

YUKON RIVER BASIN STUDY

PROJECT REPORT: FISHERIES No. 7

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NOTES ON THE 1983 SPORT  
FISHERY: ATLIN LAKE, B.C.  
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SOME NOTES ON  
THE 1983 SPORT FISHERY,  
ATLIN LAKE, B.C.

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## INTRODUCTION

Atlin Lake, located in the extreme northwestern corner of British Columbia and in the Yukon (Fig. 1), is one of a chain of lakes that are recognized by anglers for their large lake trout (Salvelinus namaycush) and for tributary production of Arctic grayling (Thymallus arcticus). A project funded under the auspices of the Yukon River Basin Study was commissioned to report on the sport fishery of Atlin Lake. The results from this survey will in part form the basis for future management decisions regarding maintenance (regulation) of present lake trout and grayling populations.

Aspects of the Atlin Lake fisheries were first discussed by Withler (1956) who described the limnological conditions of the lake and the fishery with a specific reference to changes that might result from hydroelectric development.

The objective of this study was to collect detailed information on angler origin and distribution in the fishery, their catch and effort expended. Life histories of "Atlin" lake trout and Arctic grayling were also investigated.

## DESCRIPTION OF THE STUDY AREA

Atlin Lake lies almost wholly within British Columbia (64,000 ha) except for the extreme northern tip which extends over the provincial boundary into Yukon territory (90 ha). Access to the lake is via road

