

STATE OF ALASKA

*William A. Egan, Governor*



Annual Report of Performance for

*INVENTORY AND CATALOGING*

*DISSEMINATION OF INFORMATION  
COLLECTED ON DOLLY VARDEN*

*INVESTIGATIONS OF PUBLIC FISHING ACCESS  
AND AQUATIC HABITAT REQUIREMENTS*

by

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## RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations  
of Alaska

Project No.: F - 9 - 6

Study No.: G - I Study Title: INVENTORY AND CATALOGING

Job No.: G - I - C Job Title: Inventory and Cataloging of  
Kenai Peninsula, Cook Inlet,  
and Fish Stocks.

Period Covered: July 1, 1973 to June 30, 1974.

## ABSTRACT

Surveys performed on eleven Kenai Peninsula lakes are discussed. Relative growth and survival rates are presented for rainbow trout, Salmo gairdneri, and coho salmon, Oncorhynchus kisutch, stocked in 13 area lakes. Mean lengths ranged from 119.7-385.7 mm and 104.7-303.0 mm for trout and salmon, respectively. Pertinent historical data regarding stocking size, time, and densities, as well as catch and growth rates, are discussed for various managed lakes.

A limited creel census was conducted on three lower Kenai Peninsula streams during the six-day king salmon, O. tshawytscha, fishery. The creel census, in conjunction with punch card analysis and telephone survey revealed an estimated harvest of 771 king salmon over 20 inches (50.8 cm) in length. Angler effort was estimated at 12,053 man-days; an increase of 18.9% from 1972 estimates.

An intense creel census was conducted during the saltwater king salmon fishery in Cook Inlet off Deep Creek. Catch and effort were estimated at 1,010 fish and 8,037 man-days. Migrational timing of these stocks is discussed.

A creel census was conducted from July 8 through September 2 at Kachemak Bay. Data from shore anglers were expanded to estimate a harvest of 48,689 fish and a total effort of 24,495 man-days. Various data collected from other angler categories are discussed.

## RECOMMENDATIONS

1. Initiate lake surveys in the Rocky River area.
2. Implement a study on Bench Lake to evaluate the impact of the new trail on the existing Arctic grayling population.
3. Initiate a creel census on the Kenai River to determine the importance of harvest and effort on anadromous fish species with special emphasis on king salmon.

## OBJECTIVES

1. To determine the environmental characteristics of the existing or potential recreational fishery waters of the job area and to obtain estimates of existing and/or potential angler use and the sport fish harvest.
2. To evaluate application of fishery restoration measures and availability of sport fish egg sources.
3. To assist as required in the investigation or public access status to the area's fishing waters and to make specific recommendations for segregation of public fishing access sites.
4. To investigate, evaluate and develop plans for the enhancement of anadromous and resident fish stocks.
5. To provide recommendations for the management of sport fish resources in these waters and direct the course of future studies.

## TECHNIQUES USED

### Lake Surveys

Lakes were surveyed according to standard methods (Lake and Stream Survey Manual, 1971). A Hach Al-36-WR Kit was utilized to gather chemical data and a P-100 Ross depth finder used to record bottom contours. Fish populations were sampled with monofilament gill nets (125' x 6') containing five mesh sizes ranging from 3/4"-2" bar measure. Nets were fished approximately 24 hours.

Stocked lakes were sampled by methods described by Engel (1973). An electro-shocking boat, similar in construction to the one described by Van Hulle (1968) and Roguski and Winslow (1969), was also utilized. Fork length was measured to the nearest millimeter, while weights were measured to the nearest 0.01 pound. Age of the samples was determined from length frequency.

### King Salmon Creel Census

Creel census techniques of the Kenai Peninsula king salmon punch card fishery have been previously described by Engel (1967). Because of incomplete return of punch cards, a telephone survey of anglers who did not return cards was conducted.

A subsample of 1,589 anglers who had not returned their punch cards was selected from the Anchorage-Palmer area, including military installations. Of these, 360 were contacted by telephone to determine catch data. This information was then extrapolated for all anglers not returning punch cards.

The accuracy of the results of the telephone survey was determined by a formula described by Fruend (1960);  $n = p (p-1) \frac{1.96^2}{E^2}$  where  $n$  = sample size,  $p$  =  $\frac{\text{sample size}}{\text{population size}}$  and  $E$  = error. From this, it is concluded there is a 95 percent assuredness the results will fall within 2.6 percent of the true proportions.

Total freshwater effort was determined by car counts conducted during each day of the fishery. Counts were multiplied by the average number of anglers per car to determine effort.

Escapement was determined by the method described by Nelson (1971).

Age composition and length frequency were determined from data collected by a creel census during the fishery. Age was determined for marine and freshwater fish from scales that had been pressed into cellulose acetate and read by microprojector.

A creel census was conducted in the vicinity of Deep Creek to determine harvest and effort of the saltwater king salmon fishery. The sampling week consisted of five days including all weekends and three weekdays from May 19 through August 19. Weekdays were sampled using a Latin Square design. Each sampling day consisted of 14.0 hours, 0800 to 2200, which was divided into four (4) 3.5 hour segments. Two segments were monitored each sampling day, also using a Latin Square design.

### Kachemak Bay Creel Census

A creel census was conducted from July 8 to September 2. Five sampling days per week were selected, including all weekends and three weekdays. Week days were selected on a Latin Square design. The sampling day commenced at 0500 and continued through 2200. This schedule was used from July 8 through August 19, after which the day extended from 0600 to 2100. This adjustment was required because of reduced daylight. It was also assumed, that during the unsampled portion of the day, effort was negligible.

During the sampling day, five hours were selected as count hours, again by a Latin Square design. Individual counts were taken on Homer Spit, Mud Bay and the Homer Dock to determine effort and catch. Interviews were conducted

at as many locations as possible to determine species catch and angler preference. Effort and harvest data were computed weekly throughout the fishery, then expanded to include the month of June and the first week of July.

## FINDINGS

### Lake Surveys

Basic surveys were performed on 11 Kenai Peninsula lakes during 1973. Surveys were directed toward lakes that were accessible on existing road systems. Lakes were analyzed to determine species present and potential for rehabilitation and stocking.

Fish were taken in variable mesh gill nets in 4 of the 11 lakes. *Salmo* and Upper and Lower Lost lakes contained rainbow trout, *Salmo gairdneri*, while Picnic Harbor Lake contained Dolly Varden, *Salvelinus malma*, and starry flounder, *Platichthys stellatus*. Picnic Harbor Lake, located near the mouth of Picnic Harbor on the Gulf of Alaska, was found to be brackish and its level raised approximately two feet by extreme high tides. All lakes are believed to contain threespine sticklebacks, *Gasterosteus aculeatus*.

Surface acreage of surveyed lakes ranged from 4-362 acres with maximum depths from 4-140 feet. Locations, surface acreage, and maximum depths are presented in Table 1. Catch data is presented in Table 2.

### Lake Stocking Evaluation

Hatchery-reared salmonoids have been utilized on the Kenai Peninsula since statehood to enhance existing fisheries and create new ones. Steadily increasing angler effort has warranted the use of hatchery-reared fish to supplement native populations.

Sampling continued during 1973 to evaluate survival and growth rates in 13 stocked lakes. Six lakes were planted with rainbow trout and seven lakes with coho salmon, *Oncorhynchus kisutch*. All lakes planted with rainbow trout, except Fetus Lake which was barren, have been treated chemically with rotenone to eliminate competing species, primarily stickleback. Rainbow trout stocking rates, size at stocking, dates stocked, and dates rehabilitated are presented in Table 3. A summary of coho salmon stocking information is presented in Table 4. Results of fall gillnetting are presented in Table 5.

Electro-fishing was conducted on Scout Lake where a significant sample was captured. Sampling after dark in shoal areas offered the best opportunity for success. Figure 1 is a length frequency curve comparing both methods. The range for gillnetted fish was 140-230 mm with a mean of 172.1 mm. The range for 61 electro-shocked fish captured in one hour three days later was 120-215 mm with a mean of 148.0 mm. The difference supports the theory of gillnet selectivity for larger fish.

TABLE 1. Locations, Acreage and Maximum Depth of Kenai Peninsula Lakes Surveyed in 1973.

<u>Lake Name</u>	<u>Location</u>	<u>Surface Acreage</u>	<u>Maximum Observed depth (feet)</u>
Beige	T5N, R11W, Sec. 16	13	17
Hope	T4N, R11W, Sec. 21, 22	22	27
Kalifonsky	T3N, R11W, Sec. 19	6	12
Knoll	T3N, R11W, Sec. 16	35	37
Lower Lost	T2N, R1W, Sec. 14	362	140
Upper Lost	T2N, R1W, Sec. 9, 10, 14, 15	35	65
Picnic Harbor	T10S, R13W, Sec. 36	4	11
Lower Salamatof	T6N, R12W, Sec. 2, 11	100	4
Upper Salamatof	T7N, R12W, Sec. 36	194	10
Salmo	T8N, R10W, Sec. 2, 11	125	25
Sleepy Hollow	T4N, R11W, Sec. 15	10	24

27

TABLE 2 Catch Data from Four Kenai Peninsula Lakes Surveyed in 1973.

