250,000 rainbow trout to be stocked each year through 1993. However, in 1992, only 200,000 rainbows were stocked.

The first known survey of Cooper Lake was in 1983. A summary of this and subsequent surveys can be found in a table at the end of this narrative.

Access

Cooper Lake is at the end of Snug Harbor Road which originates at mile 48 of the Sterling Highway, just east of the Kenai River bridge.

Facilities

There is a boat launching area at the end of the road. No other facilities exist.

Methods

See the Small Lakes Sampling Methods file for general information of methods.

Two gill nets were set on 7/10/92 and pulled on 7/11/92. The first net was set on the west side of the lake across from the penstock in 7 feet to 27 feet of water and soaked for 22 hours. The second net was set on the west side of the lake just north of a tributary stream and south of the narrow part of the north end of the lake in 7 feet to 25 feet of water and soaked for 22 hours. In addition, 10 minnow traps baited with roe were set in 1.5 to 6 feet of water.

Results

Date	Species	Gear	No.	CPUE	Mean Length	Length Range	S.D.
7/10	DV	GN1	12	0.546/hr	326.7 mm	268-460 mm	76.89
7/10	DV	GN2	12	0.546/hr	323.4 mm	210-473 mm	77.13
7/10	DV	GNT	24	0.546/hr	325.1 mm	210-473 mm	75.34
7/10	RT	GN1	2	0.090/hr	295.5 mm	295-296 mm	0.71
7/10	RT	GN2	2	0.090/hr	355.0 mm	325-385 mm	42.43
7/10	RT	GNT	4	0.090/hr	325.3 mm	295-385 mm	42.19
7/10	DV	MT	1	0.044/hr	128.0 mm	128 mm	
7/10	RT	MT	2	0.087/hr	126.5 mm	125-128 mm	2.12

Management Recommendations

Cooper Lake has a good population of Dolly Varden. However, the stocking of rainbow does not seem to be effective. It is recommended that on the next stocking the rainbow fry be transported by boat to various locations around the lake that have good rearing habitat.

An undated, unsigned report in the files has suggested the stocking of round whitefish, lake trout, and burbot in Cooper Lake. Whitefish increase in population rather quickly and may be strong competitors with the dolly varden and rainbow trout now in the lake. However, the stocking of lake trout may even improve the dolly varden population, and would attract more anglers to the lake, as would burbot. At present there are no lakes on the Seward Ranger District with burbot and lake trout that are accessible by a road system.

Trip Report

Sampling of Upper and Lower Russian Lakes

June 13-15, 1979

by Don Seagren

June 13, 1979

WX OBVS: OVCST/S@10mph/Air +13°C/Water +9°C/Periodic Lt. RW

Jim Edmundson and myself left Soldotna and drove to Cooper Landing. I had made prior arrangements with Kenai Lake Air Taxi for a series of flights to Upper and Lower Russian Lakes.

Ken Bethe was our pilot, flying their Cessna 180 on floats (N93182). We left Kenai Lake at 1010 hours arriving at the Fish and Game cabin on Upper Russian Lake at 1020 hours.

We put away our personal gear and ate before doing our sampling. The weather pattern was the same throughout the day - overcast and windy with periodic light rain. The only problem we encountered was drifting off our sampling stations. I had to continually run the motor in order to maintain our position on a sampling station. We finished our sampling just as the winds picked up and heavy rains came. The winds switched to the north in the evening.

Due to a shortage of 1 liter sample bottles, 500 ml samples were taken at all stations on this trip. This was an adequate supply of water for the laboratory tests we were conducting at this time. The YSI D.O. meter was used at all stations. The 0.5 meter diameter, 130 μ mesh, plankton net was used for all plankton hauls. Plankton hauls were vertical hauls.

Field Data:

Upper Russian Lake #1

Water depth - 24 meters

Water samples taken at surface, 10 m and 20 m

Hach D.O. at the surface was 7.5 ppm

One 10 m vertical plankton haul was taken

Dissolved Oxygen/Temperature

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
0	8.8	7.0	60
1	8.8	7.5	64
2	8.5	7.5	63
3	8.0	7.5	62.5
4	8.0	7.5	62.5
5	8.0	7.5	62.5
6	8.0	7.5	62.5
7	8.0	7.5	62.5
8	8.0	7.5	62.5
9	8.0	7.5	62.5
10	8.0	7.5	62.5
15	8.0	7.8	65
20	8.0	7.8	68
23	8.0	7.8	65

Solar Illuminance

Depth (m)	Footcandles
Incident	5400
0	5000
0.5	4200
1	1900
1.5	1400
2	1800

Depth (m)	Footcandles
2.5	2400
3	1800
3.5	1600 (sun)
4	1800 (sun)
4.5	1600
5	1400
6	1200
7	800
8	640
9	500
10	350
11	260
12	210
13	200
14	200
15	200
16	200
17	200

We had problems with drifting and the sun going in and out of the clouds during our light measurements. The readings were the best we could get under the existing conditions. Since the last five readings were identical, it is felt that we drifted to a shallower spot and were taking all the readings off the bottom.

Upper Russian Lake #2 - 1345 hours

WX OBVS: OVCST/S @ 10 mph/14°C

Water depth - 43 meters

Water samples taken at 0 m, 20 m, and 40 m

A 30 meter vertical plankton haul was taken

Dissolved Oxygen/Temperature

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
0	9.0	7.5	64
1	9.0	7.5	64
2	9.0	7.5	64
3	9.0	7.5	64
4	9.0	7.5	64
5	9.0	7.5	64
10	8.0	7.8	65
15	7.5	8.0	66
20	7.0	8.0	65
25	6.5	8.0	64
30	6.0	8.0	63

Solar Illuminance

Depth (m)	Footcandles
Incident	3800
0.0	3000
0.5	2000
1.0	1800
1.5	1400
2.0	1300
2.5	1300
3.0	1200
3.5	1050

Depth (m)	Footcandles
4.0	940
4.5	820
5.0	750
6.0	600
7.0	500
8.0	380
9.0	280
10.0	220
11.0	170
12.0	130
13.0	100
14.0	74
15.0	54
16.0	42 (approximate 1% level)
17.0	33
18.0	26
19.0	21
20.0	15

Upper Russian Lake #3 - 1500 hours

WX OBVS: OVCST/S @ 10 mph/14°C/Lt. RW

Water depth - 35 meters

Water samples taken at 0, 15 and 30 meters

A vertical 30 m plankton haul was taken

250,000 rainbow trout to be stocked each year through 1993. However, in 1992, only 200,000 rainbows were stocked.

The first known survey of Cooper Lake was in 1983. A summary of this and subsequent surveys can be found in a table at the end of this narrative.

Access

Cooper Lake is at the end of Snug Harbor Road which originates at mile 48 of the Sterling Highway, just east of the Kenai River bridge.

Facilities

There is a boat launching area at the end of the road. No other facilities exist.

Methods

See the Small Lakes Sampling Methods file for general information of methods.

Two gill nets were set on 7/10/92 and pulled on 7/11/92. The first net was set on the west side of the lake across from the penstock in 7 feet to 27 feet of water and soaked for 22 hours. The second net was set on the west side of the lake just north of a tributary stream and south of the narrow part of the north end of the lake in 7 feet to 25 feet of water and soaked for 22 hours. In addition, 10 minnow traps baited with roe were set in 1.5 to 6 feet of water.

Results

Date	Species	Gear	No.	CPUE	Mean Length	Length Range	S.D.
7/10	DV	GN1	12	0.546/hr	326.7 mm	268-460 mm	76.89
7/10	DV	GN2	12	0.546/hr	323.4 mm	210-473 mm	77.13
7/10	DV	GNT	24	0.546/hr	325.1 mm	210-473 mm	75.34
7/10	RT	GN1	2	0.090/hr	295.5 mm	295-296 mm	0.71
7/10	RT	GN2	2	0.090/hr	355.0 mm	325-385 mm	42.43
7/10	RT	GNT	4	0.090/hr	325.3 mm	295-385 mm	42.19
7/10	DV	MT	1	0.044/hr	128.0 mm	128 mm	
7/10	RT	MT	2	0.087/hr	126.5 mm	125-128 mm	2.12

Management Recommendations

Cooper Lake has a good population of Dolly Varden. However, the stocking of rainbow does not seem to be effective. It is recommended that on the next stocking the rainbow fry be transported by boat to various locations around the lake that have good rearing habitat.

An undated, unsigned report in the files has suggested the stocking of round whitefish, lake trout, and burbot in Cooper Lake. Whitefish increase in population rather quickly and may be strong competitors with the dolly varden and rainbow trout now in the lake. However, the stocking of lake trout may even improve the dolly varden population, and would attract more anglers to the lake, as would burbot. At present there are no lakes on the Seward Ranger District with burbot and lake trout that are accessible by a road system.

Cooper Lake Survey Summary

Date	Species	Gear	No.	CPUE	Mean Length	Length Range
6/20/83	DV	GN	32	0.34 /hr	339.7 mm	301-405 mm
6/20/83	DV	GN	94	0.96 /hr	249.9 mm	152-300 mm
6/20/83	DV	GN	13	0.13 /hr	146.2 mm	140-150 mm
6/21/84	DV	GN	42	2.897/hr	246.5 mm	128-344 mm
6/21/84	DV	GN	32	1.94 /hr	236.0 mm	132-415 mm
6/21/84	DV	GN	73	3.65 /hr	274.0 mm	143-363 mm
8/02/90	DV	VBT	2	0.09 /hr	167.5 mm	110-225 mm
8/02/90	DV	MT	2	0.09 /hr	67.0 mm	49- 85 mm
8/02/90	RT	VBT	5	0.21 /hr	50.2 mm	43- 65 mm
7/10/91	DV	GN	51	0.836/hr	244.8 mm	130-412 mm
7/10/91	DV	MT	6		155.7 mm	141-176 mm
7/10/91	RT	MT	2		94.0 mm	85-103 mm
7/10/92	DV	GN	24	0.546/hr	325.1 mm	210-473 mm
7/10/92	RT	GN	4	0.090/hr	325.3 mm	295-385 mm
7/10/92	DV	MT	1	0.044/hr	128.0 mm	128 mm
7/10/92	RT	MT	2	0.087/hr	126.5 mm	125-128 mm

DV - Dolly Varden, RT - Rainbow Trout, GN - gill net, MT - Minnow Trap, VBT - vexar box trap

Rainbow Lake

Rainbow Lake, also known as Fetus Lake, is the only stocked lake of the smaller lakes on this trail system. This Lake is located at: Seward (B-8), T 3N, R 2W, sections 6 and 7. This lake is surrounded by small hills and hemlock communities with some muskeg.

