

Fishery Data Series No. 96-34

Dall River Cooperative Research Project, 1995

by
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and
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November 1996

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics, fisheries	
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis	H_A
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
gram	g			catch per unit effort	CPUE
hectare	ha	and	&	coefficient of variation	CV
kilogram	kg	at	@	common test statistics	F, t, χ^2 , etc.
kilometer	km	Compass directions:		confidence interval	C.I.
liter	L			correlation coefficient	R (multiple)
meter	m		east E	correlation coefficient	r (simple)
metric ton	mt		north N	covariance	cov
milliliter	ml		south S	degree (angular or temperature)	°
millimeter	mm		west W	degrees of freedom	df
		Copyright	©	divided by	÷ or / (in equations)
		Corporate suffixes:		equals	=
		Company	Co.	expected value	E
		Corporation	Corp.	fork length	FL
		Incorporated	Inc.	greater than	>
		Limited	Ltd.	greater than or equal to	≥
		et alii (and other people)	et al.	harvest per unit effort	HPUE
		et cetera (and so forth)	etc.	less than	<
		exempli gratia (for example)	e.g.,	less than or equal to	≤
		id est (that is)	i.e.,	logarithm (natural)	ln
		latitude or longitude	lat. or long.	logarithm (base 10)	log
		monetary symbols (U.S.)	\$, ¢	logarithm (specify base)	log ₂ , etc.
		months (tables and figures): first three letters	Jan, ..., Dec	mideye-to-fork	'
		number (before a number)	# (e.g., #10)	minute (angular)	'
		pounds (after a number)	# (e.g., 10#)	multiplied by	x
		registered trademark	®	not significant	NS
		trademark	™	null hypothesis	H_0
		United States (adjective)	U.S.	percent	%
		United States of America (noun)	USA	probability	P
		U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	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
				standard length	SL
				total length	TL
				variance	Var

Weights and measures (English)					
cubic feet per second	ft ³ /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Spell out acre and ton.					

Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
hour (spell out for 24-hour clock)	h				
minute	min				
second	s				
Spell out year, month, and week.					

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

FISHERY DATA SERIES NO. 96-34

DALL RIVER COOPERATIVE RESEARCH PROJECT, 1995

by

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ABSTRACT

A cooperative research project by the Alaska Department Fish and Game, Yukon Flats National Wildlife Refuge (NWR), and Stevens Village Natural Resource Program was conducted at the mouth of the Dall River during 1995. An interview survey was used to estimate the level and type of visitor use of the Dall River between May 26 and September 5, 1995. The survey was also designed to provide a check on the Statewide Harvest Survey (SWHS) which estimates angler effort and northern pike *Esox lucius* harvest and catch.

Total use by all visitors was estimated to be 613 (SE = 87) visitor days by 330 (SE = 33) visitors traveling in 107 (SE = 10) boats. Most use occurred in June and July (81%) and during weekends (83%). Most visits (90%) were by non-local people; Stevens Village residents composed 8% of the total during the survey period. Most of the visitors (265 of 282 interviewed) were sport fishing for northern pike. More than half (154 of 282) camped while in the survey area and 25 of 282 (9%) visitors were hunting. Most (82 %) visitor use occurred within the lower 10 mi of the river.

Total fishing effort was estimated at 553 (SE = 79) angler days by 299 (SE = 29) anglers. Estimated total harvest of northern pike was 340 (SE = 43) fish. An additional estimated 985 (SE = 210) northern pike were caught and released. Total catch of northern pike in 1995 was estimated at 1,325 (SE = 243). These estimates are not significantly different from estimates provided by the SWHS for 1995 and are similar to the most recent five year averages from the SWHS (total effort - 619 angler days, total harvest - 320 northern pike, total catch - 1,757 northern pike).

Key words: Dall River, Stevens Village, SWHS, angler interview, use survey, harvest, fishing effort, subsistence, Co-management, northern pike, *Esox lucius*.

INTRODUCTION

The Dall River is a popular destination for anglers desiring to fish for northern pike *Esox lucius* in the middle portion of the Yukon River. In 1993, this river supported twice the fishing effort and about 5.5 times more harvest of northern pike than the Nowitna River, the only other tributary of the middle portion of the Yukon River for which data on northern pike are available (Mills 1994). Easy access to the Dall River was created with the construction of the Dalton Highway which crosses the Yukon River approximately 25 mi downstream from the Dall River mouth (Figure 1). A concrete boat launch at the Dalton Highway crossing presently provides access to the river for most types of water craft.

In 1988, the Alaska Board of Fisheries responded to a proposal from residents of Stevens Village to close the northern pike fishery in the Dall River by restricting allowable harvest of northern pike in the Yukon River and its tributaries from the Tanana to the Hodzana River to five northern pike (one over 30 in). In 1988 and 1989 the Alaska Department Fish and Game (ADF&G) conducted a project designed to assess the population of northern pike residing in the Dall River (Arvey and DeCicco 1989, Arvey and Burkholder 1990). A reliable estimate of population abundance was not obtained because northern pike travel into and out of the Dall River during the open water season. The study found that this northern pike population extends throughout the Yukon River and its tributaries from as far downstream as Hess Creek and upstream of Stevens Village to at least Old Lost Creek. Data obtained in 1988 and 1989 on the size and age of northern pike residing in the Dall River during summer indicate that a substantial portion of these fish were of large size and old age. The maximum estimated harvest of northern pike from the Dall River occurred in 1984 and was 2,482 fish (1,752 sport, 730 subsistence). All harvest estimates since that time have been less (Mills 1994, Howe et al. 1995). Based on these findings, the ADF&G concluded that the level of harvest occurring in 1988 and 1989 was well within sustainable levels.

More recent information concerning the Dall River northern pike fishery is limited to results of the Statewide Harvest Survey (SWHS) conducted by ADF&G. The precision of estimates from the SWHS is dependent on the level of participation in a particular fishery. Results for individual fisheries are not published unless at least 12 respondents to the survey indicate that they fished at a particular site. Since the inception of the survey in 1977, sufficient responses were obtained for the Dall River for only one year, 1993. In 1993, fishing effort was estimated to be 845 angler days and estimated harvest was 352 northern pike. For the 1994 season, only 11 responses were obtained from the Dall River providing estimates less precise than for 1993. In 1994 the estimates were 455 angler days and 215 northern pike harvested.

There are complex jurisdictional and land ownership issues associated with public use of the Dall River. Virtually the entire watershed lies within the boundaries of the Yukon Flats National Wildlife Refuge. Much of the land along the river itself belongs to or has been selected by Dinyee (Stevens Village Native Corporation); Doyon, Limited (the Native Regional Corporation); or individual native allotment holders. The State of Alaska owns lands underlying navigable water up to the ordinary high water mark. In addition, the entire area lies within the "Traditional Lands" claimed by Stevens Village - lands critical for their subsistence hunting, trapping, and fishing activities. There is dual State-Federal management of subsistence hunting and fishing within this area.

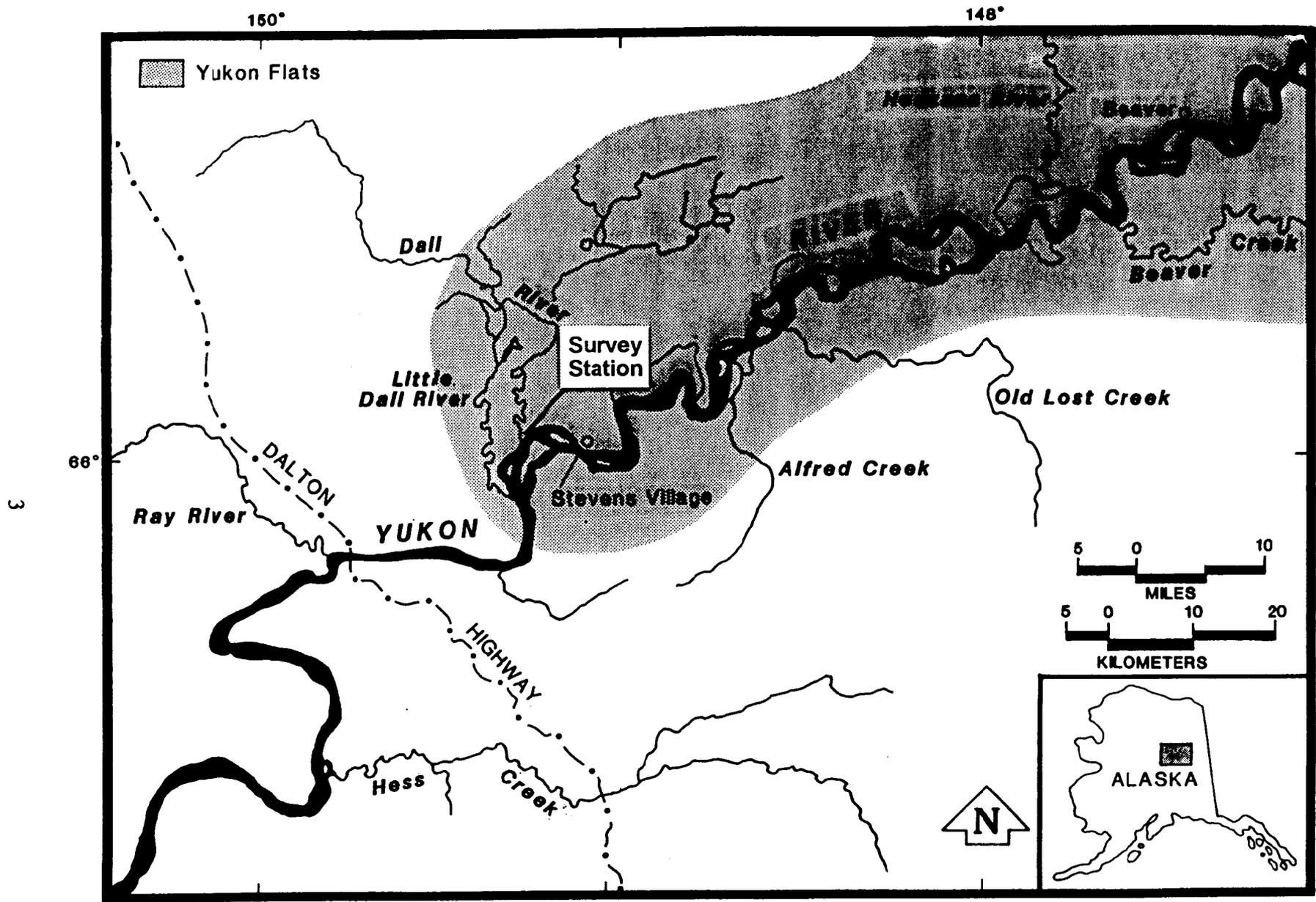


Figure 1.-Map of study area, Dall River.

To effectively manage the resources of the Dall River watershed and address concerns expressed by local residents over increased public use, a general disrespect of private property, and possible adverse impacts to the northern pike stock, a cooperative work group was established. The group, composed of representatives from the ADF&G, Stevens Village Council, Stevens Village Natural Resource Program, Dinyee Corporation, the Yukon Flats National Wildlife Refuge and the Bureau of Land Management (Appendix A), met frequently from February through May 1995 to develop this cooperative project.

The project was specifically designed to obtain estimates of fishing effort (angler days) and catch and harvest of northern pike that would be comparable with the SWHS, thereby providing a check on the 1995 results¹. The project also was designed to estimate the timing and amount of use by all visitors to the Dall River, the purposes of their visits, and location of use within the river corridor. The project sought to characterize the demographics of visitors by city of residence, current military status, and history of use. The study also estimated opinions concerning quality of northern pike fishing and changes in river use. Finally, the level of knowledge by visitors concerning land ownership within the river corridor was investigated.

METHODS

An interview survey was used to collect information on visitor use of the Dall River and on fish catch, harvest and angling effort. A survey station was established on the Dall River near its intersection with the Yukon River (Figure 1). The Dall River enters the Yukon River from the north at 66° 00' 30"N, 149° 15'W approximately 25 mi upstream from the Yukon River Bridge and approximately 3 mi downstream from Stevens Village.

One creel clerk was assigned to conduct the angler interviews during each sample period at the entrance of the Dall River. The creel survey emphasized the collection of information from visitors at the end of their visit. Creel clerks attempted to contact all boats and interview all people exiting the Dall River. The number of people in boats failing to stop was counted.

STUDY OBJECTIVES

The primary focus of the study was to obtain information about the sport fishery for northern pike which occurred on the Dall River during the 1995 season. Specific project objectives are listed below:

1. to estimate days of fishing effort occurring in the Dall River;
2. to estimate the catch of northern pike occurring in the Dall River;
3. to estimate the harvest of northern pike occurring in the Dall River; and,
4. to sample northern pike harvested from the Dall River for length and age.

In addition to these primary objectives, the study sought to obtain other data on sport fishing and on general visitor use of the Dall River during 1995. Tasks that the study specifically addressed are listed below.

¹ This assumes that no significant angling for northern pike occurs outside of the creel survey time frame. The SWHS surveys the entire year, while the creel survey covered the period May 26 through September 5.

1. The proportion of anglers rating the quality of the northern pike fishery in five categories:
 - a) on this trip,
 - b) this trip relative to previous trips on the Dall river,
 - c) this trip relative to other areas.
2. The major fishing and camping areas on the Dall River.
3. The proportion of first time users and the opinions of return users concerning change in the amount of use on the Dall River.
4. The proportion of users that know:
 - a) that much of the land along the Dall River is private,
 - b) where the boundaries to the private lands are,
 - c) if they used private land.
5. The purpose of this and previous trips to the Dall River.
6. The major species harvested by users who were hunting:
 - a) on this trip,
 - b) on previous trips.
7. How users found out about the Dall River.
8. The demographics of users by:
 - a) Alaska resident / non resident,
 - b) military / nonmilitary,
 - c) resident of Stevens Village / non resident of Stevens Village.
9. The number of visitors in each boat.
10. The percent composition of anglers interviewed that use boats in five categories (prop driven, jet, air, jet-ski, other).

STUDY DESIGN

The creel survey in 1995 was conducted at the mouth of the Dall River. All anglers entered and exited the fishery by boat or airplane from this location. The majority of fishing was from boats.