<u>Name</u>	<u>Date Sampled</u>	<u>Species</u>	<u>Catch</u>	<u>Range mm</u>	<u>Mean mm</u>	<u>Weight lbs.</u>	<u>Mean Weight lbs.</u>	<u>Catch /hour</u>
Picnic Harbor		SF*	2	---	---			0.08
	7/24/73	DV	1	252		0.45		0.04
Lower Lost	8/ 7/73	RB	1	350		1.0		0.04
Upper Lost	8/ 7/73	RB	6	170-475	378	0.10-2.75	1.50	0.09
Salmo	6/28/73	RB	15	163-393	227	0.14-1.47	0.32	0.65

\* Starry Flounder

TABLE 3. Summary of Kootenai Peninsula Lakes Stocked with Rainbow Trout Sampled by Gillnet in 1973

<u>Lake</u>	<u>Date Rotenoned</u>	<u>Date Stocked</u>	<u>Origin</u>	<u>Fish/lb.</u>	<u>Fish/Acre</u>	<u>Total Stocked</u>
Arc	7/24/65	9/ 5/69	Winthrop, Wash.	132	200	3,200
		6/11/71	Ennis, Montana	158	312	5,000
		8/ 3/72	Winthrop, Wash.	449	312	5,000
		6/20/73	Ennis, Montana	129	312	5,000
Cabin	6/18/70	9/11/70	Winthrop, Wash.	165	420	24,000
		6/ 4/71	Ennis, Montana	114	250	14,300
		6/20/73	Ennis, Montana	129	228	13,000
Fetus	--	6/28/71	Oregon	2,984	600	9,000
Jerome	6/28/68	8/27/68	Winthrop, Wash.	210	525	8,550
		9/ 5/69	Winthrop, Wash.	132	220	3,600
		9/11/70	Winthrop, Wash.	106	200	3,200
		6/11/71	Ennis, Montana	158	220	3,600
		8/ 3/72	Winthrop, Wash.	449	220	3,600
		6/20/73	Ennis, Montana	129	220	3,600
Tirmore (Short Pine)	9/ 8/72	7/26/73	Ennis, Montana	112	150	7,800
		7/26/73	Winthrop, Wash.	125	150	7,800
Johnson	9/11/72	6/20/73	Ennis, Montana	129	256	21,800

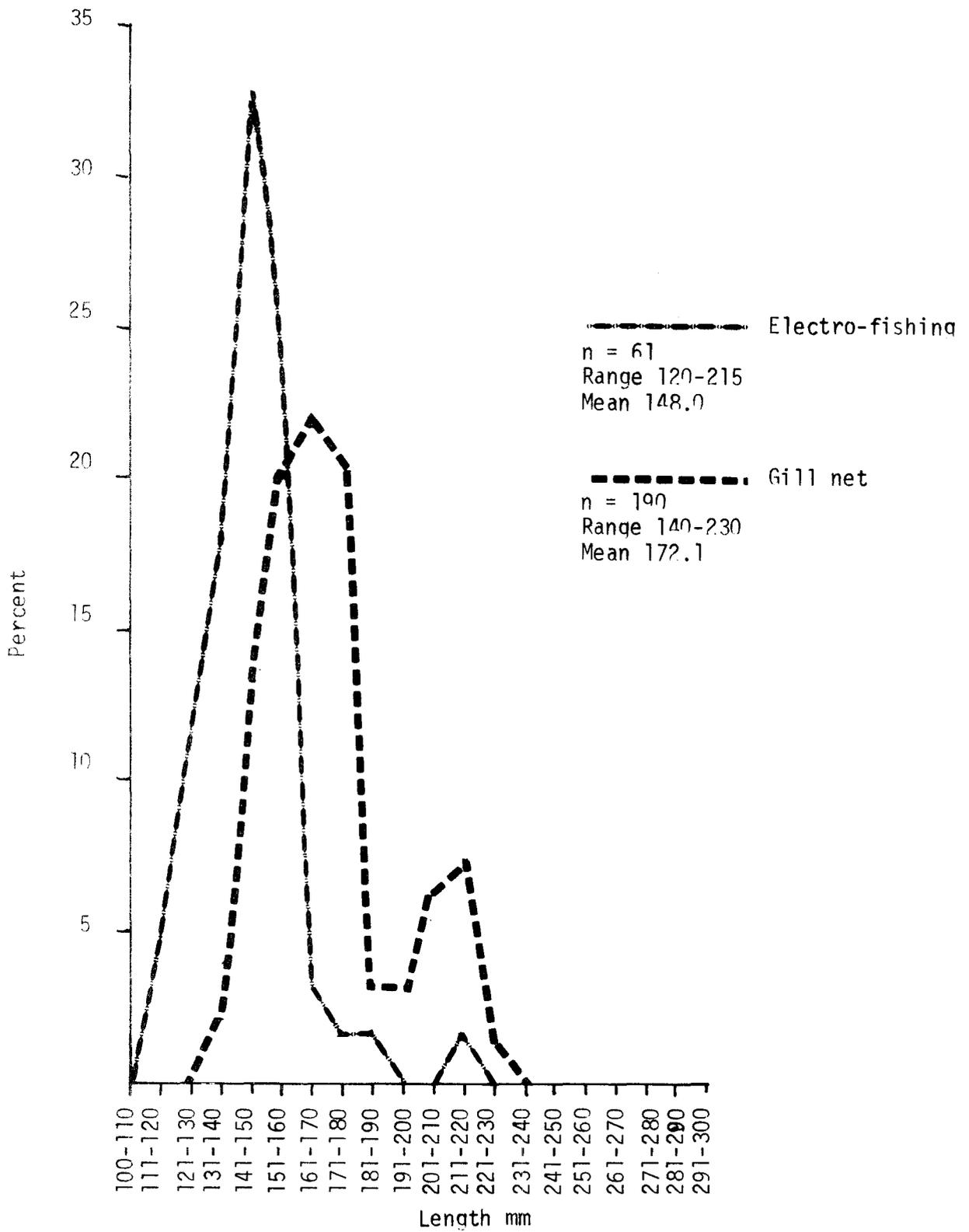


FIGURE 1. Length Frequency for Coho Salmon Comparing Gill Net Sample With Electro-fishing Sample, Scout Lake, 1973.

TABLE 4. Summary of Kenai Peninsula Lakes Stocked with Coho Salmon Sampled by Gillnet in 1973.

<u>Lake</u>	<u>Date Stocked</u>	<u>Origin</u>	<u>Fish/ lbs.</u>	<u>Fish/ Acre</u>	<u>Total Stocked</u>
Bernice	7/26/73	Kodiak, Alaska	256	100	13,400
Centennial	9/ 9/69	Seward, Alaska	144	219	7,900
	6/28/71	Seward, Alaska	391	217	7,800
	8/ 3/72	Seward-Kodiak, Alaska	319	200	7,200
Rock	7/26/73	Kodiak, Alaska	256	210	2,000
Sunken Island	6/28/71	Seward, Alaska	391	200	28,000
	7/26/73	Kodiak, Alaska	256	200	28,000
Scout	8/ 3/72	Seward, Alaska	445	250	23,800
Upper Jean	9/ 9/69	Seward, Alaska	144	250	11,500
	7/26/73	Kodiak, Alaska	256	250	11,500
Portage	7/26/73	Kodiak, Alaska	256	300	8,300

TABLE 5. Results of Gill Netting for Kenai Peninsula Lakes Sampled During Fall of 1973.

Lake	Date Sampled	Species	Sample Number	Catch Net Hr.	Length Range (mm)	Weight Mean (mm)	Weight Range (lbs.)	Mean Weight (lbs.)	Years Planted
Arc	9/14/73	RB	5	0.10	145-460	231	.04-2.77	0.67	1969-73
Cabin	9/25/73	RB	39	0.76	135-180	157.1	0.09-0.20	0.13	1973
		RB	17	0.33	315-370	337.9	0.86-3.70	1.04	1970-71
Jerome	9/20/73	RB	52	1.27	130-510	218.1	0.10-4.00	0.47	1968-73
		DV	41	0.98	200-495	349.0	0.30-3.50	1.49	---
Johnson	10/2/73	RB	118	2.70	140-255	196.0	0.09-0.47	0.24	1973
Tirmore (Short Pine)	9/25/73	RB	57	1.14	100-170	119.7		0.05	1973
Fetus	9/19/73	RB	7	0.15	330-420	385.7	1.0 -2.33	1.71	1971
Sunken Island	9/30/73	SS	91	2.11	95-125	104.7		0.03	1973
Scout	9/30/73	SS	190	4.13	140-230	172.1	0.8 -0.35	0.16	1972
Bernice	9/26/73	SS	79	2.03	130-175	143.1		0.09	1973
Rock	9/18/73	SS	28	0.80	125-150	137.3	0.06-0.12	0.08	1973
Upper Jean	9/28/73	SS	2	0.04	195-210	202.5	0.20-0.30	0.25	1973
			7	0.14	310-360	332.8	0.82-1.20	1.00	1969
Centennial	10/2/73	SS	33	0.79	195-370	264.8	0.37-1.23	0.59	1969-72
Portage	9/29/73	No Fish Captured							

## King Salmon

### Freshwater Fishery:

King salmon fishing was permitted in four Kenai Peninsula streams during 1973; Anchor River, Deep Creek, Ninilchik River, and the Kenai River. Harvest estimates for the three lower peninsula streams were determined by creel census and punch cards. The Kenai River was exempt from the punch card system in 1973 and harvest data are not available.

Harvest has been monitored by punch cards since 1966. During the quota years, from 1966 to 1970, this system was coupled with an intensive creel census. Since 1971, punch cards have been the primary source of harvest data.

Pertinent historical data are presented in Annual Reports of Progress by Dunn (1961); Logan (1962, 1963, 1964); Engel (1965, 1966, 1967), Redick (1968); McHenry (1969); Watsjold (1970), and Nelson (1971, 1972<sub>a</sub>, 1972<sub>b</sub>).

