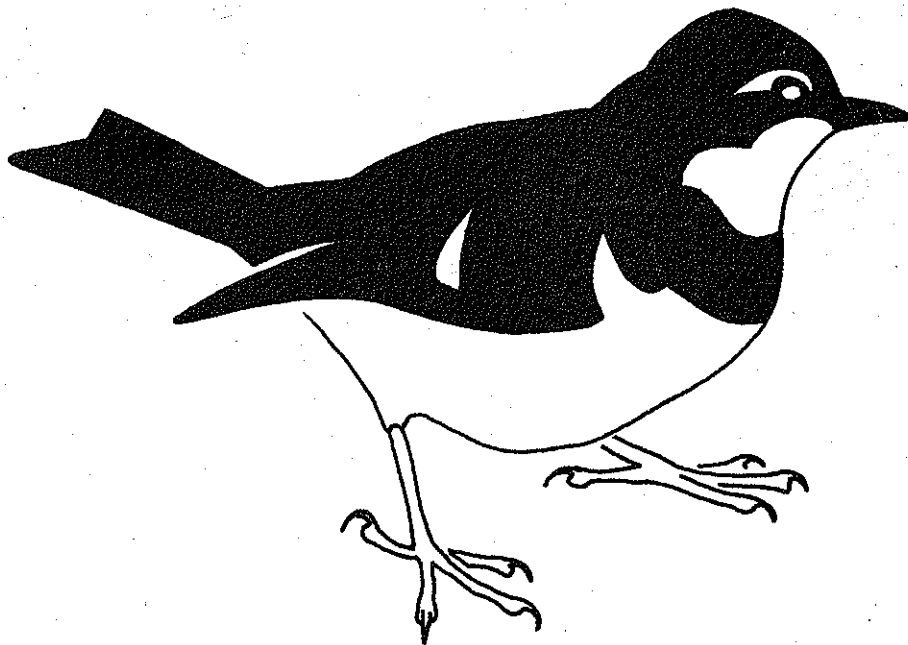


SOME IMPORTANT MIGRATORY BIRD HABITATS
IN THE YUKON TERRITORY

Malcolm Dennington
March 1985



Environment Canada Environnement Canada

Canadian Wildlife
Service

Service canadien de la
faune

Canada



MEMORANDUM

NOTE DE SERVICE

LR/mm

TO
A

Regional Director
Canadian Wildlife Service
Pacific & Yukon Region
Delta, B.C.

FROM
DE

A/Chief, Advice & Support
Canadian Wildlife Service
Pacific & Yukon Region
Delta, B.C.

SECURITY - CLASSIFICATION - DE SECURITE
OUR FILE / NOTRE REFERENCE 9070
YOUR FILE / VOTRE REFERENCE
DATE 28 February 1985

SUBJECT
OBJET

"Some Important Migratory Bird Habitats in the Yukon Territory"

The attached report was produced to make available for general distribution existing data on migratory bird use of certain areas in the Yukon Territory. The information was originally compiled in 1981 to evaluate areas thought to have high migratory bird values and to nominate the highest value areas for National Wildlife Area designation. That exercise resulted in the 1984 departmental report of "DOE's Northern Conservation Lands Plan." Detailed information not included in that report is presented here.

Laszlo Retfalvi

Approved for
Printing and Distribution

G. H. Staines.
March 15, 1985.

SOME IMPORTANT MIGRATORY BIRD HABITATS
IN THE YUKON TERRITORY

Malcolm Dennington
March 1985

Canadian Wildlife
Whitehorse, Y.T.

Abstract

As a contribution to the Department of Environment's "Northern Conservation Lands Inventory," the Pacific and Yukon Region of Canadian Wildlife Service undertook to bring together existing information on wetlands, and their use by migratory birds, in Yukon Territory.

Information sources included reports dealing with impact assessments of proposed industrial developments, results of specific waterfowl studies conducted by Yukon Territorial government and Canadian Wildlife Service personnel, Land Use Information maps, and a variety of miscellaneous reports.

Thirty-five wetland areas, ranging from a few square miles to twenty-seven-hundred square miles, were identified and tentatively ranked into three categories; Critical, Sensitive, and Important, according to their values in terms of migratory bird habitat. The North Slope, the Old Crow Flats, Lower Nisutlin River, M'Clintock Bay, and Tagish Narrows were viewed as Critical habitats. A further fourteen areas were designated as Sensitive habitats, and sixteen were assigned an Important rank. Information on many areas assigned to the latter two categories was sketchy at best, and it is stressed that the rank may be re-assessed as new information on migratory bird resources becomes available.

All areas have been identified on a 1:2,000,000 scale base map, and individual maps, at varying scales depending upon the size of the area, have been included to show wetlands in greater detail. Selected boundaries for individual areas serve little more than an identification function -- precise boundary locations would warrant further consideration in specific land use planning.

Résumé

Dans le but de contribuer au programme d'Environnement Canada connu sous le nom d'" Inventaire des terres de conservation du Nord", le Service canadien de la faune de la région du Pacifique et du Yukon a regroupé l'information disponible sur les zones marécageuses du Yukon et leur utilisation par les oiseaux migrateurs.

Cette information provient de sources diverses: études d'impact, cartes d'utilisation du territoire, inventaires et projets de recherche sur la sauvagine conduits tant par le gouvernement territorial que par le Service canadien de la faune, etc.

Trente-cinq zones ont été identifiées et catégorisées (critique, sensible et importante) selon leur valeur en tant qu'habitat pour les oiseaux migrateurs. Ces zones varient de quelques milles carrés jusqu'à 2,700 milles carrés. Des habitats critiques ont été reconnus dans cinq régions: le versant nord (Yukon North Slope), le plateau Old Crow (Old Crow Flats), la rivière Lower Nisutlin, la baie M'Clintock et les Étroits Tagish (Tagish Narrows). Quatorze autres régions ont été reconnues comme étant sensibles et seize dernières comme étant importantes. Cette catégorisation se veut flexible. Toute nouvelle information nous permettant de réévaluer nos connaissances sur les oiseaux migrateurs et leurs habitats au Yukon sera prise en considération.

Toutes ces zones ont été cartographiées à une échelle de 1:2,000,000 et des cartes individuelles, d'échelles diverses, fournissent plus de détails sur chacune d'elles. Ces cartes ne sont toutefois pas assez précises en ce qui concerne la localisation des frontières pour permettre leur utilisation dans des exercices spécifiques de planification.

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Guidelines for Canadian Wildlife Service contributions to the Northern Conservation Lands Inventory were provided by Mr. G. Lee and Mr. D. Gillespie, members of the NCLI Senior Steering Committee.

Mr. D. Mossop, Renewable Resources Branch, Government of Yukon, gave freely of his time for frequent discussions with regard to specific waterfowl habitats, and provided numerous file reports on his inventory work in northern Yukon. Mr. Mossop's observations provided essentially the only information available for identifying waterfowl habitats in the vast region between the Ogilvie Mountains and the Porcupine River.

Kathleen Fry undertook an extensive file search in order to document land disposition within, or in proximity to, identified wetland areas.

Dr. T. Barry, Dr. D. Flook, and Mr. L. Retfalvi reviewed draft copies of the report and provided appropriate technical and editorial comments.

An expansive file in the Whitehorse offices of CWS attests to the difficulties inherent in bringing together information through various individuals and at various levels of federal and territorial governments in order to meet the demands of committees and work groups. For their patience and understanding of these difficulties, the individuals identified above have my sincerest appreciation.

Introduction

This report, dealing with important migratory bird habitats in the Yukon Territory, has been prepared by the Pacific and Yukon Region of the Canadian Wildlife Service as a part of the Department of Environment Northern Conservation Lands Strategy project.

Although the information was compiled primarily in support of the Department's over-all Northern Conservation Lands program, the discussions of various wetland areas may have potential value to land use programs in both the government and private sectors. It is therefore made available in its present format.

Studies of migratory bird habitat in Yukon Territory have dealt primarily with wetlands and waterfowl populations, and the available data base is accordingly biased. Emphasis on waterfowl probably relates to (a) the relative economic importance of this group of birds, (b) the relative ease with which waterfowl habitat, or potential habitat, can be isolated, (c) the susceptibility of wetland areas to degradation through man's activities, and (d) the importance of terrestrial areas immediately associated with wetland complexes to a wide variety of terrestrial species as well as waterfowl.

Information sources on migratory birds in Yukon Territory are primarily reports dealing with short-term assessments of proposed development schemes such as mining activities, hydro-electric generating plants, pipeline routing, and highway construction. As such, the information base tends to be discontinuous in both space and time. Often reports dealing with local development plans provide little more on the migratory bird resource than a species check-list. The Land Use Information Series (1974) provided a first attempt at delineating and evaluating wildlife habitat throughout the Territory, but reconnaissance field surveys undertaken in support of that program provided little in the way of new information on migratory bird habitats. Some

more specific information has been acquired during the past few years through intensive field studies of proposed pipeline routes through the northern and southern Yukon, and site-specific field studies undertaken by the Yukon Territorial Wildlife Branch and Canadian Wildlife Service. There are however extensive areas of the Territory (particularly through the central area) which are essentially unexplored in terms of migratory bird resources. As well, for some of the better-documented areas of the northern and southern Yukon, information is still lacking with regard to habitat function, long-term utilization, and distribution of discrete populations. Efforts to improve the data base are continuing and consequent revisions to this report should be anticipated.

Relative Values of Migratory Bird Habitat:

Essentially all wetlands in the Territory provide potential habitat for some species of migratory birds. This potential is frequently assessed in terms of total numbers of birds, diversity of species, or relative rarity of a species, found occupying the wetland at any given time. Further, because of the mobility of waterfowl, use of a given area may well vary between seasons and probably from year to year. For example, on a seasonal basis, waterfowl may utilize a wetland as a spring staging site, as a production site during the summer breeding period, as a molting area during late summer, or as a pre-fall migration staging site. All of these habitat functions are probably of equal importance to the welfare of the waterfowl population on a long range basis, even though in some instances the habitat may be utilized for only a few weeks of the year. Annual variations in habitat use can be expected as a result of factors such as weather or climatic variations. It has frequently been postulated that in years when early drought conditions prevail on the prairies many species of waterfowl are displaced to the more northerly boreal forest wetlands.

The variable distribution patterns of waterfowl popula-

tions in the Yukon Territory is such that we can initially use a three-class system for evaluating wetlands, but we have proposed the following modifications to the NWT system:

(a) Both "Critical" and "Sensitive" areas may be utilized by waterfowl on a regular, annual, basis. Our distinction between the two categories is simply that relatively more birds, (total numbers or, in the case of rarer species, fractions of total populations), use Critical areas.

(b) There are areas in the Territory which we believe are important to the welfare of the waterfowl resource in that loss of the areas might result in reduced waterfowl populations. However available population data do not support assigning a Critical or Sensitive status at this time. On the other hand, there are few areas of waterfowl habitat which meet the description of "Unique" areas, possibly because ranges of many species and populations within the Yukon Territory are not well known. We have therefore deleted the Unique category in favour of an "Important" category. As further information becomes available some of the areas assigned to this category may be elevated to Critical or Sensitive status.

On the basis of the above consideration of relative values of migratory bird habitat, 35 areas in Yukon Territory have been ranked as "Critical", "Sensitive" or "Important" habitat for waterfowl. As a first step in this exercise, check-sheets were used to summarize data from the literature. Area boundaries were then defined on 1:1,000,000 scale topographic maps and each area was assigned a number. Final boundary adjustments were made when areas were outlined on 1:250,000 scale maps and land dispositions were plotted on these working copies. Information from check sheet and maps was incorporated into a brief narrative for each area and final copies of smaller-scale sheet were prepared to accompany the text.

Areas are ranked as indicated in the following table.
Highlights of waterfowl species - habitat function information are incorporated into the table.

STATUS	MAP REFERENCE	AREA NAME	WATERFOWL - HABITAT FUNCTION *
Critical	35	North Slope	Snow G.(Sf) Brant(Ssf) Sea Ducks(M) Swans(B)
"	34	Old Crow Flats	Divers(M) Ducks(B) Swans(B)
"	4	Lower Nisutlin	C.Geese(Sf) Swans(Sf) Ducks(Sf)
"	9	M'Clintock Bay	T.Swans(Ss) Ducks(Ss)
"	7	Tagish Narrows	T.Swans(Ss) Ducks(Ss)
Sensitive	33	Whitefish Lake	W.F.Geese(M) C.Geese(M) Divers(M)
"	13	Kloo-Sulpher L.	Ducks (B,M,Sf)
"	16	Pickhandle L.	Ducks(B,M) T.Swans(B?)
"	20	Lower Nordenskiold	Dabblers(B) Ducks(Ssf) Swans(S?)
"	28	Reid Lakes	Ducks(M,S,s,f)
"	25	Van Wilczek Lakes	Ducks(M,B)
"	10	Upper Laberge	Dabblers(Ss) Swans(Ss) Ducks(B)
"	23	Frances Lake	Ducks(Ss) Geese(Ss) Swans(Ss)
"	5	Teslin L. Outlet	Swans(Ss) Ducks(Ss)
"	6	L. Atlin L. Outlet	T.Swans(Ss) Ducks(Ss)
"	27	Willow Creek	Ducks(Ss,f)
"	14	Kluane L. Outlet	T.Swans(Ss) Swans(Ssf) Ducks(SsM) Geese(Ss)
"	1	Upper Whitefish R.	T.Swans(B)
"	2	Toobally Lakes	T.Swans(B)
Important	8	Bennet L. Outlet	T.Swans(Ss) Ducks(Ss)
"	22	Big Salmon-Sandy L.	C.Geese(Sf)
"	3	Dodo Lakes	T.Swans(B) Divers(B,M)
"	15	Lake Creek	Ducks(B,M,Sf)
"	12	Dezadeash Outlet	Ducks(Ss) Geese(Ss) Swans(Ss)
"	17	Aishihik Outlet	Swans(Ss) Ducks(Ss)
"	21	Laberge Outlet	T.Swans(Ss) Ducks(Ss)
"	19	Upper Nordenskiold	Ducks(B) Swans(Ssf)
"	32	Peel-Caribou	Swans(B) Divers(B,M)
"	31	Chappie Lake	Swans(B) Divers(B,M)
"	30	McQuesten Lake	C.Geese(B,M) Divers(B,M)
"	11	Taye Lake	Ducks, Geese, Swans(Sf?)

STATUS	MAP REFERENCE	AREA NAME	WATERFOWL - HABITAT FUNCTION *
Important	24	Sheldon Lake	Ducks(Sf) Geese(Sf) Swans(B?)
"	26	Wellesley Lake	Swans(Sf)
"	18	Hutschi Lakes	Swans, Ducks(Ss)
"	29	Horseshoe Slough	C.Geese(Sf) Ducks(Sf)

S - Staging (s-spring, f-fall)

B - Breeding

M - Molting (late summer influx)

Ducks - divers & dabblers

UPPER WHITEFISH RIVER

Map Reference #1

Location $60^{\circ}38'$ - $60^{\circ}55'N$ - $125^{\circ}41'$ - $126^{\circ}06'W$

Size 170 sq. miles

The Whitefish River is a major northern tributary of the Beaver River system of extreme south-eastern Yukon. Near the upper reaches of the Whitefish River there are numerous small lakes which are used by trumpeter swans, and other waterfowl, during the summer months.

To date there are very limited data on either bird populations or habitat in this area. C W S field crews conducted reconnaissance surveys for swans during the summer of 1978, and recorded 21 adults and 3 juveniles. About half of the adults occurred as pairs, but one group of 10 evidently represented a group of non-breeders. In 1980 further aerial surveys were conducted (McKelvey et al, 1981), and 24 adult swans and 2 juveniles were recorded. Fourteen of the adults occurred as pairs, and there was one group of 10 non-breeders. It is not known if the low number of juveniles, relative to adult pairs, is an indication of low nesting success or if the majority of pairs are in fact non-breeders. Further investigations of habitat functions in this area are required, but the very presence of this number of swans, and indications that they are probably all trumpeters, warrants protection of the habitat.

The distribution of swans throughout this area probably reflects uniformity of habitat. Most of the lakes are small (up to app. 1 sq. mile), have some degree of shallow shoreline with sedge-shrub cover, and have inter-connecting surface drainage channels.

This is one of the more remote areas of southern Yukon, although man's presence could be inferred through established names attached to three of the lakes (Jackpine, Spruce & Balsam). Cabins on several lakes are probably indicative of past trapping activity, and fuel drum caches on several lakes would indicate mineral or geological exploration programs.

There are no current placer or quartz claims within the boundaries of this area. There are several oil and gas leases valid to 2,001 on the immediate south-east periphery of the area, and some seismic exploration was conducted on those leases in 1974. Most of the area is covered by lapsed oil and gas exploration leases.

There appear to be no immediate threats to waterfowl habitat in this area, although petroleum and mineral exploration programs are continuing in the general vicinity.

References (1)

McKelvey, Richard W., M. Dennington, & D. Mossop, 1981.

Trumpeter Swans Breeding in the Southern Yukon. Unpub. C.W.S. report, in preparation. 6 pp. + App.

TOOBALLY LAKES

Map Reference #2

Location 60°00' - 60°30'N, 125°45' - 126°57'W

Size 1,400 sq. miles

This is a large area (third in area of those identified in this report), located in extreme southeastern Yukon. It is centered by the Toobally Lakes, and extends west to the vicinity of Lootz Lake, east to Larsen Lake and south to the B.C. - Yukon border.

Oswald & Senyk (1977) characterize the area as having "relatively low relief with broad, undulating plateaus and hills rising to 1,350 m.a.s.l.". Cover is primarily spruce forest, replaced by lodgepole pine on hills and burned-over areas. Wetlands vary from the small, shallow, ponds surrounded by extensive sedgetussock meadows (Lootz Creek area) to larger, deeper lakes with essentially no transition between shorelines and mature timber (Toobally Lakes).

An interesting feature of the area is the presence of a number of small springs, some of which apparently have a pronounced influence on lake basins. Several lakes, to the west of Toobally, exhibit a most pleasing turquoise color as a result of calcareous deposits over the substrate. Deposition is probably a result of a highly mineralized ground water inflow. East of Toobally Lakes a number of very small springs feed the series of sloughs and small lakes at the head of the Crow River. No thermal springs have been identified within the area, but thermal springs are present just a few miles to the east at Larsen Creek and on the Beaver River, and a spectacular dormant hot spring is found about 20 miles to the west, along the Coal River.

A variety of waterfowl utilize wetlands in the Toobally Lakes area, but interest currently centers on trumpeter swans which occur throughout the area during the summer months. Yukon

Territorial Game Branch personnel observed swans on Toobally Lakes during the summer of 1976, and subsequent surveys by C.W.S. staff in 1978 and 1980 revealed up to 15 pairs of swans and 3 broods. In addition a few groups of non-breeding adults were recorded. To date all swans positively identified in the Toobally Lakes area have been trumpeters. (McKelvey et al, 1980).

Trumpeter swans are reported to be exceptionally territorial during the breeding season and an individual pair may defend a territory in excess of 100 acres (Bellrose, 1976). In the Toobally area, pairs and successful breeders were found to be quite widely dispersed on suitable habitat, usually small lakes with inter-connecting channels, through the summer months. Trumpeters were routinely observed from the C W S field camp at the south end of North Toobally Lake during the summer of 1980, but no broods were found on either of the large lakes. Swans were observed near the north end of North Toobally quite early in the spring of 1980 (D. Hutton, pers. comm.) and it could be speculated that early open-water occurs at the narrows in that area, providing a spring staging site.

Access to Toobally Lakes is primarily by aircraft, although there is an all-weather road from the Alaska Highway to the Smith River airstrip (app. 7 miles south of the B.C. - Yukon border) and a winter road from Smith River to the south end of Toobally Lakes. There are a few permanent buildings on South Toobally Lake, and a sport fishing guide service has been in operation on that lake for a number of years. There is one commercial land lease on the extreme south end of South Toobally. There are no placer or quartz claims at present within the area outlined, although there are a few quartz claim blocks just outside the area, north of Larsen Lake and to the northwest of Toobally Lakes. Oil and gas leases valid to 2001 have been granted in the Beaver River region, just a few miles from the eastern boundary of this

area, but there are currently no oil and gas leases within the proposed area.

As with the Upper Whitefish River area, there appear to be few immediate threats to waterfowl habitat in the Toobally Lakes area. In light of the thermal springs in the vicinity, and the attraction of Toobally Lakes to sports fishermen, wildlife resources might well be accommodated in a management plan which would place first priority on the over-all recreational potential of this area.

References (2)

Bellrose, Frank C. 1976. Ducks, Geese and Swans of North America. Stackpole Books, Harrisburg, Pa. 543 pp.

McKelvey, Richard W., M. Dennington & D. Mossop, 1981. Trumpeter Swans Breeding in the Southern Yukon. Unpub. C.W.S. report, in preparation. 6 pp. + App.

Oswald, E.T. and J.P. Senyk, 1977. Ecoregions of Yukon Territory. Fisheries & Environment Canada. Canadian Forestry Service. 115 pp.

DODO LAKES

Map Reference #3

Location $60^{\circ}01'$ - $60^{\circ}12'N$ - $129^{\circ}00'$ - $129^{\circ}47'W$

Size 200 sq. miles

Dodo Lakes are located on the Liard River Plain in southeastern Yukon, app. 12 air-miles west of Watson Lake. During studies of the proposed Alaska Highway pipe line route, Dodo Lakes were described as being "surrounded by steep ridges; and having relatively clear waters with little sedge cover". (C W S field notes, Whitehorse). Some of the smaller lakes in the area of Dodo Lakes were found to be shallow with extensive sedge-marsh shorelines. These wetlands are probably representative of a much more extensive area of the Liard Plain; accordingly wetlands to the north and west of Dodo Lakes, generally between the Alaska Highway and the Rancheria River, have been included in Area 3.

Because most of the wetlands in this area fell outside of the four-mile-wide corridor associated with the proposed gas pipeline, pipeline related reports provide very little in the way of waterfowl population data. Foothills (1978) found that wetlands the pipeline corridor, in the Dodo Lakes area, supported relatively high numbers of diving ducks during the molting period in 1977. C W S field staff (C W S files, Whitehorse) found significant numbers of diving ducks using Allegretto Lake during the breeding and molting period of 1977. Reports of trumpeter swans using wetlands in this area during the breeding season are of particular interest. Trumpeters, with broods, have been reported on McKinnon Lake (McKelvey et al, 1980) and Dodo Lakes (Foothills, 1978). Both McKinnon and Dodo Lakes supported ducks and swans during the fall migration period in 1977. (Foothills, 1977)

Most of this area is included in lands currently under Coal Mining Licence. The Alaska Highway Gas Pipeline reserve and the Alaska Highway cross the southern portion, between McKinnon and Dodo Lakes. There are a number of gravel pit reserves, bridge head reserves and campground reserves associated with the Alaska Highway, and segments of the Alaska Highway in the vicinity of Dodo Lakes will undergo realignment. There is a small residential-agricultural lease between the Alaska Highway and Dodo Lakes, and a few legal lots in the vicinity of the Cassiar Highway Junction. A timber harvesting block along the Liard and Rancheria Rivers overlaps a small portion of the north boundary of this area.

With the exception of possible coal deposit developments there appear to be few immediate threats to waterfowl habitat in this area. Further surveys of the Liard Plain are required in order to fully assess its use by trumpeter swans during the breeding season.

References #3

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary 24 pp. + appendices.

Foothills Pipe Lines (Yukon) Ltd., 1978. Inventory Studies of Birds Along the Proposed Alaska Highway Gas Pipeline Route, Southern Yukon, Summer 1977. Prepared by: Beak Consultants Ltd., Calgary. 52 pp. + appendices.

McKelvey, W. Richard, Malcolm Dennington and David Mossop, 1980. Trumpeter Swans Breeding in the Southern Yukon. Unpub. C W S report, in preparation.

LOWER NISUTLIN RIVER

Map Reference #4

Location 60°05' -60°46'N, 132°25' -133°02'W

Size 150 Sq. miles

This area, encompassing app. 150 square miles, is located in the south-central Yukon, east of Teslin Lake. The area includes app. 40 miles (linear) of the lower Nisutlin River valley, the delta at the mouth of the river, and Nisutlin and Morley bays.

The Nisutlin River meanders through a relatively broad valley in its lower reaches, and a complex of shallow cut-off channels, oxbows and sloughs are found along the stream course. During late summer and fall extensive sand bars are exposed as islands and point-bars in the channel. The heavy loads of silt, sand and debris carried by the river during high flow periods have resulted in development of a delta complex at the head of Nisutlin Bay. As water levels on Teslin Lake drop during the early fall, extensive mud flats are exposed throughout the complex of islands and over-flow channels in the delta. Shallow water persists well out from the delta into Nisutlin Bay, exposing dense beds submergent aquatic vegetation.

Geist, et al (1974) described the Nisutlin River Delta as "...one of the most important staging and nesting areas for waterfowl in the north-western parts of the continent...." Data available at that time indicated that as many as 200 pairs of Canada geese (believed to be a distinct sub-species) nested in the Nisutlin Bay area, and app. 2,000 geese staged on the bay during the fall. Since 1974, a number of surveys of the Lower Nisutlin have failed to substantiate the presence of a large breeding population of Canada geese. In July 1976, C W S personnel (unpub. field notes) conducted a helicopter survey of the river and associated sloughs from the delta to Sydney Creek and failed to locate any broods of

geese. Hoefs (1976) conducted a survey of the river valley in June 1975, and reported 46 Canada geese, but did not indicate if broods were observed or if these were groups of non-breeders. C W S field crews conducted routine weekly surveys of the river and about a dozen sloughs between the delta and Thirtymile Creek (app. 20 miles, linear) during the summer of 1979 and observed only 2 broods of Canada geese (unpub. C W S field notes). During the same summer, D. Mossop (unpub. Y T G Wildlife Branch field notes) travelled the river between Sydney Creek and the delta, encountered one group of Canada geese with 10-13 young, one brood of 3 young, and another group with 15 young. It seems obvious that some production does occur along the river, but does not account for the much larger number of geese which have been found on the delta during the fall.

During the course of Alaska Highway Pipeline studies a number of aerial surveys were conducted at Nisutlin Bay, with the following results:

	<u>1976</u> (1)	<u>1977</u> (2)	<u>1978</u> (3)
Ducks	1390	5121	3043
Geese	1492	931	1200
Swans	420	500	723

1. Foothills (1976)
2. Foothills (1977)
3. C.W.S. (1979)

These numbers represent maximum counts for each year (surveys were conducted at weekly intervals over an 8-week period on each year) for one point in time. The total number of birds using Nisutlin Bay during the fall would probably be much higher if the net effect of daily immigration-emigration was known.

U.S. Fish and Wildlife surveys at Nisutlin, over a three year period (in Hoefs, 1976) ranked scaup, scoters, mallards, pintails, buffleheads and goldeneyes in that order of relative abundance. C W S field crews (unpub. C W S field notes, 1979) examined 9 sloughs along the river at weekly intervals during the breeding season and found mallards, wigeon, scaup, goldeneye and green-wing teal to be the most abundant species. During a brief survey of Nisutlin, Colwell and Eagle bays in mid-July, Lemon & Russell (1977) observed only goldeneye broods utilizing the bays.

The lower Nisutlin River area provides habitat for a variety of bird-life other than waterfowl. Hoefs noted that 110 species of birds had been observed and reported "in the general area". During his two 5-day surveys, Hoefs observed 72 species, and C W S field crews observed 82 species during the summer of 1979. A few species are of special interest due to their limited distribution in the Yukon. The red-winged blackbird seems to be relatively common in the Nisutlin valley, and the sora rail has been observed only in this area of the territory.

All of the lands included within the Nisutlin River portion of this area are administered by the Crown. Timber-harvesting agreements had been in effect along the lower Nisutlin, and logging and sawmill activities took place until 1972. The last timber-agreement expired in 1978, and no new activities are foreseen. There are a few quartz claims in the upper Nisutlin, near Quiet Lake, and several claim blocks to the west in the Big Salmon Range, but none within the area identified in this report. There is a grazing lease established on the Nisutlin delta, which is utilized by a local big-game outfitter as a horse-pasture. This lease lies within a 9-square-mile "no development" zone which D I A N D 's Lands Branch has identified by notation at the request of the Y T G Wildlife Branch.

Eagle Bay, the land to the south as far as the Alaska Highway, and the small point of land separating Eagle Bay and Nisutlin Bay, are reserved as Indian lands. There is one small recreational lease on the north side of Nisutlin Bay, app. 4 miles east of Teslin.

The Northern Canada Power Commission (1975) identified the Teslin River as a potential site for development of a hydro-electric plant with a capacity of app. 45 megawatts. During 1980, N.C.P.C. conducted further surveys of this potential site, and a report is being prepared at this time. If the site was developed, a change in the stage-regime on Teslin Lake could be expected, with coincident changes to the physical environment of the Nisutlin delta.

Most of Nisutlin Bay, and all of the lower Nisutlin River was included within the proposed Wolf Lake I.B.P. site (Geist, et al, 1974). Hoefs (1976) recommended that the Nisutlin floodplain be considered for "special wildlife management area" or "critical wildlife habitat area" status under which management of wildlife resources would have priority. C W S (1977) recommended Cooperative National Wildlife Area status for the lower Nisutlin River and delta, recognizing that both the territorial and federal governments had a special interest in the wildlife resources of the area. It seems probable that native peoples of the Teslin Band will express an interest in the Nisutlin during on-going land claims negotiations.

Because of it's importance to waterfowl, and in light of potential habitat changes that could be precipitated through hydro developments, the area should be given a high priority in terms of legislative protection.

References (4)

Canadian Wildlife Service, 1977. Proposal for a National Wildlife Area, Lower Nisutlin River, Yukon. Unpub. Internal Report, prepared by M. Dennington.

Canadian Wildlife Service, 1979. Migratory Bird Investigations Along the Proposed Alaska Highway Gas Pipeline Route. 1978 Fall-Waterfowl Surveys, Interim Report No. 6, May 1979.

Foothills Pipe Lines (Yukon) Ltd., 1976. Waterfowl Migration: Implications for the Proposed Alaska Highway Pipeline, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary. 21 pp. and Appendix.

Foothills Pipe Lines (Yukon) Ltd., 1977. Waterfowl Concentrations: Proposed Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary. 23 pp. and Appendices.

Geist, V., R.T. Ogilvie, D.E. Reid, D.H. Gubbe and T.D. Hubbard, 1974. Report on Wolf Lake, Panel 10, C.T. Site 18. March, 1974. 238 pp.

