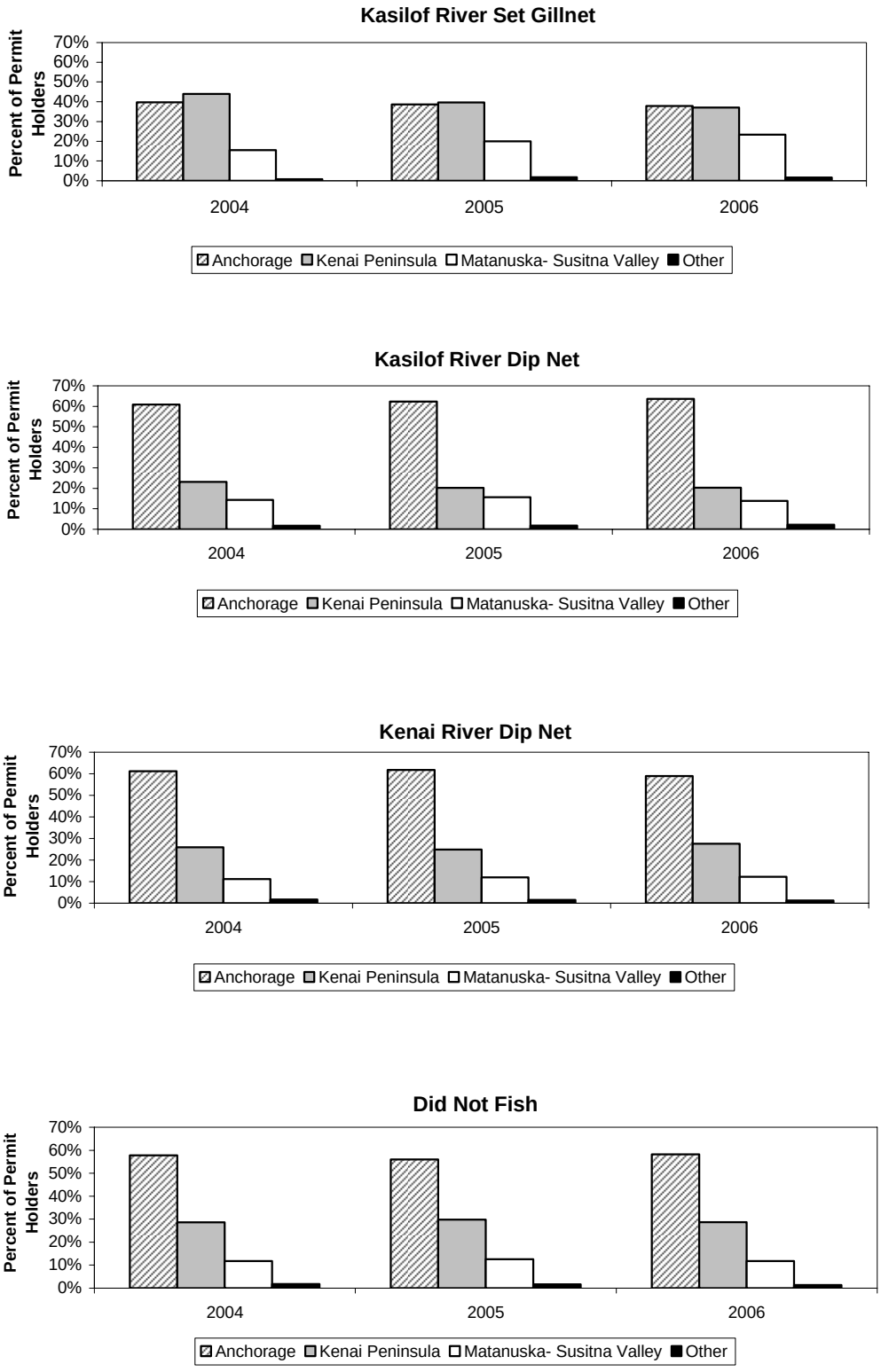


Figure 6.-Percent of Upper Cook Inlet personal use salmon fishery permit holders from Anchorage, Kenai Peninsula, Matanuska-Susitna Valley, and elsewhere in Region II by fishery and year.

