# A PROPOSAL

# FOR

# A

# WOLF INTERPRETIVE PROGRAM

# IN

# WELLS GREY PROVINCIAL PARK

prepared for

L. Dunsford
Co-ordinator, Wildland Recreation
Selkirk College

by

William Cumming
April 23, 1976.

General Delivery
Robson, B.C.
April 23, 1976.

Len Dunsford
Co-ordinator, Wildland Recreation Program
Selkirk College
Castlegar, B.C.

Dear Mr. Dunsford;

The accompanying report entitled, "A proposal for a wolf interpretive program in Wells Grey Provincial Park," is submitted in accordance with your instructions.

The primary purpose of this report is to put forward an interpretive program in Wells Grey Park. An effort has been made to cover the subject thoroughly and included is a section on habitat inventory within the park. It is imperative that this be done before any major interpretive program be implemented.

I wish to acknowledge the information and assistance given me by D.H. Pimlott, G. Smythe and R. Silver whose help was greatly appreciated.

I sincerely hope that this report will meet with your approval.

Respectfully yours,

William Cumming.

Photograph 1. Young female wolf.

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Summary

This report presents a proposal for a wolf interpretive study and program at Wells Grey Provincial Park. In preparing the proposal it was necessary to also present an introduction to the area and a history of management and habitat of wolves.

Due to the lack of first-hand information on wolf habitat in Wells Grey Park it was necessary to draw on the experiences of programs in other areas similar to Wells Grey Park. It is my contention however, that these findings are valid in relation to the proposed interpretive plan in Wells Grey Park for as Ken Semanick has stated, "A wolf is a wolf is a wolf."

INTRODUCTION

Wells Grey Provincial Park is a primitive wilderness park exceeding 520,000 hectares, encompassing the greater part of the Clearwater River watershed. The park is located approximately 380 kilometers northeast of Vancouver in the Caribou Mountains. Main entrance and administrative headquarters for Wells Grey Park are located at Hemp Creek, 40 kilometers north of Highway 5(Yellowhead Highway) via a gravel road. The turn off for the highway is near the community of Clearwater, 120 kilometers northeast of Kamloops.

On the east and north the park is bordered by mountains and on the west by an upland plateau. In the south are alpine meadows and scattered throughout the park are five major lakes,(Clearwater Lake, Mahood Lake, Azure Lake, Murtle Lake, and Hobson Lake), two river systems, and many small lakes and streams.

There are populations of Mule Deer (Odecolius hemionus) in the Hemp Creek--Murtle River Area. Moose (Alces alces andersoni) are extensive in the areas south of the Murtle River and west of the Clearwater River. In the Angus Horne Lake--Battle Mountain--Mica Mountain Areas, there are Mountain Caribou (Rangifer tarandus montanus) ranges.

There are small populations of Mountain Goat (Oreamnos americanus) and Grizzly Bear (Ursus aretus horribilis) in the northern regions of the park.

Black bears (Ursus americanus cinnamomun) range throughout the park. Also present in suitable habitat are smaller animals such as Pika (Ochotona princeps saturatus), Marmot (Marmota caligata oxytona), Weasel (Mustela erminea richarsoni and Mustela frenata oribasus), Fishers (Martes pennanti columbiana), Marten (Martes americana abietinoides), Mink (Mustela vison energumenos), Wolverine (Gulo luscus luscus) and Beaver (Castor canadensis sagittatus). A small population of Timber Wolves (Canis lupus columbianus) are resident to the park all year.[1]

Wells Grey Provincial Park is suitable for a wolf interpretive program because of the already established resident population of wolves (13-14 animals)[2] and because of the diversity and availability of prey species. These include moose (main prey species), beaver, occasionally deer, and caribou when present. This abundance of prey helps to keep the wolves restricted to the park.[3]

The main ranges of the wolf packs are close to the park headquarters (Hemp Creek) and to the principal, established interpretive area (Ray Farm). The wolves are therefore accessible for such interpretive programs as "Wolf Howls" and on-site exhibits or interpretive trails.

[1] B.C. Parks Branch Brochure--Wells Grey Provincial Park.
Personal Correspondence from R. Ritcey, Wildlife Biologist--Fish and Wildlife, Kamloops.
Cowan, I. Mt. 1973. Mammals of British Columbia. British Columbia Provincial Museum. 414p.

[2] Ritcey, R.--personal correspondence.

[3] Ritcey, R.--personnl correspondence.
Semenick, K.--personal correspondence.

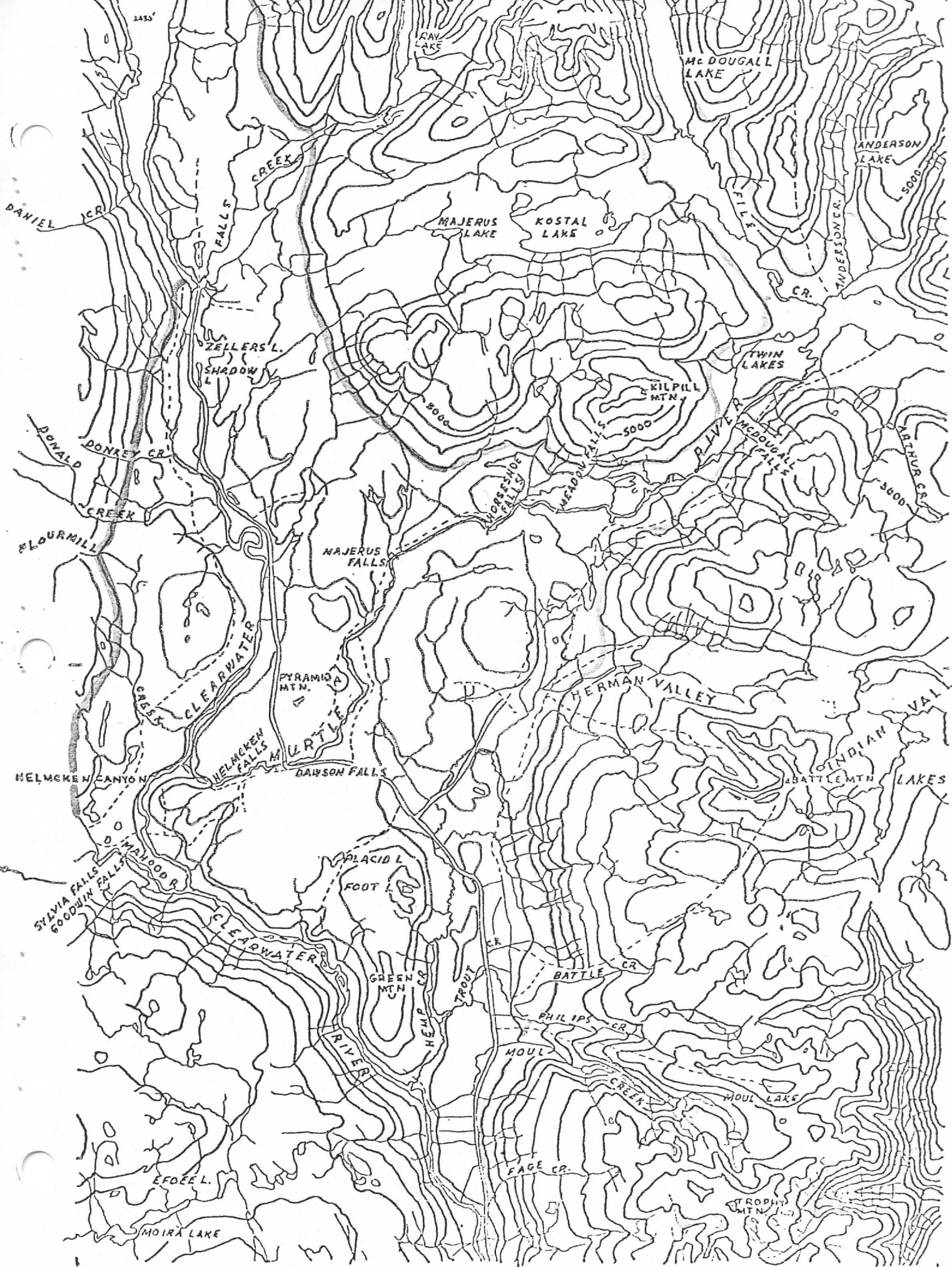

RAY LAKE
McDOUGALL LAKE
ANDERSON LAKE
5000
DANIEL CR.
FALLS CREEK
MAJERUS LAKE
KOSTAL LAKE
FILLE
ANDERSON CR.
ZELLERS L.
SHADOW L.
TWIN LAKES
KILPILL MTN.
5000
RIVER
McDOUGALL FALLS
ARTHUR CR.
5600
RONALD
DONKEY CR.
CREEK
FLOURMILL
HORSESHOE FALLS
MEADOW FALLS
MAJERUS FALLS
PYRAMID MTN.
CLEARWATER
CREEK
HERMAN VALLEY
INDIAN VALLEY
52°00'
MYRTLE
HELMCKEN CANYON
HELMCKEN FALLS
DAWSON FALLS
BATTLE MTN
LAKES
MAHOOD R.
PLACID L.
FOOT
SYLVIA FALLS
GOODWIN FALLS
CLEARWATER
GREEN MTN.
HEMP CR.
TROUT CR.
BATTLE CR.
PHILIPS CR.
RIVER
MOUL
CREEK
MOUL LAKE
EFOEE L.
FAGE CR.
TROPHY MTN.
MOIRA LAKE
15'
120°00'
45'

Figure 1. Approximate ranges of Wolf packs in Wells Grey Provincial Park

MANAGEMENT AND HABITAT OF WOLVES

Wolf Population Density in Wells Grey Park

There are two wolf packs resident to Wells Grey Provincial Park (figure 1). One pack's range is on the lower Murtle River between the Clearwater River and Murtle Lake and numbers 5 or 6 animals. The other pack's range is along the Clearwater River, south from Clearwater Lake. This pack is comprised of approximately seven animals. The ranges of these packs may overlap or combine, especially during the winter.

Bordering the park, there are three packs, the Raft River Pack (2 adults-3 young) is located on the upper Raft River Watershed and may extend into the Stephens Lakes area of the park (figure 2). The Mahood Lake Pack (6 or 8 adults) generally ranges along the southern shore of Mahood Lake but may reach into the park and mix with the other packs during winter. Thirdly, there is the Quesnel Lake Pack which may also range into the park in the northwest Hobson Lake Area.[4] (figure 3).

Wolf Predation in Wells Grey Park

Wolves in Wells Grey Park feed mainly on moose and beaver but will also take mule deer and caribou if available. There are also records of them feeding on rabbits, ducks and snakes, but these are incidental and of minor importance in the diet.

[4]Population statistics and ranges are provided by R. Ritcey, Fish and Wildlife Biologist, Kamloops.

Photograph 2. A herd of moose.