Rainbow Lake has a surface area of 15 acres and a maximum depth of 26 ft. (fig. 3).

On the west side of the lake lies an inlet with an intermittent discharge. An outlet seepage lies on the northeast side of the lake that flows east into Cleaver Lake, these two lakes are also connected on the southeast side of Rainbow Lake.

No other limnology data has been gathered on Rainbow Lake (Appendix B).

History

Rainbow Lake was first surveyed in 1970 and it was found to be barren. In 1971 9,000 rainbow trout (Salmo gairdneri) were stocked from the Fire Lake hatchery. These fish were initially from Oregon. In 1974 it was stocked with 7,600 rainbow, in 1977 it was stocked with 3,000 rainbow trout, and in 1981 3,000 more rainbow were stocked. Since 1988, the lake has been stocked with 5,000 fingerlings every other year. (Appendix A).

Sampling surveys have been done intermittently since the first survey in 1970 (See Rainbow Lake Survey Summary following this narrative). On 7/7/92 a survey was done using a 125 ft. variable mesh gill net and five minnow traps baited with cured salmon roe.

Results

Date	Species	Gear	No.	CPUE	Mean Length	Length Range	S.D.
7/8	RT	GN	15	0.588	217.1 mm	130-305 mm	74.68
7/8	RT	MT	15	0.625	125.1 mm	108-137 mm	8.28

Access

Access to Rainbow Lake is gained via a .25 mile trail just off mile 10 Snug Harbor Road (fig. 2).

Management Recommendation

The last stocking record for this lake was in 1992 with 5,000 rainbow trout, and the last sample survey was done on 7/8/92. Because of this lakes easy access and hence greater recreational demand, this lake should be surveyed on a biannual basis to assess the lakes populations status. A simultaneous survey of Cleaver Lake shows that the rainbow trout have migrated from Rainbow Lake to Cleaver Lake. See Cleaver Lake survey which follows.

Rainbow Lake Survey Summary

Date	Species	Gear	No.	CPUE	Mean Length	Length Range	Comments
9/01/71	RT	GN	37	0.79 /hr	295.3 mm	266-314 mm	
9/19/73	RT	GN	7	0.15 /hr	385.7 mm	330-420 mm	
10/1/74	RT	GN	6	0.125/hr	472.0 mm	435-500 mm	1971 Stock
10/1/74	RT	GN	130	2.70 /hr	146.8 mm	100-178 mm	1974 Stock
9/03/75	RT	GN	28	0.596/hr	244.0 mm	223-300 mm	1974 Stock
9/10/76	RT	GN	8	0.17 /hr	337.0 mm	324-362 mm	1974 stock
9/20/77	RT	GN	4	0.091/hr	421.0 mm	393-435 mm	1974 Stock
9/20/77	RT	GN	4	0.091/hr	126.8 mm	107-148 mm	1977 Stock
9/18/79	RT	GN	7	0.146/hr	496.4 mm	450-545 mm	1974 Stock
8/19/83	RT	GN	23	0.560/hr	320.0 mm	257-385 mm	1981 Stock
7/08/92	RT	GN	15	0.588/hr	217.1 mm	130-305 mm	
7/08/92	RT	MT	15	0.625/hr	125.1 mm	108-137 mm	

Rainbow Lake Stocking Schedule

Date	Species	Number
1971	RT	9,000
7/03/74	RT	7,600
7/13/77	RT	3,000
9/24/81	RT	3,000

Cleaver Lake

Cleaver Lake is located at: Seward (B-8), T 3N, R 2W, section 6. Cleaver Lake is surrounded by small hills and hemlock communities, with some muskeg and marshes intermixed in the lower areas. This lake is located due east of Rainbow Lake, on aireal photographs they appear connected.

Cleaver Lake has a surface area of 7.5 acres and a maximum depth of 7 ft. (Fig. 4).

The lake has an inlet at its west side and south end, these being intermittent seepages from Rainbow Lake. An outlet exists at the northwestern end that drains into Kenai Lake.

No other limnology data has been gathered on Cleaver Lake (Appendix B).

History

Cleaver Lake was first surveyed in 1970, and the lake was found to be barren. No other efforts have made on this lake to develop a sportfishery. However, a survey on July 7/8,1992 found many rainbow trout in Cleaver Lake. These fish apparently migrated from Rainbow Lake, which is adjacent to Cleaver Lake.

Access

Access to Cleaver Lake can be gained by a .25 mile USFS foot path at mile 10 Snug Harbor Road (fig. 2).

Methods and Materials

See Small Lakes Sampling Methods in the Small Lakes File for general reference on methods.

Cleaver Lake was surveyed on July 7/8, 1992. One variable mesh gill net and five minnow traps were set. The gill net soaked for 23 hours and was set in six to seven feet of water on the west side of the small island in the lake. The minnow traps were soaked for about 24 hours at various locations around the lake in 1.5 to 2.5 feet of water.

Results

Date	Species	Gear	No.	CPUE	Mean Length	Length Range	S.D.
7/8	RT	GN	47	2.044/hr	178.8 mm	119-300 mm	57.89
7/8	RT	MT	20	0.833/hr	121.1 mm	73-167 mm	22.71

Management Recommendations

The sampling of this lake should be continued with Rainbow Lake. A smaller gill net or a hoop net should be considered for future sampling as the lake is shallow (max. depth about 6-7 feet) and this deep area is relatively small. The 125 foot gill net stretches through most of this area and probably kills a high per centage of the fish present.

Char Lake

Char Lake is located at: Seward (B-8), T 3N, R 3W, section 1. Char is surrounded by low lying hills with hemlock communities, and marshes and muskeg in the lower areas.

Char Lake as a surface area of 10 acres and a maximum depth 22 ft. (fig. 5).

Char lake has one inlet at its north end and one at its southeast corner which drains a marsh. An outlet exists, with a discharge of 1-5 cfs, at the southwest end of the lake and feeds into a glacial inlet into Cooper Lake.

No other limnology data has been gathered on Rainbow Lake (Appendix B).

History

This lake was first surveyed in 1970, 24 arctic char (Salvelinus alpinus) were sampled with a c/e of .48/hour and a mean length of 337.0 mm. (Appendix A).

Access

This lake is located adjacent to Snug Harbor Road, mile 10.5. Although, only a small portion of the lake is adjacent to the road, no trail is known to exist around the lake, or to either side (fig. 2).

Management Recommendation

The last sample survey on this lake was 7/30/70, this lake should be considered for another sample survey in the near future, depending on the angling pressure. Arctic Char are recorded as being the resident fish in the lake, but a distinction should be made to differentiate from Dolly Varden. Because of the lakes easy access a possible plan should be considered for diversification as a resident sportfishery, by multi-stocking strategies and/or improving access in coordination the recreational demands on the lake; such as trails or parking areas.

Loon Lake

Loon Lake is located at: Seward (A-8), T 3N, R 3W, section 20. Loon Lake is surrounded by spruce and marsh communities.

Loon Lake has a surface area of 14.7 acres and a maximum depth of 5.25 ft. (fig. 6). Grassy islands and lily pads are scattered along western half of the lake. The water color was noted as being slightly yellow, but clear, with a secchi reading of 5,25 ft..

Loon Lake temperature at the surface was 16°C and the dissolved oxygen (D.O.) was 10 ppm. At 5 ft. the temperature was recorded at 15.5°C (Appendix B).

No inlets were observed when this lake was surveyed. An outlet with beaver dam exists, but no location was given as to its whereabouts.

History

This lake was surveyed on 7/14/80, and was found to be barren. It was noted that due to its being extremely shallow that enhancement potential would be low.

Access

No access exists to Loon Lake which is .5 miles north of Russian Lakes Trail located about 3 miles from Cooper Lake (fig. 2).

Management Recommendation

Due to the shallow water depth of Loon Lake and its inaccessibility little possibility for enhancement exists.

Bog Lake

Bog Lake is located at: Seward (A-8), T 3N, R 3W, section 21. This lake is situated in a low-lying marshy and muskeg area, surrounded by low hills and spruce communities. Lily pads are distributed throughout the lake.

Bog Lake has surface area of 7.3 acres and a maximum depth of 7.5 ft. (fig. 7). The water color was noted as being slightly tannic and the secchi reading was 7.5 ft.. Dissolved oxygen was recorded at 11 ppm throughout the water column, and the temperature was recorded at 17°C throughout the water column (Appendix B).

An inlet exists at the southwest corner of the lake with a discharge of .5 cfs, and an outlet at the southeast corner is blocked by a beaver dam.

History

This lake was surveyed in 1980 and was found to have a one Dolly Varden in one of the minnow traps (Appendix A).

Access

This lake is located about .5 mile from the Russian Lakes Trail about 3 miles from Cooper Lake (fig. 2). No trail exists.

Management Recommendation

This lake holds little potential for a resident sportfishery due to the shallow water depth and its inaccessibility.

Upper Russian Lake

Upper Russian Lake is located at: Seward (B-8), T 3N, R 4W, sec. 13,24. This lake is surrounded by mountains and small hills, composed of hemlock and spruce communities, with marsh and muskeg in the low lying areas.

Upper Russian Lake has a surface area of 1,100 acres and a maximum depth of 240+ ft. To date no bathymetric map has been recorded.

Upper Russian Creek feeds into the lake from the southwest side and has a discharge of 10-150 cubic feet/ second (cfs). Bear Creek on the north side has a discharge of 5-10 cfs, several small creeks on the south end and the northeast side have a discharge of 2-6 cfs, all these are feeder streams. Upper Russian River drains the lake with a discharge of 100 cfs.

No other limnology surveys have been made other than the above (Appendix B).

History

This lake was first surveyed in 1972. The anadromous fish native to the area are: red salmon (Onchorhyncus nerka), silver salmon (O. kisutch), king salmon (O. tshawytscha), Dolly Varden (Salvelinus malma), and rainbow trout (Salmo gairdneri). The native resident fish are: rainbow trout, Dolly Varden, and threespine stickleback (Gasterosteus aclueatus). No fish have been stocked in this lake from USFS data (Appendix A).

Access

This lake is located via a 12 mile hike on Russian Lakes trail going south from Russian River Campground or a 9 mile hike heading from the Cooper Lake trailhead (fig. 2). This lake is also accessible by float plane.

Facilities

The Forest Service provides a public recreation cabin and row-boat at the northeast end of the lake, adjacent the Russian Lakes trail.

