State of Alaska
Department of Fish and Game
Sportfish Division

Nomination Form
Fish Distribution Database

Region: SCN

USGS Quad(s): KENAI C-2

Fish Distribution Database Number of Waterway: see below

Name of Waterway: ☐ USGS Name ☐ Local Name

☐ Addition ☐ Deletion ☐ Correction ☑ Backup Information

For Office Use

Nomination #: 07-225

Revision Year: 2008

Revision to: Atlas ____ Catalog ____ Both ____

Revision Code: F-1

	Date
ADF&G Fisheries Scientist	
ADNR OHMP Operations Mgr.	
FDD Project Biologist	9/5/07
Cartographer	

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
sockeye salmon	1984	X		X	☑
coho salmon	1984		X		☑
					☐
					☐
					☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments: Presence of sockeye and coho salmon substantiated by nominations 01-181 & 86-061 in the following water bodies - 244-30-10010-2063-3036, 244-30-10010-2063-3036-0010, 244-30-10010-2063-3036-0020, 244-30-10010-2063-3036-0030, 244-30-10010-2063-3036-0040, 244-30-10010-2063-3036-0050

Name of Observer (please print): J. Johnson

Signature: _____ Date: 9/5/2007

Agency: ADF&G - SF

Address: 333 Raspberry Road

Anchorage, AK 99518

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Fish Distribution Database.

Signature of Area Biologist: _____ Date: _____

Name of Area Biologist (please print):

Revision 02/05

State of Alaska
Department of Fish and Game
Nomination for Waters
Important to Anadromous Fish

1986
Year of Revision
86-061

Anadromous Water Catalog Volume South Central II

USGS Quad 5 2 Kenai C-2

Name of Waterway Moose River

Anadromous Water Catalog Number of Waterway

244-30-10010-2063-3036-0010

Change to _____ Atlas

_____ Catalog

X Both

Addition X

Deletion X

Correction _____

Name addition:

USGS name _____

Local name _____

For Office Use

Nomination # _____

Carl Yanagawa 10/17/85
Regional Supervisor Date

OK SBS X 11/5/85

Tom Brucen 10-29-85
Drafted Date

Species	Date(s) Observed	Spawning	Rearing	Migration
sockeye	August 84	X		X

Comments: Provide any clarifying information, including number of fish observed, location of fish survey data, etc.

adds sockeye to East Fork Moose River at Peterson L & main fork Moose River at Swan Lake. Details written on attached map.

Attach a copy of a map showing location of mouth and upper points of each species, specific stream reaches identified for spawning or rearing, locations of barriers, such as falls. Attach a copy of the fish survey data, if available.

Name of Observer (please print) Jack Dean, Jim Friedersdorf USFWS Fishery Serv. Dir

Date: _____ Signature: _____

Address: 35605 Kalifonsky Beach Road
Soldotna, AK 99669

Signature of Area Biologist: Bruce E King for Paul Ruesch

0010
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Sept Sockeye
est 1000-1500
Upper points document limits of fish surveys and usually not the extent of fish habitat.

State of Alaska
Department of Fish and Game
Habitat and Restoration Division

Nomination for Waters Important to Anadromous Fish

Region: SOUTHCENTRAL

USGS Quad: **Kenai C-2**

Anadromous Water Catalog Number of Waterway: **244-30-10010-2063-3036-0050**

Name of Waterway: Petersen Lake ☑ USGS Name ☐ Local Name

☑ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #	01 181		
Revision Year:	2001	Regional Supervisor	11/29/01 Date
Revision to:	Atlas ____ Catalog ____		7/13/01
	Both X	AWC Project Biologist	Date
Revision Code:	B-1, b-2		11/30/01
		Drafted	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Coho	May, July, September 1984		X		☑
Rainbow Trout	May, July, September 1984			X	☐
Longnose Sucker	May, July, September 1984			X	☐
Sockeye Salmon	9/6 - 7/1984	X		X	☑
					☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments:

Add species Sockeye spawning and lifestage coho rearing to Petersen Lake based on historic USFWS sampling, see attached report excerpts.