A total of 18,875 cards were distributed to vendors, of which 12,069 were actually issued to prospective anglers. This is 11,922 less than were issued in 1972. The reduction can be attributed to the closure by the Board of Fish and Game of all king salmon fishing north of the Cook Inlet Forelands. To date 59.6% of the cards issued to anglers have been voluntarily returned. This represents an increase of 15.0% and 17.5% compared to 1971 and 1972, respectively. However, this is 15.3% less than the 1966-1970 average rate of 74.9%. A summary of punch cards issued and returned is presented in Table 6.

TABLE 6. Summary of Punch Cards Issued and Returned, 1966-1973.

<u>Year</u>	<u>Number Issued</u>	<u>Number Returned</u>	<u>Percent Returned</u>
1966	8,853	6,835	77.2
1967	5,977	4,909	82.1
1968	9,524	6,724	70.6
1969	6,680	4,651	69.6
1970	16,687	12,518	75.0
1971	23,419	10,435	44.6
1972	23,991	10,138	42.2
1973	12,069	7,188	59.6

Data collected indicated a catch of 771 king salmon from the three lower Peninsula streams: Anchor River - 330, Ninilchik River - 298, and Deep Creek - 43.

The harvest was derived from punch card returns, a telephone survey of the Anchorage area residents that did not return cards, and a creel census during the fishery. Of the 7,188 cards voluntarily returned, 3,843 (53.4%) reported they had fished king salmon in one of the three streams. Anglers who reported fishing king salmon indicated a success rate of 6.2%. A summary of

the punch card returns is presented in Table 7.

TABLE 7. Summary of 1973 Punch Card Data as Determined by Voluntary Returns and Telephone Survey.

Total cards issued by vendors		12,069	
<u>Punch cards returned</u>	<u>Number</u>		<u>Percent</u>
Successful anglers	447		6.2
Unsuccessful anglers	3,396		47.3
Did not fish	2,869		39.9
Incomplete information	476		6.6
Total	<u>7,188</u>		<u>100.0</u>
<u>Telephone Survey of cards not returned</u>	<u>Number</u>		<u>Percent</u>
Successful anglers	107		2.2
Unsuccessful anglers	2,548		52.2
Did not fish	2,226		45.6
Total	<u>4,881</u>		<u>100.0</u>
<u>Total returned and not returned</u>	<u>Number</u>		<u>Percent</u>
Successful anglers	554		4.6
Unsuccessful anglers	5,944		49.3
Did not fish	5,095		42.2
Incomplete information	476		3.9
Total	<u>12,069</u>		<u>100.0</u>

Table 8 presents harvest by date and location as computed from punch card returns.

TABLE 8. King Salmon Harvest on the Three Lower Kenai Peninsula Streams as Reported by Punch Cards, 1973.

Date	Ninilchik River		Deep Creek		Anchor Point		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5/26	34	15.6	11	9.7	25	10.4	70	12.2
5/27	18	8.2	9	8.0	19	7.9	46	8.1
6/ 2	63	28.9	2	1.8	9	3.8	74	13.0
6/ 3	25	11.5	2	1.8	22	9.2	49	8.6
6/ 9	53	24.3	58	51.3	110	45.8	221	38.7
6/10	25	11.5	31	27.4	55	22.9	111	19.4
Total	218	100.0	113	100.0	240	100.0	571	100.0
1st weekend	52	23.9	20	17.7	44	18.3	116	20.3
2nd weekend	88	40.3	4	3.5	31	12.9	123	21.6
3rd weekend	78	35.8	89	78.8	165	68.8	332	58.1
Total	218	100.0	113	100.0	240	100.0	571	100.0

TABLE 9. Summary of Successful Anglers Fishing King Salmon on the Three Lower Kenai Peninsula Streams, 1973.

	Ninilchik River			Deep Creek			Anchor River			Total		
	Number Anglers	% Number Anglers	Fish									
1 fish reported by P.C.*	126	28.1	126	77	17.1	77	124	27.6	124	327	72.8	327
2 fish reported by P.C.	46	10.2	92	18	4.0	36	58	13.0	116	122	27.2	244
Subtotal	172	38.3	218	95	21.1	113	183	40.6	240	449	100.0	571
1 fish by phone survey	30	28.0	30	18	16.8	18	29	27.1	29	77	71.9	77
2 fish by phone survey	11	10.3	22	4	3.8	8	15	14.0	30	30	28.1	60
Subtotal	41	38.3	52	22	20.6	26	44	41.1	59	107	100.0	137
Creel checked but not reported by P.C.	28	45.9	28	4	6.6	4	29	47.5	31	61	100.0	63
Total	241	39.1	298	121	19.6	143	255	41.3	330	617	100.0	771
Percent Harvest			38.7			18.5			42.8			100.0
* Punch Card												

Table 9 presents the number of successful anglers and fish taken by streams as determined from punch cards returned, a telephone survey of those that had not returned cards, and a creel census during the fishery. The telephone survey was performed because of the relatively low return of cards.

It was determined to sample anglers residing in the Anchorage area because they represented the majority of those utilizing the fishery (78.7%). The sample consisted of 1,589 people that failed to return punch cards. Of these, 778 phone numbers were obtained from Anchorage and military directories. A total of 360 individuals were contacted by two investigators over a three-day period. Results are presented in Table 10. Calculated percentages were applied directly to the number of punch cards not returned. Certain assumptions had to be made: (1) that there is no difference in the return rate between those listed in the phone directory and those not listed, (2) that the return rate for Anchorage area residents would be equal to those of other area residents, and (3) that the success rate for Anchorage area non-returnees is similar to that of other area non-returnees.

TABLE 10. Results of a Telephone Survey Conducted to Determine Percentage of Punch Card Non-Returnees that had Captured King Salmon in 1973.

Total size of selected sample	1,589	
Number of people listed in phone book	778	
Total people contacted	360	
	<u>Number</u>	<u>Percent</u>
Did not fish	188	52.2
Fished unsuccessfully	164	45.6
Fished successfully	<u>8</u>	<u>2.2</u>
Total	<u>360</u>	<u>100.0</u>

During 1973, the fishery was open for three successive weekends, the last weekend in May and the first two of June. As reported by punch cards, Saturday catches contributed 63.9% (365) of the total harvest. The first weekend, which is the additional weekend granted by the Board of Fish and Game in 1972, produced only 20.3% of the harvest as reported by punch cards.

Fishing effort was determined by car counts conducted each day of the fishery at 10:00 a.m. on each stream. Through past interviews it was determined that each car contained an average of 3.4 anglers. Car counts were multiplied by a factor of 3.4 to determine the minimum man-days of effort (Table 11).

Creel census data included only those fishing around the mouth of the stream and also in the stream itself. Anglers fishing beyond a one-mile radius were not affected by the punch card fishery; only if a king salmon was landed within the one-mile radius would it have to be recorded on a punch card.

TABLE 11. Fishing Effort on Three Lower Kenai Peninsula Streams During the King Salmon Fishery, 1973.

Date	Ninilchik River		Deep Creek		Anchor River		Total	
	Cars	Man-days	Cars	Man-days	Cars	Man-days	Cars	Man-days
5/26	228	775	201	683	162	551	591	2,009
5/27	198	673	231	785	193	656	622	2,114
6/ 2	291	989	210	714	140	476	641	2,179
6/ 3	214	728	164	558	140	476	518	1,762
6/ 9	223	758	129	439	197	670	549	1,867
6/10	161	547	264	898	199	677	624	2,122
Total	1,315	4,470	1,199	4,077	1,031	3,506	3,545	12,053
Percent Effort		37.1		33.8		29.1		
Percent Catch		38.7		18.5		42.8		

Reviewing punch cards also revealed information as to where king salmon anglers resided and which ones caught fish. Residencies and success rates of anglers from each area is presented in Table 12. Local residents of Homer and Anchor Point, which are the largest settlements close to the fishery, showed the two highest success rates, 18.9% and 12.3%, respectively. While anglers from these areas represented only 5.8% of the total anglers, they accounted for 16.7% of the catch as reported by punch cards. Anchorage area residents accounted for 68.6% of the harvest reported by punch cards but maintained a success rate of only 5.4%.

As all punch cards were not returned, the harvest of 771 king salmon over 20 inches is projected. This figure includes 571 fish reported by punch cards, 137 extrapolated from the phone survey, and 63 fish that were creel checked but not reported on returned punch cards. A minimum harvest would be 654 taken from the creel census and punch card returns. The maximum harvest would be 871. Using maximum limits of the phone survey would result in a harvest of 500 fish by those who did not return cards. From this range, it is felt that the actual harvest of king salmon from the three lower Peninsula streams is very close to the derived figure of 771.

Historical harvest for the years 1966-1973 is presented in Table 13. This year's harvest was 321 fish greater than the seven-year average and also the highest recorded since 1966. The percentage contribution of each stream to the total harvest approximates the seven-year mean. The greater harvest is attributed to increased pressure and also to the fact that the years 1966-1971 were managed on a quota basis.

Escapement counts were conducted during the later part of July and early August. Each index area was counted twice by foot surveys and expanded to include the entire stream. Aerial surveys were not performed due to inclement weather and poor stream conditions.

Escapement counts for 1970 and 1971 are not available for Deep Creek and Ninilchik River due to unfavorable counting conditions. The formula used to expand the index area counts is:

$$\frac{\text{Average number of king salmon in index area 1964-1969}}{\text{Average king salmon escapement 1964-1969}} = \frac{\text{Number of king salmon in index area 1973}}{\text{Estimated escapement 1973}}$$

Table 14 and 15 present historical harvest and escapement data for the three lower Peninsula streams. Table 16 presents 1973 and historical king salmon escapement statistics.