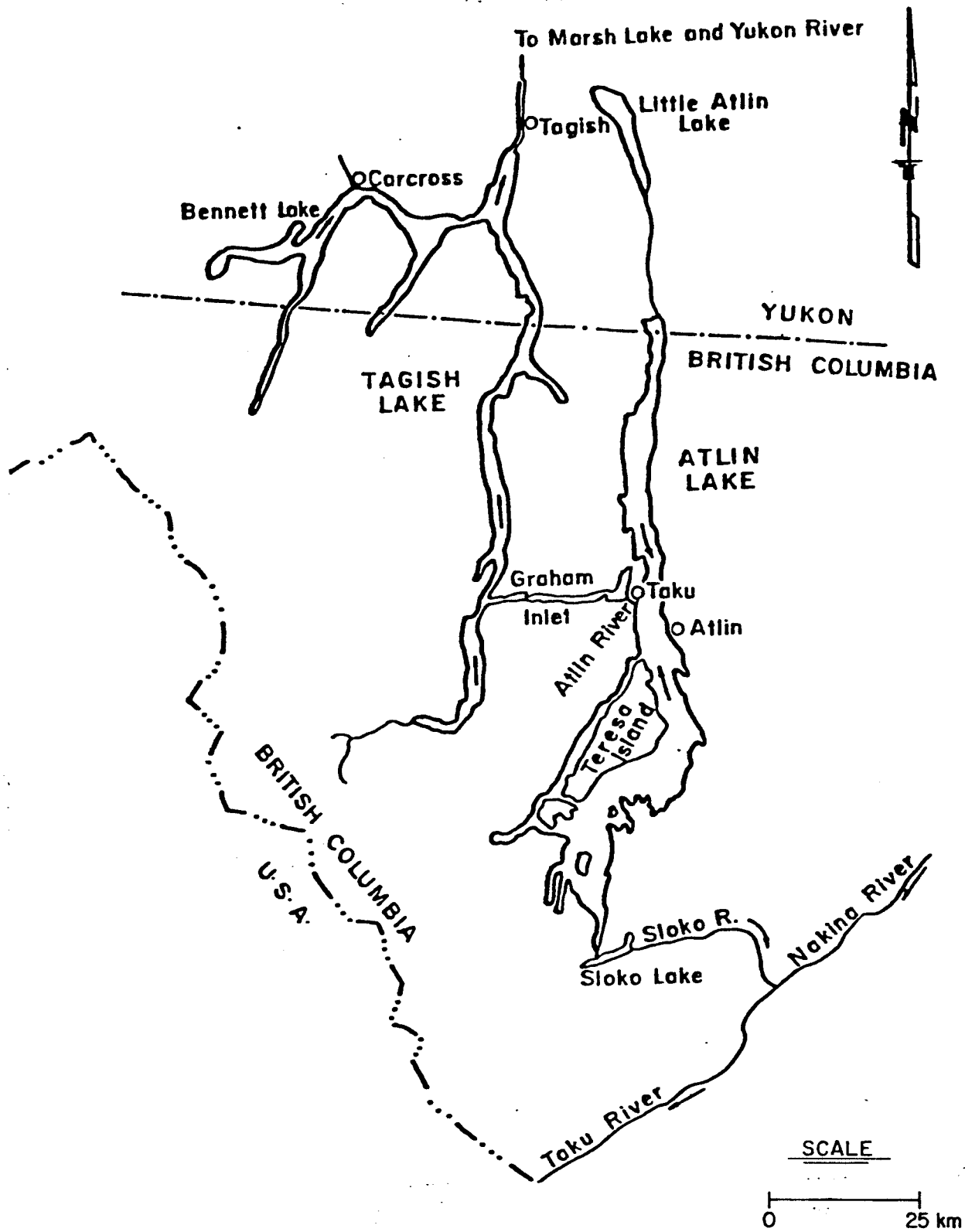


Fig. 1 Atlin Lake Drainage Area

along the east side, 200 km south from Whitehorse in the Yukon. In all some 11,000 sq. km of area are drained by Atlin Lake. To the south the terrain is mountainous and most tributary streams are glacially-headed, silt laden and unproductive while tributary streams in the north (towards the Yukon) flow over more gentle terrain and, if lake-headed, are clear and relatively productive.

Atlin Lake is drained by the Atlin River which flows into Tagish Lake, part of the myriad of waterways which from the Lewes River join the Yukon River proper.

Mining, recreation, trapping and commercial fishing are the major activities within the Atlin watershed.

Species harvested by the sport and commercial fisheries in the watershed include lake trout, Arctic grayling, round whitefish (Coregonus cylindraceua quadrilaterale), lake whitefish (Coregonus clupeaformis), northern pike (Esox lucius), and burbot (Lota lota). In both fisheries lake trout are the preferred species. (S. Johnson - Pers. comm.).

Lake trout fisheries operate year round from boats in summer and under the ice in winter. Local (Atlin) concern for lake trout stocks, in particular the reduced number of large fish in anglers' creels, prompted the B.C. Ministry of Environment to stop issuing netting (sustenance) permits and to lower catch and possession limits on the British Columbia side. Despite complaints about the commercial catch of lake trout in the Yukon portion of Atlin Lake, the Federal Department of Fisheries and Oceans continues to allow commercial harvest of lake trout albeit for limited tonnage.

## METHODS

Atlin Lake was divided into five zones (Fig. 2). Zones were selected on the following basis:

- Zone 1 - The most southerly zone overshadowed by the Llewellyn Glacier and bounded to the north by an imaginary line drawn between Warm Bay and Teresa Island. Angler access to these glacial, less productive waters is difficult.
- Zone 2 - Torres Channel, located due west of Teresa Island. Angler access is somewhat restricted, however topography affords some shelter from the elements.
- Zone 3 - The area immediately surrounding the town of Atlin including Atlin River bounded to the south by an imaginary line drawn between Warm Bay and Teresa Island and to the north by a similar line drawn east to west through the narrows, north of Fourth of July Creek. This zone has the best access for anglers to both the lake and river fishery.
- Zone 4 - The area due south of the British Columbia-Yukon border to the line described for Zone 3 near Fourth of July Creek. Access in this area is limited. The sport fishery may be influenced by commercial harvest in Zone 5.
- Zone 5 - That area wholly within the Yukon. Access to anglers is limited. There is a commercial fishery in this zone.

A creel census clerk interviewed anglers from June 15 to September 30, 1983. Anglers based in the town of Atlin were interviewed daily (afternoon or evening) whereas anglers fishing Zones 4 and 5 were interviewed weekly (usually on a Sunday afternoon). Interviews were shore based hence accessed by foot or vehicle. It was felt that Zones 4 and 5 were fished most often by Whitehorse residents that arrived Friday after work and left on Sunday (L. Enders -Pers. comm). Therefore a one day census (Sunday) of Zones 4 and 5 would provide the information desired. Appropriate creel census forms were completed for each angler.