Figure 2. Range of Raft River Pack

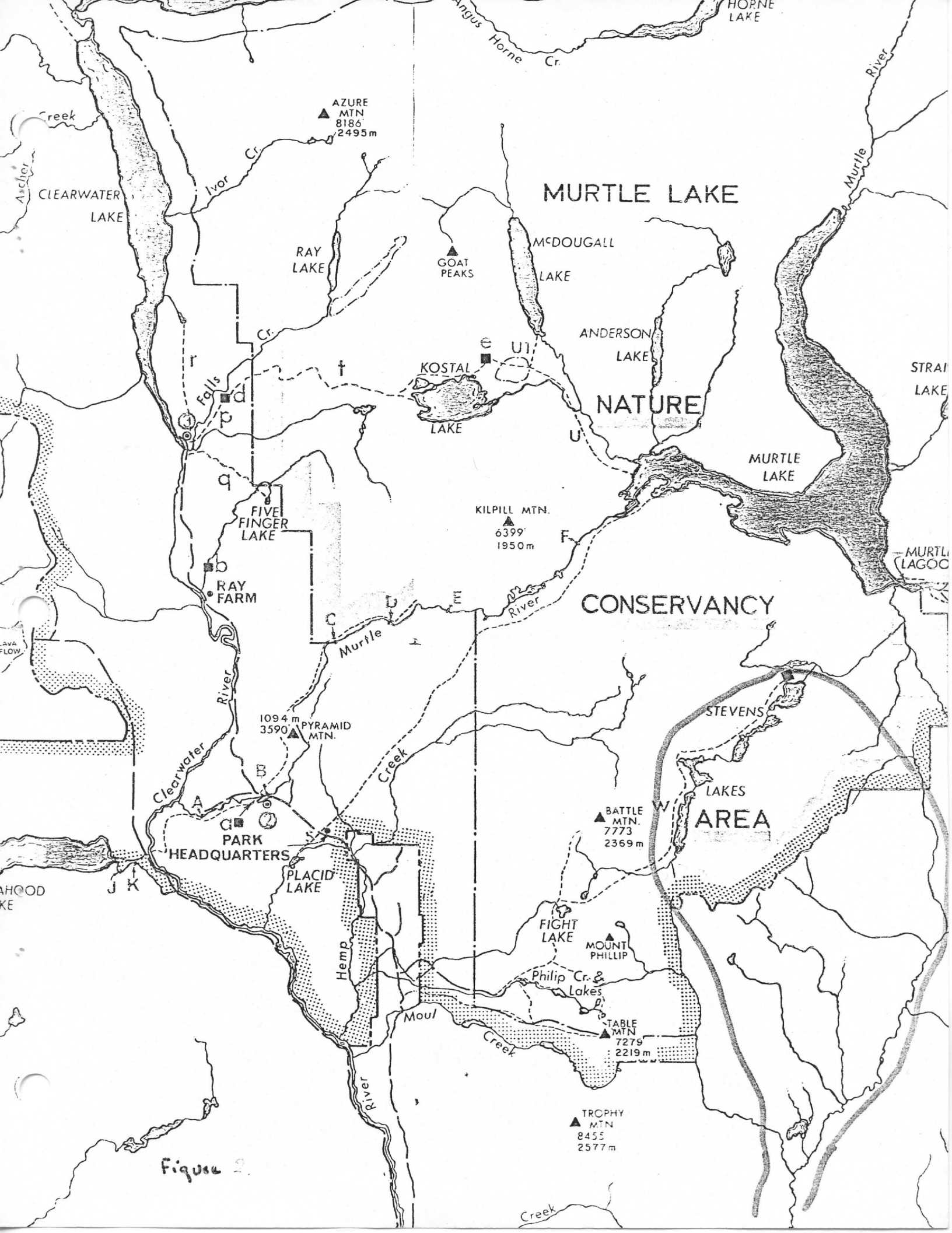

HORNE LAKE
Angus Horne Cr.
River
Murtle
AZURE MTN 8186 2495m
Creek
Archer
Ivor Cr.
CLEARWATER LAKE
MURTLE LAKE
RAY LAKE
GOAT PEAKS
McDOUGALL LAKE
ANDERSON LAKE
Cr.
KOSTAL LAKE
NATURE
MURTLE LAKE
Falls
FIVE FINGER LAKE
KILPILL MTN. 6399 1950m
RAY FARM
CONSERVANCY
River
Murtle
Clearwater River
1094m 3590 PYRAMID MTN.
Creek
STEVENS LAKES AREA
BATTLE MTN. 7773 2369m
PARK HEADQUARTERS
PLACID LAKE
FIGHT LAKE
MOUNT PHILLIP
Hemp
Philip Cr. & Lakes
Moul
Creek
TABLE MTN 7279 2219m
River
TROPHY MTN 8455 2577m
Creek

Figure 2

Wolf populations have in the past caused few problems to ranchers living adjacent to the park. In 1974, wolves stayed near a couple carcasses (cattle) that died of "feeding problems". A number of the wolves did not leave for their normal summer range that year. These wolves killed or badly injured 15-30 cows and calves before one of the wolves was shot, subsequently leading to the end of the killing. The ranchers did not suffer losses in1975 but wolves have reappeared around the calving areas and there has been some pressure for the poisoning of wolves from the ranchers as a result.

There has been no evidence of wolves adversely affecting big game populations in the park.[5]

Present Management of Wolves

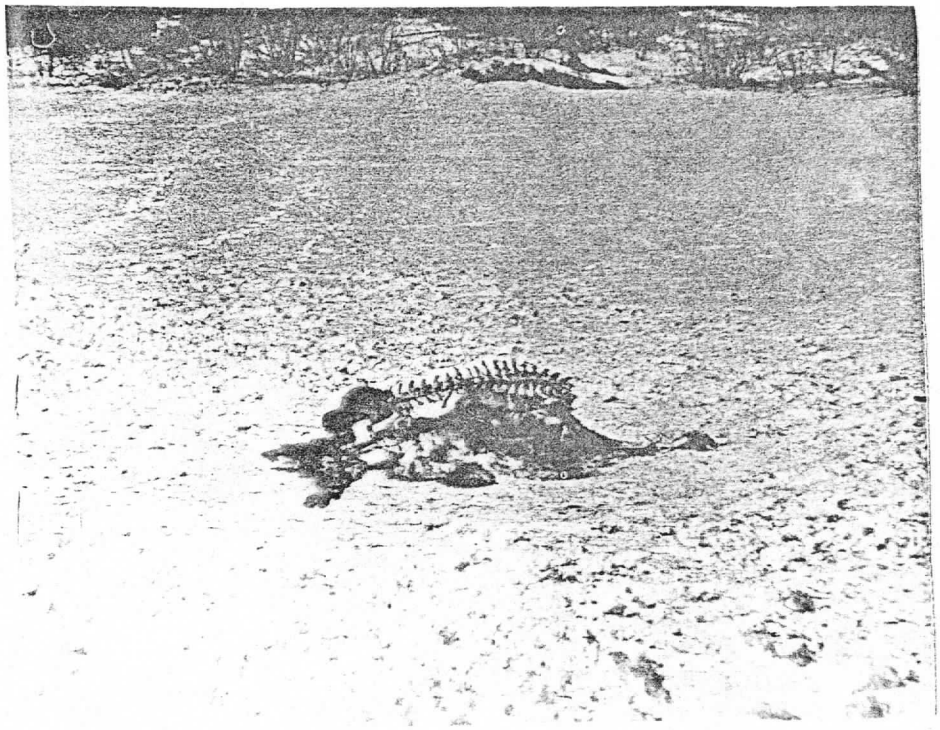
The wolf in British Columbia is managed as a Big Game Animal and not as a Furbearer. Hunting is possible with a valid liscence. Seasonal and bag limits may vary with local population trends. Trapping of wolves is illegal, although a few special permits to trap wolves are issued in management units where recent increases in wolf populations have resulted in substantial livestock losses.[6] These permits are difficult to obtain and are under strict control.

[5] Ritcey, R.--personal correspondence.

[6] Tampa, F.1975. Letter to J. Theberge.

Photograph 3. Deer carcass on lake

Photograph 4. Deer in moderately deep snow



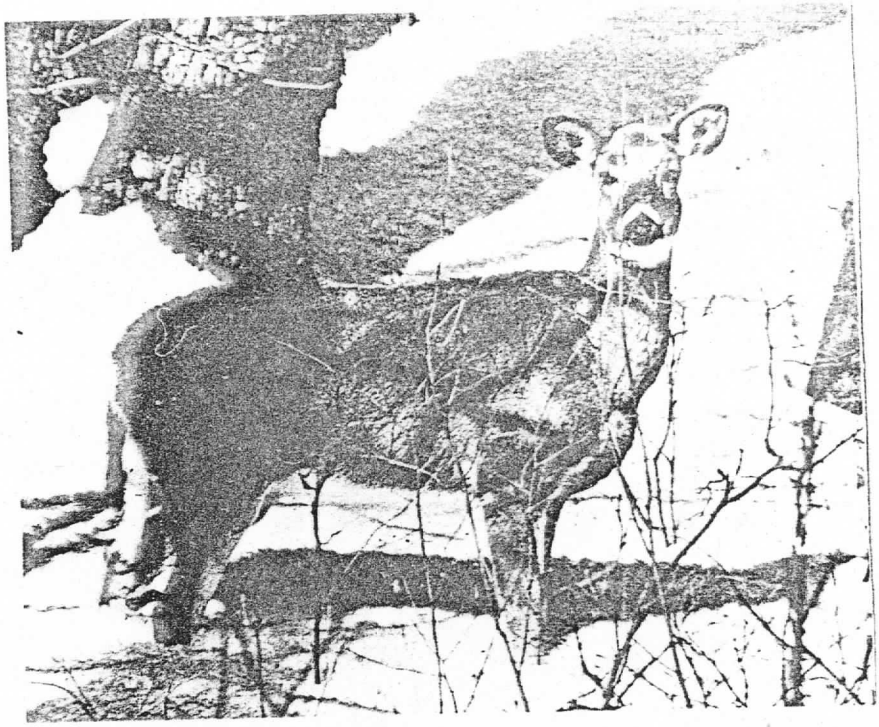


Figure 3. Range of the Quesnel Lake Pack.