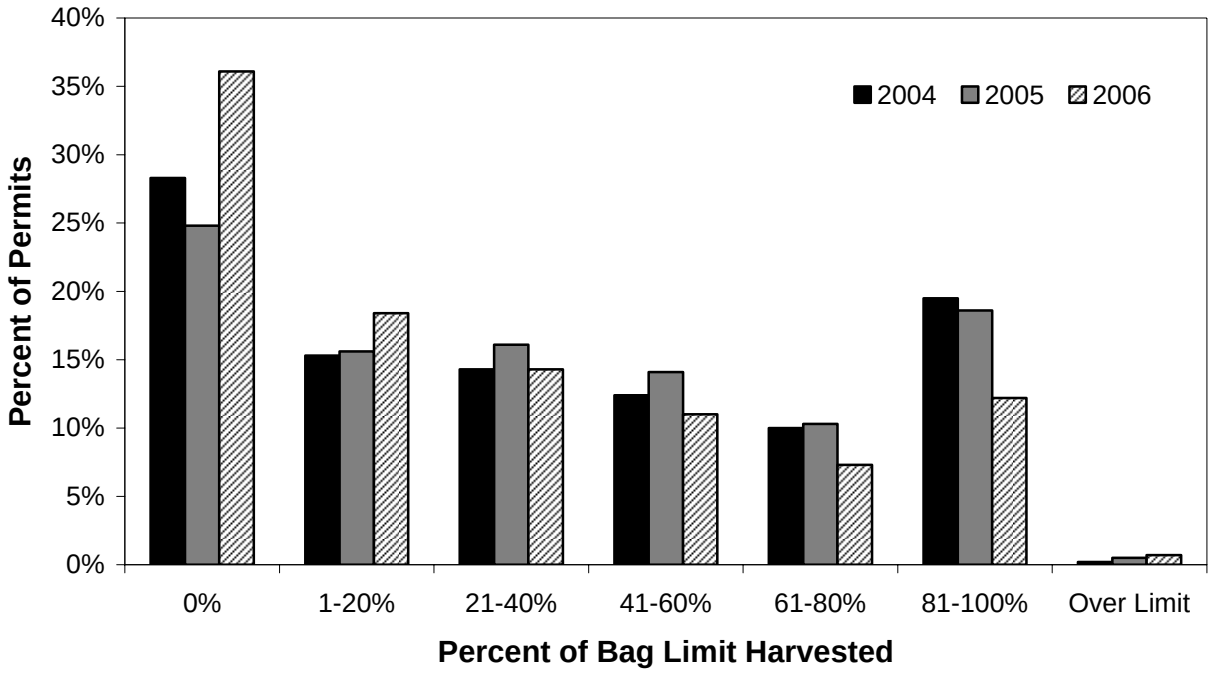
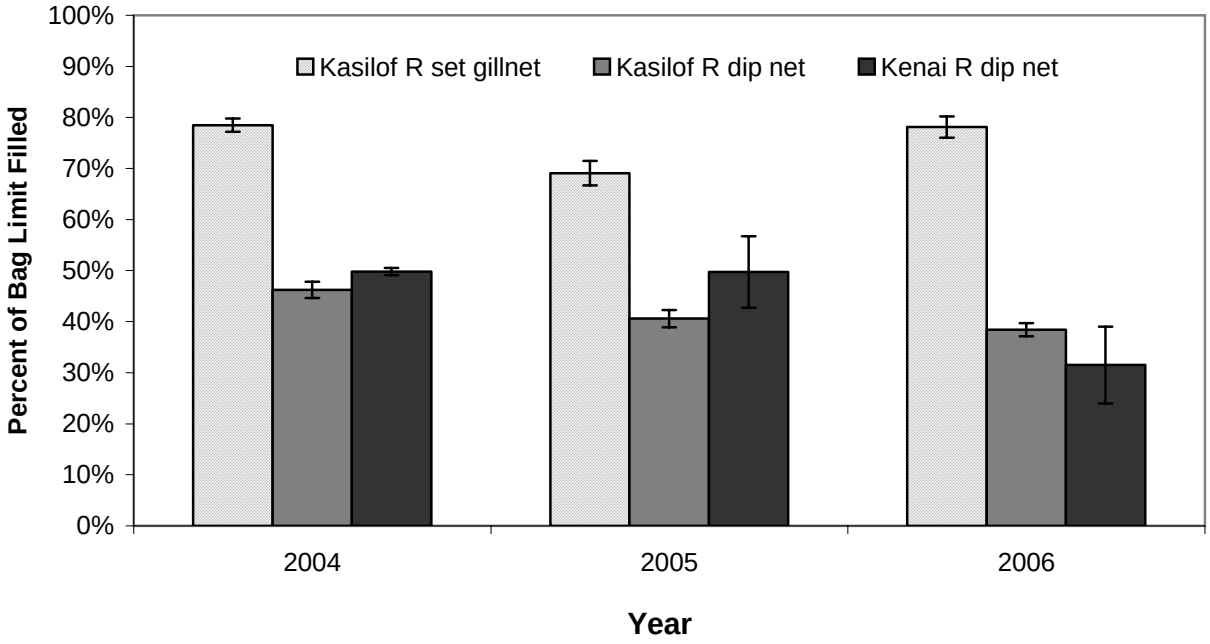
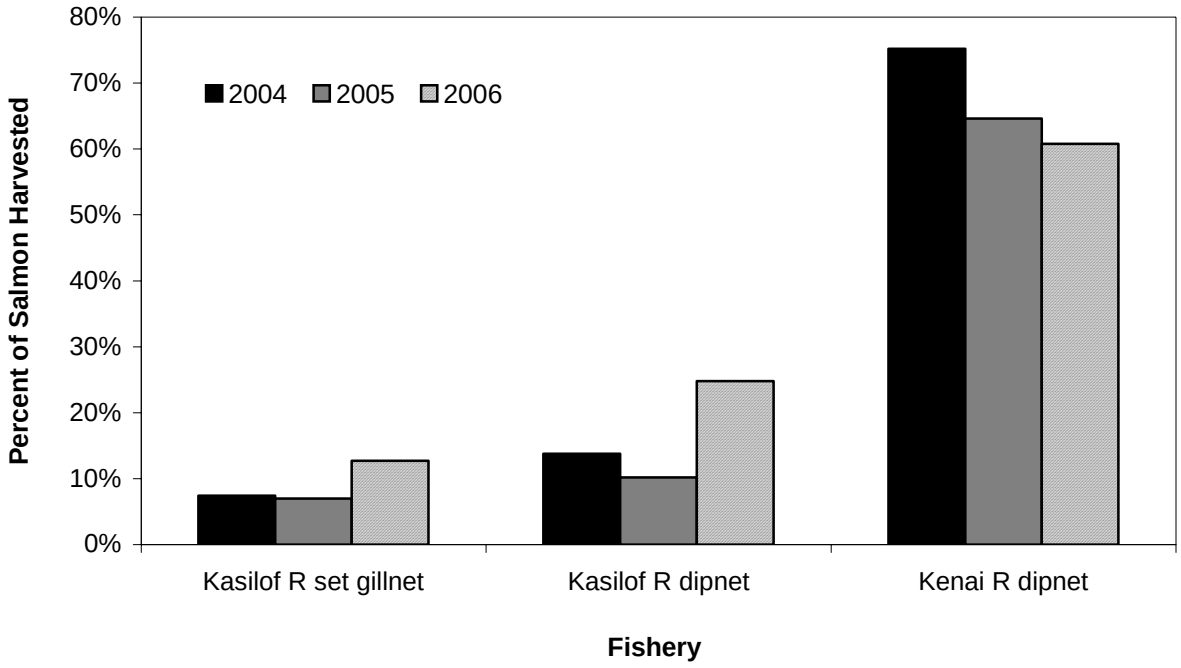


Figure 7.-Percent of bag limits filled by Upper Cook Inlet personal use salmon fishery permit holders, 2004-2006.



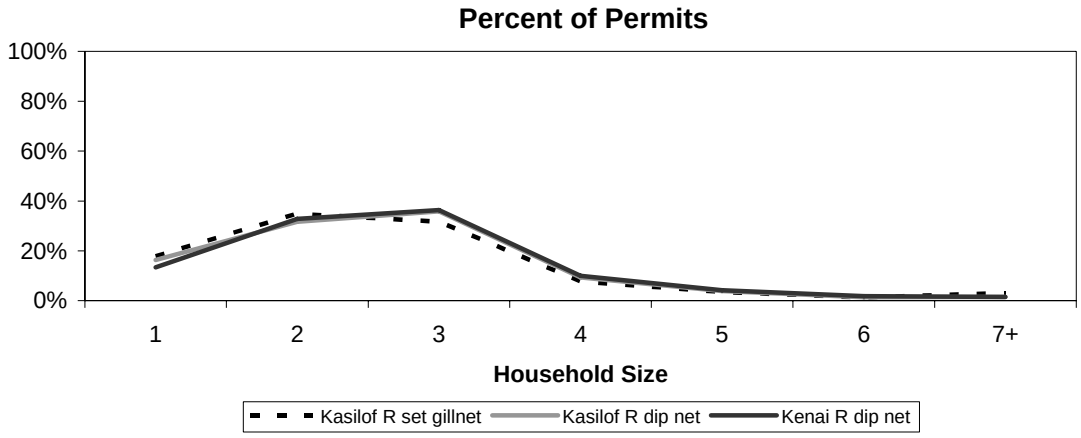
Note: Data presented are for permit holders that only participated in one fishery (92% of permits holders who fished). Error bars represent 95% confidence intervals.

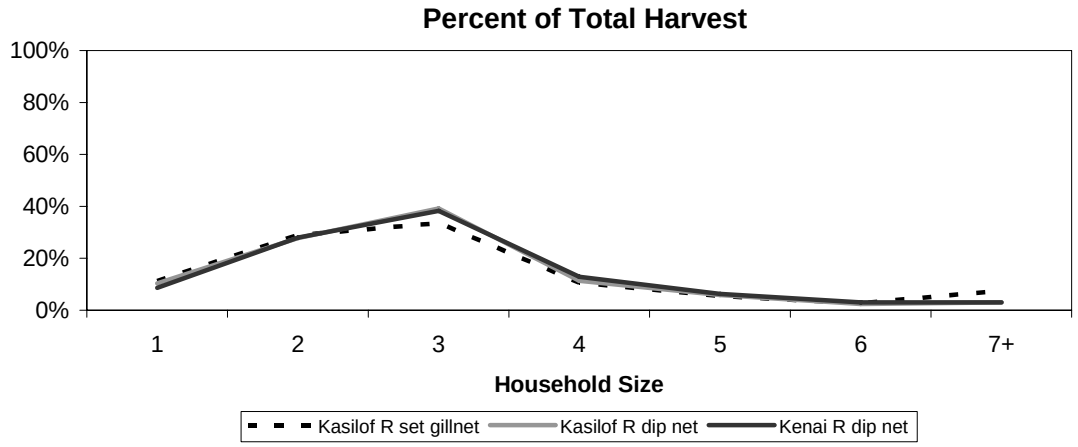
Figure 8.-Average percent of bag limit filled by personal use salmon fishery and year.

