SYNCRUDE CANADA LTD.

PROFESSIONAL PAPER 1979-1

J. Michael Harvey

L.G.L. Ltd.

OVERVIEW OF WILDLIFE HABITATS WEST OF THE SYNCRUDE PLANT SITE, LEASE #17

Syncrude Canada Ltd.
10030 - 107 Street
Edmonton, Alberta
T5J 3E5

Syncrude Canada Ltd., Professional Paper 1979-1

Syncrude's Professional Paper series consists of reports which are not scheduled for publication as Environmental Research Monographs, but which would be of interest to researchers working in related fields outside Syncrude.

ABSTRACT

This study involved evaluation of the habitat for mammals and birds in the area from the proposed tailings pond west to the MacKay River, through identification and mapping of land cover types from aerial photographs and estimation of wildlife populations from existing data. The study was completed between June and September 1977.

The study area is a relatively uniform mix of young trembling aspen and open muskeg. These early successional stages support a dense growth of underbrush species of shrubs, forbs and grasses in the timbered areas and large expanses of Laborador tea, sedges and marsh plants in the muskeg. Black spruce cover is starting to develop on parts of the muskegs, while white spruce has not yet begun to enter the aspen forests.

Although the early successional nature of the area provides excellent habitat for some species (moose, ruffed grouse and some furbearers), the lack of large water bodies largely precludes the occurrence of waterfowl, gulls, pelicans, cranes and small shorebirds. Muskrat and otter also are seldom seen. The absence of mature conifer stands similarly reduces the value of the area to spruce grouse, red squirrels, fisher, marten and lynx.

To the extent that the area does not appear to include any rare or endangered species and the habitats in the area are common to a large portion of Northern Alberta, it can be stated that the area is not critical to any wildlife species.

ACKNOWLEDGEMENTS

I wish to thank K. Yonge, G. Marchak and T. Van Meer of Syncrude Canada Ltd. for assistance during this study. Dr. E. Peterson and A. Levenson of Western Ecological Services Ltd. shared vegetation data.

Dr. E. Tull and W.R. Koski of LGL Limited reviewed the manuscript and J. Erwin prepared the typescript.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

Syncrude Canada Ltd. requested LGL Limited to carry out an evaluation of the habitat for mammals and birds in the area from the proposed tailings pond west to the MacKay River (Figure 1). The study area includes about 40 km^2 that may be surface mined in twenty-five years or sooner and the present study is to contribute baseline data for an environmental impact assessment. The study involved identification and mapping of land cover types from aerial photographs and estimation of wildlife populations from existing data. Photo interpretation was verified at a few locations that were accessible by truck or by foot. General observations of wildlife were made at this time; however, no detailed field studies were undertaken. The study was completed between June and September 1977.

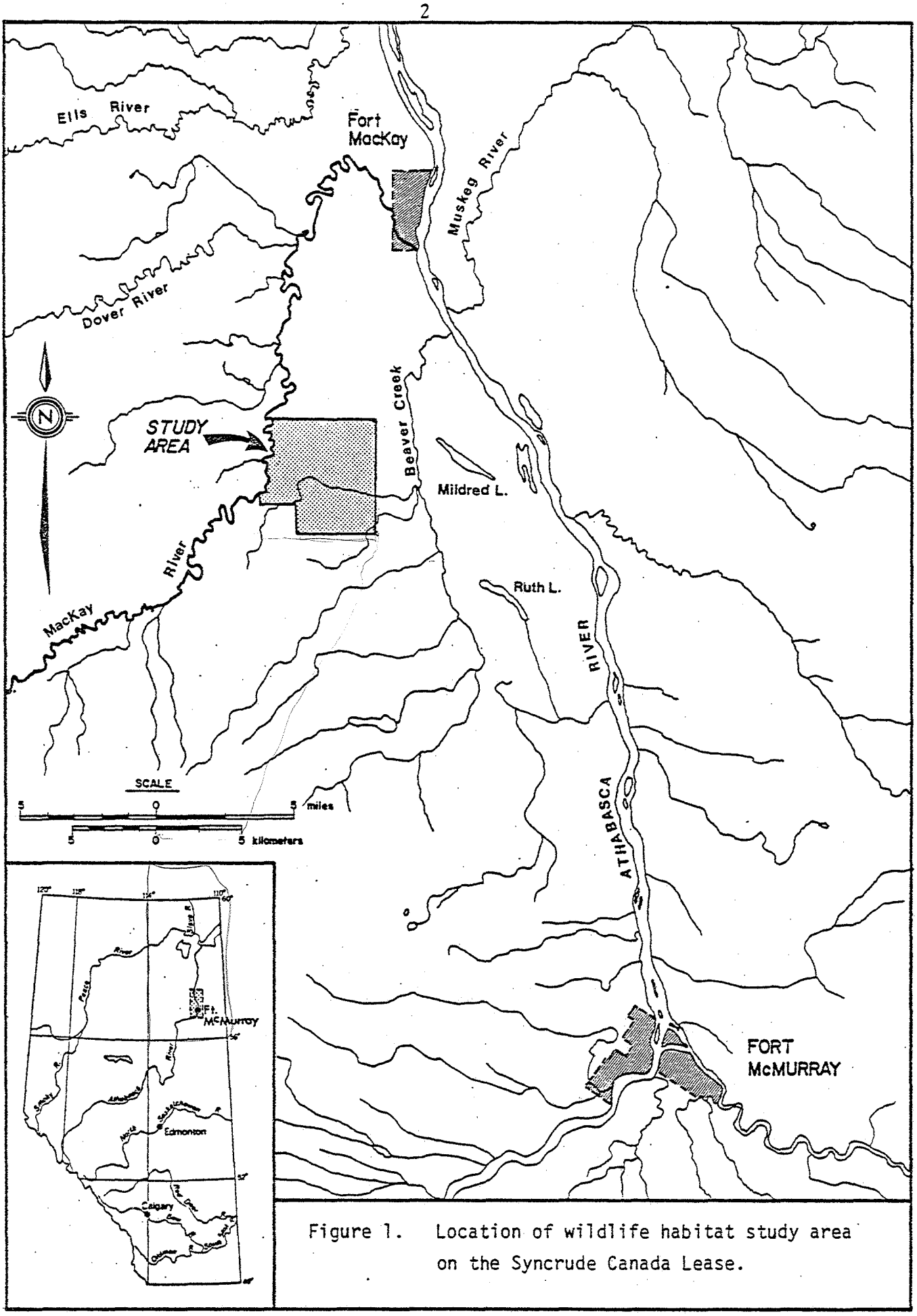


Figure 1. Location of wildlife habitat study area on the Syncrude Canada Lease.