Name of Observer (please print): USFWS Kenai Fisheries Research Staff

Signature: _____ Date: 7/10/01

Address: USFWS Kenai Fishery Resource Office

P.O. Box 1670, Kenai, AK 99611

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: _____

Revision 3/97

PETERSEN LAKE

SURVEY PERIOD

Personnel of the U.S. Fish and Wildlife Service performed three fish surveys and one detailed water quality survey on Petersen Lake during 1984. The fish surveys were conducted on May 29-30 by W.J. Jakubas and G.A. Muhlberg, and on July 24-25 and September 6-7 by J.W. Friedersdorff and A.S. Firman. Detailed water quality data were gathered by J.W. Friedersdorff and A.S. Firman on July 24. Table 1 summarizes survey findings.

PHYSICAL FEATURES

Petersen Lake is located in the eastcentral section of the Kenai National Wildlife Refuge (NWR) and is part of the Kenai River Basin. Its latitude is north 60° 31' and longitude west 150° 23'. The lake name is misspelled on USGS Topographic Map Kenai (C-2), 1951 as "Peterson". It was named in the memory of James D. Petersen, Refuge Manager of the Kenai National Moose Range who drowned in a storm on Skilak Lake September 9, 1955, while on patrol duty. The lake and surrounding area were designated to be in the Moderate Land Management Category by the Kenai NWR Comprehensive Conservation Plan (USFWS 1985). The watershed area for the lake is estimated to be 8.7 square miles. Petersen Lake has a surface area of 94 acres, a volume of 1,800 acre feet, and is at an estimated elevation of 295 feet. The lake has a mean depth of 18.8 feet and maximum depth of 41 feet (Table 1 and Figure 1).

Petersen Lake is situated in relatively flat terrain with low hills to the south and a gentle slope to the west. Terrestrial vegetation around the lake consists of young paper birch and white spruce which are regrowth from the 1947 refuge fire. A mature stand of birch and spruce lies to the east between Petersen and Kelly lakes. Alder shrubs are common along most of the shoreline.

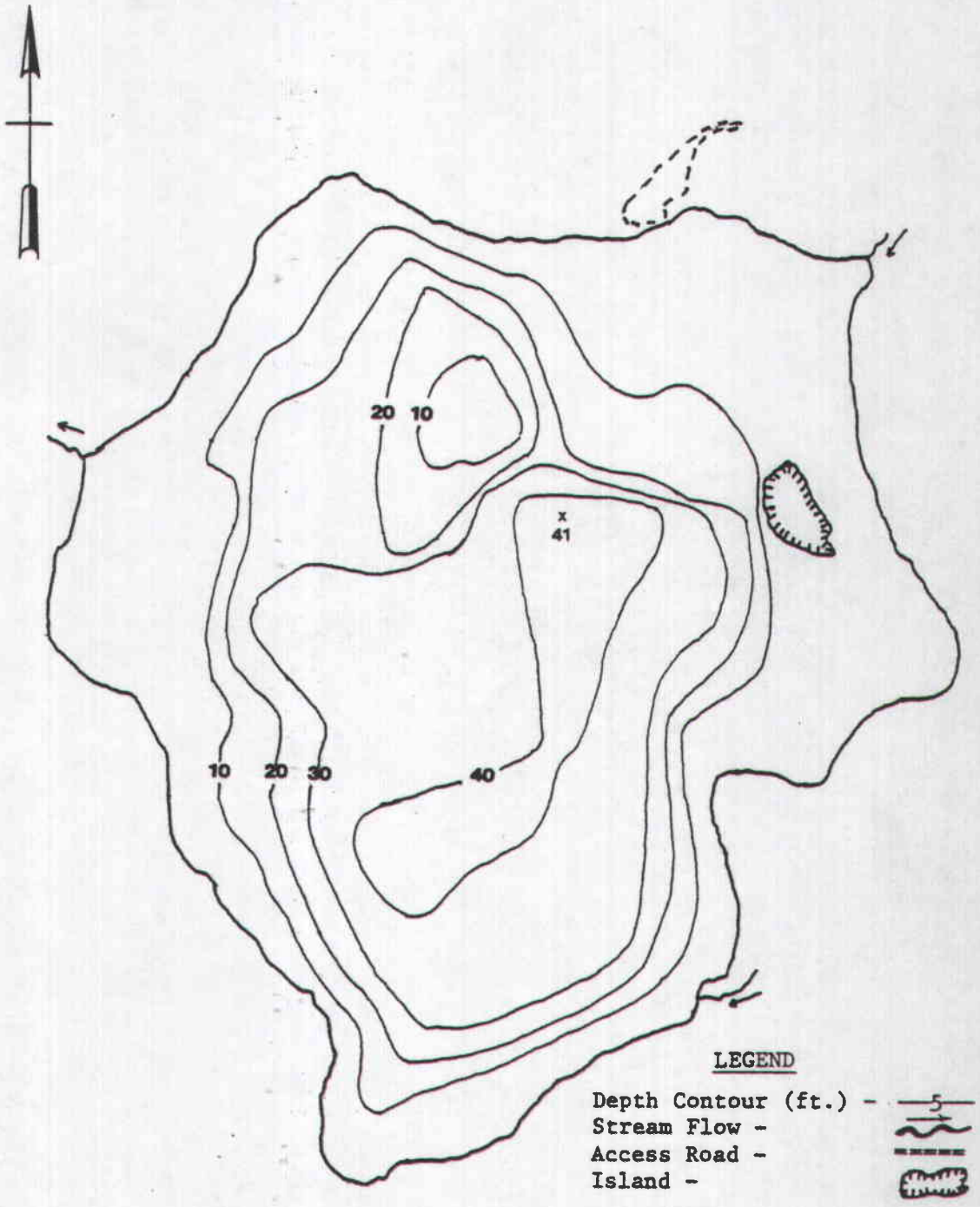
Lake water level is controlled by streams, springs, and run-off. The lake receives the flow from Kelly Lake located about 0.1 mile to the east. The larger inlet stream on the southeast shore was 9 feet wide and 0.3 feet deep. In July its flow was estimated at 4 cubic feet per second (cfs) and in September 5 cfs. This stream, with a series of small pools and riffles and moderate stretches of gravel substrate, was judged to be medium quality rainbow trout spawning habitat. The smaller inlet, located on the northeast shore, may be a split tributary from the larger inlet stream or spring fed. Its origin was not determined. It was 9 feet wide and 0.2 feet deep with an estimated flow of 1.4 cfs in July and 2.0 cfs in September. It had only small quantities of gravel in a few areas and was judged to be negligable to low quality rainbow trout spawning habitat. Although flow appeared to be permanent in both inlet streams, they may become too low during dry periods to permit fish passage.