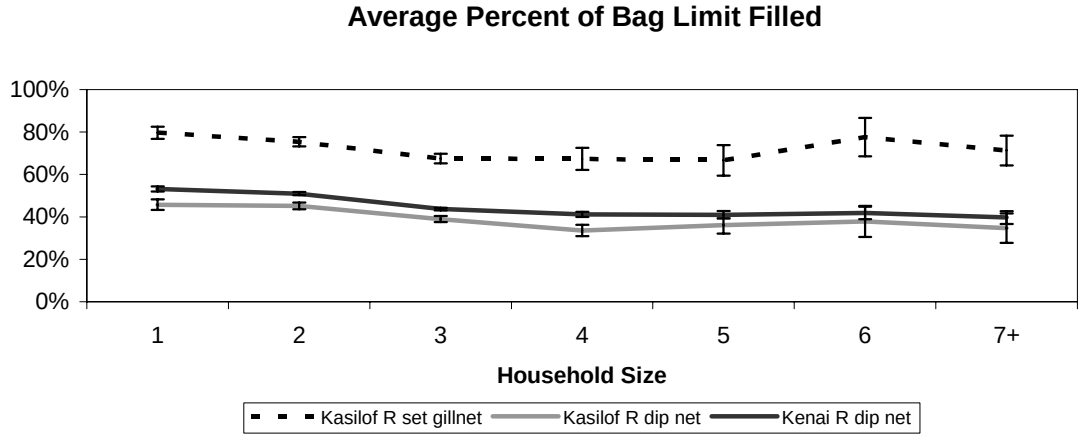


Note: Data presented exclude salmon reported from permits with "unknown" fisheries (8.9%).

Figure 9.-Percent of salmon harvest by Upper Cook Inlet personal use salmon fishery, 2004-2006.

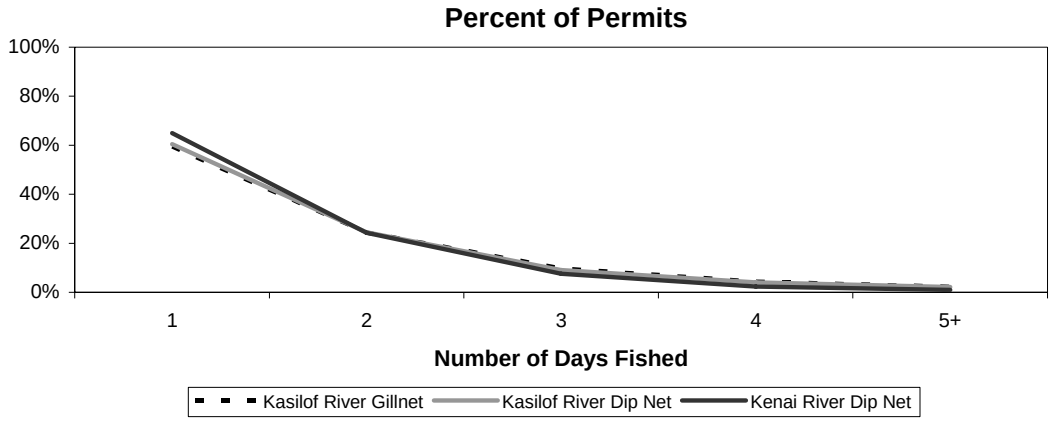


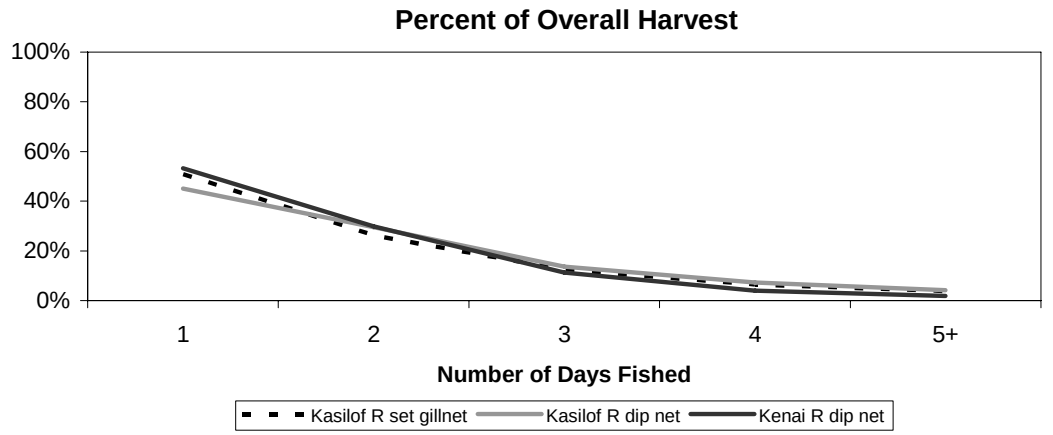


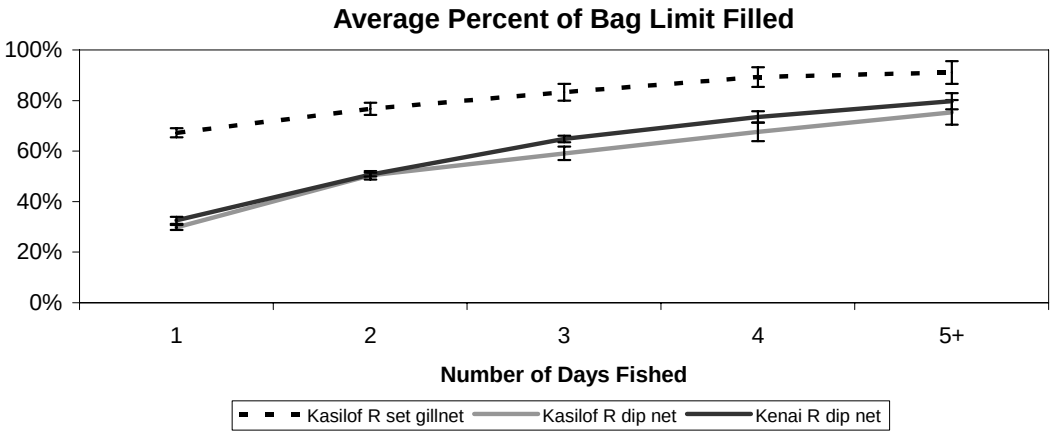


Note: Data presented are for permit holders that only participated in one fishery (92% of permit holders who fished). Error bars represent 95% confidence intervals.

Figure 10.-Percent of permits, percent of total harvest, and average percent of bag limit filled by personal use salmon fishery and household size, 2004-2006.







Note: Data presented are for permit holders that only participated in one fishery (92% of permit holders who fished). Error bars represent 95% confidence intervals.

Figure 11.-Percent of permits, percent of total harvest, and average percent of bag limit filled by personal use salmon fishery and number of days fished, 2004-2006.

APPENDIX A. EXAMPLES OF UPPER COOK INLET PERSONAL USE PERMITS

Appendix A1.-Example of a 2006 Upper Cook Inlet personal use salmon permit.

Vendor Copy Permit Number: **06-**

2006 Upper Cook Inlet Personal Use Salmon Fishery

Last Name	First Name	Middle Initial

Mailing Address

City	State	Zip Code

Phone Number: (907)

Total Number of Household Members:		Total Household Salmon Harvest Limit:		You are allowed 25 salmon for the head-of-household, and 10 salmon for each additional household member. **This is your salmon limit for the entire 2006 season.** In addition, each household permit is allowed 10 flounders. Your name and address are subject to public disclosure.

2006 Alaska Resident Fishing License Number:									Alaska Driver's License Number:							

I have read and understand the permit requirements (listed on the back) and agree to return this permit to Alaska Department of Fish and Game by August 15, 2006. Failure to return this permit is a violation of 5 AAC 77.015(c) and subject to a $200 fine and loss of your future personal use fishing privileges.

Permit Holder Signature	Date

Vendor Signature	Vendor Number:				

Permit Number: **06-**

2006 Upper Cook Inlet Personal Use Salmon Fishery Permit

☆ TIPS OF THE TAILS MUST BE REMOVED AND HARVEST MUST BE RECORDED IMMEDIATELY; PRIOR TO LEAVING THE FISHING SITE ☆

Last Name	First Name	Middle Initial

Names of Other Household Members

Total Number of Household Members:		Total Household Salmon Harvest Limit:		You are allowed 25 salmon for the head-of-household, and 10 salmon for each additional household member. **This is your salmon limit for the entire 2006 season.** In addition, each household permit is allowed 10 flounders.