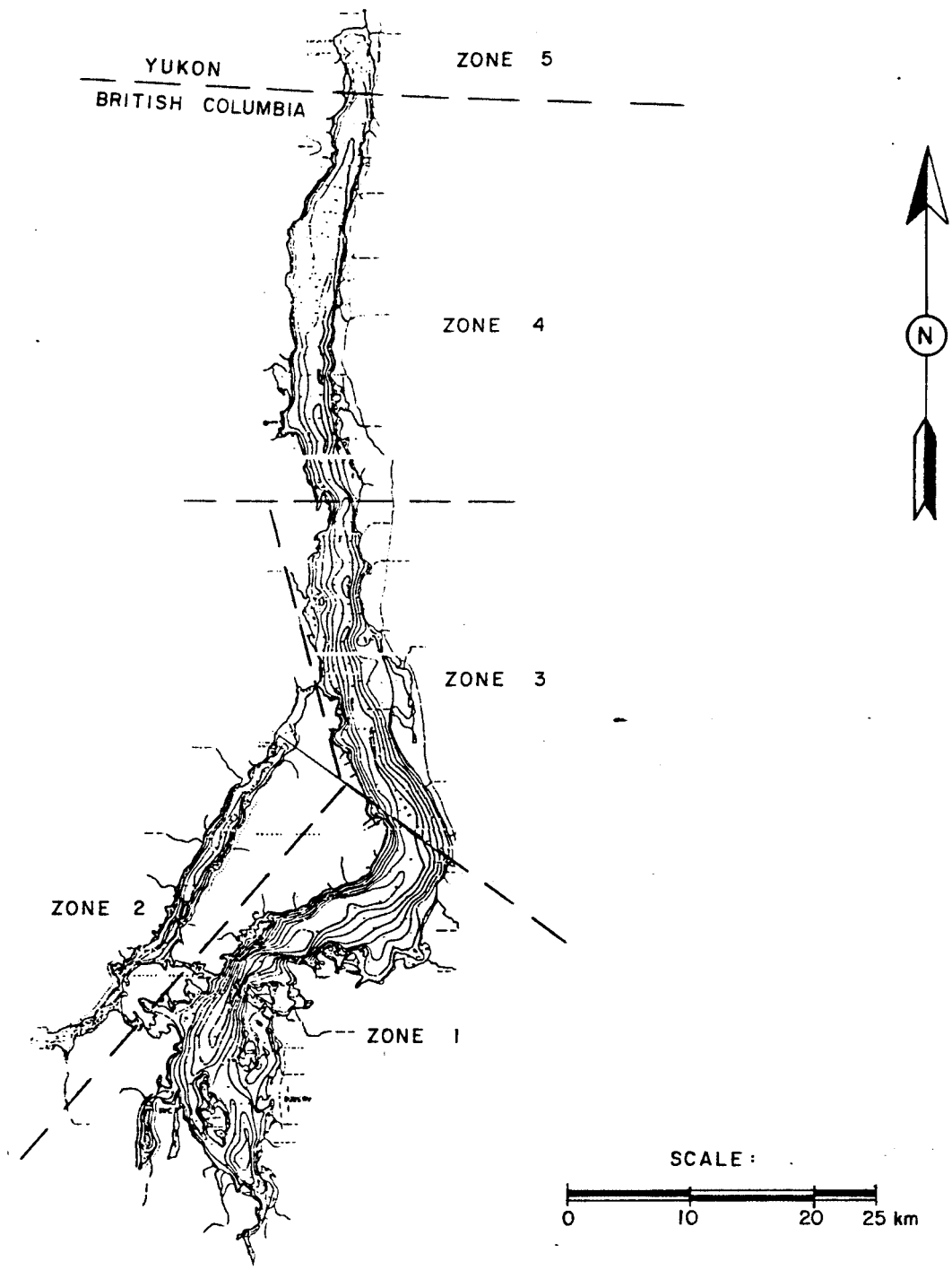


Fig. 2 Atlin Lake, showing zones selected for Creel Survey purposes, 1983.

Scale and otolith samples from angler-caught grayling and lake trout were taken as were length and weight measurements. In addition, observations on sex and state of sexual maturity were routinely made. This data is presently undergoing analysis and will be reported elsewhere (Chudyk, in prep.).

## RESULTS

### ANGLER ORIGIN

The Atlin Lake angler population was divided into five residence categories. During the 1983 census period there were 166 (66%) Atlin resident anglers, 53 (21%) Yukon resident anglers, 12 (5%) Alaska resident anglers, 10 (4%) other B.C. resident anglers and 12 (4%) other non-resident anglers (U.S.A.) (Table 1).

### CATCH DISTRIBUTION

Lake trout catch was directly proportional to angling effort (Fig.3). Angler effort expended to catch grayling was small. Overall catch in August was better than in June with peak lake trout harvest centered around the week ending August 21.