The outlet stream, which is the East Fork Moose River, is located on the west end of the lake. It averaged 15 feet wide and 0.4 feet deep and consisted of a series of pools and riffles. July flow was estimated to be 6 cfs and September flow 14 cfs. About half the substrate was gravel and the stream appeared to be high quality rainbow trout spawning habitat. The outlet stream flows 10.8 miles northwest through Equmen, Watson, Imperi, and Afonasi lakes to the Moose

Figure 1.

PETERSEN LAKE

(94 Acres)



River. It provides anadromous fish access to Petersen Lake as well as salmon spawning habitat. In turn the Moose River flows 9.2 miles southwest to a confluence with the Kenai River near Sterling. The lake bottom has large areas of 1 to 4-inch gravel with some cobble that appeared ideal habitat for sockeye salmon spawning.

Direct automobile access is provided to the lake by a 0.6 mile gravel road which connects to the Sterling Highway. Refuge regulations currently prohibit outboard motors larger than 10 horsepower and aircraft landing is not authorized.

FISH

Rainbow trout were the dominant game fish in the lake. They were found in moderate abundance in the May, July, and September surveys with respective catch per unit efforts (CPUE) of 0.43, 0.32, and 0.17 fish per net hour. Juvenile coho salmon ranged from a moderately high abundance (CPUE 0.86) in May to a moderate abundance (CPUE 0.25) in July. Longnose sucker ranged from moderately high abundance (CPUE 0.55) in May to a low abundance (CPUE 0.04) in September. In July, a seine was used to collect dimpling juvenile fish near the mouth of the outlet; 25 juvenile coho salmon were captured. During our September survey approximately 1,000 adult anadromous sockeye salmon were estimated to be in the lake resulting in a CPUE of 0.61 fish per net hour. About 10 percent of the sockeye observed were dead. All salmon were in full spawning color and examination of 55 specimens indicated they were mostly spawned out. A sockeye redd was located near the southeast inlet stream. During a later visit on October 26, only a few decomposed sockeye remnants remained. Threespine stickleback ranged from a high abundance of 6.01 fish per trap hour in July to a moderate abundance of 1.80 fish in September. One ninespine stickleback was trapped in our September survey. Species CPUE's for the three surveys are summarized in Tables 2, 3, and 4. A total of 4 gill nets and 12 minnow traps were used during each survey to measure fish abundance. A seine was used in July to capture additional juvenile salmon.