OBJECTIVES

The objectives of this study were the following:

1) to identify habitats of mammal and bird species in the study area,
2) to describe generally the habitats in terms of carrying capacity, schedules of use, and value to wildlife, and
3) to estimate wildlife populations, based on existing data.

METHODS

The following methods were used in carrying out the study:

1. Aerial photographs (black and white pan, 31 July 1975, 1:6,000) were interpreted using the following land cover classification. The classification is loosely based on existing classifications including Lacate (1969) and Zoltai *et al.* (1975) and is designed to indicate wildlife habitat components rather than purely vegetational or physiographic descriptions.

    1. Open Standing Water (no aquatic vegetation)

        1.1 <.5 m deep
        1.2 .5-3 m
        1.3 >3 m

    2. Open Running Water

        2.1 <.5 m deep
        2.2 .5-2 m
        2.3 >2 m

    3. Aquatic Vegetation

        3.1 submerged
        3.2 floating (and probably submerged also)
        3.3 emergent (including sedge meadows)

        For each category in 3:

            A Water <.5 m deep
            B .5-2 m
            C >2 m

    4. Terrestrial Vegetation

        4.1 hardwood
        4.2 conifer
        4.3 mixed, hardwood dominant
        4.4 mixed, conifer dominant
        4.5 shrubs

        For categories 4.1-4.5:

            A <30% crowncover
            B 30-60
            C >60

            a <5 m high
            b 5-10 m
            c >10 m

4.6 grasslands, low shrubs, clearcuts
4.7 burns
4.8 bare soil

5. Intensive Land Use

5.1 Agricultural

A pasture
B crop
C feedlot

5.2 low density residential
5.3 high density residential
5.4 recreational
5.5 industrial

2. A map of the study area was prepared indicating the land cover types. This map was made from 1:6,000 scale air photos and was subsequently reduced to 1:12,000. Land areas greater than .3 ha were recorded.

3. A literature review of the habitat requirements of wildlife species and of the probable population densities in the study area was carried out. Emphasis was placed on economically important and rare mammal and bird species.

4. Six days of field reconnaissance were carried out in order to check air photo interpretation and to make ancillary observations regarding vegetation growth and wildlife populations and distributions. Field data were obtained by driving the 24th baseline road westward to the west interceptor ditch, and along the west interceptor ditch, and by hiking via cutlines through the remainder of the study area west to the MacKay River. Field reconnaissance was carried out 11-13 July 1977 and 29-31 August 1977.

Tree heights were obtained by measuring trees that had been bulldozed at the edges of cutlines. Ages were obtained by increment borings examined under a binocular microscope. Borings were taken at breast height and ages were recorded as the number of visible rings on the boring. Trees used for height and age measurements were selected throughout the study area.

5. The land cover map, field observations, and literature review were used to compile descriptions of the quality and locations of wildlife habitat in the study area.

RESULTS & DISCUSSION

Land Cover Types

The land cover types in the study area are indicated in Figure 2 (attached in folder) and are described in the following sections.

Open Standing Water (1.2)

The only open water bodies in the study area are the beaver ponds located along the several streams crossing the area. These ponds are mainly less than 1 ha in area, are at least 2 m deep near dams and houses, and have silty-muddy substrates. The water is reddish brown, indicating high organic content and probably low oxygen concentrations in winter.

Open Running Water (2.1)

Shallow running water is present in the study area in the form of small meandering streams and the west interceptor ditch. These water bodies were too small to be mapped, and in most cases they are overgrown by shrubs and are not visible on air photos.

Emergent Aquatic Vegetation (3.3)

Relatively little aquatic vegetation occurs on the shores of the beaver ponds. Most ponds have a narrow fringe of sedge (*Carex atherodes*, *C. aquatalis*, and other *Carex* sp.) and some cattail (*Typha latifolia*), but no large banks of cattail or bulrush (*Scirpus validus*) were observed. The lack of well developed aquatic vegetation may be due to recent flooding of the beaver ponds, although in some cases flooded willow and aspen trees are dead and trees of substantial size are growing on the beaver houses, indicating that the ponds have existed for some time.

Emergent vegetation (sedges, wetland grasses) occurs throughout the study area on small streams and low wet areas. In general these areas are small and could not be identified at the mapping scale used. They are

common, however, and well developed. Some contain small clumps of cattail and bulrush. Water in these areas is usually shallow (less than .5 m) and entirely overgrown with vegetation. The water appears to be permanent, however, in most places.

Aspen-Poplar (4.1)

Trembling aspen (*Populus tremuloides*) is the most common tree in the study area. Large undisturbed tracts occur east of the MacKay River, and smaller acreages occur elsewhere. Balsam poplar (*Populus balsamifera*) is relatively rare, occurring only among the aspens on the banks of the MacKay River and in a few other small and isolated wet areas. River alder (*Alnus tenuifolia*) also occurs in these areas. Throughout the aspen forest large willow (*Salix*) and alder (*Alnus crispa*) are found sparsely scattered. The understory vegetation is relatively dense and consists of rose (*Rosa*), willow, currant (*Ribes*), lowbush cranberry (*Viburnum edule*), bracted honeysuckle (*Lonicera involucrata*), and numerous small forbs.

In most of the study area the aspen stands are densely stocked, although some areas are more open. Stems range up to about 15 cm DBH although most are less than 10 cm. In the northeast corner and in the south of the study area some aspens have attained 27 cm DBH. These areas were missed by the recent forest fires. Smaller saplings are not surviving, and thinning of the smaller stems is occurring. In most areas aspens range to about 12 m in height and only the largest of them would be considered merchantable. Figure 3 indicates the height to diameter relationship of aspens. Few aspens on the study area are larger than 15 cm DBH and 16 m tall.