The fishery began in late May following break up of the Yukon River, and ended on about September 5. Fishing occurred during all hours of the day. For this reason, the creel survey on the Dall River began on the last weekend in May (26) and continued through September 5. Two full time positions were required to conduct interviews.

The creel survey was a direct expansion completed-trip survey based on a stratified sampling design. The design consisted of 33 strata. All days were divided into four, six-hour time periods (0000-0600, 0600-1200, 1200-1800, 1800-2400). Each weekend was considered a stratum (15 strata), a weekend was defined as starting at 1200 on Friday and continuing until 1800 on Monday. During the week of July 4 the weekend was defined as beginning at 1200 hrs Friday, June 30 and continuing until 1200 hrs on Wednesday July 5. Non-weekend days were divided into four three-week blocks. Within a three-week block, each of the four six-hour periods were considered a stratum (e.g., second three-week block, time period 0000-0600 was a stratum). Days were then randomly selected within the three-week block, six-hour time period strata.

Within each stratum, specific six-hour periods were randomly chosen from the available periods of the survey. Two full-time technicians worked 13 sampling periods per week or 39 sampling periods during a three-week block. It was estimated that 67% of the effort and harvest would

occur during the weekend; therefore, 67% of the sampling effort was allocated to weekends. A normal weekend consisted of 13, 6-hour periods of which 9 were randomly chosen to be sampled. During a three-week block, 27 of the possible 39 sampling periods were sampled on the weekends. The remaining 12 sampling periods were allocated according to the following schedule:

Period	Estimated Effort	Number of Periods to Sample
0000-0600	17%	2
0600-1200	25%	3
1200-1800	33%	4
1800-2400	25%	3

The resultant schedule is listed in Appendix B.

Creel technicians attempted to contact all boats exiting the river regardless of whether or not the party had been fishing. All "missed" anglers were counted. All contacted anglers were interviewed, and their northern pike fishing effort (days), catch and harvest (number of northern pike) was recorded.

During each interview, the following information was collected from each individual:

- 1) the amount of time he or she spent fishing (in days);
- 2) the number of northern pike caught;
- 3) the number of northern pike harvested; and,
- 4) the lengths of northern pike harvested and other biological information as available.

In addition, information about visitors to the Dall River including city and state of residence, the purpose of the trip, frequency of visits, opinions concerning northern pike fishing, and changes in public use of the area was recorded. The numbers and species of game animals taken during the survey period or on prior trips were noted. The survey recorded the participants' knowledge of the existence and location of private land, and attitudes concerning use of private land.

Specific instructions regarding the interview process and recording data is included as Appendix C. Interview questions and the field data form are included as Appendix D.

DATA ANALYSIS

Expansion of the stratified random sample data provided estimates for the 1995 open water season of the number of: 1) people that visited the Dall River; 2) anglers that used the Dall River; 3) northern pike caught and released; and, 4) northern pike harvested.

The estimation procedure was taken from Cochran 1977:

$$\bar{y}_{st} = \frac{\sum_{h=1}^L N_h \bar{y}_h}{N} = \sum_{h=1}^L W_h \bar{y}_h \quad (1)$$

$$S_h^2 = \frac{1}{n_h - 1} = \sum_{i=1}^{n_h} (y_{hi} - \bar{y}_h)^2 \quad (2)$$

$$\hat{V}(\bar{y}_{st}) = \sum_{h=1}^L \frac{W_h^2 S_h^2}{n_h} - \sum_{h=1}^L \frac{W_h S_h^2}{N} \quad (3)$$

$$\text{total} = N\bar{y}_{st} \quad (4)$$

$$\hat{V}(\text{total}) = N^2 s^2 (\bar{y}_{st}) \quad (5)$$

where:

- N = total number of 6 hr periods = 576
L = 33, total number of strata
 N_h = number of periods in stratum h, for $h = 1, \dots, L$
 n_h = number of periods in sample h
 y_{hi} = value obtained for the ith period
 $W_h \frac{N_h}{N}$ = stratum weight
 $f_h \frac{n_h}{N_h}$ = sampling fraction in the stratum
 $\bar{y}_h = \frac{\sum_{i=1}^{n_h} y_{hi}}{n_h}$ = sample mean for stratum h

Proportions were estimated by simple single sample formulas.

$$\hat{p}_g = \frac{n_g}{n}; \text{ and,} \quad (6)$$

$$V[\hat{p}_g] = \left[\frac{\hat{p}_g(1 - \hat{p}_g)}{n - 1} \right] \left[1 - \frac{n}{\hat{N}} \right]. \quad (7)$$

where:

- n_g = the number in the sample from group g ;
 n = the number individuals responding to a survey question or the number of fish sampled;
 \hat{p}_g = the estimated fraction of the population that is made up of group g ; and,
 \hat{N} = the estimated total number of visitors.

The sampling fraction was 80%. The increased precision and accuracy of the stratified estimate is negligible.

The second term in formula 7, the finite population correction factor $(1-n/N)$ was not used in calculating variance for proportions of fish in age or length categories.

RESULTS

TOTAL USE OF DALL SURVEY AREA

Total use of the Dall River by all visitors between May 26 and September 5, 1995 was estimated to be 613 visitor days by 330 (SE 33) people in 107 (SE 10) boats (Table 1).

Table 1.-Estimated total use of the Dall River by all visitors, 1995.

	Estimate	SE	95% Confidence Interval	
			Lower Limit	Upper Limit
Number of visitors	330	33	264	395
Number of boats	107	10	87	126
Days of use	613	87	443	784

On 48 of the 103 days (47%) no boats entered the Dall River. On 28 days (27%) one boat was observed entering the Dall River; two boats were observed on 14 days, three boats were observed on five days, four boats on five days, five boats on two days and on one day six boats were observed entering the survey area (Figure 2 and Appendix E1). The daily average number of boats between May 26 and September 5 was approximately one boat per day. Eighty-nine percent (95 of the 107) boats present during the survey period were interviewed.

Group Size

The number of people in each boat varied from one to six. Most boats (62%) contained either two or three people (Figure 3a and Appendix E2). Eleven percent of the boats contained one person, 31% carried two people, 31% carried three people, 13% carried four people, 12% had five people and 4% of the boats carried six people.

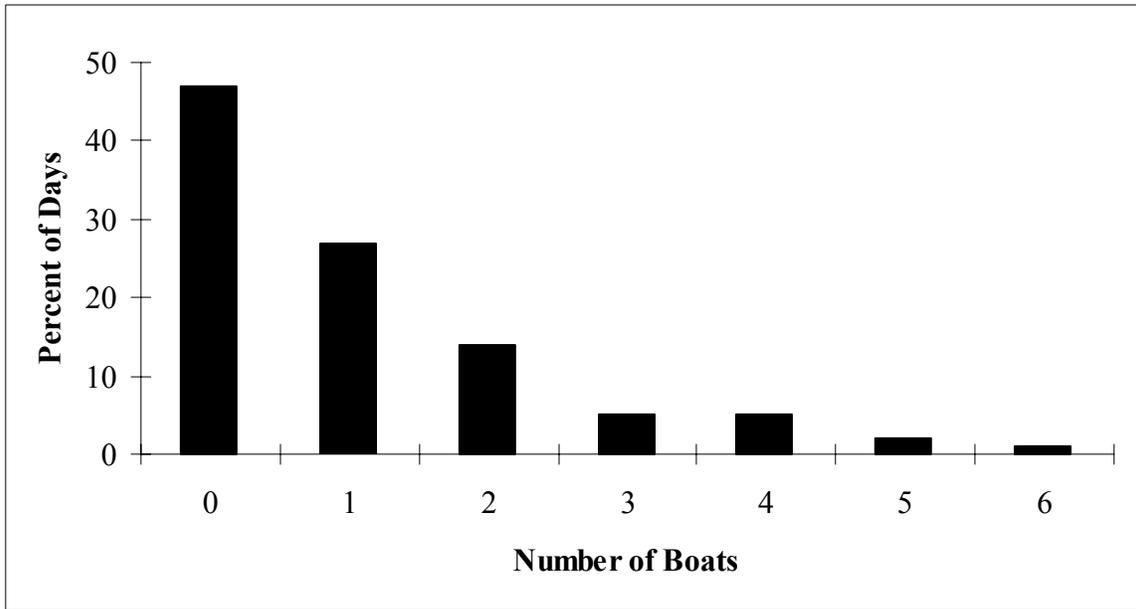


Figure 2.-Number of boats counted entering the Dall River between May 26 and September 5, 1995.

Length of Stay

Most (94%) visitors remained in the area for two or fewer days; (note that any use less than 24 hours was considered a day). Fifty-four percent remained one day, 40% remained two days, 6% remained three days, 5% remained four days, and 2% remained five days (Figure 3b and Appendix E3.).

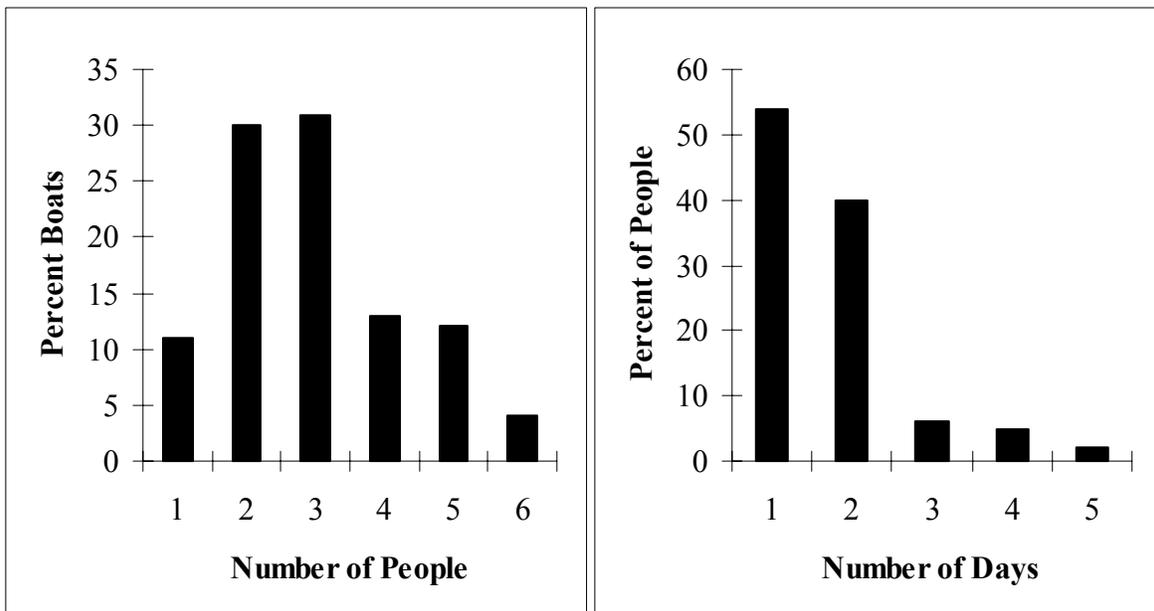


Figure 3.-a. Number of people in boats entering the Dall River between May 26 and September 5, 1995. b. Length of stay for visitors to the Dall River, 1995.

When Visitors Used Dall Survey Area

Use of the Dall River was highest during the month of July. Nearly half (47%) of the visitors to the area came during this month (Table 2). Approximately one-third (34%) of the visitors came during June and the last weekend in May. Use was less during August and the first weekend in September with 19% of visitors arriving during this period.

Use during weekends was greater than weekdays; 83% of visits occurred on weekends (Table 2). During August, nearly all (96%) visitors came during weekends.

Table 2.-Proportion of visitor use during weekdays and weekends and by month.

		Weekday	Weekend	Total
June ^a	Visitors counted	21	74	95
	Proportion (SE)	0.221 (0.016)	0.779 (0.016)	0.337 (0.011)
July	Visitors counted	26	107	133
	Proportion (SE)	0.195 (0.013)	0.805 (0.013)	0.472 (0.011)
August ^b	Visitors counted	2	52	54
	Proportion (SE)	0.037 (0.010)	0.963 (0.010)	0.191 (0.011)
All Season	Visitors counted	49	233	282
	Proportion (SE)	0.174 (0.009)	0.826 (0.009)	1.000

^a The June period includes the last weekend in May

^b The August period includes the first five days of September.

Where the Visitors Came From

During the 103 day survey period, most use (92%) of the Dall River was by non-local visitors. The amount of use by local people changed during the course of the summer. During the June period, 20% of the people and 26% of the boats visiting the survey area were of local origin. At the beginning in July, use of the area by local people dropped dramatically and remained at a very low level for the remainder of the survey. Nearly all of the non-local visitors to the Dall River were from the Fairbanks area (Table 3). A small portion of the visitors came from other Alaskan communities and from other states. The proportion of the visitors that were in the military was small; 9% of all individuals surveyed said they were in the military. This proportion changed by month (13.2% in June, 3.2% in July, 13.7% in August).

The survey station was staffed for an additional 10 days following the end of the Dall River survey on September 5 to monitor use of the river through mid-September. During this 10 day period, the sampling schedule was inconsistent and, as a result, estimates of total use are not available. However, counts of boats and responses of visitors contacted during this 10 day period indicate that use was very limited (Table 4).

Table 3.-Location of residence of visitors interviewed during the survey period.

Month	Location	Boats			People		
		Count	Proportion	SE	Count	Proportion	SE
June ^a							
	Local	10	0.263	0.024	19	0.200	0.016
	Other Rural Alaska	1	0.026	0.009	6	0.063	0.010
	Fairbanks ^b	23	0.605	0.027	62	0.653	0.019
	Other Urban Alaska	0	0		0	0	
	Outside	3	0.079	0.015	6	0.063	0.010
	Unknown	1	0.026	0.009	2	0.021	0.006
	Total	38			95		
July							
	Local	1	0.025	0.008	3	0.023	0.005
	Other Rural Alaska	0	0		0	0	
	Fairbanks ^b	38	0.950	0.012	124	0.932	0.008
	Other Urban Alaska	0	0		0	0	
	Outside	0	0		1	0.008	0.003
	Unknown	1	0.025	0.008	5	0.038	0.006
	Total	40			133		
August ^c							
	Local	0	0		0	0	
	Other Rural Alaska	0	0		0	0	
	Fairbanks ^b	15	0.882	0.026	49	0.907	0.015
	Other Urban Alaska	0	0		1	0.019	0.007
	Outside	1	0.058	0.020	1	0.019	0.007
	Unknown	1	0.058	0.020	3	0.056	0.012
	Total	17			54		
All Season							
	Local	11	0.116	0.011	22	0.078	0.006
	Other Rural Alaska	1	0.010	0.004	6	0.021	0.003
	Fairbanks ^b	76	0.800	0.013	235	0.833	0.009
	Other Urban Alaska	0			1	0.004	0.001
	Outside ^d	4	0.042	0.007	8	0.028	0.004
	Unknown	3	0.032	0.006	10	0.036	0.004
	Total	95			282		

^a June period includes May 26 - 30.