#### Saltwater Fishery:

The Deep Creek king salmon creel census was conducted for the second consecutive year. The census was continuous from May 19 to August 3. A total of 1,500 interviews were recorded and 227 instantaneous boat counts conducted in the Deep Creek Area. An additional 264 spot boat checks were made at

TABLE 12. Residencies and Success Rates of Anglers from Various Areas As Determined by Punch Card Returns, 1973.

<u>Residency</u>	<u>Cards Returned</u>	<u>Percent</u>	<u>Successful</u>	<u>Percent Successful</u>
Anchorage	4,067	56.6	208	5.1
Elmendorf AFB	849	11.8	58	6.8
Ft. Richardson	541	7.5	30	5.5
Homer	350	4.9	66	18.9
Kenai	361	5.0	14	3.9
Soldotna	231	3.2	11	4.8
Eagle River	146	2.0	9	6.2
Anchor Point	65	0.9	8	12.3
Palmer	55	0.8	3	5.5
Other Resident	294	4.1	20	6.8
Non-Resident (Tourist)	<u>229</u>	<u>3.2</u>	<u>22</u>	<u>9.6</u>
Total	7,188	100.0	449	6.2

TABLE 13. Historical and Comparative King Salmon Harvest from Three Lower Kenai Peninsula Streams as Determined by Punch Cards and Creel Census, 1966-1973.

Year	Ninilchik River		Deep Creek		Anchor River		Total	
	Number of Fish	Percent Harvest	Number of Fish	Percent Harvest	Number of Fish	Percent Harvest	Number of Fish	Percent Harvest
1966	218	39.5	48	8.7	286	51.8	552	100.0
1967	118	22.0	183	34.1	236	43.9	537	100.0
1968	206	33.8	157	25.7	247	40.5	610	100.0
1969	131	51.4	40	15.7	84	32.9	255	100.0
1970	275	54.5	60	11.9	170	33.6	505	100.0
1971	137	57.8	42	17.7	58	24.5	237	100.0
1972	156	33.9	137	29.8	167	36.3	460	100.0
1973	298	38.7	143	18.5	330	42.8	771	100.0
1966-1972 Mean	177	39.3	95	21.1	178	39.6	450	100.0

TABLE 14. Historical Harvest and Escapement Data Collected on Three Lower Kani Peninsula King Salmon Streams, 1960-1973.

Year	Ninilchik River			Deep Creek			Anchor River			Total		
	Harvest	Escapement	Percent Harvest	Harvest	Escapement	Percent Harvest	Harvest	Escapement	Percent Harvest	Harvest	Escapement	Run
1960	---	---	--	---	---	--	1,150	1,200	48.9	1,150+	2,350+	3,500
1961	---	---	--	---	---	--	1,010	850	54.3	1,010+	850	1,860+
1962	---	530	--	---	750	--	500	970	34.0	500+	2,250	2,750+
1963	---	450	--	---	600	--	1,160	1,340	46.4	1,160+	2,390	3,550+
1964	No Fishery	910	--	No Fishery	800	--	No Fishery	1,700	0.0	--	3,410	3,410
1965	No Fishery	1,030	--	No Fishery	690	--	No Fishery	1,600	0.0	--	3,320	3,320
1966	220	670	24.7	50	540	8.5	290	1,330	17.9	560	2,540	3,100
1967	120	360	25.0	180	270	40.0	240	1,200	16.7	540	1,830	2,370
1968	210	450	31.8	160	200	44.4	250	530	32.0	620	1,180	1,800
1969	130	760	14.6	40	960	4.0	80	1,800	4.3	250	3,520	3,770
1970	280	---	--	60	---	--	170	1,850	8.4	510	1,850+	2,360+
1971	140	---	--	40	---	--	60	1,220	4.7	240	1,220+	1,660+
1972	170	1,360	11.1	140	530	20.9	180	1,890	8.7	490	3,780	4,270
1973	300	640	31.9	140	220	38.9	330	1,660	16.6	770	2,520	3,290

41

Figures have been rounded to nearest 10.

TABLE 15. Contribution of Three Lower Kenai Peninsula Streams to the Total King Salmon Return, 1966-1973.

Year	Ninilchik River		Deep Creek		Anchor River		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1966	890	28.7	590	19.0	1,620	52.3	3,100	100.0
1967	480	20.3	450	19.0	1,440	60.7	2,370	100.0
1968	660	36.7	360	20.0	780	43.3	1,800	100.0
1969	890	23.6	1,000	26.5	1,880	49.9	3,770	100.0
1970	280+	--	60+	--	2,020	--	2,360+	--
1971	140+	--	40+	--	1,280	--	1,660+	--
1972	1,530	35.8	670	15.7	2,070	48.5	4,270	100.0
1973	940	28.6	360	10.9	1,990	60.5	3,290	100.0
Total*	5,390	29.0	3,430	18.5	9,780	52.5	18,600	100.0
Mean*	898		572		1,630		3,100	

\*Excludes 1970 and 1971  
 Figures rounded to nearest 10

42

TABLE 16. Comparative King Salmon Escapement Counts from Three Lower Kenai Peninsula Streams and Stariski Creek.

	1973 Escapement	Record High	Record Low	Mean Not Including 1973
Anchor River	1,659	1,890 (1972)	530 (1968)	1,345
Deep Creek	224	800 (1964)	200 (1968)	593*
Ninilchik River	636	1,030 (1965)	360 (1967)	725*
Stariski Creek**	107	582 (1964)	200 (1967)	295

\* Excludes 1970 and 1971 data.

\*\* Stariski Creek is not open to fishing but is a producer of king salmon.

four different locations south of Deep Creek to ascertain the effort along the coast at points other than Deep Creek. The 105 boats observed during these counts averaged 0.40 boats per count. This effort was considered negligible and therefore not included in harvest estimates.

Data collected during the 1973 fishery and 17 years of commercial trap records indicated that two distinct runs of king salmon are subjected to the saltwater sport fishery in Cook Inlet. The first run is present from May 19-June 30 and the second July 1-August 3.

A hand trap was located near Stariski Creek, approximately nine miles south of Deep Creek; the records were complete from 1943-1958. For run timing calculations, only the years 1943 through 1948 and 1950 could be used. After 1950, the season was closed from 3.5-5 days per week. Data for 1949 was omitted because the trap began fishing very late and missed most of the early king salmon run.

Trap records and the 1973 creel census data show a period of low abundance between June 25 and June 30 (Figures 2 and 3). The early run is fished primarily by sport fishermen, while the late run is harvested by both sport and commercial interests.

There was a marked difference in results between weekend and weekday fishermen. Catch per unit effort was higher while average effort per day was lower for both runs on weekdays. Table 17 compares the weekends and weekdays for both early and late run fisheries. Catch per hour has been calculated by dividing the estimated harvest by the total projected angler hours in both Tables 17 and 18. Table 18 summarizes harvest, effort, and catch per hour for early and late run fisheries by weekly period. Calculations show that 14.3% of the estimated harvest was observed and 16.2% of the estimated effort was interviewed. This year's fishery displayed a 127.8% increase in effort and a 53.2% decrease in harvest over 1972. The increased effort can be partially explained by the king salmon closure north of the Forelands. Decreased harvest may be attributed to climatological conditions. During 1972, Cook Inlet was abnormally calm and the waters relatively clear, while in 1973 frequent storms and turbid water conditions probably reduced the effectiveness of the fishery.

#### Age Composition:

Scales and length data were collected during both fresh and saltwater king salmon fisheries with the findings present in Table 19. The majority of the fish from the three lower Peninsula streams and those taken in saltwater were the progeny of the 1967 brood year, which was one of the higher escape-ments on record.

Figure 4 is a length frequency histogram comparing marine and freshwater harvest. Two different modes suggest that a significant number of fish taken in salt water are bound for areas other than Deep Creek or Ninilchik River.