Clearwater River
QUESNEL LAKE
HOBSON LAKE
9280
2829m
DUTCHMAN MTN.
7794'
2376m
ISOSCELES PK.
7973'
2430m
Goat Creek
MT. HUNTLEY
7968
BUCHANAN PI
AZURE

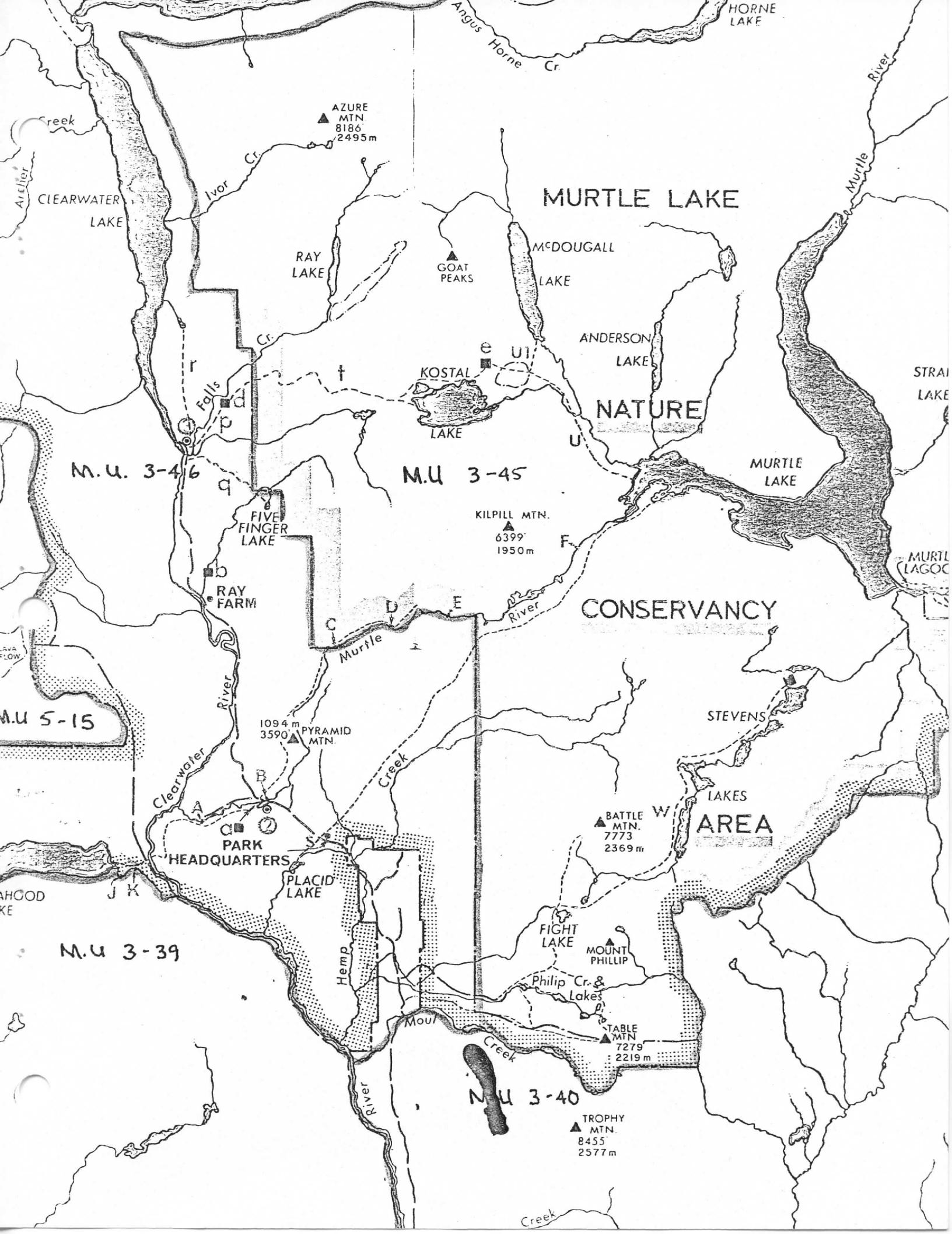
Wells Grey Provincial Park is composed of British Columbia Fish and Wildlife Branch Units 3-45 and 3-46[7] (figure 4). There has been no season for wolves in the area since 1974. This was due to low hunter harvests in the area[8]. In the adjoining Management Units 3-40 and 3-44 (to the east of the park), there is a season from November first to February twenty-eight (twenty-nine) (bag limit, one wolf) and in Management Units 3-39, 5-1 (south of park), 5-15 (west of park) and 7-2 and 7-4 (north of the park), there is an open season from April first to March thirty-first with a bag limit of three wolves.

There has been no management of wolves or wolf populations in Wells Grey Provincial Park. Wolf populations have tended to parallel the rise and decline of the moose population. However, during the late 1940's there was a heavy poisoning campaign which reduced the wolf population from a peak of about 30 wolves in 1948 to between 14-17 in 1954. Their numbers have since declined and the average wintering population is now only close to 10 wolves (figure 5).

Up to the present time there has been no research on wolf populations, wolf habitat, or predator-prey relationships in Wells Grey Provincial Park. Owing to this, there should be an inventory of wolf range and habitat done in conjuction with the British Columbia Fish and Wildlife Branch.

[7]British Columbia Hunting Regulations, 1975. Fish and Wildlife Dep't.
[8]Ritcey, R., 1976. Letter to R. Silver.

Figure 4. Boundary of Fish and Wildlife Management Units in study area


HORNE LAKE
Angus Horne Cr.
AZURE MTN 8186 2495m
Ivor Cr.
CLEARWATER LAKE
RAY LAKE
GOAT PEAKS
MURTLE LAKE
McDOUGALL LAKE
ANDERSON LAKE
KOSTAL LAKE
NATURE CONSERVANCY
MURTLE LAKE
M.U. 3-46
M.U 3-45
FIVE FINGER LAKE
KILPILL MTN. 6399 1950m
RAY FARM
Murtle River
M.U 5-15
1094m 3590' PYRAMID MTN.
Clearwater River
Creek
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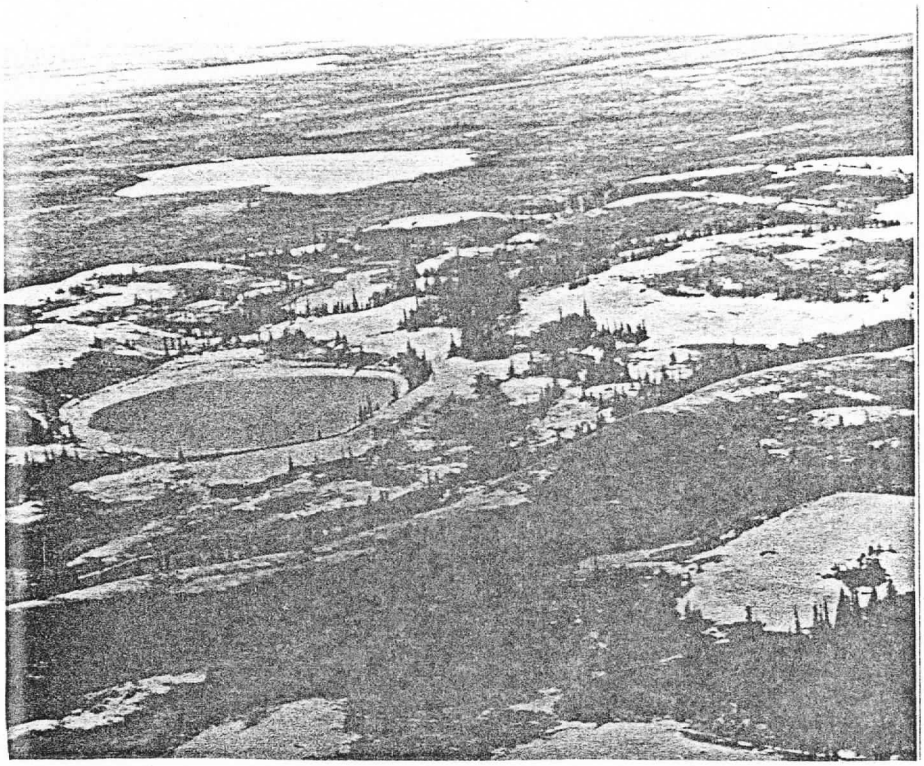
PARK HEADQUARTERS
PLACID LAKE
FIGHT LAKE
MOUNT PHILLIP
Philip Cr. & Lakes
Hemp
Moul
TABLE MTN 7279 2219m
Creek
River
M.U 3-40
TROPHY MTN. 8455 2577m
M.U 3-39
Creek

Photograph 5. Typical northern wolf habitat

Photograph 6. Typical vegetation in wolf habitat



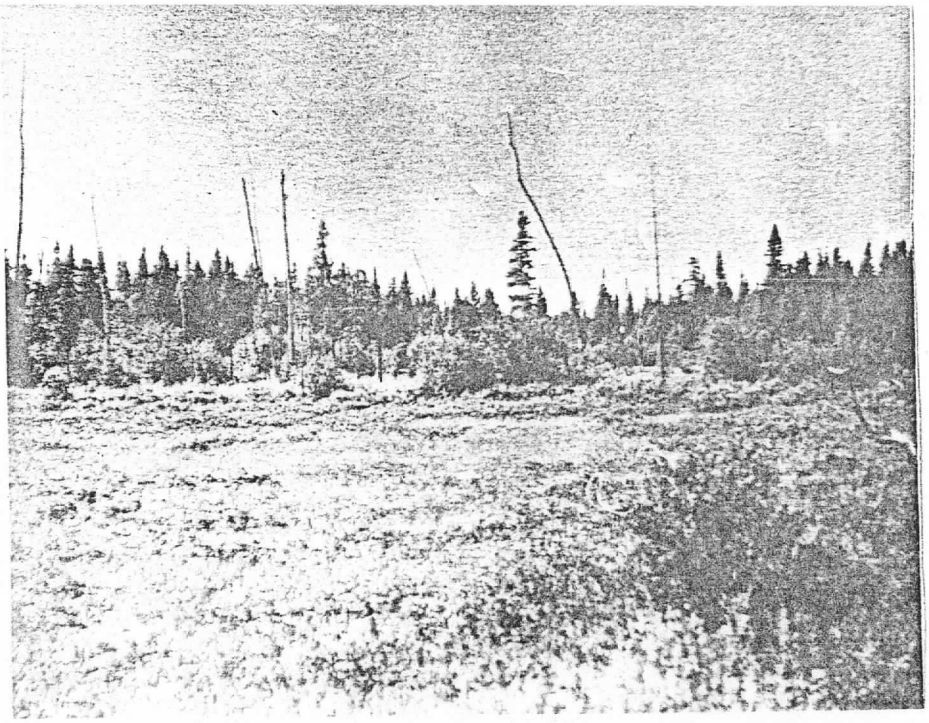
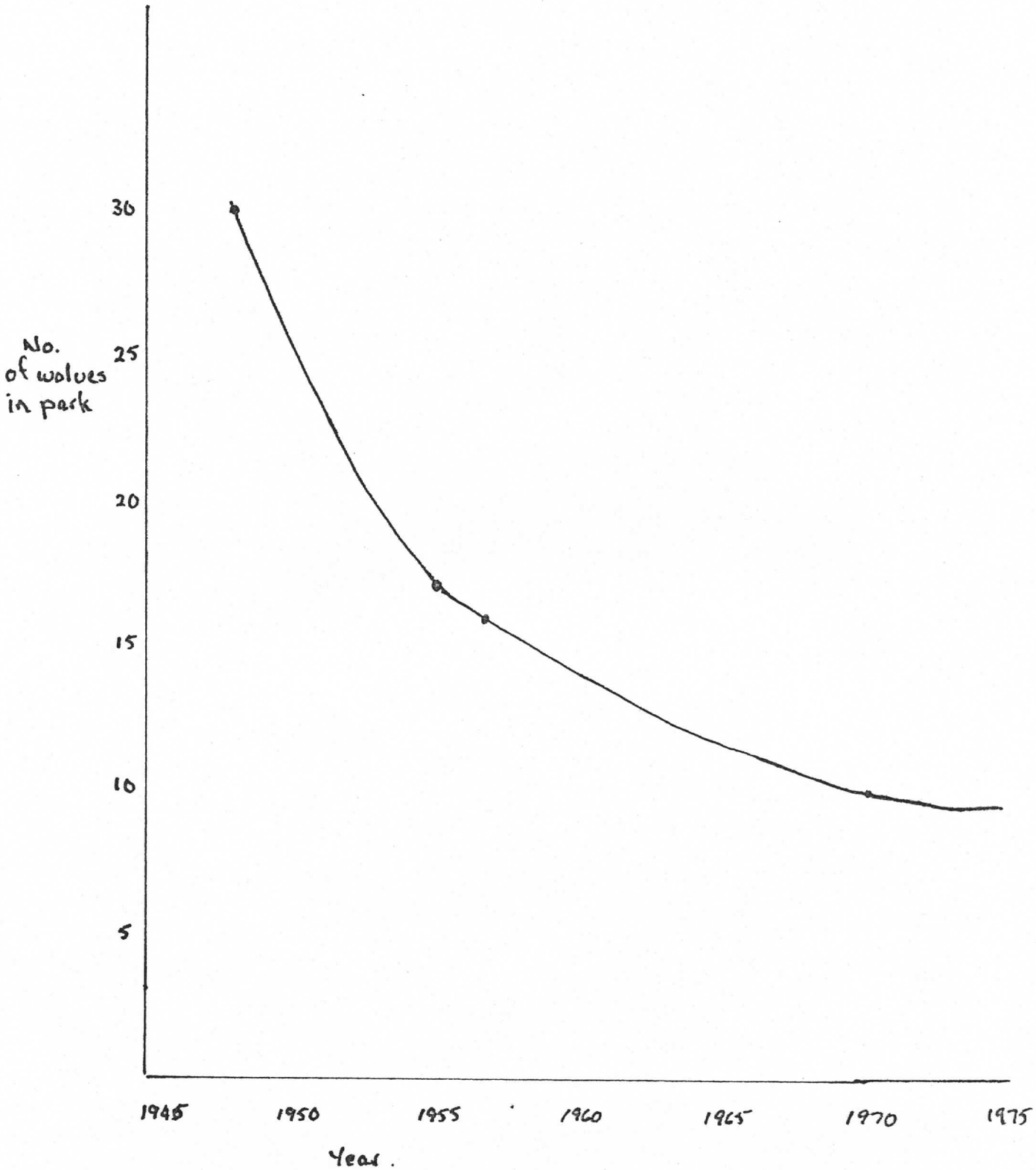