^b Includes the Interior Alaska communities of Fairbanks, North Pole, Fort Wainwright, and Eielson AFB.

^c August period includes September 1-5.

^d Six of eight “Outside” visitors were accompanied by “Fairbanks” residents.

Table 4.-Visitors counted during September 5 through September 15, 1995.

Month	Location	Boats			People		
		Count	Proportion	(SE)	Count	Proportion	(SE)
September							
	Local	2	0.33	0.21	5	0.33	0.13
	Fairbanks	0	0		0	0	
	Other Alaska	0	0		0	0	
	Outside	0	0		0	0	
	Unknown	4	0.67	0.21	10	0.66	0.13
	Total	6			15		

Frequency of Use by Visitors to the Dall River

A total of 263 people provided information concerning their history of use of the Dall River. One hundred nineteen (45%) indicated that they were first time visitors; 144 (55%) said that they had visited the Dall River before. Most (82 of 144) of the repeat visitors had been visiting the Dall River for less than five years. Fifty individuals said they have visited for 5 to 9 years, three visitors have been using the area for 10 to 14 years. Only nine of the visitors said that they had been visiting the Dall River for more than 15 years (Figure 4 and Appendix E4).

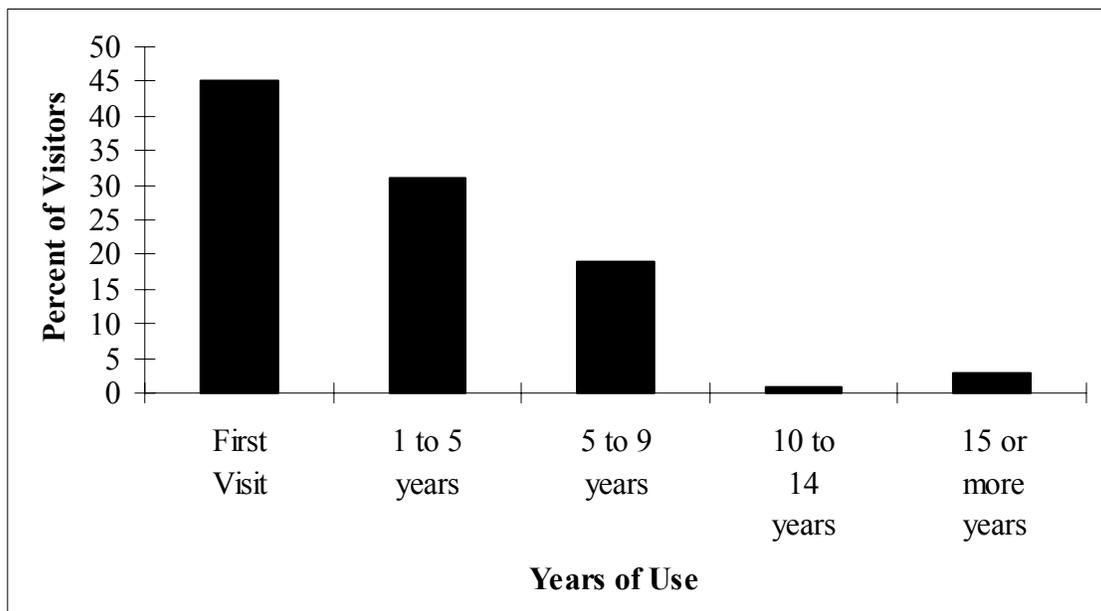


Figure 4.-Number of years that visitors have been using the Dall River.

Changes in Amount of Use of Dall River, Opinion Survey

Opinions of 159 visitors recorded during the survey indicated that one-third of the people interviewed (33%) believed that the use of the river had changed little since they began visiting the area. About 40% felt that use had increased (15%, increased greatly; 25%, increased). Slightly more than one-fourth (27%) believed that use of the Dall River had decreased (23%, decrease; 4%, decreased greatly) since they started visiting the area (Figure 5 and Appendix E5).

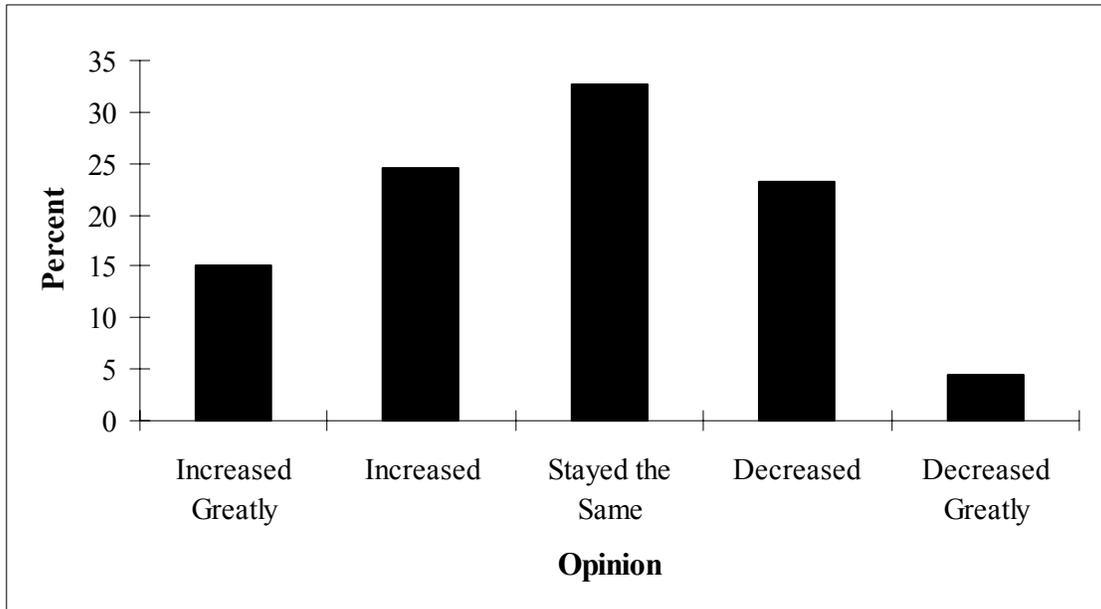


Figure 5.-Opinions of 159 visitors comparing the amount of use of the Dall River in 1995 with previous visits.

Purpose of Visit to Survey Area

Of the 282 individuals surveyed, 265 (94%) indicated that they visited the Dall River to fish for northern pike. One hundred fifty-four (55%) people camped within the survey area during their visit to the river. Twenty-five of the 282 (9%) indicated that they were hunting. Boating was reported as a purpose for visiting the area by 160 (57%) individuals. Other activities reported included traveling, flying, visiting, and guiding (Appendix F).

NORTHERN PIKE FISHERY

The estimated total fishing effort during the survey period (May 26 - September 5) was 553 angler days by 299 anglers (Table 5).

Table 5.-Estimated total use by anglers of the Dall River, 1995.

	Estimate	SE	95% Confidence Interval	
			Lower Limit	Upper Limit
Total anglers	299	29	243	356
Total fishing effort (days)	553	79	399	707

The estimated total harvest of northern pike of all sizes from the Dall River during the survey was 340 fish (Table 6). An estimated 57 of these northern pike were 30 inches or larger. An estimated 283 fish were less than 30 inches. About three-fourths of the northern pike caught were released. An estimated 958 northern pike of all sizes were caught and released: 111 northern pike were 30 inches or larger, 874 northern pike were less than 30 inches. Thirty of the 265 anglers interviewed (11%) released all northern pike that they caught.

Table 6.-Estimated harvest and catch of northern pike from the Dall River, 1995.

	Estimate	SE	95% Confidence Interval	
			Lower Limit	Upper Limit
Harvest				
N. Pike < 30"	283	34	217	349
N. Pike > 30"	57	14	30	85
All N. Pike	340	43	256	425
Caught and Released				
N. Pike < 30"	874	183	516	1,231
N. Pike > 30"	111	30	53	169
All N. Pike	985	210	573	1,397
Total Catch (catch + harvest)				
N. Pike < 30"	1,157	211	744	1,570
N. Pike > 30"	168	36	98	238
All N. Pike	1,325	243	849	1,801

The estimates of fishing effort and catch and harvest of northern pike provided by the present study were compared to estimates calculated from the SWHS (Howe et al. 1996). There was not a significant difference between the estimates derived from the two independent surveys; point estimates from the Dall River Research Project were within the 95% confidence intervals from the SWHS (Figure 6, Appendix H2).

Most northern pike were caught during July (54%) or during the August 1 through September 5 time period (38%, Figure 7, Appendix G). A much smaller portion of the 1995 catch (8%) occurred during the May 26 through June 30 time period.

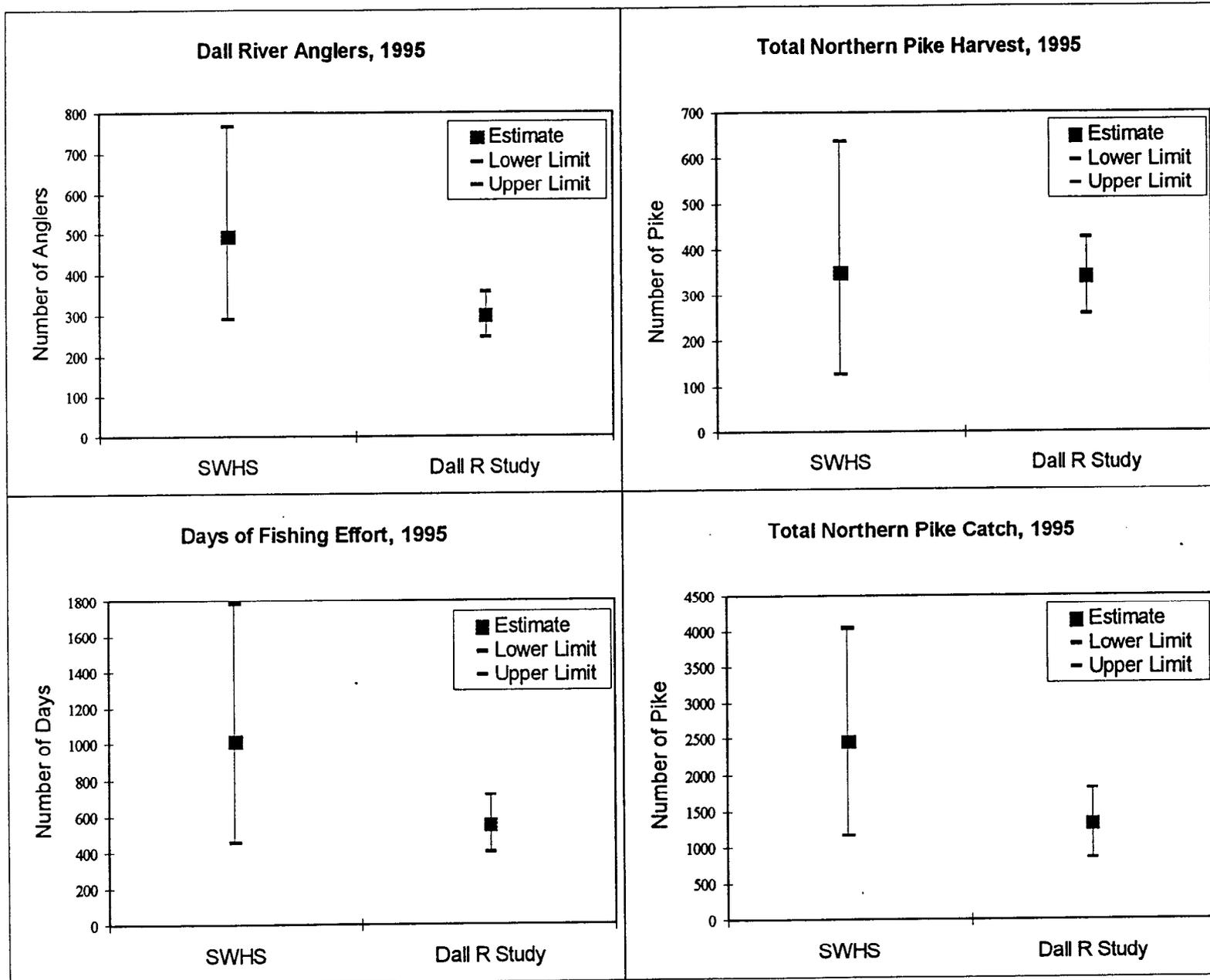


Figure 6.-Estimates and 95% confidence intervals of the number of anglers, days of fishing effort, total harvest of northern pike, and total catch of northern pike from the Dall River in 1995. Estimates are from the SWHS and the Dall River Research Project.