Rainbow trout ranged in fork length from 3.7 inches (95 mm) to 18.9 inches (480 mm) and in weight from 0.02 pound (9.6 g) to 2.9 pounds (1300 g) (Tables 5, 6, and 7). Their mean length was 12.6 inches (319 mm) and mean weight 1.0 pound (447 g). Their condition mean increased from 1.06 in May to 1.26 in July then decreased to 1.13 in September. Trout age varied from two to nine years (Table 8), and their average growth rate was 1.8 inches per year. Nearly all coho salmon were juvenile fish. Their fork length ranged from 1.5 inches (37 mm) to 9.7 inches (245 mm) and weight from 0.002 pound (0.7 g) to 0.4 pounds (160 g). Their mean fork length was 3.8 inches (96 mm) and mean weight 0.03 pounds (13 g). Condition means increased from 1.02 in May to 1.31 in July decreasing to 1.14 in September. A subsample of 11 coho showed them to be one and two years old and growing at an average rate of 1.9 inches per year. The longnose sucker ranged in fork length from 10.6 inches (270 mm) to 19.7 inches (500 mm) and in weight from 0.5 pounds (240 g) to 3.5 pounds (1575 g). Their mean fork length was 15.5 inches (394 mm) and mean weight 1.8 pounds (816 g). Mean condition varied little during the year being 1.27 in May, 1.23 in July, and 1.20 in September. Analysis of 10 sucker opercles indicated they ranged in age from five to 19 years (Table 9). The anadromous sockeye salmon ranged in fork length from 14.6 inches (370 mm) to 23.8 inches (605 mm). Sockeye scales were

Table 2.

FISH CATCH AND EFFORT SUMMARY
Petersen Lake 5/29-30/84

Gear	Average Fishing Time (hrs.)	Amount Gear (sq.ft.)	Fish Species	Total Fish Number	Sex M-F-U	Fish CPUE Net Hour	Fish CPUE Trap Hour
4 Gill Nets	14	3,200	Rainbow Trout	24	7-13-4	0.43	N/A
			Coho Salmon	48	0-0-48	0.86	N/A
			Longnose Sucker	31	14-8-9	0.55	N/A
			All Species	103	21-21-61	1.85	N/A
12 Minnow Traps	22	N/A	Coho Salmon	47	0-0-47	N/A	0.18
			Threespine Stickleback	1343	0-0-1343	N/A	5.09
			All Species	1390	0-0-1390	N/A	5.27

Table 3.

FISH CATCH AND EFFORT SUMMARY
Petersen Lake 7/24-25/84

Gear	Average Fishing Time (hrs.)	Amount Gear (sq.ft.)	Fish Species	Total Fish Number	Sex M-F-U	Fish CPUE Net Hour	Fish CPUE Trap Hour
6 Gill Nets	14	4,800	Rainbow Trout	18	1-14-3	0.32	N/A
			Coho Salmon	14	0-0-14	0.25	N/A
			Longnose Sucker	12	1-1-10	0.21	N/A
			All Species	44	2-15-27	0.78	N/A
12 Minnow Traps	18	N/A	Threespine Stickleback	1298	0-0-1298	N/A	6.01
			Coho Salmon	8	0-0-8	N/A	0.04
			All Species	1306	0-0-1306	N/A	6.05

Table 4.

FISH CATCH AND EFFORT SUMMARY
Petersen Lake 9/6-7/84

Gear	Average Fishing Time (hrs.)	Amount Gear (sq.ft.)	Fish Species	Total Fish Number	Sex M-F-U	Fish CPUE Net Hour	Fish CPUE Trap Hour
6 Gill Nets	15	4,800	Sockeye Salmon	55	16-7-32	0.61	N/A
			Rainbow Trout	15	4-6-5	0.17	N/A
			Coho Salmon	23	1-0-22	0.26	N/A
			Longnose Sucker	4	1-3-0	0.04	N/A
			All Species	97	22-16-59	1.08	N/A
12 Minnow Traps	20		Threespine Stickleback	432	0-0-432	N/A	1.80
			Ninespine Stickleback	1	0-0-1	N/A	<0.01
			Coho Salmon	39	0-0-39	N/A	0.16
			Rainbow Trout	1	0-0-1	N/A	<0.01
			All Species	473	0-0-473	N/A	1.97

Table 5.