This permit is for gillnetting at the mouth of the Kasilof River and dipnetting at the mouth of the Kasilof and Kenai Rivers in 2006. Dipnetting at Fish Creek (near Wasilla) is only open by Emergency Order. You must have this permit with you while fishing and you must record your harvest before you leave the fishing site. Check the Southcentral Sport Fishing Regulations for legal times, gear and species restrictions.

Check this box if no one in your household fished ☐

Report each day and location you fished, record your catch, even if you didn't catch anything.

	LOCATION FISHED (CHECK ONE)			HARVEST BY SPECIES					
DATE	Kenai River	Fish Creek	Kasilof River	RED	CHUM	KING	COHO	PINK	Flounder
M / Day	☐	☐	☐						
M / Day	☐	☐	☐						
M / Day	☐	☐	☐						
M / Day	☐	☐	☐						
M / Day	☐	☐	☐						
M / Day	☐	☐	☐						

Return this permit to Fish and Game by August 15, 2006.
You must return your permit even if you did not fish.

Permit Requirements and Vendor Instructions

Permit Requirements

1. Applicant must be an **Alaska Resident**.
2. Applicant must have a valid **2006** Alaska resident **Sport Fishing License** or possess an ADF&G Permanent Identification card (PID – a permanent sport fishing, hunting, trapping license) or Disabled Alaska Veterans (DAV) license or applicant is under the age of 16 years.
3. Only **ONE** permit per household is allowed.
4. Permits **MUST** be returned to Fish and Game **by August 15, 2006**, even if the permit holder did not fish. Failure to return this permit is a violation and subject to a $200 fine and loss of future personal use fishing privileges. Your harvest information is vital to the management and conservation of the resource.

SPECIAL INSTRUCTIONS TO THE VENDOR:

- Return your vendor copies each month to Fish & Game in the envelopes provided.
- All unissued permits and all vendor copies of permits must be **returned** after the fishery closes or by **Sept. 15, 2006**.

Send these in the envelopes provided to:

State of Alaska – Department of Fish & Game
Personal Use Salmon Permits
333 Raspberry Rd.
Anchorage, AK 99518-1599

Additional Questions?
Call the Sport Fish Information Center at (907) 267-2218

To Issue a Permit

1. Ask to see the applicant's **2006** Alaska sport fishing license or PID or DAV or identification of under 16 years of age.
2. Write the **license number** in the space provided on the top of the form.
3. Have the **applicant** fill out his/her name, address, and driver's license number on the top and bottom of the form, including names of other household members.
4. A household is allowed 25 salmon for the head-of-household and 10 salmon for each additional household member. A household is allowed 10 flounders.
5. **Vendor** must determine the total number of **household members** and the **total salmon harvest limit**, and write it in the spaces provided on the top and bottom portion of the form.
6. Applicant must **sign and date** the top portion. The Vendor must also sign and provide their vendor number.
7. The **Vendor** returns the **Top** portion to Fish and Game, and the applicant gets the **Bottom.**
8. **Vendor** is responsible for verifying that ALL the identifying information on the top and bottom of the form is complete. Do NOT leave any **BLANK** spaces.
9. **Do Not** allow people to walk out with blank permits.

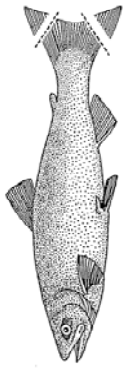
_____

_____

_____

PLACE FIRST-CLASS POSTAGE HERE

REMOVE BOTH TIPS OF THE TAIL FIN FROM SALMON CAUGHT IN **PERSONAL-USE** FISHERIES



STATE OF ALASKA
DEPARTMENT OF FISH & GAME
PERSONAL USE SALMON PERMITS
333 RASPBERRY ROAD
ANCHORAGE AK 99518-1599

Appendix A2.-Example of a 2005 Upper Cook Inlet personal use salmon permit.

Vendor Copy Permit Number: **05-**

2005 Upper Cook Inlet Personal Use Salmon Fishery

Last Name	First Name	Middle Initial
Mailing Address		
City	State	Zip Code
Phone Number: (907)		

Total Number of Household		Total Household Salmon Harvest Limit:		You are allowed 25 salmon for the head-of-household, and 10 salmon for each additional household member. **This is your salmon limit for the entire 2005 season.** In addition, each household permit is allowed 10 flounders.

2005 Alaska Resident Fishing License Number:									Alaska Driver's License Number:							

I have read and understand the permit requirements (listed on the back) and agree to return this permit to Alaska Department of Fish and Game by August 15, 2005. Failure to return this permit is a violation of 5 AAC 77.015(d) and subject to a $200 fine and loss of your future personal use fishing privileges.

Permit Holder Signature	Date

Vendor Signature	Vendor Number:				

Permit Number: **05-**

2005 Upper Cook Inlet Personal Use Salmon Fishery Permit

☆ TIPS OF THE TAILS MUST BE REMOVED AND HARVEST MUST BE RECORDED IMMEDIATELY; PRIOR TO LEAVING THE FISHING SITE ☆

Last Name	First Name	Middle Initial
Names of Other Household Members		

Total Number of Household Members:		Total Household Salmon Harvest Limit:		You are allowed 25 salmon for the head-of-household, and 10 salmon for each additional household member. **This is your salmon limit for the entire 2005 season.** In addition, each household permit is allowed 10 flounders.

This permit is for dipnetting at the mouth of the Kasilof and Kenai Rivers and Fish Creek (near Wasilla) and for gillnetting near the mouth of the Kasilof River in 2005. You must have this permit with you while you are fishing, and you must record your harvest before you leave the fishing site. Check the Southcentral Sport Fishing Regulation Summary for legal times, gear and species restrictions.

Check this box if no one in your household fished ☐

Report all days fished and all fish harvested. Record <u>every day</u> you fish, even those days when you didn't catch anything.

DATE	LOCATION (circle one)	RED	CHUM	KING	COHO	PINK	Flounder
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						
M / Day	Kenai River, Fish Creek, Kasilof River						

***FISHERIES ARE: KENAI RIVER DIP NET, FISH CREEK DIP NET, KASILOF RIVER GILL NET AND KASILOF RIVER DIP NET**

***Return this permit to Fish and Game by August 15, 2005**. You must return your permit even if you did not fish.*

APPENDIX B. SOCKEYE HARVEST BY DATE DURING THE UPPER COOK INLET PERSONAL USE FISHERIES, 2004-2006

Appendix B1.-Sockeye harvest by date during the Kasilof River set gillnet fishery, 2004-2006.

	Harvest								
	2004			2005			2006		
Date	Total [a]	Mean [b]	SE	Total [a]	Mean [b]	SE	Total [a]	Mean [b]	SE
15-Jun	1,474	12.6	1.0	3,024	20.6	1.2	2,551	14.3	0.7
16-Jun	1,329	14.0	1.1	2,612	18.4	1.1	3,033	15.6	0.9
17-Jun	1,953	16.0	1.1	3,549	20.9	1.3	3,428	15.8	0.8
18-Jun	2,266	15.5	1.0	3,566	21.1	1.2	2,376	14.1	0.8
19-Jun	2,912	18.5	1.0	2,832	20.7	1.3	2,056	15.3	1.1
20-Jun	3,531	22.6	1.3	2,589	17.9	1.1	2,519	16.5	1
21-Jun	3,185	26.5	1.4	1,467	10.8	0.8	2,845	19.1	1.1
22-Jun	3,229	30.2	2.0	907	10.0	0.8	2,732	20.1	1.1
23-Jun	1,482	27.0	2.4	660	8.0	0.9	1,935	15.6	1.1
24-Jun	1,019	22.6	2.2	2,147	20.6	1.5	3,410	22.4	1.2
25-Jun	[c]	[c]	[c]	[d]	[d]	[d]	[c]	[c]	[c]

[a] Data presented are for "known" permits during legal harvest dates only.

[b] Mean is mean harvest per permit.

[c] Fishery closed.

[d] Emergency Order No. 2-S-1-05 extended gillnetting from June 24 to June 25 in 2005; data were not distinguished between "gill net" and "dip net" in the database and are, therefore, not presented here.