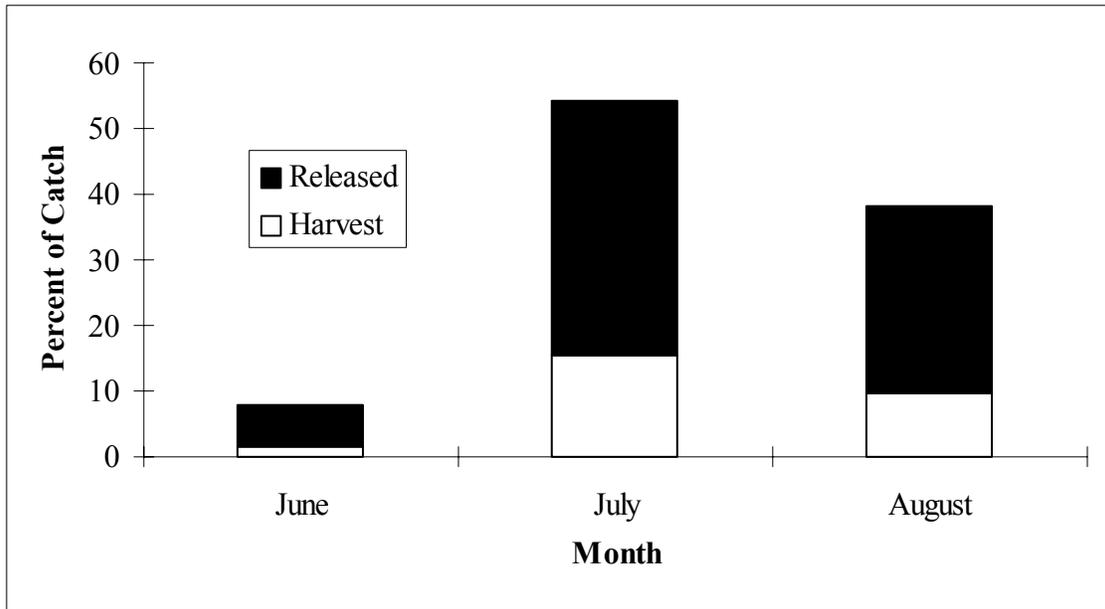


Figure 7.-Monthly catch of northern pike during 1995. The June period includes May 26 - June 30. The August period includes August 1 - September 5.

About 64% (169 of 265) of the anglers interviewed harvested one or more northern pike from the Dall River. Most of these anglers reported harvesting only one northern pike (Table 7). Approximately one-fourth (24%, 40 of 169) of the anglers that harvested northern pike took large fish (total length > 30 inches).

Table 7.-Number of northern pike harvested by anglers interviewed at the Dall River during 1995.

Number of Fish	Harvest								
	Northern pike < 30"			Northern pike > 30"			All NP		
	Anglers	Proportion	SE	Anglers	Proportion	SE	Anglers	Proportion	SE
1	73	0.566	0.015	35	0.875	0.018	108	0.639	0.012
2	27	0.209	0.012	5	0.125	0.018	32	0.189	0.010
3	13	0.101	0.009	0	0		13	0.077	0.007
4	7	0.054	0.007	0	0		7	0.091	0.005
5	7	0.054	0.007	0	0		7	0.041	0.005
6	2	0.016	0.004	0	0		2	0.012	0.003
Total Anglers	129			40			169		
Max no. of fish	6			2			6		
Min no. of fish	1			1			1		
Variance	1.62			0.11			1.36		
Total fish	241			45			286		
Mean no. of fish	2			1			2		

Fifty-four percent (142 of 265 anglers) of the anglers fishing for northern pike on the Dall River released some or all of their catch; 11% (30 anglers) released all northern pike that they caught. About 72% of the catch-and-release anglers released one to five fish (Table 8). Three percent of the anglers that released at least part of their catch reported that they released more than 20 northern pike.

Lengths from 154 northern pike harvested by anglers were measured (Figure 8a). Lengths ranged from 500 mm to 990 mm FL (20 to 40 inches TL) and averaged 688 mm (28 inches TL). One hundred fourteen length samples were collected during July; 28 in August and 12 during June (Appendix G2).

Ages were estimated from 127 northern pike harvested by anglers (Figure 8b). Ages ranged from age-4 through age-12; the average age in the sample was age-7 (SE=1.2). Ninety-two age samples were from July, 23 were from August, and 12 were from June (Appendix G).

Quality of Fishing, Opinion Survey

Opinions of anglers recorded during the survey changed as the season progressed (Figure 9 and Appendix E6). In June, most anglers contacted (68%) thought the northern pike fishing was poor. This attitude shifted such that by August 67% of anglers rated northern pike fishing good or excellent. This change in attitude correlated with increased catches.

Quality of Dall River Northern Pike Fishing Compared with other Areas, Opinion Survey

During the 1995 season, most anglers interviewed (52%) felt that northern pike fishing was better at the Dall River than at other areas they had fished (Figure 10 and Appendix E7).

Other Locations Fished for Northern Pike in 1995 by Dall River Anglers

Eighty-nine of 265 anglers (34%) interviewed at the Dall River fished for northern pike at other locations during 1995. During 1994, fifty-one percent (136 of 265) of anglers interviewed at the Dall River in 1995 fished for northern pike at other locations. The most frequently reported other location for northern pike fishing in 1994 and 1995 was the Chatanika River/Minto Flats area (Table 9). Relatively few anglers reported fishing other middle Yukon River locations (e.g. Old Lost Creek, Ray River, Yukon Flats, Appendix F); 13 anglers (15%) in 1995, 18 anglers in (13%) 1994.

Table 8.-Number of northern pike caught and released by anglers interviewed at the Dall River in 1995.

Number of Fish	Catch and Release								
	Northern pike < 30"			Northern pike > 30"			All NP		
	Anglers	Proportion	SE	Anglers	Proportion	SE	Anglers	Proportion	SE
1	35	0.299	0.140	6	0.240	.029	41	0.289	0.013
2	16	0.137	0.011	4	0.160	.025	20	0.141	0.010
3	13	0.111	0.001	7	0.280	.031	20	0.141	0.010
4	5	0.043	0.006	1	0.040	.013	6	0.042	0.006
5	11	0.094	0.009	5	0.200	.028	16	0.113	0.009
6	3	0.026	0.005	0	0		3	0.021	0.004
7	3	0.026	0.005	0	0		3	0.021	0.004
8	0	0		0	0		0	0.028	
9	3	0.026	0.005	1	0.040	.013	4	0.056	0.005
10	7	0.0560	0.007	1	0.040	.013	8	0.021	0.007
11	3	0.026	0.005	0	0		3	0.028	0.004
12	4	0.034	0.006	0	0		4	0	0.005
13	0	0	0	0	0		0	0.028	
14	4	0.034	0.006	0	0		4	0.028	0.005
15	4	0.034	0.006	0	0		4	0.007	0.005
16	1	0.009	0.003	0	0		1	0	0.002
17	0	0		0	0		0	0.007	0
18	1	0.009	0.003	0	0		1	0	0
19	0	0		0	0		0	0	0.002
20	0	0		0	0		0	0.028	0
More	4 ^a	0.034	0.006	0	0		4 ^a	0.034	0.006
Total Anglers	117			25			142		
Max no. of fish	50			10			50		
Min no. of fish	1			1			1		
Variance	47.26			5,348			40.67		
Total fish	672			83			755		
Mean no. of fish	6			3			5		

^a One angler released 21 northern pike, one released 23 northern pike, one 30, and one released 50 northern pike.

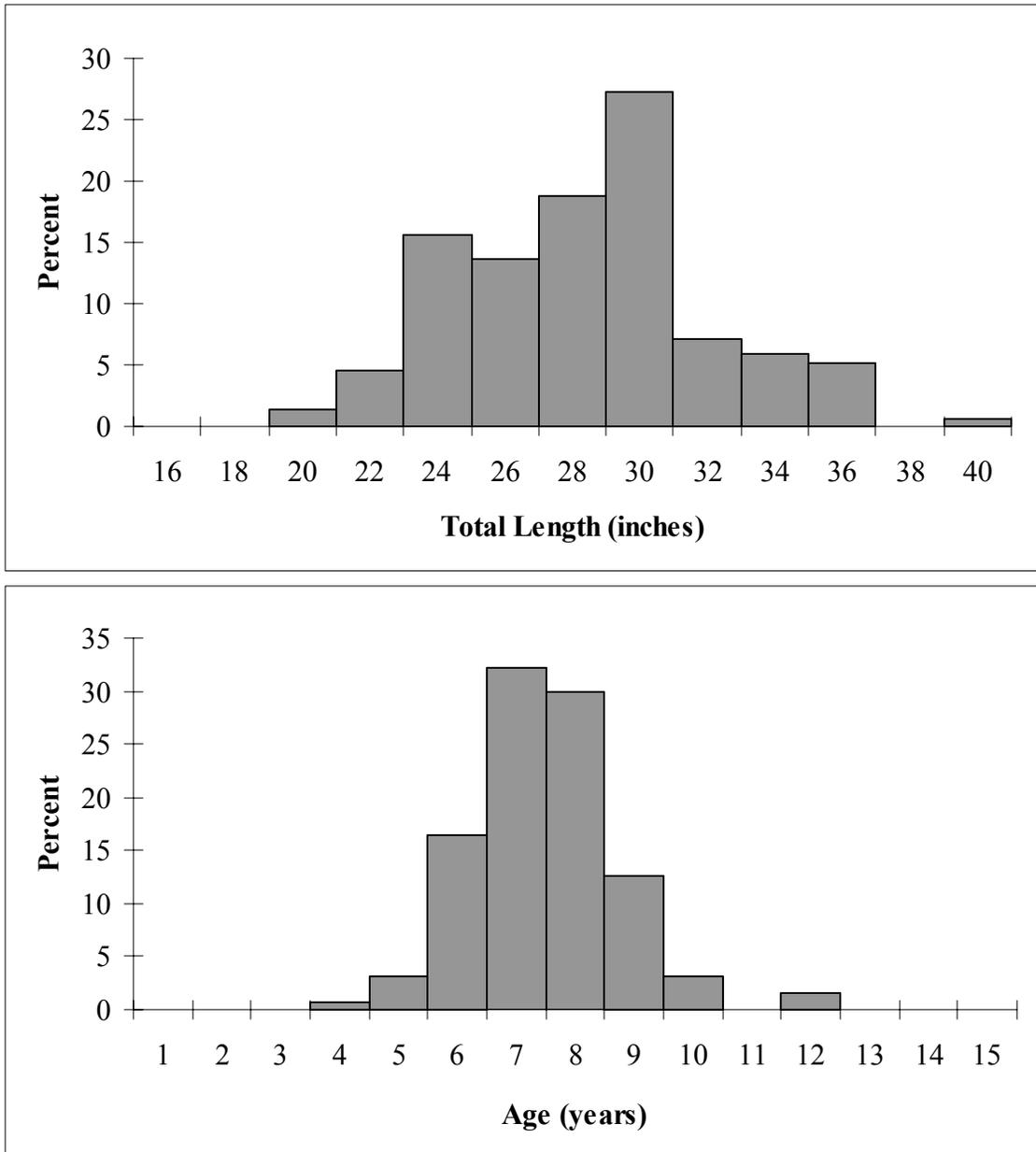


Figure 8.-a. Lengths of 154 northern pike sampled from the sport fish harvest on the Dall River in 1995. b. Ages estimated for 127 northern pike sampled from harvest by the sport fishery on the Dall River in 1995.

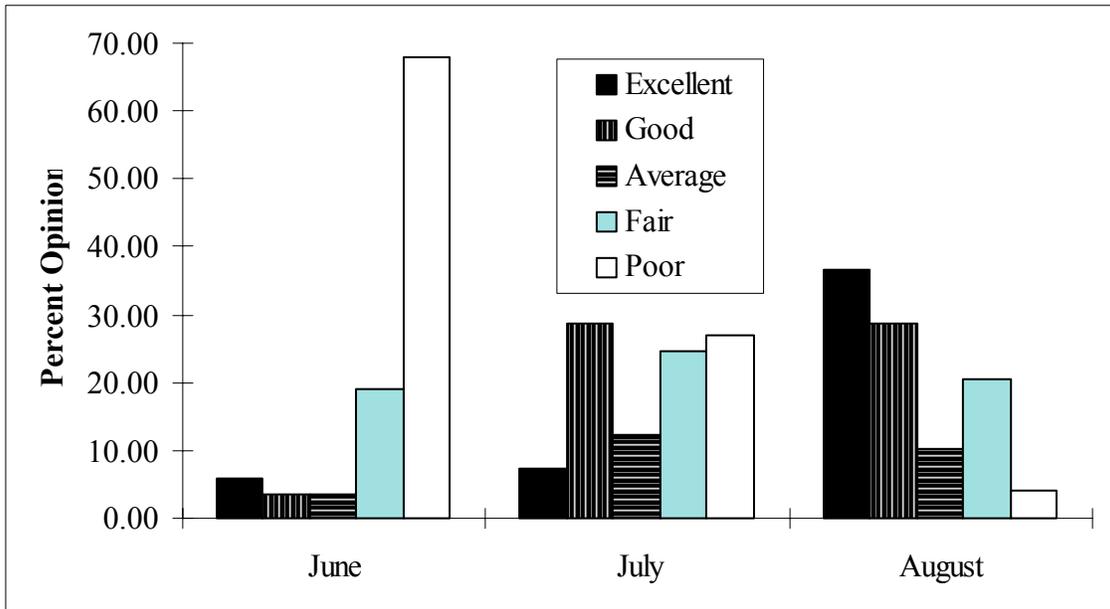


Figure 9.-Opinions reported by anglers on the quality of northern pike fishing at the Dall River during 1995.

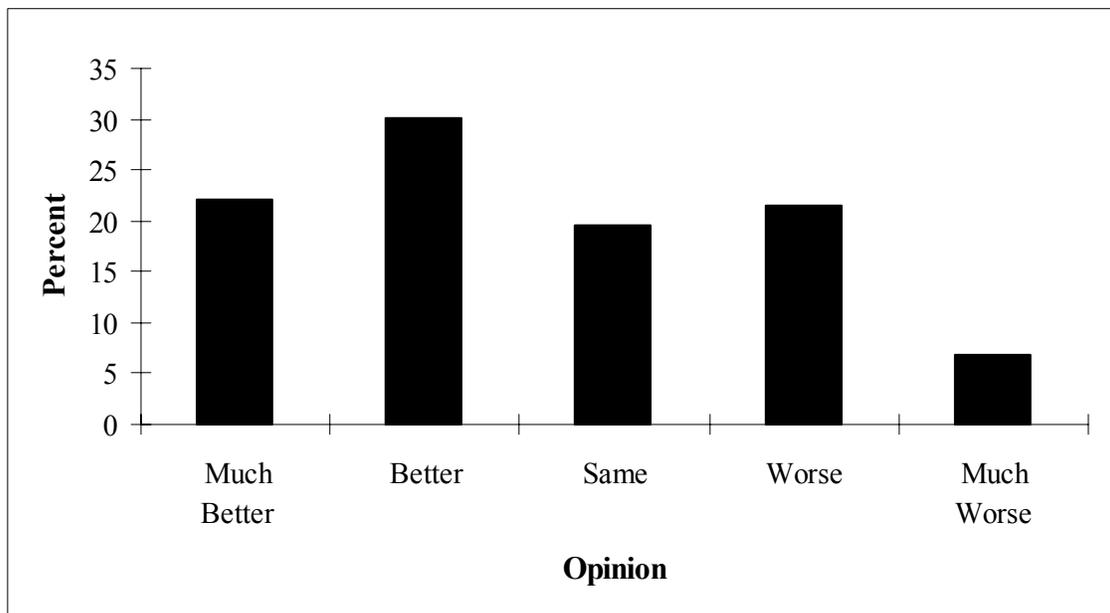


Figure 10.-Opinions of 163 anglers asked to compare northern pike fishing on the Dall River with other locations they have fished for northern pike.