Most of the aspen stands represent an early seral stage of forest regeneration following extensive forest fires. The largest aspens in this area are about 35 yrs old, as indicated in Figure 4, and since aspen is an early pioneer species, fires probably occurred only a few years earlier. Large fire-scarred logs (presumably white spruce, *Picea glauca*), some 40 cm in diameter, are found throughout the study area. These logs are only

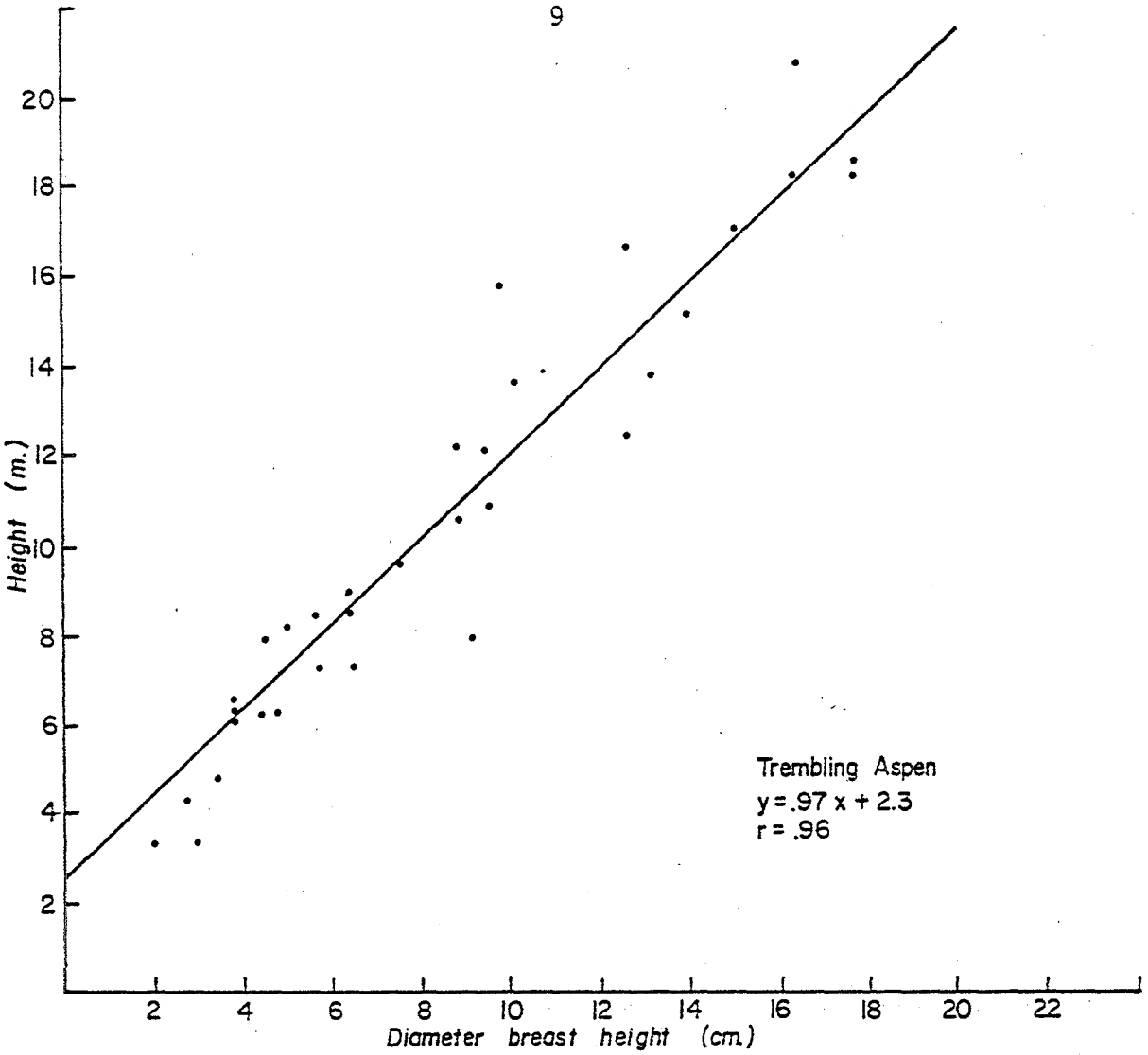


Figure 3. Height-to-diameter relationship of trembling aspen on Syncrude Canada lease.

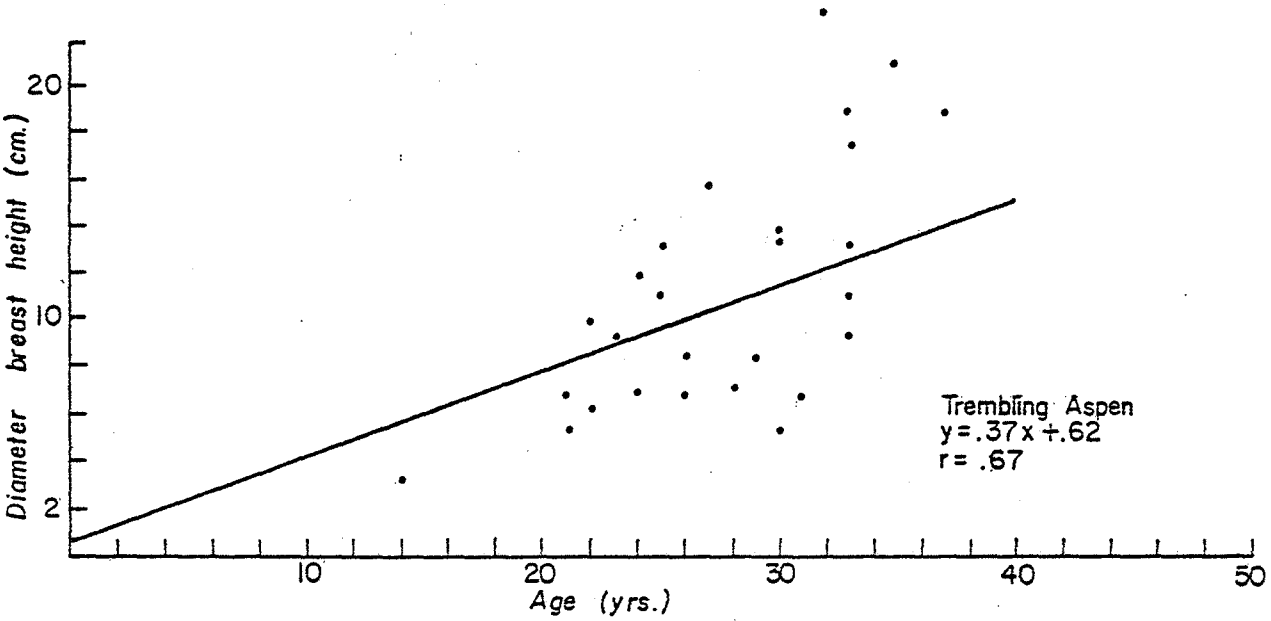


Figure 4. Diameter-to-age relationship of trembling aspen on Syncrude Canada lease.

slightly decomposed, and in a few locations they are still firmly standing. As the aspen forest matures the willows and alders, presently being overtopped by the aspen, will die, the understory will die, smaller aspens will die, and white spruce will appear. At present, white spruce is very rarely observed in most of the study area.