Figure 5. Winter population estimates of Wolves 1948 to present


No. of wolves in park
30
25
20
15
10
5
1945
1950
1955
1960
1965
1970
1975
Year.

Wolf Habitat in Wells Grey Park

The range of the two resident wolf packs in Wells Grey Park is closely related to the ranges of moose and beaver (the principle prey species) in the park. The area consists of the flats south of Falls Creek, roughly following the Murtle Lake Conservancy Area boundary to Moul Creek, then west along Moul Creek to the Clearwater River, along the Clearwater River to Mahood River and Mahood Lake and then north to Clearwater Lake (figure 6)[9].

There are many small lakes and streams in this area. The region was burned in the late 1940's and the habitat is easily comparable to the conditions existing at Isle Royale National Park in Michigan, U.S.A. This park was subject to heavy burns during the late 1930's and because of this moose populations in the area increased substantially causing severe over browsing of the park. During the period from 1948-50 a wolf pack moved onto the island coming across Lake Superior on the ice from Ontario. Careful studies of the developing relationships between moose and wolves have been conducted[10]. Isle Royale National Park has therefore been the site of the most intensive wolf studies in North America.

Conditions for wolves in Wells Grey Provincial Park should therefore afford similar conditions as those existing at Isle Royale National Park. In Wells Grey Park wolf populations seem to be

[9] This area corresponds to the Limited Entry Hunting--Moose Area, (M.U. 3-46).

[10] Wildlife Review, 1975. Vol. 5. No. 5.

Photograph 7. Female wolf feeding pup.

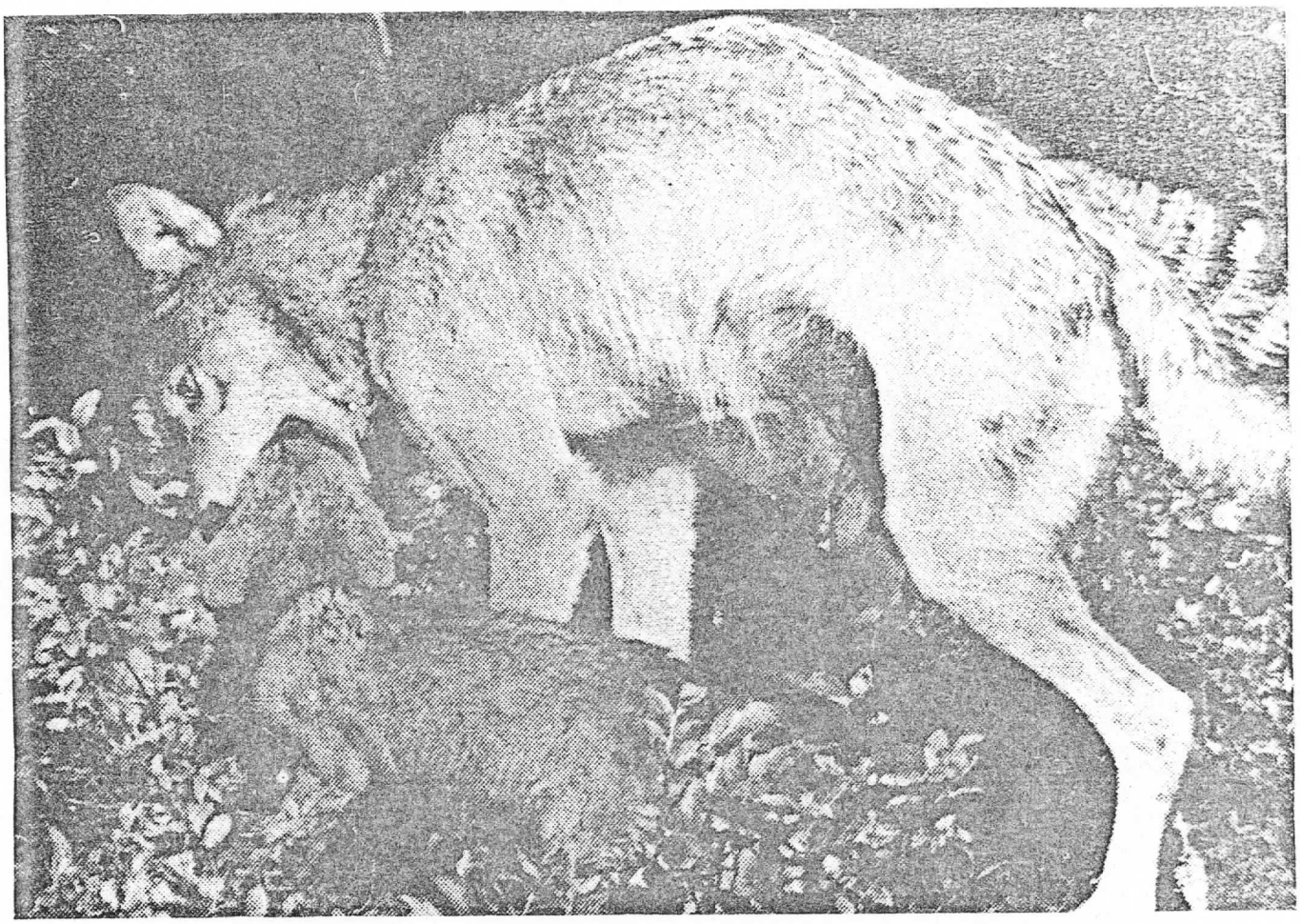
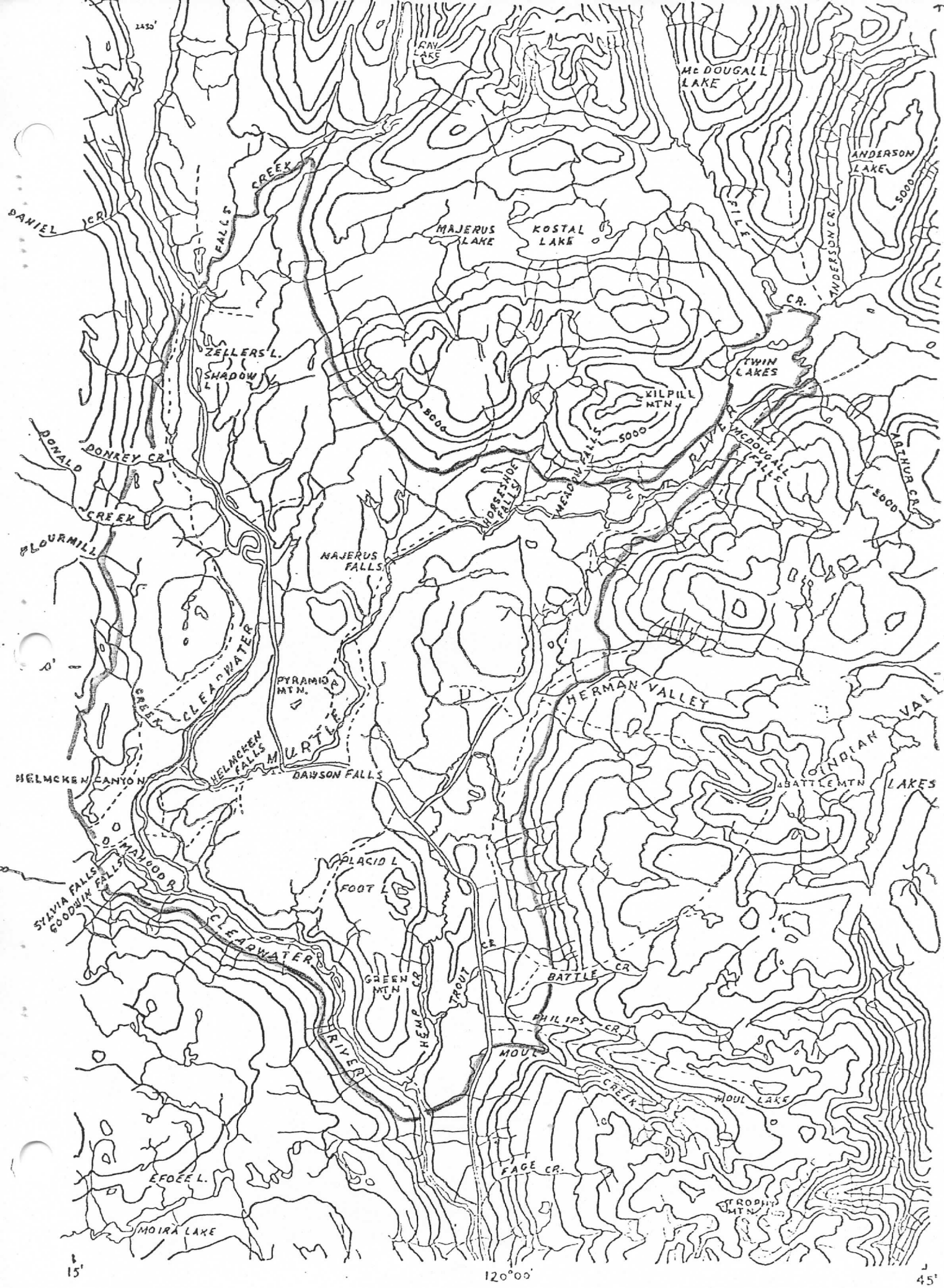