Management Recommendation

This lake is under the authority of two government agencies; U.S. Fish and Wildlife Service and the U.S. Forest Service. The Forest Service boundary dissects the middle of the lake. Any management recommendations would have to involve the coordination of these two agencies.

Lower Russian Lake

Lower Russian Lake is located at: Seward (B-8), T 4N, R 4W, section 9 and 16. This lake is surrounded by mountains with spruce and alder communities, and the low-lying areas are intermixed with marsh and cottonwood communities.

Lower Russian Lake has a surface area of 215 acres and a maximum depth of 25 ft. (fig.8). The water is clear with a secchi reading of 17 ft..

The main inlet is Upper Russian River with a mean discharge of 120 cfs. Three small inlet streams on the west side have a discharge of 1-2 cfs, and one small inlet on the east side has a discharge of 1-2 cfs. Russian River drains the lake with mean a discharge of 124 cfs.

No other limnology data has been recorded by USFS (Appendix B).

History

This lake was first surveyed in 1972. The native anadromous fish native to the area are: red salmon (Onchorhyncus nerka), silver salmon (O. kisutch), king salmon (O. tshawytscha), Dolly Varden (Salvelinus malma), and rainbow trout (Salmo gairdneri). The native resident fish are: rainbow trout, Dolly Varden, and threespine stickleback (Gasterosteus aclueatus). The lake is closed to all salmon fishing. On 6/16/83 27,327 silver salmon were stocked in Lower Russian Lake (Appendix A). No follow-up report can be found on Seward Ranger Distrct files. Although, Alaska Department of Fish and Game (ADF&G) has maintained a weir at the outlet of the lake to monitor the escapement of red salmon, this information can be obtained at the ADF&G office in Soldotna.

Access

Access to Lower Russian Lake can be made by a 4 mile hike south from the Russian River Campground (fig. 2). This lake can also be flown into via float plane.

Facilities

The U.S. Forest Service provides a public handicap accessible recreation cabin with a dock and row-boat.

Management Recommendation

This lake is administered by two agencies; U.S. Fish and Wildlife Service (USFWS) and the U.S. Forest Service (USFS). The Forest Service boundary passes through the middle of the lake. Any management recommendations would have to be in coordination with USFWS and USFS.

Cooper Lake "A"

Cooper Lake "A" is located at: Seward (B-8), T 3N, R 3W, section 15. This lake is situated in a broad rolling valley with spruce, alder, and willow communities, intermixed with marsh and muskeg. The northeast corner of the lake is partially covered with water lilies.

Cooper Lake "A" has a surface area of 7.5 acres, a maximum depth of 16.4 ft., an average depth of 9.5 ft., and a volume of 7.3 hectare/meter (fig. 9). The water color is clear, with a secchi reading of 13 ft. (4 m.) down and 12 ft. (3.75 m.) up. The temperature was recorded on 7/11/84 at 15°C at .5 m. and the dissolved oxygen was 10.5 mg/l (Appendix B).

This lake appeared to be spring fed, it has only one outlet at the west side of the lake with a discharge of .3 cfs.

History

This lake was surveyed on 7/11/84, and was found to be barren (Appendix C Supplemental Reports).

Access

Access to this lake is via the Russian Lakes Trail. The lake is located 4.5 miles from the Cooper Lake trailhead and is an easy .25 mile hike over rolling terrain (fig. 2).

Management Recommendation

This is a good lake to consider for a future resident sportfishery, due to access along the Russian Lakes Trail and its physical, chemical, and biological characteristics (Appendix C). Although, it should be checked for over winter survival before any stocking takes place; under ice dissolved oxygen should be measured.

Cooper Lake "B"

Cooper Lake "B" is located at: Seward (B-8), T 3N, R 3W, section 15. This lake is situated in a tiny canyon, with a beaver dam blocking the outlet. The canyon walls are covered with grasses and moss, on the top of the canyon walls are spruce and alder communities.

This lake has a surface area of 5.6 acres, a maximum depth of 9.8 ft. (3 m.), an average depth of 6.6 ft. (2 m.), and a volume of 2.75 hectare/meter (fig. 10). The water was clear and the secchi recording was 2.0 m. up and 2.0 m. down. The temperature was 12°C at .5 m. and the dissolved oxygen was 9.0 mg/l on 7/11/84 (Appendix B).

A low gradient stream that feeds the lake from the west flows through a grass meadow, and the discharge was recorded at .8 meters/second. The outlet stream is blocked by a beaver dam, which is about 1 m. high, and has a discharge of .8 meters/second.

History

This lake was first surveyed on 7/11/84 and was found to be barren. On 9/4/84 an electro-shocking survey found that king salmon (O. tshwytscha) use this area for rearing (Appendix C).

Access

This lake is adjacent to the Russian Lakes Trail, approximately 4.3 miles in from the Cooper Lake trailhead (fig. 2).

Management Recommendation

This lake offers little potential to be established as a resident sportfishery. This lake is too shallow for over winter survival and the water quality is poor (Appendix C Supplemental Reports).

Depth (m)	Footcandles
2.0	850
2.5	790
3.0	700
3.5	630
4.0	560
4.5	520
5.0	440
6.0	340
7.0	260
8.0	210
9.0	160
10.0	130
11.0	90
12.0	70
13.0	54
14.0	40
15.0	32
16.0	26
17.0	22 (approximate 1% level)
18.0	18
19.0	17

By 1600 hours, the weather was deteriorating rapidly. Luckily, we had completed all our planned sampling. We returned to the cabin and packed the sampling gear in preparation for the 1000 hours pick-up in the morning.

We had porcupines chewing on the cabin. If they continue, they could turn into a real problem.

June 14, 1979

WX OBVS:CAVU/S @ 10 mph/12°C

Ken Bethe showed up on schedule to pick us up and take us to Lower Russian Lake. We left Upper Russian Lake at 1010 hours, arriving at Lower Russian Lake at 1015 hours. We left the motor and gas tank in the airplane since it was not needed at Lower Russian Lake.

Gary Todd piloted the boat, while Jim and I did our sampling. Due to the wind, the third person was helpful to keep us from drifting off the sampling station. We had problems getting accurate light readings due to the sun going in and out of the clouds. The meter also began to malfunction. We took it back to the cabin and dried it off, inside and out. It appeared to function properly once it was dry. Jim Browning took us out to get our light readings.

The ice was completely off of Lower Russian Lake on May 6, 1979. The stream flow at the weir was 218.40 CFS. After our sampling was over, we assisted in installing the adult salmon trap.

Field Data:

Lower Russian Lake #1 - 1230 hours

Water depth - 6 meters

Water samples taken at 0, 2.5, and 5 meters

One 4 meter plankton haul was taken

Hach Kit D.O. at the surface was 10.5 ppm

Dissolved Oxygen/Temperature

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
0	11.5	10.5	95
1	11.5	10.5	95
2	11.0	10.5	95

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
3	9.5	10.7	96
4	9.5	11.0	96
5	9.5	11.2	98
6 (bottom)	9.5	11.4	99

Solar Illuminance

Taken at 1445 hours due to minor equipment failure earlier

Depth (m)	Footcandles	
Incident	5900	(sun out)
0	5500	(sun out)
0.5	4800	(sun out)
1.0	4000	(sun out)
1.5	720	(sun behind clouds)
2.0	590	(sun behind clouds)
2.5	500	(sun behind clouds)
3.0	410	(sun behind clouds)
3.5	410	(sun behind clouds)
4.0	340	(sun behind clouds)
4.5	450	(sun out)
5.0	450	(sun out)
6.0 (bottom)	340	(sun out)

Lower Russian Lake #2 - 1300 hours

Water depth - 6.5 meters

Water samples taken at 0, 2.5, and 5 meters

A 5 meter vertical plankton haul was taken

Dissolved Oxygen/Temperature

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
0	11.5	10.9	99
1	11.5	11.0	100
2	11.0	11.0	99
3	11.0	11.0	99
4	10.5	11.2	100
5	9.5	11.3	98
6	9.5	11.3	98
6.5 (bottom)	9.2	11.3	97

Solar Illuminance - 1500 hours

Depth (m)	Footcandles (While Sun Fluctuating)	Footcandles (While Sun Out)
Incident	5400	6400
0	6200	6000
0.5	4500	
1.0	5000	4500
1.5	3000	
2.0	1800	4000
2.5	1400	
3.0	1300	3400
3.5	810	
4.0	1500	2500
4.5	1400	
5.0	1700	1700
5.5		
6.0 (Bottom)	1100	1100

Lower Russian Lake #3 - 1330 hours

Water depth - 6 meters

Water samples taken at 0, 2.5, and 5 meters

Four 5 meter vertical plankton hauls were taken

Dissolved Oxygen/Temperature

Depth (m)	Temperature (°C)	D.O. (ppm)	% O_2 Saturation
0	11.5	10.6	96
1	11.5	10.7	97
2	11.5	10.9	99
3	11.2	11.1	100
4	10.0	12.0	105
5	10.0	12.3	107
6 (Bottom)	9.8	12.3	106

Solar Illuminance - 1510 hours

The profile was done entirely with the sun out.

Depth (m)	Footcandles
Incident	6300
0	5900
0.5	4800
1.0	4000
1.5	3500
2.0	3200
2.5	2900
3.0	2300
3.5	2000
4.0	1700

Depth (m)	Footcandles
4.5	1500
5.0	1200
5.5	1000
6.0 (Bottom)	780

June 15, 1979

WX OBVS: CAVU/5 mph/15°C

Ken Bethe arrived on time to pull us out. We left Lower Russian Lake at 1010 hours, arriving at Kenai Lake at 1020 hours. After paying our bill, we drove back to Soldotna, arriving at 1215 hours.