Mixed Woods (4.3)

Extensive forest fires in the study area removed the tree cover approximately 40 yrs ago (ca. 1937) and white spruce is presently in the very early stages of regeneration in the aspen forest. Several small areas in the study area, however, were untouched by fires and large white spruce can be found. These areas are in the northeast corner east of the interceptor ditch road, and in the south about 1 km south of the 24th baseline road. In these areas some aspen and poplar remain and the large spruce are not densely stocked. In these areas white spruce of 48 cm DBH were observed. In the adjacent areas of early successional aspen, seedling white spruce are common, although they are seldom found elsewhere in the study area. This probably results from the presence of the mature spruce seed source.

Shrub (4.5)

Shrub vegetation has been classified into two quite different types on the study area. In wet areas willows are the dominant vegetation and usually grow in closely associated clumps from 2.5 to 6 m tall. Alder is sparsely mixed with the willow. The understory consists of grasses and sedges that often exceed one m in height. This cover type occurs on the margins of ponds, along streams, and in low areas where surface water persists. The small streams are essentially overgrown with willow and cannot be seen from above.

The other shrub type is black spruce (*Picea mariana*) muskeg, that consists of large expanses of *Sphagnum* moss largely overgrown by Laborador tea (*Ledum groenlandicum*) and small black spruce. These small black spruce are usually scattered but infrequently occur in small dense patches. They range from seedlings to 2 m or more in height. There may be the occasional white birch (*Betula papyrifera*), dwarf birch (*Betula glandulosa*) or more

rarely jack pine (*Pinus banksiana*) scattered over the muskeg. The Laborador tea appears to die and to produce new growth so that much of the area is covered with a mixture of dead twigs and green shoots. Cloudberry (*Rubus chamaemorus*) is a common forb, and cotton grass (*Eriophorum*) is common in places. The local topography is sharply undulating due to the tussocks of *Sphagnum*, and the water table is high, usually just below the moss layer.

It is apparent from the burned snags (assumed to be black spruce) of 7 cm or more DBH that these areas represent an early successional stage and that black spruce will again dominate if left undisturbed. At this time, however, these areas provide wildlife cover more typical of shrubs than of conifers, and were so classified.

Grasslands (4.6)

Grasslands, as classified here, include cleared areas that have regrown to grasses (and usually some small shrubs and invading aspens) and muskeg areas consisting of *Sphagnum* and Laborador tea (and associated forbs).

Cleared areas as yet represent a small proportion of the study area. They occur on cutlines and drill sites where grasses, small shrubs and small aspens are quick to regenerate. Only the most recent clearings have unvegetated soil exposed.

In the muskeg areas large expanses of *Sphagnum* exist that are free from shrubs other than scattered dense mats of *Ledum*. These areas contain cloudberry, cotton grass and other forbs and lichens typical of an open muskeg. The terrain is hummocky and spongy. These areas will no doubt develop a cover of black spruce, but at present they provide habitat more typical of a grassland community.

Bare Soil, Naturally Occurring (4.8)

Naturally occurring bare soil is found only on slumps actively eroding on the banks of the MacKay River. This sandy soil is dry and slow to revegetate naturally. The areas of bare soil are not large.

Intensive Land Use-Industrial (5.8)

This classification includes those areas recently cleared of vegetation for roads, gravel extraction or drainage. The west interceptor ditch is the main example in the study area. The clearing where the 24th baseline road meets the MacKay River is presently exposed soil but this area will eventually be revegetated.

Wildlife Habitats

This section relates the land cover types existing on the study area to the habitat requirements of the wildlife occurring in the region. Available population data and observations made during field reconnaissance are also included.

Ungulates

Moose (*Alces alces*), White-tailed deer (*Odocoileus virginianus*) and mule deer (*O. hemionus*) are known to occur in the Ft. McMurray area, but only moose occur in significant numbers. Penner (1976) estimated populations of .23 moose/km^2 and other regional studies gave similar results. Moose tracks can be found throughout the study area on cutlines and beside roads. One adult cow was seen during the present study on the 24th baseline about 0.1 km west of the interceptor ditch.

White-tailed and mule deer are uncommon; only one mule deer was seen during Penner's (1976) study. Deep snow and severe weather cause high annual mortality, but populations may increase periodically during mild winters, particularly in response to continued clearing of the aspen forest and the production of early successional shrubs. Deer tracks were observed on the 24th baseline about 1 km west of the interceptor ditch and on a north-south cutline in the southwest part of the study area.

Moose typically inhabit coniferous forest, particularly where openings and water bodies provide an edge effect. In Minnesota, areas logged less than 20 years previously provided good habitat (Krefting 1974), particularly in summer and early winter. In the Cumberland area of Saskatchewan,

good moose habitat included white spruce-aspen subclimax forests with red osier dogwood (*Cornus alba*) understory and tall willow-alder shrub complexes nearby (Dirschl *et al.*, 1967). Large sedge meadows were considered poor habitat.

In the Peace-Athabasca Delta, the best moose summer habitat was large stands of white spruce with interspersions of poplar, aspen, birch and willow, and with a shrub understory; and low, wet, frequently-flooded areas consisting of open channels and both low and tall willows (Allison, 1973). Scrub spruce muskeg provided moderate habitat.

Penner's (1976) detailed observations on the Syncrude Lease indicated that moose preferred the tall shrubs and deciduous stands, that they avoided the mixed forests in the early winter, and that they used the mixed forests in late winter. Conifer stands were avoided at all seasons, as were the large disturbed areas. The MacKay River valley was considered to provide critical winter habitat for moose.

The entire study area provides relatively high quality habitat for moose. The large aspen stands of relatively young age provide adequate browse, and this food supply is augmented by the numerous dense growths of willow and the shrub growths in the numerous small cutlines and drill sites. Even Laborador tea in the large expanses of open muskeg provides browse for moose (Martin, Zim and Nelson, 1951). The relative seclusion and freedom from hunters is an important habitat factor.

Disadvantages of the study area for moose are the lack of aquatic vegetation such as water lily (*Nymphaea variegatum*), and the lack of dense conifer stands that would provide protection during winter. These disadvantages are not considered critical, however.

The study area does not provide high quality habitat for deer, largely because of the severe winter weather and heavy snowfall. Browse and forb growth is available in quantity and water is readily available throughout the study area, but winter protection in the form of conifer stands does not exist. As a result large deer populations probably cannot be maintained although they may increase locally during periods of successive mild winters.

Aquatic Furbearers

Beaver

Beaver (*Castor canadensis*) activity occurs throughout the study area wherever suitable stream flow and topography exist to provide a pond at least 2 m deep. Penner (1976) found an average of .42 active colonies per km of stream; on the MacKay River the average rose to 1.0 colony per km. These densities were similar to those recorded in other northern studies and the beaver population may be considered abundant. Penner noted a relatively high, and unexplained, proportion (38%) of abandoned lodges.