FISH LENGTH, WEIGHT, AND CONDITION SUMMARY
Petersen Lake 5/29-30/84

Gear	Category	Species	Sample Size	Mean	Standard Deviation	Range
Gill Nets	Fork Length (mm)	Rainbow Trout	21	311	55.2	225 - 395
		Coho Salmon	28	115	7.06	95 - 125
		Longnose Sucker	26	395	60.2	285 - 490
	Weight (g)	Rainbow Trout	21	351	186	110 - 660
		Coho Salmon	28	15.3	1.84	11.3 - 18.3
		Longnose Sucker	26	827	346	250 - 1575
	Condition (K)	Rainbow Trout	21	1.06	0.33	0.66 - 2.38
		Coho Salmon	28	1.02	0.31	0.71 - 1.34
		Longnose Sucker	26	1.27	0.15	1.08 - 1.88

Table 6.

FISH LENGTH, WEIGHT, AND CONDITION SUMMARY
Petersen Lake 7/24-25/85

Gear	Category	Species	Sample Size	Mean	Standard Deviation	Range
Gill Nets	Fork Length (mm)	Rainbow Trout	17	350	57.6	255 - 475
		Longnose Sucker	11	375	86.6	270 - 500
	Weight (g)	Rainbow Trout	17	582	290	210 - 1300
		Longnose Sucker	11	716	441	240 - 1540
	Condition (K)	Rainbow Trout	17	1.26	0.14	1.11 - 1.68
		Longnose Sucker	11	1.23	0.12	1.07 - 1.42
Seine	Fork Length (mm)	Coho Salmon	25	59.7	12.5	37 - 92
	Weight (g)	Coho Salmon	25	3.10	1.98	0.7 - 10.1
	Condition (K)	Coho Salmon	25	1.31	0.07	1.18 - 1.44

Table 7. FISH LENGTH, WEIGHT, AND CONDITION SUMMARY
Petersen Lake 9/6-7/84

Gear	Category	Species	Sample Size	Mean	Standard Deviation	Range
Gill Nets	Fork Length (mm)	Rainbow Trout	13	292	121	95 - 480
		Coho Salmon	18	117	32.5	95 - 245
		Longnose Sucker	4	440	21.2	420 - 465
	Weight (g)	Rainbow Trout	13	425	420	9.60 - 1260
		Coho Salmon	18	23.0	34.3	8.10 - 160
		Longnose Sucker	4	1020	110	900 - 1140
	Condition (K)	Rainbow Trout	13	1.13	0.11	0.91 - 1.37
		Coho Salmon	18	1.14	0.17	0.93 - 1.65
		Longnose Sucker	4	1.20	0.05	1.13 - 1.25

reabsorbed to a point accurate age determination was impossible, except that we were able to see one and two freshwater annuli and up to two ocean annuli.

AQUATIC VEGETATION

Aquatic vegetation in the lake was sparce and largely confined to areas near the eastern shore. Yellow pond lily and the pondweed, Potamogeton friesii were the dominant aquatic plants. No wetlands or bogs were present. Approximately 6 percent of the lake area was covered with aquatic vegetation. A complete list of vegetation is in Table 10.

WATER QUALITY

The lake's alkalinity level of 67 mg/l was almost twice as high as the average found in the 37 lakes surveyed during 1983-84. This value fits a medium productivity level using our modification of Moyle's lake productivity classification (MacKenthun and Ingram 1967). The pH of 7.7 was among the more alkaline found in the study. During July, the lake was thermally stratified (Table 11). Surface water temperature was 16.1°C and remained fairly constant down to 20 feet at 15°C. A thermocline was present at about 26 feet. Water temperature stabilized in a shallow hypolimnion at 8.0°C. Corresponding dissolved oxygen concentrations were supersaturated on the surface (10.8 mg/l) down to 20 feet (10.9 mg/l) and 97 percent saturated at 26 feet (10.3 mg/l). In the lower 12 feet of the lake dissolved oxygen was less than 1 percent saturated (0.2 mg/l), a condition lethal to fish. Most of the lake had high dissolved oxygen values for cold water game species. Temperature and dissolved oxygen profiles for June and September are shown in Tables 12 and 13.