TABLE 1. Reported number of Atlin Lake anglers that angled for lake trout during the 1983 creel survey.

Resident Area	Anglers (%)
Atlin (Local)	166(66)
Yukon	53(21)
Alaska	12(5)
Other B.C.	10(4)
Other non-resident Anglers (U.S.A.)	<u>12(4)</u>
	253

TABLE 2. Number of anglers, angler days, catch and catch per day in Zones 1-5 from angler creel data, Atlin Lake - 1983.

LAKE TROUT

Zone	Anglers	Angler Kill Days	Kill	Release	Catch/Day
1	25	44	24	12	.8
2	115	187	99	30	.7
3	111	116	40	17	.5
4	2	2	5	0	2.5
5	0	0	0	0	0
TOTAL	253	349	168	59	

GRAYLING

2	3	9	1	0	.1
3	65	69	27	44	.9
TOTAL	68	78	28	44	
GRAND TOTAL	321	427	196	103	

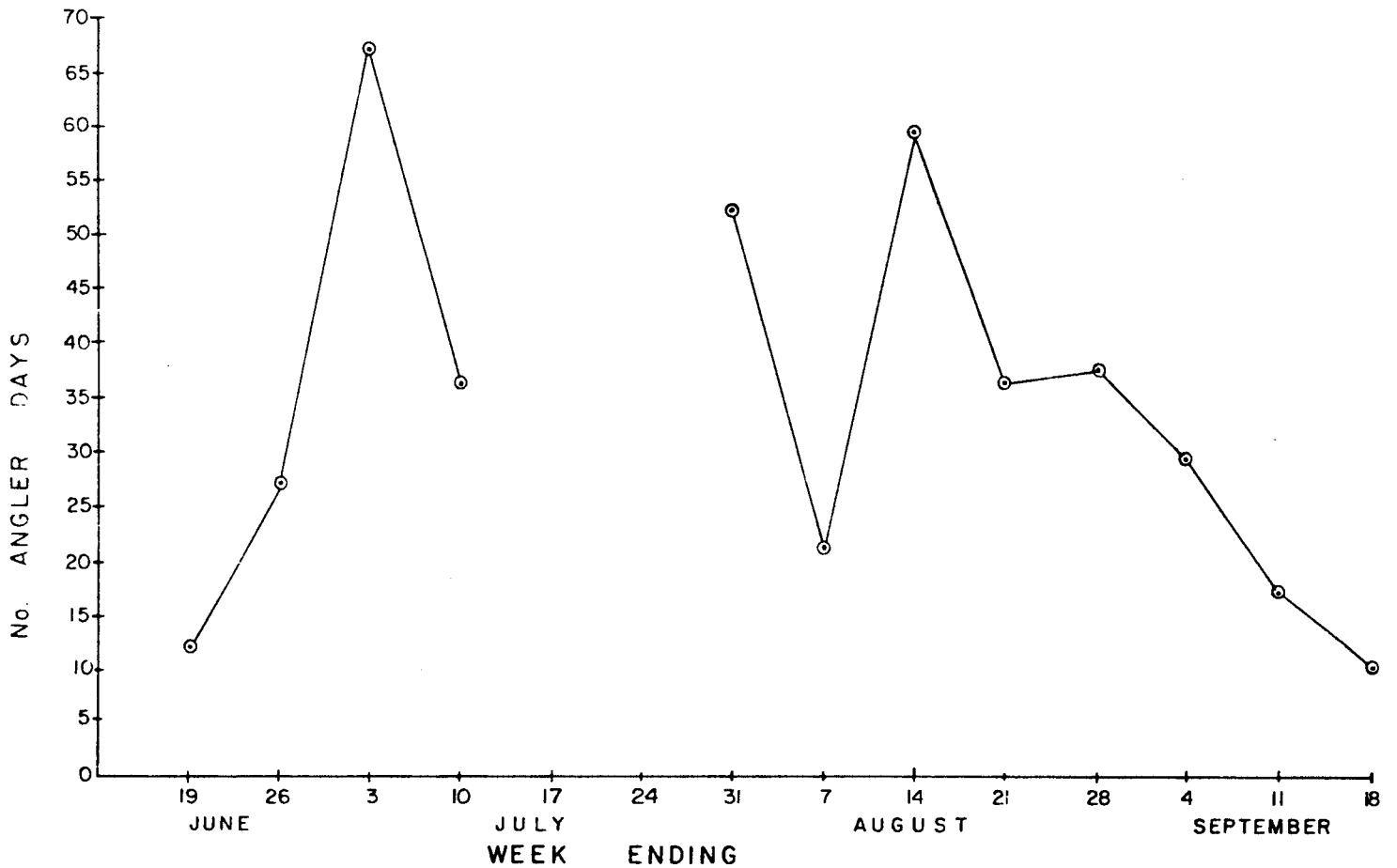
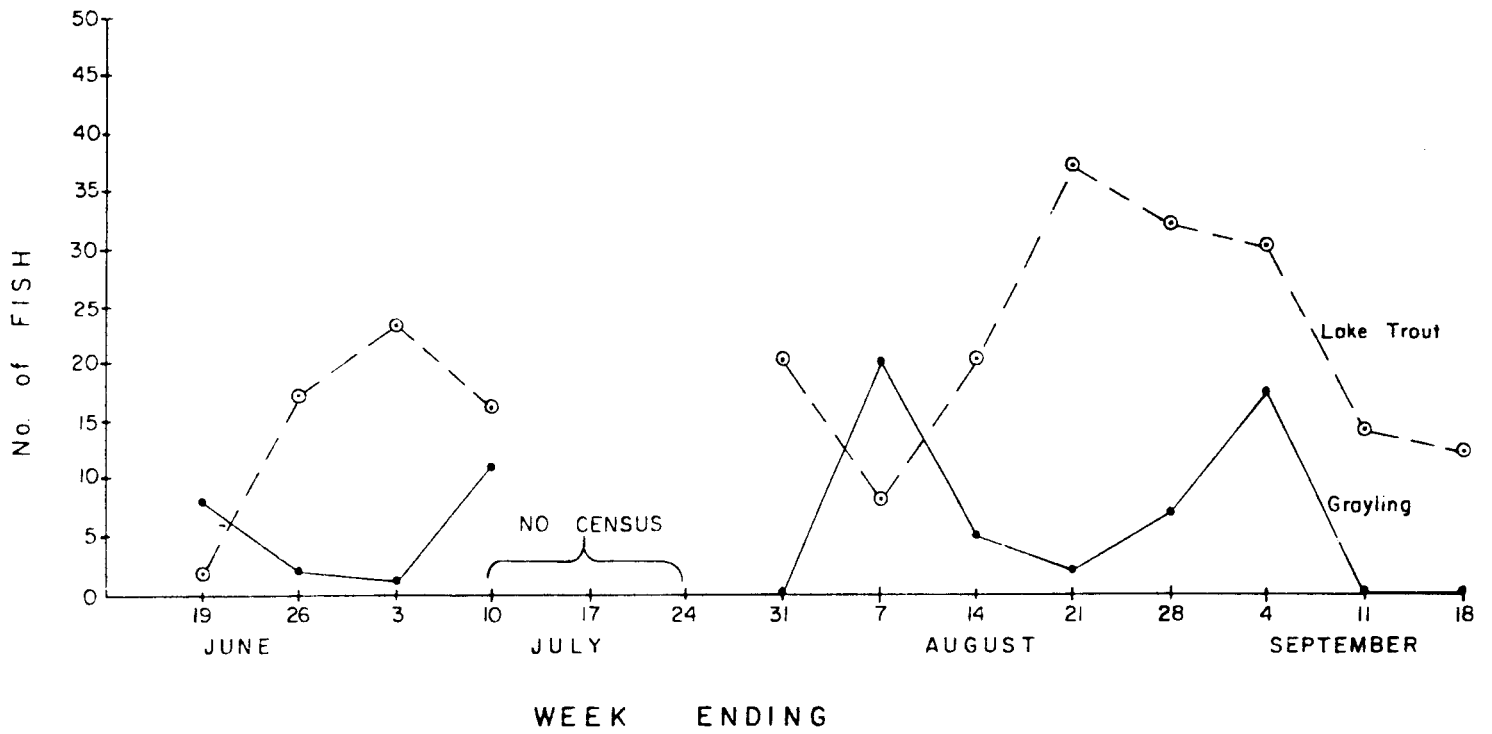


Fig. 3 Number of Angler Days and Species Harves by Week Ending From Creel Information, Atlin lake, 1983

## ANGLER EFFORT AND SUCCESS

Three hundred and twenty-one anglers contributed a total of 427 angler days to fishing Atlin Lake. Of the total effort for lake trout 44 days were spent fishing Zone 1, 187 days were spent in Zone 2, 116 days were spent in Zone 3, 2 days were spent in Zone 4 and 0 days were spent fishing Zone 5 (Table 2). Seventy-eight days were spent fishing for grayling in Zone 5 and 9 angler days in Zone 2.