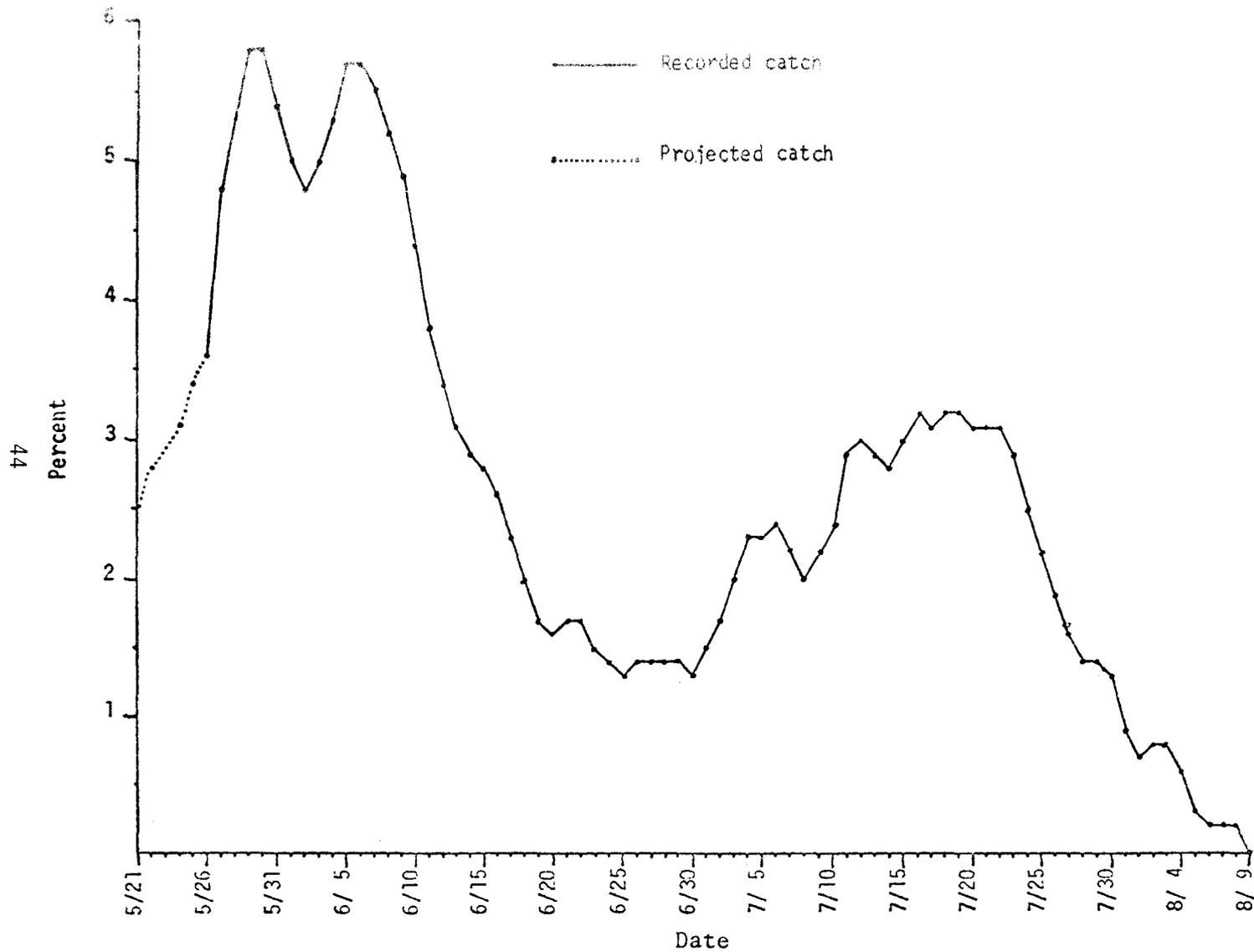


FIGURE 2. Average King Salmon Catch Taken from Stariski Trap Records for Years 1943-1948 and 1950. (graph smoothed by  $\frac{a+2b+c}{2}$ )

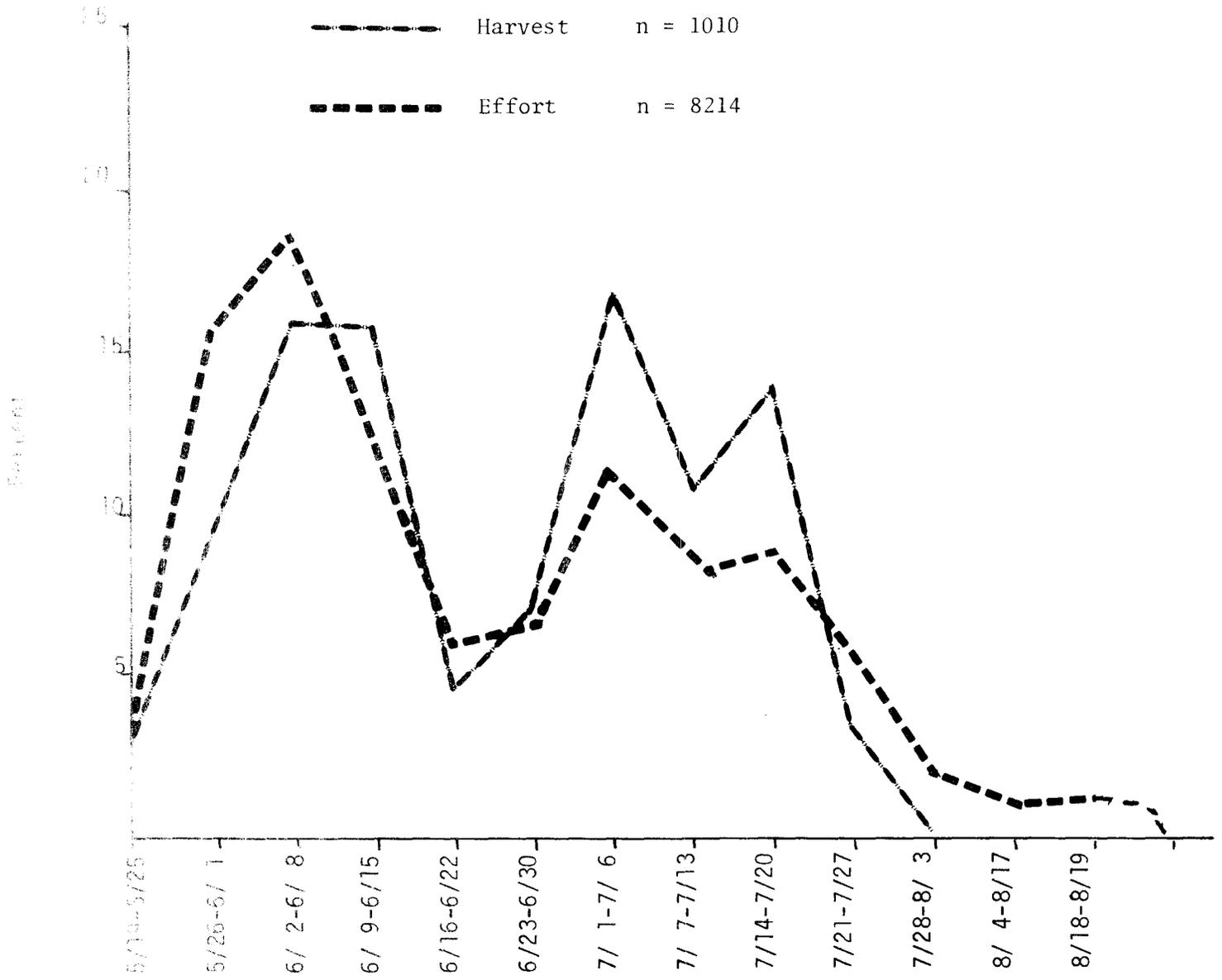


FIGURE 3. Harvest and Effort Computed by Date for the 1973 Deen Creek King Salmon Saltwater Fishery.

TABLE 17. Summary of Data Collected During 1973 Deep Creek Creel Census Comparing Weekends and Weekdays for Early and Late Runs.

	<u>No. of Days</u>	<u>Angler Interviews</u>	<u>King Salmon Reported</u>	<u>Hours Reported</u>	<u>Projected Catch/Hours</u>	<u>Av. Hours Fished/Angler</u>	<u>Estimated Harvest</u>	<u>Estimated Effort Man-days</u>	<u>Average Effort/Day</u>	<u>Average Catch/Day</u>
<b>Weekend Days</b>										
Early Run	14	407	31	1,435	0.026	3.53	232	2,491	178	16.6
<b>Weekday Days</b>										
Early Run	29	421	44	1,517	0.029	3.60	287	2,754	95	9.9
Total Early Run	43	828	75	2,952	0.028	3.57	519	5,245	122	12.1
<b>Weekend Days</b>										
Late Run	9	229	23	884	0.032	3.69	157	1,228	136	17.4
<b>Weekday Days</b>										
Late Run	25	243	46	882	0.058	3.63	334	1,564	63	13.4
Total Late Run	34	472	69	1,726	0.050	3.66	491	2,792	82	14.4
<b>Total Both Runs</b>										
Weekends	23	636	54	2,279	0.028	3.58	389	3,719	162	16.9
Week Days	54	664	90	2,399	0.040	3.61	621	4,318	80	11.5
<b>Total</b>	<b>77</b>	<b>1,300</b>	<b>144</b>	<b>4,678</b>	<b>0.034</b>	<b>3.60</b>	<b>1,010</b>	<b>8,037</b>	<b>104</b>	<b>13.1</b>

TABLE 18. Summary of Harvest, Catch Rate and Effort by Weekly Period  
 Collected During Deep Creek Saltwater King Salmon Fishery, 1973.

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<u>Weekly Period</u>	<u>Estimated Harvest</u>	<u>Estimated Effort</u>	<u>Catch/Hour</u>
5/19 - 5/25	18	211	0.025
5/26 - 6/ 1	84	1,294	0.022
6/ 2 - 6/ 8	170	1,531	0.031
6/ 9 - 6/15	136	997	0.035
6/16 - 6/22	49	488	0.020
6/23 - 6/30	62	724	0.027
SubTotal Early Run	519	5,245	0.028
7/ 1 - 7/ 6	159	758	0.056
7/ 7 - 7/13	125	695	0.049
7/14 - 7/20	161	718	0.047
7/21 - 7/27	44	477	0.029
7/28 - 8/ 3	2	144	0.005
SubTotal Late Run	491	2,792	0.050
Total Both Runs	1,010	8,037	0.034

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TABLE 19. Age Structure of King Salmon Taken from Three Lower Kenai Peninsula Streams and the Saltwater Fishery Offshore of Deep Creek, 1973.