Table 9.-Other locations fished for northern pike by anglers interviewed at the Dall River during 1995.

Location	1995			1994		
	Anglers	Proportion	(SE)	Anglers	Proportion	(SE)
Chatanika/Minto	38	0.427	0.018	68	0.500	0.015
Harding Lake	11	0.124	0.012	10	0.074	0.008
Other middle Yukon streams	13	0.146	0.013	18	0.132	0.010
Other streams	20	0.225	0.015	28	0.206	0.012
Other lakes	7	0.079	0.010	12	0.088	0.008
Total	89			136		

Fishing Location within the Dall River 1995

Most anglers fished in the lower part of the Dall River during 1995 (Figure 11 and Appendix E8). Fourteen percent of anglers fished within sight of the mouth of the river, 48% fished in the lower 2 mi, 60% used the lower 5 mi, and 82% fished in the lower 8 mi. A few anglers traveled farther; 5% traveled more than 25 mi up river to fish.

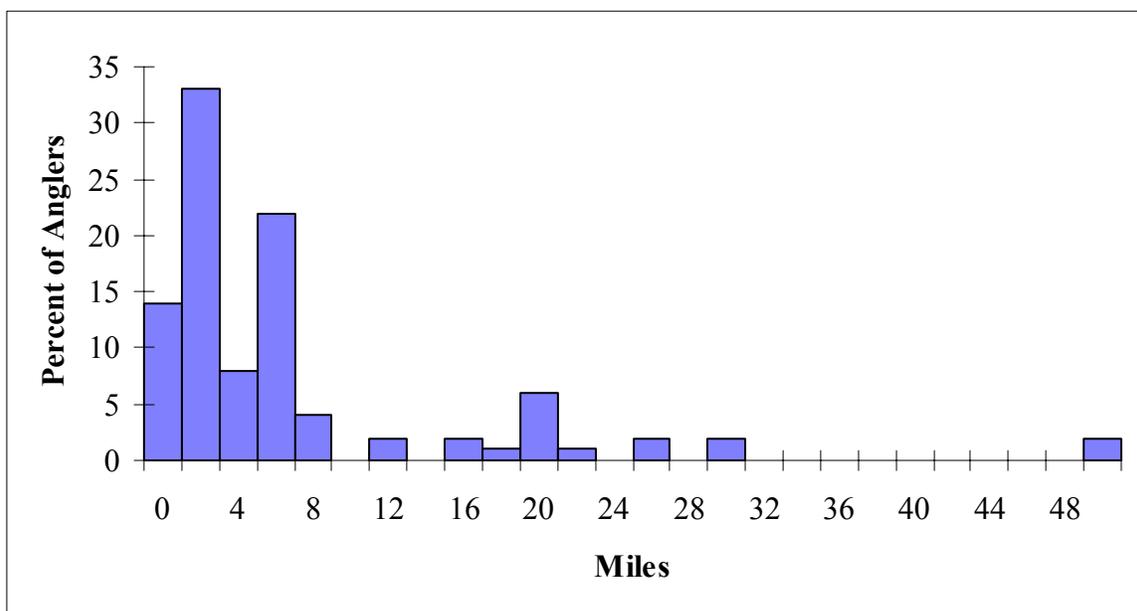


Figure 11.-Upstream limit (miles) of fishing reported by anglers on the Dall River during 1995.

PRIVATE LAND ALONG THE DALL RIVER, AWARE OF PRIVATE LAND?

Visitors were asked if they were aware that much of the land along the Dall River was privately owned. Two hundred forty-nine people responded of which 199 (80%) said yes, they were aware that much of the land along the Dall River is private land.

Visitors were also asked if they were able to identify the boundaries of private land. Two hundred forty-two people provided responses. In contrast to the previous question, only 78 people (32%) said they were able to identify the boundaries of private land.

Finally, visitors were asked if to their knowledge they went onto any of the private lands along the Dall River. Nearly all (233, 96%) of the 242 people answered no. Four percent said they knowingly entered private land.

HUNTING ALONG THE DALL RIVER

Twenty-five of the 282 people interviewed (9%) said that they were hunting during their visit to the Dall River. Four of these individuals (16%) were from Stevens Village, six were from Livengood (24%) with the remainder (15, 60%) from Fairbanks or Anchorage. Eight of the twenty-five hunters (32%) were successful and harvested some type of game animal(s).

In 1995, five hunters harvested black bear and three individuals harvested muskrat. The bears were taken by non-local hunters. One of the hunters was from Livengood, four were from Fairbanks. Three bears were harvested during the Memorial Day weekend. One was harvested during July and one was harvested in August.

Four individuals that hunted in 1995 said they harvested animals from the Dall River in the past: two black bears in 1994 (one during May); and, one black bear in 1991. One hunter harvested ducks in September 1993.

DISCUSSION

USE LEVEL

Although use of the Dall River has increased since the construction of the Haul Road bridge, data collected during this study characterizes use of the Dall River in 1995 as light. On nearly half of the days between May 26 and September 5, no boats entered the Dall River. On an additional 27% of the days only one boat was observed entering the Dall River. Nearly all anglers fished in the lower part of the river but a few traveled at least 30 mi up the river to fish.

Visitors were surveyed concerning historical changes in the amount of use of the Dall River. Forty-five percent of the visitors believed that use had increased since they began using the river. One-third (33%) of the respondents said that the level of use had remained the same while 27% believed that use had decreased. It seemed likely that these results were related to the short time that many of the visitors have used the area. To examine this idea, opinions offered by short term users were compared to those of longer term users. No significant difference was found in the opinions of short term versus long term users ($\chi^2 = 5.5$, $P = 0.24$).

LOCAL USE OF DALL RIVER

More than one-third of the use of the Dall River area occurred during late May and June (34% of all visitors, 40% of all boats, Table 3). Most of the visits were by non-local people (80% of people, 74% of boats). However, a substantial portion of the visits during this early season period (20% of people, 26% of boats) were by people from Stevens Village. After the beginning of July, use of the Dall River area by local people dropped dramatically and remained at a very low level for the remainder of the survey period (September 5). Use of the Dall River by all people was very low in September (Table 4). In September, use of the Dall River by Stevens

Village people increased such that 20% of the boats and 17% of the people were from Stevens Village.

This use pattern by Stevens Village residents is consistent with the traditional use of the River as described by First Chief Randy Mayo of Stevens Village during testimony given at the April 1995 meeting of the Federal Subsistence Board:

“Prior to the opening of the haul road it (the Dall River) was a prime subsistence resource area and was used between the seasons before the King Salmon comes....people used to go there and fish for whitefish and northern pike.”

The purpose of trips to the Dall River reported by local people during May and June included fishing, hunting, and visiting land allotments. Chinook (king salmon) begin arriving at Stevens Village from downriver during the last week of June (K. Schultz, Alaska Department of Fish and Game, Fairbanks, personal communication). In 1995, no evidence was collected to suggest that residents of Stevens Village were precluded from using the Dall River area as a result of use by non-local visitors.

NORTHERN PIKE FISHERY

The annual SWHS, conducted by the ADF&G, is used to detect changes in participation of sport fisheries in rural areas of Alaska. Following restrictions in the sport fish regulations in 1988, the estimated sport harvest of northern pike decreased to less than 600 fish per year (Appendix H1). The most recent five year average (1991 - 1995) was 364 northern pike per year (range 215 - 559, Appendix H1). This level of harvest is substantially less than the estimated 1984 sport harvest of 1,752 northern pike which was reported to be sustainable by the 1988 and 1989 studies (Arvey and Burkholder 1990, Bernard et al. 1993). Fishing effort also decreased following the regulation change and has averaged 580 angler days in the most recent five year period (range 224 - 1,018, Appendix H1). The estimates of fishing effort and harvest are arguably unreliable due to the low number of responses in many years. Until 1993, too few responses from the Dall River were obtained by the SWHS to provide estimates that were sufficiently precise to be included in the published reports. The low number of responses to the SWHS indicates a low level of participation by anglers in this fishery and a limited harvest of northern pike from this site. The increase in the number of responses to the SWHS since 1993 is at least in part the result of increased levels of sampling by the SWHS. A significant increase in use of the Dall River area and harvest of northern pike from this location since 1987 is not supported by the SWHS results nor by this study.

The 1995 Dall River Project was designed to provide a check on the use and harvest data provided by the SWHS. Comparison of the results from the two independent surveys found that the estimates of fishing effort (number of anglers, number of days fished) and estimates of catch and harvest of northern pike at the Dall River for 1995 were not different (Figure 6, Appendix H2). Until other information is made available, estimates from the SWHS will be considered representative of trends in the Dall River fishery.

A few anglers interviewed did not know the current sport fishing regulations for the Dall River area. The sport fishing regulation (since 1987) for the Yukon River and its tributaries between the Tanana and the Hodsana rivers permits only five northern pike in possession of which only one may be 30 in or larger. Two of the anglers interviewed reported keeping six northern pike.

Five anglers reported keeping two northern pike larger than 30 in. Although it is an angler's responsibility to be familiar with regulations, it appears that additional educational efforts directed at anglers visiting the area would be beneficial.

This project was not designed to estimate the length or age composition of the sport harvest from the Dall River. However, the length and age data obtained in 1995 do not suggest a change in size or age of fish available to anglers since 1988 and 1989. The ranges of lengths and ages sampled from the harvest in 1995 are consistent with the ranges observed during the 1988 and 1989 studies except that northern pike less than 475 mm FL (19 in) and age-4 are missing from the 1995 sample. In the earlier studies, northern pike were collected with gill nets, hoop nets and by hook and line sampling. Lengths ranged from about 300 to 1,025 mm FL (12 to 41 in TL) and ages ranged from age-1 to age-14 (Arvey and Burkholder 1990). In the present study, all samples were collected from anglers. Selection by anglers for harvesting northern pike of preferred size (20 in and larger) was likely responsible for the absence of small and young northern pike in the 1995 sample.

Angler opinions concerning the quality of northern pike fishing at the Dall River changed from negative to positive during the course of the 1995 season. During the June period, 34% of visits to the river occurred, while only 8% of all northern pike were caught (2% harvested, 6% caught and released); average catch per angler day in June was 0.4 northern pike per day. In July, visitor use increased and 54% of all northern pike were caught (16% harvested, 39% caught and released). Catch per angler day in July was 1.9. Visitor use decreased in August with only 19% of all visitors using the river during this period. The catch of northern pike in August accounted for 38% of the seasonal total; catch per angler day was higher at 3.3 northern pike per day. Changes in angler opinions during the season were undoubtedly due to the availability of northern pike in the lower river where most anglers fished. Little is known about the seasonal movements of northern pike in the Dall River. The group of northern pike that reside in the lower river is composed of individuals that move out of the Dall River and into the Yukon River as well as those that have immigrated from other locations via the Yukon River (Arvey and Burkholder 1990). It is likely that the improvement in angler success during July and especially in August resulted from seasonal movements of fish into the lower river from upstream areas and/or from other locations.

The 1988 and 1989 studies reported that little sport fishing was detected in this part of the Yukon River outside of the Dall River. Because the 1995 study did not sample anglers that did not also fish in the Dall River, we are not able to directly examine the distribution of fishing effort in the middle Yukon area. However, from interviews conducted, it is clear that very few Dall River anglers also fish for northern pike in other nearby locations (Table 9). In both 1994 and 1995, no more than 15% of anglers fished for northern pike in the Dall River and other middle Yukon locations. In addition, the SWHS indicates that a substantial portion of northern pike harvest in the middle Yukon comes from the Dall River. Results from the SWHS show that the estimated northern pike harvest of 350 northern pike from the Dall River in 1995 represents 40% of the northern pike harvest from the Yukon River drainage from the mouth of the Koyukuk River to Ft. Yukon (Howe et al. 1996).

While few northern pike anglers fishing in the Dall River also fished for northern pike in other nearby waters, about half of these anglers did fish for northern pike in other Alaskan waters. When asked to compare northern pike fishing in the Dall River with other locations that they had

fished, most (52%, Figure 10) felt that northern pike fishing on the Dall River was better than the other areas they had fished. An additional 20% believed that quality of northern pike fishing was the same at the Dall River as other locations they had fished.

A concern expressed repeatedly by local residents was their belief that most northern pike released by anglers died as a result of the handling, injury and other stresses associated with catch and release fishing. Studies that have investigated the effects of catch and releasing northern pike have reported mortality rates ranging from 3 to 10% (Falk and Gillman 1975; McKinley et al. *In prep*). Project personnel who observed anglers fishing near the survey station commented that the mortality rate of northern pike released by some anglers was very likely substantially greater than 10%. Some anglers clearly did not understand that careful handling of fish is required if they are to be released without serious injury. A greater effort is apparently required in educating potential catch and release anglers in the proper handling of fish that they intend to release. Careful release ensures that most (>10%) fish will continue to grow and live for many years. Maximizing the survival of released fish will likely minimize conflicts that arise where traditional attitudes do not accept the practice of catch and release fishing. An attitude of respect for the fish and for the environment in general is critical to minimizing conflicts between traditional attitudes and modern sport angling practices.