Figure 6. Moose range in Wells Grey Provincial Park


RAY LAKE
McDOUGALL LAKE
ANDERSON LAKE
5000
DANIEL CR.
FALLS CREEK
MAJERUS LAKE
KOSTAL LAKE
FILLY
ANDERSON CR.
CR.
ZELLERS L.
SHADOW L.
TWIN LAKES
KILPILL MTN.
8000
5000
DONALD
DONREY CR.
CREEK
McDOUGALL FALLS
ARTHUR CR.
5000
FLOURMILL
HORSESHOE FALLS
MEADOW FALLS
MAJERUS FALLS
CLEARWATER
CREEK
PYRAMID MTN.
MURTLE
HERMAN VALLEY
INDIAN VALLEY
HELMCKEN CANYON
HELMCKEN FALLS
DAWSON FALLS
BATTLE MTN
LAKES
PLACID L.
FOOT L.
SYLVIA FALLS
GOODWIN FALLS
CLEARWATER
GREEN MTN.
HEMP CR.
TROUT CR.
BATTLE CR.
PHILIPS CR.
MOUL
RIVER
CREEK
MOUL LAKE
FAGE CR.
EFOEE L.
TROPHY MTN.
MOIRA LAKE
15'
120°00'
45'

stabilized at a winter level of 10 animals (in two packs) with major predation on moose and beaver, with mule deer taken occasionally[11]. Wolves in Wells Grey Park may have some controlling effect on moose population, however, most recent studies of wolves seem to indicate that wolf predation does not play an important role in ungulate population control except when the ratio of wolves to ungulates exceeds 1:100[12].

There is relatively little detailed information on the ranges and movements of wolves during summer and winter. There are several reasons for this, in addition to the secretive behavior of wolves, the denseness of forest vegetation in wolf ranges makes direct observations difficult. In winter the problem is reduced somewhat, but even then following a pack from day to day is difficult, for wolves frequently resort to heavy coniferous cover where they cannot be seen--even from the air. Identification of specific groups is based on the number of individuals in the pack, the area in which they occur, and their apparent familiarity with their surroundings.

Uses of Range in Summer

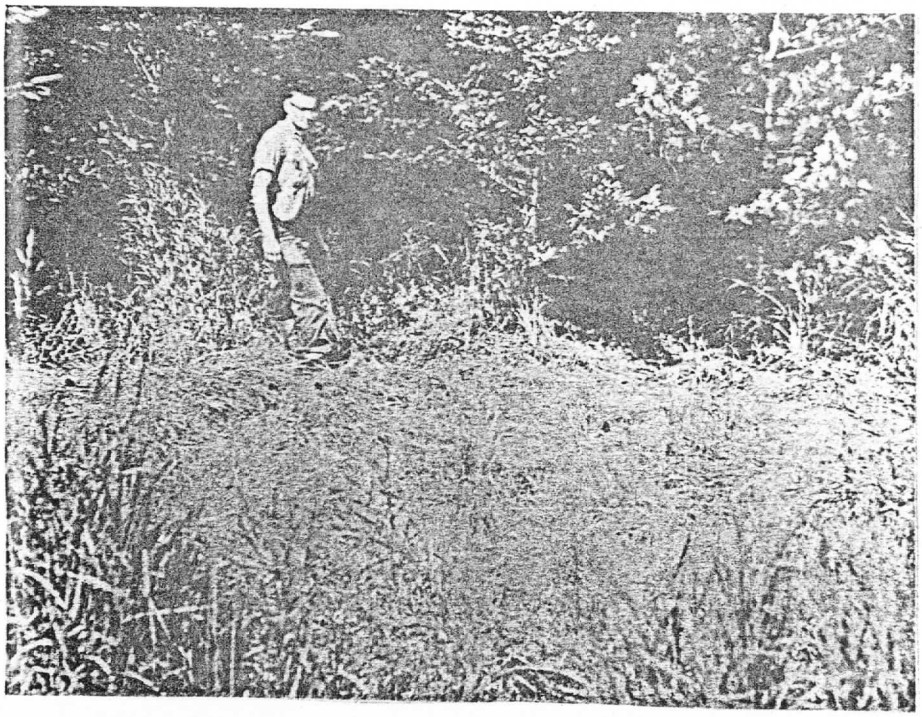
Pack members tend to associate more loosely during the summer than in the winter. Wolves may leave the den site singly, in pairs or altogether. During the summer, ranges tend to be more restricted

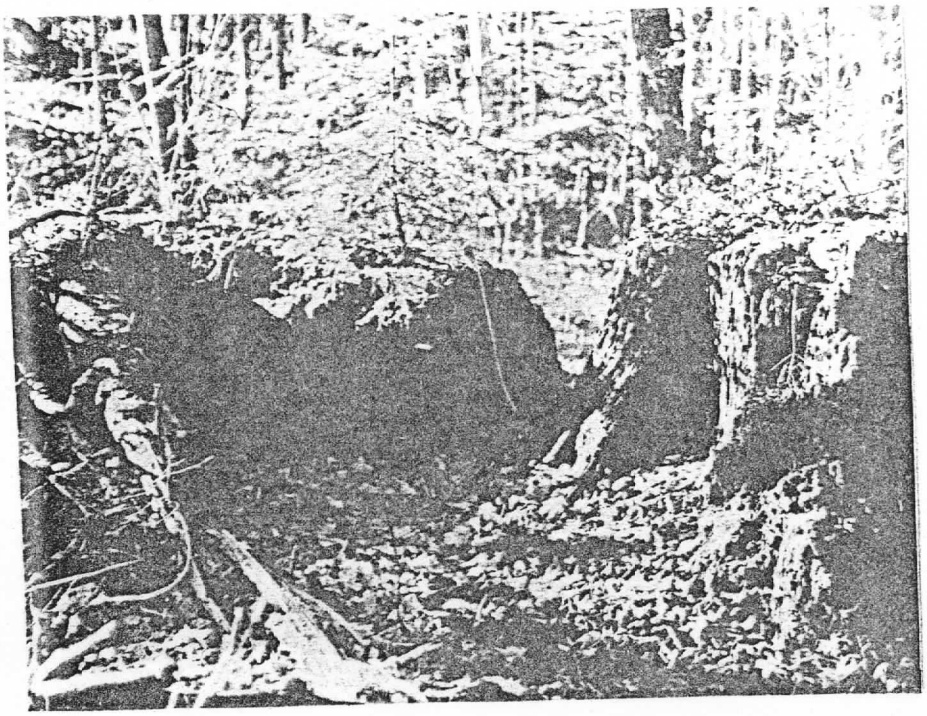
[11] Wolf scat analysis showed that wolves were living almost entirely on moose and beaver. Beaver were a minor food source taken mostly during the warm season--R. Ritcey.

[12] Pimlott, D.H., 1969. The Ecology of the Timber Wolf in Algonquin Park, 92p.

Photograph 8. Rendezvous site

Photograph 9. Den site





than during the fall and winter. Population studies[13] indicated that packs remain in fairly discreet areas and rarely did howling responses of packs cause much problem in interpretation. This would not have been the case if packs had been moving long distances from the den to hunt. Studies using animals tagged with radio collars have also tended to indicate that summer ranges are relatively small.

Wolves tend to use a variety of sites such as rock crevices, hollow fallen trees, overturned trees or excavations at the base of trees and in outwash sands as dens. Wolves may appropriate dens originally excavated by other species(coyotes, foxes) or may excavate the dens themselves.

The use of howls to locate den sites has been effectively used in Algonquin Park, however, some studies point out that wolves do not howl while pups are in the den and this method may not be effective under all conditions.

The use of "rendevous" to indicate the place to which the pups are moved after an initial period at the den, was introduced by Murie (1944). The use of rendevous sites appears to be a consistant part of wolf behavior in North America.

Rendevous sites are characterized by having considerable areas of vegetation flattened down. Joslin (1966) called these "activity areas" and presumed that they had been made by the activity of pups.

[13]Joslin, P., 1966. Summer activities of two timber wolf packs in Algonquin Park, 93p.

Rendevous areas are usually associated with openings in the forest and are near water. A system of trails is usually evident around the site. Beds almost always occur within the site but close to the edge of the adjacent forest. Occupancy at these sites may vary from 6 to 30 days[14].

Uses of Range in Winter

The two wolf packs in Wells Grey Provincial Park may join during the winter. Larger packs may have greater success in bringing down large prey such as moose. Previous research has indicated that optimum pack size is around 10 animals. This is considered to be the average winter population in Wells Grey.

Wolves are animals which have the capacity to travel long distances in short periods of time. They often appear to travel for the sake of travelling. Mech[15] has suggested that much of the travelling is necessary and that it's function may be to permit the pack to locate prey which are susceptible to predators[16]. The apparent restriction of movement during the summer could be partly due to the availability of immature animals or smaller prey, such as beaver, which do not pose any danger to the wolves.

For many years the belief existed that wolves consistently travelled over circuitous routes at regular intervals.

[14]Joslin, P., 1966.
[15]Mech, L.D., 1966. The Wolves of Isle Royale. 210p.
[16]Wolves may test up to twenty animals before one is attacked.

Detailed studies[17] have revealed that the travel patterns appear to be primarily influenced by the availability of prey and by the presence of topographical features such as lakes, streams, hills, trails, roads etc. which may guide their movements or permit them to cover their range readily. Circuitous movements may occur predictable regularity. Quite frequently a pack that travels a water course in one direction will simply reverse its direction and end up back at it's starting point.

[17] Stenlund, M.H.,1955. A field study of the timber wolf on the Superior National Forest.45p.
Mech,L.D.,1966.

PROPOSAL FOR A WOLF INTERPRETIVE PROGRAM AT WELLS GREY PROVINCIAL PARK

The interpretive program proposed in this report is designed primarily for the visitor to Wells Grey Provincial Park. The majority of the visitors to the park come either to fish or to look at the many waterfalls in the park[13]. An interpretive program should therefore help to make the visitor aware of the presence of wolves in the park and introduce the visitor to the ecology of wolves in the area.

Naturalists, however, should be able to expand on the basic program so as to assist the visitor with more than a casual interest in wolves.

Interpretive programs should be kept non-technical and deal mainly with the social habits of wolves such as den life, pups, etc. to involve the lay audience. The program should not include large expenses for equipment or buildings, the main emphasis being evening talks and slide shows by the naturalist.