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Lemon, Moira and Sharon Russell, 1977. Alcan Waterfowl Survey. Unpub. interim report prepared for Canadian Wildlife Service. 29 pp. (C.W.S. files, Whitehorse)

Northern Canada Power Commission, 1975. The Development of Power in the Yukon. Prepared by: Sigma Resource Consultants Ltd., Canadian Resourcecon Ltd., Lee Doran Associates Ltd. and Glen Smith, Wildlife Consultant.

TESLIN LAKE OUTLET

Map Reference #5

Location 60°27' - 60°33'N, 133°13' - 133°27'W

Size 13 sq. miles

Teslin Lake lies on the B.C. Yukon border and extends for about 45 miles in a north-westerly direction into central Yukon. The lake's major tributaries are the Gladys, Teslin, Jennings and Swift Rivers in B.C., and the Morley and Nisutlin Rivers in Yukon. Outflow is northwesterly to the Yukon River system via the Teslin River. The outlet is app. 2.5 miles above the Alaska Highway Teslin River bridge at Johnson's Crossing. Open water is frequently found in the narrows at the lake outlet and downstream to, or past, Johnson's Crossing, during the winter. In early spring, well before general break-up, the open water area expands out into the end of Teslin Lake and downstream to the vicinity of Squanga Creek (App. 7 miles below Johnson's Crossing).

In 1976 (a relatively mild winter), extensive stretches of the Teslin River, in the vicinity of Johnson's Crossing, remained ice-free. Mossop (1976) observed 46 goldeneyes and 10 mergansers in that area in early March - in all likelihood these birds overwintered on the river. As spring progressed, maximum counts increased to include 845 ducks, 20 geese and 1,600 swans. In early February, 1977 (another relatively mild winter) C W S (field notes, C W S, Whitehorse) reported 25 goldeneyes on the river in the vicinity of Johnson's Crossing, and 55 goldeneyes by mid-March. Later that spring Foothills (1977) counted 1,468 ducks and 140 swans.

This part of the Teslin River seems to be also attractive to waterfowl during the fall migration period. For the three years 1976, 1977 and 1978, average maximum counts during the fall included 656 ducks, 195 geese and 149 swans (Foothills 1976, 1977, and C W S, 1979).

The settlement of Johnson's Crossing lies near the center of this area, and includes a number of Crown Grant lots on either side of the river. There are several residential leases on the west bank of the river a few miles below Johnson's Crossing, a Water Surveys reserve 2 miles downstream and a Y T G gravel pit reserve in the same area. The Dept. of Public Works has placed a bridge head reserve on lands in immediate proximity to the bridge and the Alaska Highway Pipeline Corridor reserve overlaps most of the area. D I A N D has placed a reserve on the shorelines of the river and lake to the 2275 contour level. Recently, Northern Canada Power Commission (1980) directed a study of the hydro-electric potential of the Teslin River and identified potential dam sites app. 30 miles downstream from Johnson's Crossing. The proposed water storage levels on Teslin Lake would fall within the historic high and low levels, however the change in water level regimes would undoubtedly have an effect on waterfowl habitat in the outlet area.

The current interest in hydro-electric potential of the Teslin River dictates a need to initially understand the physical processes which contribute to early open water in the river channel and how waterfowl utilize those open areas (spatial distribution, food sources, duration of stop-over). This information would provide a basis for evaluating the potential impact, on waterfowl populations, of changes in the flow regime which would accompany a hydro development. Given the current level of information, it is probably inappropriate at this time to recommend legislative protection for the area which would exclude developments such as a hydro-electric plant.

References #5

Canadian Wildlife Service, 1977. Waterfowl Population Surveys Along Proposed Pipeline Routes in the Southern Yukon Territory and Northern B.C., 1977. Prepared by: Malcolm Dennington & Patrick Milligan. Unpub. C.W.S. report, C.W.S. files, Whitehorse.

Canadian Wildlife Service, 1979. Migratory Bird Investigations Along the Proposed Alaska Highway Gas Pipeline Route. 1978 Fall Waterfowl Surveys. Interim report No. 6. May, 1979.

Foothills Pipe Lines (Yukon) Ltd., 1976. Fall (1976) Waterfowl Migration: Implications for the Proposed Alaska Highway Pipeline, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary, Alberta. 20 pp.

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary. 24 pp. + appendices.

Mossop, D., 1976. Studies of Waterfowl Staging Areas, Winter, 1976. Yukon Game Branch, Interim Report.

Northern Canada Power Commission, 1980. Teslin River Hydro Power Study. Prepared by: Shawinigan Engineering Consultants Limited, Calgary, Alberta. October, 1980. 110 pp. + appendices.

LITTLE ATLIN LAKE OUTLET

Map Reference #6

Location 60°08' - 60°13'N, 133°51' - 133°56'W

Size 9 sq. miles

Little Atlin Lake is situated in south-central Yukon, app. 10 miles north of the B.C. - Yukon border, and 22 air-miles southeast of Whitehorse. The lakes' major inflow is from the extensive Snafu lakes complex to the east; outflow is southward to Atlin Lake via the Lubbock River. The area identified at this time is app. 18 square miles, and includes the narrow south end of the lake and a few miles of the Lubbock River. Open water frequently occurs at the mouth of the river, and for varying distances downstream, during the winter months, and narrows in the south end of the lake are open in early spring, well before general break-up.

Soper (1954) examined Little Atlin Lake in mid-June, 1950 and estimated the total waterfowl population at 220 birds. Soper concluded "the lake is distinctly inferior in character for wildfowl". However, during most winters some water remains open at the lake outlet, and for a short distance down the Lubbock River, and these areas are used by early migrants each spring. Mossop (1976) noted 9 swans (probably trumpeters) at the lake outlet in mid-April, and a total of 650 birds, including Canada geese, swans, canvasbacks, scaup, goldeneyes and buffleheads, by early May. Mossop included Little Atlin Lake outlet in the list of "major" early spring staging areas for waterfowl in the southern Yukon. Further spring surveys are required to more accurately define the area of importance and numbers of birds using the area throughout the spring.

There are two small agricultural leases along the south and east shorelines of the lake, and a grazing lease on the west side of the Lubbock River app. 1 1/2 miles below the lake outlet.

The Atlin highway roughly parallels the east shore of Little Atlin Lake, and there is an access road (app. 2 miles) from the highway west to the Lubbock River. There is a bridge across the river, and a trail continues west from that point toward the head of Wolverine Creek. There are a few placer claims on Wolverine Creek (app. 3 miles west of the identified area boundary) and there has been some logging and wood-cutting activity in the past in the Wolverine Creek area. There are probably few current threats to waterfowl habitat on Little Atlin Lake.

References #6

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter, 1976. Yukon Game Branch, Interim Report.

Soper, J. Dewey, 1954. Waterfowl and Other Ornithological Investigations in Yukon Territory, Canada, 1950. Wildlife Management Bulletin, Series 2, No. 7. 55 pp. + illus.

TAGISH NARROWS

Map Reference #7

Location 60°15' - 60°20'N, 134°14' - 134°20'W

Size 8 sq. miles

The Tagish Narrows, located in the south-central Yukon, between Tagish and Marsh Lakes, ranks as one of the best-known and most important early spring staging areas for waterfowl in the southern Yukon. Like many of the large lake outlets at this latitude some open water is frequently present throughout the winter, or if the channel does freeze over, the ice will be out well in advance of general spring break-up.

During mild winters a few water birds (goldeneyes and mergansers) may remain at the Narrows throughout the winter. Trumpeter swans began to arrive in early April, and are followed by large numbers of ducks, representative of essentially all species which migrate through the southern Yukon. Whistling swans start to arrive at Tagish in mid-April (C W S , 1979).

Mossop (1976) conducted 5 aerial and ground surveys of Tagish Narrows between early February and May of 1976. The highest counts obtained on those surveys were on May 5, when 4,000 ducks and 250 swans were present. Foothills (1977) conducted aerial surveys between late March and mid-May, 1977, and reported 158 swans on April 20, and 2,259 ducks on April 26. C W S (1979) conducted 8 ground counts at Tagish Narrows between April 13 and May 2, 1978 and reported peak numbers of 2,471 ducks, 160-170 Trumpeter swans and 748 Whistling swans. These surveys showed pintails, wigeons and mallards to be the most common dabbling ducks and Canvasbacks, Goldeneyes and Buffleheads to be the most common divers. Twenty four species of waterfowl were recorded at Tagish during those surveys.

No. 6 Highway, connecting the Alaska Highway with Carcross, crosses the Tagish Narrows near the Marsh Lake end, then parallels the west bank for app. half the distance south to Tagish Lake. There are a number of cottage lot leases between the Narrows and the highway in the area, and several agricultural leases on the west side of the highway. As well, there are cottage lot leases on the small island mid-way on the channel and along the east shore near the Tagish Lake end. Y T G maintains a public campground on the east bank immediately south of the highway, and an Indian Reservation extends southward from the campground for app. 1 mile. Two surveyed parcels of land south of the Indian Reservation have been set aside, by notation, by D I A N D as a "Bird Refuge". There are placer claims on Pennycook Creek which have been worked intermittently over the past few years.

Activities at Tagish Narrows are primarily those associated with recreation (fishing, boating, skiing, snowmobiling, etc.) although there are a substantial number of year-round residents also. Y T G Highways and Public Works had planned to realign the existing highway and construct a new bridge near mid-channel, but in 1979 the bridge was rebuilt in its original position, and a road realignment now seems unlikely. The Northern Canada Power Commission regulates water levels on Marsh Lake (consequently, on the Narrows) via a control structure on the Yukon River a few miles below Marsh Lake. Current operating levels do not seem to be in conflict with the habitat requirements of waterfowl during the early spring. Parts of the Narrows fall within two registered traplines, but during discussions with the operators in 1976 it was learned that little trapping activity takes place on the Narrows.

A proposal for a migratory bird sanctuary at Tagish was prepared by C W S (1976) but to date no action has been taken on that proposal. Boundaries were generally defined as the high-water line (in order to avoid conflict with existing land dispositions) and the two parcels of land identified by D I A N D

as a bird refuge were incorporated into the proposed sanctuary. It must be emphasized that the two parcels of land referred to have little significance to spring waterfowl populations on the Narrows, other than from the standpoint of preventing further development along that segment of the shoreline. The areas requiring protection are principally the ice-shelves along the shorelines and the open water. The sanctuary proposal included a provision for prohibiting the use of motorized vehicles (snowmobiles, outboards) in those areas during the critical spring-staging period. It is also significant that the area is essentially a spring-staging area, and the critical period lasts for only 6-8 weeks. There is little evidence of waterfowl breeding populations at the Narrows during summer months (Soper, 1954) and no evidence of extensive fall staging activity.

In light of present and continuing land use dispositions at Tagish, and in order that waterfowl managers may have a meaningful input to any future changes in water-regulation programs on the Marsh-Tagish system, renewed efforts should be made to formulate legislative protection for waterfowl habitat at Tagish Narrows.

References (7)

Canadian Wildlife Service, 1976. Land Use Activities in the Tagish Narrows Area and a Proposal for a Migratory Bird Sanctuary. Internal report prepared by: M. Dennington, Feb. 20, 1976. 17 pp. & app.

Canadian Wildlife Service, 1979. 1978 Spring Waterfowl Surveys in the Southern Yukon. Interim Report, May 1979. 67 pp.

Foothills Pipe Lines (Yukon) Ltd., 1977. Spring (1977) Waterfowl Migration: Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary. 30 pp + Appendices.

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter 1976. Yukon Game Branch, Interim report.

Soper, J.D. 1954. Waterfowl and Other Ornithological Investigations in Yukon Territory, Canada, 1950. Wildlife Management Bulletin, Series 2, No. 7.

BENNETT LAKE OUTLET

Map Reference #8

Location 60°09' - 60°12'N - 134°37' - 134°46'W

Size 5 sq. miles

Bennett Lake lies on the B.C.-Yukon border app. 40 miles south of Whitehorse. The outlet, at the town of Carcross, is via a narrow channel into Nares Lake, a small lake which in turn empties eastward into Tagish Lake and eventually to the Yukon River. Open water occurs during early spring for a few hundred yards out into the bay west of Carcross, through the channel to Nares Lake and, to a lesser extent, at the outlet of Nares Lake.

The first trumpeter swans to arrive in the Yukon during the spring migration probably stop at Bennett Lake. In the spring of 1980, 3 trumpeters were observed at Carcross on March 14 (D. Mossop, M. Dennington, unpub. field notes) fully three weeks before the build-up of trumpeters at Tagish Narrows would be expected. Local residents reported that they normally expect to see swans arriving at Carcross during the last week of March. Use of the area by other waterfowl appears moderate - during April, 1980 surveys the maximum number of ducks reported on any one survey was 43 (Canadian Wildlife Service, field notes, C W S files, Whitehorse). It is quite probable that most waterfowl arriving at Carcross stop only briefly before moving through the lake system to Tagish Narrows and M'Clintock Bay. However the importance of the area to Trumpeter swans requires further investigation.

Much of the traffic enroute to the Dawson goldfields at the turn of the century passed through the Bennett-Nares system, and the railroad which followed currently crosses the narrows at Carcross. The Skagway-Klondike Highway bridge crosses the narrows a few hundred yards downstream from the railway bridge.

The settlement of Carcross, which occupies both sides of the narrows and extends north along the shoreline of Bennett Lake, is for the most part within a Y T G block land transfer. There are three recreational lot bases on the north shore of Nares Lake and one legal lot on the south side of the narrows. An area of sand dunes, directly north of Carcross, was proposed as an I B P site, and the entire area is included within C A R C 's (1980) list of environmentally significant areas of the Yukon.

References #8

Canadian Arctic Resources Committee, 1980. Environmentally Significant Areas of the Yukon Territory. Edited by: John B. Theberge, J. Gordon Nelson and Terry Fenge. Yukon Series Research Monograph 4. 134 pp. + map.

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter, 1976. Yukon Game Branch, Interim Report.

M'CLINTOCK BAY

Map Reference #9

Location 60°32' - 60°35'N - 134°29' - 134°43'W

Size 16 sq. miles

This area, located at the north end of Marsh Lake in the south-central Yukon, includes the bay, the mouth of the Yukon River and the section of the river and its side-channels and ponds between Marsh Lake and the Alaska Highway crossing.

Ice-free areas persist at the river mouth and through portions of the downstream channel during mild winters. On any year, open water as found in M'Clintock Bay and downstream to the vicinity of the highway bridge in early spring, well in advance of general break-up. As spring advances, mud-flats in and around the bay, and sandbars along the river are exposed. A variety of waterfowl and shorebirds utilize these areas during the annual spring migration.

Water levels on this section of the Yukon River and Marsh Lake are regulated by a control structure on the river immediately below the highway bridge. Storage levels are brought up during the summer and fall, resulting in flooding of a complex of ponds, channels and wet meadows along the river below Marsh Lake. These areas are utilized, to varying degrees, by waterfowl during the fall migration.

Waterfowl counts have been conducted during the spring at M'Clintock Bay during four of the past five years. Peak numbers observed are as follows:

	<u>1976(1)</u>	<u>1977(2)</u>	<u>1978(3)</u>	<u>1980(4)</u>
Ducks	822	2,549	1,135	1,781
Geese		80	50	103
Swans	500	644	2,060	1,200

- (1) Mossop (1976)
- (2) Foothills (1977)
- (3) C W S (1979)
- (4) C W S , 1980 (field notes, C W S files, Whitehorse)

Maximum numbers of birds at M'Clintock can be expected in late April, but the peak may be of short duration, therefore unless counts are conducted at regular intervals a significant portion of the staging population could be overlooked. For example, Foothills (1977) conducted 8 surveys of the area between late March and mid-May (at app. weekly intervals) and obtained a maximum count of 2,549 ducks on April 26th. C W S (1977) reported a count of 5,000 ducks obtained from a ground-count in "late April" of the same year. Additionally, it is extremely difficult to obtain an accurate measure of daily immigration-emigration during a migration period, therefore any given count will have to be recognized as an absolute minimum estimate of the total population utilizing the area.

Soper (1950) estimated the waterfowl population of the Marsh Lake outlet - Yukon River area to be 546 birds (predominately scaup and scoters) in mid-June, 1950. N C P C (1974) found 10-12 broods of ducks (canvasback and wigeon) and app. 100 non-breeding scaup and scoters in the area during mid-summer, 1974, but indicated that during the fall migration "the outlet of Marsh Lake receives a largenumber of migrant birds which feed and rest among the flooded willows". C W S (1977) reported minimum counts of 609 waterfowl on the river and associated sloughs during the fall of 1977, but noted that one slough alone supported 315 ducks in mid-September. Because of high water levels during the fall, and the consequent distribution of waterfowl through the flooded margins of ponds and channels, it has not been possible to establish a meaningful estimate of total fall populations.

Recreational cottage-lot leases have been granted along both sides of M'Clintock Bay, and the adjacent north shore of Marsh Lake is a major recreational area. There are also a few recreational lot leases between the Alaska highway and the Yukon River below Marsh Lake. There is an active sawmill site south of the river, which is accessible via a road from the Alaska Highway, and there is a grazing lease south of the river, mid-way between Marsh Lake and the highway bridge. The entire area lies within the proposed Alaska Highway Pipeline corridor.

Few of the above land-water use dispositions currently represent serious threats to waterfowl populations or habitat. We have no population data for the area prior to installation of the flow-control structure on the river, although there are suggestions (N C P C , 1974) that high fall water levels have had a negative effect on fall staging waterfowl. Recreational activities in the M'Clintock Bay area (use of outboards, snowmobiles, etc.) during the spring staging period should be discouraged. Formal recognition of the importance of this area to waterfowl, within land or water development planning, could best be accomplished through some means of legislative protection. Flexibility, to allow recreational activities during the summer and fall, would be required.

References (9)

Canadian Wildlife Service, 1977. Waterfowl Surveys Along Proposed Pipeline Routes in the Yukon Territory and Northern B.C. Unpub. C.W.S. Interim report prepared by M. Dennington and P. Milligan. 71 pp + Appendices.

Canadian Wildlife Service, 1979. 1978 Spring Waterfowl Surveys in the Southern Yukon. Interim Report, May 1979. 67 pp.

Foothills Pipe Lines (Yukon) Ltd. 1977. Spring (1977) Waterfowl Migration: Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by: Beak Consultants Ltd., Calgary.

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter 1976. Yukon Game Branch, Interim report.

Northern Canada Power Commission, 1974. An Environmental Overview Study of the Proposed Marsh Lake Dam. Prepared by: Renewable Resources Consulting Services Ltd. 54 pp.

Soper, J. Dewey. 1950. Waterfowl and Other Ornithological Investigations in the Yukon Territory, Canada, 1950. Wildlife Management Bulletin, Series 2, No. 7.

UPPER LABERGE

Map Reference #10

Location 60°53' - 60°59'N - 135°00' - 135°10'W

Size 35 sq. miles

This area located at the south end of Lake Laberge, app. 12 miles north of Whitehorse, includes a variety of waterfowl habitats. The bay at the extreme south-west corner of Lake Laberge is a large, (app. 1 sq. mile) waterbody, with a very shallow, sloping shoreline. Seasonal fluctuations in water levels on the lake proper result in rather extensive zones of exposed wet, muck soils around the shoreline, and a few silty offshore bars. During high water the shoreline advances well up into the tall willows which encircle most of the bay.

Extensive sand bars are found in the Yukon River, at the point where it enters Lake Laberge, and in the developing oxbow 2 miles upstream. Narrow channels of open water may be found at the river mouth in early spring prior to general break-up. There is no documentation of aquatic vegetation associated with these areas, but the sand bars are probably an attractive loafing area for waterfowl during migration periods.

To the immediate south and east of the large oxbow there are extensive "marshlands" along lower Laberge Creek, and a small lake near the southern extremity of the marshlands. The available literature provides no descriptions of these areas, however surveys conducted in conjunction with the proposed Dempster Lateral gas pipeline route indicated that the marshes are utilized by waterfowl.

In April 1977, maximum counts of 5,000 ducks and 150 swans were recorded for the bay area, defined above (C W S field notes, Whitehorse). During the fall of 1977, Foothills (1977) reported 2,988 ducks, 100 geese and 360 swans using the "delta"

area on the Yukon River and the Laberge Creek marshes (roughly 90% of the birds were recorded on the delta area). During the spring of 1978, Foothills (1978) reported 523 ducks, 3 geese and 65 swans on the delta and marshes. Foothills (1979) field crews conducted aerial surveys of the bay at the southwest corner of Lake Laberge during the summer of 1978 and counted 110 ducks (mostly small groups of molting birds) and 15 broods of dabbling ducks. During the spring of 1980 C W S (field notes, C W S, Whitehorse) found maximum numbers of 654 ducks, 158 swans and 5 geese on the bay.

It is not known if the Foothills surveys of the Laberge Creek marshes included the small lake on the west side of the creek (locally known as Swan Lake). D. Mossop (pers. comm.) has indicated that the lake is used by waterfowl.

Lands south of Lake Laberge and west of the Yukon River are currently managed by the Yukon government as part of a block land transfer. There are three grazing leases within the outlined boundary, one at "Swan Lake" and two along the west side of the bay on Lake Laberge (each lease is roughly 1 square mile). There is also an agricultural lease on the west side of the bay, where in recent years a considerable amount of land-clearing activity has taken place. There is a small commercial lease on the land enclosed by the large oxbow on the Yukon River, and a commercial-residential lease along the outlined boundary west of the bay. An Indian and Inuit Affairs reserve, located on the east and west shore of Lake Laberge, partially overlaps the north boundary of this area. Most of the south shoreline of the bay area is included within a crown grant (app. 1 sq. mile) and there is another small crown grant at the site of the old Upper Laberge settlement on the west bank of the Yukon River in the delta area.

Land use developments are taking place currently at Upper Laberge and the area may be on the route selected for a Dempster lateral gas pipeline. A waterfowl habitat management plan which would recognize a variety of habitat types should be envisioned.

References #10

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Klondike Highway Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 19 pp. + appendices.

Foothills Pipe Lines (Yukon) Ltd., 1978. Spring (1978) Waterfowl Migration: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 19 pp. + appendices.

Foothills Pipe Lines (Yukon) Ltd., 1979. Summer (1978) Waterfowl and Upland Game Bird Surveys: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Robert L. Brown, Bioresources Consulting, Fruitvale, B.C. 44 pp.

TAYE LAKE

Map Reference #11

Location 60°54' - 60°58'N - 136°16' - 136°27'W

Size 8 sq. miles

Taye Lake is located in the Sifton mountain range in south-western Yukon, app. 50 air-miles northwest of Whitehorse, and 8 miles north of the Alaska highway. The lake lies near the Hutschi Lakes divide - waters from Hutschi flow north via the Nordenskiold River, drainage from Taye Lake is to the south via the Mendenhall River.

Soper (1954) described Taye Lake as lying in a "swampy lowland" and having a shoreline composed primarily of earth banks. Aerial photos show a shallow, irregular shoreline with offshore emergent vegetation well-established at the inlet and outlet ends of the lake. There are numerous small ponds in the low, marshy areas at either end of the lake and on several outwash fans along the shoreline.

Soper (1954) estimated a total waterfowl population of about 120 birds on Taye Lake in early June, 1950. The author went on to say, however, "It is said that thousands of ducks and some Canada geese and lesser Snow geese visit Taye Lake during the spring migration and that especially large numbers rest there during the autumn migration". Although Mossop (1976) includes Taye Lake in the list of minor spring staging areas in southern Yukon, he did not include supporting population data. C W S (field notes, C W S files, Whitehorse) conducted an aerial survey of Taye Lake on April 29, 1976 and found a small area of open water at the outlet end being used by 25 ducks. There was open water through the inlet channel, at the north end of the lake, at that time, and one flock of 75 dabblers and several small groups of 10-12 ducks were

observed. There is no other known waterfowl population data for Teye Lake, but in light of Soper's comments, further surveys are warranted.

Teye Lake is accessible by trail (condition unknown) from the Alaska Highway at Champagne. There is a legal lot on the west bank of the Mendenhall River app. 1/2 mile south of Teye Lake, and there is a quartz claim block on one of the tributary streams along the east side of the lake.

There are no current threats to waterfowl habitat at Teye Lake. The use of this area by waterfowl during the summer and fall requires further investigation.

References #11

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter 1976.
Yukon Game Branch Interim Report.

Soper, J. Dewey, 1954. Waterfowl and Other Ornithological
Investigations in Yukon Territory, Canada, 1950. Wildlife
Management Bulletin, Series 2, Number 7. 55 pp. + illustrations.

DEZADEASH LAKE OUTLET

Map Reference #12

Location 60°31' - 60°34'N, 136°44' - 136°55'W

Size 7 sq. miles

Dezadeash Lake is located in the Coast Mountains of southwestern Yukon, app. 25 miles south-east of Haines Junction. The lake has a relatively small drainage basin; the Kluhini River supplying the major inflow. Outflow is to the north-east via the Dezadeash River, which in turn empties into the Alsek system.

At it's exit from the lake the Dezadeash River flows through a narrows, and into Six Mile Lake. A series of narrows serve to separate this lake into three, somewhat distinct segments. During early spring, open water is found through the narrows at Dezadeash outlet, and Six Mile Lake, well in advance of general spring break-up. It is this feature which makes the area attractive to waterfowl during spring migration.

The Land Use Information Series (Dept. of Indian and Northern Affairs, 1973) identified the south end of Dezadeash Lake as a spring staging area for waterfowl (particularly swans) and the outlet area as a fall staging area. No data are presented with regard to presence of early open water or waterfowl observations, and subsequent surveys do not indicate the presence of open water at the south end of the lake prior to general break-up. Swans have usually departed from the large lakes in southern Yukon when spring break-up occurs, and it seems probable that the Land Use Series assessment was based on an isolated circumstance when swans were present at the south end of the lake after break-up. No surveys have been conducted in the Six Mile Lake area during fall months to verify it's importance as a fall staging area, although Soper (1954) stated the area ".... is said to be a good place for

shooting in the fall".

Mossop (1976) visited Dezadeash Lake in mid-April, 1976 and found about 5 acres of open water area at the river-mouth, but no waterfowl were observed. C W S (field notes, C W S , Whitehorse) visited the area in late April, of the same year, and recorded 560 ducks, 12 geese and 39 swans through the Six Mile Lake area. Mossop resurveyed the site on May 5th and observed 1,817 ducks (primarily dabblers). Mossop considered the outlet area to be one of the major early spring staging areas of the southern Yukon.

The only known land disposition within this area is a small residential lease on the east shore of Dezadeash Lake near the river mouth. The Yukon Territorial Gov't. (1980) identified potential cottage lot sites on Dezadeash Lake and indicated that the Parks Branch was "considering" development of an access road along the north shore of the lake in order to open up canoe opportunities on the Dezadeash River.

There appear to be few immediate threats to waterfowl habitat in the Dezadeash Lake Outlet area, but further spring and fall field surveys should be undertaken at this time.

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KLOO-SULPHER LAKES

Map Reference #13

Location 60°56' - 61°06'N - 137°50' - 137°59'N

Size 26 sq. miles

Kloo and Sulpher Lakes lie within the Shakwak Valley, app. 20 miles south-east of Kluane Lake. Wetlands include Kloo Lake, (App. 5 sq. miles), Sulpher Lake (app. 1 sq. mile) and a cluster of small "potholes" along the Jarvis River to the north of Kloo Lake.

The entire area was surveyed by various observers, and at various times, during the course of Alaska Highway gas pipeline studies (1977-78) but most individual surveys covered only a portion of the area at a given time. In the spring of 1977, Foothills (1977) recorded maximum counts of 1,078 ducks and 43 swans on Kloo Lake and "Jarvis Creek". During the fall of 1977, Foothills (1977(a)) recorded maximum counts of 1,201 ducks and 75 swans on Kloo and Sulpher Lakes. C W S (1979) conducted nine aerial surveys of Kloo Lake, Sulpher Lake and the Jarvis River wetlands during the fall of 1978 and reported maximum combined totals of 959 ducks, 125 geese and 19 swans. During the summer of 1977, C W S (Field notes, C W S, Whitehorse) field crews found both diving and dabbling ducks breeding on essentially all of the small ponds in the Jarvis River area, but divers (mostly scaup) utilized the two larger lakes. It is quite probable that the smaller lakes are important in terms of waterfowl production, whereas Kloo and Sulpher Lakes are primarily moulting and staging areas.

There are no mining claims or oil and gas leases in this area, but there are a number of significant land use commitments. The Alaska Highway Gas Pipeline Corridor encompasses all of Sulpher

Lake and the south half of Kloo Lake. The land between Kloo and Sulpher Lakes, from the Alaska Highway to the north end of Kloo Lake, is an Indian and Inuit Association reserve. Most of the Jarvis River wetlands are encompassed by a grazing lease and there are a number of minor land dispositions along the Alaska Highway, on the south boundary of the area. There are a few buildings on the west side of Kloo Lake (status unknown) with access via undeveloped trails from the Alaska Highway.

There appear to be few immediate threats to waterfowl habitat in the Kloo-Sulpher Lakes area, providing that the proposed pipeline alignment is accepted and construction schedules conform to the established terms and conditions.

References #13

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KLUANE LAKE OUTLET

Map Reference #14

Location 61°22' - 61°30'N, 139°00' - 139°14'W

Size 23 sq. miles

Kluane, the largest lake in Yukon territory, lies in the central part of the Shakwak valley, flanked by the Kluane Ranges to the southwest and the Ruby Range to the northeast. The Slims River which originates on the Kaskawalsh Glacier in the St. Elias Range and empties into the lake at its southern extremity, is the major tributary of the lake. Outflow is via the Kluane River, which exits near the base of Brooks Arm at the north end of the lake.

The phenomena of open water during some winters and during early spring, which is common to many large lake outlets in southern Yukon, is encountered at Kluane's outlet. Open water may be encountered on the Kluane River, downstream, to the vicinity of the Duke River confluence.

Burwash Lake, on the south side of the Kluane River and about 4 miles west of the river mouth, was identified during Alaska Highway Gas Pipeline studies as an important lake for waterfowl. C W S (field notes, C W S files, Whitehorse) field crews described the lake as being shallow, having an abundance of aquatic plants, and marsh areas at the southeast and southwest corners. Although little population data was available, it was felt that because of its proximity to the Kluane Lake outlet, Burwash Lake could be important as a fall staging area. Accordingly, the boundary for the Kluane Lake Outlet area has been selected to include the outlet, a portion of Brooks Arm, a few miles of the Kluane River and Burwash Lake.