There are no natural lakes in the study area. All standing water indicated in Figure 2 results from beaver activity.

Trapline harvests on the Syncrude Lease were summarized by Penner (1976). These data indicated that beaver were the most important furbearing species in the area, and that relatively large harvests (and incomes) were obtained. Only one registered trapline (No. 587) exists on the present study area and it has been actively trapped in recent years (K. Yonge, pers. comm.).

In summary, the beaver population in the study area may be expected to approximate the carrying capacity. The large amounts of young aspens and the dense growths of willows assure abundant food supplies for a large beaver population. The number of sites for ponds of adequate depth may be limiting, however, due to the low relief of the area.

Muskrat

Although muskrats (*Ondatra zibethicus*) are common in northeast Alberta, the lack of natural water bodies in the study area has resulted in virtually no muskrats occurring here. No muskrat activity was recorded by Penner (1976) on the beaver ponds, and none was observed during this study.

It is possible that some muskrats will eventually use the established beaver ponds, but the decided lack of large reed and cattail beds makes this area unsuitable for muskrats.

Mink

Mink (*Mustela vison*) are the second most common mustelid (after ermine [*M. erminea*]) in the Fort McMurray area. Mink are found generally in undisturbed riparian areas where forest vegetation is dense. They prefer deciduous and mixed forests to pure spruce. Male mink maintain a home range of up to 8 km^2, and thus spend considerable time travelling along stream banks in search of prey.

Populations of mink have been low in recent years (Penner, 1976) but they still contribute to the fur harvest. Mink activity was noted by Penner in the west central, north central and MacKay River parts of the study area.

The study area appears to supply moderately good physical habitat for mink. There is a lack of streams containing fish populations and there are no muskrats to supply food for mink; hence food may be limiting. The MacKay River shoreline is likely the most productive part of the study area for mink, although the succession of large beaver ponds on several streams may be important if amphibian and fish populations are adequate. Little information is available for these ponds.

Otter

Otter (*Lontra canadensis*) are one of the least abundant furbearers in the Fort McMurray area. Penner's (1976) only observations were made near the Athabasca River, and four otter were observed near that river in July 1977 (Syncrude Canada personnel, pers. comm.).

Terrestrial Furbearers

Wolf, Coyote and Fox

Wolves (*Canis lupus*) and coyotes (*C. latrans*) are common throughout the area. Penner (1976) considered coyotes the most abundant large carnivore in the region. They were found in all vegetation types and showed a preference for the large disturbed areas where garbage was available. Wolves also appeared to prefer disturbed areas and made considerable use

of cutlines and river banks for travelling. Home ranges of 250-650 km^2 are common and thus wolves make use of areas larger than the present study area. Penner concluded that at least eight wolves roamed throughout the Syncrude Lease. Fresh wolf tracks were observed in all parts of the study area during this study.

The study area can be considered good habitat for large carnivores. The open, relatively early successional forest cover and plentiful water supply provides large populations of moose, beaver and hare, important prey species for wolves and coyotes. In addition, the relative freedom from hunters and trappers improves the habitat for these furbearers, and the presence of cutlines and garbage from the industrial activities further enhances the environment.

Red foxes (*Vulpes vulpes*) are not common in the study area although the physical habitat appears to be adequate and food supplies (hare, small rodents) are probably plentiful. Competition with wolves and coyotes may keep populations of foxes at a low level.

Marten and Fisher

Marten (*Martes americana*) and fisher (*M. pennanti*) are reclusive carnivores that are not readily observed. Trap records indicated that the marten population is very low on the Syncrude Lease and that fishers are relatively plentiful (Penner, 1976).

Both species prefer climax coniferous forests (Banfield, 1974), especially where watercourses are present, but will also use subclimax deciduous forests. Track studies on the Syncrude Lease substantiated this--most tracks were found in the pure white and pure black spruce forests, and very few were found on disturbed sites (Penner, 1976). During this study, however, a fisher was observed climbing on aspen slash in a cutline in the northeast corner of the study area.

The present study area is almost entirely early successional aspen, shrub, or very early successional black spruce muskeg and hence does not provide high quality marten or fisher habitat. However, Penner found fisher tracks throughout the northeast part of the study area (where some stands

of mixed woods exist), and also in the south central part. In the absence of further disturbance these areas, particularly the northern ones, may continue to harbour a moderate population of fishers. Fishers have a home range of up to 16 km in diameter, and thus the study area can support only a modest number.

Red Squirrel

Squirrels (*Tamiasciurus hudsonicus*) are common throughout the boreal forest wherever white spruce are plentiful to provide seeds for food. Jack pine and dense black spruce also support large populations of squirrels. Decidedly smaller populations of squirrels are found in pure deciduous stands.

Red squirrels, although small, form a significant part of some trapline harvests, and are obtained in large numbers in the Fort McMurray area. Due to the lack of mature conifers, however, very few squirrels exist in the present study area. Penner (1976) found some tracks on the east and south perimeters of the study area, and also near the MacKay River, and during this study squirrels were heard calling from mature white spruce in the northeast and south parts of the study area. In general, however, the study area is not good red squirrel habitat.

Varying Hare

The varying or snowshoe hare (*Lepus americanus*) is the most abundant furbearer on the Syncrude Lease. These animals prefer early successional deciduous forests with brushy understorys (Keith 1966). Penner (1976) found that they preferred deciduous stands and, to a lesser degree, mixed woods and conifers. They avoided large cleared areas and well-used roads.

Cycles in hare populations are well documented and annual fluctuations can be expected. During this study three hares were observed in as many days from well-used roads, possibly indicating a moderate population.

The study area provides high quality hare habitat, especially in the areas of undisturbed aspen. Penner (1976) found most track activity in the eastern half of the study area, although the western part along the

MacKay River appears to also be high quality habitat. In years of low hare populations, the remaining animals survive in the most favoured habitats and, as populations increase, they expand into less favoured areas such as mixed woods and conifers. It is possible that in 1975 and 1976 (during the Penner study) populations had shrunk east from the MacKay River into areas east of the large muskeg in the central part of the study area.

Ermine

The study area appears to provide high quality ermine habitat since the early successional forest probably harbours relatively high small rodent populations.

Ermine (*Mustela erminea*) were considered by Penner (1976) to be the most common mustelid in the study area, and populations were estimated to be higher than those reported for similar areas in the Northwest Territories. Ermine were found in most vegetation types except black spruce, willow and disturbed areas. Ermine formed an important part of the annual fur harvest.