Strictly from a stock conservation viewpoint, even if the estimated 985 northern pike that were released at the Dall River during 1995 were instead harvested, the resulting harvest of 1,325 would still be within sustainable levels.

HUNTING ALONG THE DALL RIVER

Few hunters were encountered during the survey period. Most of the hunters were from urban areas; 40% were from rural Alaska (16% Stevens Village, 24% Livengood). One party composed of two urban hunters was hunting with a tier II moose permit but was unsuccessful. Most of the urban hunters were hunting for black bears. One-fifth of the people that were hunting along the river harvested black bears. Survey personnel commented that there were a large number of black bears seen along the river. During the later part of the season project personnel had numerous encounters with bears near camp. Based on anecdotal information only, it appears that the density of bear along the Dall River, particularly in August is high.

Between September 6 and September 15 six additional boats were counted within the survey area (Table 3). These boats contained five local people and 10 people from unknown communities. Although interview data are limited, it was assumed that some of these visitors were present to hunt. No moose were harvested from the Dall River while survey personnel were present.

STEVENS VILLAGE PERSPECTIVE

The Stevens Village Resource Management Program declined the opportunity to provide discussion and interpretation from a traditional subsistence view point of the Dall River survey results.

CONCLUSIONS

The estimates for northern pike harvest and catch and for fishing effort obtained by the 1995 Dall River project are consistent with recent estimates provided by the annual SWHS. Estimates for the 1995 season from the SWHS are not significantly different from those obtained through the

project conducted on site during 1995. Until different information becomes available, the estimates provided by the SWHS will be considered to be representative of the level of sport fishing occurring on the Dall River.

There is no evidence that a conservation concern exists for the northern pike population which inhabits the Dall River and surrounding area. Previous studies have shown that the population of northern pike that reside in the lower river is composed of individuals that move out of the Dall River and into the Yukon River as well as those that have immigrated from other locations via the Yukon River (Arvey and Burkholder 1990). The present study shows that most sport fishing for northern pike occurs in the lower part of the river and that few anglers fishing in the Dall River also fish other nearby locations. Given the huge size of the northern pike population which is likely to reside in this section of the Yukon River and its tributaries, the level of catch and harvest to which these northern pike have been subjected is well below sustainable levels.

ACKNOWLEDGMENTS

The authors wish to thank field personnel David Hopley, Don Stevens, and Herb George for their conscientious work in conducting the survey. Ben Stevens, director of the Stevens Village Natural Resource Program, deserves special recognition for his hard work in helping to plan and to carry out all aspects of this field project. Appreciation is extended to David Yokel and the BLM for providing and maintaining radio telephone communication. Thanks to Donna Buchholz for key punching the data and to the biometric staff, namely, Patricia Hansen, Mike Wallendorf and David Bernard, for assistance with data analysis and for aiding in the development of statistical procedures used in this report. We also wish to show our appreciation to the people of Stevens Village for extending their hospitality and making project personnel welcome. Many thanks to Terry Haynes, and Ted Heurer for their thoughtful review and editorial comments on drafts of this report. This project and report were made possible by partial funding provided by the State of Alaska, and the U. S. Federal government through the Stevens Village Natural Resource Program and the U. S. Fish and Wildlife Service (Yukon Flats NWR).

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APPENDIX A

Appendix A.-Project contributors/participants.

Alaska Department of Fish and Game

John Burr, Division of Sport Fish
Patricia Hansen, Division of Sport Fish (RTS)
Mike Wallendorf, Division of Sport Fish (RTS)
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David Yokel, Arctic District

Dinyee (Steven Village Corporation)

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Stevens Village Natural Resource Program

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Herbert George, Resource Specialist
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Craig Fleener, Council of Athabaskan Tribal Governments

U. S. Fish and Wildlife Service

Ted Heurer, Yukon Flats NWR
David James, Yukon Flats NWR
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APPENDIX B

Appendix B.-Sampling schedule.

MAY	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight																					
6:00 AM																					
6:00 AM																					X
12 noon																					
12 noon																					X
6:00 PM																					
6:00 PM																				X	X
Midnight																					

JUNE	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight	X	X							X		X	X		X		X		X			
6:00 AM																					
6:00 AM		X	X			X	X	X		X				X	X					X	
12 noon																					
12 noon		X	X	X		X	X	X	X			X		X	X	X	X		X	X	X
6:00 PM																					
6:00 PM	X			X			X	X			X			X	X				X	X	X
Midnight																					

-continued-

Appendix B.- 2 of 3.

JUNE- JULY	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight	X		X		X			X						X	X	X	X	X			
6:00 AM	X	X	X					X	X	X	X			X		X	X				X
12 noon																					
12 noon		X						X	X	X		X	X	X		X	X	X	X	X	
6:00 PM																					
6:00 PM	X			X			X	X	X			X			X	X	X		X		X
Midnight																					

JULY	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight	X	X							X	X				X	X	X					
6:00 AM	X	X						X	X		X			X	X	X	X			X	X
12 noon																					
12 noon		X			X		X	X	X		X				X	X	X		X	X	X
6:00 PM																					
6:00 PM	X		X				X	X			X				X			X		X	X
Midnight																					

-continued-

Appendix B.-Page 3 of 3.

AUGUST	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight																					
6:00 AM																					
6:00 AM		X				X	X		X				X	X	X	X		X		X	X
12 noon																					
12 noon	X	X				X	X	X	X	X		X	X	X	X	X		X	X	X	X
6:00 PM																					
6:00 PM	X	X	X			X	X	X					X	X			X		X		X
Midnight																					

AUGUST	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
HOUR	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Midnight																					
6:00 AM																					
6:00 AM	X	X	X		X		X	X	X		X		X		X	X	X				
12 noon																					
12 noon	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X				
6:00 PM																					
6:00 PM	X			X		X	X		X		X		X	X	X	X					
Midnight																					

APPENDIX C

Appendix C.-Dall River cooperative research project creel survey.

Instructions to Creel Clerk:

Procedures for boats entering the Dall River

Record the following information for **all boats** entering the survey area on the data form provided.

1. The **time** and **date** that the boat **enters the survey area**.
2. The **number of people** in the boat and **type of boat** (power skiff, jet boat, air boat, jet ski etc.).

The exit survey will record the participants knowledge of the existence and location of private lands and their attitudes concerning the use of private lands along the Dall River. If boaters stop and ask “Where can we camp?”, answer simply “You can camp on public lands which begin about 2.5 miles upriver”. Indicate on the data form that this information was requested.

Procedures for boats leaving the Dall River

Read or recite the following statement.

“Hello I am (your name) representing the Dall River Cooperative Research Project. We are conducting a survey of public use of the Dall River area and of catch and harvest of northern pike. I hope you have time to answer a few questions. We would also like to measure any northern pike that you keep and to collect a scale sample.”

Angler Interview

Fill out as much of the interview form as possible for each group when they are leaving the survey area. If the group refuses to be interviewed, **be sure to record the time and date that the boat left the survey area and the number of people in the group on an interview form.**

For all fish sampled, record the following information on mark sense form (Tagging/Length Ver1.0):

Length - measured in mm from tip of snout to fork of tail.

Sex - female, male, undetermined.

Collect a **scale sample**, see diagram for selection of preferred scales.

Remember to Thank them for their cooperation when the interview is finished.

APPENDIX D

Appendix D1.-Angler interview questions.

1. Did you fish for northern pike? If **NO** go to question 10.
 2. How long (days) did you fish? hunt? camp?
 3. How many northern pike less than 30", and 30" or larger did you catch and **keep**? Other species?
 4. How many northern pike less than 30", and 30" or larger did you catch then **release**? Other species?
 5. How would you rate the fishing for pike during this visit?
1- excellent, 2- good, 3- average, 4- fair, 5- poor
 6. In which **other** rivers or lakes have you fished for northern pike in **1995**? During **1994**?
 7. How would you rate pike fishing on the Dall River compared to other areas?
1- much better, 2- better, 3- the same, 4- worse, 5- much worse
 8. Where do you live (city)? Are you presently in the military?
 9. Will you please show me on this map the areas where you fished on the Dall River? Use the marker buoys to help locate areas. Mark with **F**.
 10. If you spent the night, will you please show me on this map where you camped? Use the marker buoys to help locate areas. Mark with **C**.
 11. Have you visited the Dall River before? **YES** go to question 12. **NO** go to question 13
 12. Compared to previous visits, has the amount of use of the Dall R:
1- increased greatly, 2- increased, 3- stayed the same, 4- decreased, 5-decreased greatly
 13. Rate the purposes of your visit from 1 (most important) to 5 (least important):
__Camping __Boating __Fishing __Hunting __Other (list)
 14. If you visited the Dall River before, rate the purposes of your visit from 1 (most important) to 5 (least important):
__Camping __Boating __Fishing __Hunting __Other (list)
 15. If hunting while visiting the Dall River, what species of animals did you harvest **this trip**, on a **previous trip**?
 16. Are you aware that much of the land along the Dall River is private land?
 17. Were you able to identify the boundaries of private land?
 18. To your knowledge, did you go on any of the private lands along the river?
 19. How did you find out about the Dall River?
 20. Do you have any comments on fishing or land use on the Dall River?
-

Appendix D2.-Angler interview data form.

ANGLER INTERVIEW DATA FORM

TIME _____ DATE _____ NUMBER OF PEOPLE _____ TYPE OF BOAT _____

1	2	3			4			5	6		7			
		Fished NP?	Days Fished	Fish Harvested			Fish Released			Rate Fishing		Fished NP other Areas? (list)		
				<30 NP	Big NP	Other	<30 NP		Big NP			Other	This YR	Last YR
1	Y N							1 2 3 4 5			1 2 3 4 5			
2	Y N							1 2 3 4 5			1 2 3 4 5			
3	Y N							1 2 3 4 5			1 2 3 4 5			
4	Y N							1 2 3 4 5			1 2 3 4 5			
5	Y N							1 2 3 4 5			1 2 3 4 5			
6	Y N							1 2 3 4 5			1 2 3 4 5			

9. MARK FISHING LOCATIONS ON MAP.

WERE FISH FROM THIS PARTY SAMPLED? Y N

10. MARK CAMPING LOCATIONS ON MAP.

IF YES, HOW MANY FISH SAMPLED? _____

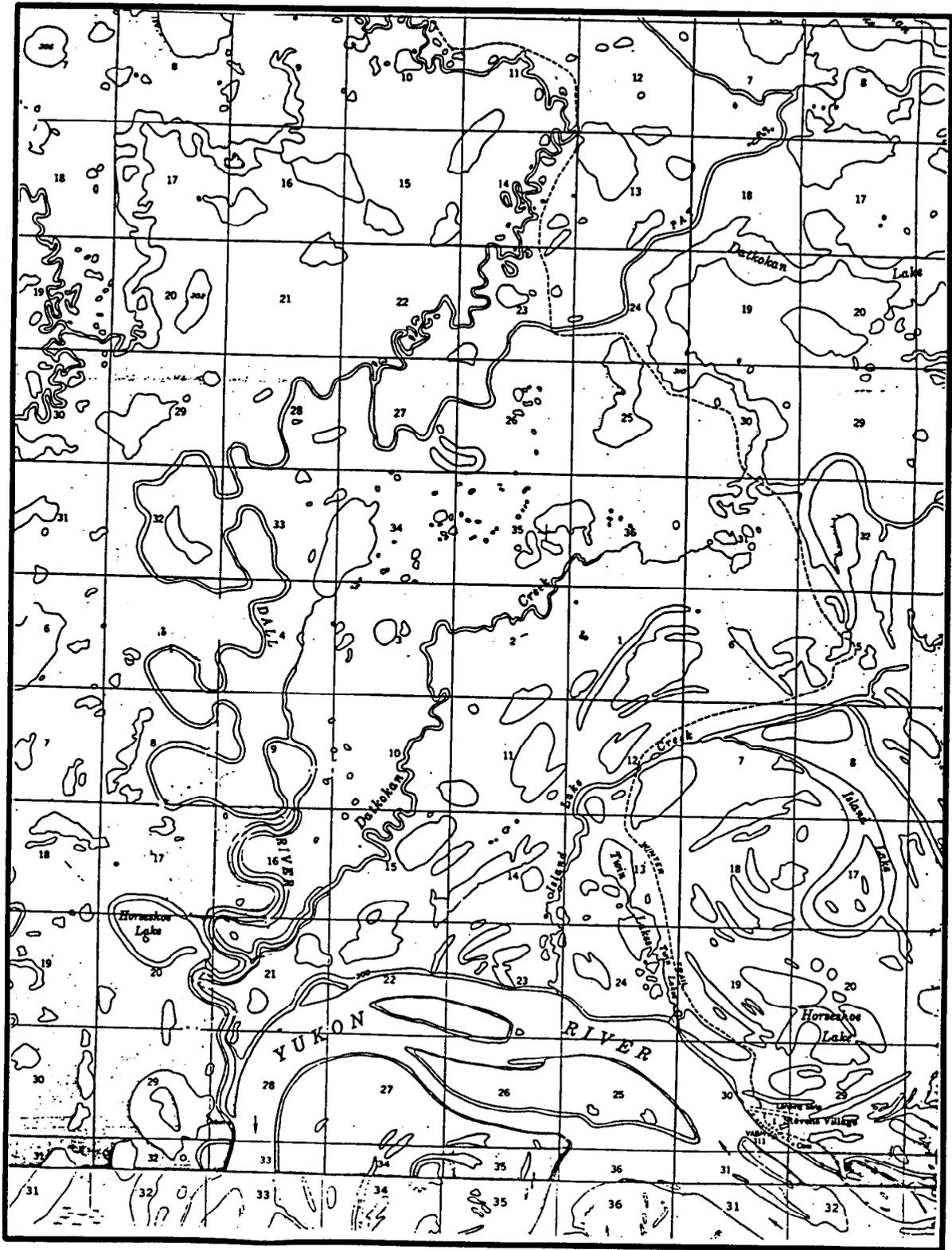
8			11	12	13					14						
City	State	Military	Previous Visit	River Use	Rate purpose of THIS trip					Rate purpose of PREVIOUS trip						
					C	B	F	H	O	Date	C	B	F	H	O	
1		Y N	Y N	1 2 3 4 5												
2		Y N	Y N	1 2 3 4 5												
3		Y N	Y N	1 2 3 4 5												
4		Y N	Y N	1 2 3 4 5												
5		Y N	Y N	1 2 3 4 5												
6		Y N	Y N	1 2 3 4 5												

Question 15

Question 15									16	17	18	
This Visit			Previous Visit Date			Previous Visit Date			Aware P Land	Boundries P Land	Enter P Land	
Hunt?	Species 1	Species 2	Hunt?	Species 1	Species 2	Hunt?	Species 1	Species 2				
1	Y N			Y N			Y N			Y N	Y N	Y N
2	Y N			Y N			Y N			Y N	Y N	Y N
3	Y N			Y N			Y N			Y N	Y N	Y N
4	Y N			Y N			Y N			Y N	Y N	Y N
5	Y N			Y N			Y N			Y N	Y N	Y N
6	Y N			Y N			Y N			Y N	Y N	Y N

19	20
How did you learn of Dall River?	Comments

Appendix D3.-Map of angler interview area.