<u>AGE</u>	<u>1.1</u>	<u>1.2</u>	<u>1.3</u>	<u>1.4</u>	<u>1.5</u>	<u>2.1</u>	<u>2.2</u>	<u>2.3</u>	<u>2.4</u>	<u>Total</u>
Saltwater Number	1	4	21	79	11			1	3	120
Percent	0.8	3.4	17.5	65.8	9.2			0.8	2.5	100.0
Freshwater Number			24	78	1				1	108
Percent		3.7	22.2	72.3	0.9				0.9	100.0
<u>BROOD YEAR</u>		<u>1966</u>		<u>1967</u>		<u>1968</u>		<u>1969</u>		<u>1970</u>
Saltwater Number		14		80		21		4		1
Percent		11.7		66.6		17.5		3.4		0.8
Freshwater Number		2		78		24		4		
Percent		1.9		72.2		22.2		3.7		

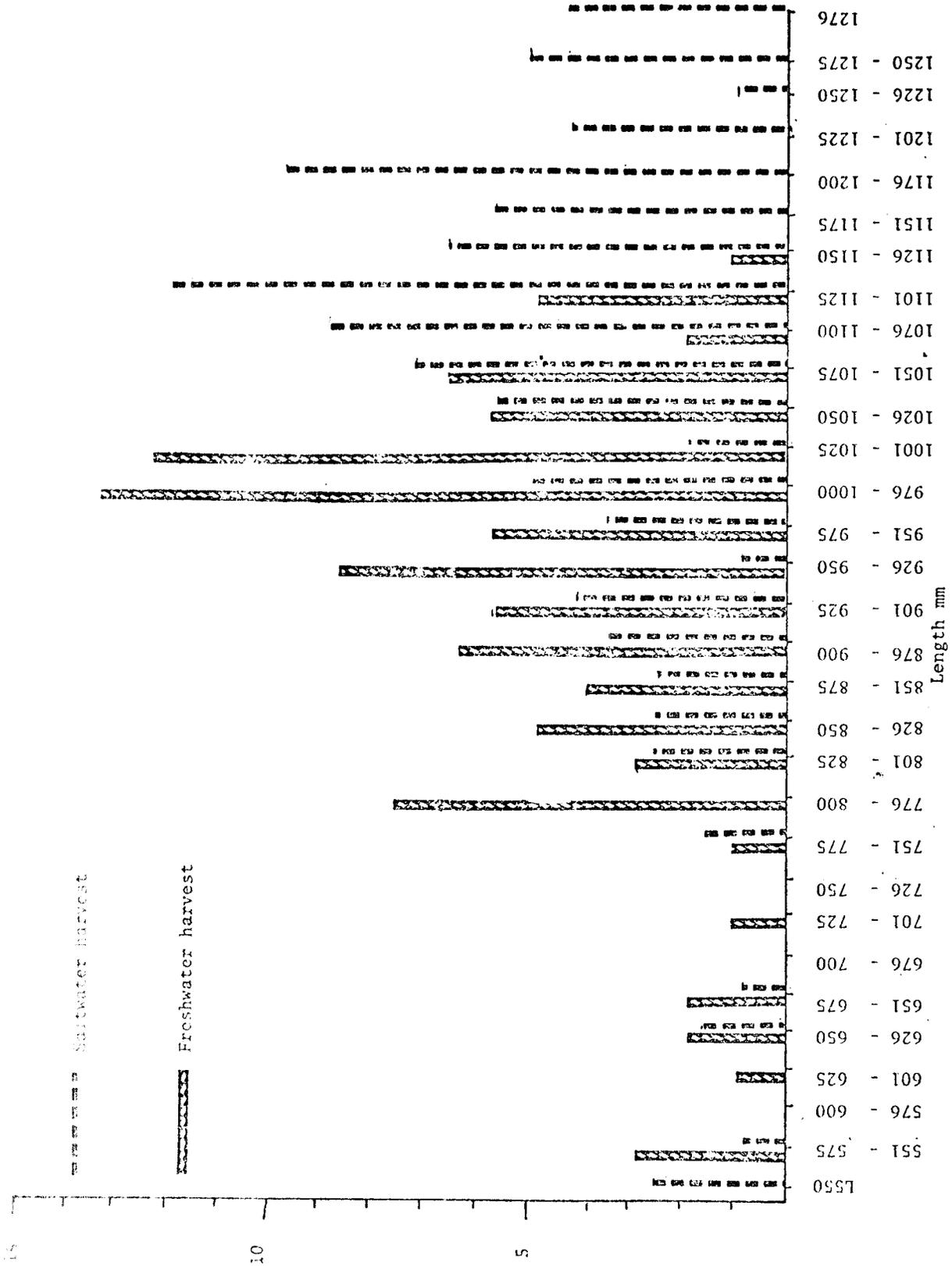


FIGURE 4. Length Frequency Comparison Between King Salmon Harvested in Anchor River, Deep Creel and Niniilchik River and Those Harvested in Saltwater or Deep Creel, 1973.

The mean length of a 22 fish sample from the three lower Peninsula streams that had spent three winters at sea (three ocean) was 823.0 mm fork length. A corresponding sample of 20 fish from the saltwater fishery had a mean length of 863.5 mm. For freshwater four ocean fish (n=72), the mean length was 991.0, while a comparable sample (n=84) captured in saltwater had a mean length of 1,104.0 mm. These data indicate the fishery is comprised of mixed stocks but insufficient data is available at this time to determine any significant difference in length between early and late run fish in the saltwater fishery.

No quantitative data is available for the Kenai River king salmon fishery. It is of interest to note, that of 93 fish harvested in the Kenai River and entered in the Soldotna King Salmon Derby, the average weight was 40.7 lbs. with a range of 7.1 lbs. to 67.0 lbs. This represents 63.7% of all fish entered in the Derby.

### Kachemak Bay

Kachemak Bay is an important recreational area for Southcentral Alaska. However, limited investigation has been done regarding its recreational potential. Kachemak Bay is located at the southern end of the Kenai Peninsula on the eastern side of Cook Inlet. Unlike the murky waters of Cook Inlet, Kachemak Bay is clear and contains varieties of fish and shellfish that are receiving increasing angler pressure.

Figure 5 is a map of Kachemak Bay. The two major communities are Homer on the north shore of the bay and Seldovia on the south shore. Because Homer is linked by paved highway to Anchorage most of the anglers were visitors from the Anchorage area and tourists. With a paved road running the length of the Homer Spit, most of the shore fishermen concentrated here. There is also a small boat harbor located on the east shore of the spit with boat launching facilities.

A creel census was conducted in 1966 and 1972. The results are presented in Annual Reports of Progress by Engel (1967 and 1973). A creel census was again initiated in 1973 to determine pressure exerted and the extent of different species desired and harvested. The census was conducted from July 8 through September 2. The harvest was then expanded to include the month of June and the early part of July. A total of 3,230 interviews were collected over the summer including shore fishermen, charter boat anglers, private boat anglers, and subsistence shellfish anglers.

The bay was divided into 13 sections and location of angler use plotted by section. That area immediately surrounding the Homer Spit was the most popular to small boat anglers. The charter boat operators favored the area off Barbara Point. The most popular areas for shellfish anglers were McDonald Spit and Halibut Cove.

Creel census data were collected from boat anglers as they returned to the small boat harbor. Shore fishermen were interviewed while fishing and in the camping area located on the end of the spit. Information collected

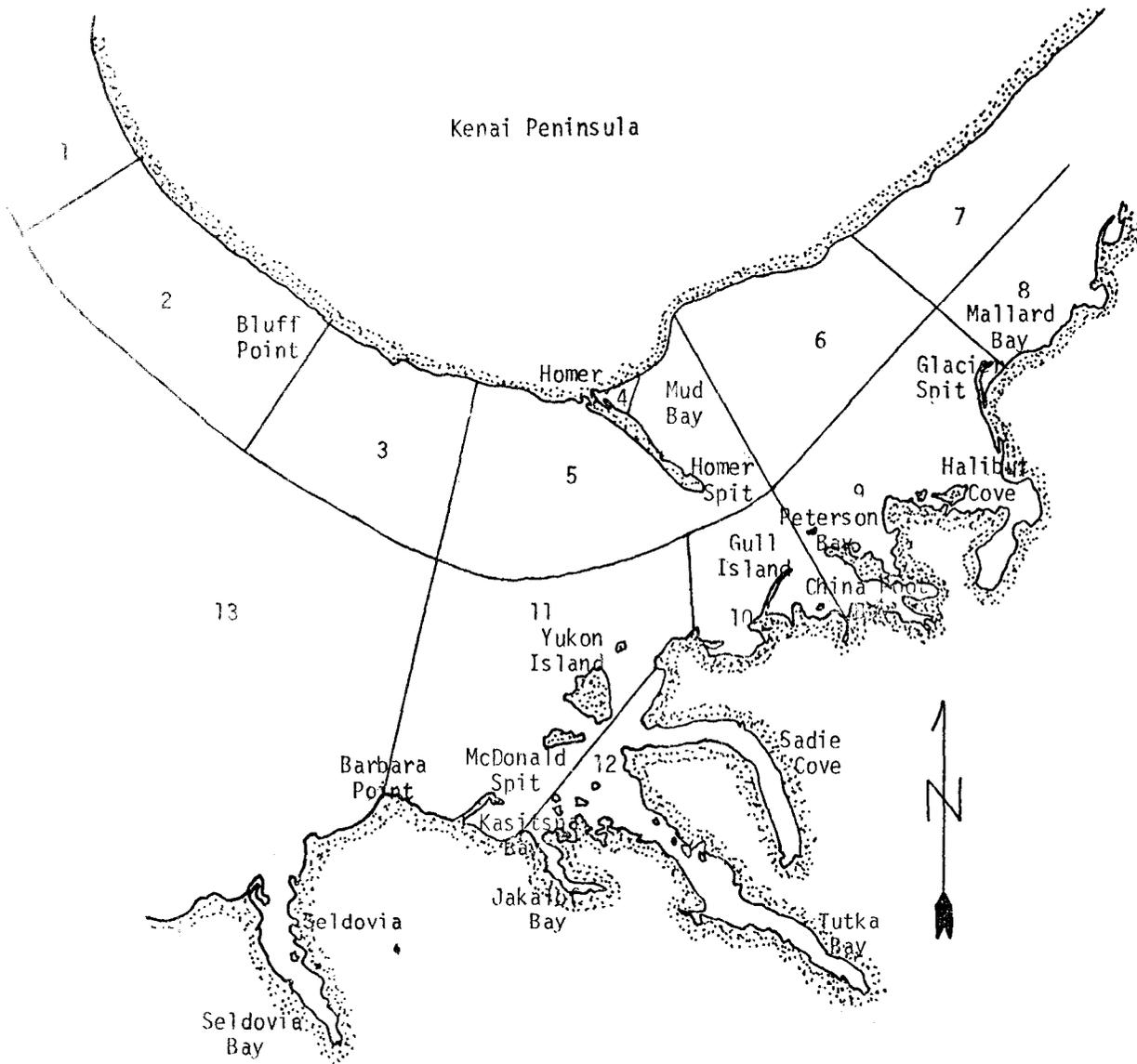


FIGURE 5. Kachemak Bay

during angler interviews included: (1) anglers in the party, (2) total hours fished, (3) area fished, (4) species preferred, (5) species caught. No boat counts were conducted and no estimates are available regarding total harvest and effort by boat anglers.