Appendix B2.-Sockeye harvest by date during the Kasilof River dip net fishery, 2004-2006.

	Harvest								
	2004			2005			2006		
Date	Total [a]	Mean [b]	SE	Total [a]	Mean [b]	SE	Total [a]	Mean [b]	SE
25-Jun	673	8.7	1.2	1,973	11.7	1	788	9	0.8
26-Jun	335	5.6	1.0	624	6.7	0.7	555	13.2	2.3
27-Jun	728	9.5	0.8	234	6.9	1.1	613	9.7	1
28-Jun	324	9.8	1.5	617	10.5	1.1	259	7.8	1.1
29-Jun	793	13.2	2.0	391	9.1	1.8	343	8.2	1.2
30-Jun	275	6.7	1.7	326	7.1	0.9	137	4.2	0.9
1-Jul	635	9.8	1.5	1,534	11.8	0.8	705	6.8	0.9
2-Jul	731	7.3	0.6	887	6.6	0.5	811	7	0.8
3-Jul	912	7.0	0.6	991	7.6	0.7	284	4.4	0.6
4-Jul	664	7.2	1.0	854	9.6	1	951	10.6	1.2
5-Jul	351	6.8	1.2	711	9.4	1.1	565	8.6	1.1
6-Jul	757	11.3	1.3	578	9.5	1.4	1,021	11.3	1.4
7-Jul	1,005	12.6	1.1	333	5.5	0.8	644	7.4	0.8
8-Jul	468	10.6	1.9	493	5.7	0.8	844	6.5	0.5
9-Jul	537	5.5	0.6	699	5	0.5	523	5.9	0.8
10-Jul	498	5.2	0.8	614	7.6	0.9	728	8.2	0.8
11-Jul	685	6.1	0.6	845	11.9	1.3	369	4.2	0.5
12-Jul	749	10.1	1.1	969	11.7	1.2	599	4.9	0.7
13-Jul	2,838	23.5	1.4	787	9.5	0.9	643	5.4	0.6
14-Jul	3,574	21.1	1.2	612	6.9	0.9	2,821	10	0.5
15-Jul	1,788	13.9	1.0	1,069	7.9	0.7	6,967	14.2	0.5
16-Jul	2,333	11.8	0.8	2,360	11.5	0.7	1,564	8.5	0.6
17-Jul	2,204	8.5	0.5	1,228	9.7	0.8	1,095	8.2	0.8
18-Jul	1,444	8.8	0.8	796	11.2	1	1,061	7.9	0.7
19-Jul	680	7.8	1.0	908	10.2	0.9	750	6.9	0.8
20-Jul	2,225	14.4	1.2	814	8.8	0.8	1,381	10.4	1
21-Jul	2,041	15.0	1.2	803	9.8	1	1,218	7.12	0.7
22-Jul	790	10.7	1.2	1,042	11.7	1.1	971	4.1	0.3
23-Jul	929	10.7	1.1	1,589	12	1	622	4.7	0.6
24-Jul	1,160	9.4	0.9	859	10.7	1	1,435	11.1	0.9
25-Jul	728	9.2	1.0	582	11.2	1.2	1,092	9	0.8
26-Jul	314	11.2	1.7	375	11	1.8	758	9.4	1.1
27-Jul	422	13.6	2.7	255	9.1	1.7	807	9.1	1.3
28-Jul	426	14.2	1.9	329	10.6	1.7	3,809	19.1	1
29-Jul	358	9.0	1.4	425	10	1.1	1,882	11.2	1
30-Jul	569	10.3	1.4	673	11	1.5	3,624	16.9	0.8
31-Jul	439	7.7	1.1	324	9	1.6	978	13.6	1.6
1-Aug	423	8.8	1.2	250	7.6	1.2	1,205	19.4	2.4
2-Aug	323	10.1	2.1	355	11.1	1.8	689	11.7	1.3
3-Aug	647	16.6	2.2	273	9.8	1.6	827	13.3	1.7
4-Aug	364	13.0	2.1	141	5	1	595	9.6	1
5-Aug	226	7.5	1.1	609	10.9	1.1	535	7.23	0.8
6-Aug	325	7.1	0.9	403	6.7	1.2	460	8.5	1
7-Aug	469	8.2	1.4	137	4.3	0.7	231	8.9	2.2

[a] Data presented are for "known" permits during legal harvest dates only.

[b] Mean is mean harvest per permit.

Appendix B3.-Sockeye harvest by date during the Kenai River dip net fishery, 2004-2006.

	Harvest								
	2004			2005			2006 [a]		
Date	Total [b]	Mean [c]	SE	Total [b]	Mean [c]	SE	Total [b]	Mean [c]	SE
10-Jul	1,416	4.6	0.4	3,966	11.0	0.6	1,066	5.4	0.5
11-Jul	950	4.5	0.6	3,754	13.7	0.7	848	4.4	0.4
12-Jul	1,339	7.7	0.8	5,905	14.8	0.6	946	4.2	0.4
13-Jul	10,005	21.4	0.7	5,363	10.1	0.4	820	3.7	0.3
14-Jul	20,934	20.7	0.4	4,265	7.7	0.4	2,783	6.8	0.4
15-Jul	18,854	18.6	0.4	16,085	14.9	0.4	8,930	11.0	0.3
16-Jul	19,397	14.6	0.3	24,157	17.2	0.4	10,365	13.0	0.4
17-Jul	15,715	10.4	0.3	14,353	14.7	0.4	5,390	8.1	0.3
18-Jul	7,135	7.9	0.3	16,033	19.0	0.5	4,798	5.8	0.2
19-Jul	4,352	7.6	0.4	8,668	12.3	0.4	6,469	7.2	0.3
20-Jul	13,008	12.6	0.4	10,908	11.4	0.3	13,512	12.3	0.3
21-Jul	31,776	22.5	0.4	8,153	11.0	0.4	30,607	18.5	0.3
22-Jul	6,321	11.4	0.5	19,858	18.0	0.4	[d]	[d]	[d]
23-Jul	10,803	13.4	0.4	20,324	15.9	0.4	[d]	[d]	[d]
24-Jul	13,525	14.0	0.4	9,077	12.75	0.4	[d]	[d]	[d]
25-Jul	9,174	15.2	0.5	5,093	12.6	0.5	[d]	[d]	[d]
26-Jul	4,664	15.9	0.7	3,427	9.7	0.5	[d]	[d]	[d]
27-Jul	5,569	16.6	0.7	2,086	7.5	0.5	[d]	[d]	[d]
28-Jul	6,141	15.8	0.7	3,143	9.9	0.6	[d]	[d]	[d]
29-Jul	4,677	14.9	0.7	7,160	15.9	0.6	[d]	[d]	[d]
30-Jul	4,151	11.3	0.5	9,694	15.2	0.5	[d]	[d]	[d]
31-Jul	4,271	10.1	0.5	2,740	10.0	0.6	6,030	10.1	0.4
1-Aug	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]
2-Aug	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]	[d]
3-Aug	[d]	[d]	[d]	[d]	[d]	[d]	102	3.8	1
4-Aug	[d]	[d]	[d]	[d]	[d]	[d]	1,144	7.4	0.6
5-Aug	[d]	[d]	[d]	[d]	[d]	[d]	3,844	7.4	0.3
6-Aug	[d]	[d]	[d]	[d]	[d]	[d]	2,145	5.5	0.3
7-Aug	[d]	[d]	[d]	[d]	[d]	[d]	1,707	6.9	0.5
8-Aug	[d]	[d]	[d]	[d]	[d]	[d]	1,168	5.1	0.4
9-Aug	[d]	[d]	[d]	[d]	[d]	[d]	1,316	6.6	0.5
10-Aug	[d]	[d]	[d]	[d]	[d]	[d]	2,280	10.2	0.7