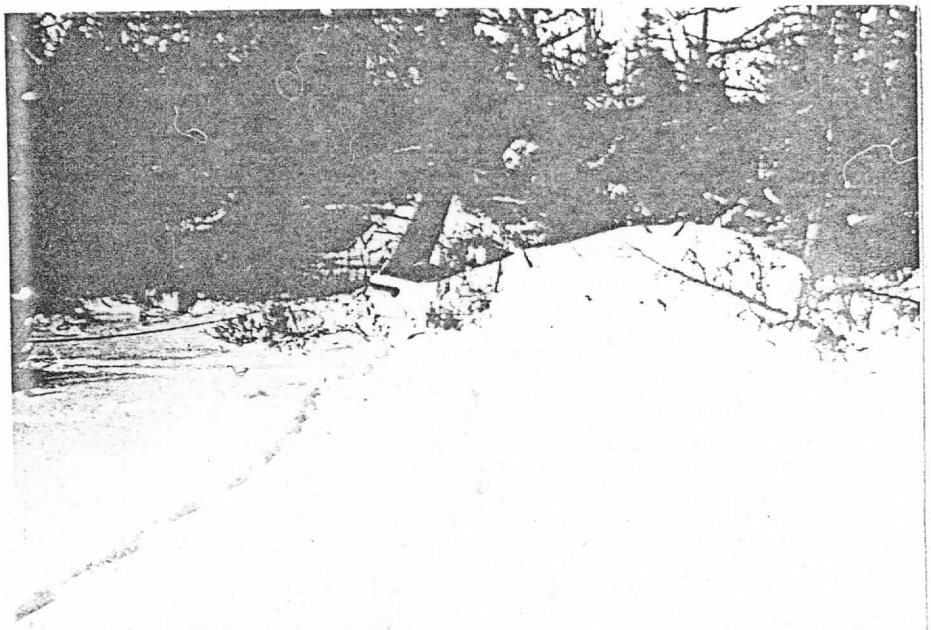
This type of program could eventually be expanded during the winter as part of the educational experience in local schools and providing information and entertainment to naturalist groups and wildlife associations.

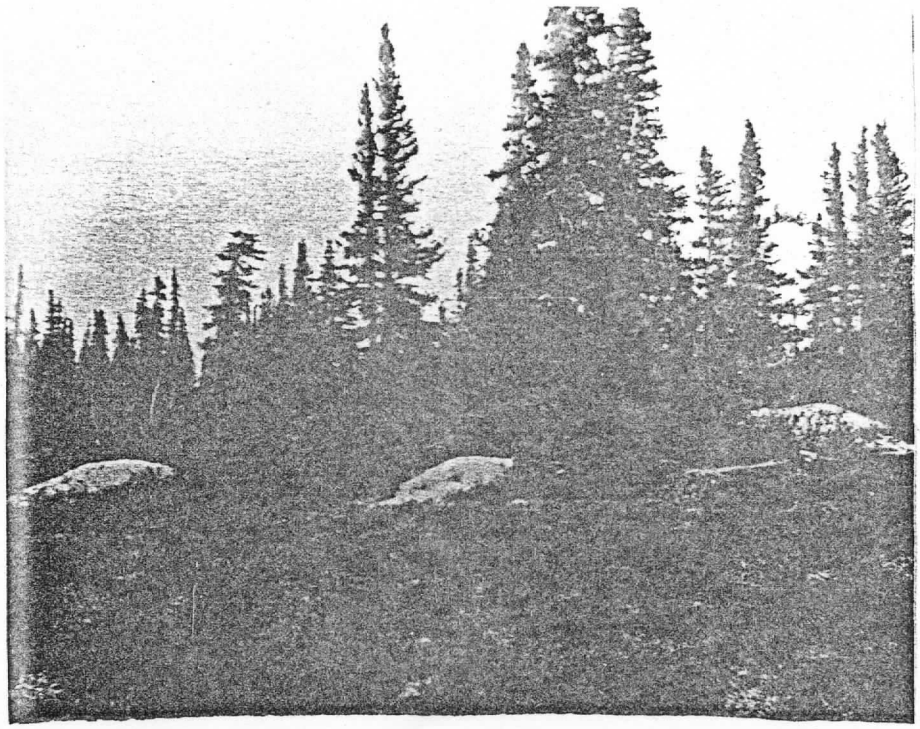
Essentially, it is hoped that such a program will better acquaint the visitor with the ecology of the wolf. The visitor should become interested through personal experience and curiosity,( hearing wolf howls at night, seeing wolf tracks or the site of an old kill).

[13]Wells Grey Provincial Park Brochure
B.C. Provincial Research Reports. Wells Grey Visitor Use Study.

Photograph 10. Wolf tracks in snow

Photograph 11. Den site





The major themes of the program should include the ecology of the Timber Wolf in Wells Grey Park, relation of the wolf to his habitat and the animals on which he preys. It should explain;

a) how the wolf fits in relation to the animals it uses for food.

b) how natural predation helps to improve the prey species by weeding out the old and sick animals and by reducing the number of young which helps to keep down the populations using their winter range.

The program should document the social behavior of wolves, their relations to young pups, to the members of the pack and to other packs. Secondly, the program should focus on man's interaction and involvement with the wolf and how under certain conditions (natural prey being wiped out, overgrazing of marginal land etc.) wolves prey upon domestic livestock, and how "man controls" wolves[19].

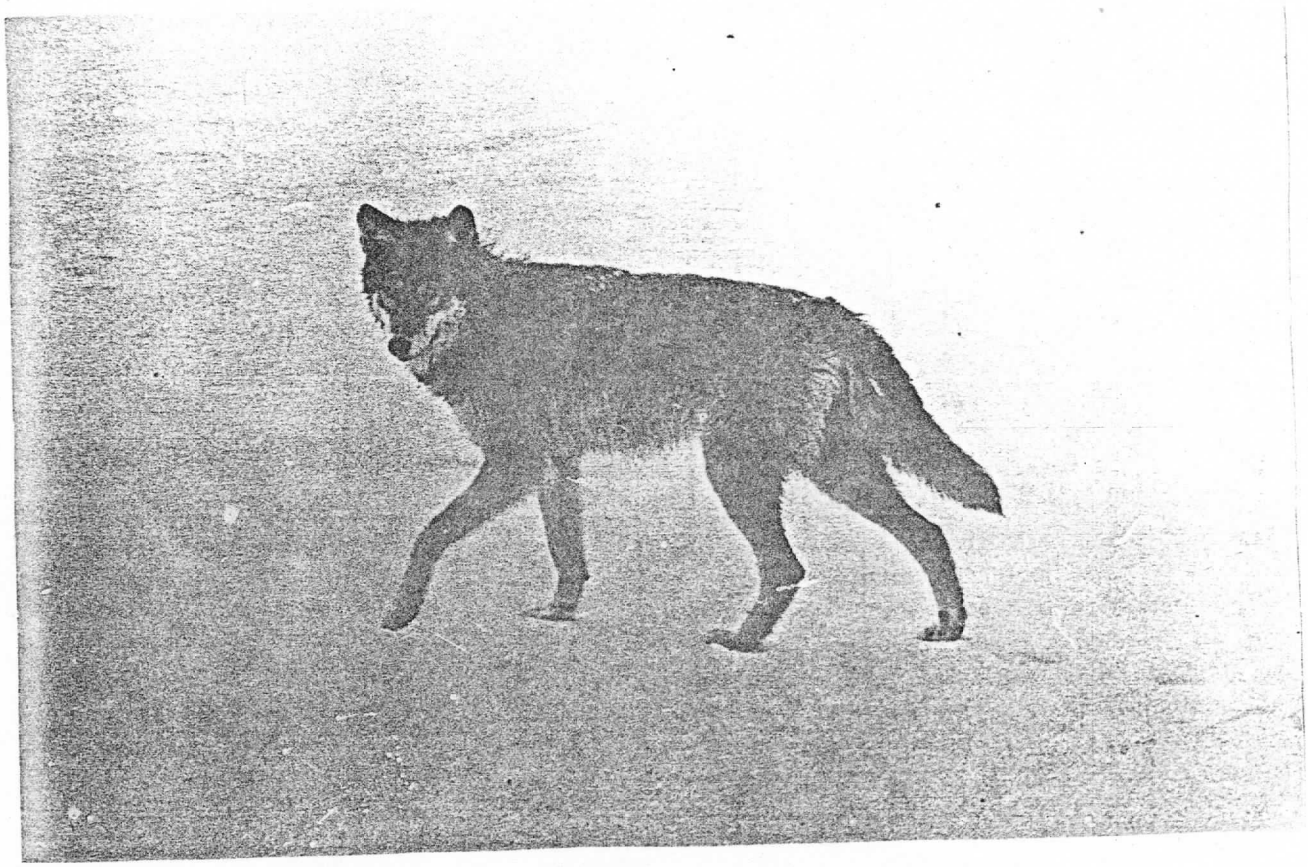
The proposed interpretive program would be largely based on audio-visual displays (slide shows and movies) shown during evening campsite talks, "Howl Programs", and a few on-site exhibits.

Slide shows should be prepared by the naturalist from field observations of wolves in the park as well as material from outside sources (such as the Ontario Department of Natural Resources--Algonquin Park, British Columbia Fish and Wildlife and Parks Canada). Movies such as, "Cry of the Wild" or "Death of a Legend" could also be incorporated into the evening campsite programs.

These talks and slide shows should provide the starting point

[19] I.U.C.N. Bulletin, 1974. Vol. 5. No. 5.--Manifesto on Wolf Conservation--Education and Tourism.

Photograph 12. Timber wolf



for those visitors who are more interested in the wolves as well as satisfying the curiosity of those visitors less involved.

It may be possible for the park naturalist to obtain a wolf pup to train and use in the program. This would reinforce the theme and content of the slide shows. Providing a live, gentle wolf in the actual program that could be seen and experienced would give more meaning to the presentation for a large portion of the audience.[20]

This idea does present a few problems. The wolf or wolves would always have to remain with the same person, thus the naturalist in charge of the program would have to be a full time employee. There may also be a problem of liability in case of an accident involving a park visitor or pet( if a visitors dog is wandering around and harassed the wolf). However, this is a very unlikely occurrence as it has been proven that tame wolves are very gentle and friendly and will remain tame throughout their life.[21]

The wolf could also be used during "Howl Programs". The presence of a live wolf would stimulate wild packs into responding more frequently than if recorded howls or human imitations were used. "Howl Programs" have been given successfully at Algonquin Provincial Park in Ontario as part of the interpretive program. "Howls have attracted up to 1000 people with over 600 cars on occassion.[22]

[20] Pimlott, D.H.--personal correspondence.

[21] Pimlott, D.H.--personal correspondence.
Theberge, J.B.--personal correspondence.
Crister, L., 1956. Arctic Wild--Harper Bros.

[22] Pimlott, D.H., 1960. Use of tape recorded wolf howls to locate timber wolves.7p.