The total catch over the census period was 299 fish of which 227 were lake trout (59 were released) and 72 were grayling (44 were released) (Table 2). In all 35 per cent of the catch was released.

Zone 2 produced 129 (57%) of all trout to anglers' creels, closely followed by Zone 3 which produced 57 (25%). Zone 3, which includes Atlin River, produced 71 (99%) of the grayling caught.

Catch per day for lake trout was not discernibly different between zones. (Results from Zone 4 were discounted due to small sample size.) A weighted catch per day of .7 or one trout for every 1.5 days fishing most accurately represents angling expectations on Atlin Lake in 1983.

Residents of Atlin Lake caught 74% of the lake trout in 1983, while Yukon residents caught 15% and non-residents of Canada (U.S.A.) caught 8%. Other residents of B.C. and residents of Alaska combined caught only 3% of the total lake trout.

## DISCUSSION AND CONCLUSIONS

The preceding data is presented in its raw form with little or no analysis having been performed on it. During the summer of 1983, two events occurred which severely hampered the completion of the project in the manner in which it was originally conceived and scheduled. The first event involved the implementation of a new Provincial government staffing policy, which interrupted the creel census for most of July until alternate means of hiring temporary staff could be found. The second event was the incidence of atypical weather patterns which caused long periods of inclement conditions in the Atlin area (and, in fact, throughout B.C.) and which greatly reduced normal angling activity. It is therefore evident that sequel creel surveys in 1984 and perhaps in 1985 should be carried out as prerequisite to providing an accurate picture of the Atlin Lake sport fishery.

Notwithstanding the above, some inferences can be drawn from the 1983 survey. Among crude indicators of trend in the sport fishery are the following: angler residence, zone fished and relative catch. The Atlin sport fishery appeared to be largely local; with 66% of the total angler population residing in the community of Atlin. The zone fished was probably dictated by ease of access and proximity to Atlin, therefore Zones 2 and 3 were most popular. The catch of lake trout in Zone 2 (Torres Channel) was somewhat coincidental with suspected lake trout spawning areas which became active toward the end August and through September. (L. Enders, Pers. comm.)

The average size of lake trout sampled in the 1983 census was 2.6 kg. If this represents the average size of lake trout killed in the 1983 sport fishery then the lake trout harvest by weight of 168 fish can be assumed to be 437 kg. Maximum allowable harvest (16,000 kg) is calculated using a conservative maximum sustainable harvest rate of .25 kg per hectare per annum (Healey, 1978). Therefore the allowable harvest less the sport harvest (16,000 kg - 437 kg = 15,563 kg surplus) indicates that overall lake trout stocks are healthy. Even when the sport harvest (437 kg) is combined with the maximum Zone 5 commercial harvest quota, (900 kg) (S. Johnson, Pers. comm.) for a total harvest of 1,337 kg a healthy surplus of roughly 14,000 kg still exists. However, it would appear from some anglers' comments: "We don't fish Zone 5 because the fish are too small." that there is a preference for larger "trophy sized" lake trout. Preliminary investigation of life history information (data presently being analyzed will be reported elsewhere) indicates that lake trout ranging in size from 9 to 14 kg are from 20 to 36 years of age. Although not presently evident from the results of the 1983 creel survey, it is the author's opinion that these larger "trophy sized" fish are in relatively short supply

#### SUMMARY

The Atlin Lake sport fishery consists predominantly of Atlin residents. The lake trout sport fishery is concentrated in Zones 2 and 3 from the middle of June through August. Spawning sites should be researched and protection given as required. Preliminary data indicates that the fishery is healthy. As 1983 was somewhat atypical additional creel census is required.

## ACKNOWLEDGEMENTS

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I would like to acknowledge the assistance provided by M. Clarke of Inland Waters Directorate who provided the ways and means of getting a derailed project back on track again.

## REFERENCE

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- Healey, M.C. 1978. The Dynamics of Exploited Lake Trout Populations and Implications for Management. The Journal of Wildlife Management. 42:303-328.