Laboratory Analysis of Samples From Upper Russian Lake

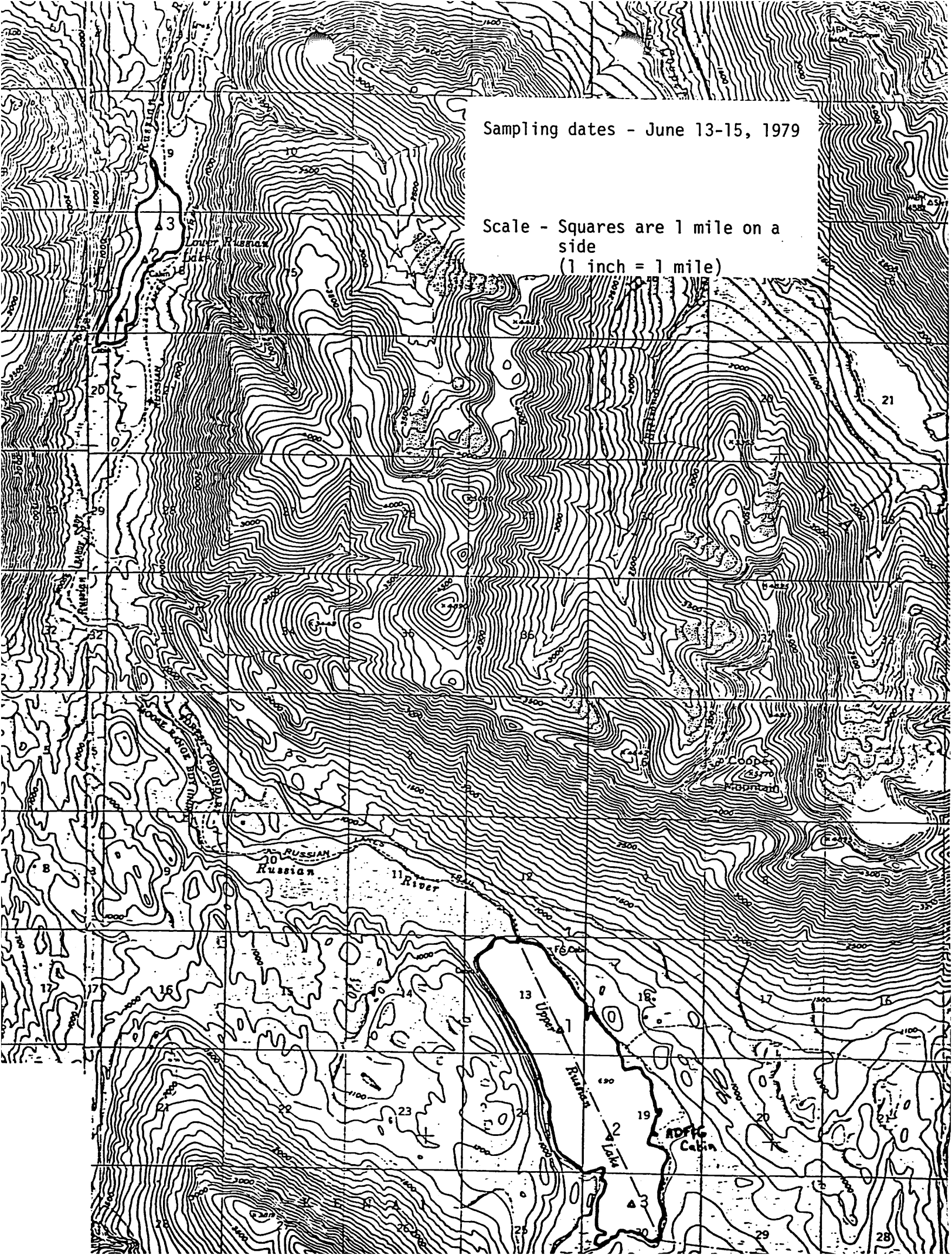
Location	Sample Date	Analysis Date	Depth (m)	pH	Conductivity (μMHOS/cm)	Alkalinity (mg/l)	Hardness (mg/l)	TDS* (mg/l)
Station 1	6/13/79	7/31/79	Surface	7.28	61 (50 ml sample)	23.5	24.97	60
Station 1	6/13/79	7/31/79	10	7.30	61	23.5	24.97	56
Station 1	6/13/79	7/31/79	20	7.21	62	23.0	24.97	58
Station 2	6/13/79	7/31/79	Surface	7.29	61	23.0	23.37	57
Station 2	6/13/79	7/31/79	20	7.31	61	23.0	23.37	56
Station 2	6/13/79	7/31/79	40	7.25	62	23.0	23.37	56
Station 3	6/13/79	7/31/79	Surface	7.32	60	24.0	24.97	54
Station 3	6/13/79	7/31/79	15	7.25	61	23.0	23.37	58
Station 3	6/13/79	7/31/79	30	7.27	61	23.5	23.37	57

* Total Dissolved Solids

Laboratory Analysis of Samples From Lower Russian Lake

Location	Sample Date	Analysis Date	Depth (m)	pH	Conductivity (μMHOS/cm)	Alkalinity (mg/l)	Hardness (mg/l)	TDS* (mg/l)
Station 1	6/14/79	7/24/79	Surface	7.14	81	30.0	39.33	67
Station 1	6/14/79	7/24/79	2.5	7.27	78	30.0	36.15	55
Station 1	6/14/79	7/24/79	5	7.42	76	30.5	36.15	68
Station 2	6/14/79	7/24/79	Surface	7.26	80	31.5	37.75	61
Station 2	6/14/79	7/24/79	2.5	7.36	79	30.5	36.15	87
Station 2	6/14/79	7/24/79	5	7.33	76	30.0	31.36	57
Station 3	6/14/79	7/24/79	Surface	7.42	79	31.0	36.15	74
Station 3	6/14/79	7/24/79	2.5	7.41	79	31.0	32.96	52
Station 3	6/14/79	7/24/79	5	7.30	76	29.0	31.36	66

* Total Dissolved Solids


Sampling dates - June 13-15, 1979
Scale - Squares are 1 mile on a side
(1 inch = 1 mile)
Lower Russian Lake
Cabin
Russian
River
Upper Russian Lake
ADF&G Cabin
Cooper Mountain

Explanation of Abbreviations

Used to Record Weather Observations

WX OBVS	Weather observations
CAVU	Ceiling and visibility unlimited (clear and sunny)
OVCST	Overcast (total cloud cover)
BRKN	Broken (mostly cloudy, some clear areas)
SCTD	Scattered (mostly clear with some clouds)
RW	Rain
SW	Snow
Lt.	Light
Mod.	Moderate
Hvy.	Heavy

Wind speed measured with Taylor hand held meter

Air temperature measured with pocket thermometer.

Trip Report
Limnological Sampling and Bottom Contour Mapping of
Upper and Lower Russian Lakes
July 31, 1979 - Augst 2, 1979
by Don Seagren

July 31, 1979

WX OBVS: OVCST-BRKN/7-10 m.p.h./17°C

Bill Altland and I left Soldotna at 0830 hours to sample the Russian Lakes system. We stopped at Hidden Lake to pick up the D.O. meter, arriving at Cooper Landing at 1010 hours.

We flew with Gary Rogers, of Kenai Lake Air Taxi, in their Cessna 180 on floats, N91382. We left Kenai Lake at 1025 hours, arriving at Upper Russian Lake at 1035 hours.

We had two problems this trip. The first, a minor one, was not having 10% formalin for preservation of the plankton samples. We mixed our own in the field. The second, was not having the PAO titrant in the Hach kit. This was needed for calibration of the D.O./temperature meter. Without calibration of the D.O./temperature meter, all the readings would be inaccurate. As a result there were no temperature or dissolved oxygen profiles made during this trip.

Upper Russian Lake - Station A: 11:20 hours

WX OBVS: SCTD/7 mph/17°C

Water depth: 24 meters

Seechi disc readings: down 10 meters, up 8 meters , average 9 meters

12 liter water samples were taken from 1 meter and 20 meters

A 20 meter vertical plankton haul was made using the 0.5 meter x 130 μ mesh net. (This net was used for all plankton hauls on this trip)

The primary productivity (^{14}C uptake) experiment was incubated from 1200 hours to 1600 hours at 1 meter.

Bottles # 1: Dark
2: Dark - kill
3: Light
4: Light

Solar Illuminence:

Depth (m)	Foot Candles	Depth (m)	Foot Candles
Incident	3,600	8.0	900
0.0	3,200	9.0	700
0.5	1,600	10.0	600
1.0	1,500	11.0	600
1.5	1,400	12.0	600
2.0	1,400	13.0	36 (1% light level)
2.5	1,400	14.0	32
3.0	14,00	15.0	26
3.5	1,400	16.0	25
4.0	1,400	17.0	24
4.5	1,300	18.0	15
5.0	1,200	19.0	7.0
6.0	1,000	20.0	3.8
7.0	900	21.0	2.9

Upper Russian Lake - Station B

WX OBVS: SCTD/7 mph/17^{o}C

Water depth: 23 meters

Secchi disc readings: down 8 meters, up 7 meters, average 7.5 meters.

A vertical plankton haul was made from 20 meters

12 liter water samples were taken from 1 meter and 20 meters.

The primary productivity (^{14}C uptake) experiment was incubated from 1325 hours to 1725 hours at 1 meter.

Bottles: #1: Light
2: Light (lost top of bottle)
3: Dark
4: Dark - kill

Solar Illuminence

Depth (m)	Foot Candles	Depth (m)	Foot Candles
Incident	2,200	9.0	290
0.0	2,200	10.0	240
0.5	1,400	11.0	200
1.0	1,100	12.0	150
1.5	1,000	13.0	120
2.0	1,000	14.0	100
2.5	1,000	15.0	66
3.0	900	16.0	57
3.5	900	17.0	50
4.0	900	18.0	42
4.5	900	19.0	38
5.0	580	20.0	30
6.0	520	21.0	26
7.0	440	22.0	22 (1% light level)
8.0	360		

While the primary productivity experiment was incubating, we conducted transects, using a Heath/Schlumberger Model W1-2910 chart recording depth sounding, to determine the bottom contours of Upper Russian Lake.

The primary productivity samples were preserved with Lugols acetate solution and filtered in the field. The filters were brought back to the lab and frozen for later analysis. Sampling was completed at 1825 hours.

Plexiglass periphyton substrates and Hester-Dendy benthic substrates were placed in two locations near the Fish & Game cabin. They will be sampled on a monthly basis. The weather was overcast and flat calm in the evening.

Incidental observations: River otter and three pups
Beaver
Greater yellowlegs
Sanderling
3-Harlequin chicks
Bald eagles
12-Common merganser chicks
8-Barrows Goldeneye chicks
4-Common loon

August 1, 1979

WX OBVS: OVCST-BRKN/Calm/15°C

Light misty rain was falling at Lower Russian Lake when we arrived.

Gary Rogers showed up as scheduled, to transfer us from Upper Russian Lake to Lower Russian Lake. We left Upper Russian Lake at 0920 hours, arriving at Lower Russian Lake at 0927 hours. Due to the weight, Gary had to make a second trip to Upper Russian Lake to back haul our motor, gas tank and water samples.

After we stored our gear, Bill and I went out to do our sampling. Dave Nelson and Larry Larson were due to arrive later in the day. There was a large over escapement of sockeye salmon (O. nerka) into the Russian River system. They were going to monitor the sport fishing effort along with the weir crew, in the area from the falls to the weir. This is the first time this stretch of river has been open to the sport fishing of sockeye salmon.