Park visitors are taken to easily accessable locations within howling distances of wild wolf packs. These packs are stimulated into howling by recordings of wolf howls or imitations by the park naturalist and staff. The visitor is treated to the "unique psychological experience of hearing the howl of wolves in the wild.[23]

Wolf howls in Wells Grey Park would not be conducted on the same scale as those in Algonquin Park. Small groups, on foot, would be led by the naturalist to areas of easy access close to active den sites or "rendevous areas" and through the use of recordings[24] or by imitations of the naturalist or by actual howls of the "trained wolf" be subjected to the responce of the wild wolves.[25]

There is also the possibility of on-site exhibits such as denning sites or "rendevous areas" that have been located and are no longer used by the wolves in that region. Small signs could be placed at these areas explaining what they are and their role in the life of the wolf. These areas could also be used in nature walks through the area allowing a chance to more fully explain the life habits of the wolf.[26]

It may be found that during the inventory and research program of wolf habitat that there are one or more areas that the wolves frequent that are easily observable and to which the naturalist could take one or two people at a time to view the wolves intheir

[23] Pimlott, D.H.,1969. The ecology of the timber wolf in Algonquin Park.92p.

[24] Appendix B.--recorded wolf howls.

[25] Pimlott, D.H.--"We are using human howling more and more in the course of normal field work when it is not feasible to carrytaping equipment with us. The results suggest that any person undertaking timber wolf research should consider developing his ability to howl."

[26,27,28] Carbyn, L.N.,1967. Wolf Fluctuations in Jasper National Park.

Materials and Special Equipment

Materials for this program would include slide and movie projectors, tape recorders and amplifiers, photographic essentials and film for slides and prints.

The first priority in setting up the program will be to inventory and establish the boundaries of the pack ranges, to identify denning sites and "rendevous areas" and to gain information of pack movement throughout the region of the range of the "Howl Program". While this inventory is being carried on slides from other areas (Ontario Department of Natural Resources; Parks Canada etc.) could be used for campground talks. These slide shows should be supplemented by movies and by discussions of actual encounters with wolves within the park. After the inventory is completed ranges, "rendevous areas" and denning sites should be mapped.

Equipment for the "Howl" part of the program should consist of a portable lightweight taperecorder, an amplifier for increasing the range of the unit and a separate speaker unit (for example an Electrovoice CDP847 speaker). The Mohawk recorder is powered by either 16 or 40 hour dry cell batteries and the Audix amplifier can be powered by any 12 volt battery supply. The complete unit weighs approximately fifteen pounds.[29] It may also be possible for the naturalist to closely imitate wolf howls and eliminate the recorder

[29] Pimlott, D.H., 1960. The use of tape recorded howls to locate timber wolves.

Photograph 13. Wolf pups

Photograph 14. Ear tagged wolf pup

unit under prime conditions when wolves are very close to the howl sites.

Photographic equipment such as telephoto lenses etc. may be needed to supplement equipment owned by the naturalist. These may be rented by the Parks Branch. Most naturalists own their own basic camara equipment so photographic costs could be kept to a minimum keeping this in mind.

On-site exhibits will need very little in the way of materials. Small signs explaining the use of the areas by wolves should be placed at these sites. These signs should be as inconspicuous as possible and blend in with the natural environment.

One piece of very special equipment has been mentioned before--a wolf. Preferably, this wolf should be raised by the naturalist in charge of the program so as to ensure that the naturalist has full confidence in handling the animal and that the wolf has full confidence and trust in the naturalist.[30] It may be possible to obtain the wolf from a game farm or zoo rather than taking one from the den of a wild pack. Proper precautions should be observed in keeping the wolf away from visitors pets as they may harass the wolf leading to problems with certain types of park visitors.

[30] Pimlott, D.H. and R.J. Rutter, 1968. The World of the Wolf. 202p.

Implementation of Program

First Year

During the first year of the interpretive program the main work will be researching the habitat of the wolf in Wells Grey Park. An inventory of prey habitat should be included in this research program. Browse species and browse condition, moose and beaver populations should be established.

The actual ranges of the Clearwater River Pack and the Murtle River Pack should be identified. Denning sites and rendevous areas should be inventoried and mapped and movement patterns of the packs outlined. Old dens and rendevous areas should also be mapped for interpretive sites.

The relationship of the wolf to it's prey should be researched with regard as to whether wolf populations have any effect contolling prey species (specifically moose).

This research should be done in conjuction with the Fish and Wildlife Branch and could conceivably become a series of studies by graduate students and post doctorate researchers from the major universities.

During the initial research period the interpretive program in the park should be confined to evening slide-talk shows at the campsites using borrowed material from other areas and movies such as "Death of a Legend".

Naturalist staff, in the interim period, would be compiling related data and starting field work in preparing collections of slides and most importantly becoming aware and familiar with wolf habitat and conditions in Wells Grey Park.

The research program is not designed as a one year project but as a continuing study and could, in time, be used to help establish proper, pertinent management guidelines for wolf populations in British Columbia.

After a basic inventory has been completed the interpretive program could be expanded to include the wolf "howl" trips (after the locations of denning sites and pack movements have been recorded) and on-site exhibits. The commencement of this aspect of the program would be during the second or third season of operation.

"Wolf howls" could be initiated before movement inventories have been completed. The success of these programs, however, would be limited to chance encounters with wolves within range of the howl site.

After the program has been operating with some regularity, persons engaged in the research areas could be invited to deliver special programs throughout the season providing an added dimension to the interpretive format. Although the introduction of a tame wolf may be considered at any time the best results would be to wait until all initial problems have been solved.

Photograph 15. Wolf pups

Expanding the program outside of the park should also be delayed until such time as (at least 2 years) the program has been polished and refined and the naturalist is familiar and at ease with his subject.

Manpower Requirements

The interpretive program could be run by one naturalist, this should be a permanent position so that the naturalist will be in a position to assimilate the information obtained from the research team into the format of the presentation. Once the program has been in operation a considerable length of time, a seasonal naturalist should be hired to help with the "Wolf Howl" program and nature walks. Both these naturalists would share responsibility in all areas of interpretation in Wells Grey Park.

The requirements of the research program depend on what research is actually being done at any particular time. At the beginning of the program field research could be done by a group of about three or four persons. This could be expanded or reduced depending on the project or the time of year or work load.

Budgeting

Funding for the research portion of the project could come from national research organizations, international conservation groups such as the I.U.C.N.[31], the Federal Government, from university research grants for graduate and postgraduate studies and from the

[31] International Union for Conservation of Nature and Natural Resources.

provincial government through the Fish and Wildlife Branch.

Most, if not all the money, needed for personnel should come from universities and research grants. Necessary equipment for inventory would be supplied by the university engaged in the research.

For the interpretive program expenses should be kept at a minimum. Capital costs for the program would be for essential items such as a slide projector, movie projector, tape recorder, amplifier and speakers for the "howl" program and costs of film. The total costs for these items are estimated at approximately $3000.00.

Signs for site locations should cost no more than $1000.00. Thus the total capital expenditure could conceivably be more than $4000.00. Copies of the moviies previously mentioned can be obtained from the National Film Board. Other costs include the rental of supplemental photo equipment, $500.00/yr. for the first 2 years).

Salary to the naturalist (in keeping with current wage trends) would most probably circulate near the $12,000.00 per year mark.

## CONCLUSIONS AND RECOMMENDATIONS

This report deals with the planning and method of presentation of an interpretive program for wolves in Wells Grey Provincial Park. It has shown that there is a demand for such a program in the Provincial Parks system by citing examples of results of other such programs in other parts of Canada (Algonquin Park). The report indicates that it is not necessary for large capital expenditures in setting up the program and that the on-going program can operate on a small budget.

Before any major interpretive program can be established it would be imperative to carry out an inventory of habitat and range of wolves within the park. This is important in establishing on-site interpretive areas and gaining knowledge of approximate locations of wolf packs in order to conduct "howl" programs.

Although the program has been developed and designed for Wells Grey Park in particular, with proper modifications it could, where feasible, be assimilated for use in any park in British Columbia.

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Appendix A

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Wells Grey Visitor Use Study

Four surveys were carried out in Wells Grey Provincial Park during the summer of 1974. Two of these surveys sought information about campers while the other two gathered separate information on boaters and hikers. The surveys provided visitor profiles for campers, boaters and hikers, established behavior patterns for each and determined their attitudes toward the park.

The majority of all three types of users were from British Columbia. Camping is a family activity while the hiker and boater groups attract a majority of males. For campers, sightseeing is the most popular activity. Scenery is the parks biggest attraction and the park meets the expectations of most. Hikers would like to see more trails and the majority of boaters return to use the park year after year.

Appendix B - THE USE OF TAPE-RECORDED WOLF HOWLS TO LOCATE TIMBER WOLVES*

by

Douglas H. Pimlott
Department of Zoology
University of Toronto

The innate wariness of timber wolves (Canis lupus) and coyotes (Canis latrans) combined with the relatively low population densities which usually exist, poses many problems to workers conducting ecological research programs. This is particularly true on range where the animals live in a wooded habitat in such areas there is little chance of obtaining information by direct observation, a method used so successfully by Murie in his studies of timber wolves in Mt. McKinley National Park in Alaska (Murie, 1944) and of coyotes in Yellowstone National Park (Murie, 1941).

We realized the magnitude of the problem when a timber wolf research program was undertaken in Algonquin Provincial Park in 1958. A helicopter played a major role in the conduct of the field work. We found, as have other workers (e.g., Stenlund, 1955), that much information can be obtained by the use of aircraft during the winter. The wolves use the ice-covered lakes and streams as travel routes and kill many of their prey on the lake or stream surfaces. When the ice was gone, the wolves disappeared into the forest and great difficulty was encountered in locating areas where they could be captured or where food habit studies could be undertaken.

I wish to acknowledge the assistance of a number of persons in the development of this method of wolf location. J. A. Shannon, a co-worker on the Wolf Research Program, has contributed a great deal. He conducted the coyote work which will be briefly discussed. Several students and trappers added their ideas as we went along. These ideas have been rehashed so many times that we no longer have much appreciation of where they originated. W. W. H. Gunn and J. B. Falls made suggestions on equipment and made recordings of the howls of both captive and wild wolves. B. J. Wickett provided the original equipment and has continued to be my adviser on technical points pertaining to electronic equipment. The developmental work has truly been the effort of a team.

## The Development of the Technique

A captive population of timber wolves, coyotes and coyote-dog hybrids is maintained at the Wildlife Research Station in Algonquin Park. These

*Originally presented at the 22nd Midwest Fish and Wildlife Conference, Toronto, Ontario, December 5, 6 and 7, 1960.

animals frequently howl in unison and are readily stimulated by human "wolf-howling." Their behaviour recalled a remark made by R. Y. Edwards about the possible use of tape recordings in timber wolf research. In March, 1959, Dr. W. W. H. Gunn made four recordings of the howls of the captive animals. There were three timber wolves, three coyotes and one hybrid in the area at the time the recordings were made. It turned out that the combined howling of timber wolves, coyotes and hybrid produced three sequences that are very similar to the howling of a timber wolf pack and their young.

## Operating Equipment

Due to the uncertainty about the results that would be obtained, equipment for the trial work was rented. It consisted of a Revere T.1100 tape recorder, an amplifier with a 15-watt output, two 100-watt inverters and an Atlas CJ44 speaker. The unit was powered by two 12-volt storage batteries. The unit was not portable and all of the initial work was done from the network of roads which exists within the Park.

