LAKE HABITAT SURVEY FORM (Part 1)

1. Lake Name Carter Lake 2. ADF&G Cat. No. _____
3. Bay/Drainage Trail Lakes 4. Management Area _____
5. USGS Topo. Map(s) Seward (B-7), T 5N, R 1W, sections 28 and 33
6. Aerial Photo

Flight Line	Roll #	Photo #	Year	Photo Grid #

Undated

7. Inlets

	Map Length	Accessible Length	Spawning Area	Discharge
Many sm	___ km	___ km	___ M^2	___ M^3/Sec
northea	___ km	___ km	___ M^2	___ M^3/Sec
northwe	___ km	___ km	___ M^2	___ M^3/Sec

8. Outlets

	Map Length	Accessible Length	Spawning Area	Discharge
east	___ km	___ km	0 M^2	___ M^3/Sec
	___ km	___ km	___ M^2	___ M^3/Sec
	___ km	___ km	___ M^2	___ M^3/Sec

9. Surface Area 48 acres ha 10. Elevation 1,486 ft. M
11. Maximum Depth 60 ft. M 12. Average Depth _____ M
13. Volume _____ hectare/meter 14. Spawning Shoal Area _____ M^2
15. Water Color light brown 16. Turbidity 4 ft. (light penetration) M
17. Temperature/Depth 4.4 °C/ 0 M, 4.0 °C/25' M, ___ °C/___ M, ___ °C ___ M
18. Dissolved Oxygen 14/0' 14/25' ppm 19. Carbon Dioxide 5/0' 5/25' ___ ppm
20. Total Alkalinity 7/0' 7/25' ___ ppm 21. Total Hardness 34/0' 34/25' ___ ppm
22. Total Dissolved Solids ___ ___ ___ ___ ppm 23. PH ___ 7.3 units
24. Specific Conductance ___ ___ ___ ___ umhos/cm 25. Total Phosphorus ___ ___ ug/l
26. Nitrate ___ ___ ug/l
27. Aquatic Vegetation (Describe Type, relative abundance, distribution, etc.)

_____

_____

_____

28. Plankton Tows
    a. Horizontal

	Time		Distance	
Tow 1	_____	Seconds	_____	meters
Tow 2	_____	Seconds	_____	meters

Describe type and relative abundance of planktons sampled _____

_____

_____

_____

b. Vertical

	Time	Depth of Vertical Haul
Tow 1	_____ Seconds	_____ meters
Tow 2	_____ Seconds	_____ meters

Describe type and relative abundance of planktons sampled _____

_____

_____

_____

_____ (1976)

29. FISH PRESENT...NATIVE none Introduced grayling(1963), rainbow

30. ENHANCEMENT POTENTIAL (Type, description, target species, photo number and description, etc...) Tickle-dam built in 1976.

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31. Special Considerations/Comments (Major Land Uses, Special Land Classification, Photo numbers and description, etc...) _____

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32. Investigators _____ 33. Date _____

CARTER LAKE FILE

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Carter Lake Fisheries Habitat Survey
Chugach National Forest

Introduction

A fishing habitat survey of Carter Lake located on the Chugach National Forest was conducted on June 30, 1975, by 48 Youth Conservation Corps members under supervision of 7 YCC crew leaders and Norm Howse, USFS Wildlife and Fisheries Program Manager. The lake is located in T. 5N., R.1W., Sections 28 and 33, S.M. on USGS Quadrangle map, Seward (B-7). The objectives of the survey were:

1. to assess the limnological characteristics of the lake
2. to assess the fishery potential of the lake
3. to determine what management actions might be taken to increase the quality and recreational use of the fishery resource.

Methods and Materials

1. Office

Prior to the field work, an enlarged drawing of the lake was prepared from aerial photographs and maps. From these drawings, lake topography (see enclosure 1) determiniations were made and copies produced for field checking of measurements and plotting of field data.

2. Field

In the field, physical, chemical, and biological data were secured at several stations on the lake.

Physical measurements of the lake topography, air temperature, water temperature, bottom composition, water color, light penetration, and locations and abundances of possible spawning areas were noted. Maximum depths and depths at selected locations were plotted on the lake drawings so that contours could be drawn and approximate volumes determined.

Chemical measurements were taken using a Hach DR Engineers Water Analysis Laboratory. A one litre Kemmerer water sampler was used to obtain samples.

Biological samples of benthal invertebrates were collected using an Ekman dredge. Observations for aquatic vegetation were made. A rubber raft was used to transport personnel and equipment around the lake.

Results and Discussion

This natural lake is located in a mountain alpine at an elevation of 1486 feet. It has an inlet on the west side of the lake and one outlet, Carter Creek. The watershed area is about 1440 acres in size. There are two routes of access to the lake. The shortest, the Carter Lake Trail, (3 miles) originates on the Seward Highway; the longer (6.2), the Crescent Creek Trail originates off the Sterling Highway. Although Carter Lake Trail is shorter, it is not as well defined as Crescent Creek Trail. There are no campsites at the lake and the use has been limited primarily to sheep and bear hunting.