Wolverine

Relatively little is known of the dynamics of wolverine (*Gulo gulo*) populations or their habitat requirements. Home ranges of 200 to 500 km^2 have been reported from northern Europe (Krott, 1959, cited in Penner, 1976), making the present study area a small part of an animal's requirements. Track data (Penner, 1976) indicated that populations on the Syncrude Lease were as large as those reported elsewhere in the general region. Most activity was located near the MacKay River in the undisturbed forest. It may be assumed that the study area provides adequate habitat for wolverines.

Lynx

Little information is available regarding lynx (*Lynx lynx*) populations. During recent studies (Penner, 1976) populations have been low and lynx were rarely seen on the lease. Numbers of lynx closely follow those of the hare and lynx are now being more commonly observed and trapped (Syncrude

Canada personnel, pers. comm.).

The study area is considered good habitat throughout for hare, and hence will also provide good habitat for lynx.

Black Bear

Black bears (*Ursus americanus*) are common throughout the boreal forest and are commonly seen on the Syncrude Lease. No specific data are available on their numbers. Tracks were seen on cutlines throughout the study area and it may be assumed that the study area provides good habitat for them. The general area is early successional, is relatively highly productive of browse and understory plants, has a low to moderate population of moose and large predators and probably has a highly productive small rodent population. Consequently an omnivore opportunist such as the black bear would find prey, carrion and fresh berries and other vegetation in good supply. Garbage from the nearby human activities would augment the food supply.

Other Mammals

Studies are presently being carried out regarding small mammal populations on the Syncrude Lease. No previous data are available concerning the abundance of small mammals. The early successional nature of the forest throughout most of the study area probably provides good habitat for populations of deer mice (*Peromyscus maniculatus*), jumping mice (*Zapus hudsonicus*), shrews and other small mammal species. A list of species that may occur in the area, based on ranges provided by Banfield (1974), follows:

Masked shrew	*Sorex cinereus*
Water shrew	*S. palustris*
Arctic shrew	*S. arcticus*
Pigmy shrew	*Microsorex hoyi*
Little brown bat	*Myotis lucifugus*
Silver-haired bat	*Lasionycteris noctivagans*
Big brown bat	*Eptesicus fuscus*
Hoary bat	*Lasiurus cinereus*
Snowshoe hare	*Lepus americanus*
Least chipmunk	*Eutamias minimus*
Woodchuck	*Marmota monax*
Red squirrel	*Tamiasciurus hudsonicus*
Northern flying squirrel	*Glaucomys sabrinus*

Beaver	*Castor canadensis*
Deer Mouse	*Peromyscus maniculatus*
Gapper's red-backed vole	*Clethrionomys gapperi*
Northern bog lemming	*Synaptomys borealis*
Heather vole	*Phenacomys intermedius*
Muskrat	*Ondatra zibethicus*
Meadow vole	*Microtus pennsylvanicus*
Chestnut-cheeked vole	*Microtus xanthognathus*
House mouse	*Mus musculus*
Meadow jumping mouse	*Zapus hudsonicus*
Porcupine	*Erithizon dorsatum*
Coyote	*Canis latrans*
Wolf	*C. lupus*
Red fox	*Vulpes vulpes*
Black bear	*Ursus americanus*
Grizzly bear[R]	*U. arctos*
Marten	*Martes americana*
Ermine	*Mustela erminea*
Least weasel	*M. nivalis*
Mink	*M. vison*
Wolverine	*Gulo gulo*
Badger[R]	*Taxidea taxus*
Striped skunk	*Mephitis mephitis*
River otter	*Lutra canadensis*
Lynx	*Lynx lynx*
Caribou	*Rangifer tarandus*
Mule deer	*Odocoileus hemionus*
White-tailed deer	*O. virginianus*
Moose	*Alces alces*
Bison	*Bison bison*

R=rare

Water Birds

Due to the very limited amount of standing water in the study area, the quality of the habitat for water-associated birds is low. The following species are best suited to the study area and moderate populations are no doubt present, although first hand data are not available. Much of the following information is based on studies carried out on the eastern and central parts of the Syncrude Lease (Sharp *et al.*, 1976). Water-associated species other than those listed may occur but are assumed to be relatively uncommon and the habitat is not considered to be of particular value to them.

American bitterns (*Botaurus lentiginosus*) have been seen flying between small marshes and Mildred Lake, and one was seen on a large muskeg in the south-central part of the study area. Fledglings have been seen on the Syncrude Lease. The large number of beaver ponds and tall grass-sedge marshes make the study area good bittern habitat.

Mallards (*Anas platyrhynchos*) are very common in the Syncrude area and although small ponds in deciduous woods are not prime mallard habitat, some birds will nest on them. Mallards were observed during this study flying over the grassy marshes.

Blue-winged Teal (*Anas discors*) nest near lakes with considerable sedge and grass shoreline. Although little of this habitat type occurs on the study area, teal were observed commonly in grassy wet areas during this study and are assumed to have nested on nearby beaver ponds.

Common Goldeneye (*Bucephala clangula*) prefer swampy terrain, with grassy shorelines and deciduous shrubs and trees nearby. Dead snags provide nesting habitat for these hole-nesting ducks. Goldeneye were commonly observed on the beaver ponds during this study.

Bufflehead (*Bucephala albeola*), like the goldeneye, prefer small shallow ponds with deciduous trees nearby for nesting. Although none was seen during this study, the beaver ponds no doubt provide good nesting habitat by supplying drowned aspens, grass and sedge covered shorelines and secluded water of appropriate size.

Sora (*Porzana carolina*) are common on the study area; several were identified by calls during this study. They nest and feed in marshy areas near ponds.

Common snipe (*Capella gallinago*) probably occur in the marshy wet areas and near the beaver ponds in the study area.

Spotted sandpipers (*Actitis macularia*) were seen commonly along the west interceptor ditch. As the revegetation program proceeds and as invertebrate life in the ditch increases, this habitat will improve. Yellowlegs (*Tringa*) were also common on this ditch.

Many other sandpipers and plovers may occasionally use parts of the study area during migration and possibly for nesting. The relatively small area of open marsh, however, precludes the study area from being highly productive or critical habitat. Because of the lack of large lakes, gulls, terns, pelicans, cormorants and herons which occur in some numbers in the region, do not use the study area. Sandhill Cranes (*Grus canadensis*) migrate through the area in some numbers but would not find the wooded study area attractive.

Upland Birds

Spruce grouse (*Canachites canadensis*) select areas of nearly pure conifers (Robinson, 1969). Consequently,the present study area provides almost no valuable habitat for this species.