[a] Emergency Order No. 2-RS-1-16-06 closed dipnetting at the mouth of Kenai River on July 21; Emergency Order No. 2-RS-1-34-06 re-opened dipnetting at the mouth of Kenai River on July 31; and Emergency Order No. 2-RS-1-37-06 re-opened dipnetting at the mouth of Kenai River from August 3-10

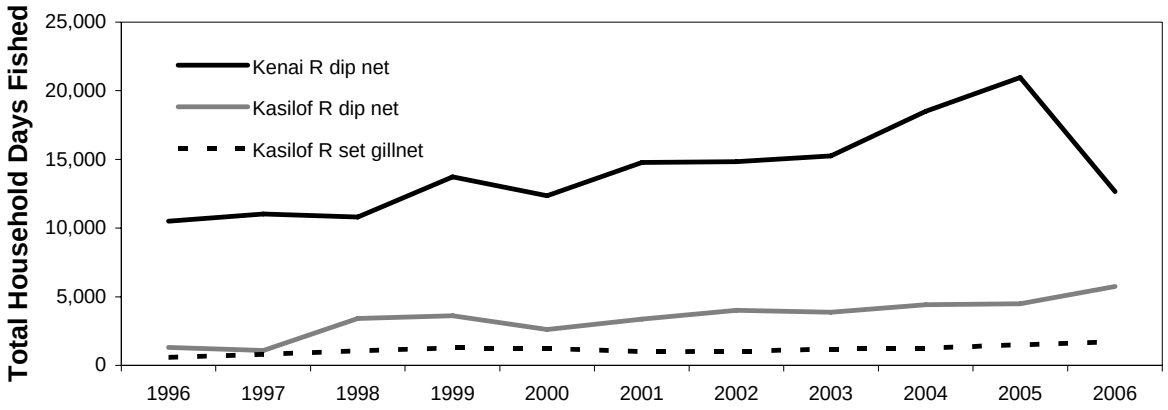
[b] Data presented are for "known" permits during legal harvest dates only.

[c] Mean is mean harvest per permit.

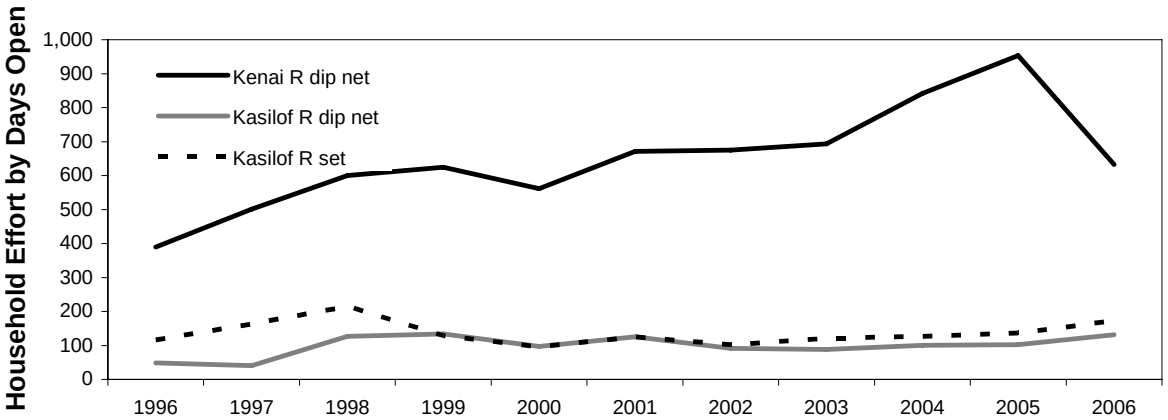
[d] Fishery closed

APPENDIX C. EFFORT AND HARVEST TRENDS DURING THE UPPER COOK INLET PERSONAL USE FISHERIES, 1996-2006

Appendix C1.-Trends in fishing effort during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.

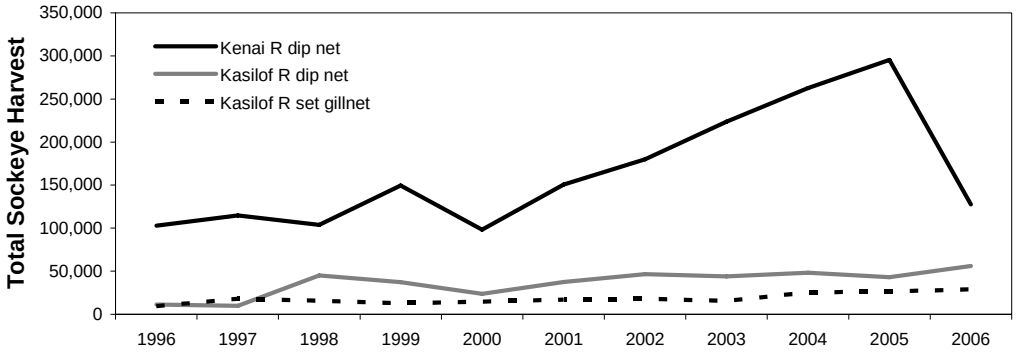


Note: all standard errors are less than ± 90.

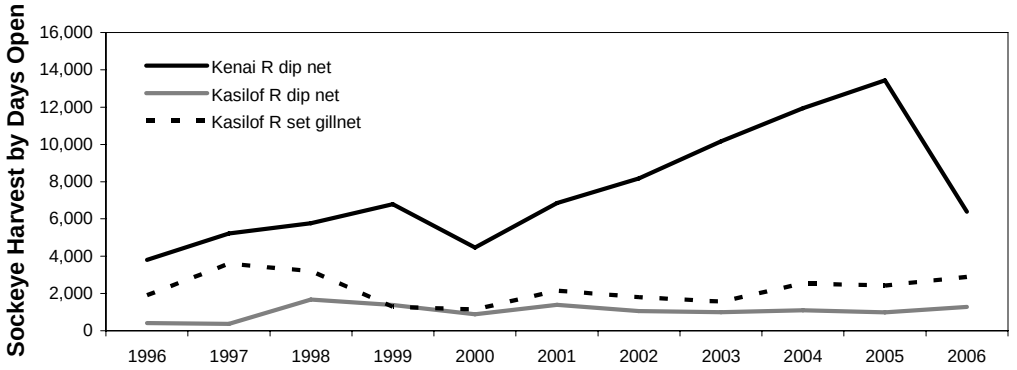


Note: calculated as the overall number of household days fished/number of days the fishery was open each year.

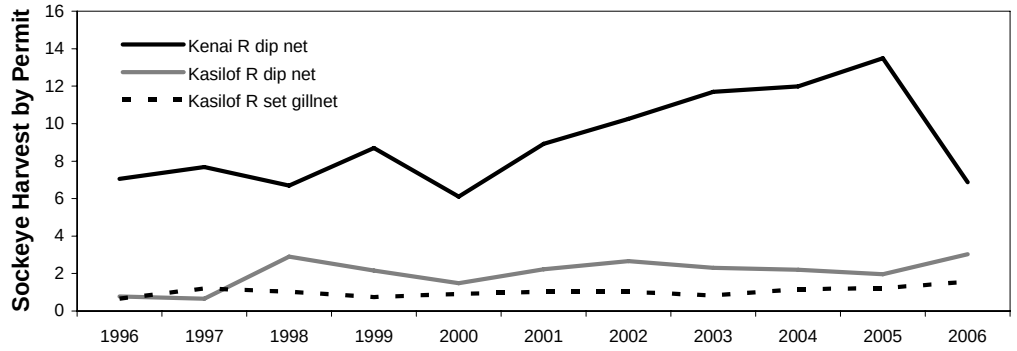
Appendix C2.-Trends in sockeye salmon harvest during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.



Note: all standard errors are less than ± 1,100.