Soper (1954) found very few waterfowl using Kluane Lake in early August, 1950, but residents of the Burwash Landing area

had reported that in the fall of 1945 large numbers of ducks, whistling swans, Canada geese, whitefronted geese and lesser Snow geese had staged in the outlet area. It was felt that numbers had declined after 1945. Fall surveys conducted in conjunction with the proposed Alaska Highway Pipeline project by Foothills (1976, 1977) and C W S (1979) during three consecutive years (1976-78) showed average, maximum, counts of 244 ducks, 211 geese, and 232 swans on the Kluane outlet area. (C W S (1978) reported 40 geese on Burwash Lake during the fall of 1977). Mossop (1976) observed 1,850 ducks, including 900 canvasbacks, at the outlet in early May, 1976. In the spring of 1977, Foothills (1977(a)) reported maximum counts of 1,264 ducks, 240 geese and 296 swans on the Kluane River and north Kluane Lake. These data must all be viewed as minimum population estimates as they represent numbers at one point in time during migration periods.

The outlet of Kluane Lake is accessible via four miles of trail, from a point on the Alaska Highway a few miles west of Burwash Landing. This trail roughly bisects the proposed Duke Meadows I B P site (C C I B P, 1975). The outlet area and Brooks Arm form an extension to the North Kluane "environmentally significant area" identified by C A R C (1980). The eastern boundary of the Alaska Highway Pipeline Corridor reserve crosses the south western portion of the identified area, and passes through Burwash Lake. There is a grazing lease, utilized by a big game outfitter, on the south side of the Kluane river, at it's mouth, and a Water Surveys reserve in the same area. The Yukon Territorial government has established a number of highway route realignment reserves along the north side of the Kluane river in proximity to the lake outlet.

References #14

Canadian Arctic Resources Committee, 1980. Environmentally Significant Areas of the Yukon Territory. Edited by: John B. Theberge, J. Gordon Nelson and Terry Fenge. Yukon Series Research Monograph 4. 134 pp. + Map.

Canadian Committee for the International Biological Programme - Conservation of Terrestrial Biological Communities, Panels 9 and 10. 1975. Northern Ecological Sites. Edited by: J. Payne.

Canadian Wildlife Service, 1978. Waterfowl Population Surveys Along Proposed Pipeline Routes in the Southern Yukon Territory and Northern B.C., 1977. Prepared by: Malcolm Dennington and Patrick Milligan. Unpub. C.W.S. report, C.W.S. files, Whitehorse, Yukon.

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LAKE CREEK COMPLEX

Map Reference #15

Location 61°44' - 61°47'N, 139°54' - 140°04'W

Size 6 sq. miles

This area consists of a group of small wetlands, along Lake Creek near it's confluence with the Koidern River, in the Shakwak Valley app. 40 miles north-west of Burwash Landing. The largest waterbody has a surface area of app. .75 sq. miles, and there are 20 - 30 smaller wetlands ranging downward in area to "pothole" status. C W S field crews who surveyed the lakes during the Alaska Highway Pipeline studies described the area as similar to the Pickhandle Lakes, but on a much smaller scale. Wetlands have extremely irregular shorelines, extensive areas of submergent and emergent vegetation, and most are connected by small, surface drainage channels. (C W S field notes, C W S , Whitehorse). Surveys were conducted by Foothills only during the fall of 1977, when maximum counts of 150 ducks and 3 swans were reported. C W S field crews noted "large numbers" of dabbling ducks utilizing sandbars on the largest lake in the complex during the summer of 1977. Rafts of scoters and diving ducks were noted on open water areas of one of the smaller lakes. Four trumpeter swans were also noted on the larger lake during that summer, but no broods were found.

The Alaska Highway Gas Pipeline reserve encompasses most of the Lake Creek complex and there are a number of highway re-alignment reserves. The area is within the Kluane Game Sanctuary, was included within the proposed Klutlan Glacier I B P site (I B P -C T , 1975) and identified by C A R C (1980) as one of Yukon's ecologically sensitive areas.

The major threat to waterfowl habitat in the Lake Creek complex is related to development of linear facilities (pipelines,

highways) within the confines of the Shakwak Valley. C A R C 's recommendation for National Park or National Wildlife Area status for the Lake Creek complex, as part of a much larger area of the North Klwane region, seems appropriate.

References #15

Canadian Arctic Resources Committee, 1980. Environmentally Significant Areas of the Yukon Territory. Edited by: John B. Theberge, J. Gordon Nelson and Terry Fenge. Yukon Series Research Monograph 4. 134 pp. + map.

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PICKHANDLE LAKE

Map Reference #16

Location $61^{\circ}53'$ - $61^{\circ}59'N$, $140^{\circ}12'$ - $140^{\circ}34'W$

Size 22 sq. miles

The Pickhandle Lake area is a dense complex of small lakes and potholes, lying adjacent to the Alaska Highway, between Kluane Lake and the Alaska-Yukon border. The area is app. 18 square miles and is closely confined by the Kluane Range on the west and the Kluane Plateau on the east. The Koidern River has established a meandering course through the length of the complex and many of the small potholes are connected to the river by small surface drainage channels.

Most of the wetlands have very irregular perimeters, but show considerable variation from steep, peat banks to shallow, sandy flats. Many of the ponds exhibit dark, organic stained waters, and most have a variety of submergent and emergent vegetation including extensive beds of pond lily.

Waterfowl counts were conducted at Pickhandle during studies of the Alaska Highway Pipeline corridor, however the complexity of wetlands made it nearly impossible to conduct total counts. Foothills (1977) reported maximum counts of 885 ducks, 83 swans and 26 geese on their spring survey in mid-May, 1977. Fall surveys, in the same year, showed 468 ducks, 9 swans and 5 geese on what we assume to be the same areas. (Foothills, 1977(b)). C W S (1979) conducted surveys of a sample of wetlands in the Pickhandle complex, during the spring, summer and fall of 1977, then expanded the information to provide an estimate of total populations for the entire complex. That estimate, which included ducks, geese, swans, loons and grebes, varied over the three seasons from app. 1,500 to 2,300 birds.

One of the more important aspects of the Pickhandle complex is that due to its location within the Shakwak Valley, and to the variety of wetland habitats available, representatives of nearly all species of waterfowl which migrate through, or breed in the southern Yukon, can be observed during the open-water season. It is probable that this contributed to the Canadian Committee for the International Biological Program (1975) description of the site as "best waterfowl and shorebird habitat in Kluane Game Sanctuary, one of the best in Yukon". This is also one of the few areas in south-western Yukon where trumpeter swans have been recorded during summer months. Trumpeters have reportedly nested near Pickhandle Lake (J. Cook, pers. comm.) although the trumpeters which were observed here in 1977 were apparently non-breeders.

The Alaska Highway provides access to the immediate east side of the Pickhandle complex. During the summer, the Koidern River provides water access to much of the interior, although through-navigation of the river is impeded by several log-jams. The eastern portion of the area is within the Alaska Highway Pipeline corridor, and the pipeline proper may closely parallel the Alaska Highway in the Pickhandle area. A block of quartz claims overlaps the south-west corner of the area, and there is a Y T G campground on Pickhandle Lake. The complex was proposed as an I B P site and the entire area lies within the Kluane Game Sanctuary.

Concern for waterfowl resources in the Pickhandle area relates to development of linear facilities (pipelines, highways) through the confines of the Shakwak valley in that area, and management programs which may evolve subsequent to a Land Claims settlement.

References #16

Canadian Committee for the International Biological Program - Conservation of Terrestrial Biological Communities, Panel 9 and 10, 1975. Northern Ecological Sites.

Canadian Wildlife Service, 1979. Migratory Bird Investigations Along the Proposed Alaska Highway Gas Pipeline Route. Bird Use of Wetlands during the Summer and Fall of 1977. Interim Report No. 3. Ap., 1979.

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Foothills Pipe Lines (Yukon) Ltd., 1977(b). Fall (1977) Waterfowl Concentrations: Proposed Alaska Highway Gas Pipeline Route, Southern Yukon. Prepared by Beak Consultants Ltd., Calgary.

AISHIHIK LAKE OUTLET

Map Reference #17

Location $61^{\circ}10'$ - $61^{\circ}12'N$, $137^{\circ}02'$ - $137^{\circ}58'W$

Size 2 sq. miles

Aishihik Lake lies along the eastern front of the Ruby Range in south-western Yukon, app. 80 air-miles northwest of Whitehorse. Outflow from the lake is regulated by a control structure, then continues southward via a short channel to Canyon Lake. A control structure at the outlet of Canyon Lake, immediately above Otter Falls, serves to divert the normal flow of the Aishihik River through a man made canal to the hydro plant. Discharge from the plant is back to the Aishihik River, which empties into the Dezadeash.

The short section (1.5 miles) of the Aishihik River which forms the drainage between Aishihik Lake and Canyon Lake is narrow and has a rocky substrate through it's first few hundred yards. The channel then enters a wide slough (Canyon Pond) and the current of the stream is much-reduced. The remainder of the channel between Canyon Pond and Canyon Lake is again confined, with gravel and boulder substrate and shoreline. Open water may occur through all or parts of this channel throughout the winter months. In mid-April, 1976, Mossop (1976) reported that the entire channel between Aishihik Lake and Canyon Lake, was open.

There is little available data on waterfowl use of Aishihik Lake outlet. Soper (1954) conducted a partial survey of Canyon and Aishihik lakes in mid-summer, and found generally low breeding populations. It is of interest to note that Soper observed harlequin ducks - a species of considerable current interest - on the channel between Canyon and Aishihik Lakes. The Land Use Information Series (D I A N D , 1973) identifies the south end

of Canyon Lake as an early open water area (due to the flow of water over Otter Falls) and spring waterfowl staging site for ducks, geese and swans. Since the control structures have been in operation early-season open water can be found in the channel below Otter Falls and in the diversion canal, but not on the south end of Canyon Lake. Mossop (1976) observed only 25 wigeons between Aishihik and Canyon Lakes in early May, 1976, and on this basis considered the outlet to be a minor staging area for waterfowl. Further surveys are required to determine current use of the entire area.

The west bank of the Aishihik Lake outlet channel was included within the proposed Aishihik Lake I B P site (I B P - C T , 1975). Most of the outlet area is currently within a Y T G campground reserve and Northern Canada Power Commission holds a reserve on lands surrounding the outlet control structure. Water Surveys hold a small reserve for a monitoring station at the south end of Aishihik Lake. The area receives a considerable amount of tourist traffic, via a road from the Alaska Highway, during the summer months, and portions of the river between Aishihik and Canyon Lakes are popular with sports fishermen.

The major threat to this area would involve water level manipulation for the hydro-electric generating plant. Since the plant was opened, N C P C has expressed an interest in obtaining permission to utilize more water from the storage reservoir (higher storage levels and lower drawdown levels) and transferring waters from the Nordenskiold drainage into Canyon Lake.

References #17

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References (18)

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HUTSHI LAKES

Map Reference #18

Location $61^{\circ}07'$ - $61^{\circ}11'N$, $136^{\circ}32'$ - $136^{\circ}38'W$

Size 7 sq. miles

Hutshi Lakes are a chain of small lakes on the upper Nordenskiöld River drainage in southwestern Yukon, app. 55 air miles north-west of Whitehorse. The chain is oriented in a general north-south direction and includes three lakes, each with a surface area of roughly 1.5 sq. miles, and a number of small ponds within the inter-lake lowlands. The most northerly of the three lakes is characterized by a small marsh complex on the south end and two areas of narrows within the lake proper. The central lake has a more linear shoreline and few marsh associations. The southern lake has a very irregular shoreline, extensive areas of shallow water and several small islands.

Soper (1954) surveyed parts of the lake-system in early July, 1950, and found few waterfowl present at that time (he estimated a summer population of only 6 birds per square mile), but noted "Wildfowl, including a few geese and swans, are reported to be more numerous in Hutshi Lakes during migration". C W S (field notes, C W S, Whitehorse) personnel surveyed Hutshi Lakes in late April, 1976, and found open water at the outlet of the south lake. App. 75 ducks and 25 swans were present.

There are no known land dispositions in this area. Hutshi Lakes fall within the Sifton Range, site 33 identified by C A R C (1980) as an "environmentally significant" area.

The area is of current concern due to a proposal by Northern Canada Power Commission to transfer waters from the Nordenskiöld basin to the Aishihik system. Further surveys of waterfowl populations are required.

UPPER NORDENSKIOLD RIVER WETLANDS

Map Reference #19

Location $61^{\circ}23'$ - $61^{\circ}35'$ N, $136^{\circ}02'$ - $136^{\circ}09'$ W

Size 18 sq. miles

The Nordenskiold River rises in the Moraine Lake area, in south-western Yukon, app. 60 air-miles northwest of Whitehorse, and flows northward to join the Yukon River at Carmacks. Through much of its course the river has a low gradient and has developed a complex meander pattern within the relatively broad valley. Near mid-point on the river course, glacial deposits (kames, kettled terraces) provide a setting for a complex of small lakes and ponds and sedge meadows. Most of the waterbodies are shallow, have extensive sedge zones along their shorelines, and support submergent vegetative communities.

Waterfowl use of wetlands along the upper Nordenskiold is poorly documented. Soper (1954) noted that "some of the small lakes and sloughs were frequented by a few ducks (greater scaup, mallards, baldpates and American golden-eyes)." "Large numbers" of swans have been reported in the general vicinity of this area during the spring and fall migration period (G. Howell, pers. comm.). During the summer of 1980, a C W S summer student crew conducted a reconnaissance of wetlands along the upper Nordenskiold. Waterfowl population data from that program has yet to be analysed, but a review of field notes indicates that a good cross-section of waterfowl species was found throughout the area during the breeding season. It is expected that habitat quality is similar to that found along the Lower Nordenskiold River (area #20).

The southern half of this area is covered by a coal mining licence, and there is a small coal lease across the extreme southern boundary. There are no known placer or quartz mining

claims recorded within the area.

There is an overland access to the Nordenskiöld River, near Division Mountain, via the old Dawson trail from Braeburn and a more recent spur trail developed during mineral exploration programs. The Nordenskiöld River is navigable by canoe, although numerous log-jams demand portaging. In the authors view, the river offers good recreational potential for the non-expert canoeist.

The major current threat to wetlands in this area relates to the effect of draw-down on the Nordenskiöld River, through N C P C 's proposed inter-basin transfer to the Aishihik system, on small standing waterbodies along the river.

References (19)

Soper, J. Dewey, 1954. Waterfowl and Other Ornithological Investigations in the Yukon Territory, Canada, 1950. Wildlife Management Bulletin, Series 2, No. 7. 55 pp. + illus.

LOWER NORDENSKIOLD RIVER WETLANDS

Map Reference #20

Location 61°49' - 62°03'N, 136°04' - 136°17'W

Size 28 sq. miles

In the lower reaches of the Nordenskiold Valley, a few miles south of Carmacks, the river has developed an exceptionally convoluted pattern with resultant oxbows, cut-off channels, potholes and wet meadows. Wetlands within this part of the valley were described by Foothills (1979) as "complex fertile environments - high density, shallow waterbodies, high density of submergents and emergents". The area is app. 14 miles in length and 1 1/4 miles across.

During the fall of 1977, Foothills survey crews recorded max. counts of 376 ducks, 125 geese and 1,103 swans on the lower Nordenskiold wetlands. Maximum counts during the spring of 1978 (Foothills, 1978) included 314 ducks and 43 swans. During the summer of 1978, Foothills (1979), recorded 268 ducks and 33 broods (canoe and aerial surveys). Based on brood counts, Foothills concluded that the Nordenskiold complex represented the best breeding habitat for dabbling ducks on the entire Dempster lateral corridor (Whitehorse - Richards Island).

This area lies within the proposed route of the Dempster Lateral pipeline, although to date no formal "corridor-reserve" has been established for that pipeline. There is a small agricultural lease, and three small legal lots established near the lower (north) end of the area, and an application for a residential lot app. 2 miles upstream from the surveyed lots. There are placer claims on the unnamed creek north of Porter Mountain, but they do not extend downstream to intersect the area described here.

Inter-basin transfer of waters from the Nordenskiöld basin to the Aishihik system, as proposed by Northern Canada Power Commission, may be the most significant potential threat to the lower Nordenskiöld wetland complex.

References #20

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LAKE LABERGE OUTLET

Map Reference #21

Location $61^{\circ}22'$ - $61^{\circ}28'N$, $135^{\circ}05'$ - $135^{\circ}16'W$

Size 14 sq. miles

Lake Laberge is located on the mainstem Yukon River system in southern Yukon, app. 15 miles north of Whitehorse. The Yukon River empties into Lake Laberge at the extreme south end, and discharges at the north end. Area 21 includes the shallow bay which forms the outlet and app. 10 miles of the river below the outlet.

The river channel in this area is well incised in glacial silts and sands. River banks tend to be steep, actively eroding, and frequently devoid of vegetative cover. During most winters, and in early spring, open water is found at the outlet, extending back into the lake for about 1/2 mile and downstream on the river for as much as 15 miles.

Mossop (1976) stated that diving ducks frequently overwinter at the outlet of Lake Laberge, and the open water provides a "minor" staging site for spring migrants. Mossop recorded maximum counts of about 200 divers in early May. C W S (field notes, C W S, Whitehorse) field crews observed app. 200 divers, 300 dabblers and 40 swans at the outlet area on April 24, 1976. Much more intensive spring surveys are required in order to fully evaluate the importance of this area to migrating waterfowl.

Gold Rush River tours holds a small commercial lease on the west bank of the Yukon River at it's outlet from Lake Laberge, and the same company has applied for a commercial lease on the east bank, directly across from the existing lease. There is a legal lot (roughly 50 acres) on the east bank, at the outlet,

at the abandoned settlement of Lower Laberge. Water Surveys hold a small reserve on the river app. 4 miles downstream from the outlet, and D I A N D has placed a reserve on the shoreline of the river to the 2100' contour (presumably in light of possible future hydro-electric developments). Y T G 's Resource Planning Branch has identified potential cottage-lot sites along both the east and west shores of Lake Laberge near the north end of the lake. The areas are identified as offering "the best potential for recreation cottage lot subdivision development on a large lake within reasonable distance of Whitehorse...". (Gov't. of Yukon, 1980). A cottage lot development, together with the Yukon Territorial Parks Branch interest in more fully developing recreational potential of the Yukon River System, may result in construction of an access road to the north end of Lake Laberge. Planning of recreational development should be consistent with waterfowl use of the outlet area during early spring.

References (21)

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BIG SALMON - SANDY LAKES

Map Reference #22

Location 61°12' - 61°26'N, 133°10' - 133°30'W

Size 39 sq. miles

Quiet Lake lies in south-central Yukon, adjacent to the South Canal highway and app. 40 miles north of Johnsons Crossing. The outlet channel at the north end of Quiet Lake passes through a short (2 miles) channel into Sandy Lake, then via a 4-5 mile channel into Big Salmon Lake, which in turn is drained by the Big Salmon River. Both Sandy and Big Salmon Lakes have well defined shorelines, and where shallow areas are encountered, sand or gravel beaches have developed. The lakes have very limited areas of marshy shoreline and very little emergent vegetation. Through its course, and particularly through the first 10 miles (linear) the Big Salmon River has an extremely convoluted channel and a complex association of meander scrolls, oxbows, small ponds and sedge meadows.

Open water occurs at the lake outlets in early spring, prior to general spring break-up. Mossop (1976) estimated the combined early open water to have a surface area of roughly 500 acres.

The use of this area by waterfowl is not well documented. The Land Use Information Series (D I A N D , 1973) identified the outlet of Big Salmon Lake, and the first 10 miles of the river, as an area used by ducks and geese during the breeding season. C A R C (1980) identified the area for "waterfowl nesting and general habitat and proposed a "Migratory Bird Sanctuary" designation . Mossop (1976) estimated 150 pintails on open water between Sandy and Big Salmon Lake in mid-April 1976, and 665 ducks and 75 swans on the same area by early May. Two adult swans were observed on

the Big Salmon River, near the north end of the area, by C W S staff (C W S field notes, Whitehorse) in August, 1979. Discussions with a summer-resident of Big Salmon Lake (R. Dunlap, pers. comm.) revealed that few waterfowl are found on Big Salmon Lake during the summer months, but Canada geese can be expected during the early autumn.

There are two quartz claim - blocks along the eastern and northern edges of the area and placer claims within the area on the lower reaches of Brown Creek. There is a recreational lease on an island at the east end of Big Salmon Lake, and a cottage has been constructed on that site. A local big-game outfitter has a cabin on the west shore of Big Salmon Lake and there is another cabin on the west bank of the Big Salmon River in the outlet area.

Access to Big Salmon Lake and River during the summer months is via the waterway from Quiet Lake (launching areas on Quiet Lake are accessible from the South Canal Highway). There is an overland access to the east end of Big Salmon Lake from the South Canal road at Rose River, but wash-outs and steep grades restrict access to 4-wheel-drive or all-terrain vehicles.

The water route from Quiet Lake, through the Sandy - Big Salmon Lakes and down the Big Salmon River to the Yukon River and Carmacks, has become a popular route for canoeists.

It is doubtful if the current waterfowl data would provide much support for Canadian Arctic Resources Committee (1980) recommendation that this area be established as a Migratory Birds Sanctuary. Further field surveys are required and protection of waterfowl habitat might be accommodated within a recreation-management concept.

References (22)

Canadian Arctic Resources Committee, 1980. Environmentally Significant Areas of the Yukon Territory. Edited by: John B. Theberge, J. Gordon Nelson and Terry Fenge. Yukon Series Research Monograph 4. 134 pp. + map.

Dept. of Indian & Northern Affairs, 1973. Land Use Information Series. Produced by the Department of the Environment, 1973.

Mossop, D. 1976. Studies of Waterfowl Staging Areas, Winter 1976. Yukon Game Branch Interim Report.

FRANCES LAKE

Map Reference #23

Location 61°02' - 61°35'N, 129°08' - 129°45'N

Size 110 sq. miles

Frances Lake is located in south-eastern Yukon app. 80 miles north of Watson Lake. The lake appears in the form of a Y, the two arms extending roughly 25 miles north from the outlet at the south end. Drainage, via the Frances River, is into the Liard system. Narrows occur in the lake, toward the south end of the east arm and at several spots on the west arm.

Bastedo (1979) described the area around Frances Lake as being heavily forested, exceptionally scenic, and providing habitat for a variety of wildlife. Although no population data are provided, Bastedo described the narrows in the lake, and app. 20 kilometers of the Frances River below the lake outlet, as being critical for waterfowl during the early spring and during the nesting period. Mossop (1976) recorded 1,751 ducks, 15 swans and 75 Canada geese on early open water areas at the narrows and on the upper Frances River in early May. It must be emphasized that these figures represent waterfowl use at only one point in time, during the migration period. Given the location of Frances Lake within the Upper Liard Basin, and the fact that it provides open water at a time when most of the surrounding wetlands are still frozen over, it is highly likely that a much higher number of waterfowl use the area during the late April-early May migration period.

Frances Lake lies within an area that has been proposed for Territorial Park status, and the Canadian Arctic Resources Committee (1980) identified this area, together with a northward and westward extension, as an ecologically significant area of the territory. There are a few quartz claims along the east shore of the lake, placer claims near the north end of the west arm, and a number of recreational, legal and titled lots at various locations

around the lake. There is a Y T G campground, a Yukon Forest Service reserve and a Water Surveys reserve on the west arm at the nearest point-of-access from the Robert Campbell highway. D I A N D has placed a reserve on the shoreline to the 2,500' contour. This reserve is probably as a consequence of Northern Canada Power Commissions' (1975) identification of hydro-electric potential on the Frances River, with Frances Lake being envisioned as a storage reservoir.

Further quantitative data on waterfowl use of Frances Lake throughout the open-water season is required. In light of Bastedo's evaluation of wildlife habitat in that area, it would seem that wildlife resources might be assigned a high priority in future development plans.

References #23

Bastedo, James, 1979. An Ecological Survey Method for Environmentally Significant Areas in the Yukon with Results from the Frances Lake Study Site. Working Paper Number 5, President's Committee on Northern Studies, University of Waterloo, Ontario. Dec. 1979. 56 pp.

Canadian Arctic Resources Committee, 1980. Environmentally Significant Areas of the Yukon Territory. Edited by: John B. Theberge, J. Gordon Nelson and Terry Fenge. Yukon Series Research Monograph 4, 134 pp. + Map.

Mossop, D., 1976. Studies of Waterfowl Staging Areas, Winter, 1976. Yukon Game Branch, Interim Report.

Northern Canada Power Commission, 1975. The Development of Power in the Yukon. Sigma Resources, Canadian Resourcecon Ltd., Lee Doran Associates Ltd., and Glen Smith, Wildlife Consultant. Jan., 1975.

SHELDON LAKE

Map Reference #24

Location 62°02' - 62°48'N, 130°35' - 132°49'W

Size 810 sq. miles

Sheldon Lake is located in eastern Yukon, on the Ross River drainage, app. 70 air-miles north-east of the town of Ross River. This area includes Field and Lewis lakes, which are directly south of Sheldon Lake, and 3 or 4 smaller lakes to the south-west of Sheldon Lake.

Bostock (1957) considered the on-line location of small lakes on the Ross River to be somewhat unique for the region. Bostock stated that "the lakes on the Ross river are shallow basins, a few miles in extent, and not more than 45 feet in depth. They are gradually being filled by sedimentation, and their level lowered by cutting down at the outlets....". Names of lakes are not referenced, but it seems probable that Bostock was referring to Sheldon Field and Lewis lakes. The process of sedimentation and lowering of surface levels that is described is indicative of potentially productive wetlands due to nutrient inflow and generally higher temperature regimes expected in shallow lakes.

A few swans have been observed on Sheldon Lake during the breeding season (C W S field notes, Whitehorse) but the species has not been positively identified nor have broods been reported. The Land Use Information Series (D I A N D , 1973) noted that ducks and geese use Sheldon, Field and Lewis lakes during the fall migration, and that marshes around Sheldon lake provide excellent habitat for ducks (Porsild (1951)) noted, in reference to Sheldon, Field and Lewis lakes, that "on and around

these lakes, extensive marshes, sloughs, shallow shelving beaches, and mud flats afford abundant habitats for aquatic and marsh plants".

Although waterfowl population data that is currently available does not tend to be encouraging, descriptions of the Sheldon Lake area would suggest excellent waterfowl potential, and further population surveys should be undertaken.

This area lies adjacent to the North Canal Highway, which serves as an overland access to several major mining prospects in the MacMillan Pass area. There is current speculation that mining activities will move into the production phase in the near future, and the North Canal road will receive much heavier traffic volumes. In anticipation of these developments the Yukon Territorial Government will be conducting intensive surveys of biological features of the upper Ross River - MacMillan River areas during the summer of 1981. C W S personnel, in cooperation with Y T G Wildlife Branch personnel, will conduct studies of waterfowl populations and habitat through the Sheldon Lake area, the Ross River wetlands along the North Canal, and the upper reaches of the North and South MacMillan Rivers.

References (24)

Dept. of Indian Affairs & Northern Development, 1973. Land Use Information Series. Produced by the Dept. of the Environment.

Bostock, H.S., 1957. Yukon Territory. Selected Field Reports of the Geological Survey of Canada, 1898 to 1933. Geological Survey of Canada, Memoir 284. Queens Printer, Ottawa, 1957. 650 pp.

Porsild, A.E., 1951. Botany of Southeastern Yukon Adjacent to the Canal Road. National Museum of Canada, Bulletin No. 121. Canada Dept. of Resources and Development. 400 pp.

VON WILCZEK LAKES

Map Reference #25

Location 62°38' - 62°47'N, 136°36' - 136°47'W

Size 18 sq. miles

The Von Wilczek Lakes are located in central Yukon near the Klondike Highway, between Minto and Pelly Crossing. There are app. 15 lakes and ponds in the group, the two largest being each in the order of 1 sq. mile.

The lakes support extensive emergent and submergent plant communities, but are particularly notable for stands of round stem bullrush, a species which is seldom encountered elsewhere in the territory. Whether it is as a consequence of the somewhat unique vegetative characteristics, or simply the location of the lakes relative to other wetlands or traditional flyways, is a matter of speculation, but the lakes do attract exceptionally large numbers of waterfowl during mid and late summer.

J. Dewey Soper (1965) conducted surveys of most of the better-known waterfowl areas of southern Yukon during the summer of 1950, and remarked of waterfowl habitat on the Von Wilczek Lakes "They were found to be quite outstanding in these respects (aquatic plant life and waterfowl numbers), better, in fact, than any other lakes examined in Yukon Territory". He estimated a mid-July population of at least 1,000 ducks, including mallards, pintail, green-winged teal, greater scaup, American golden-eye and bufflehead.

C W S (1979) recorded 3,921 ducks on the Von Wilczek Lakes in mid-summer 1977. In the fall of that year, Foothills (1977) reported 1,945 ducks and 125 geese (max. counts from several aerial surveys). In the spring of 1978, Foothills (1978) reported a max. count of 804 ducks (May 15) and during the late summer Foothills (1979) reported 2,335 ducks and 62 duck broods. An interesting feature of C W S observations in the summer of 1977 was the presence of 72 American coots - a species infrequently

observed in the territory.

All of the lakes lie within a short distance of the Klondike Highway, and several, including the most northerly of the large lakes, are readily visible from that road. There are no placer or quartz claims within the area, however there is one residential lease and an associated grazing lease. The proposed Dempster Lateral Gas Pipeline Route (as envisioned in 1978) passes within 1 to 4 kilometers of the Von Wilczek Lakes (Foothills, 1979) but as yet there is no official corridor reserve for that project. In November, 1978, an application was made to the Dept. of Indian Affairs and Northern Development for a permit to construct a few hundred yards of access trail into a stand of timber north west of the Von Wilczek Lakes. The applicant planned to selectively remove a small amount of timber for building logs. A permit was granted, but it is not certain that the activity was subsequently undertaken.

Considering the unique features of these wetlands, their apparent attractiveness to waterfowl, and the lack of current land dispositions in the area, an early move toward legislative means of protection should be in order.

References #25

Canadian Wildlife Service, 1979. Migratory Bird Investigations Along the Proposed Alaska Highway Pipeline Route. Bird Use of Wetlands During the Summer and Fall of 1977. Interim Report No. 3. April 1979. 19 pp. + Appendices.

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Klondike Highway Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 21 pp. + Appendices.

Foothills Pipe Lines (Yukon) Ltd., 1978. Spring (1978) Waterfowl Migration: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 19 pp. + Appendices.

Foothills Pipe Lines (Yukon) Ltd., 1979. Summer (1978) Waterfowl and Upland Game Bird Surveys; Proposed Dempster Lateral Pipeline Route. Prepared by: Robert L. Brown; Bioresources Consulting, Fruitvale, B.C. 44 pp.

WELLESLEY LAKE

Map Reference #26

Location $62^{\circ}16'$ - $62^{\circ}27'N$, $139^{\circ}34'$ - $140^{\circ}08'W$

Size 170 sq. miles

Wellesley Lake is located in western Yukon app. 40 miles south-east of the point where the Alaska Highway crosses the Yukon-Alaska border. The lake lies mid-way between the White and Donjek Rivers, and drainage is to the north-east via Wellesley Creek to the Donjek.