Effort and harvest estimates were computed weekly. Total anglers enumerated were divided by the number of counts conducted to determine the average number of anglers per hour. This number was multiplied by the total number of fishing hours in the week to yield total angler hours. Total angler hours was divided by the average hour fished per angler to determine the effort in man-days. Harvest was determined by multiplying the catch per hour for each species by the estimated total number of angler hours for that weekly period. Harvest and effort estimates were computed for anglers fishing from the Homer Spit, subsistence shellfish anglers fishing from the Homer Dock and silver salmon anglers in Mud Bay. The results are presented in Tables 20, 21, and 22.

Another aspect of the creel census dealt with angler preference regarding species. The most sought-after fish by shore anglers off the Homer Spit was salmon, followed by "no preference" (Table 23).

The harvest was computed by weekly periods during the creel census, then expanded to include that period from June 1 to July 7. Tables 24 and 25 present the harvest data from shore anglers. Cod species and flatfish represented the majority of the catch of shore anglers with 88.2%, while salmon and Dolly Varden comprised 11.5% of the catch.

Because the fishery began before the creel census program was initiated, estimates were made to include that period from June 1 through July 7.

It was assumed that the effort for the month of June was 75% of the effort between July 30 and September 2. It was further assumed that the effort during the first week of July was equal to that of the second week of July.

Harvest of all species, except pink salmon, O. gorbuscha, was assumed to be 75% of the harvest from July 30 through September 2. The assumption was made that pink salmon enter the fishery during the last week of June. Harvest of pink salmon from June 24-30 and July 1-7 was assumed to equal the estimated harvest of July 30-August 5 and July 23-29, respectively. It was further assumed that harvest of all other species was the same during the first week of July as that of the second week of July.

The shellfish harvest was also sampled, but only those anglers fishing from the Homer City Dock, located at the end of the Spit, were checked. People fish for shrimp and crab using rod and reel, ring or hoop nets, and pots. No attempt was made to distinguish species of crab or shrimp. However, the bulk of the shrimp catch was coonstripe shrimp, Pandalus hypcinotus, and the most of the crab harvested were tanner, genus Chionoecetes, and dungeness, Cancer magister. Because shrimp and crab seem to be more readily available to the angler later in the summer, June's harvest and effort was assumed to be 75% of July's. The harvest and effort for the first week of July was

TABLE 20. Summary of Kachemak Bay Creel Census Statistics by Weekly Period for Shore Anglers on Homer Spit (Excluding Mud Bay) July 8 through September 2, 1973.

<u>Weekly Period</u>	<u>Anglers Enumerated</u>	<u>Av. Anglers Per Count</u>	<u>Anglers Interviewed</u>	<u>Hours Reported</u>	<u>Av. Hrs. Per Trip</u>	<u>Fish Reported</u>	<u>Fish/ Hour</u>	<u>Salmon Per Hour</u>	<u>Man-days Effort</u>
7/ 8 - 7/15	1,313	43.77	139	321	2.31	292	0.908	0.137	2,577
7/16 - 7/22	1,375	57.29	111	291	2.62	309	1.061	0.254	2,602
7/23 - 7/29	990	41.25	94	196	2.09	333	1.699	0.122	2,349
7/30 - 8/ 5	766	30.64	78	177	2.27	154	0.870	0.084	1,606
8/ 6 - 8/12	851	34.04	103	164	1.59	161	0.981	0.048	2,548
8/13 - 8/19	555	24.13	143	225	1.58	227	1.228	0.035	1,787
8/20 - 8/26	241	10.04	123	172	1.40	128	0.744	0.029	753
8/27 - 9/ 2	575	23.00	137	193	1.41	185	0.958	0.025	1,713
<b>Total</b>	<b>6,666</b>	<b>33.33</b>	<b>928</b>	<b>1,739</b>	<b>187</b>	<b>1,789</b>	<b>1.046</b>	<b>0.107</b>	<b>15,935</b>

53

TABLE 21. Summary of Kachemak Bay Creel Census Statistics by Weekly Period for Mud Bay Silver Salmon Anglers, August 9 through September 2, 1973.

<u>Weekly Period</u>	<u>Anglers Enumerated</u>	<u>Av. Anglers Per Count</u>	<u>Anglers Interviewed</u>	<u>Hours Reported</u>	<u>Av. Hrs. Per Trip</u>	<u>Silver Salmon Per Hour</u>	<u>Man-days Effort</u>
8/ 9 - 8/12	81	5.40	28	56	2.00	0.053	182
8/13 - 8/19	94	4.09	58	106	1.83	0.084	261
8/20 - 8/26	34	1.42	25	38	1.52	0.052	98
8/27 - 9/ 2	94	3.76	48	86	1.79	0.058	221
<b>Total</b>	<b>303</b>	<b>3.48</b>	<b>159</b>	<b>286</b>	<b>1.80</b>	<b>0.066</b>	<b>762</b>

TABLE 22. Summary of Kachemak Bay Creel Census Statistics by Weekly Period for Subsistence Shellfish Anglers on Homer Dock, July 8 through September 2, 1973.

<u>Weekly Period</u>	<u>Anglers Enumerated</u>	<u>Av. Anglers Per Count</u>	<u>Anglers Interviewed</u>	<u>Hours Reported</u>	<u>Av. Hours Per Trip</u>	<u>Shrimp Per Hour</u>	<u>Crab Per Hour</u>	<u>Man-days Effort</u>
7/ 8 - 7/15	308	10.27	54	215	3.98	3.102	0.074	351
7/16 - 7/22	227	9.46	26	117	4.50	6.213	0.564	250
7/23 - 7/29	339	14.13	19	72	3.79	1.805	0.277	444
7/30 - 8/ 5	289	11.56	22	57	2.59	1.719	0.368	531
8/ 6 - 8/12	403	16.12	100	271	2.71	9.671	0.066	708
8/13 - 8/19	308	13.39	115	283	2.46	6.749	0.180	637
8/20 - 8/26	277	11.54	138	295	2.14	5.681	0.179	566
8/27 - 9/ 2	539	21.56	132	314	2.38	7.337	0.162	951
<b>Total</b>	<b>2,690</b>	<b>13.45</b>	<b>606</b>	<b>1,624</b>	<b>2.68</b>	<b>6.241</b>	<b>0.182</b>	<b>4,438</b>

TABLE 23. Angler Preference (in percent) Regarding Fish Species, Homer Spit, July 8 through September 2, 1973.

<u>Weekly Period</u>	<u>No Preference</u>	<u>Salmon</u>	<u>Dolly Varden</u>	<u>Cod</u>	<u>Flatfish</u>	<u>Other</u>	<u>Total</u>
7/ 8 - 7/15	45.2	20.8	6.7	0.7	5.1	21.5	100.0
7/16 - 7/22	48.7	43.2	4.5	1.8	0.9	0.9	100.0
7/23 - 7/29	46.8	39.4	1.1	5.3	5.3	2.1	100.0
7/30 - 8/ 5	65.4	30.7	---	1.3	2.6	---	100.0
8/ 6 - 8/12	36.0	47.0	---	3.0	5.0	3.0	100.0
8/13 - 8/19	35.0	48.2	---	7.7	2.1	7.0	100.0
8/20 - 8/26	26.5	53.9	2.0	7.8	1.0	8.8	100.0
8/27 - 9/ 2	32.1	50.4	---	5.1	5.8	6.6	100.0
Average	40.8	41.8	1.9	4.7	3.1	7.0	100.0

TABLE 24. Harvest by Species, Percent Contribution of Each Species to Total Harvest Fish, Creel Checked and Catch Per Hour, Homer Spit Shore Anglers, June 1 through September 2, 1973.

<u>Species</u>	<u>Estimated Harvest</u>	<u>% Contribution To Total Harvest</u>	<u>No. Fish Creel Checked*</u>	<u>% Harvest Creel Checked*</u>	<u>Fish/Hr.*</u>
Cod Species	22,623	46.5	822	5.1	0.480
Flatfish	20,314	41.7	750	5.7	0.438
Pink Salmon	4,000	8.2	148	4.5	0.086
Dolly Varden	952	2.0	30	4.9	0.017
Silver Salmon	676	1.4	35	5.2	0.020
Greenling	65	0.1	2	5.4	0.001
Irish Lord	59	0.1	2	6.5	0.001
Total	48,689	100.0	1,789	5.3	1.046

\* Fish creel checked, percent estimated harvest creel checked and fish per hour calculated from harvest estimates of July 8 through September 2.

TABLE 25. Projected Harvest by Species for Shore Fishermen Fishing From the Homer Spit and Mud Bay, 1973.