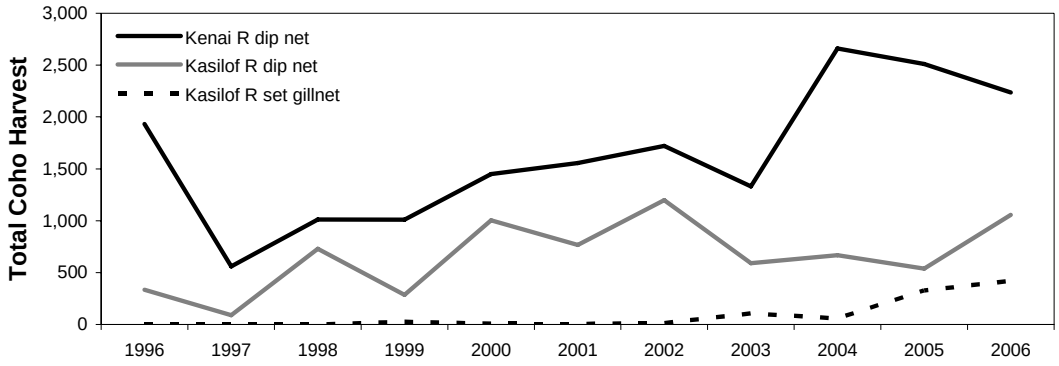


Note: calculated as the overall sockeye harvest / number of days the fishery was open each year.

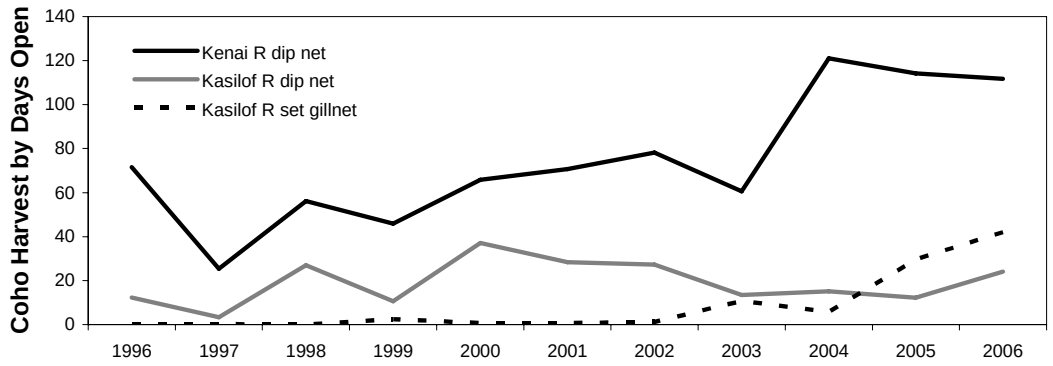


Note: calculated as the overall sockeye harvest / number of permits issued each year.

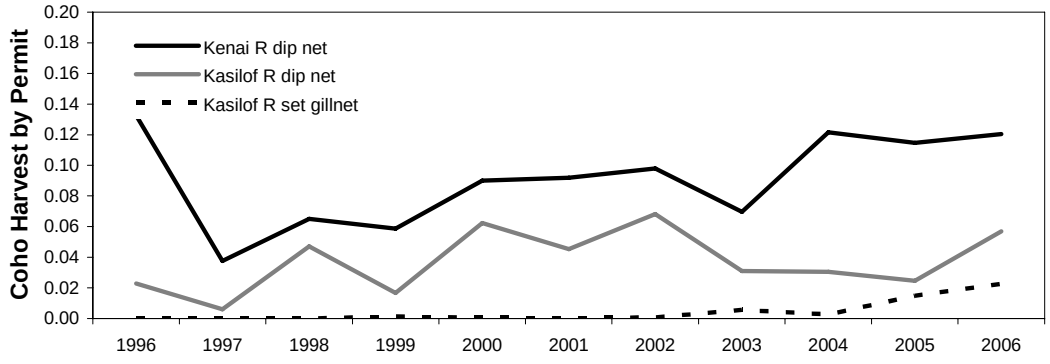
Appendix C3.-Trends in coho salmon harvest during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.



Note: all standard errors are less than ± 110.

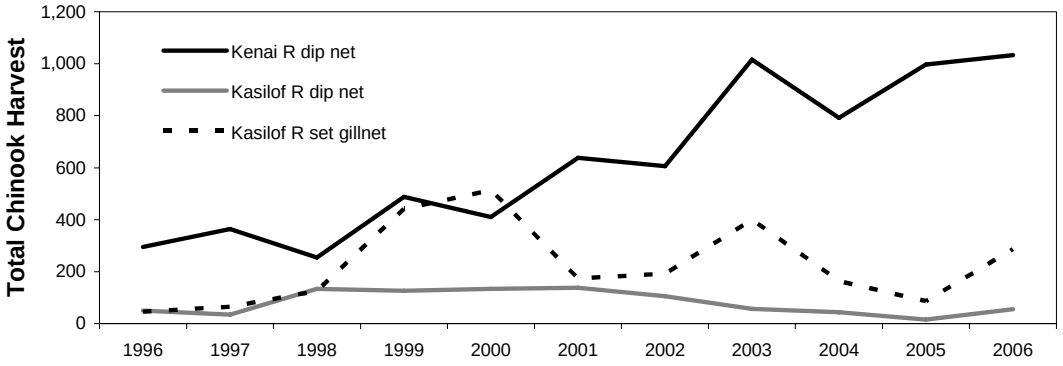


Note: calculated as the overall coho harvest / number of days the fishery was open each year.

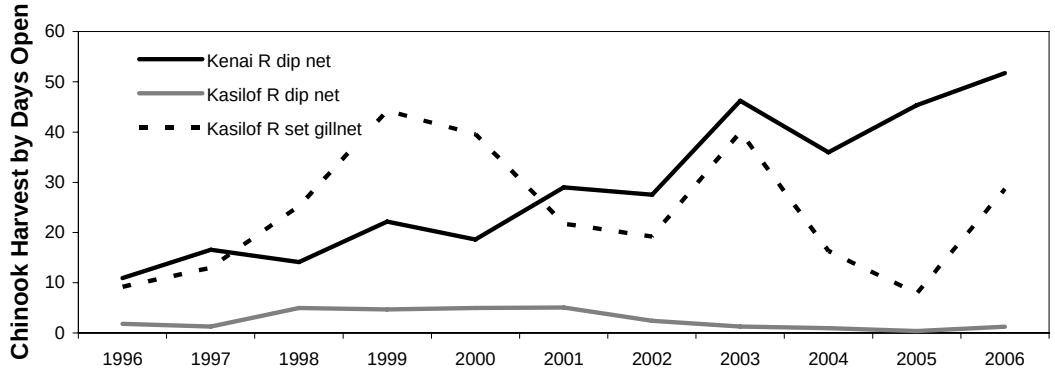


Note: calculated as the overall coho harvest / number of permits issued each year.

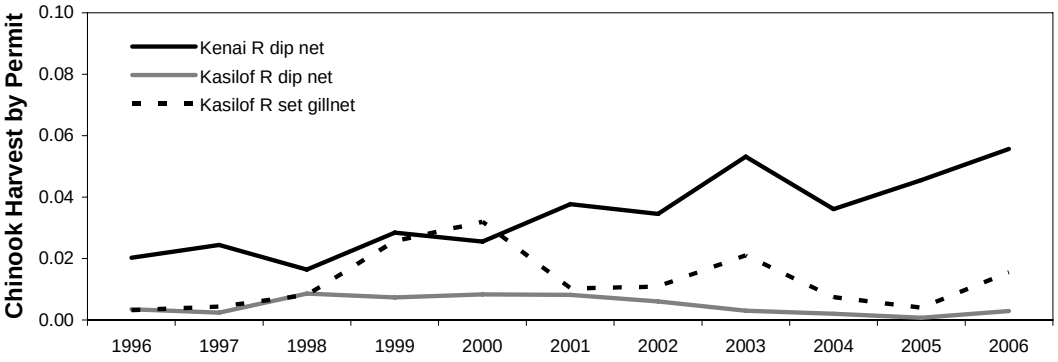
Appendix C4.-Trends in Chinook salmon harvest during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.



Note: all standard errors are less than ± 30.