Wellesley is a relatively large lake (app. 32 sq. miles) lying on a low relief glacial till plain. It is surrounded by many small, kettle-hole ponds. Regional vegetation is open, black spruce, white spruce, balsam poplar and willow-dwarf birch associations. Oswald and Senyk (1977) noted "sedge tussock fields, hummocks, peat plateaus, palsas, patterned fen and bog complexes, and fen polygons ... occur over low relief terrain where drainage is restricted". Available aerial photography (1950) shows most of the small "potholes" to be completely encircled by sedge communities, and most have extensive off-shore aquatic vegetation zones.

Waterfowl population data for the Wellesley Lake area is restricted to a few casual observations. An observation of 200 - 300 swans on Wellesley Lake in late September, 1980 (C W S field notes, Whitehorse) leads to speculation that the lake may be used as a stop-over by waterfowl during the fall migration. The small potholes are probably quite similar to those along the Alaska Highway near Beaver Creek, which are known to be used by a variety of ducks during the breeding season.

The area boundary chosen for this exercise encompasses only a sample of the small wetlands in the Wellesley Lake area.

If future surveys confirm that the small basins are important to waterfowl production, the boundaries might well be expanded to the west to draw in wetlands along the White River drainage.

There is currently one small commercial lease on the east end of Wellesley Lake. The lake provides one of the better sport fishery areas, for large lake trout, in the Yukon, and is designated as a trophy lake in order to restrict the harvest. There are no access roads within the area although Wellesley Lake is accessible by snowmobile, during the winter months, via a winter-trail from Snag.

References (26)

Oswald, E.T. and J.P. Senyk, 1977. Ecoregions of Yukon Territory. Fisheries and Environment Canada. Canadian Forestry Service. 115 pp. + map.

WILLOW CREEK COMPLEX

Map Reference #27

Location 63°00' - 63°09'N, 136°27' - 136°35'W

Size 31 sq. miles

The Willow Creek complex is a group of small lakes on the Willow Creek drainage, a tributary of the Pelly River, immediately west of the Klondike Highway north of Pelly Crossing. There are about twenty lakes within the area, all under one square mile in surface area. There is essentially no descriptive material on these lakes in the literature, and waterfowl population data is limited to the results of several surveys done in conjunction with the proposed Dempster Lateral gas pipeline route.

During the fall of 1977, Foothills (1977) obtained maximum counts of 830 ducks and 10 swans on lakes in the Willow Creek drainage. Max. counts of 300 geese and 460 ducks were reported Foothills (1978) in the spring of 1978. During the summer of 1978, Foothills (1979) observed 752 ducks and 10 broods on the Willow Creek Lakes. With the exception of the summer surveys (when all 21 lakes were surveyed), there is no indication of precisely which lakes were surveyed. The numbers of waterfowl observed during these surveys are not really impressive, although it is important to recognize that the counts, particularly those taken during the migration period, represent the population at only one point in time. When the numbers of birds observed during nine spring surveys (Foothills, 1978) are totalled, the Willow Creek Lakes ranked second to Von Wilczek Lakes, with 15.3% of all waterfowl observed along the southern portion of the proposed pipeline route. Additionally, the geographic location of Willow Lakes, between Von Wilczek Lakes and Reid Lakes suggests that they should be included in any preliminary review of important wetlands.

The Klondike Highway passes in close proximity to Jackfish Lake, one of the more southerly lakes in the Willow

Creek complex. A YTG campground reserve at Jackfish Lake is the only known land disposition in the area. The proposed Dempster lateral pipeline route would pass through the Willow Creek drainage.

The proposed pipeline route would cross the Willow Creek drainage at a point south of the Jackfish Lake campground reserve. The route would follow the general trend of the Willow Creek drainage, passing through the area of the Willow Creek drainage. The route would be located within the Willow Creek drainage, and would cross the Willow Creek drainage at a point south of the Jackfish Lake campground reserve.

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References #27

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Klondike Highway Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 20 pp. + Appendices.

Foothills Pipe Lines (Yukon) Ltd., 1978. Spring (1978) Waterfowl Migration: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 19 pp. + Appendices.

Foothills Pipe Lines (Yukon) Ltd., 1979. Summer (1978) Waterfowl and Upland Game Bird Surveys: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Robert L. Brown, Bioresources Consulting, Fruitvale, B.C. 44 pp.

REID LAKES

Map Reference #28

Location $63^{\circ}23'$ - $63^{\circ}28'N$, $136^{\circ}58'$ - $137^{\circ}22'W$

Size 60 sq. miles

Reid Lakes are located in central Yukon, app. 15 miles west of Stewart Crossing and 6 miles south of the Stewart River, along the west side of the Tintina Valley. There are approximately 15 small lakes and ponds within the outlined area. Reid Lakes, the most westerly of the group, and the largest, include two lakes with a total surface area of app. 8 square miles.

The available literature provides no descriptions of the lakes, and because there is no overland access to most of them, their importance to waterfowl appears to have been unrecognized prior to studies of the proposed Dempster lateral gas pipeline route. Aerial photos show the larger of Reid Lakes to have a very straight, smooth shoreline, with essentially no marsh development. The west and north shorelines appear to have oriented lines typical of wave action over a sandy substrate. The smaller lake has a much more irregular shoreline and at least some areas of offshore emergent vegetation. Similar variations are evident on some of the other small lakes within this area.

During the fall of 1977 Foothills (1977) observed a maximum of 1,467 ducks on the Reid Lakes complex, although it is not known how many of the lakes were surveyed. Similarly the Foothills (1978) spring count in 1978 showed 140 ducks. Foothills (1979) summer and fall counts on 15 lakes in the complex showed a maximum count of 3,576 ducks. No geese or swans were recorded. Foothills (1979) described the Reid Lakes group as being "limited Class 2b (good) breeding habitat, and a major molting and early fall staging" area.

The anticipated route of a Dempster lateral gas pipeline would be through the eastern edge of the outlined area, but to date there is no formal corridor reserve. There is a 10 mile river dredging lease and a few placer claims on the Stewart river immediately northeast of the outlined area, but no known land dispositions at this time within the area.

Current threats to waterfowl habitat appear to be minimal, but the importance of the area to waterfowl should be recognized and accomodated if pipeline construction plans materialize.

References #28

Foothills Pipe Lines (Yukon) Ltd., 1977. Fall (1977) Waterfowl Concentrations: Proposed Klondike Highway Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 20 pp. + appendices.

Foothills Pipe Lines (Yukon) Ltd., 1978. Spring (1978) Waterfowl Migration: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Beak Consultants Ltd., Calgary. 19 pp. + appendices.

Foothills Pipe Lines (Yukon) Ltd., 1979. Summer (1978) Waterfowl and Upland Game Bird Surveys: Proposed Dempster Lateral Gas Pipeline Route. Prepared by: Robert L. Brown, Bioresources Consulting, Fruitvale, B.C. 44 pp.

HORSESHOE SLOUGH

Map Reference #29

Location 63°23' - 63°28'N, 135°14' - 135°19'W

Size 30 sq. miles

Horseshoe Slough is a large oxbow on the south side of the Stewart River, app. 45 miles upstream from Mayo. In that area the Stewart River flows through a relatively broad valley and is characterized by a meandering course with numerous cut-off channels, meander scrolls, islands and barren point-bars. The lower portion of Nogold Creek, which flows into the Stewart River at Horseshoe Slough, shows an extremely convoluted channel form and a dense complex of small oxbows and potholes along the north side of the stream-course.

Data on waterfowl populations for area 29 are essentially non-existent. The Land Use Information Series (D I A N D , 1973) identified Horseshoe Slough and noted that "in fall, Canada Geese and several species of ducks stage on this section of the Stewart River and on adjacent sloughs". The text does not provide supporting data for that evaluation. T. Nette (pers. comm.), who was the Territorial Game Officer stationed in Mayo for several years, indicated that residents of Mayo frequently visit the Horseshoe Slough area during fall months to hunt for waterfowl.

Certainly the open point bars on islands and bends in the river channel are reflective of habitat used by geese and ducks during the fall migration through southern Yukon, but surveys are required in order to determine the intensity of use in the Horseshoe Slough area. Similarly, the maze of small wetlands along the lower reaches of Nogold Creek appear to provide potential breeding habitat for waterfowl,

but determination of actual use will be dependant upon field surveys.

The Northern Canada Power Commission has investigated hydro-electric potential of the Stewart River and identified Frazer Falls (app. 6 miles downstream from Horseshoe Slough) as a possible dam site. Accordingly, D I A N D has placed a reserve on lands along the river between the 1,900' contour lines. N C P C (1975) recognized that a dam at Frazer Falls "... may affect important waterfowl..." but there is no reference to specific habitats or populations. A reservoir which would utilize lands to the 1,900' contour would flood essentially all of the identified Horseshoe Slough area.

References (29)

Dept. of Indian Affairs & Northern Development, 1973. Land Use Information Series. Produced by the Department of Environment.

Northern Canada Power Commission, 1975. The Development of Power in the Yukon. Report prepared by: Sigma Resource Consultants Ltd., Canadian Resourcecon Ltd., Lee Doran Associates Ltd., and Glen Smith, Wildlife Consultant.

MCQUESTEN LAKE

Map Reference #30

Location $64^{\circ}03'$ - $64^{\circ}11'N$, $134^{\circ}45'$ - $135^{\circ}18'W$

Size 43 sq. miles

McQuesten Lake lies in the Ogilvie Mountains in central Yukon, app. 40 air-miles north-west of Mayo. Area 30 includes McQuesten Lake, a complex of small "potholes" lying in the valley to the north-east of McQuesten Lake, Clark Lakes and Scougale Lakes. The small potholes lie on a divide; drainage to the west is via the South McQuesten River, to the east via the Beaver River.

Wetlands in this area have developed on glacial lake sediments (Oswald and Senyk, 1977) and, from air photo examination, appear to be quite shallow with extensive sedge-shrub shoreline zones.

Information on waterfowl populations in this area is restricted to a few casual observations. Soper (1954) did not survey McQuesten Lake, or the associated wetlands but cited comments from local residents that few ducks remained in the area during the summer, and an aircraft pilot had found no geese on McQuesten Lake in late July. There were reports of geese nesting on suitable sites in the general area prior to the time of Soper's visit (1950). Larger numbers of ducks, Canada, snow and white-fronted geese were reported to use the area during the spring and fall migration.

T. Nette (pers. comm.), who was a Game Officer in Mayo during the late 70's, reported that geese do breed on the smaller wetlands in this area and move to the larger lakes during the molting period. Rafts of ducks (primarily divers) were observed on the lakes during late summer.

The characteristics of wetlands within this area, as viewed from aerial photographs, the high density of wetland basins, and the few reports of waterfowl observations, combine to lend speculation that the area has good potential. Aerial counts of waterfowl during spring, summer & fall should be undertaken.

There are a number of large quartz-claim blocks in the Davidson Range, to the south-east of McQuesten Lake, one of which overlaps area 30 near Clark Lakes. A winter access trail from Keno Hill passes along the south side of the entire area and continues north-east to Kathleen Lakes (the condition of this trail during summer months is not known).

In light of existing mining operations in the Keno district, and the potential development of an access route through this area to mining interests in the upper Bonnet Plume, there could be a significant threat to waterfowl habitat in the McQuesten area. The current data base however does not warrant placing a high priority on protective legislation.

References (30)

Oswald, E.T. and J.P. Senyk, 1977. Ecoregions of Yukon Territory. Fisheries and Environment Canada, Canadian Forestry Service. 115 pp. + map.

Soper, J. Dewey, 1954. Waterfowl and Other Ornithological Investigations in Yukon Territory, Canada, 1950. Wildlife Management Bulletin, Series 2, Number 7. 55 pp. + illus.

CHAPPIE LAKE COMPLEX

Map Reference #31

Location 65°41' - 65°54'N, 134°51' - 135°16'W

Size 80 sq. miles

The Chappie Lake wetlands are located on the south side of the Peel River between the points where the Wind River and Bonnet Plume River join the Peel. The complex consists of a group of small lakes and ponds (the largest, Chappie Lake, is app. 2 sq. miles) on a low plateau between the two river systems. The terrain is hummocky, cover is predominately sparse black spruce and mosses. Many of the lakes appear to be shallow (possibly thermokarst development), have dark organic-stained, waters, and support relatively little aquatic vegetation. Chappie Lake has a zone of emergent vegetation along part of it's shoreline.

There is very little published information on waterfowl in the Chappie Lakes area, although ongoing environmental assessment work, being carried out in conjunction with a coal exploration program, may provide some insight into waterfowl populations in that area. The Land Use Information Series (D I A N D , 1973) noted that "swans and several species of ducks nest on the deeper lakes that are found in the northern part of the Bonnet Plume Basin and in the region west of the Bonnet Plume River". That would include the Chappie Lake wetlands. D. Mossop (pers. comm.) has conducted reconnaissance surveys of the area and noted whistling swans (normally considered to be a tundra-breeding species) and diving ducks during the summer period.

The entire area is within a much larger block of coal mining leases which are under active exploration. Oil & gas leases have been issued in the past for the Chappie Lake area, but all have currently expired. No drilling activities were undertaken.

Further field surveys are required to determine the magnitude of whistling swan production. It is also expected that Canada geese may nest in the area, and the status of that species should be within the objectives of a field program.

The progress of the coal exploration program should be reviewed periodically, and the companies' impact assessment should be examined for waterfowl habitat content.

References (31)

Dept. of Indian Affairs & Northern Development, 1973. Land Use Information Series. Produced by: Dept. of the Environment.

PEEL-CARIBOU RIVER COMPLEX

Map Reference #32

Location 66°00' - 66°30'N, 133°57' - 134°55'W

Size 600 sq. miles

This area lies in north-eastern Yukon, between the Richardson Mountains and the Peel River and is within the central portion of the Peel Plateau. That portion of the plateau is characterized by sharply-incised stream channels and a complex of small (max. 3-4 sq. miles) lakes and ponds. Wetland basins have sloping, irregular shorelines, with narrow sedge-zones or sparse black spruce-shrub communities on their perimeters. Generally, waters show a dark organic staining. Some emergent vegetation (pond lily, burreed and horsetail) occurs in shallow lakes, but generally the lakes appear to be relatively unproductive.

Poston et al (1973) classified most of the wetlands as a 3a (fair) and 3b (poor) waterfowl habitat. More recently, Mossop (pers. comm.) conducted surveys in the area and estimated as many as 100 pairs of Whistling swans and large numbers of diving ducks breed and molt on lakes in that part of the Peel Plateau. Given its total aerial extent and the density of wetlands, even a "fair" habitat rating, combined with Mossop's preliminary findings, indicates a need to further assess the importance of this area to waterfowl.

There are no known, current, land dispositions within the Peel-Caribou Rivers complex. Much of the area was formerly under oil and gas lease or permit and a considerable amount of petroleum exploration has taken place. Three wells were drilled within the currently-identified boundaries, and eight more were drilled in peripheral areas (all dry holes).

There do not appear to be any significant threats to waterfowl habitat in this area at present.

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References (32)

Poston, H.J., A.J. Doberstein and S.R. Barber, 1973. Atlas of Waterfowl Habitat Maps. Part of a Wildlife Habitat Inventory of the MacKenzie Valley and Northern Yukon. Canadian Wildlife Service Report, Prepared for: Environmental-Social Program, Northern Pipelines. May 1973.

WHITEFISH LAKE COMPLEX

Map Reference #33

Location $66^{\circ}55'$ - $67^{\circ}24'N$, $136^{\circ}52'$ - $137^{\circ}53'W$

Size 700 sq. miles

The Whitefish Lake wetlands complex, at the confluence of the Bell, Eagle and Porcupine Rivers, is identified on surficial geology maps as the Bell Basin (Hughes, 1972). The area has a recent geologic history similar to that of the Old Crow Flats in that most of the wetlands present today are thaw basins in sediments which remained following drainage of a much larger, glacial lake. Whitefish Lake, lying near the center of the complex, with an area of app. 4 to 5 sq. miles, is the largest lake; most are less than 1 sq. mile. The lakes are generally shallow, have dark, organic-strained waters and support emergent and submergent vegetative communities.

During studies of the proposed Mackenzie Valley Pipeline route, wetlands in the Whitefish Lake area were given class 2b (good) and class 3a (fair) ratings for waterfowl, but no supporting population data are presented (Poston, et al, 1973) D. Mossop and R. Hayes (pers. comm) conducted a few reconnaissance surveys of the Whitefish Lake area during the summers of 1978-79 and noted White-fronted geese, Canada geese, diving ducks and swans. The observers speculated that the area could be important for those species as a breeding and/or molting area. Further field studies are required to determine population levels and confirm habitat functions.

The Whitefish Lake complex lies south of the Bell River and accordingly is not included within most of the recent "northern Yukon" planning proposals. Can. Arctic Resources Committee (1980) apparently recognized the area as being worthy of special consideration and proposed an appropriate extension to the northern Yukon site.

There are no placer or quartz claims located within the area at this time. Some oil and gas exploration has been undertaken, including a few drilling explorations (1 well within the currently defined boundaries of the area, and 4 in peripheral areas - all abandoned dry holes). Currently, there are oil and gas leases in the vicinity of the Porcupine River on the west side of the Whitefish Lake complex.

Petroleum exploration and development programs, and management plans pursuant to a Land Claims settlement, are probably the major concerns for this area. As an initial step, there is a need to acquire better information on waterfowl populations and habitat functions of the Whitefish Lake area.

References (33)

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OLD CROW FLATS

Map Reference #34

Location $67^{\circ}16'$ $-68^{\circ}21'N$, $138^{\circ}24'$ $-141^{\circ}00'W$

Size 2,700 sq. miles

This unit, including the Old Crow Basin, north of the Porcupine River and the Bluefish Basin south of the Porcupine, encompasses about 2,700 square miles. Wilkin, et al (1978) identified the ".....abundance of lakes, lakes of all sizes but not of all shapes" as the outstanding feature of the Old Crow Flats. Lakes have developed within a deep organic overburden, and most exhibit rectangular shapes (irregular-shaped basins are generally found within larger, partially-drained, rectangular basins). Most lakes are defined as shallow (less than 2 meters), lacking surface inflow-outflow drainages, and having steep banks. Because there are few surface channels connecting lakes on the Flats to the major drainages, streams such as the Old Crow River and Johnson Creek have been able to carve their channels well below the level of most lakes, leaving the lakes in a "perched" position. The significance of this phenomenon is probably summarized best by Wilkin's (et al) statement: "Any disturbance of the terrain that leads to increases of surface runoff and erosion could have consequences apart from localized gullying. The lakes themselves could quickly be drained, thus destroying most valuable habitat for wildlife and natural resources for indigenous peoples".

Poston, et al (1973) identified most of the lake complexes in the Old Crow Basin as Class 1 waterfowl habitat (Utilizing a 4-class rating system, with 1 defined as "excellent northern waterfowl habitat, and 4 defined as "marginal" or "insignificant"). Lakes in the Bluefish Basin were deemed to be of lesser quality, and generally designated as Class 2 or 3. The habitat evaluations however are based almost entirely on the physical characteristics of wetlands and do not incorporate a consideration of waterfowl populations.

Soper (1954) cites population density estimates for the Old Crow Flats, based on 1948-50 aerial surveys, of app. 40 - 60 "wildfowl" (ducks and geese) per square mile. Mossop (1975, 1976, 1977) conducted the most intensive waterfowl population studies, on the Old Crow Flats, to date. Summarizing data from Mossop's reports, one finds estimated waterfowl population densities varying over the course of the season and from year to year. During late spring surveys in 1975, 76 and 77 population densities ranged from 43 to 132 birds/square mile (approx., based on estimated 1,500 square miles of habitat), but fall population densities for the same years ranged from 228 to 311 birds/square mile. The following table summarizes Mossop's population estimates for major groups and species of waterfowl for the three years.

	1975		1976		1977	
	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>
Divers	156,036	304,481	72,640	198,476	45,803	No Data
Dabblers	45,509	149,811	44,226	140,608	20,102	No Data
Geese (Grey)	400	15,330	2,549	1,487	2,642	No Data
W. Swans	259	1,958	472	1,250	263	No Data

Scaup, Scoters and Oldsquaw were the most numerous divers (other species were Canvasback, Goldeneye and Ring Necks), while Green Wing Teal, Pintails and Wigeons made up the bulk of the dabbler population. Mossop indicates a weakness in the data associated with clumped distribution patterns for divers during the spring. Also, aerial surveys could not be completed during the summer and fall of 1977, but ground counts indicated an abnormal distribution (based on previous two years surveys) during the spring, and significant build-ups did occur in June and July.

Probably the most significant feature of the population data, next to the total number of birds, involves the summer influx of birds arriving to molt on the Flats. Mossop also noted that the build-up of dabbling populations in June and July of 1977 appeared to be correlated with spring drought conditions on the central plains and consequent displacement of dabblers to the Old Crow Flats.

In a letter to C W S personnel, King (1973) estimated average waterfowl breeding populations over the ten years, 1960 - 1970, based on annual surveys over eight, 18-mile transects over the Old Crow Flats, as follows:

Divers	202,000
Dabblers	112,200

King estimated the average fall population would be about double the breeding population, or app. 628,400 for the ten year period.

King's estimates of the breeding population are considerably higher than Mossop's spring estimates, and Mossop shows a relatively greater population build-up through the summer. Considering the observed seasonal and annual variations in waterfowl numbers on the Old Crow Flats it is probably reasonable to expect that half a million waterfowl would utilize the area on an "average" year.

Some seismic exploration was conducted on the Flats during the winter of 1969-70, and a proposal for further seismic programs was submitted to the Land Use section of D I A N D in 1973. That proposal was delayed through a moratorium on exploration imposed by the Minister of D I A N D for a one-year period. The moratorium was apparently effected annually until 1978 when the Minister withdrew all of the lands in the northern Yukon, north of

the Porcupine and Bell Rivers, pending a land-claims settlement and a final decision on a National Wilderness Park.

The Old Crow Basin was identified in the catalogue of Northern Ecological Sites (1975) as a potential I.B.P. site, and was included within the proposed Arctic International Wildlife Range. The Flats formed a part of the area identified as a possible addition to a National Wilderness Park proposed under the COPE Agreement-in-Principle (Y T G , 1980,(a)). In it's Northern Yukon Resource Management Model, Y T G (1980(b)) identifies the Old Crow Flats as part of a proposed extension to a northern Yukon resource management zone. In a letter to the Minister of Environment Canada, (August 12, 1980) the Commissioner of the Yukon identified the Old Crow Flats as a candidate for inclusion within the Convention on Wetlands of International Importance, but suggested that such a move should await settlement of the Yukon native Land Claims.

The existing moratorium (July 6, 1978) on development in the northern Yukon affords satisfactory interim protection for migratory bird habitat on the Old Crow Flats. Any moves toward a more permanent legislative initiative would probably have to await a land claims agreement-in-principle.

There are no known mining claims within this area. Although there is a moratorium on petroleum exploration on the Old Crow Flats, most of the area remains under permit to a consortium of exploration companies.

Migratory Bird Sanctuary status for the Old Crow Flats has been recommended in the past, and waterfowl must certainly be recognized as one of the most important renewable resources of the area. Significant proportions of the continental waterfowl populations utilize the Flats annually, or occasionally, and degradation or mismanagement of the area would have far reaching effects.

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NORTH SLOPE

Map Reference #35

Location $68^{\circ}31'$ - $69^{\circ}38'$ N, $136^{\circ}19'$ - $141^{\circ}00'$ W

Size 2,700 sq. miles

The entire Yukon north coast, extending for app. 120 miles from the Alaska border to the N.W.T. border and inland for an average of 20 miles (roughly to the 1000' contour) is seen as a critical area for migratory birds. There is a substantial volume of literature on migratory bird resources of the area as a result of studies conducted in conjunction with the Canadian Arctic Gas pipeline proposal. Those studies provide a basis for isolating a number of sub-areas which are of particular significance to waterfowl populations. A wide range of habitat types are involved, filling one or more of the spring, summer and fall habitat requirements for various waterfowl.

During late August the Western Arctic Lesser Snow Goose population leaves the breeding grounds in the Anderson River delta-Banks Island area and moves westward to the outer Mackenzie River delta, the Yukon North Slope and the Alaska North Slope. The birds stage in those areas to feed during September, then return eastward to begin the fall migration up the Mackenzie River valley. In 1973 the population was estimated at 400,000, of which an estimated 260,000 utilized the Yukon North Slope (Koski & Gollop, 1974). Snow goose distribution patterns on the Yukon North Slope vary from year to year, but on at least two of the three years (1973-75) for which data is available, areas (a) Mackenzie Foothills, (b) Walking River, (c) Babbage River, (e) Firth-Malcolm River deltas and (g) Babbage delta-Phillips Bay, supported significant numbers of geese (Koski 1975, Koski, 1977). The first three areas (a, b & c) are inland feeding areas, and extend well up into the foothills. Coastal areas are probably more important to snow geese as staging and resting sites.

Black brant populations, which breed in the Canadian Arctic, from the Mackenzie Delta eastward, follow the Yukon and Alaska coastlines during the fall migration to the Pacific coast. (Spring migration routes are not well documented, but birds reaching the Yukon coast during the spring may have followed river-systems overland from S.E. Alaska). Bellrose (1976) estimates the Canadian population at roughly 18,000 birds during late summer. Schweinsburg (1974) observed over 14,000 black brant passing west over Nunakuk Spit between August 24 and September 6, 1971. Koski (1977) observed 12,200 black brant along the Alaska Coast, immediately west of the Yukon border, in late August, 1975. Both investigators found brant utilizing barrier beach lagoons and river deltas. Clarence Lagoon (j), Nunakuk Spit (i) the Firth-Malcolm River deltas (e) and Phillips Bay (g) are of particular importance to brant on the Yukon coast.

Bellrose (1976) estimates the Canadian breeding population of whistling swans at 30,000, of which 20,000 breed in the Mackenzie Delta - Liverpool Bay area. Whistling swans arrive on the Yukon North Slope in late May, via the Mackenzie valley, and during the summer are distributed along essentially the entire slope. (Johnson et al, 1975) Mossop (1974) estimated a minimum breeding density of .07 pairs of swans per square mile on the coastal plain, and .55 pairs per square mile on the Yukon section of the Mackenzie delta. Koski (1975) indicates a population density of 2.01 swans per square mile at the Blow River delta and in the Shallow Bay area, in 1972 (probably fall staging concentrations). Small lakes on the coastal plain, from the Firth River to the N.W.T. border, the outer Mackenzie - Blow River deltas and Phillips Bay area are probably the most significant whistling swan habitats.

White-fronted geese, from the mid continent population, breed in the Mackenzie delta area and on the Alaska north slope, but there is little evidence of breeding populations on the Yukon's North Slope.

Koski (1975) cites observations of 3,500 white-fronts passing Nuneluk Spit in the fall of 1972, and 10,000 were estimated to have passed Bloomfield Lake in 1973, but stop-over areas within the Yukon were probably limited to the outer Mackenzie delta. Similarly, Koski (1975) indicates only minimal use of the Yukon coast area by migrant Canada geese.

Coastal lagoons and the relatively protected waters between Herschel Island and the mainland, provide molting areas for a variety of ducks, during mid-summer. Gollop and Davis (1974) estimated 10,000 ducks using the area between Herschel Island and the mainland for molting in early August, 1972. Mossop (1974b) found average concentrations of 2,500 Oldsquaw and 500 scoters in the area during August, 1972. Vermeer and Anweiler (1975) estimated 5,500 Oldsquaws and 4,500 Surf Scoters molted in the area south of Herschel Island during the summer of 1973. Other ducks using the area during August and September included scaup, eiders, mergansers and pintails.

Many other species of migratory birds utilize the Yukons North Slope, however population status and distribution patterns are not well-documented. Johnson, et al (1975) indicates substantial numbers of sandhill cranes have been observed near Phillips Bay, and suggests that the coastal area from Shallow Bay to the Blow River may be a pre-migration staging area for sandhills. Schweinsberg (1974) indicated that the North Coast was equally important to waterfowl and shorebirds, and estimated the shorebird population density at 593 per square mile based on observations from five ground sites. Vermeer and Anweiler (1975) observed "thousands" of Northern Phalaropes, Pectoral Sandpipers and Golden Plovers, and lesser numbers of Red Phalaropes, Ruddy Turnstones, Semi-Palmated Sandpipers, Least Sandpipers, Sanderlings and Long-billed Dowitchers,

migrating along the coastline near Herschel Island in August, 1973.

Other species of migratory birds utilize the Yukon's North Slope during the open-water seasons, but a complete species review is obviously beyond the scope of this report. The attempt has been to identify some of the more important habitats within the area and provide some appreciation of their significance to continental bird populations.

The importance of the Yukon's North Slope, in terms of wildlife resources, has probably been recognized for years. Over the past ten years a maze of legislative proposals, aimed at protecting wildlife resources and the wilderness characteristics of the northern Yukon, have been brought forth by special interest groups. In 1970, the Arctic International Wildlife Range Committee (Proceedings - 1970) recommended that the area, generally north of the Porcupine River, be set aside through an Order-In-Council, as a Canadian extension of the Arctic National Wildlife Range in Alaska. The International Biological Program identified the western portion of the North Slope (Firth River) as a proposed site under the Conservation of Terrestrial Biological Communities program, to be contiguous with the proposed Old Crow Basin Site (Northern Ecological Sites, 1975). The Yukon Territorial Government Parks Branch included the Firth River area and Herschel Island in their list of proposed Territorial Parks (Hutton, 1975). Following the Mackenzie Valley Pipeline Inquiry, Justice Thomas Berger (1977) recommended that lands north of the Porcupine River in Yukon should be withdrawn under provision of the Territorial Lands Act and designated as a National Wilderness Park following appropriate revisions to the National Parks Act. In 1978, Parks Canada identified the western portion of the North Slope (Babbage River to the Alaska

border, and south to include the Old Crow Flats) as a natural area "worthy of protection". During the same year the Minister of Indian Affairs and Northern Development issued a withdrawal order for 15,000 sq. miles of the northern Yukon, under the Territorial Lands Act. In 1978, the Government of Canada reached an agreement-in-principle with the Committee for Original People's Entitlement under which the Inuvialuit would acquire ownership of app. 1,000 sq. miles on the Yukon North Slope and 5,000 sq. miles (plus a potential addition of 10,000 sq. miles) would be established as a National Wilderness Park. Environment Canada (1979) proposed that all lands included within the withdrawal, except the area required as a National Park, plus an eastward extension to the west side of the Mackenzie delta in the N.W.T., be protected as a National Wildlife Area under the Canada Wildlife Act. Also in 1979 a Steering Committee, established pursuant to the agreement-in-principle, recommended that the area identified for National Wilderness Park status receive interim protection under the Canada Wildlife Act (Brooks, 1979). The Government of the Yukon (1980) has now recommended a combination of land management strategies, including a National Park for the northwest (Firth River area) a Territorial Park for Herschel Island, and Resource Management zone status for essentially the remainder of the area north of the Porcupine River.