Lower Russian Lake: Station A: 1100 hours

WX OBVS: OVCST-BRKN/5 mph/17°C

Water depth: 5.5 meters

Secchi disc readings: down 4 meters, up 4 meters average 4 meters

A vertical plankton haul was made from 4 meters

12 liter water samples were taken from 1 meter and 4 meters.

The primary productivity (^{14}C uptake) experiment was duplicated at the 1 meter depth to look for any differences in sampling technique.

A_1 was incubated from 1130 hours to 1530 hours

Bottles #1: Light
2: Light
3: Dark - Kill
4: Dark

A_2 was incubated from 1135 hours to 1535 hours.

Bottles #1: Dark
2: Dark - Kill
3: Light
4: Not used due to a missing cap.

Solar Illuminence

Depth (m)	Foot Candles	Depth (m)	Foot Candles
Incident	3,000	2.5	1,000
0.0	2,900	3.0	680
0.5	2,100	3.5	640
1.0	1,600	4.0	530
1.5	1,400	4.5	450
2.0	1,100	5.0	380
		5.5	320

While the primary productivity experiment was incubating, we installed plexiglas periphyton substrates and Hester-Dendy benthic substrates in two locations along the west side of the lake. Site #1 was a sandy beach, while site #2 had a rocky bottom. The substrates will be checked on a monthly basis, when we do our normal sampling.

We also conducted eight transects, shown on the accompanying map, to determine the depth and bottom contours of Lower Russian Lake.

The primary productivity samples were preserved with Lugol's acetate solution and filtered in the field. The filters were stored in vials and frozen for later analysis. Sampling was completed at 1630 hours. We remained overnight at the Lower Russian Lake cabin.

Incidental observations: Arctic terns
Cow moose and calf
Female Barrow's goldeneye and 8 chicks
Dipper
Bohemian waxwing

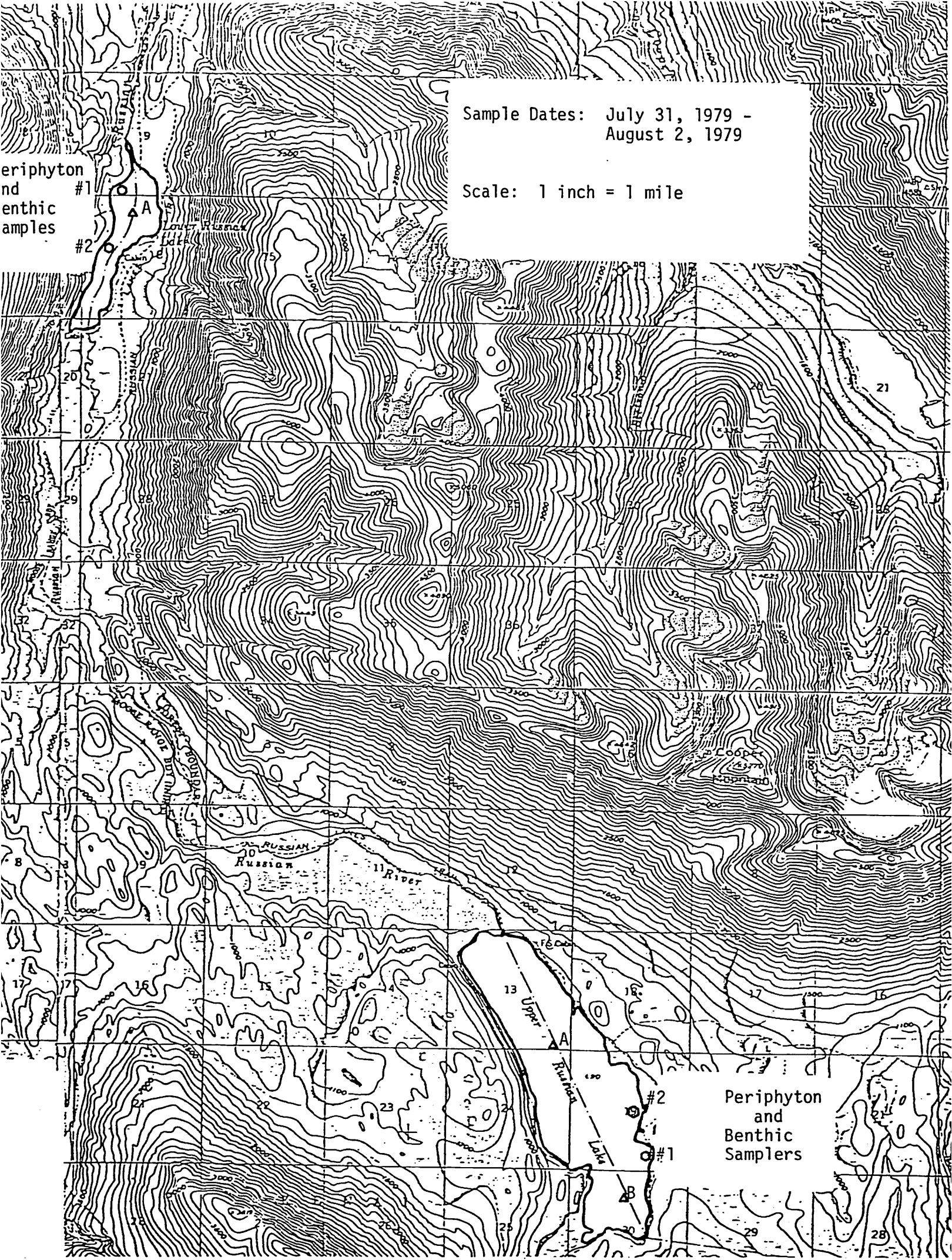
August 2, 1979

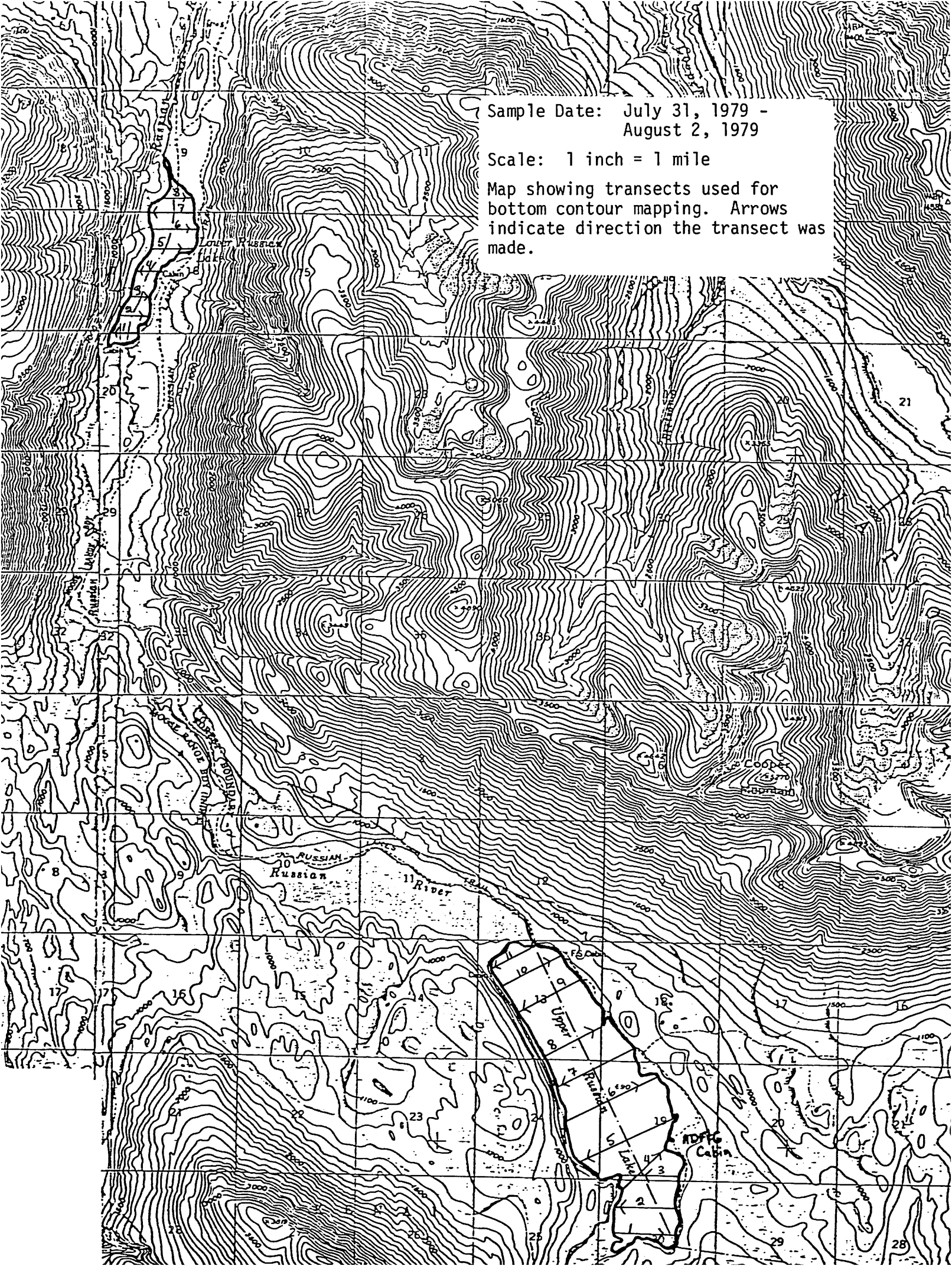
WX OBVS: 56°F/Calm/OVCST/Low Fog

Gary Rogers arrived at 0900 hours to take us out. We left Lower Russian Lake at 0905 hours, arriving at Kenai Lake at 0915 hours. After paying our bill, we left for Soldotna, arriving at 1145 hours. The gear was stored and water samples refrigerated for later analysis.