We now have a number of portable units all of which are transistorized. The record players are complete units known as "Call of the Wild" and are sold by the Animal Trap Company of Lititz, Pennsylvania. Each is powered by 12 flashlight batteries. The tape recorder units were assembled from available components, one consists of a "Mohawk Chief" Midget tape, an Audix amplifier and an Electro Voice CDP847 speaker. The other unit has a Fi-Cord tape recorder, the other components are the same. The Mohawk recorder is powered by either 16- or 40-hour dry-cell batteries. The Fi-Cord has rechargeable batteries which give approximately two hours of continuous operation. The Audix amplifier can be powered by any 12-volt battery supply. We use two 6-volt dry cells connected in series. The complete tape recorder units weigh approximately 15 pounds.

## Results in 1959

We used the recordings for a short period in May and, to a limited extent, during July. During July, we made numerous tests of the response of the captive animals to the recordings. The first reply to the recordings from a group of wild wolves was obtained on August 5, from a fixed location on McCaskill Lake, in the interior of the Park. A pack of 3 or 4 wolves replied on the third playing at 2200 hours and again 12 minutes later. They did not respond to recordings at 2205, 2208, 2220 or 2245 hours. The following night we played a recording at 30-minute intervals for three hours from the same location but did not receive any replies.

A week later in the Rence Lake area, a pack of wolves responded three minutes after the playing of two successive sequences at 2008 hours. They did not reply at 2018 but replied again at 2028 and 2041 hours. Subsequent

checks showed that this was a family group with a den about three-quarters of a mile from the point where the first replies were obtained. A third group was located at Sunday Creek on August 28 and also proved to be a family group with a den nearby.

Both of these packs were within operating distance of the Wildlife Station and were used as "test groups." Between August 13 and October 10 we made a total of 31 checks on the two groups, 11 in one case and 20 in the other. Replies were obtained on 26 of the checks, 21 of which were from the primary working site.[1] The weather on four of the five days, when the groups were not heard replying, was unfavourable with either wind or rain interferring. On 20 occasions the groups replied on the first playing from a station, on 3 occasions they replied on the second check and on 3 on the third check. These checks were at least 20 minutes apart. In both cases we took compass bearings of the howling and plotted these on 1¼ inch to 1 mile topographic maps. The fixes proved to be quite accurate and the dens of both groups were located on the first ground search. Animals were observed at both dens.

Results in 1960

Quite early in 1960 it became evident that results were not as consistent as those obtained on the Rence Lake and Sunday Creek groups in 1959. The direction of the compass bearings of the replies in the various areas were not as consistent and we did not receive as high a percentage of responses in the follow-up checks. It evolved that the areas occupied by the various groups were quite well defined, however in view of the objectives of our summer program.

A pack located east of Potter Lake on July 19 was most intensively studied during the summer. In the period from June 21 to August 31 the area was checked 30 times; replies from the group were obtained on 14 occasions. Wolves from this pack were heard howling spontaneously on two other occasions. The compass bearings of the howling wolves varied greatly and suggested that the pack was travelling widely. On August 7, I realized that some of the apparent movement was due to the presence of another group that occasionally answered on the west side of the lake. Later, on August 18, it was established that a third pack that had been previously located to the north, had come within audible range. It had also added to the previous confusion. From this point on the picture became clearer and bearings of the howling suggested the vicinity of a small lake as the most likely home site of the original pack. However, the frequency of replies did not increase and some bearings still showed considerable variation. In the first search of the area some wolf sign was observed along the shore of the lake. In the second check, a beaver meadow was located where numerous scats and resting areas were found; however, no den was located then, or in

[1] The site most advantageously situated in relation to the den site or to the area where the pack is most commonly heard.

a final search of the area undertaken recently. The sign, scat size principally, confirmed that there were young in the group, a conclusion that had been drawn from the sound of the howling. The presence of the pack was later established, by their replies, on two of three checks made during September and October, one of the bearings suggested that they were at the home site, the other suggested that they were within a mile of it.

Wolf packs were again located in both the Rence Lake and the Sunday Creek areas; however, they did not utilize the same dens as in 1959. The Sunday Creek area was investigated more thoroughly since it fell within our population-study area. Recordings were played from the primary working site on 57 occasions between April 25 and November 25, eighteen replies were received. These were frequently of low intensity and suggested that the den site, if one existed, was farther north. However, the location of the group varied considerably.

Factors Which Influence Results

The field studies and the work with the captive animals have shown a number of interrelated factors which undoubtedly influence the results obtained. Some of the factors are:

1. Length of time since the last howl of the group.
It appears that the stimulus of wolves to howl is, at least in part, directly proportional to the length of time since they last howled. It is frequently difficult to evoke a response within 15 to 20 minutes, or even longer, after they last howled.

2. Volume at which recordings are played.
We have failed to get replies on a number of occasions when we were quite close to a group. Conversely, we have noted occasions when our captive animals failed to reply to the howling of wild groups, when the howling, although clearly audible, was of a low intensity due to the distance of the wild group.

3. Limitation of human hearing.
Replies have been obtained which have not been heard at the howling location. This may occasionally result in wolves replying ahead of the line of travel, hence not replying when they are within operating range.

4. Atmospheric conditions.
The influence of wind is obvious, however, we have also found that under apparently "calm" conditions, the distance at which we can hear our captive animals has varied from as much as one-half mile to two miles.

The response of wolves appears to be poorer on rainy nights or on nights following heavy rain. I believe that some aspects of wolf behaviour may be one of the influents at such times, as well as the problems of the noise level and of humidity.

5. Vegetative cover and topography.
Sound is absorbed, muffled and deflected by vegetation and by hills, hence both the transmission and the reception is influenced by the location of the unit and of the wolves with respect to trees and hills. Leaf rustle is often troublesome even on nights that are almost calm.

6. Natural sounds.
Replies that would be faintly audible in the late summer or fall may be missed during the late spring and early summer, due to the interference of natural sounds of the night, particularly frog, whip-poor-wills and loons.

Operating Techniques

The greater part of the work with the recordings has been done between dusk and dawn. The reasons for working during this period are the wolves reply more readily and that atmospheric conditions are generally much more favourable. Recently, because of long periods of inclement weather, we began to make more frequent use of the recordings during calm daylight periods. We have had enough success to indicate that the possibility of working at this time should not be entirely discounted.

Our methods of using the recordings varied greatly during the past season but have gradually become more standardized. I now use the following methods quite consistently:

1. At each check point I play two different recordings, the first at either moderate or low volume and, if no reply is obtained, a second about a minute later at high volume. Although the data have not been analyzed, I estimated that replies are received after the second recording in about 10 per cent of the cases.

2. When working by road, where a return trip is of necessity made over the same route, we space our check points so that they are two to three miles apart, depending on topography, etc. We play recordings at every second of these points on the outgoing trip and at the others on the return trip. In cases where the route is a circuituous one we play at closer intervals, use lower volume and topographic features to reduce the likelihood of wolves howling beyond our audibility in the direction of travel.

Where we work by canoe or on foot, these precautions are usually unnecessary, for, even if the wolves do howl beyond audible range, the rate of travel is slow enough to permit the "howl stimulus" to build up before the next check point is reached.

3. When contact is being maintained with a single group of wolves for an extended period, the recordings are not played oftener than every 30 minutes. In such cases it frequently requires two or three sequences before the responses can be evoked. I believe that in this type of work particularly packs with young reply more readily than packs comprised solely of adults.

## Application of the Techniques in Field Studies

The tape recordings were used in the three major programs which we undertook during the past summer. In a food habit study, we first searched areas to locate groups and, as the work progressed, confirmed their continued presence in the study area. In a population study, we undertook to determine the distribution and number of groups in a 12-township block of approximately 1000 square miles. This proved feasible and a comprehensive picture was obtained. The possible use of the technique in specific coyote control work in agricultural areas was the third program. The results in this study were highly variable. In the Renfrew area of Eastern Ontario the coyotes consistently replied. In the Fort Frances area of Western Ontario no replies were obtained during a week of intensive work in July; on Manitoulin Island only one reply was obtained (and this may have been from timber wolves), during two weeks of continuous work in August but, during a 7-day period in September, 12 replies were obtained in the same areas. These programs will be reported upon in detail at a later date.

## The Use of Human Howling

Soon after we began to experiment with the tape recordings, we began to investigate the possibility of wolves replying to the howls of humans (unrecorded). The first test was made with the Rence Lake pack on the night of August 24, 1959, when the wolves twice responded to the howls of two students, George Francis and Peter Addison.

During the fall, various members of the program recorded a considerable number of successful attempts with this method of locating packs or individual wolves. One of our trappers, K. Clarke, kept in contact with the Rence Lake group during an entire morning, receiving replies from them at seven different intervals. On another occasion, our trapper E. Stewart, howled near the Sunday Creek den and received a reply from a single wolf; he howled again, but heard nothing. He remained very quiet, a few minutes later a wolf approached to within 15 feet of him. On August 18, my son and I spent the night in the centre of the Potter Lake study area. Three other parties were working the perimeter of the same area. During the night and early morning we received responses from members of a nearby pack on five of the seven occasions when we howled. Two of these responses came from two wolves that were away from the main group and three were from the entire pack. The pack also howled on numerous other occasions in reply to one or other of the recorders or to captive wolves which were on an island in Potter Lake.

We are using "human howling" more and more in the course of normal field work when it is not feasible to carry a recorder or record-player unit with us. The results suggest that any person undertaking timber wolf research should consider developing his ability to howl.

## Conclusions

The principal conclusion that we have drawn is that our work with the use of tape recordings is still at a very preliminary stage of development. We suspect that there are sounds that may be more effective in evoking responses than the tape recordings of wolf howls. We believe that among the wide variety of howls that we hear wild wolves making there are some which are much more effective in evoking responses than are others. We suspect that it may be possible to identify specific groups by characteristics of their howls, and that it may be possible to make a close estimate of the number of wolves that are howling in the response of a pack.

## Summary

Tape recordings of the combined howls of captive timber wolves, coyotes and a coyote-dog hybrid were tested in 1959 to determine the possibility of locating packs of wild wolves through their responses to the playing of recordings of howls.

Two packs, located in August, were easily accessible and were used as test groups. In the period from August 13 to October 10, tests were made on 31 days, the wolves responded on 26 different days. The dens of both packs were located on the first search.

The results in 1960, when work was done with more than 20 packs, were not as consistent as were the 1959 results. The bearings of the howls showed more variation and responses were not obtained on as high a percentage of the trials. Replies were heard from the most intensively studied pack on 14 of 29 trials. A favoured area of this pack was near a small lake; however, a den site was not located.

Factors which may influence the results which are obtained are the length of time since the last howl of a pack, the volume at which recordings are played, limitations of human hearing, atmospheric conditions, vegetation and topography and natural sounds.

The greater part of the field work with the electronic equipment is done at night; however, fair results have been obtained on a number of occasions during the day.

The technique was used in three studies undertaken in 1960, population and distribution of timber wolves, food habits of timber wolves and coyotes, and specific control of coyotes.

Wolves were frequently located through the use of human howls and this method is now used regularly in field studies when it is not feasible to carry the electronic equipment.