Shrub willow extend to the base of the mountain on the northwest side of the lake. The south side and the lake outlet area are also willow but interspersed with alder. On the steeper mountainous southeast side, the vegetation is primarily spruce and some hemlock but again willow and alder cover the drainages and outwash areas. A slight gradient exists on the northwest side of the lake for approximately one quarter mile with an open meadow on the south. The northeast side has a much steeper slope causing some difficulty travelling by foot near the shore. A large hill exists on the northwest side which appears to be a moraine deposit. In general, there is good access to the majority of the lake shore area.

The outlet stream of Carter Lake has a moderate gradient for about one quarter mile and then begins a steep descent to drain into Moose Creek. About 500 feet below the outlet mouth is a wide pool area, but limited as a spawning area for rainbow trout. Bottom type for the pools is 75% silt, 10% boulder, 10% gravel, and 5% detritus material. The pools will, however, provide rearing area for fry.

The stream has good cover and is in a stable channel. The pool/riffle ratio is 75/25 however, a good portion of the pools in the outlet and are not suitable for spawning. The riffle areas of the stream have a bottom type of 50% rubble, 30% boulder, and 20% gravel indicating that there are fair spawning conditions for rainbow trout. The inlet stream to Carter Lake is very limited for spawners due to a cold water temperature, and a steep gradient. Other than the outlet area, there appears to be only limited spawning area on the lake shore.

Table I presents the physical characteristics of the lake and Table II presents the physical measurements obtained.

Table I

Physical Characteristics of Carter Lake

Area	48 Acres
Maximum Length	3300 Feet
Maximum Width	990 Feet
Maximum Depth	60 Feet
Length of Shoreline	7900 Feet
Shoreline Development Ratio	1.4*

*The ratio of shoreline length (L) to circumference of a circle of area (A). The limiting factor is 1, for a circular lake. In all other lakes, higher development ratios are found.

Table II

Physical Measurements of Carter Lake on June 30, 1975

Time	1200 Hours
Weather	Cloudy
Wind	Calm
Air Temperature	49° F.
Lake Water Temperature	40° F. (surface) 39° F. (25' depth)
Outlet Water Temperature	55° F.
Water Color	Light Brown
Light Penetration	4 Feet
Bottom Composition	10% rubble, 90% silt
Water Level	Normal
Lake Bottom Vegetation	None observed

The chemical composition of the water is presented in Table III.

Table III

Water Analysis of Carter Lake on June 30, 1975

Chemical	Surface	25' Depth	Outlet	Inlet
Dissolved Oxygen	14	14	14	14
Carbon Dioxide	5	5	5	5
Total Acidity	7	7	7	7
M.O. Alkalinity	34	34	34	34
PHTH Alkalinity	0	0	0	0
Hydrogen - ion (pH)	7.3	7.3	7.3	7.3
Hardness	34	34	34	34
Turbidity	Clear	Clear	Clear	Clear

The invertebrate and insect population composition is shown in Table IV.

Table IV

Invertebrates and Insects Found in Carter Lake and Tributaries on June 30, 1975

Invertebrates and Insects	Abundance
Caddis Fly larvae - Tricoptera	Average
Blackfly larvae - Diptera	Few
Mosquito larvae - Diptera	Few
Freshwater Shrimp - Gammarus	Abundant
Midge larvae - Chironmid	Few

One 50 foot gill net and 2 minnow traps were set in the lake between 1000 and 1500 hours on June 30, 1975. No fish were captured either from the gill net or from the two minnow traps placed near shore. No fish were observed and there were no other indications suggesting fish life in the lake system.

Other observations of wildlife made at the lake included several Dall sheep in the adjacent mountains and numerous moose sign. Also evidence of coyote and black bear were present. There appears to be no sign of beaver in the lake complex.

From the data obtained, it appears that the physical, chemical, and biological characteristics of Carter Lake indicate that the conditions are satisfactory for production of a good rainbow trout (Salmo gairdneri) population. The lake has good depth which should provide adequate overwinter survival. The water quality is adequate and the food source should sustain a good population. Due to the existing trail, this lake could develop into a popular and better used site for sport fisheries. A winter ice fishery could be developed here in addition to the regular season fishery.

Recommendations

1. It is recommended that in cooperation with the Alaska Department of Fish and Game a stocking program for Carter Lake be planned for fiscal year 1976. A meeting should be set up with Sid Logan, Area Sport Fisheries Biologist for ADF&G to discuss a cooperative agreement and the necessary administrative details. Rainbow trout are recommended.

2. It is recommended that a trickle type dam be constructed below the pool approximately 500 feet downstream from the lake outlet. The purpose of the trickle dam will be to retain rainbow trout in the lake. The construction could be an FY 1977 YCC project in conjunction with the stocking. However, engineering assistance will probably be needed in both the design and construction.

3. It is recommended that the trail between Crescent Lake and Carter Lake be connected and that a public use cabin be considered for Carter Lake.

JOHN WENGER
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Chugach National Forest