	<u>6/1-6/30</u>	<u>7/1-7/7</u>	<u>7/8-7/15</u>	<u>7/16-7/22</u>	<u>7/23-7/29</u>	<u>7/30-8/5</u>	<u>8/6-8/12</u>	<u>8/13-8/19</u>	<u>8/20-8/26</u>	<u>8/27-9/2</u>	<u>Total</u>
Cod	4,866	1,668	1,668	2,999	4,934	2,039	2,124	1,352	435	538	22,623
Flat Fish	4,745	2,687	2,687	2,366	1,503	783	1,557	1,991	319	1,676	20,314
Pink Salmon	551	165	816	1,734	551	165	0	13	0	5	4,000
Dolly Varden	114	223	223	140	100	41	74	12	0	25	952
Silver Salmon	0	0	0	0	50	144	217	140	39	86	676
Other Species	38	18	18	0	0	0	25	12	0	13	124
<b>Total</b>	<b>10,314</b>	<b>4,761</b>	<b>5,412</b>	<b>7,239</b>	<b>7,138</b>	<b>3,172</b>	<b>3,997</b>	<b>3,520</b>	<b>793</b>	<b>2,343</b>	<b>48,689</b>

assumed to be equal to the second week of July. Table 26 summarized the data collected during the creel census along with projections for June and the first week of July. An effort comparison between shore anglers and subsistence shellfish anglers is presented in Table 27.

Private concerns in the Kachemak Bay area offer a variety of activities under the term "charter boat". Commercial ventures such as barge service and passenger service are offered along with the tourist attractions of fishing, clam digging, and sight seeing. The creel census data was obtained from operators log books (Table 28).

A total of 846 anglers utilizing charter boats were reported by charter operators. They recorded a catch of 1,284 fish of which 55.7% were halibut, Hippoglossus stenolepis, and 16.5% were salmon. Charter boat operators reported most of the halibut (69.2%) were taken in areas 2 and 13 (Figure 5) while most of the salmon (88.4%) were taken from areas 5, 9, and 12.

Anglers utilizing personal boats were sampled during that period from July 8 through September 2 by contacting them as they returned to the Homer Small Boat Harbor. A total of 298 boats containing 663 anglers were interviewed. They reported a catch of 283 fish in 1,549 hours (Table 29). Species composition is presented in Table 30.

Because Kachemak Bay is large enough and relatively unprotected in areas, anglers using personal boats tended to remain close to the Homer Spit. Areas 4 and 5 received 70.8% of the pressure reported (Table 31).

TABLE 26. Summary of Estimated Harvest and Effort Calculated for Subsistence Shellfish Anglers off Homer City Dock, 1973.

	<u>Anglers Interviewed</u>	<u>Catch/Hour</u>		<u>Catch Reported</u>		<u>Estimated Harvest</u>		<u>Estimated Effort Man-days</u>
		<u>Shrimp</u>	<u>Crab</u>	<u>Shrimp</u>	<u>Crab</u>	<u>Shrimp</u>	<u>Crab</u>	
6/ 1 - 6/30		2.702	0.157			8,200	476	1,014
7/ 1 - 7/ 7		3.103	0.073			3,789	86	307
7/ 8 - 7/29	99	3.772	0.256	1,524	102	15,806	1,048	1,045
7/30 - 9/ 2	507	7.061	0.166	8,612	194	59,376	1,346	3,490
<b>Total</b>	<b>606</b>	<b>5.403</b>	<b>0.172</b>	<b>10,136</b>	<b>296</b>	<b>87,171</b>	<b>2,956</b>	<b>5,856</b>

59

TABLE 27. Comparative Angler Effort by Date for Three Kachemak Bay Fisheries, 1973.

<u>Date</u>	<u>Shore Anglers</u>	<u>Shellfish Anglers</u>	<u>Mud Bay Anglers</u>	<u>Total</u>
6/ 1 - 6/30	6,305	1,014	0	7,055
7/ 1 - 7/ 7	2,255	307	0	2,562
7/ 8 - 7/29	7,528	1,045	0	8,556
7/30 - 9/ 2	8,407	3,490	762	12,659
<b>Total</b>	<b>24,495</b>	<b>5,856</b>	<b>762</b>	<b>30,832</b>

TABLE 28. Summary of Charter Boat Creel Census Statistics on the Homer Spit, Kachemak Bay, May 28 through August 26, 1973.

<u>Weekly Period</u>	<u>Boat Trips</u>	<u>Total Anglers</u>	<u>Hours Reported</u>	<u>Av. Hrs. Fished</u>	<u>Total Fish Reported</u>	<u>Fish/Hr.</u>	<u>Halibut Reported</u>	<u>Halibut Hr.</u>	<u>Salmon Reported</u>	<u>Salmon Hr.</u>
5/28-6/ 3	5	16	95	5.94	7	0.073	7	0.073	0	--
6/ 4-6/10	4	12	61	5.08	12	0.196	12	0.196	0	--
6/11-6/17	12	48	282	5.87	52	0.184	34	0.120	1	0.003
6/18-6/24	17	67	293	4.37	87	0.296	35	0.119	0	--
6/25-7/ 1	16	91	353	3.88	91	0.257	52	0.147	1	0.002
7/ 2-7/ 8	16	79	388	4.91	87	0.224	50	0.128	2	0.005
7/ 9-7/15	17	81	307	5.02	199	0.491	57	0.140	15	0.036
7/16-7/22	28	130	540	4.15	156	0.288	84	0.155	44	0.081
7/23-7/29	22	103	506	4.91	134	0.264	93	0.183	10	0.019
7/30-8/ 5	23	95	474	4.99	217	0.457	149	0.314	58	0.122
8/ 6-8/12	7	32	160	5.00	97	0.606	53	0.331	42	0.262
8/13-8/19	16	73	354	4.85	111	0.313	70	0.197	28	0.079
8/20-8/26	4	19	95	5.00	34	0.357	19	0.200	11	0.115
<b>Total</b>	<b>187</b>	<b>846</b>	<b>4,008</b>	<b>4.74</b>	<b>1,284</b>	<b>0.320</b>	<b>715</b>	<b>0.178</b>	<b>212</b>	<b>0.052</b>

09

TABLE 29. Summary of Kachemak Bay Creel Census Statistics for Boat Anglers (Excluding Charter Boats) Interviewed at Homer Small Boat Harbor, July 8 through September 2, 1973.

<u>Weekly Period</u>	<u>Boats Sampled</u>	<u>Anglers Interviewed</u>	<u>Hour Reported</u>	<u>Average Hrs. Fished</u>	<u>Total Fish Reported</u>	<u>Fish/Hr.</u>	<u>Salmon Reported</u>	<u>Salmon/Hr.</u>
7/ 8-7/15	22	60	194	3.23	62	0.320	23	0.118
7/16-7/22	21	59	195	3.31	43	0.221	13	0.066
7/23-7/29	30	78	217	2.79	33	0.152	9	0.041
7/30-8/ 5	33	77	176	2.29	30	0.170	17	0.096
8/ 6-8/12	52	107	257	2.40	48	0.187	44	0.171
8/13-8/19	42	85	160	1.88	25	0.156	17	0.106
8/20-8/26	47	94	157	1.67	17	0.108	8	0.051
8/27-9/ 2	51	103	193	1.87	25	0.130	6	0.031
<b>Total</b>	<b>298</b>	<b>663</b>	<b>1,549</b>	<b>2.34</b>	<b>283</b>	<b>0.183</b>	<b>137</b>	<b>0.088</b>

TABLE 30. Summary of Harvest by Species for Kachemak Bay Small Boat Operators (Excluding Charter Boats) Interviewed at Homer Small Boat Harbor, July 8 through September 2, 1973.

Weekly Period	Dolly Varden		Pink Salmon		Coho Salmon		Halibut		Flatfish		Cod		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
7/ 8-7/15	19	30.7	23	37.1	--	--	10	16.1	8	12.9	2	3.2	62	100.0
7/16-7/22	8	19.0	13	31.0	--	--	4	9.5	13	31.0	4	9.5	42	100.0
7/23-7/29	9	27.3	7	21.2	2	6.1	4	12.1	11	33.3	-	---	33	100.0
7/30-8/ 5	10	33.3	10	33.3	7	23.4	1	3.3	2	6.7	-	---	30	100.0
8/ 6-8/12	--	---	2	4.2	42	87.5	1	2.1	3	6.2	-	---	48	100.0
8/13-8/19	--	---	4	16.0	13	52.0	7	28.0	1	4.0	-	---	25	100.0
8/20-8/26	1	5.9	--	--	8	47.1	6	35.2	2	11.8	-	---	17	100.0
8/27-9/ 2	2	8.0	--	--	6	24.0	13	52.0	3	12.0	1	4.0	25	100.0
Total	49	17.4	59	20.9	78	27.7	46	16.3	43	15.2	7	2.5	282	100.0

TABLE 31. Distribution of Sport Fishing Boats (Excluding Charter Boats) in Kachemak Bay as Reported by Anglers Interviewed at Homer Small Boat Harbor, July 8 through September 2, 1973.

Area	Weekly Period								Total
	<u>7/ 8</u> <u>7/15</u>	<u>7/16</u> <u>7/22</u>	<u>7/23</u> <u>7/29</u>	<u>7/30</u> <u>8/ 5</u>	<u>8/ 6</u> <u>8/12</u>	<u>8/13</u> <u>8/19</u>	<u>8/20</u> <u>8/26</u>	<u>8/27</u> <u>9/ 2</u>	
I									0
II	1	1	1			1	1	2	7
III	2	1		3	1		1		8
IV			1	2	11	14	8	8	44
V	14	13	16	23	32	19	26	24	167
VI		3	3	2	2		3	3	16
VII					1			2	3
VIII							1	1	2
IX	4	2	1	2	2	2	1	3	17
X	1		1					1	3
XI			5		3	6	6	6	26
XII		1	2	1		1			5
XIII	—	—	—	—	—	—	—	—	0
Total	22	21	30	33	52	43	47	50	298

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