Analysis of Water Samples From Upper and Lower Russian Lakes

Location	Sample Date	Analysis Date	Depth (m)	pH	Conductivity (μmHOS/cm)	Alkalinity (mg/l $CaCO_3$)	Ca^{++} (mg/l)	Mg^{++} (mg/l)	Total Dissolved Solids (mg/l)
Upper Russian Lake Station A	7/31/79	8/6/79	1	7.4	59.0	25.0	11.0	0	43.0
Upper Russian Lake Station A	7/31/79	8/6/79	20	7.3	62.0	22.0	11.0	0	32.0
Upper Russian Lake Station B	7/31/79	8/6/79	1	6.3	72.0	4.0	10.0	0	60.0
Upper Russian Lake Station B	7/31/79	8/6/79	20	7.3	61.0	24.0	10.0	0	38.0
Lower Russian Lake Station A	8/ 1/79	8/2/79	1	7.3	78.0	22.0	18.0	0	71.0
Lower Russian Lake Station A	8/ 1/79	8/2/79	4	7.5	85.0	35.0	15.0	0	50.0


Sample Dates: July 31, 1979 -
August 2, 1979
Scale: 1 inch = 1 mile
eriphyton
nd
enthic
amples
#1
#2
A
Lower Russian
Lake
Upper Russian
Lake
Russian
River
Cooper
Mountain
13
Upper
Russian
Lake
#2
#1
A
B
Periphyton
and
Benthic
Samplers


Sample Date: July 31, 1979 - August 2, 1979
Scale: 1 inch = 1 mile
Map showing transects used for bottom contour mapping. Arrows indicate direction the transect was made.
Lower Russian Lake
Upper Russian Lake
ADF&G Cabin
Cooper Mountain
Russian River
RUSSIAN
RUSSIAN
Russian
Russian
Russian

Explanation of Abbreviations

Used to Record Weather Observations

WX OBVS	Weather observations
CAVU	Ceiling and visibility unlimited (clear and sunny)
OVCST	Overcast (total cloud cover)
BRKN	Broken (mostly cloudy, some clear areas)
SCTD	Scattered (mostly clear with some clouds)
RW	Rain
SW	Snow
Lt.	Light
Mod.	Moderate
Hvy.	Heavy

Wind speed measured with Taylor hand held meter

Air temperature measured with pocket thermometer.

Trip Report
Limnological Sampling of
Upper and Lower Russian Lakes
September 11-14, 1979
Don Seagren

September 11, 1979

WX OBVS: BRKN/10-15 mph/15°C

Jim Edmundson and I left Soldotna at 0820 hours, via a State vehicle, arriving at Moose Pass at 1000 hours. We had a series of flights set up with Ludwig Pfleger, owner of Trail Lakes Flying Service. We loaded up his 206 on floats, N 756 MD, and left Lower Trail Lake at 1033 hours, arriving at Lower Russian Lake at 1047 hours.

Lower Russian Lake:

WX OBVS: SCTD/Sunny/18°C/6 mph

We unloaded the plane and took our personal gear up to the cabin. We left the sampling gear along the shore for later use. After putting the boat in the water, we spent the rest of the day cutting, hauling and splitting firewood for use during our winter sampling trips.

Incidental Observations: Numerous sheep at Cooper Landing
6-Common Mergansers
Kingfisher
Magpie
1-Puddle Duck (species unknown)

September 12, 1979 - Lower Russian Lake:

WX OBVS: OVCST-BRKN/Calm/14°C

Winter won't be far away. The leaves in the area were turning colors rapidly and falling fast. The area will be full of bare trees in a short time.

We found lots of ripe mossberries and lowbush cranberries in the area. We had no way to preserve them. If we did, we would have picked some in the evening to take home.

We loaded up the boat and headed out to do our sampling for the day.

Lower Russian Lake, Station A: 1005 hours

WX OBVS: OVCST-BRKN/+17°C/10-15 mph

Water depth: 6 meters

Hach kit D.O. at surface: 10 mg/l

(Previous reports have given D.O. readings in ppm. ppm and mg/l are analogous readings, so the results can be compared.)

Water samples taken at 1 meter and 5 meters.

Secchi disc readings: Down: 6.0 meters
Up: 6.0 meters
Average: 6.0 meters

A 5 meter vertical plankton haul was made using a 1 foot diameter x 153 μ net.

^{14}C (primary productivity) experiment was set at 1005 hours and pulled at 1405 hours; total incubation time: 240 minutes

Solar Illuminance

Depth (m)	Foot Candles (Up)	(Down)	% Incident Light Level (Up)	(Down)
Incident	1,300	135		
0	350	14	27	10
0.5	340	15	26	11
1.0	340	14	26	10
1.5	270	13	21	10
2.0	200	20	15	15
2.5	230	12	18	9
3.0	260	10	20	7
3.5	200	8.5	15	6
4.0	170	7.5	13	6
4.5	150	6.5	12	5
5.0	130	5.5	10	4
6.0	96.5	3.3	7	2

Dissolved Oxygen/Temperature Profile

Depth (m)	Temperature (^{o}C)	Dissolved Oxygen (mg/l)	% Oxygen Saturation
0	10.0	11.0	97
1	10.4	11.0	98
2	10.4	11.0	98
3	10.4	11.0	98
4	10.4	11.0	98
5	10.4	10.8	96
6	10.2	10.4	92

While the ^{14}C experiment was incubating, we went to check on the periphyton and benthic substrates that we had set in two locations last month. At Station 1, the benthic substrate was found on the shore. The periphyton substrate was in place and was sampled. At Station 2, both the periphyton and benthic substrates were missing. We replaced both the benthic and periphyton at Station 1 only. Station 2 was eliminated for the rest of the season. The lost samplers may have been due to the high water conditions that occurred after they were set.

We finished sampling at 1500 hours. From noon on, we had heavy overcast and fog, low clouds and light rain. The weather was deteriorating rapidly.

We took a stream flow of the Lower Russian River, with a pygmy Gurley meter, in the same location that flow measurements were taken all season.

Width: 42 m

Average Depth: .22 m

Velocity: 1.3 m^3/second

We saw only one hunter during our trip. It was relaxing not having the usual crowd of tourists in the area. The white sox and no-see-ums were still out in force.

We were to be picked up this evening to be taken to Upper Russian Lake. We waited until near dusk for our transportation before retiring back to the cabin for the night. The weather at Lower Trail Lake must have been too bad to fly.

We noticed juvenile salmonids constantly feeding all over the lake in the evening

September 13, 1979

WX OBVS: OVCST/5-10 mph/ 14^{o}C/Lt. Rw

We waited most of the day for transportation to Upper Russian Lake. He finally arrived at 1727 hours. He was delayed due to bad weather in the Moose Pass/Lower Trail Lakes area. Due to the added weight of the water samples and calm conditions, he had to make two trips, to move us and our gear to Upper Russian Lake. At 1830 hours, we were settled in at Upper Russian Lake. The weather was overcast, calm with light rian. We had planned on spending two days at Upper Russian Lake, one cutting wood for the winter and one sampling. Due to the delay, we eliminated the wood cutting on this trip. Looking at the cabin, we found it has little support left. Most of the pilings have shifted due to the freeze/thaw cycles. It will be interesting to see how much longer the cabin remains standing.

September 14, 1979 - Upper Russian Lake

WX OBVS: OVCST/Low Clouds and Fog/RW/12^{o}C/10 mph

We had rain constantly all night. We managed without a fire for warmth. The axe that had been at the cabin had been stolen so we didn't have a way to cut or split firewood.

From the cabin, the lake didn't look too bad. We had to make two trips to get the sampling done. When we first arrived at Station A, we found 20+ mph winds and 3 foot waves, along with constant heavy rains. We decided to sample the benthic and periphyton substrates first, and see if the wind would die down.

At Station 1, both the benthic and periphyton substrates were missing. We replaced both substrates. At Station 2, the benthic substrate was missing and was replaced. The periphyton substrate was in place and was sampled. The missing substrates were presumably due to high water conditions that occurred since they were set. Of course at both Lower and Upper Russian Lakes, the possibility of human removal also exists.

We returned to Station A later and found the conditions the same as before. We managed to do all our sampling except the ^{14}C primary productivity experiment.

Station A - Upper Russian Lake

WX OBVS: OVCST/Low Clouds and Fog/ 12^{o}C/Hvy. RW/20^{+} mph/3' waves

Water depth:

Hach D.O. raken at the surface : 9.0 mg/l

No Secchi disc readings were taken

A 30 m vertical plankton haul was made using the 1' dia. x 153 μ net

Water samples taken at: 1 m and 24 m

Solar Illuminance

Depth (m)	Foot Candles (Up)	Foot Candles (Down)	% Incident Light Level (Up)	% Incident Light Level (Down)	Depth (m)	Foot Candles (Up)	Foot Candles (Down)	% Incident Light Level (Up)	% Incident Light Level (Down)
Incident	1,200	170			11.0	75	7	6	4
0	450	35	38	21	12.0	67	6	6	4
1.0	420	15	35	9	13.0	53	5.5	4	3
2.0	350	50	29	29	14.0	45	4	4	2
3.0	270	30	23	18	15.0	36	3.3	3	2
4.0	250	40	21	24	16.0	30	2.5	2.5	1
5.0	210	30	18	18	17.0	44	5	4	3
6.0	180	40	15	24	18.0	43	6	4	4
7.0	175	33	15	19	19.0	40	6	3	2
8.0	165	30	14	18	20.0	33	4	2.8	2
9.0	130	15	11	9	21.0	45	10	4	3
10.0	100	10	8	6					