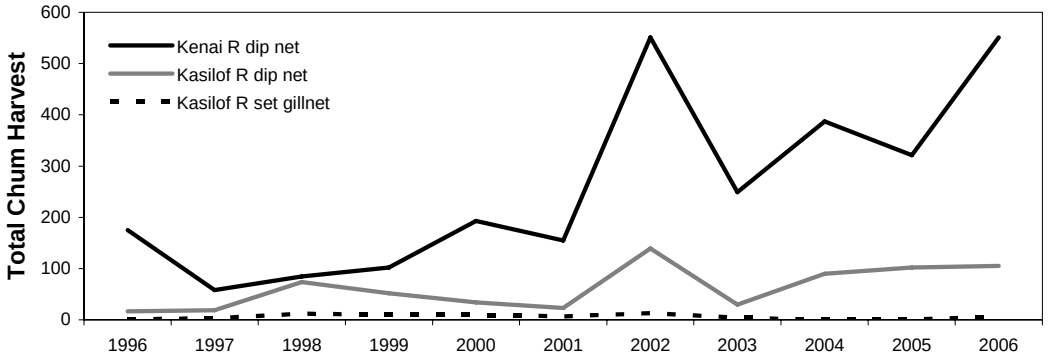


Note: calculated as the overall Chinook harvest / number of days the fishery was open each year.

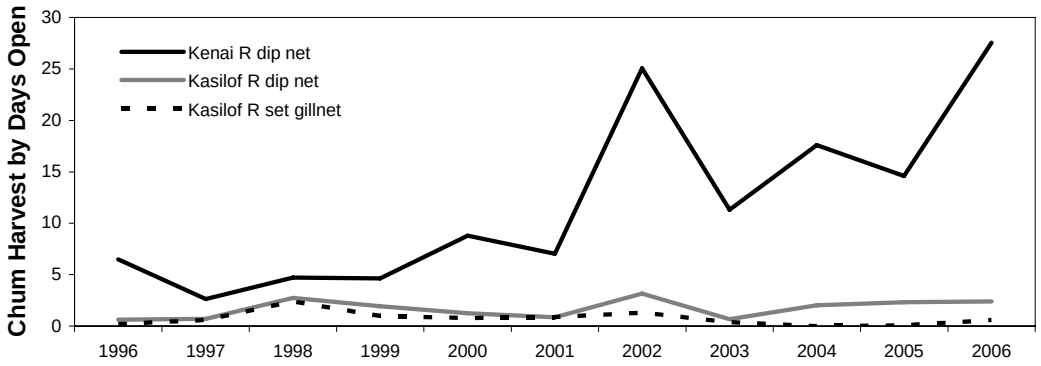


Note: calculated as the overall Chinook harvest / number of permits issued each year.

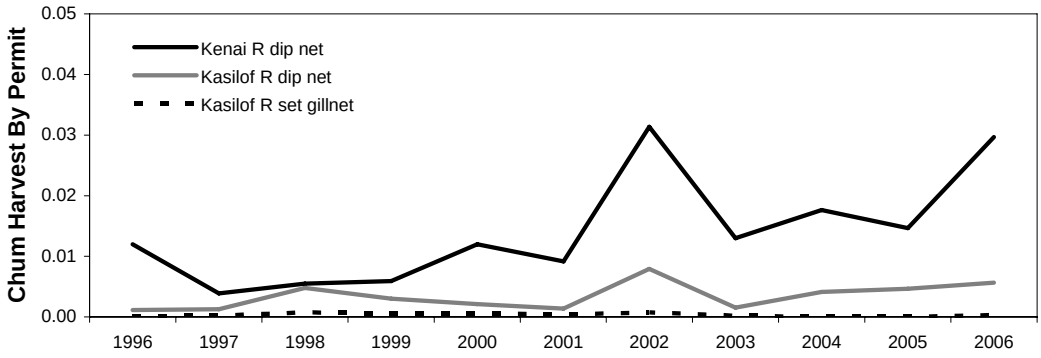
Appendix C5.-Trends in chum salmon harvest during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.



Note: all standard errors are less than ± 40.

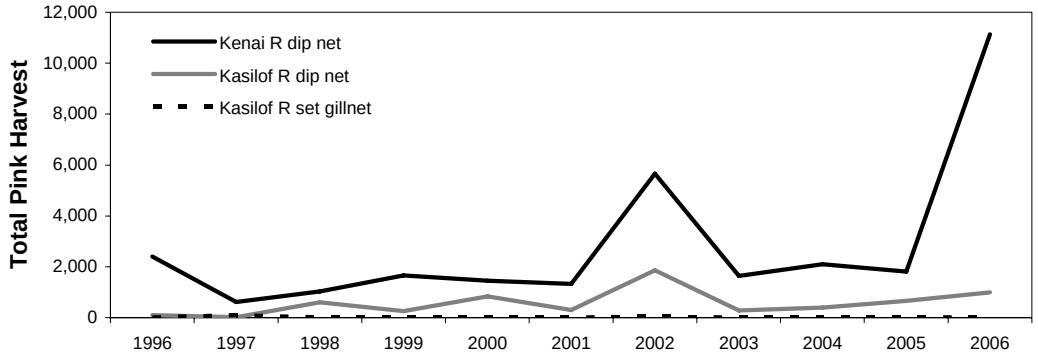


Note: calculated as the overall chum harvest / number of days the fishery was open each year.

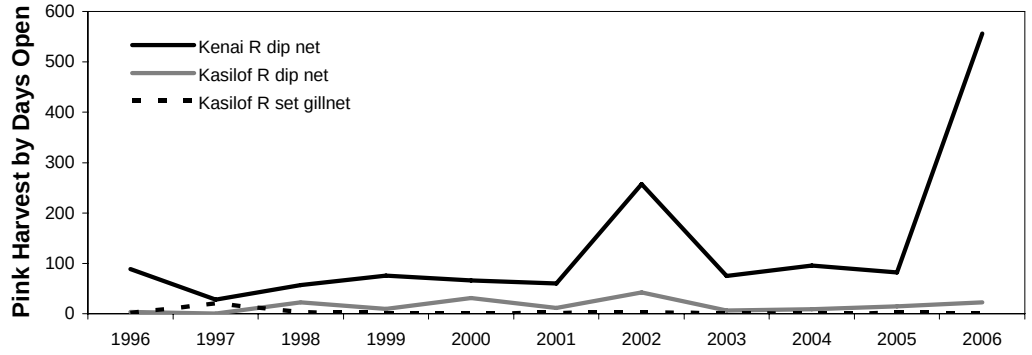


Note: calculated as the overall chum harvest / number of permits issued each year.

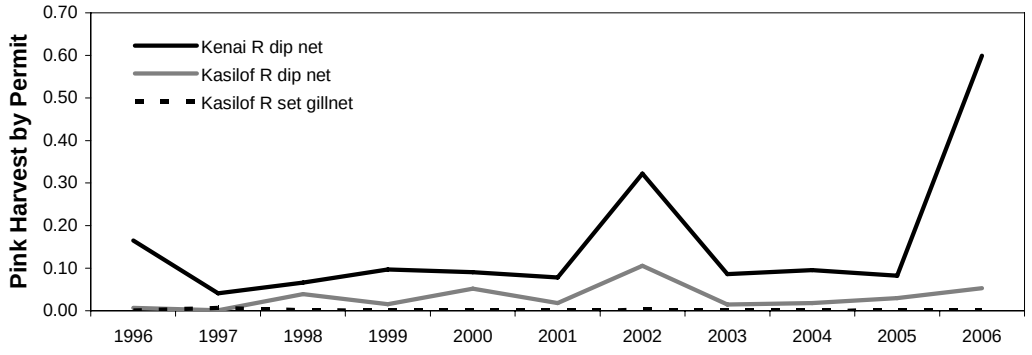
Appendix C6.-Trends in pink salmon harvest during the Upper Cook Inlet personal use salmon fisheries, 1996-2006.



Note: all standard errors are less than ± 110.



Note: calculated as the overall pink harvest / number of days the fishery was open each year.



Note: calculated as the overall pink harvest / number of permits issued each year.