Aside from the withdrawal under the Territorial Lands Act, none of the above legislative measures have been formalized, and any significant steps may well await an agreement-in-principle between the Government of Canada and the Council for Yukon Indians in line with on-going Land Claim Negotiations.

There are no known placer or quartz claims within the North Slope area at this time. The two D.E.W. Line sites at Komakuk Beach and Shingle Point are operated continuously by a small, rotating, staff. Each site has a well-maintained airstrip for supply and personnel transport. There is a small residential

lease, at the old settlement site on Herschel Island, which has been occupied by one family during the past 4 or 5 years. The settlement and bay areas have been utilized periodically by the petroleum exploration industry for fuel storage and as an overwintering site for drill ships. Most of the coastline, large blocks of the immediate off-shore area, and some of the mainland east of Phillips Bay, is currently under oil and gas lease or permit. Three exploratory wells (dry holes) have been drilled on the mainland, within the North Slope area. Currently, the petroleum industry has shown an interest in developing a shallow-water port facility at King Point to serve as a base for off-shore exploration and possibly as a gathering point during an expected production phase.

Concern for waterfowl populations and habitat on the Yukon's North Slope stems from the current acceleration of industrial development plans (primarily petroleum exploration and development, with ancillary ports, roads, airfields, pipelines and settlements) and from the complexity of legislative proposals brought forth by various interest groups as a means of balancing development and conservation of natural areas. Whatever the final formula may be, the importance of very extensive areas of the Slope to waterfowl populations must be recognized and accommodated.

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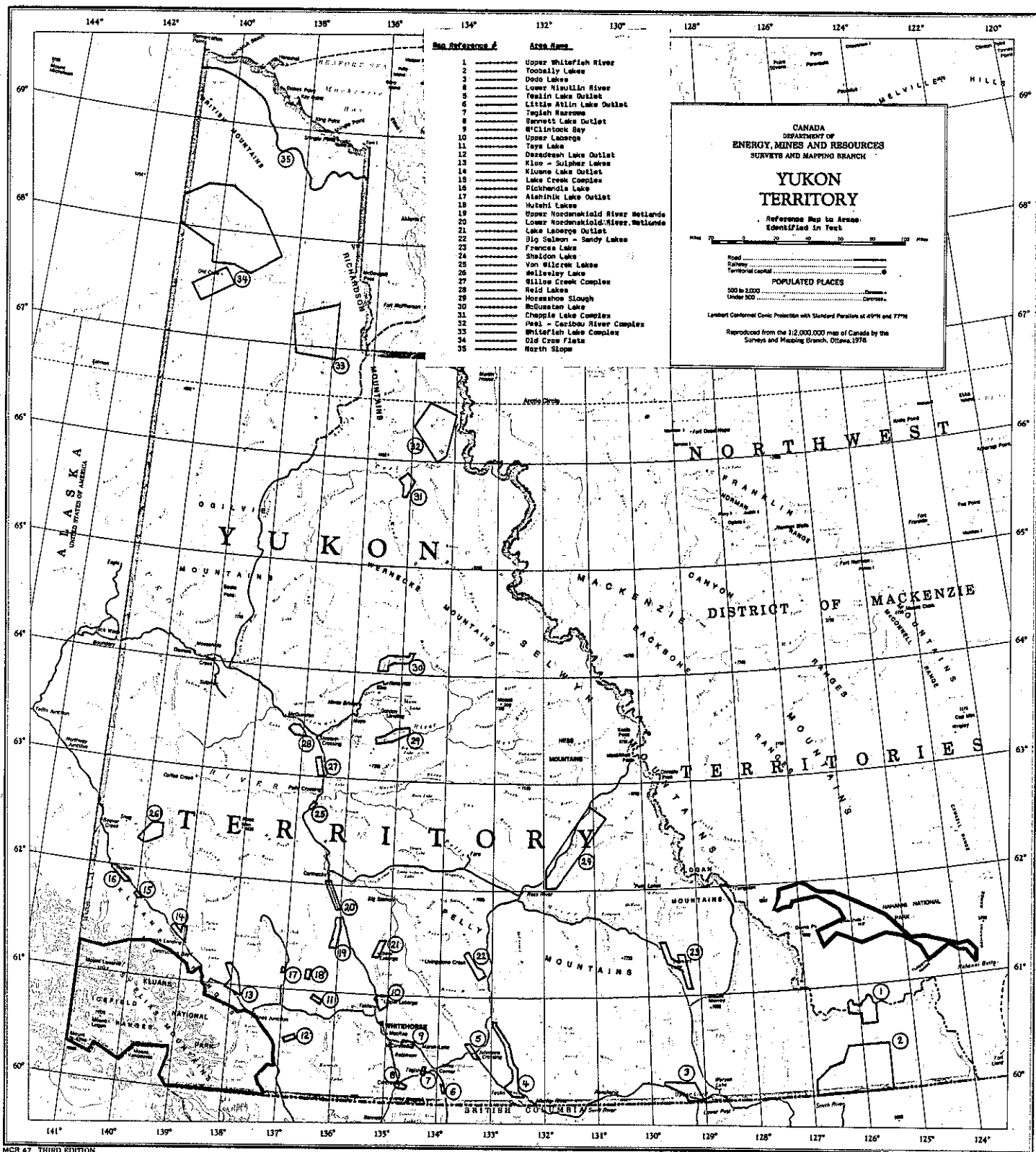
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No. Reference #	Area Name
1	Upper Whitefish River
2	Toonally Lakes
3	Dodo Lakes
4	Lower Klondike River
5	Trojan Lake Outlet
6	Little Atlin Lake Outlet
7	Teqleh Narrows
8	Sawett Lake Outlet
9	McClintock Bay
10	Upper Laberge
11	Taya Lake
12	Dawson's Lake Outlet
13	Kluo - Sulphur Lakes
14	Kluane Lake Outlet
15	Lake Creek Complex
16	Piddichon Lake
17	Atlin Lake Outlet
18	Hutehi Lakes
19	Upper Noodinokaid River Wetlands
20	Lower Noodinokaid River Wetlands
21	Lake Laberge Outlet
22	Big Salmon - Sandy Lakes
23	Frasca Lake
24	Shalton Lake
25	Von Wilczek Lakes
26	Willowey Lake
27	Willow Creek Complex
28	Reid Lakes
29	Horseshoe Slough
30	McQuarrie Lake
31	Chapin Lake Complex
32	Paul - Caribou River Complex
33	Whitefish Lake Complex
34	Old Crow Flats
35	North Slope

CANADA
 DEPARTMENT OF
 ENERGY, MINES AND RESOURCES
 SURVEYS AND MAPPING BRANCH
**YUKON
 TERRITORY**
 Reference Map to Areas
 Identified in Text

POPULATED PLACES
 500 to 2,000 Census
 Under 500 Census

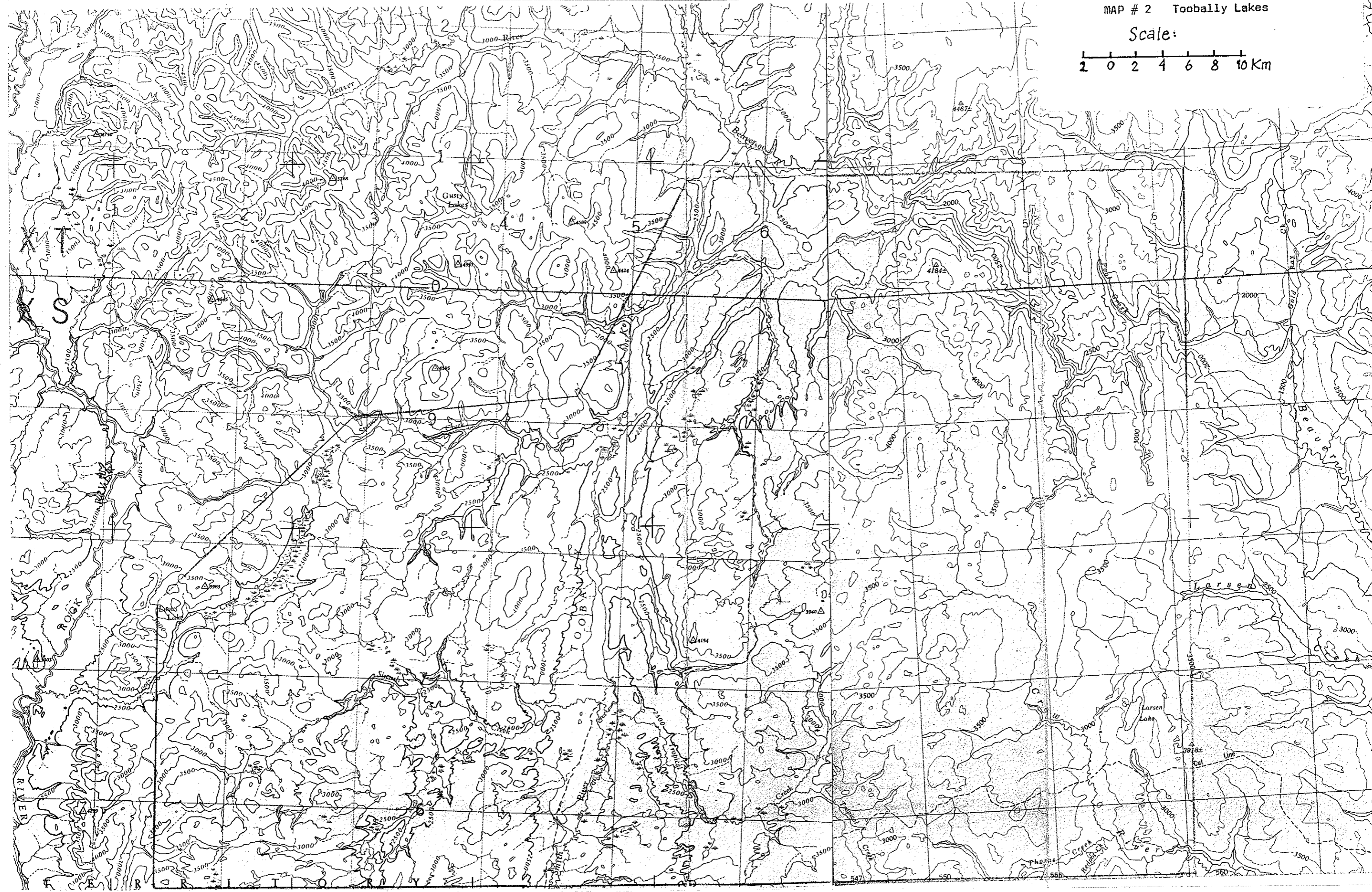
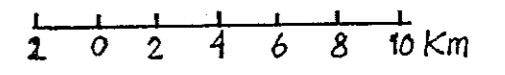
Lambert Conformal Conic Projection with Standard Parallels at 60°N and 77°N
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MAP # 1 Upper Whitefish River

Scale: 1:250,000

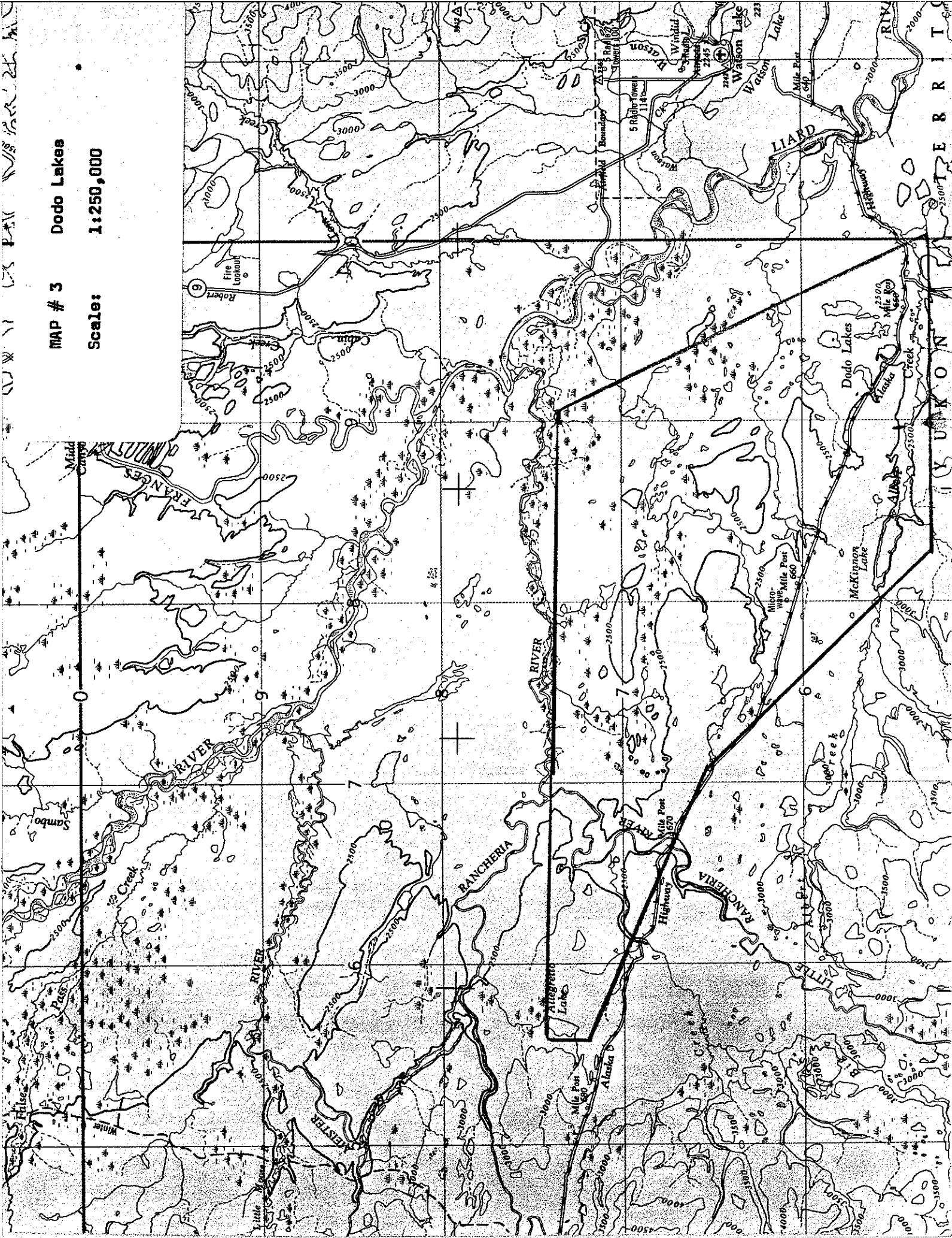


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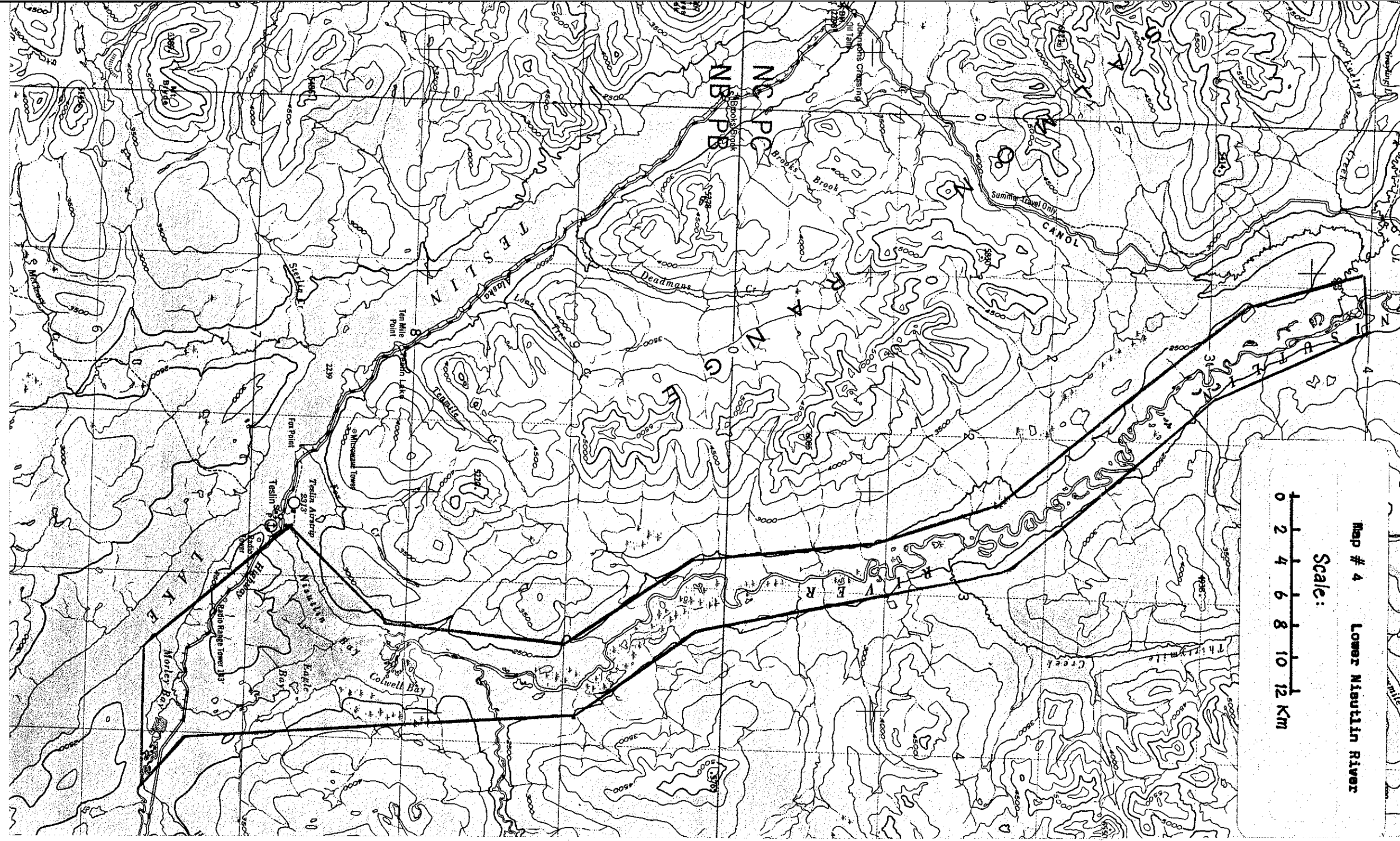


MAP # 3 Dodo Lakes

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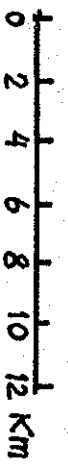


ALASKA TERRITORY



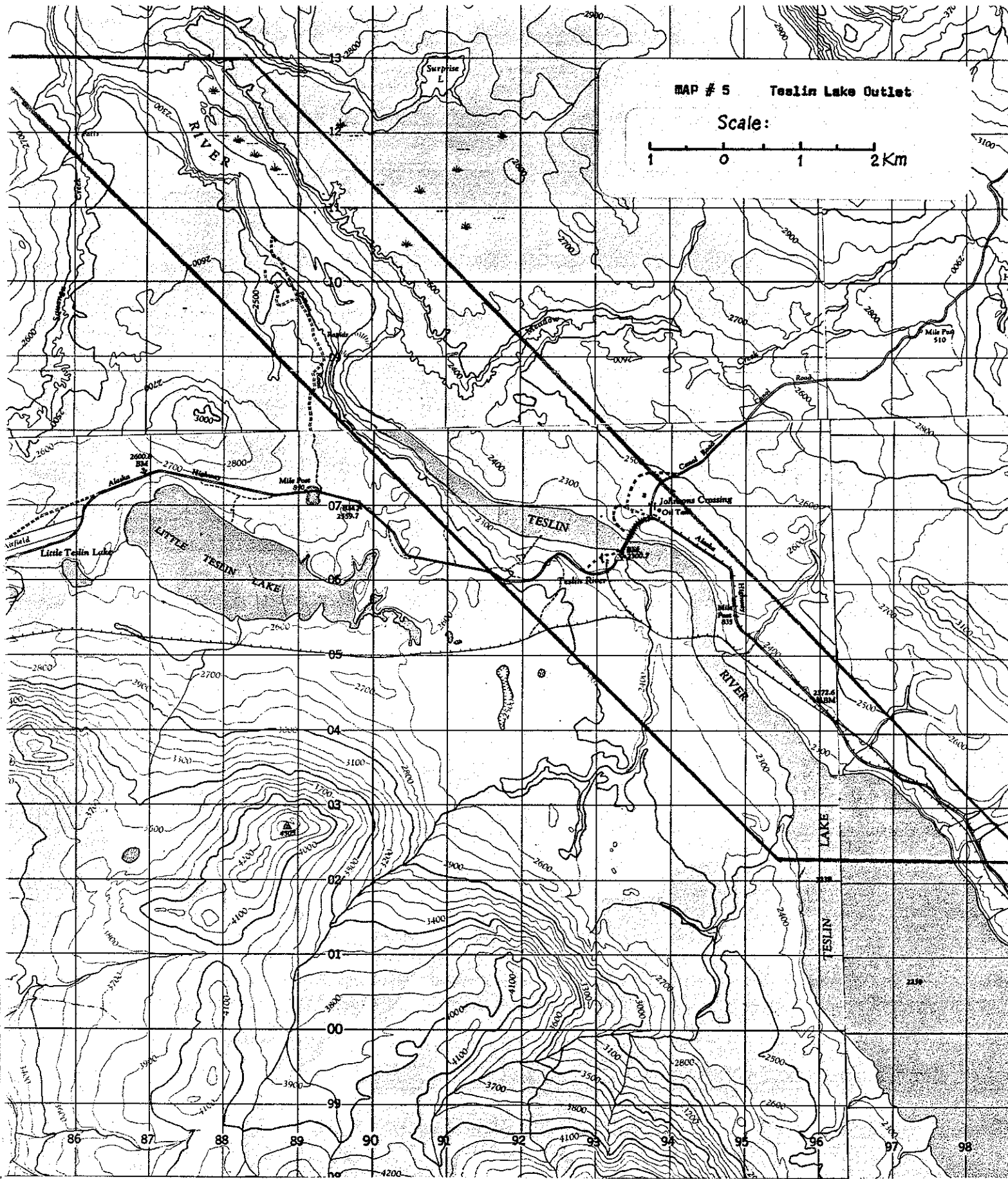
Map # 4 Lower Nisutlin River

Scale:



MAP # 5 Teslin Lake Outlet

Scale:

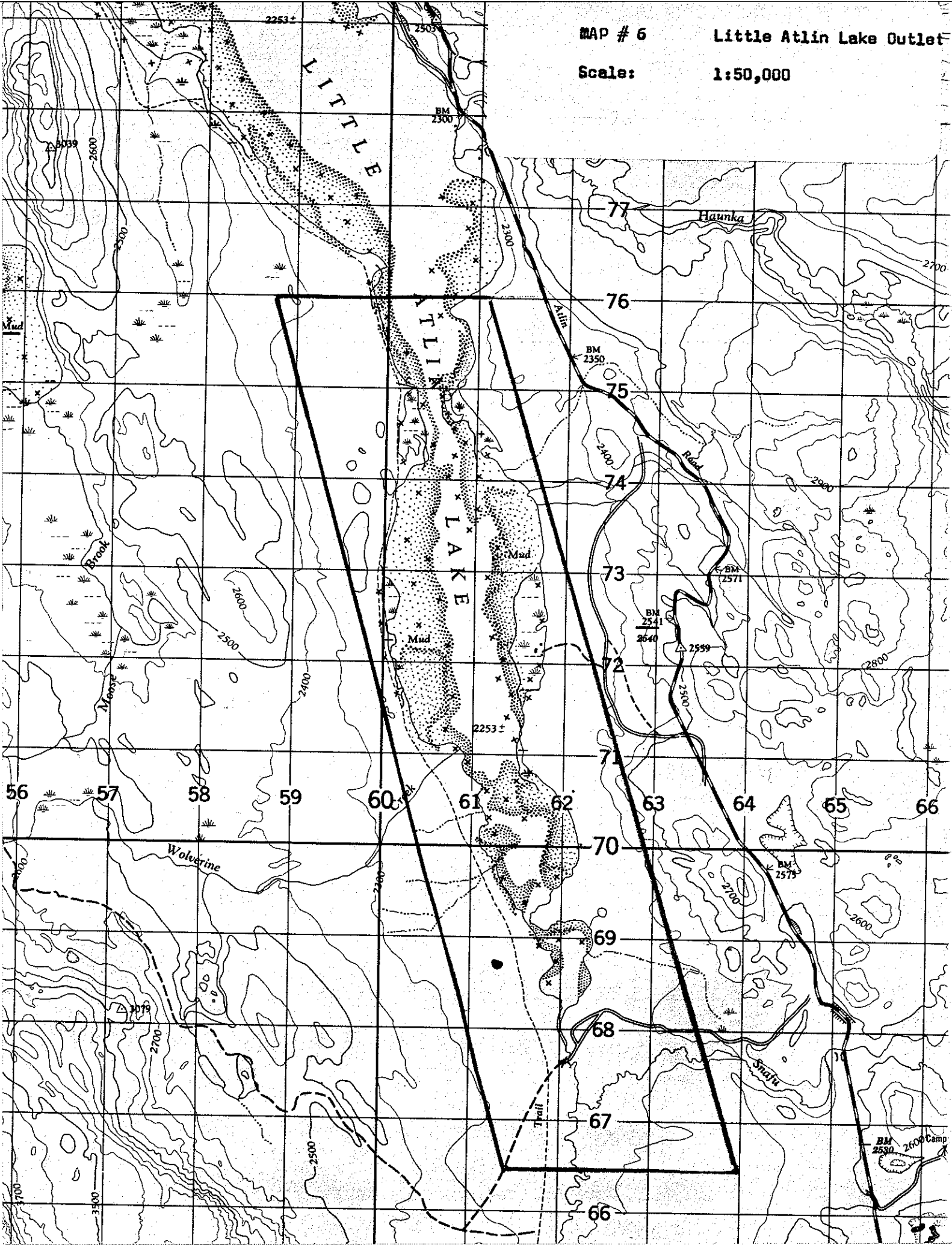


MAP # 6

Little Atlin Lake Outlet

Scale:

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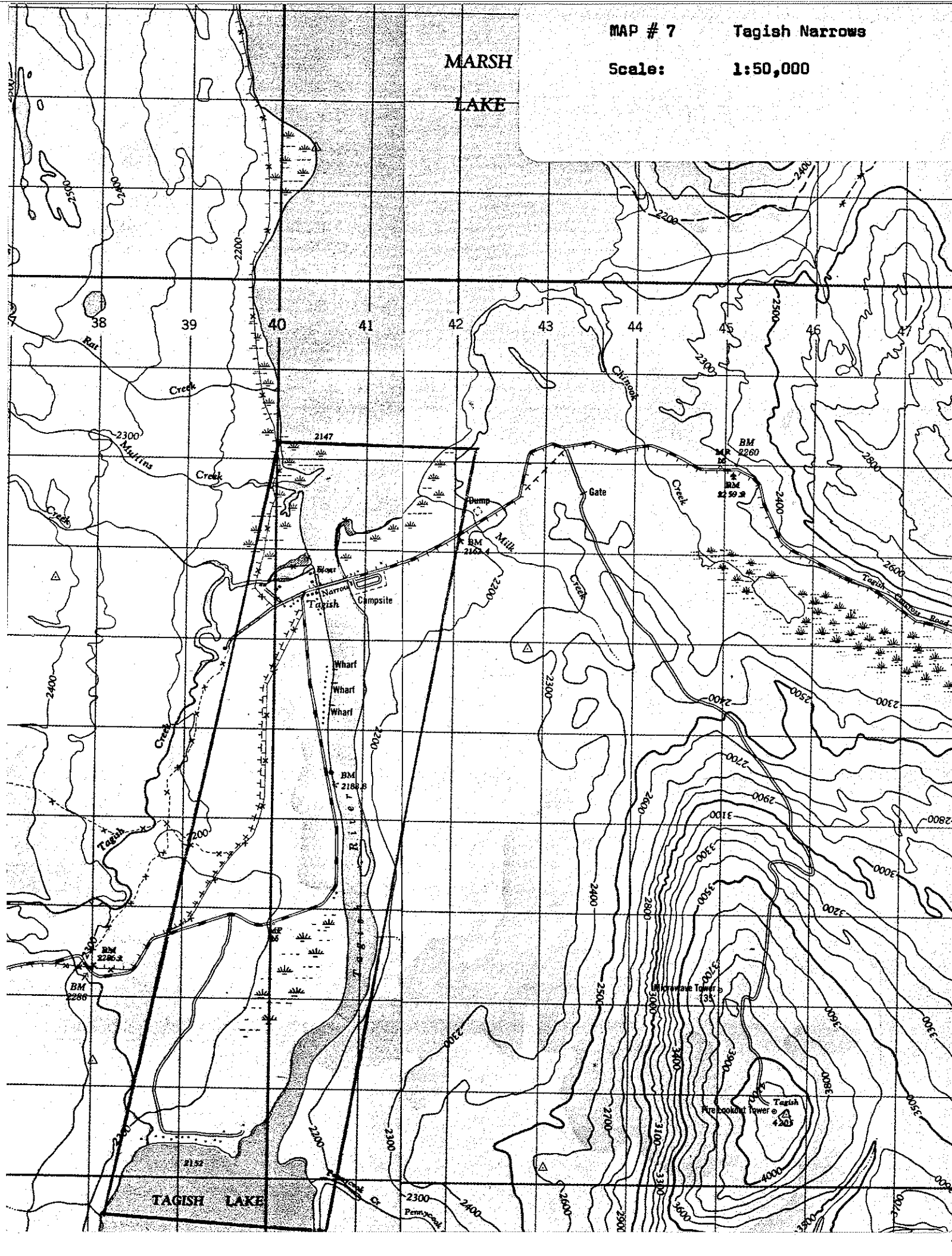
MAP # 7

Tagish Narrows

Scale:

1:50,000

MARSH
LAKE

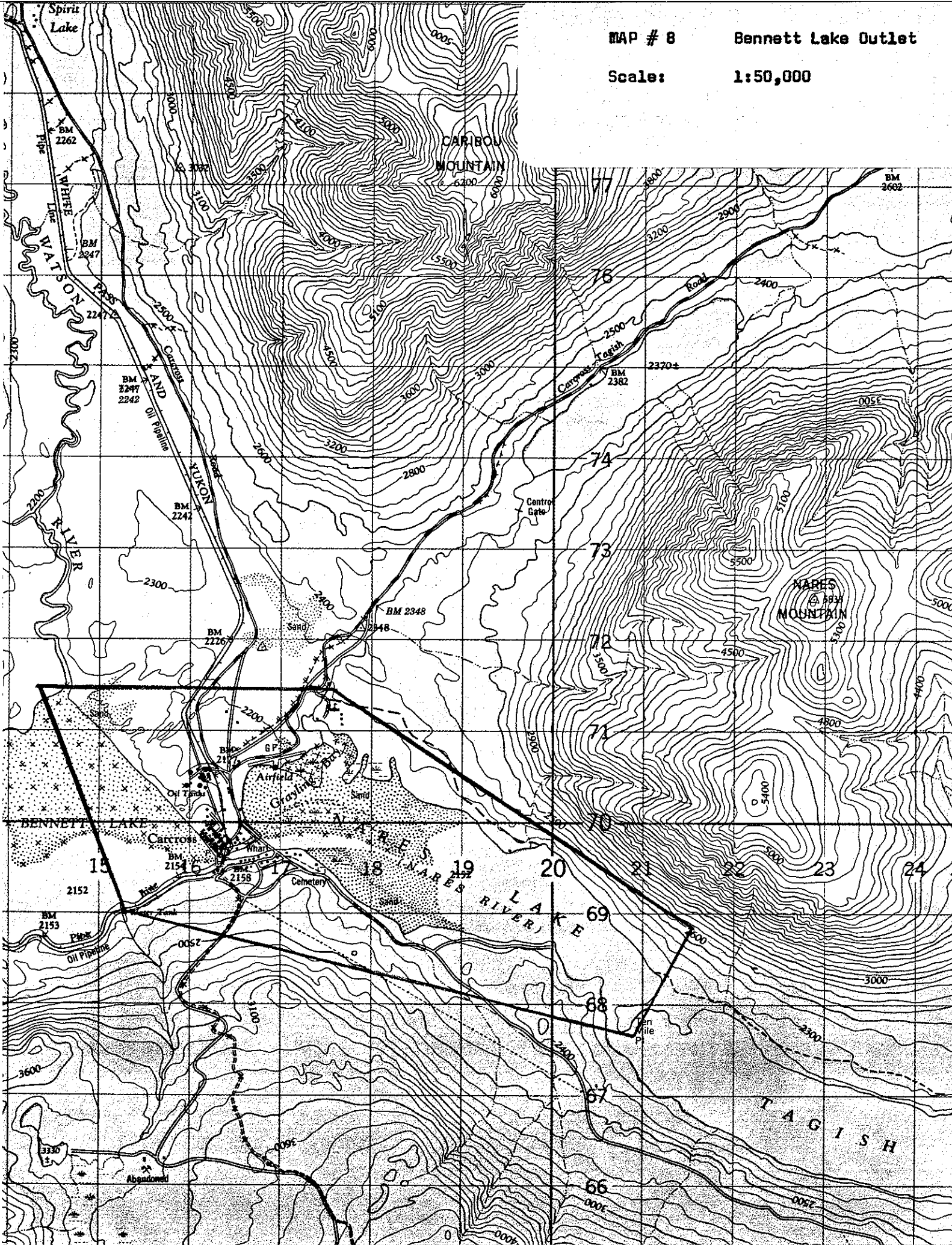


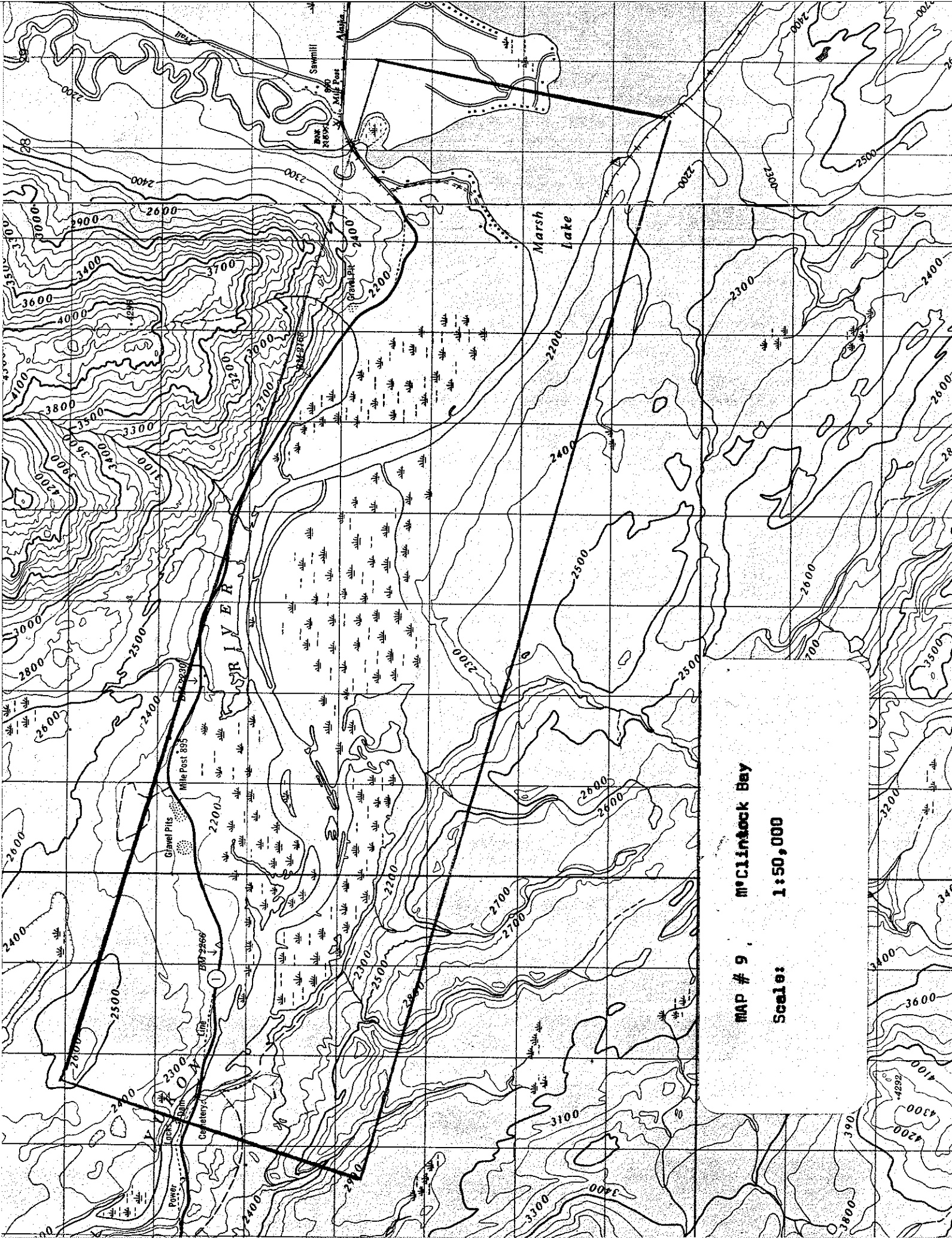
MAP # 8

Bennett Lake Outlet

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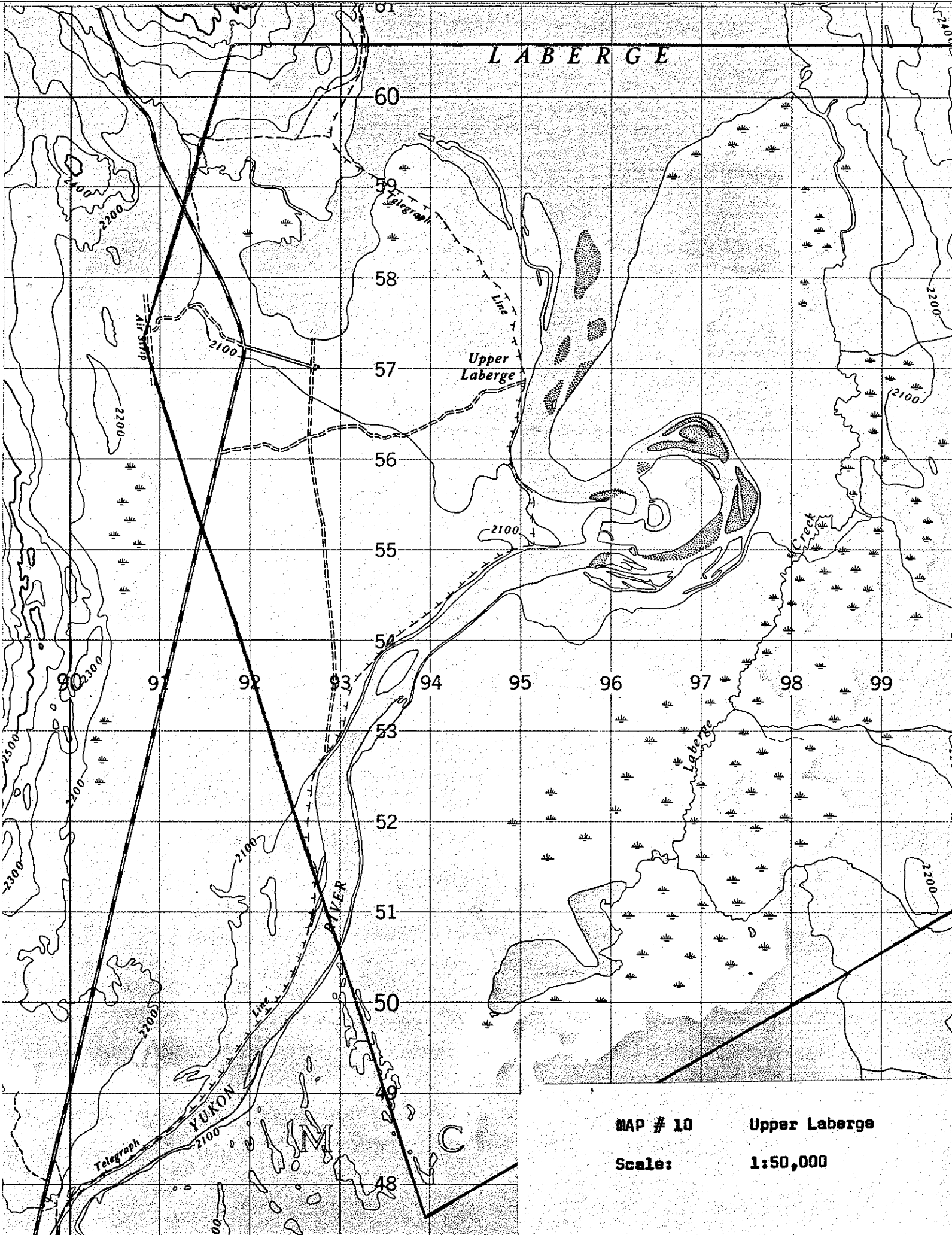
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MAP # 9 , McClintonck Bay

Scale: 1:50,000



MAP # 10

Upper Laberge

Scale:

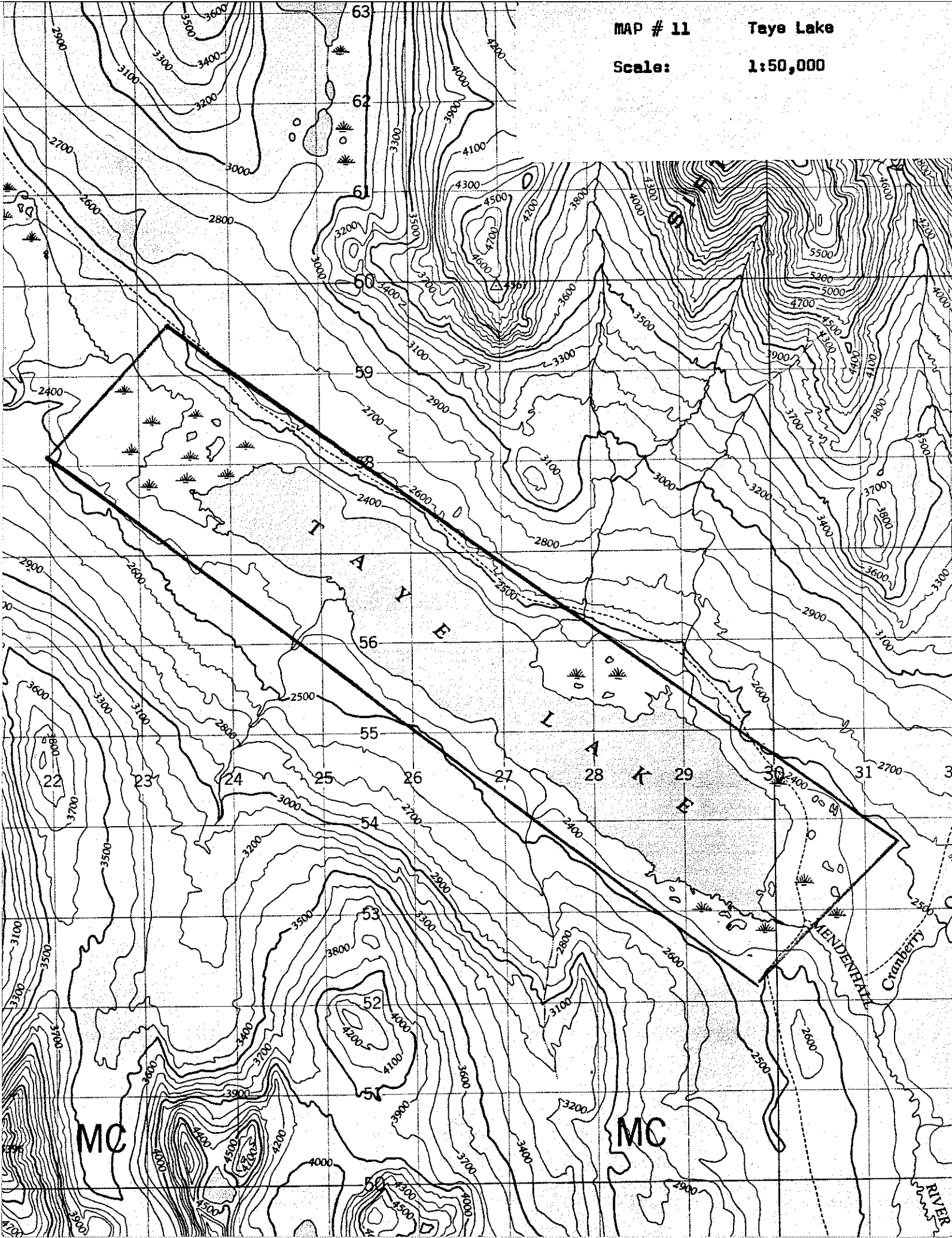
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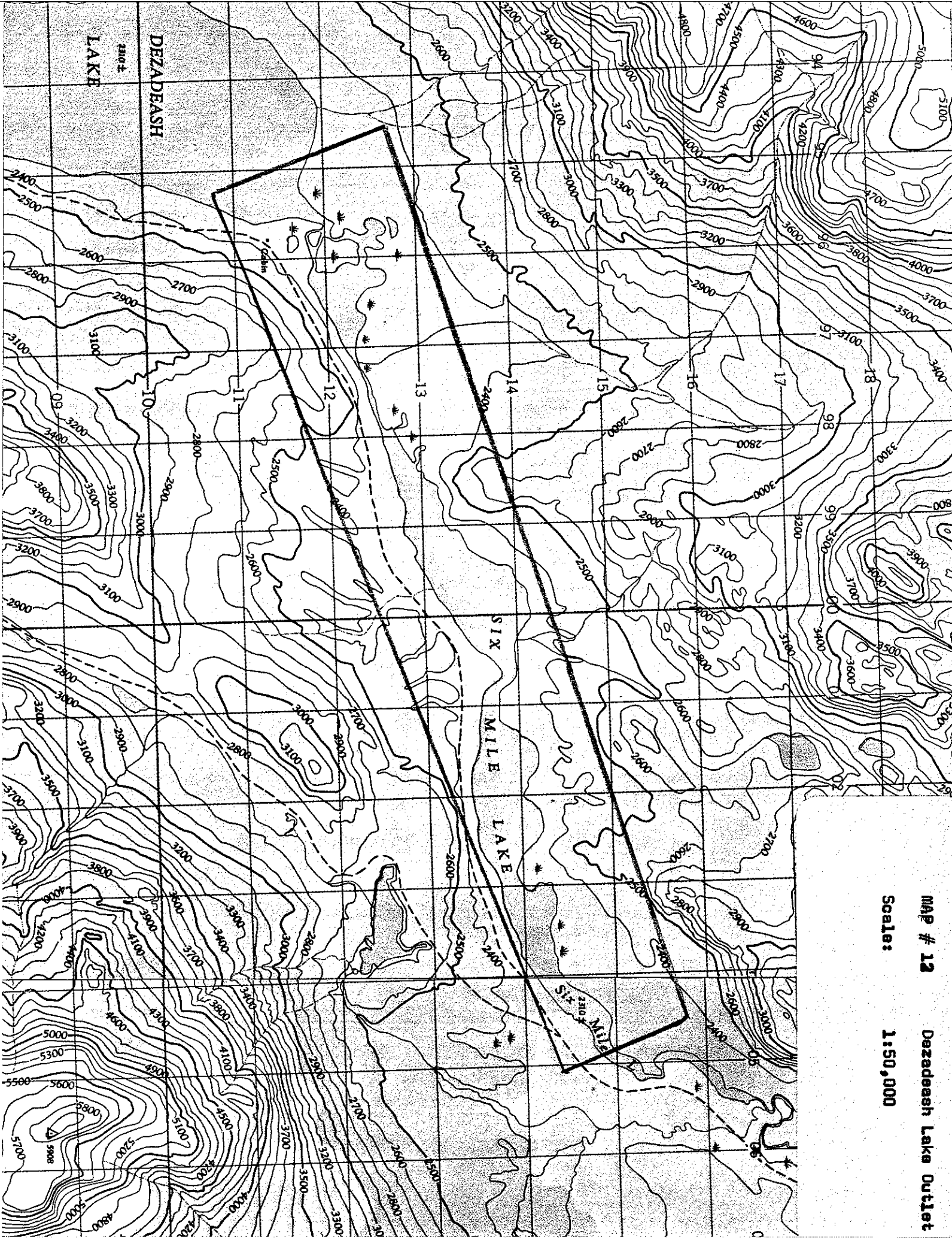
MAP # 11

Taye Lake

Scale:

1:50,000



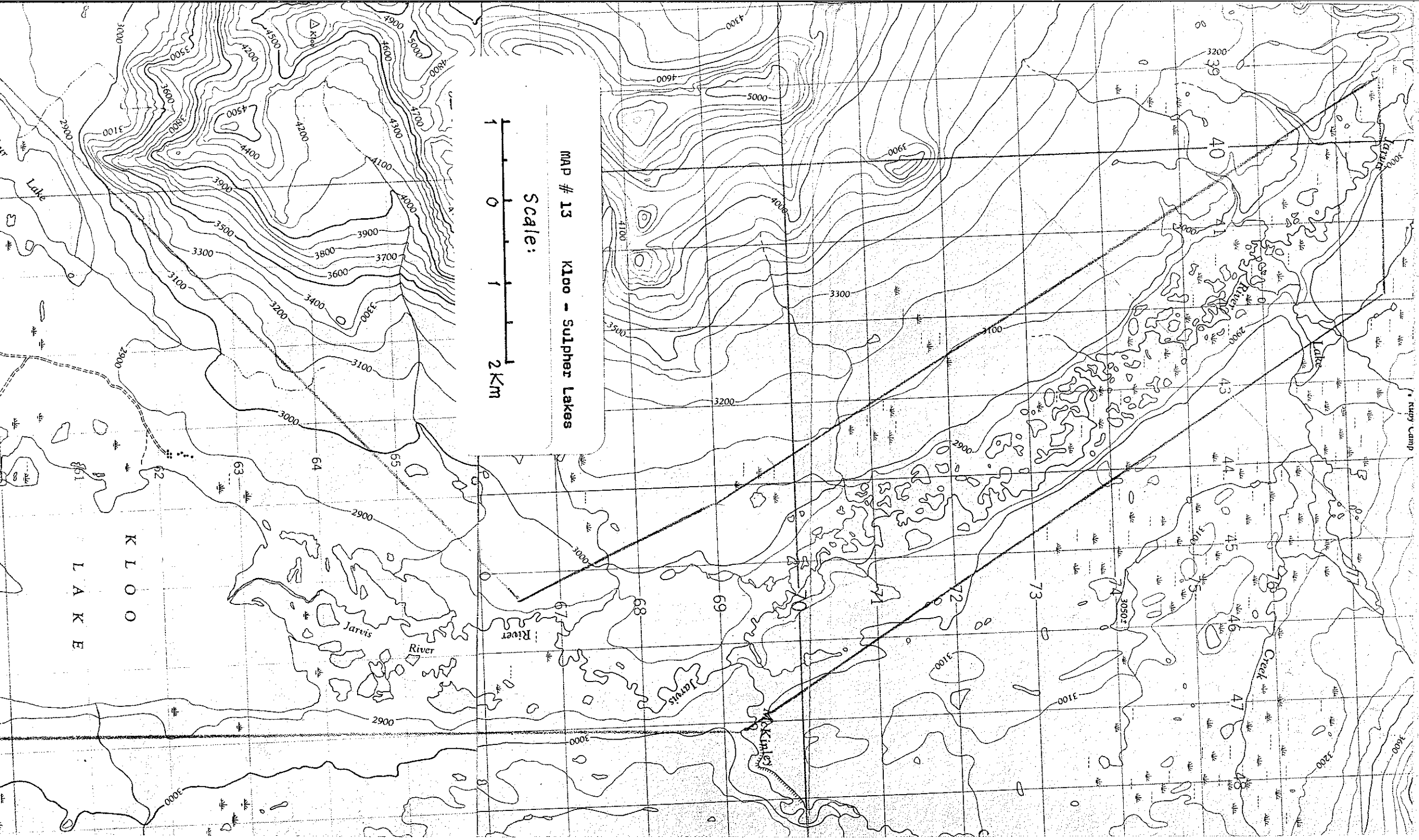


DEZADEASH
LAKE

SIX MILE LAKE

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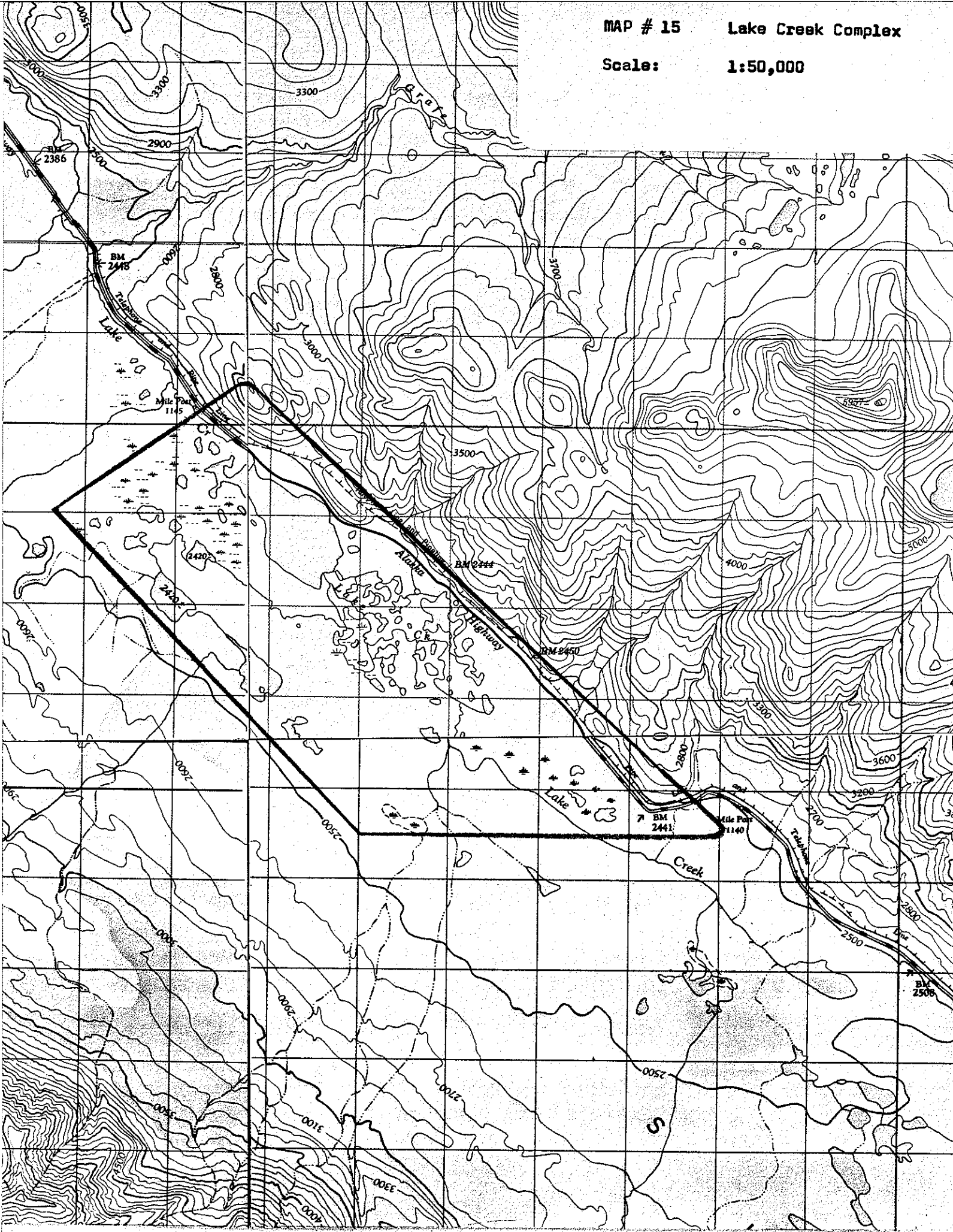
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Dezadeash Lake Outlet
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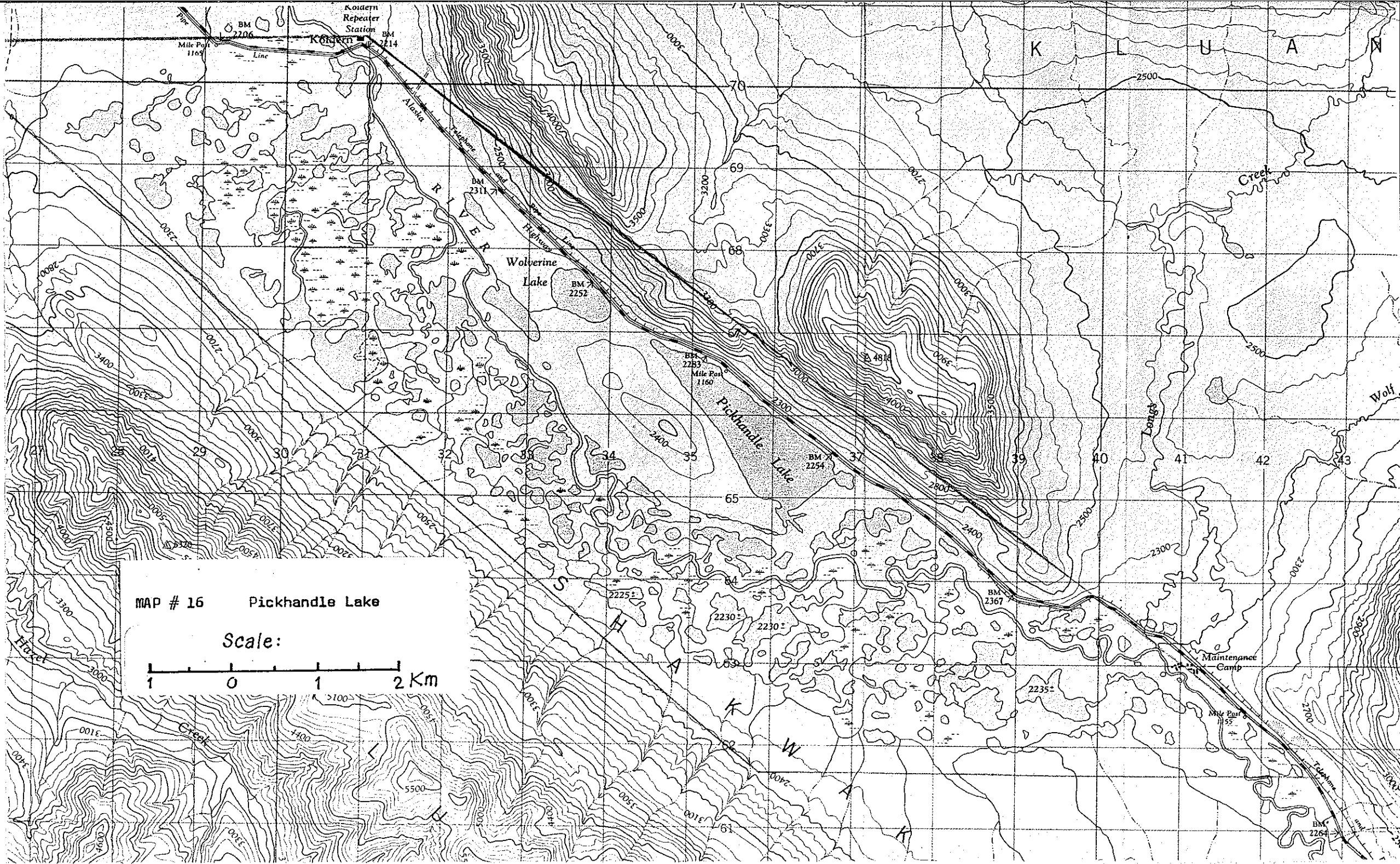


MAP # 13 Kloo - Sulphur Lakes

Scale:







MAP # 16 Pickhandle Lake

Scale:

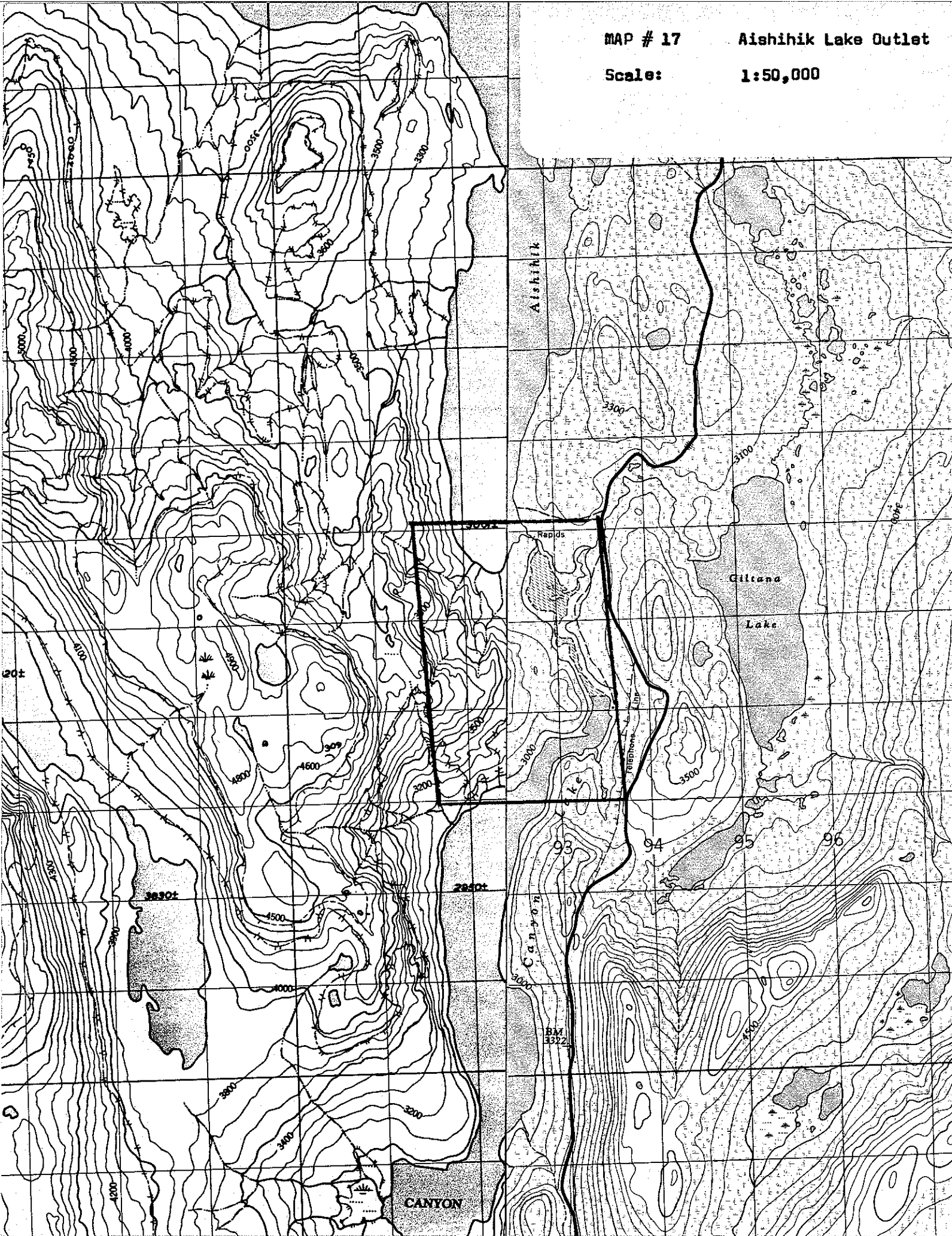


MAP # 17

Aishihik Lake Outlet

Scale:

1:50,000

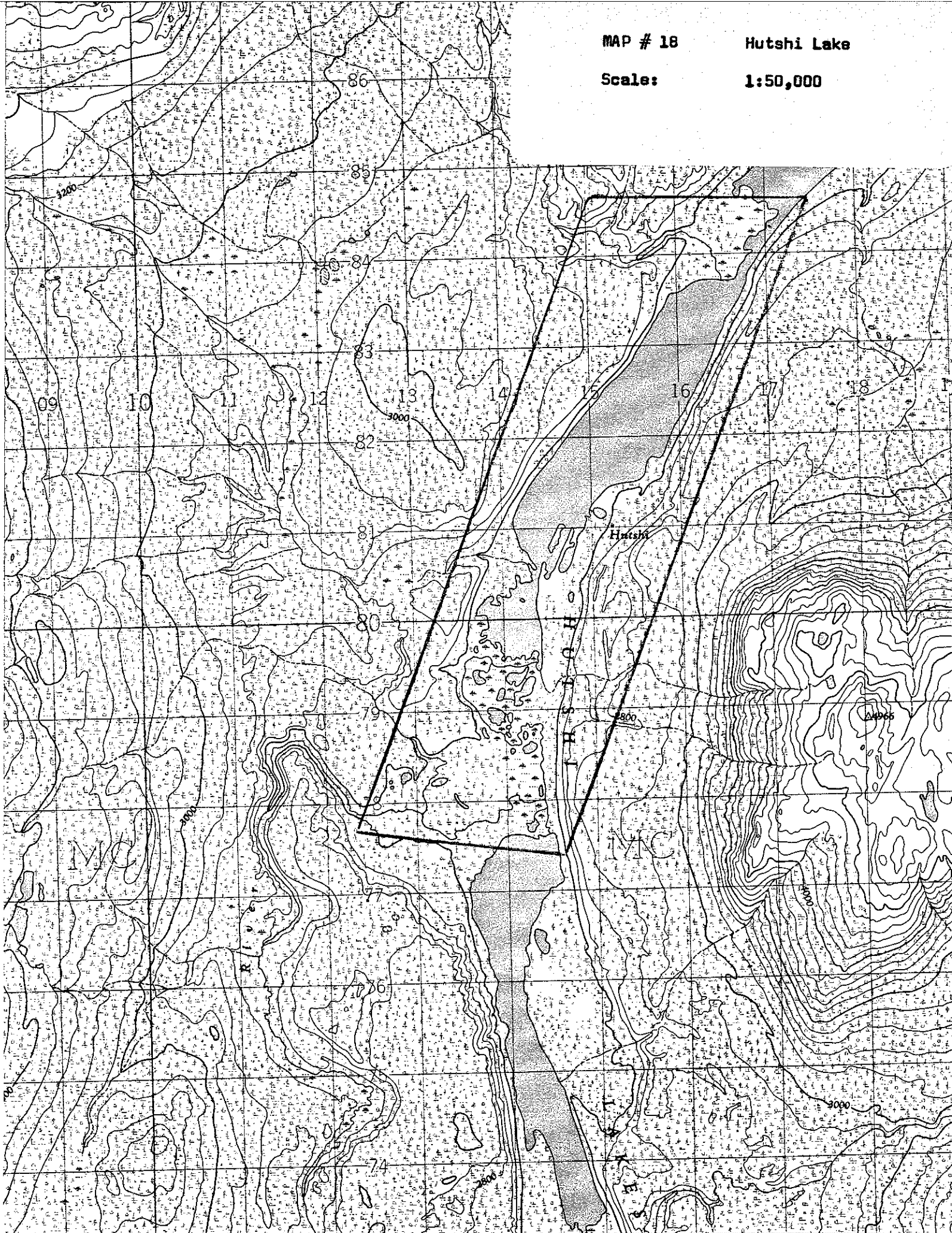


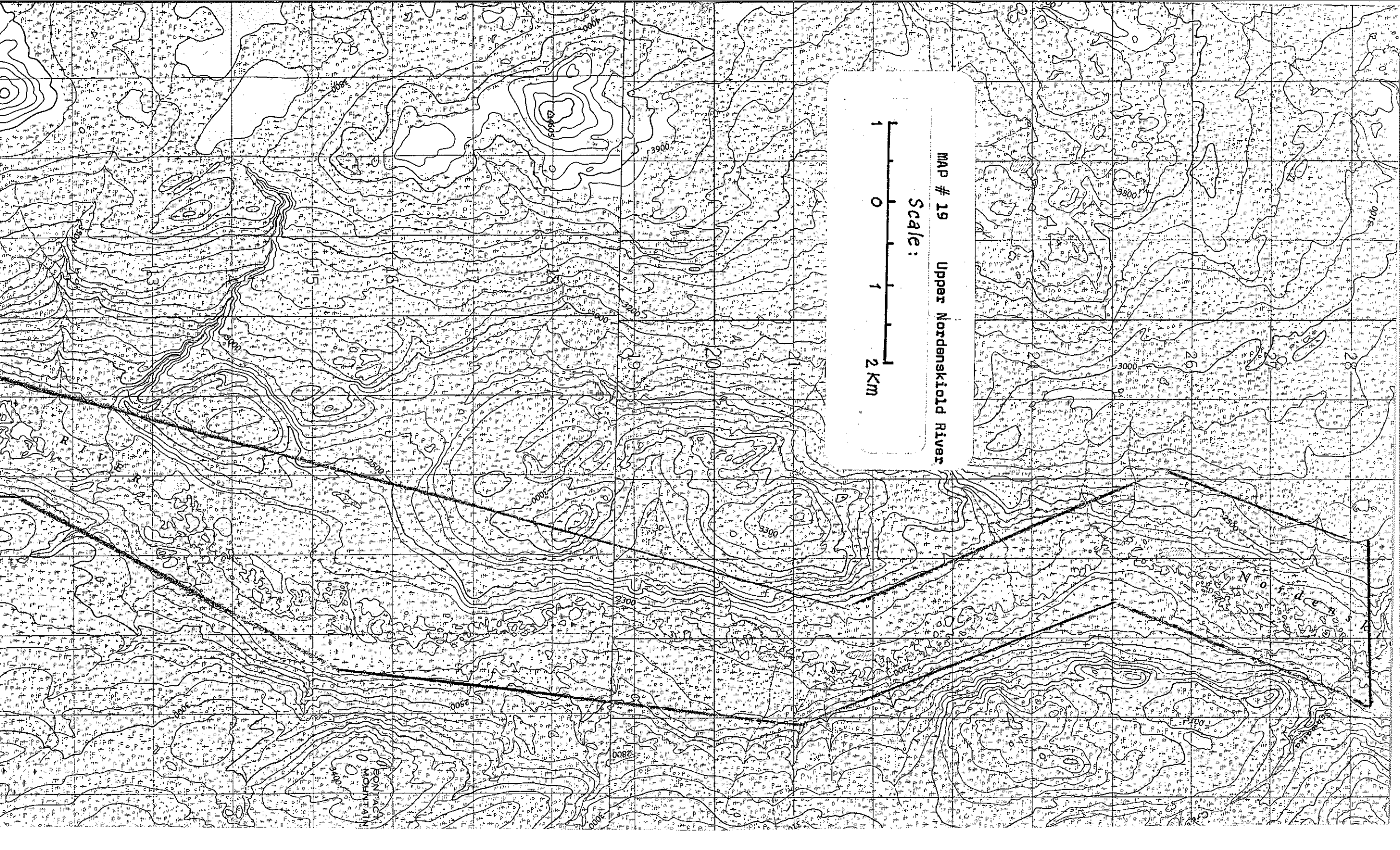
MAP # 18

Hutshi Lake

Scale:

1:50,000



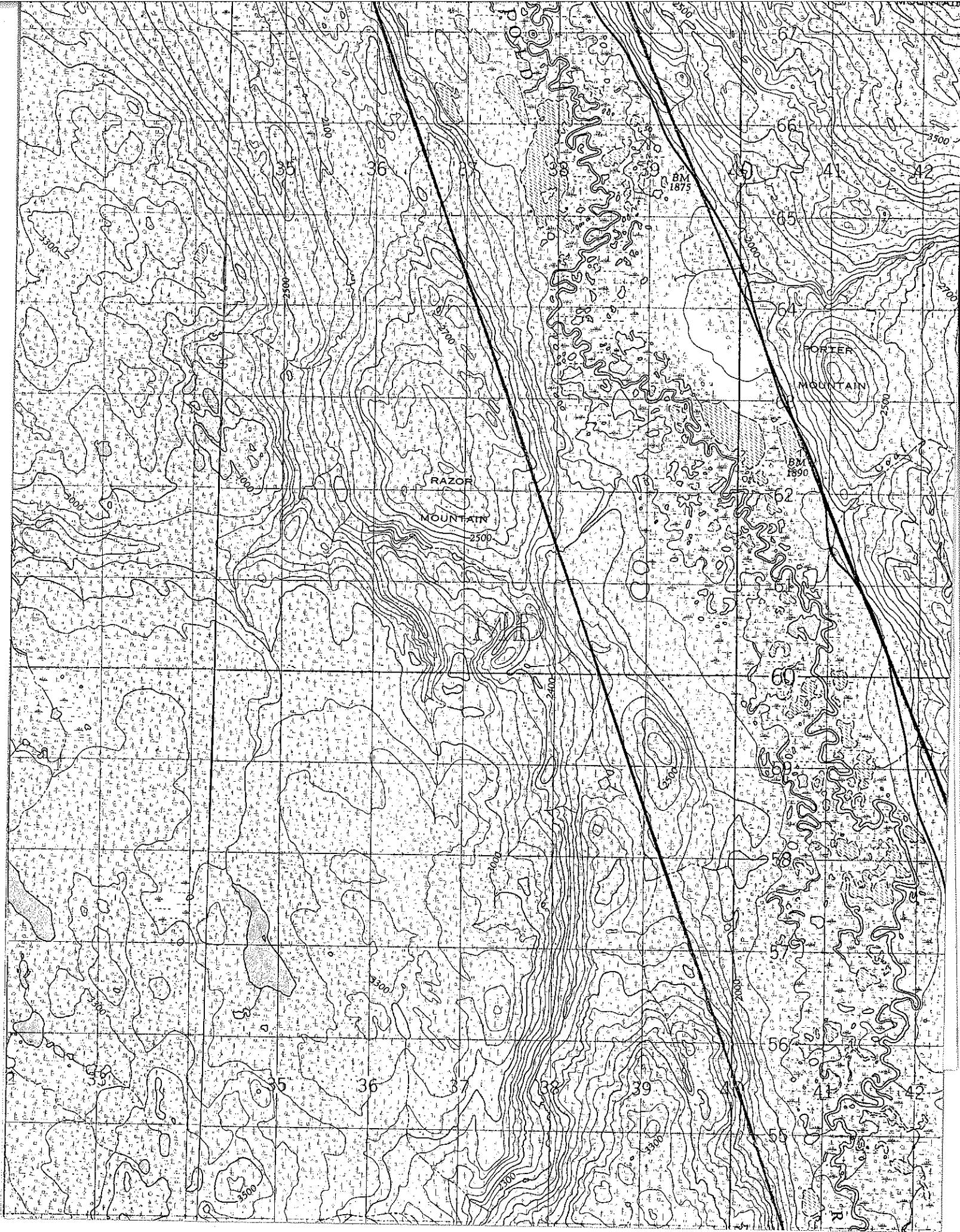


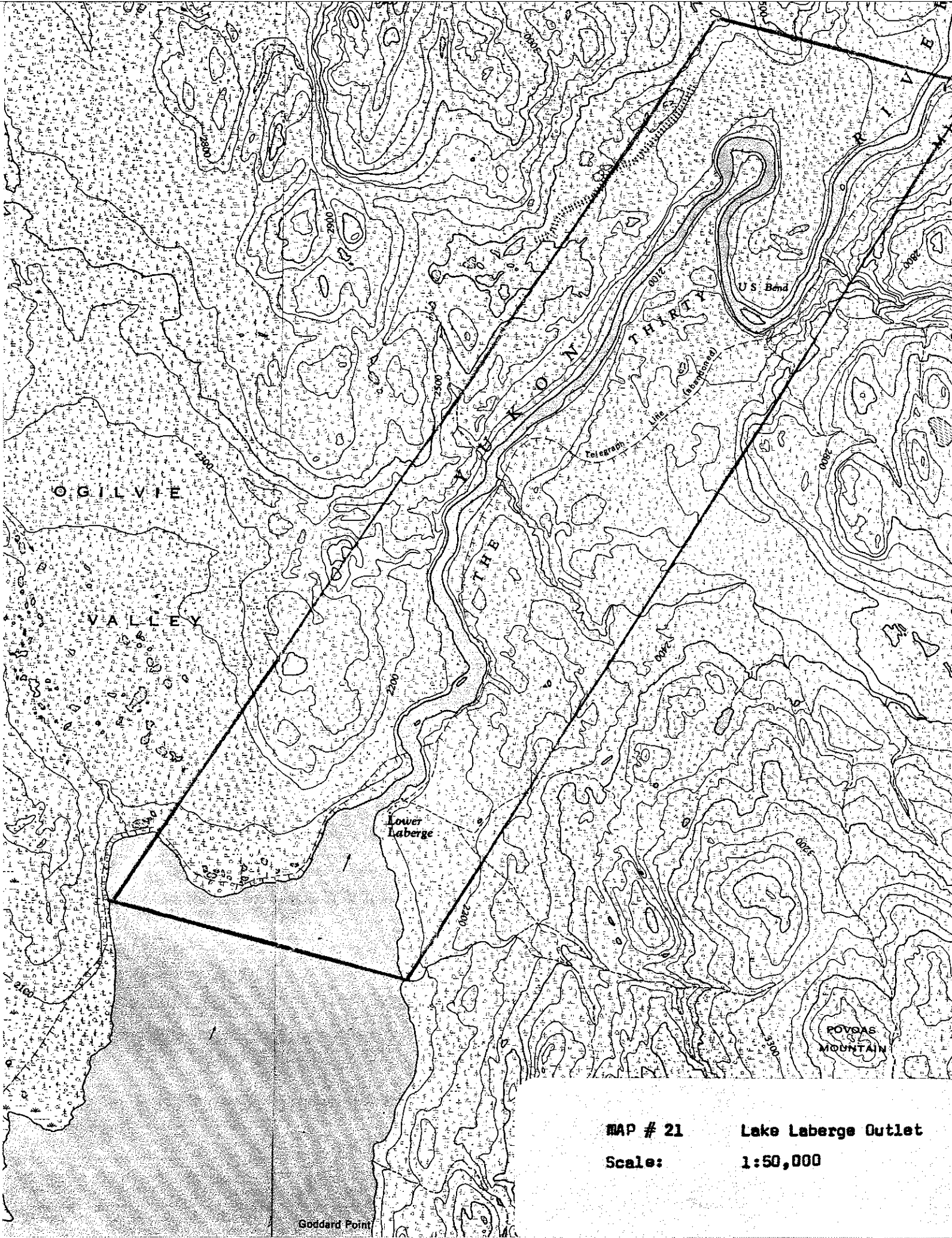
MAP # 19 Upper Nordenskiöld River

Scale:



NORDENSKIÖLD RIVER





O G I L V I E

V A L L E Y

Lower
Laberge

U.S. Bend

POGAS
MOUNTAIN

MAP # 21

Lake Laberge Outlet

Scale:

1:50,000

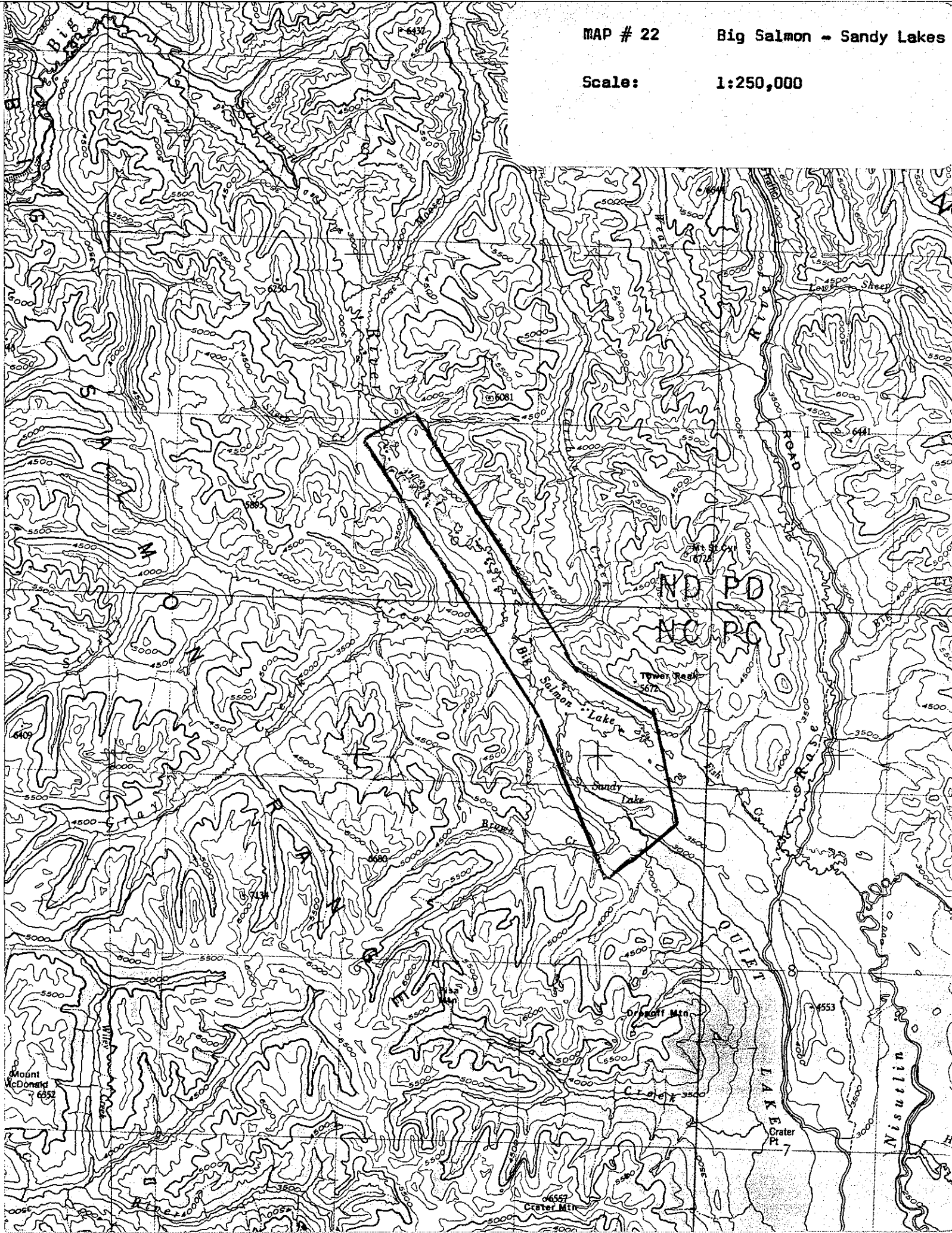
Goddard Point

MAP # 22

Big Salmon - Sandy Lakes

Scale:

1:250,000



MAP # 23

Frances Lake

Scale:

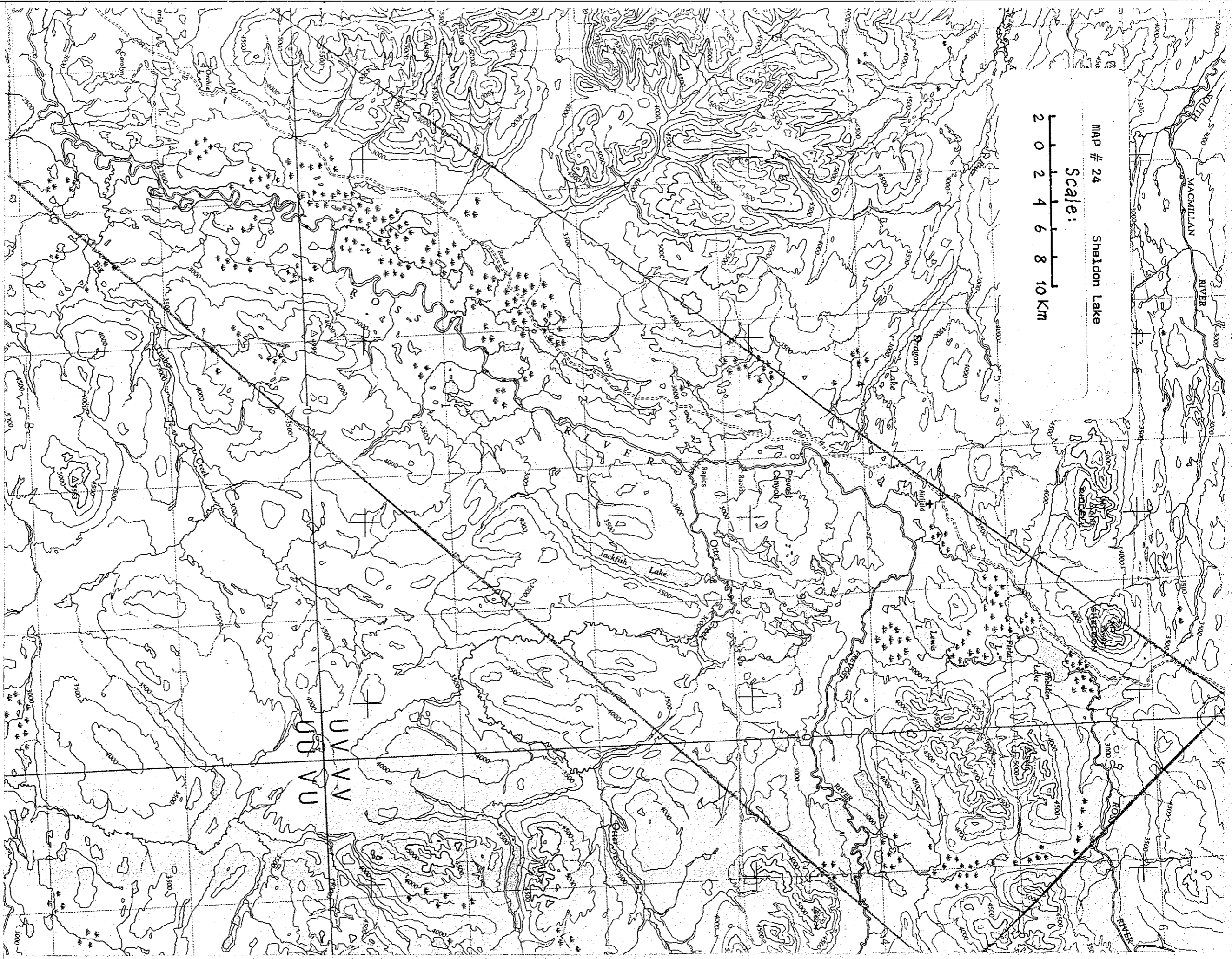
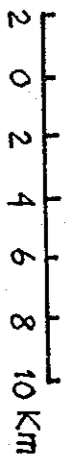
1:250,000

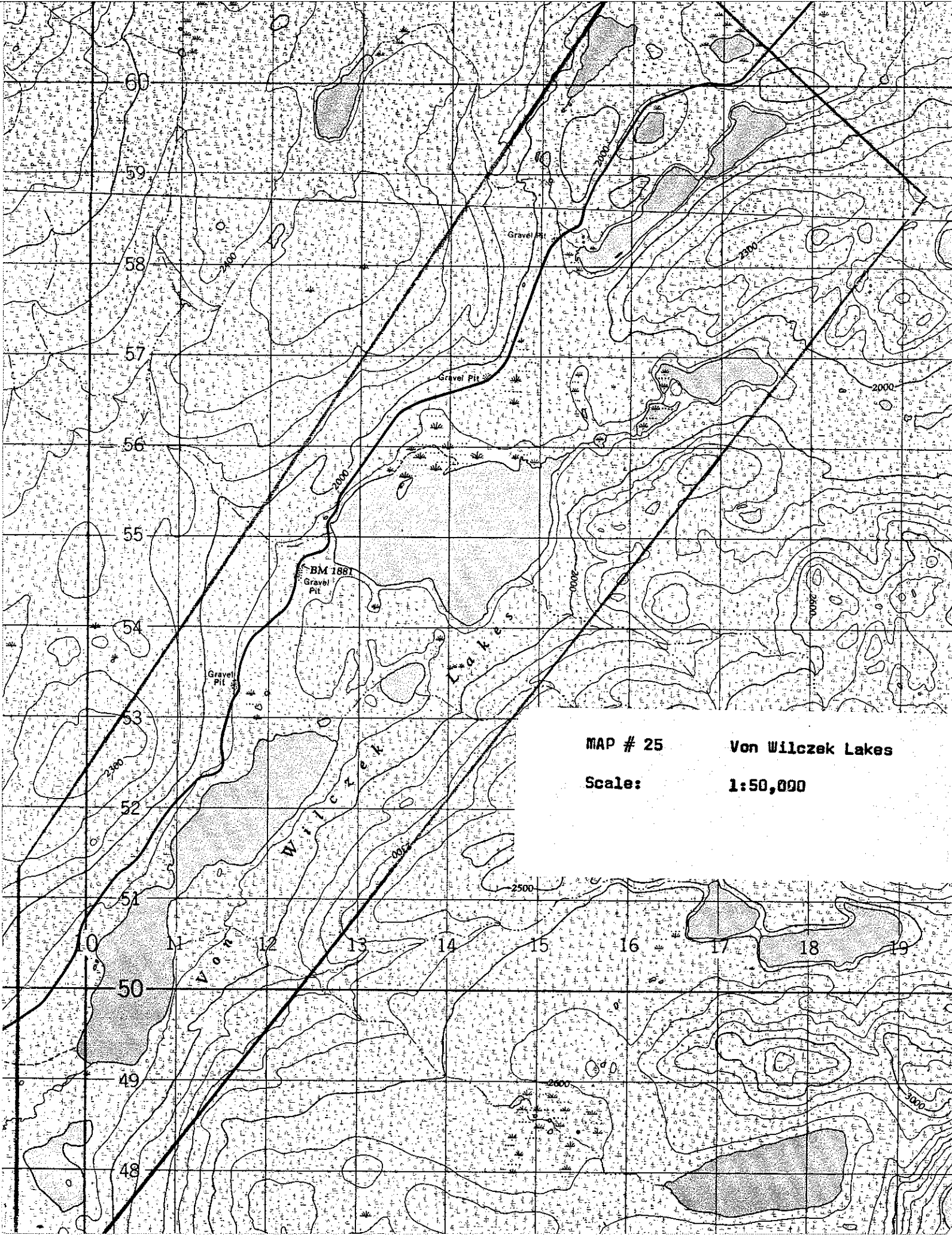


MAP # 24

Sheldon Lake

Scale:





MAP # 25

Von Wilczek Lakes

Scale:

1:50,000



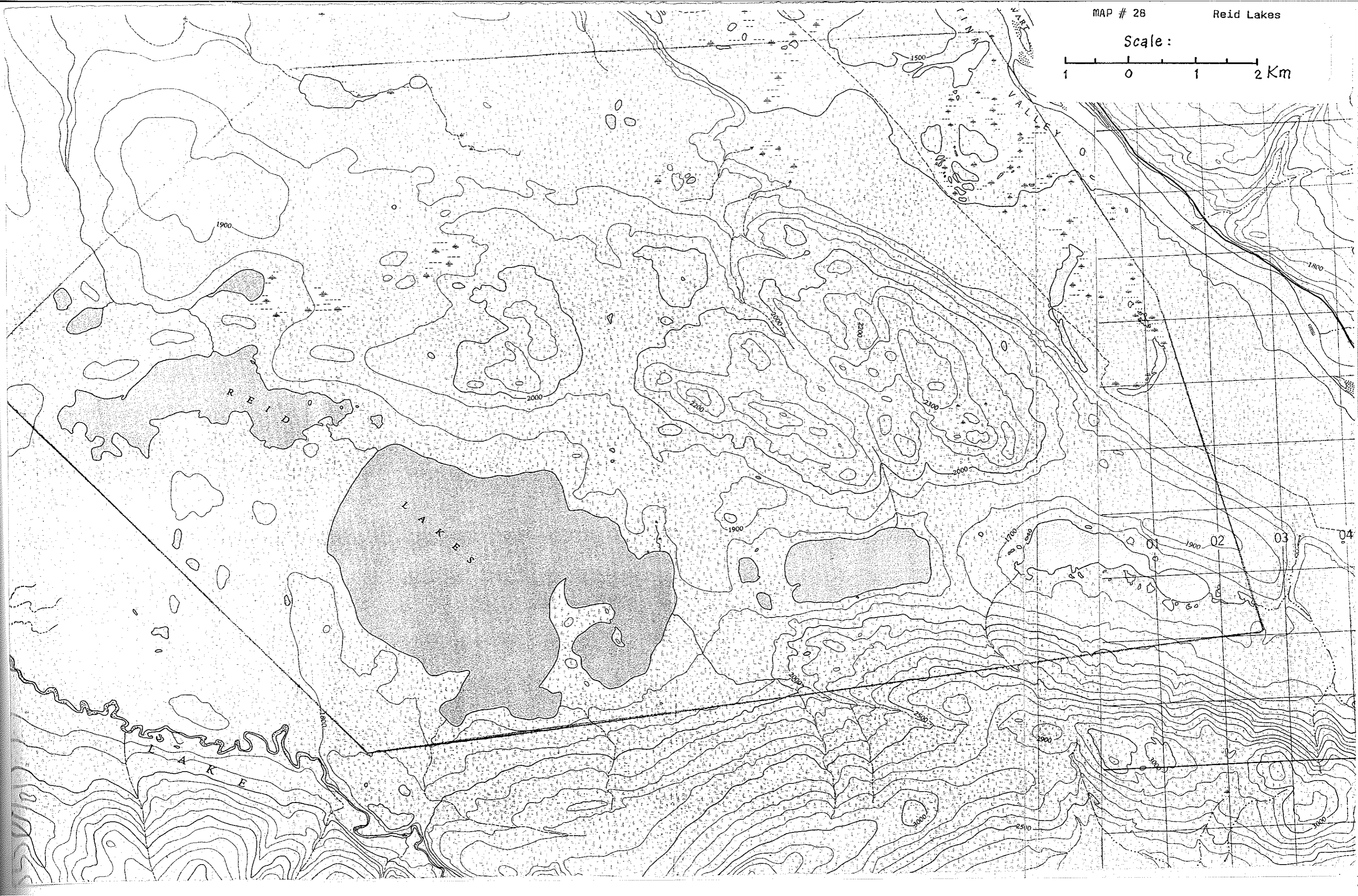
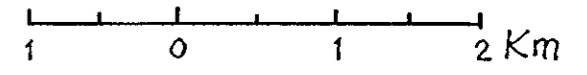
Willow

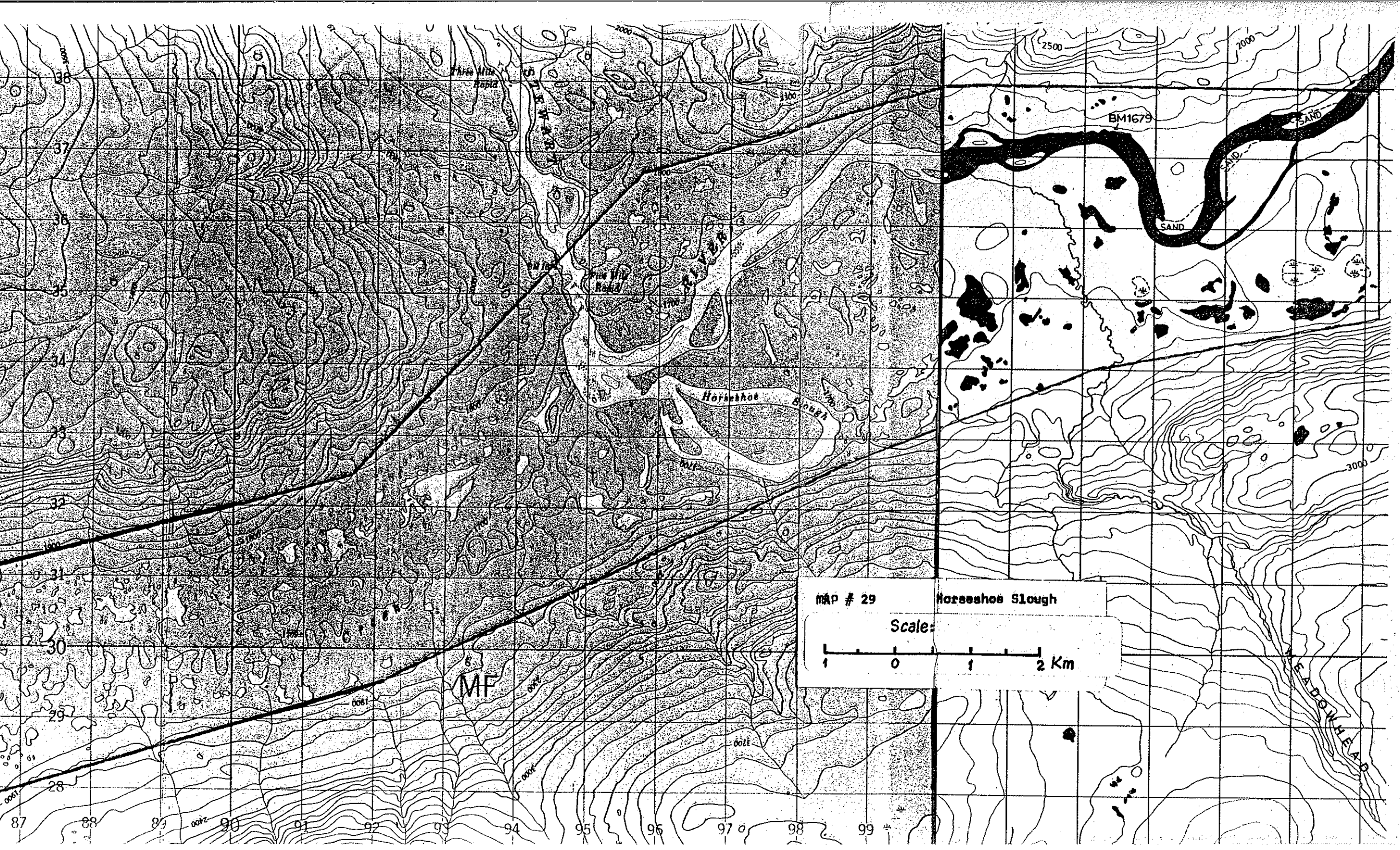
MAP # 27 Willow Creek Complex

Scale:



Scale:





Three Mile Rapids

Three Mile Rapids

Horseshoe Slough

BM1679

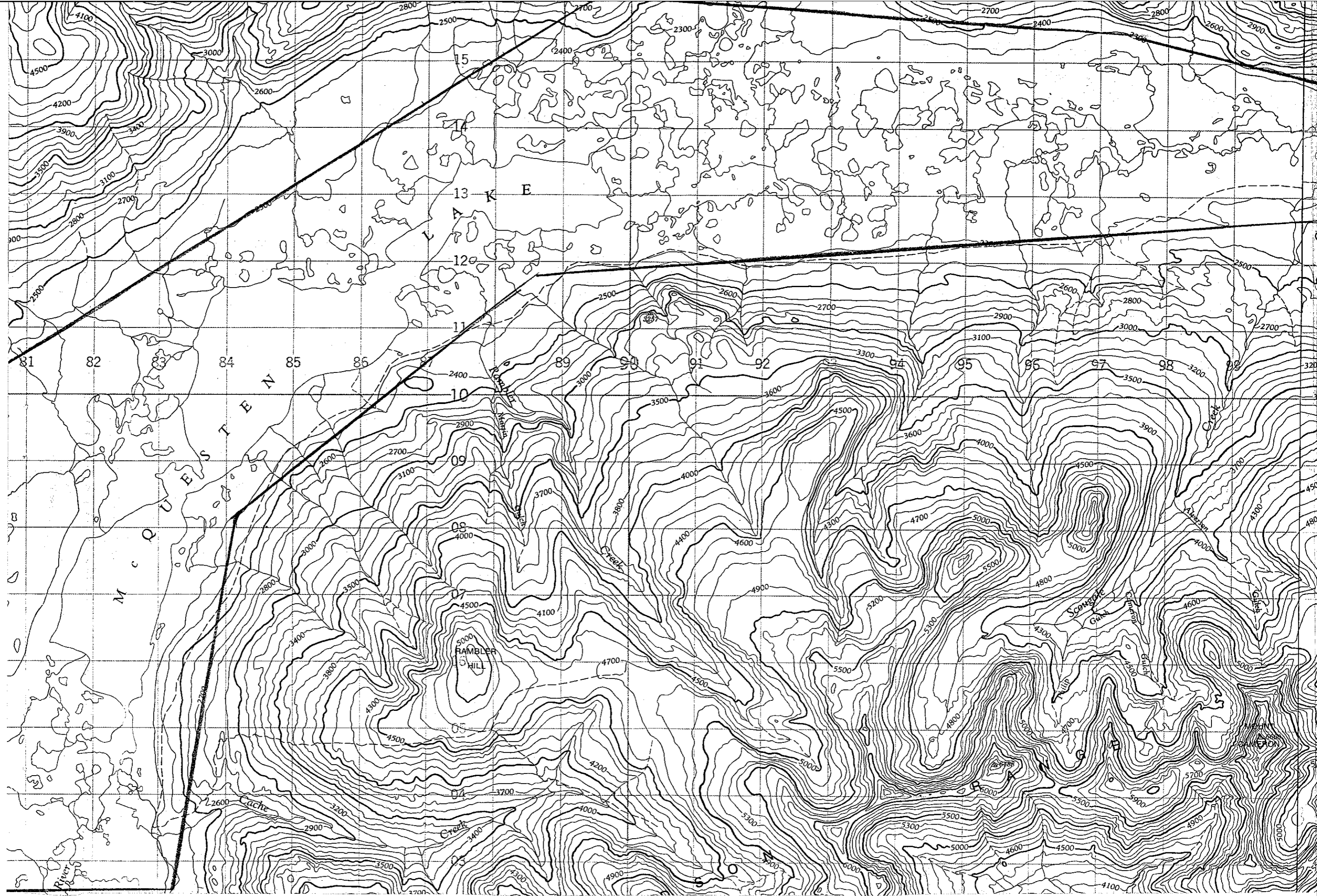
SAND

SAND

HEAD

MAP # 29 Horseshoe Slough
Scale:
1 0 1 2 Km

MF

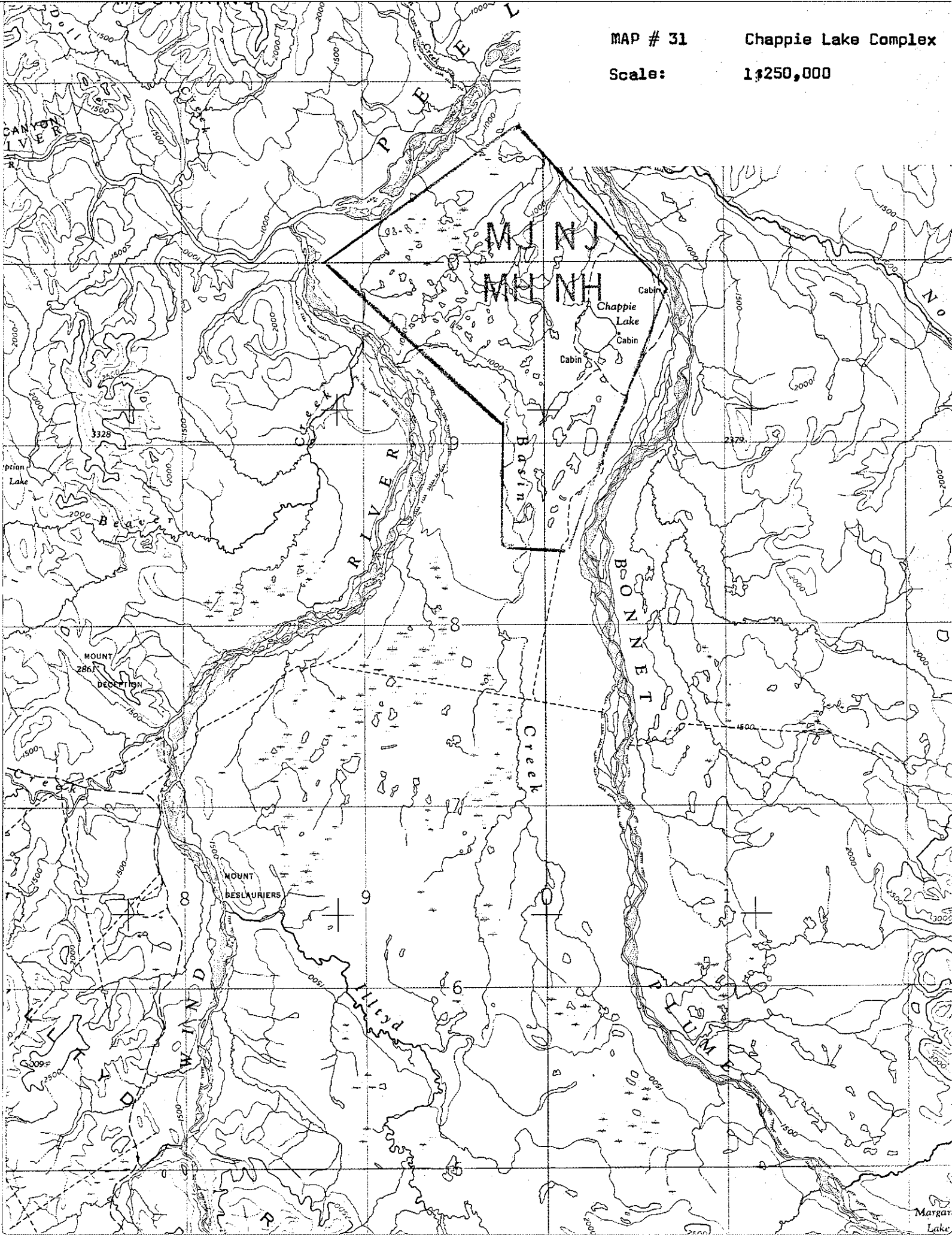


MAP # 31

Chappie Lake Complex

Scale:

1:250,000

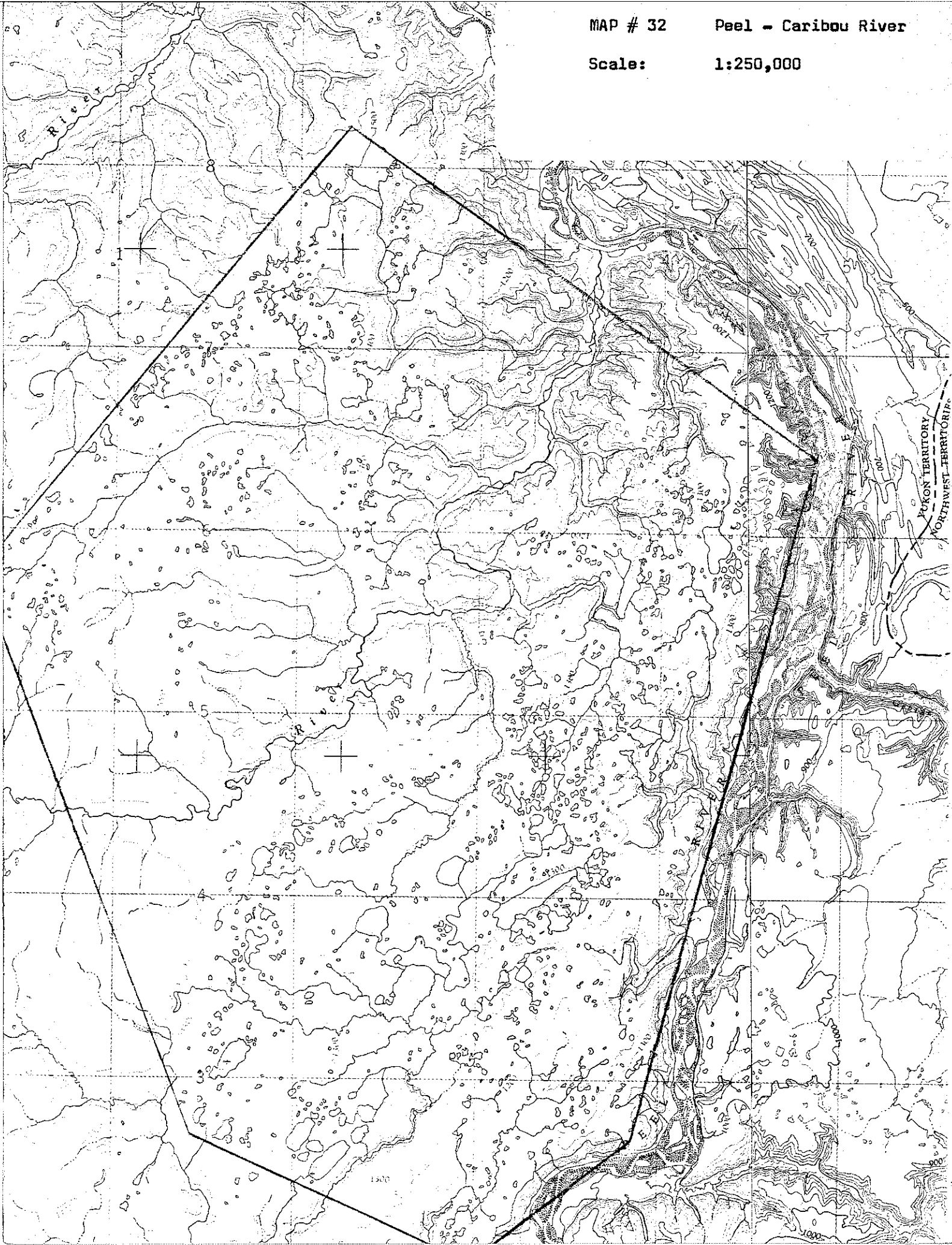


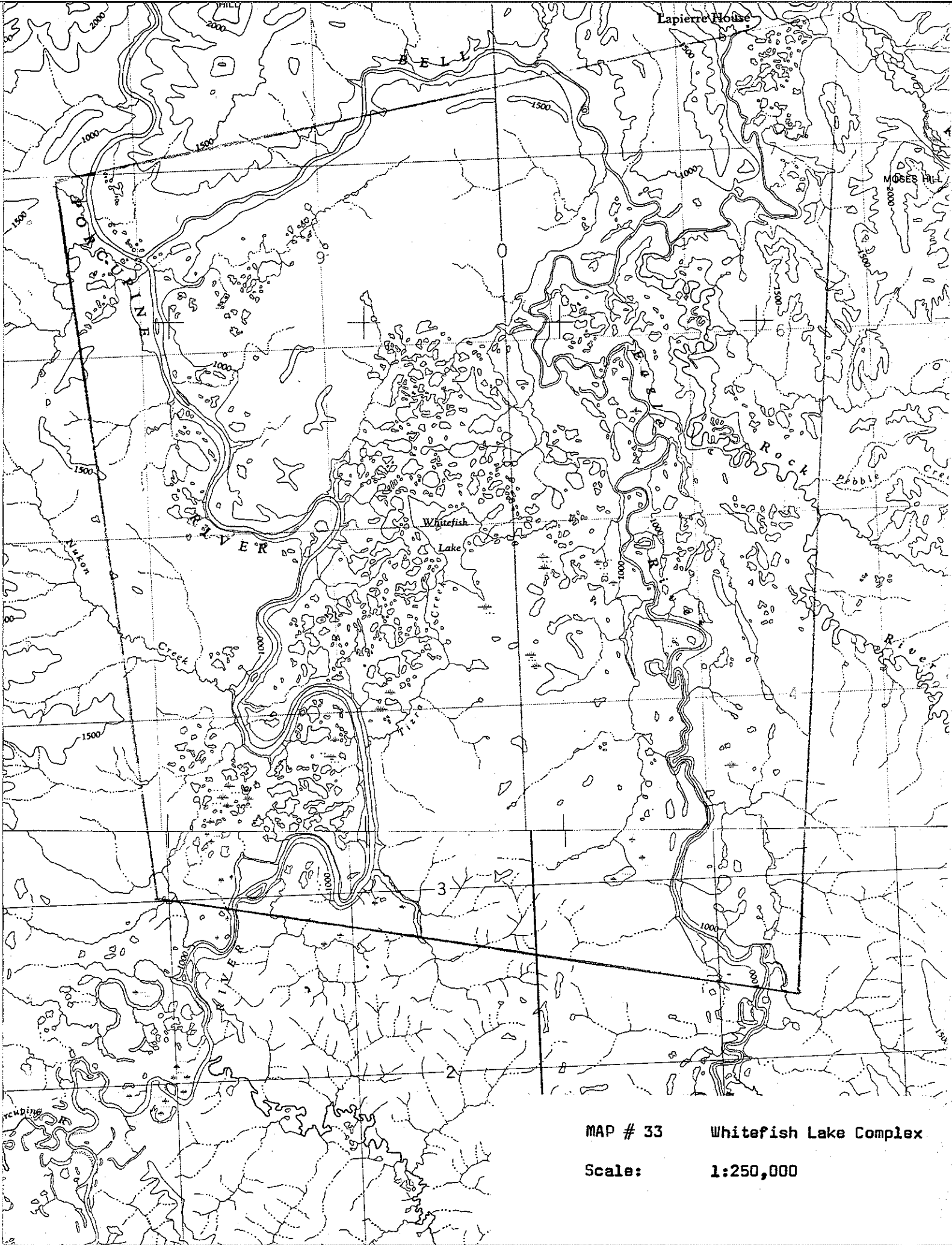
MAP # 32

Peel - Caribou River

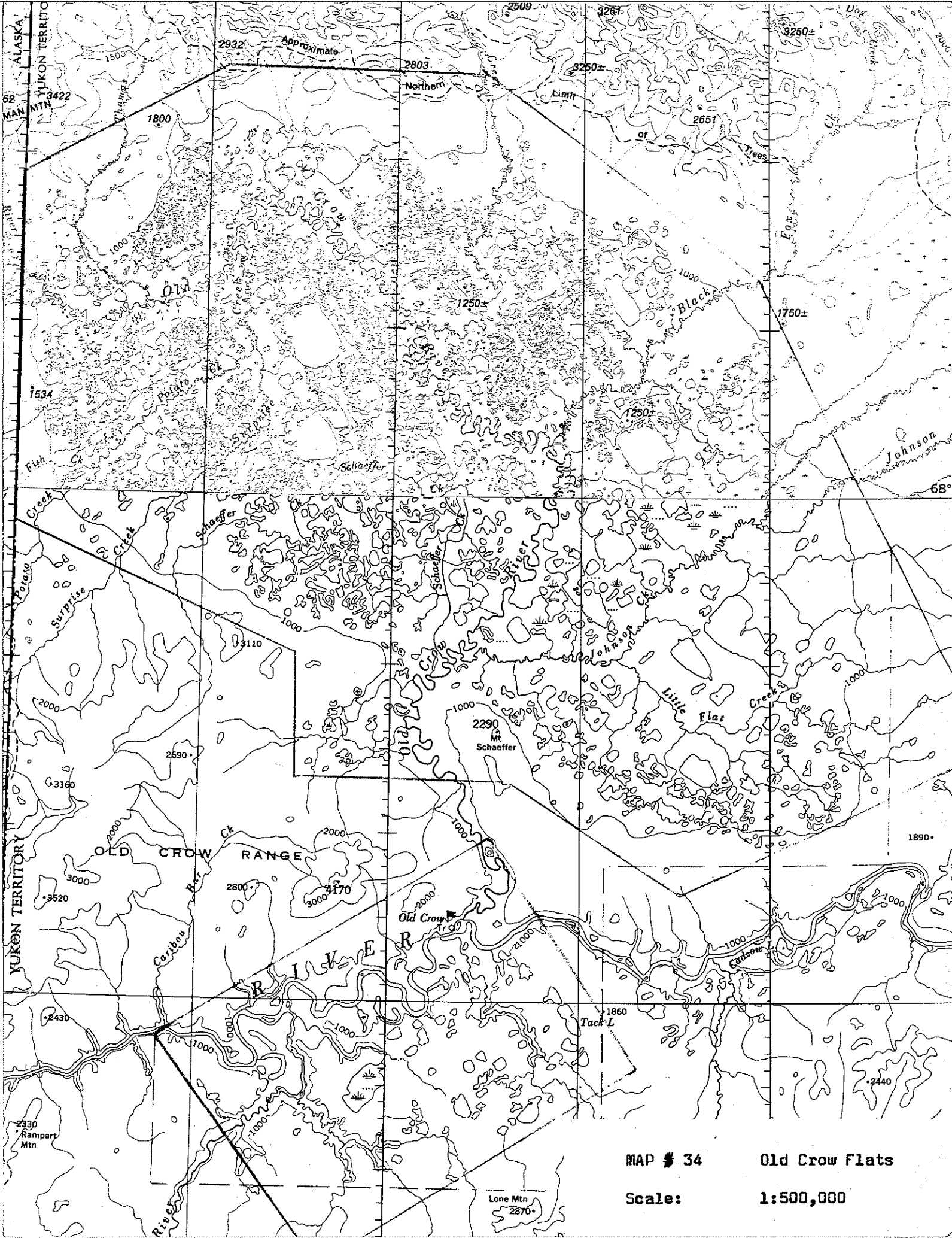
Scale:

1:250,000





MAP # 33 Whitefish Lake Complex
Scale: 1:250,000



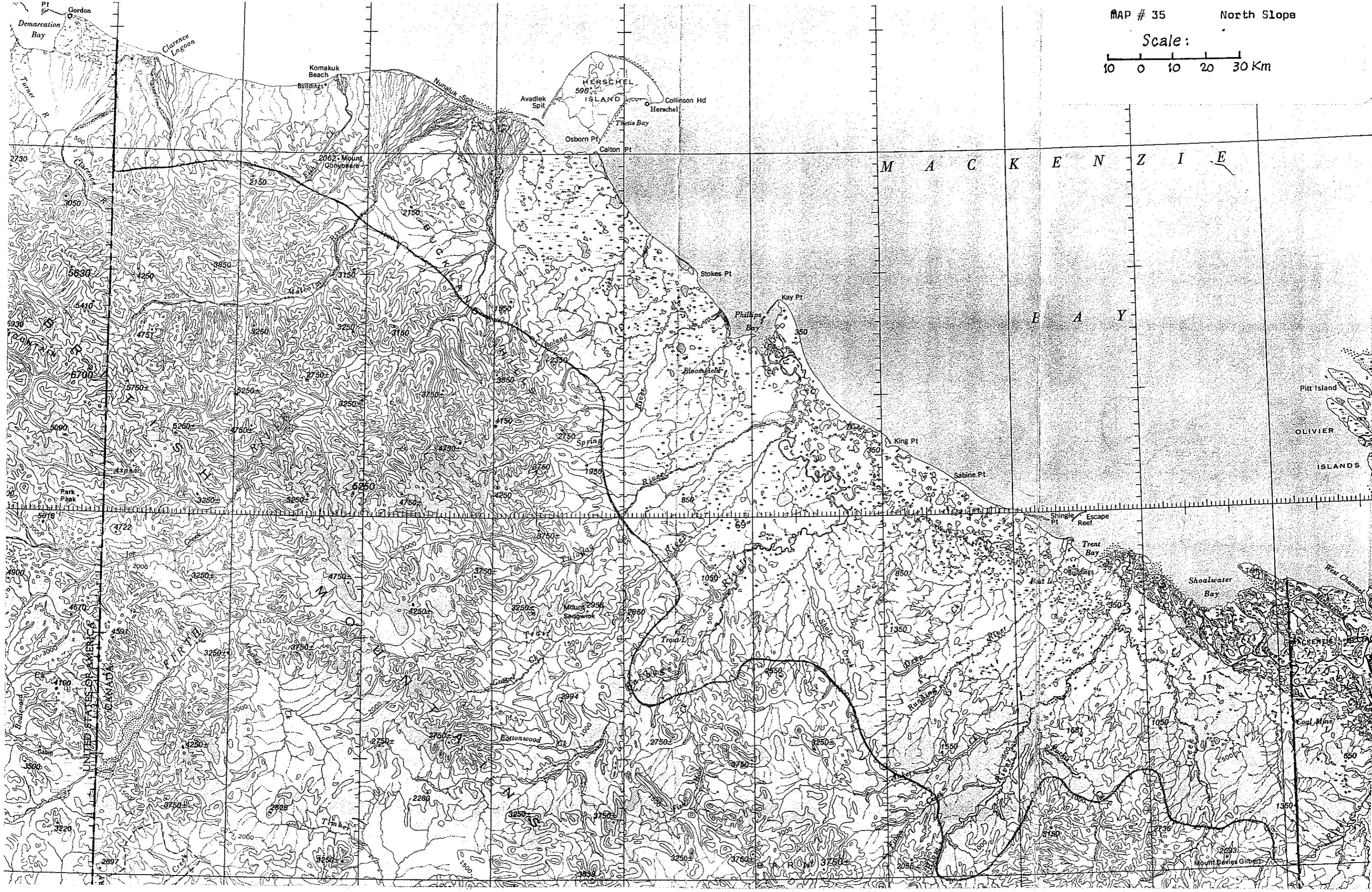
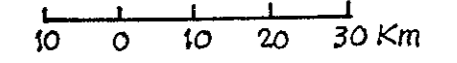
MAP # 34

Old Crow Flats

Scale:

1:500,000

Scale:



Pt Gordon

Demarcation Bay

Clarence Lagoon

Komakuk Beach

Buildings

Nuraluk Spit

HERSCHEL ISLAND

590'

Avadlek Spit

Collinson Hd

Herschel

Osborn Pt

Calton Pt

Thetis Bay

Stokes Pt

Kay Pt

Philips Bay

Bloomfield

King Pt

Sabine Pt

Shingle Pt

Escape Reef

Trent Bay

Shoalwater Bay

West Channel

Pitt Island

OLIVIER ISLANDS

FRANCIS ISLANDS

Coal Mine

Mount Davis Gilbert

M A C K E N Z I E

E A Y

B A R N

UNITED STATES OF AMERICA

ALASKA

CLARENCE LAGOON

CLARENCE LAGOON

CLARENCE LAGOON

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