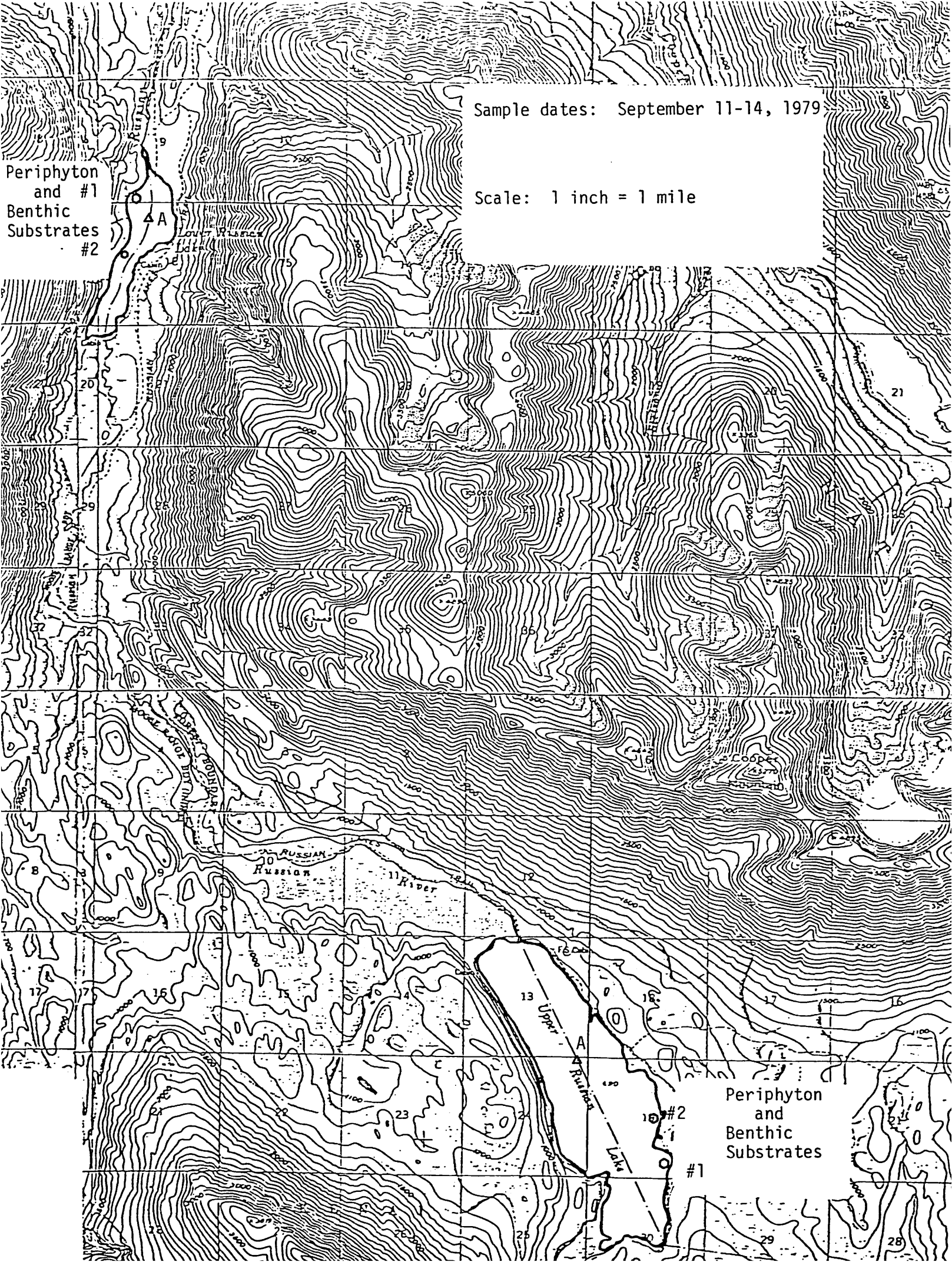
Dissolved Oxygen/Temperature Profile

Depth (m)	Temperature (°C)	Dissolved Oxygen (mg/l)	% Oxygen Saturation
0	12.2	9.0	83
1	12.2	9.0	83
2	12.2	9.0	83
3	12.2	8.9	82
4	12.2	8.9	82
5	12.2	8.9	82
6	12.2	8.8	81
8	12.2	8.7	81
10	12.2	8.7	81
12	12.0	8.6	80
16	12.0	8.6	80
20	12.0	8.6	80
24	12.0	8.6	80

At Bear Creek, where we have benthic and periphyton substrates, we noticed approximately 200-300 fresh sockeye salmon off the mouth of the creek as well as just in the creek. There were numerous fresh signs to indicate that bears were frequently in the area.

Trail Lakes Flying Service arrived at 1545 hours. After several tries, we were off Upper Russian Lake at 1605 hours, arriving at Lower Trail Lake at 1621 hours.

We sampled only one station at Upper Russian Lake on this trip, based on Upper Russian Lake being a single basin lake. It was later decided to switch back to the two station sampling scheme we previously did.


Sample dates: September 11-14, 1979
Scale: 1 inch = 1 mile
Periphyton and #1 Benthic Substrates #2
Periphyton and Benthic Substrates
#1
#2
A
Lower Russian Lake
Upper Russian Lake
Russian River
Cooper
Russian

Laboratory Analysis of Upper and Lower Russian Lakes Water Samples

Location	Depth (m)	Sample Date	Analysis Date	pH	Conductivity (μMhos/cm)	Alkalinity (mg/l)	Ca^{++} (mg/l)	Mg^{++} (mg/l)
Lower Russian Lake-Sta. A	1	9/12/79	9/16/79	7.76	88	34	17	1
Lower Russian Lake-Sta. A	5	9/12/79	9/16/79	7.78	87	36	16	1
Upper Russian Lake-Sta. A	1	9/14/79	9/16/79	7.48	54	24	10	1
Upper Russian Lake-Sta. A	24	9/14/79	9/16/79	7.44	57	26	11	1

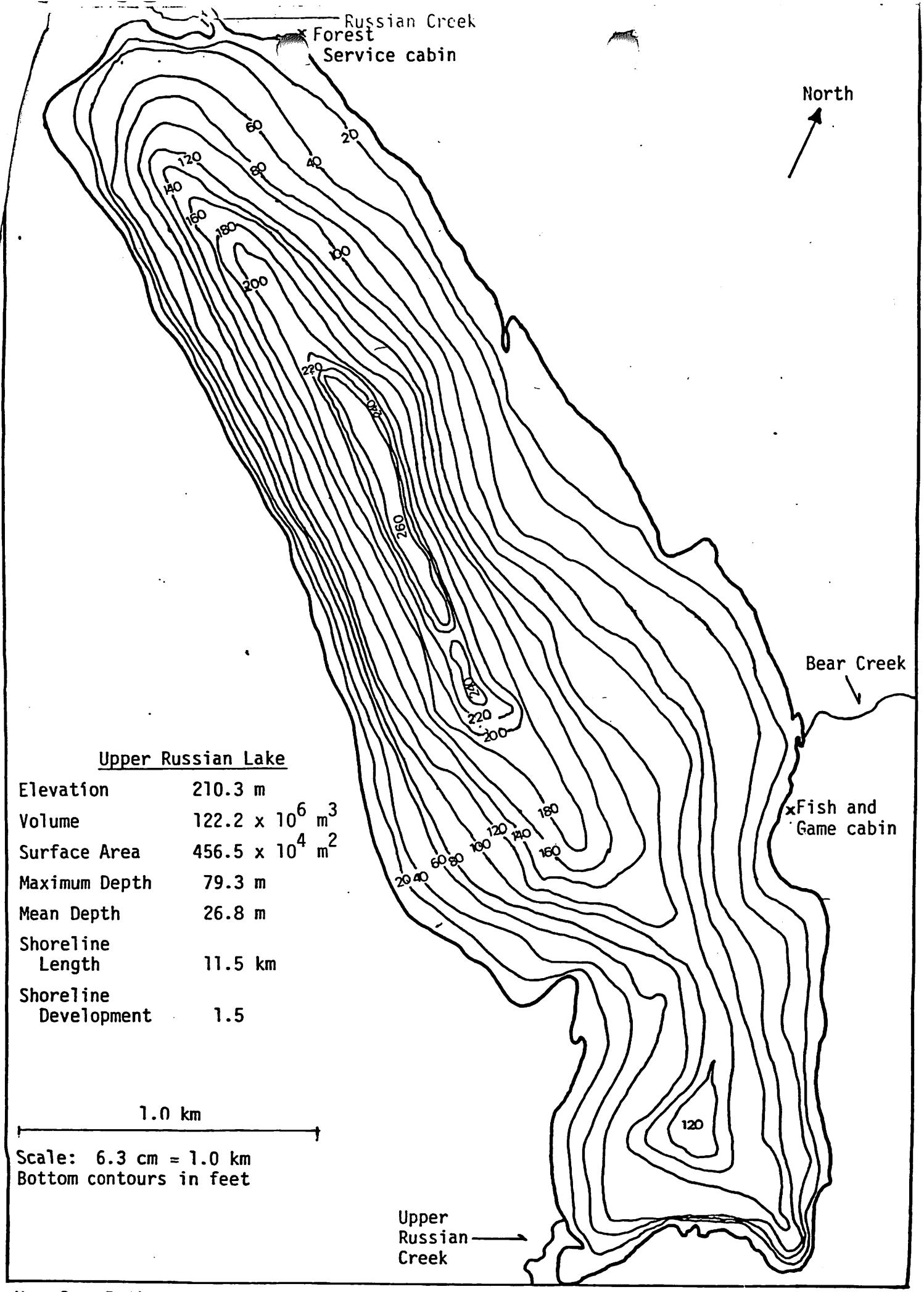
Explanation of Abbreviations

Used to Record Weather Observations

WX OBVS	Weather observations
CAVU	Ceiling and visibility unlimited (clear and sunny)
OVCST	Overcast (total cloud cover)
BRKN	Broken (mostly cloudy, some clear areas)
SCTD	Scattered (mostly clear with some clouds)
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SW	Snow
Lt.	Light
Mod.	Moderate
Hvy.	Heavy

Wind speed measured with Taylor hand held meter

Air temperature measured with pocket thermometer.



Map 3. Bathymetric map of Upper Russian Lake showing depth contours and morphometric data.

upper Russian Lake

Winter Sampling of Upper Russian Lake

April 5 & 6, 1979

by Don Seagren

April 5, 1979

WX OBVS: BRKN-SCTD/5 mph/-4°C

After about a week of bad weather, we finally got some improvement so we could get into Upper Russian Lake. Finding an airplane on skiis was our other problem.

We finally found what we needed at Dick's Flying Service. Their Beaver, on wheel skiis, was the only commercial aircraft around on skiis. Among our other options was Kenai Air's Jet Ranger helicopter at $325/hour. The Federal people would have helped us if we were in a bind, but preferred we use commercial pilots.

Jim Edmundson and myself flew with Mike Moll (Dick's Flying Service) in his Beaver (N99838) on wheel skiis, leaving Soldotna at 1217 hours, and arriving at Upper Russian Lake at 1247 hours.

The rivers and streams throughout the area appeared to be free flowing with only some shore ice left along the banks.

Skilak Lake was free of snow cover and appeared to be covered with rotten ice. Many open leads and holes could be seen all across the lake. All the streams and rivers flowing into Skilak Lake were flowing freely. It will probably be another week or two before the lake is completely free of ice.

Although we didn't fly directly over it, Hidden Lake appeared solid. Like other lakes in the area, the streams flowing into and out of Hidden Lake were flowing freely.

The streams associated with Upper Russian Lake were all free flowing. The lake itself appeared to be solid with a continuous covering of snow. Upon landing we found the ice was solid, but the snow soft due to the effects of the sun.

Upper Russian Lake

WX OBVS: CAVU/Calm/+5°C - a weather front appears to be moving in from Skilak Lake area.

We stayed at the Fish and Game cabin, located at the upper end of the lake. Instead of being empty, like we were informed, we found it reasonably well stocked for an emergency situation. The only things we found lacking were candles, cartridges for the lantern and firewood. I presume the winter recreationists had used up the available wood supply stored outside. The cabin was in good shpe, showing no signs of damage, break-in, or recent unauthorized habitation.