Ruffed grouse (*Bonasa umbellus*) are permanent residents of the region and are found throughout the study area in relatively large numbers. During this study three families of fledglings and four single adult ruffed grouse were observed on the study area in July. In August grouse were commonly encountered in the aspen forest. Ruffed grouse populations fluctuate widely in numbers from year to year, and the ratio of maximum to minimum densities in an area may vary from ratios of 8:1 to 15:1 (Keith, 1963).

This species prefers young stands of deciduous trees (aspen, balsam poplar and white birch) with adjacent cleared areas. Deciduous or mixed woods with a heavy shrub understory also provide excellent habitat (Johnsgard, 1973; Fisher, 1939). Rusch and Keith (1971) recorded four important community types in central Alberta--burns, aspen, black and white spruce, and open bog.

The predominant foods of adult ruffed grouse in winter are buds and catkins of deciduous trees and also rose hips. During the summer the diet becomes less restrictive and includes insects, berries and seeds.

An important aspect of ruffed grouse habitat is the presence of appropriate drumming logs for epigamic displays. Boag and Sumanik (1969) identified the characteristics of drumming sites and found that preferred sites

had a greater density of young aspens, and greater canopy cover than unused sites. Young white spruce were also usually present.

The present study area provides excellent ruffed grouse habitat, and in subsequent years as white spruce production increases the quality of the habitat will improve. The large areas of relatively young aspen and the fairly dense undergrowth of shrubs, combined with the large number of deadfalls from a previous forest, make this ideal grouse range.

Sharp-tailed grouse (*Pedioecetes phasianellus*) are not common in the study area due to the lack of large clearings of grass or other open areas. The best sharp-tail habitat is usually grasslands with scattered shrubs and trees (Hamerstrom, 1963). If large areas are cleared of forest, sharp-tail populations may rise. This species occurs as a year-round resident throughout this region.

Raptors

The following raptors probably occur in some numbers on the study area, either in the forested parts or the marshy areas.

Red-tailed hawk	*Buteo jamaicensis*
Marsh hawk	*Circus cyaneus*
American kestrel	*Falco sparverius*
Great horned owl	*Bubo virginianus*
Hawk owl	*Surnia ulula*

Red-tailed hawks are common in Alberta. They typically prefer an interspersion of mature forest grasslands and can be expected to use the muskeg areas and marshes in the study area for hunting, and the forest edges for nesting.

Marsh hawks were observed frequently on the study area during this study. They hunt and nest in marshy areas and were observed slowly hunting low along cutlines.

Kestrels were commonly observed perched on wires on the Syncrude construction site and also near the highway from Fort McMurray. They prefer open areas with scattered perches.

Both great horned and hawk owls utilize forests and forest edges and can be expected to be common on the study area.

The following hawks and owls are known to occur near the Syncrude lease. All are transients or scarce summer or permanent residents.

Goshawk	*Accipiter gentilis*
Sharp-shinned hawk	*A. striatus*
Broad-winged hawk	*Buteo platypterus*
Swainson's hawk	*Buteo swainsoni*
Rough-legged hawk	*Buteo lagopus*
Golden eagle	*Aquila chrysaetos*
Bald eagle	*Haliaeetus leucocephalus*
Gyrfalcon	*Falco rusticolus*
Peregrine falcon	*Falco peregrinus*
Merlin	*Falco columbarius*
Great gray owl	*Strix nebulosa*
Long-eared owl	*Asio otus*
Short-eared owl	*Asio flammeus*
Boreal owl	*Aegolius funereus*

Both Sharp-shinned and Broad-winged hawks were observed during this study.

Other Birds

A large number of other birds (nighthawk, *Chordeiles minor*; kingfisher, *Megaceryle alcyon*; woodpeckers, and passeriformes) occur in the area. In absence of specific studies, the data of Sharp and Richardson (1976) adequately describe those species found in the area and their habitat preferences.

Conclusions

The study area is a relatively uniform mix of young trembling aspen and open muskeg. These early successional stages support a dense growth of underbrush species of shrubs, forbs and grasses in the timbered areas and large expanses of Laborador tea, sedges and marsh plants in the muskeg. Black spruce cover is starting to develop on parts of the muskegs, while white spruce has not yet begun to enter the aspen forests.

This vegetation cover, combined with the abundant supply of surface water, provides excellent habitat for moose, ruffed grouse, and a number of furbearers such as beaver, ermine, mink, snowshoe hare, coyote and wolf. Previous studies, and observations made during this study, indicate that relatively large populations of these species occur on the study area.

The uniformity of the study area does not warrant delineation of habitats of various wildlife species at this time. If habitat utilization studies were continued (perhaps to augment the Penner [1976] study), these data could be used in conjunction with the land cover map provided in this study (Figure 2) to map specific habitats. At present this could only be done in a speculative way.

Although the early successional nature of the area provides excellent habitat for some species, the lack of large water bodies largely precludes the occurrence of waterfowl, gulls, pelicans, cranes and small shorebirds. Muskrat and otter also are seldom seen. The absence of mature conifer stands similarly reduces the value of the area to spruce grouse, red squirrels, fisher, marten and lynx. During severe winter weather, ungulates usually seek shelter in conifer stands, and thus these animals (particularly deer) may suffer in some years. Because the presence of the MacKay River valley may counteract the lack of conifers by providing protection during winter, this area may be important winter habitat for moose and deer inhabiting the western part of the study area.

The cutlines and drill sites that criss-cross the study area probably enhance the habitat value of the otherwise uniform vegetation cover. In most cases these areas quickly revegetate with grasses, forbs and saplings, providing food for a number of species. Animal tracks on most cutlines (moose, deer, wolf, bear) indicate they are used as travel corridors. A few species such as fisher, marten and wolverine may be intimidated by such disturbance to the forest.

To the extent that the area does not appear to include any rare or endangered species and the habitats in the area are common to a large portion of Northern Alberta, it can be stated that the area is not critical to any wildlife species.

LITERATURE CITED

Allison, L. 1973. The status of moose on the Peace-Athabasca Delta. The Peace-Athabasca Delta Project Group, Edmonton. Vol. 2.

Banfield, A.W.F. 1974. The mammals of Canada. Univ. Toronto Press.

Boag, D.A. and K.M. Sumanik. 1969. Characteristics of drumming sites selected by ruffed grouse in Alberta. J. Wildl. Mgmt. 33:621-628.

Dirschl, H.J., A.S. Goodman and M.C. Dennington. 1967. Land capability for wildlife production and utilization in the western Saskatchewan River Delta. Saskatchewan River Delta Development Committee, Regina.