Water color was medium green and Secchi disc transparency 15 feet. The lake had a Morphoedaphic Index of 24.2 and a Shoreline Development Factor, including the lake island, of 1.29.

MANAGEMENT HISTORY

Personnel of the Alaska Department of Fish and Game (ADF&G) first surveyed the lake in July, 1960. A total of 27 rainbow trout and 9 longnose sucker were captured in two days of gill netting for respective CPUE's of 0.19 and 0.06 fish per net hour (Kubik and Reynolds 1960). The length range of the rainbow trout was 7.0 inches (178 mm) to 18.3 inches (465 mm) and weight from 0.1 pound (45 g) to 2.5 pounds (1135 g). They also indicated the presence of stickleback. Their method of length measurement was not indicated. The Fish and Wildlife Service (FWS) surveyed the lake in July, 1974 (Bailey 1974). A total of 35 rainbow trout were captured (CPUE 0.73) and 33 longnose sucker (CPUE 0.69). The fork length range for the trout was 6.9 inches (175 mm) to 18.3 inches (465 mm) and weight from 0.1 pound (57 g) to 2.6 pounds (1162 g). Their mean length was 11.0 inches (280 mm) and mean weight 0.7 pound (305 g). Longnose sucker ranged in fork length from 8.7 inches (220 mm) to 18.3 inches (465 mm) and weight from 0.3 pound (113 g) to 2.6 pounds (1191 g). Their mean fork length was 15.8 inches (401 mm) and mean weight 1.8 pounds (813 g). Bailey and Nelson (1974), in an October 8 memo to the Kenai NMR Manager, stated the Petersen Lake fishery was in excellent condition and that the size range of trout indicated spawning was taking place in the lake and/or associated streams.

WILDLIFE

During the three survey periods a variety of wildlife species were seen or heard (Table 14). Waterfowl included common loons, common mergansers, a northern pintail, and white-winged scoters. There were also 17 species of passerines, 4 species of shorebirds, and 4 species of gulls and terns. Bald eagles were seen flying around the lake on two occasions. No beaver lodge was present on the lake, but vegetative cuttings indicated beaver in nearby streams or lakes had visited the lake. The presence of muskrat was indicated by clam shell feeding areas.

RECREATIONAL USE

Petersen Lake is a popular camping area during the summer. Many visitors camp at the lake while enjoying other parts of the refuge. Fishing, wildlife viewing, and boating are also popular. During the July and September surveys there were from three to five campers in the parking area every day. Conversations with anglers indicated they could harvest up to one trout per hour during good fishing. They also indicated that they caught more medium sized trout than large ones.