Since it was still early, and the weather was cooperating, we decided to explore the area and begin our sampling. As things turned out the next day, it was good we did. We loaded up our gear and walked to the outlet.

Upper Russian Lake is set in a broad mountain valley, with the outlet at the northern end. The southwest side of the lake is steeper, and presumably deeper, than the opposite shore where the ADF&G cabin is located. It's about 3 miles long with an average of 1" of snow distributed uniformily over the lake. The Russian Lakes Trail runs along the Northeast shore. All the streams flowing into or out of the lake were open. Most of the snow around the lake was gone, although there was still quite a bit in the higher elevations.

Upper Russian Lake Outlet - 1510 hours

WX OBVS: CAVU/0-5 mph/+8°C

The outlet was open, in a fan shape, about 50' - 75' out into the lake. It had a rocky bottom, about 50' wide. The clear water was only about a 2 feet deep at its maximum. Water temperature, taken with a pocket thermometer, was +2°C at the outlet.

Samples of water and snow were taken about 100 yards downstream from the mouth. The area had a rocky bottom, with about 2' - 3' of clear water. The channel was about 75 yards wide and split by an island. The YSI temperature/D.O. meter and Markson digital pH meter were used for all measurements on this trip.

Field data:

Depth	Temp.	D.O.	pH
Surface	2°C	16.8 ppm	7.42

Upper Russian Lake #1 - 1615 hours

WX OBVS: CAVU/ 6 mph/+4°C

½" uniform snow cover

2.5' - 3' of moderately hard ice

Clear water

Water depth: 47 meters

Hach kit D.O. taken at the surface was 16.5 ppm

Samples taken: ice, 46 m, 26 m, 5 m

We took two sets of temperature/D.O. measurements to check the YSI meter. The readings from surface to the bottom (0-47 m) are marked ↓. The readings from the bottom to the surface (47-0 m) are marked ↑.

Field Data:

Depth (m)	Temp. (°C)↓	D.O. (ppm)↓	pH	D.O. (ppm)↑	Temp. (°C)↑
0	0°	17.2	7.68	15.0	0.5
5	1.25	16.0		14.6	1.25
10	1.25	15.4		14.4	1.30
15	1.25	14.8		14.4	1.30
20	1.50	14.2		14.2	1.25
25	1.50	13.8		14.0	1.50
30	1.50	13.1		13.4	1.50
35	1.50	12.4		13.3	1.50
40	1.70	12.4		13.4	1.70
45	1.70	12.1		13.4	1.70
45.5	1.70	13.8		--	--
46	2.0	14.2		13.4	2.0
47 (Bottom)	2.0	14.4		13.4	2.0

On our way to sample site #2 we stopped to examine a Cessna 180 that was imbedded in the ice. Only the tail was visible above the ice. It was located directly across from the Fish and Game cabin. If they wait too long before attempting recovery, they'll probably loose it.

Upper Russian Lake #2 - 1800 hours

WX OBVS: Sunset/CAVU/7 mph/0°C

The expected storm front didn't materialize. It covered about half the lake and then receeded.

1" uniform snow cover

3' of soft ice

Water depth: 28.5 meters

Clear water

Samples taken: ice, 28 m, 16 m, 4 m.

Field data:

Depth (m)	Temp. (°C)	D.O. (ppm)	pH
0	0°	14.2	7.27
1	0.8	14.2	
2	1.0	13.8	
4	1.1	13.7	
6	1.1	13.3	
8	1.1	13.2	
10	1.1	13.1	
12	1.2	13.0	
14	1.2	12.9	
16	1.2	12.7	
18	1.2	12.6	
20	1.2	12.5	
22	1.2	12.3	
24	1.5	12.0	
26	1.5	12.0	
28	1.5	12.0	
28.5 (Bottom)	1.5	12.0	

We finished sampling at 1845 hours and hiked back to the cabin. While Jim started a fire and put away the gear, I collected and cut firewood. We ended up eating by flashlight since there were no candles or propane cartridges for the lantern. A few clouds appeared from the Cooper Lake area late at night along with a faint display of northern lights.

Incidental observations: Trees preparing to bud soon

1 set of moose tracks on ice near outlet

5 sets of wolf tracks on ice near outlet

Crane flies on the ice

April 6, 1979

WX OBVS: OVCST/5 - 10 mph at the cabin/+2°C/Snow, blowing with periodic white out conditions.

We woke up to go sampling in the middle of a snow storm. At times, we couldn't see the other side of the lake. Figuring we wouldn't be leaving today as planned, we stoked the fire and waited to see if the storm would subside at all. After several cups of coffee, we ventured forth into the storm to sample the remaining locations.

Upper Russian Lake #3

WX OBVS: OVCST/15 mph/ Snow/+2°C/Ceiling at about 500'

1" uniform snow cover

3' of soft ice

Water depth: 35 m

Clear water

pH 7.38

Samples taken: ice, surface

We had just finished drilling a hole in the ice and had begun the sampling process, when we heard the sound of an airplane. Mike Moll showed up early, at 1230 hours, to pick us up. He wasn't due for a few more hours. We hadn't even expected him, due to the snowstorm.

The weather was due to get worse, so we terminated all sampling, and rushed back to the cabin to pack. We left Upper Russian Lake at 1303 hours, arriving at Soldotna at 1327 hours.

Other than the weather, we encountered no problems during this trip. We have worked most of the problems out of the sampling routine.

LAB ANALYSIS OF UPPER RUSSIAN SAMPLES

Location	Sample Date	Analysis Date	Depth (m)	pH	Conductivity µMHOS/CM	Alkalinity ppm($CaCO_3$)	Hardness ppm($CaCO_3$)
Outlet	4/5/79	4/16/79	0	7.44	62	35	26
Outlet	4/5/79	4/16/79	Snow	6.08	5.5	2	3
Station 1	4/5/79	4/16/79	Ice	6.07	6.2	3	4
Station 1	4/5/79	4/16/79	5	7.33	58	23	25
Station 1	4/5/79	4/16/79	25	7.31	63	24	27
Station 1	4/5/79	4/16/79	46	7.38	61	24	28
Station 2	4/5/79	4/16/79	Ice	6.12	6.8	2	1
Station 2	4/5/79	4/16/79	4	7.35	63	26	23
Station 2	4/5/79	4/16/79	16	7.37	63	24	27
Station 2	4/5/79	4/16/79	28	7.53	63	25	27
Station 3	4/6/79	4/16/79	Ice	6.65	12.5	4	1
Station 3	4/6/79	4/16/79	0	7.44	63	25	27

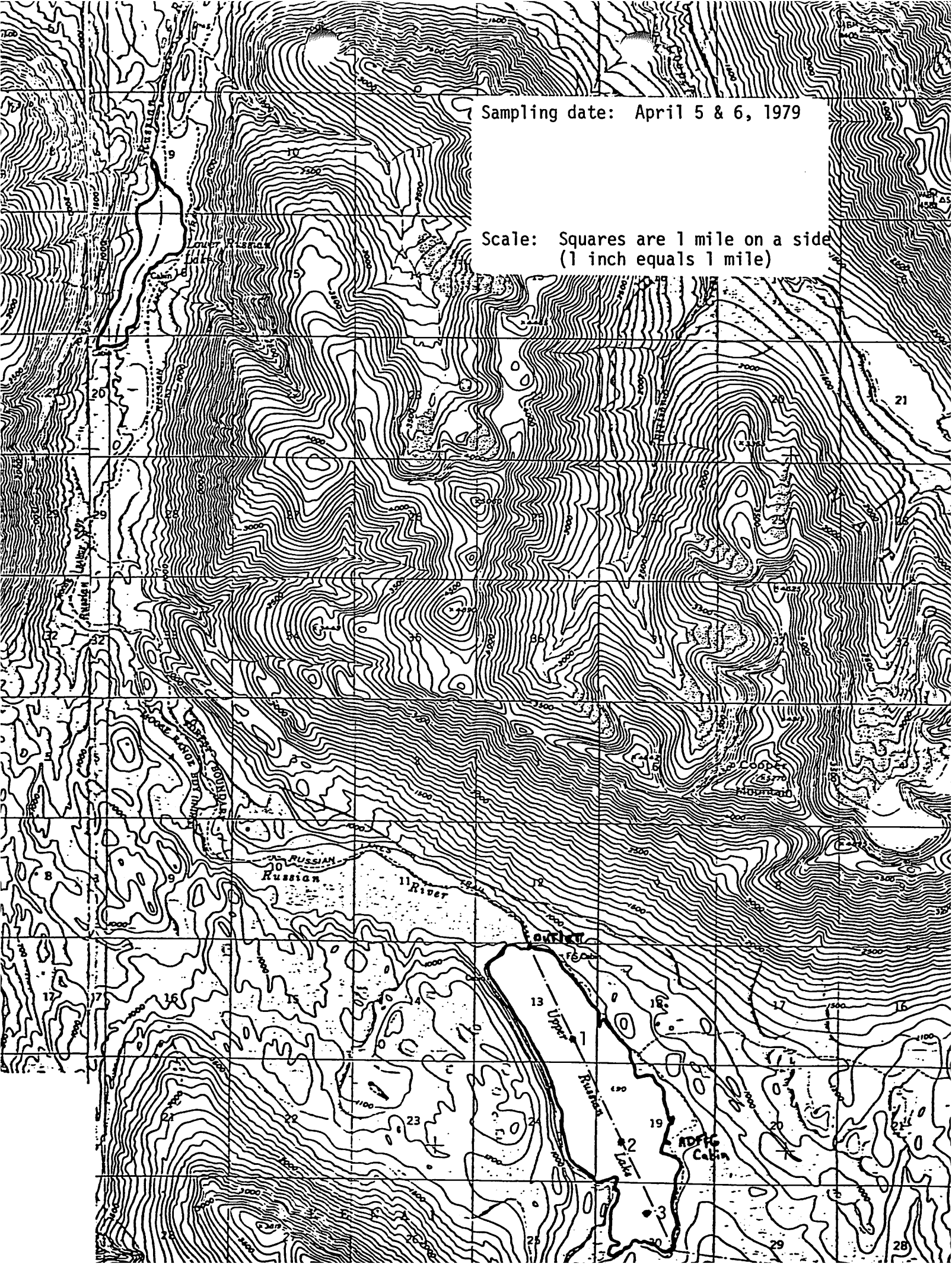
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Sampling date: April 5 & 6, 1979
Scale: Squares are 1 mile on a side
(1 inch equals 1 mile)
Lower Russian Lake
Russian River
Cooper Mountain
Outlet
Upper Russian Lake
ADF&G Cabin
1
2
3