APPENDIX E

Appendix E1.-Number of boats entering the Dall River between May 26 and September 5, 1995.

Number of Boats	Days		
	Number	Proportion	SE
0	48	0.466	0.049
1	28	0.272	0.044
2	14	0.136	0.034
3	5	0.049	0.021
4	5	0.049	0.021
5	2	0.019	0.014
6	1	0.0097	0.0097
Total	103		

Appendix E2.-Number of people in boats entering the Dall River between May 26 and September 5, 1995.

Number of People	Boats		
	Number	Proportion	SE
1	10	0.105	0.011
2	29	0.305	0.016
3	29	0.305	0.016
4	12	0.126	0.011
5	11	0.116	0.011
6	4	0.0421	0.0069
Total	95		

Appendix E3.-Length of stay by visitors to the Dall River between May 26 and September 5, 1995.

Number of Days	People		
	Number	Proportion	SE
1	142	0.504	0.011
2	106	0.376	0.011
3	16	0.0567	0.0053
4	13	0.0461	0.0048
5	5	0.0177	0.0030
Total	282		

Appendix E4.-Number of years that visitors have been using the Dall River.

Years Visiting the Dall River	People		
	Number	Proportion	SE
First Visit	119	0.466	0.049
1 to 5 years	82	0.272	0.044
5 to 9 years	50	0.136	0.034
10 to 14 years	3	0.049	0.021
15 or more years	9	0.049	0.021

Appendix E5.-Opinions of 159 visitors comparing the amount of use of the Dall River in 1995 with previous visits.

Change in Use	Responses		
	Number	Proportion	SE
Increased Greatly	24	0.151	0.021
Increased	39	0.245	0.025
Stayed the Same	52	0.327	0.027
Decreased	37	0.233	0.024
Decreased Greatly	7	0.044	0.012
Total	159		

Appendix E6.-Opinions of anglers on the quality of northern pike fishing at the Dall River, 1995.

Opinion	June			July			August			All Season		
	Freq	Proportion	SE	Freq	Proportion	SE	Freq	Proportion	SE	Freq	Proportion	SE
Excellent	5	0.060	0.012	9	0.074	0.011	18	0.367	0.033	32	0.125	0.010
Good	3	0.0357	0.0097	35	0.287	0.020	14	0.286	0.031	52	0.204	0.012
Average	3	0.036	0.010	15	0.123	0.014	5	0.102	0.021	23	0.0902	0.0086
Fair	16	0.190	0.021	30	0.246	0.019	10	0.204	0.028	56	0.220	0.012
Poor	57	0.679	0.024	33	0.270	0.019	2	0.041	0.014	92	0.361	0.014
All	84	1		122	1		49	1		255	1	

Appendix E7.-Opinions of 163 anglers asked to compare pike fishing at the Dall River with other locations they had fished for northern pike.

Compare Fishing	Responses		
	Number	Proportion	SE
Much Better	36	0.22086	0.00048
Better	49	0.30061	0.00059
Same	32	0.19632	0.00044
Worse	35	0.21472	0.00047
Much Worse	11	0.06748	0.00018
Total	163		

Appendix E8.-Upstream limit of fishing reported by anglers on the Dall River during 1995.

Miles Traveled	Responses		
	Number	Proportion	SE
0	35	0.141	0.011
2	83	0.335	0.015
4	21	0.085	0.009
6	54	0.218	0.013
8	11	0.0444	0.0065
10	0	0	0
12	5	0.0202	0.0045
14	0	0	0
16	4	0.0161	0.0040
18	2	0.0081	0.0028
20	14	0.0565	0.0073
22	3	0.0121	0.0035
24	0	0	0
26	5	0.0202	0.0045
28	0	0	0
30	5	0.0202	0.0045
32	0	0	0
34	0	0	0
36	0	0	0
38	0	0	0
40	0	0	0
42	0	0	0
44	0	0	0
46	0	0	0
48	0	0	0
50	6	0.0242	0.0049
Total	248		

APPENDIX F

Appendix F1.-Responses to survey.

Question 1, Fished for Northern Pike?

Response	M/June	July	August/S	All Season
Y	89	125	51	265
N	6	8	3	17
Total	95	133	54	282

Question 2.

Activity	Total Number of	
	People	Days
Fishing	265	453
Camping	154	336
Hunting	25	42

Questions 3, 4; Fish Catch.

	Harvest	Catch and Release	Total Catch
Pike < 30"	129	117	246
Pike > 30"	40	25	65
All Pike	169	142	311
Sheefish	8	1	9
Burbot	9	35	44
Whitefish	1	0	1

Question 5, Rate Fishing.

Opinion	M/June	July	August/S	All Season
1	5	9	18	32
2	3	35	14	52
3	3	15	5	23
4	16	30	10	56
5	57	33	2	92
Total	84	122	49	255

1-excellent, 2-good, 3-average, 4-fair, 5-poor

-continued-

Appendix F1.-Page 2 of 13.

Question 6, Other sites fished by Dall River Pike fishermen in 1994 and 1995

Location	Number of People	
	1995	1994
Anderson	0	2
Aniak R	0	2
Beaver Cr	1	0
Bethel	0	1
Canada (Ontario)	0	1
Canada (Quebec)	1	
Canada (Winipeg R)	0	1
Canada (Yukon Terr)	2	0
Chatanika R	11	12
Clear	3	3
Dall R	16	30
Delta	0	1
Fairbanks	2	1
Fiasco L	2	0
Fish Cr	0	1
Galena	1	0
George L	1	6
Goodpaster	1	0
Harding L	11	10
Hess Cr	1	3
Little Salmon R	2	0
Manley	0	3
Medicine L	0	2
Minto	23	48
No Name Cr	0	1
Old Lost Cr	2	0
Porcupine R	2	0
Ray R	7	12
Red Shirt L	0	1
Salchaket Sl	3	1
Tanana Sl	1	4
Tetlin	3	0
Tolavana	4	8
Tozitna R	0	1
Twin L (E, W)	0	1
US (MN)	0	2

-continued-

Appendix F1.-Page 3 of 13.

Question 6, Other sites fished by Dall River Pike fishermen in 1994 and 1995 (continued).

Location	Number of People	
	1995	1994
US (WS)	0	1
USA	0	3
Wein L	1	0
Wood R	2	4
Yukon Flats	0	1

Question 7, Compare Fishing.

Opinion	M/June	July	August/S	All Season
1	1	24	11	36
2	17	29	3	49
3	18	14	0	32
4	23	7	5	35
5	6	5	0	11
Total	65	79	19	163

1-much better, 2-better, 3-the same, 4-worse, 5-much worse

Question 8a, City of Residence

City of Residence	M/June	July	August/S	All Season
Stevens Village	18	0	0	18
Other Yukon R. Village	1	3	0	4
Livengood	6	0	0	6
Fairbanks	62	124	49	235
Anchorage	0	0	1	1
Outside AK	6	1	1	8
Unknown	2	5	3	10
Total	95	133	54	282

Question 8b, Currently in Military?

Response	M/June	July	August/S	All Season
Y	12	4	7	23
N	79	121	44	244
Total	91	125	51	267

-continued-

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Question 9, Location Fished.

Miles from Mouth	Number of People
0	41
1	19
2	68
3	20
4	1
5	10
6	45
7	5
8	6
9	0
10	0
11	3
12	2
13	0
14	0
15	0
16	4
17	2
18	0
19	9
20	5
21	0
22	3
23	0
24	0
25	3
26	3
27	0
28	0
29	0
30	5
50	6
Total	260

-continued-

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Question 10, Did you Camp?

Response	M/June	July	August/S	All Season
Y	48	83	23	154
N	47	50	31	128
Total	95	133	54	282

Question 11, Previous Visit?

Response	M/June	July	August/S	All Season
Y	45	70	29	144
N	43	54	22	119
Total	88	124	51	263

Question 12, Change in River Use.

Opinion	M/June	July	August/S	All Season
1	4	16	4	24
2	7	25	7	39
3	9	29	14	52
4	25	4	8	37
5	0	7	0	7
Total	45	81	33	159

1-increased greatly, 2-increased, 3-the same, 4-decreased, 5-decreased greatly

-continued-

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Question 13, Rate Purpose of this Visit.

Purpose of Visit/Rating	M/June	July	August/S	All Season	
Camping	1	3	14	2	19
	2	3	34	1	38
	3	23	8	7	38
	4	10	0	0	10
	5	0	0	0	0
Total	39	56	10	105	
Boating	1	5	5	0	10
	2	40	38	7	85
	3	19	45	1	65
	4	0	0	0	0
	5	0	0	0	0
Total	64	88	8	160	
Fishing	1	68	103	42	213
	2	15	16	6	37
	3	0	0	0	0
	4	0	0	0	0
	5	0	0	0	0
Total	83	119	48	250	
Hunting	1	6	0	5	11
	2	6	1	2	9
	3	0	0	0	0
	4	3	0	0	3
	5	0	0	0	0
Total	15	1	7	23	
Other Primary Activities Listed		Flying		6	
		Traveling		6	
		Visiting		6	
		Guiding		3	
		Total		21	

1-Primary purpose, 2-Second purpose, 3-Third purpose, 4-Fourth purpose, 5-Fifth purpose.

-continued-

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Question 14, Rate Purpose of Previous Trip

Rating	Camping	Boating	Fishing	Hunting	Other
1	5	8	116	5	10
2	33	38	13	12	0
3	20	38	2	0	0
4	7	0	0	0	0
5	0	0	0	0	0
Total	65	84	131	17	10

1-Primary purpose, 2-Second purpose, 3-Third purpose, 4-Fourth purpose, 5-Fifth purpose.
 "Other" Primary Activities Listed: visiting-5, guiding-2, flying-1, net fishing-1, swimming-1

Question 15a, Hunt Present Trip?

Response	M/June	July	August/S	All Season
Y	16	2	7	25
N	76	118	44	238
Total	92	120	51	263

Question 15b, Species Harvested This Trip?

Species	Number of Game Animals Harvested, 1995			
	M/June	July	August/S	All Season
Black Bear	3	1	1	5
Moose	0	0	0	0
Ducks	0	0	?	?
Muskrat	3+	0	0	3+

Question 15c, Species Harvested Previous Trip?

Species	Number of Game Animals Harvested			
	1991	1993	1994	Total
Black Bear	1	0	2	3
Moose	0	0	0	0
Ducks	0	?	?	?
Muskrat	0	0	0	0

-continued-

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Question 16, Aware Private Land?

Response	M/June	July	August/S	All Season
Y	52	110	37	199
N	35	12	3	50
Total	87	122	40	249

Question 17, Identify Boundaries of Private Land?

Response	M/June	July	August/S	All Season
Y	19	40	19	78
N	67	76	21	164
Total	86	116	40	242

Question 18, Knowingly Enter Private Land?

Response	M/June	July	August/S	All Season
Y	3	0	6	9
N	83	116	34	233
Total	86	116	40	242

Question 19, How did you learn of Dall River

Current Status or Source of Information	Number of Visitors
from Friends, Relatives, "Word of Mouth"	172
Long Term Knowledge (not local resident)	24
Stevens Village Resident	10
from Fishing Guide	7
by Chance	4
from Map	3
from ADF&G	2

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Question 20, Comments offered by Survey Respondents.

COMMENT	DATE
GOOD FISHING (CAUGHT THESE FISH AT LITTLE NORTH DALL MOUTH.	950527
GOOD FISHING (CAUGHT THESE FISH AT LITTLE NORTH DALL MOUTH.	950527
PRETTY SCENE, LOTS FISH BUT DID NOT GET ANY	950527
LIKE TO HAVE BUFFER ZONE ALONG RIVER WHERE PUBLIC ACCESS IS ALLOWED	950528
PASSENGER REFUSED TO BE INTERVIEWED.	950528
1 MAN IN THIS GROUP HAS BEEN COMING HERE FOR 19 YR. HE SAID THE FISHING WENT DOWNHILL FROM ABOUT 1980-1981, BUT HAS IMPROVED SINCE 1991. HE SAID ITS OK TO CAMP ON NATIVE LAND IF YOU'RE BELOW THE FLOOD STAGE HIGH WATER MARK.	950529
THIS MAN HAS SEEN NATIVES WITH NETS ACROSS THE MOUTH CATCHING LOTS OF LARGE BREEDER PIKE. HE BLAMES THIS FOR THE DECREASE IN THE PIKE STOCK.	950530
THIS BOAT WAS FROM STEVENS VILLAGE. THEY FISHED WITH A NET ACROSS THE MOUTH FOR A FEW HOURS AND CAUGHT 1 WHITEFISH. THEY WERE NOT INTERVIEWED DUE TO THE FACT THEY WERE NOT SPORT FISHING AND AS LOCALS MOST OT THE QUESTIONS ARE N/A.	950530
"RAINED WHOLE TIME I WAS HERE!"	950603
HARVESTED PIKE WAS EATEN PRIOR TO INTERVIEW. CAMPING SITE NOT ON OUR MAP.	950604
PUT A SIGN SAYING WERE NATIVE LAND STARTS AND STOPS. MARK LAND BOUNDARIES.	950607
SEEN LIKE FISH FOR PIKE IS LOW THIS YEAR. WELL BE BACK SOME TIME MAYBE 4TH JULY	950608
FIRST TIME FISHING	950608

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Question 20, Comments offered by Survey Respondents.