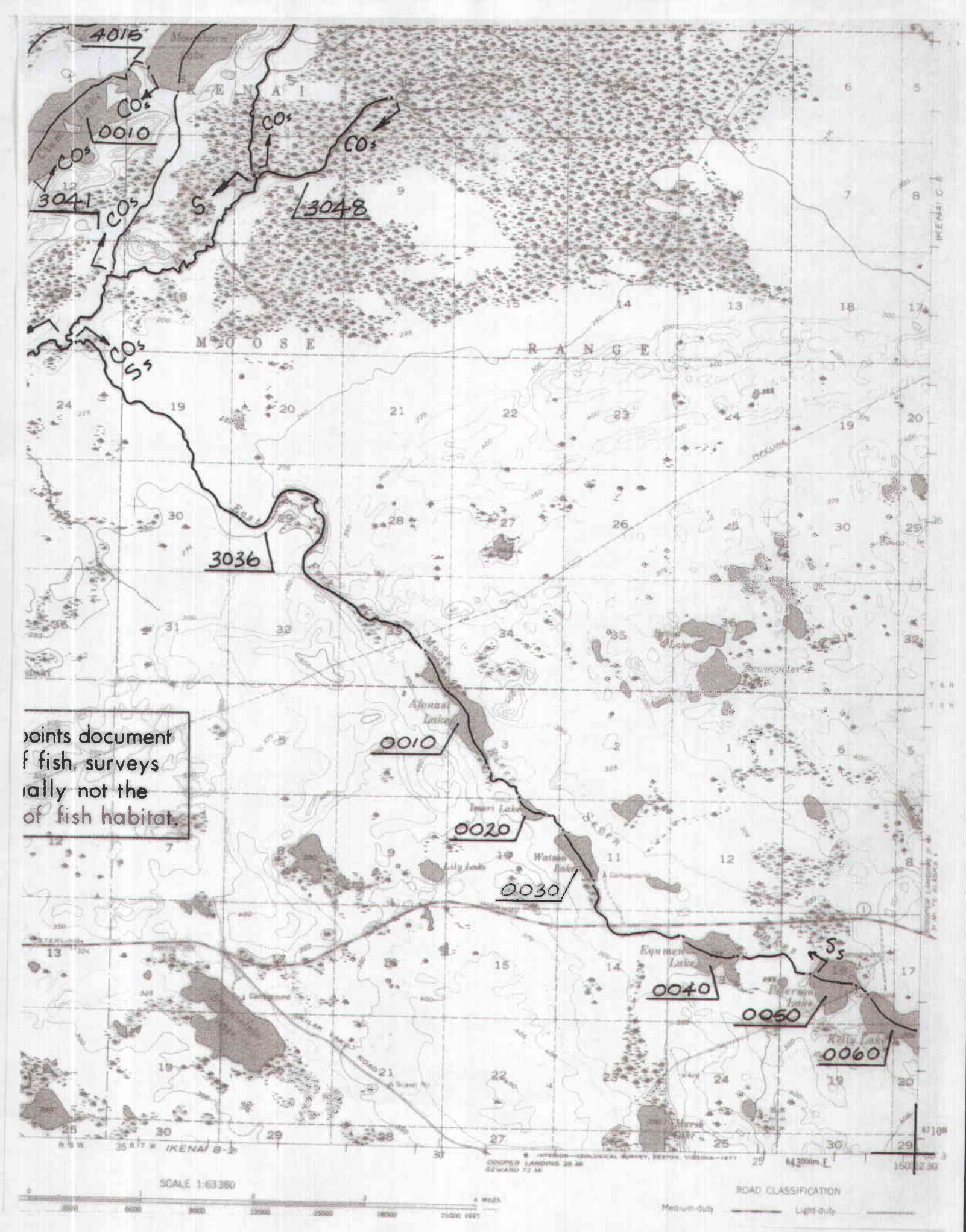
Public recreation facilities on the lake include multiple fire pits and picnic tables around a large common parking lot. A water well, gravel boat ramp, bulletin board, and pit toilet are also present.

FISHERY RESOURCE SUMMARY

Rainbow trout were the dominant game fish in Petersen Lake. During our three surveys we found moderate trout CPUE's of 0.43, 0.32, and 0.17 fish per net hour. The variety of trout sizes and age classes indicates successful spawning and recruitment is occurring. The 1960 ADF&G and 1974 FWS surveys found moderate to moderately high trout abundances suggesting the long term presence of a healthy rainbow trout population.

Juvenile coho salmon ranged from a high abundance (CPUE 0.86) to a moderate abundance (CPUE 0.25) confirming the lake as a coho nursery area. The lake also affords spawning habitat for anadromous sockeye salmon and is suspected of serving as a nursery area for the juveniles, even though we failed to capture any young sockeye. Longnose sucker populations ranged from moderately high (CPUE 0.55) to low (CPUE 0.04). Threespine stickleback and ninespine stickleback constitute the forage species.

Fishing pressure on the lake is believed to be moderate, partly as a result of its popularity as a camping area. The lake is medium in fertility and had a MEI of 24.2. Dissolved oxygen values were high for cold water game fish except in the deepest parts of the lake. The inlet streams provide medium to low quality rainbow trout spawning habitat plus access to Kelly Lake. The outlet stream provides a migration route for anadromous fish and is high quality rainbow trout spawning habitat. The outlet stream plays a key role in maintaining the rainbow trout population. Based on our findings we believe Petersen Lake can support a moderate yield rainbow trout sport fishery. It also serves as a spawning area and possibly a nursery area for sockeye salmon,



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of fish habitat.