Fisher, K.W. 1939. Studies of the eastern ruffed grouse in Michigan (*Bonasa umbellus umbellus*). Mich. State Coll. Tech. Bull. 166.

Hamerstrom, F.N. Jr. 1963. Sharptail brood habitat in Wisconsin's northern pine barrens. J. Wildl. Mgmt. 27:793-802.

Johnsgard, P.A. 1973. Grouse and quail of North America. Univ. Nebraska Press, Lincoln.

Keith, L.B. 1963. Wildlife's ten-year cycle. Madison Univ. Wisconsin Press.

Keith, L.G. 1966. Habitat vacancy during a snowshoe hare decline. J. Wildl. Mgmt. 30:828-832.

Krefting, L.W. 1974. Moose distribution and habitat selection in North Central North America. Naturaliste Can. 101:81-100.

Lacate, D.S. (ed.). 1969. Guidelines for bio-physical land classification. Can. Forestry Service, Ottawa.

Martin, A.C., H.S. Zim and A.L. Nelson. 1951. American Wildlife and Plants: A guide to wildlife food habits. Dover Publications Inc. New York.

Penner, D.F. 1976. Preliminary baseline investigations of furbearing and ungulate mammals using Lease No. 17. Environmental Research Monograph 1976-3. Syncrude Canada Ltd.

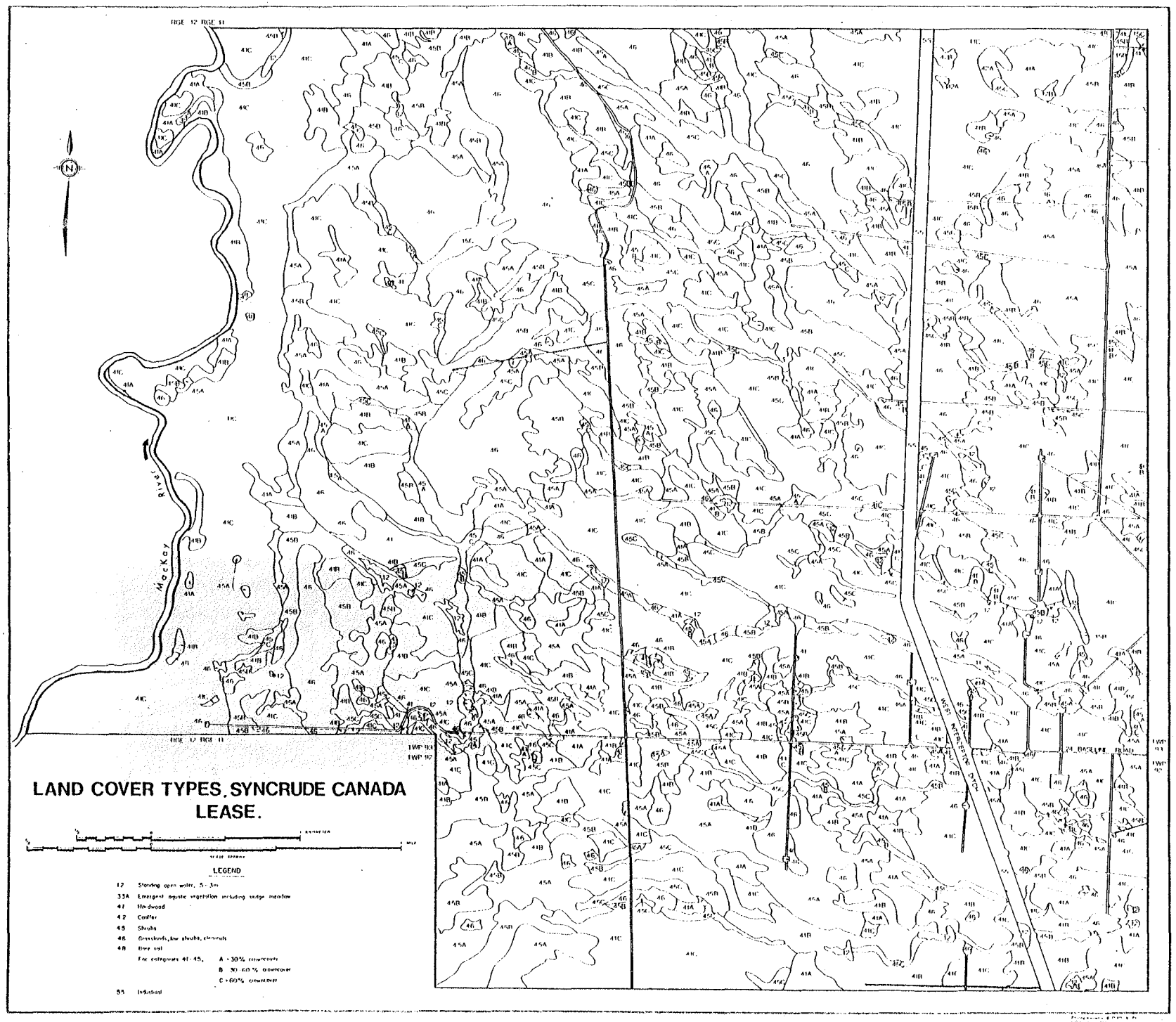
Robinson, W.L. 1969. Habitat selection by spruce grouse in northern Michigan. J. Wildl. Mgmt. 33:113-120.

Rusch, D.H. and L.B. Keith. 1971. Ruffed grouse-vegetation relationships in central Alberta. J. Wildl. Mgmt. 35:417-429.

Sharp, P.L. and W.J. Richardson. 1976. Inventory studies of birds on and near Crown Lease Number 17, Athabasca Oil Sands, 1975. Prepared by LGL Limited for Syncrude Canada Ltd.

Sharp, P.L., W.J. Richardson and J.C. Ward. 1976. Inventory studies of birds on and near Crown Lease Number 17, Athabasca Oil Sands, 1975. (Part One). Prepared by LGL Limited for Syncrude Canada Ltd.

Zoltai, S.C., F.C. Pollett, J.K. Jeglum and G.D. Adams. 1975. Developing a wetland classification for Canada. *In*: Forest soils and forest land management. 1975. Bermier, B. and C.H. Winget (eds.). Les Presses de l'Univ. Laval.



LAND COVER TYPES, SYNCRUDE CANADA LEASE.

Conditions of Use

Harvey, J.M., 1979. Overview of wildlife habitats west of the Syncrude plant site, Lease #17. Syncrude Canada Ltd., Edmonton, Alberta. Professional Paper 1979-1. 27 pp. plus map.