COMMENT	DATE
NO PROBLEM ON LAND USE, LEAVE CABINS ALONE, LIKE IT TO STAY FOR SPORT FISHING DON'T LIKE THE MILITARY FISHING HERE, THEY FISH IT OUT. POOR FISHING THIS YEAR.	950610
SLOW THIS TIME OF YEAR. PROBABLY BECAUSE OF F&G CAMP HERE AT MOUTH. TOO MUCH NOISE	950611
WOULD LIKE TO SEE LOG JAMS REMOVED BY ADF&G TO IMPROVE ACCESS. ONE PIKE HAD A 4-5 INCH LEAST CISCO IN ITS STOMACH.	950614
HE SAID NO MORE LOG JAMS IS CREATING MORE ACCESS AND MORE PEOPLE.	950615
THESE MEN ARE TRAVELING FROM WHITEHORSE TO THE MOUTH AT EMMONAK.	950617
NOTE: WRITTEN IN QUESTION 13 - CANOEING FROM OLD CROW TO MOUTH	950617
FUN NICE WEATHER!	950620
PERSON #3 WAS IN SAME BOAT ENTERING AT 2330 ON 6-17 TO SCOUT AREA FOR CLIENTS. HE RETURNED WITH THEM 6-19. HIS PORTION OF SURVEY WAS COMBINED WITH 6-17 VISIT. HE ONLY FISHED 10 MINUTES ON 6/17 TRIP.	950620
DURING THE SUMMER I LIKE TO TRAVEL AROUND ON THE RIVER.	950622
CLOSE FISH FOR 3-5 YEARS LET THEM FISH RELEASED TURN BACK. SEEN WHITEFISH FEEDING ON TOP!!!!	950624
THOUGHT FISHING WAS POOR TODAY DUE TO HIGH WINDS AND COLD FRONT.	950624
WISH THERE WERE MORE MOSQUITOES.	950625
*GUIDE (PERSON#3) RETURNED TO RIVER AT 1300, 6-25. HE WENT TO FIX UP CAMP AND PREPARE FOR FUTURE CLIENTS. DID NOT FISH.	950625

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Question 20, Comments offered by Survey Respondents.

	COMMENT	DATE
	LOST ANOTHER LARGER PIKE THAT SNAPPED A LINE.	950625
	NICE AREA	950701
	WISH FISHING WAS BETTER.	950701
	POOR WEATHER DAY, HIGH WATER.	950701
	WHEN ASKED IF AWARE OF PRIVATE LANDS THIS MAN SAID I DON'T CARE. QUEST 14 COMMENT- FAMILY HAS BEEN COMING FOR YR. GRANDPA WAS HERE 40 YR. AGO.	950701
	NICE AREA.	950702
	VERY NICE AREA	950702
	THIS WAS THE SAME FAMILY THAT CAME THROUGH ON 7-1, WHO DID NOT CARE ABOUT PRIVATE PROPERTY. THEY FELT THE STATE AGENCIES ARE DESTROYING ALASKA'S FISHERIES. * THE 2 PIKE CAUGHT WERE FILLETED.	950703
	INT. 46 &95 CAME IN AND LEFT TOGETHER. DID NOT SLOW DOWN AT ALL ON THEIR WAY OUT AND DID NOT APPEAR EAGER TO TALK TO US. ONLY DEFINITE INF. FROM THESE BOATS IS TIME ON RIVER. ARRIVE 0100 DEPART 0900 (7-2,7-4) THEY WERE NP FISHING	950704
	RECENTLY MOVED TO FAIRBANKS, UNFAMILIAR W/NATIVE LANDS THE THREE PIKE CAUGHT WERE EATEN AT CAMP.	950706
	GREAT AREA!	950708
	THIS GROUP CAMPED ON THE ISLAND ACROSS THE RIVER THINKING IT IS PUBLIC LAND.	950709

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Question 20, Comments offered by Survey Respondents.

COMMENT	DATE
MAYBE TOO EARLY TO FISH WE'LL COME BACK IN AUGUST.	950713
BOATING ON A NICE DAY.	950713
GOOD FISHING * THESE PEOPLE WERE NOT AWARE THAT YOU COULD ONLY KEEP 1 PIKE >30 INCHES..	950713
3RD TIME #1 HAS BEEN TO DALL THIS SUMMER	950716
HE WAS NOT INTERVIEWED UPON LEAVING THE 2ND TIME AND SAID HE CAUGHT NO FISH ON THAT TRIP.	950716
5 OTHER PIKE HARVESTED WERE NOT SAMPLED BECAUSE THEY WERE ALREADY FILLETED AND PACKED IN COOLER.	950716
PEACEFUL CALM, GOOD SCENE	950716
I'M SPECULATING THE PREVIOUS VISITS WERE PAST SUMMERS. DON DID NOT ASK OR RECORD SPECIFICS.	950716
NICE WEATHER.	950716
TOO MANY ANGLERS THIS WEEKEND	950716
RIVER IS NICE.	950721
DON'T PROMOTE RIVERS ON BASES & ADF&G LEADS TO OVERFISHING. -SIZE HAS GONE DOWN ON PIKE IN LAST 10 YR. FEELS HIDDEN FISHING SPOTS SHOULD BE FOUND BY LOOKING ON YOUR OWN, NOT ADVERTISED OR PROMOTED BY FT. WAINRIGHT OR ADF&G.	950723

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Question 20, Comments offered by Survey Respondents.

COMMENT	DATE
HAS A LOT OF COMPLAINTS, WONDERS WHEN DALL RIVER WILL BE SHUT DOWN.	950723
SAME BOAT AS JULY 18 GO-DEVIL. JUST PASSING THROUGH TRAVELING BACK FROM PORCUPINE R.	950725
GREAT FISHING	950726
NICE AND QUIET	950727
ANGLER #1 HAS BEEN COMING FOR 20 YR.	950729
DON'T APPRECIATE-INFORMATION OF FISHING-BEING ADVERTISED.	950729
BEAUTIFUL RIVER.	950730
GOOD TIME. NO PROBLEMS	950731
THESE MEN SAW 11 BLACK BEARS ON TRIP. THE ONE THEY SHOT CAME INTO THEIR CAMP. ENTERED RIVER 1530 ON 8-4-95.	950808
ANGLER #1 WAS HERE ON MONDAY AUG. 7, HE AND A FRIEND CAUGHT & RELEASED 8 PIKE THAT DAY BUT WERE NOT INTERVIEWED. ALSO 1 SHEEFISH. IT APPEARED THIS GROUP KEPT MORE FISH THAN THEY ADMITTED TO.	950812
THIS PARTY REFUSED TO BE INTERVIEWED FOR THE 2ND TIME THIS YEAR. THEY WERE HERE 6-8-95. THEY FISHED IN FRONT OF CAMP MOST OF THE TIME AND CAUGHT QUITE A FEW FISH. I DIDN'T SEE THEM RELEASE A SINGLE FISH. I WOULD ESTIMATE THEY KEPT 12-15 NP	950819
TIER II MOOSE HUNTERS	950901
2 OF THESE MEN WERE HERE LAST WEEKEND AND CAUGHT 60-70 PIKE, 2 SHEEFISH-KEPT 6 PIKE. ALSO CAUGHT SEVERAL LARGE PIKE AT OLD LAST CREEK (OR ALFRED CREEK ?) 1/2 BETWEEN STEVENS VILLAGE & PURGATORY. ONE WAS 24 LB.	950904

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Appendix F2.-Data summary table. Description of Vessels observed on the Dall River in 1995.

Type of Vessel	Number	Percent
Power Boats	108	96%
Canoe	2	2%
Float Plane	2	2%
Airboat	1	1%

Horsepower	Number	Percent
25	12	15%
50	28	35%
75	5	6%
100	8	10%
125	20	25%
150	3	4%
175	0	0%
200	1	1%
225	0	0%
250	0	0%
275	0	0%
300	0	0%
325	1	1%
350	1	1%
375	1	1%
400	0	0%

Drive Type	Number	Percent
Jet Driven	46	48%
Prop Driven	50	52%

Boat Length	Number	Percent
10	0	0%
11	0	0%
12	1	1%
13	0	0%
14	7	6%
15	2	2%
16	22	20%
17	0	0%
18	16	15%
19	6	6%
20	26	24%
21	7	6%
22	16	15%
23	0	0%
24	5	5%

APPENDIX G

Appendix G1.-Harvest and catch of northern pike by anglers interviewed during survey.

		June			July			August			All Season		
		Fish	p	SE	Fish	p	SE	Fish	p	SE	Fish	p	SE
Harvest	<30"	13	0.183	0.046	121	0.2435	0.019	71	0.2029	0.022	205	0.223	0.014
	> 30"	1	0.014	0.014	22	0.0443	0.0092	17	0.0486	0.012	40	0.0436	0.0067
	Total	14	0.197	0.048	143	0.2877	0.020	88	0.2514	0.023	245	0.267	0.015
Catch and Release	<30"	55	0.775	0.050	327	0.6579	0.021	213	0.6086	0.026	595	0.648	0.016
	> 30"	2	0.028	0.020	27	0.0543	0.010	49	0.1400	0.019	78	0.0850	0.0092
	Total	57	0.803	0.048	354	0.7123	0.020	262	0.7486	0.023	673	0.733	0.015
Total Catch	Total	71	1		497	1		350	1		918	1	

Appendix G2.-Length distribution of northern pike sampled from Dall River harvest, 1995.

Length Group		June			July			August			All Season		
TL (in)	FL (mm)	Freq	p	SE	Freq	p	SE	Freq	p	SE	Freq	p	SE
16	400	0	0	0	0	0	0	0	0	0	0	0	0
18	450	0	0	0	0	0	0	0	0	0	0	0	0
20	500	1	0.083	0.083	1	0.0088	0.0088	0	0	0	2	0.0130	0.0092
22	550	2	0.17	0.11	5	0.044	0.019	0	0	0	7	0.045	0.017
24	600	2	0.17	0.11	21	0.184	0.036	1	0.036	0.036	24	0.156	0.029
26	650	1	0.083	0.083	15	0.132	0.032	5	0.179	0.074	21	0.136	0.028
28	700	2	0.17	0.11	25	0.219	0.039	2	0.071	0.050	29	0.188	0.032
30	750	3	0.25	0.13	28	0.246	0.040	11	0.393	0.094	42	0.273	0.036
32	800	0	0	0	9	0.079	0.025	2	0.071	0.050	11	0.071	0.021
34	850	0	0	0	7	0.061	0.023	2	0.071	0.050	9	0.058	0.019
36	900	1	0.083	0.083	3	0.026	0.015	4	0.143	0.067	8	0.052	0.018
38	950	0	0	0	0	0	0	0	0	0	0	0	0
40	1000	0	0	0	0	0	0	1	0.036	0.036	1	0.0065	0.0065
Total		12	1.00		114	1.00		28	1.00		154	1.00	

Appendix G3.-Age distribution of northern pike sampled from Dall River harvest, 1995.

Age Group	June			July			August			All Season		
	Freq	p	SE	Freq	p	SE	Freq	p	SE	Freq	p	SE
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	1	0.011	0.011	0	0	0	1	0.0079	0.0079
5	0	0	0	4	0.043	0.021	0	0	0	4	0.031	0.016
6	5	0.42	0.15	13	0.141	0.037	3	0.130	0.072	21	0.165	0.033
7	1	0.083	0.083	34	0.370	0.051	6	0.261	0.094	41	0.323	0.042
8	5	0.42	0.15	29	0.315	0.049	4	0.174	0.081	38	0.299	0.041
9	0	0	0	10	0.109	0.033	6	0.261	0.094	16	0.126	0.030
10	1	0.083	0.083	1	0.011	0.011	2	0.087	0.060	4	0.031	0.016
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	2	0.087	0.060	2	0.016	0.011
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	1.00		92	1.00		23	1.00		127	1.00	

APPENDIX H

Appendix H1.-Estimated fishing effort harvest and catch of northern pike from the Dall River, 1978 through 1995. Data are from Mills 1979-1994, Howe et al. 1996 and the present study.

Year	Fishing Effort	Harvest		95% CI		Total Catch	Households Responding
		Estimate	(SE)	Low	High		
1978	259	177	na	na	na	nd	4
1979	394	723	na	na	na	nd	7
1980	250	499	na	na	na	nd	5
1981	498	1,014	na	na	na	nd	10
1982	473	455	na	na	na	nd	4
1983	405	1,794	na	na	na	nd	5
1984	1,428	1,752	na	na	na	nd	7
1985	139	416	na	na	na	nd	2
1986	596	1,407	na	na	na	nd	7
1987	545	866	na	na	na	nd	5
Reduction of Sport Fish Harvest Limit and Length Limit Restriction							
1988	217	418	na	na	na	nd	4
1989	438	125	na	na	na	nd	8
1990	273	372	(135)	145	623	1,810	9
1991	359	559	(176)	210	729	1,029	10
1992	224	342	(130)	146	623	1,042	8
1993	845	352	(123)	150	621	2,645	15
1994	455	215	(97)	54	430	1,308	11
1995	1,018	350	(133)	128	639	2,463	20
1995 ^a	553	340	(43)	256	425	1,325	
Pre-1988 Average Harvest		910					
1988-1995 Average Harvest		342				1,660	

^a Estimated from the present study

Appendix H2.-Comparison of estimates of the number of anglers, days of fishing effort, total harvest of northern pike, and total catch of northern pike from the SWHS and from the Dall River Research Project occurring at the Dall River during 1995.

Estimate	SWHS ^a	Dall River Research Project
Number of Anglers	494	299
SE	122	29
lower 95% CL	290	243
upper 95% CL	767	356
Days Fished	1,018	553
SE	353	79
lower 95% CL	455	399
upper 95% CL	1,786	707
Total Harvest	350	340
SE	133	43
lower 95% CL	128	256
upper 95% CL	639	425
Total Catch	2,463	1,325
SE	756	243
lower 95% CL	1,147	849
upper 95% CL	4,051	1,801

^a Data are from Howe et al. 1996.