



**PRELIMINARY MAMMALIAN SURVEY IN THE AREA OF  
MARGUERITE RIVER CRAG AND TAIL, MAYBELLE RIVER AND  
RICHARDSON RIVER DUNES WILDLAND PROVINCIAL PARKS,  
ALBERTA**



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**October, 2001**

Front page pictures: Background: **Athabasca Dunes Ecological Reserve** and **Maybelle River Wildland Provincial Park**; top right: **northern long-eared bat**; bottom left: **black bear tracks** in sand.

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## **SUMMARY**

Field surveys of the mammal fauna of Marguerite River Crag and Tail, Maybelle River and Richardson River Dunes Wildland Provincial Parks and surrounding area were conducted from June 12 - 24 and from August 22 - 25, 2000.

A literature search suggested that 44 mammalian species could be expected to inhabit the three wildland provincial parks. Small mammal trapping, direct observations, tracks, animal calls or other sounds, structures and scats of mammal species yielded 29 species. Fur trapping records show five additional species in the study area. The additional ten expected species were not detected during the field survey.

The observation of one grizzly bear in the Marguerite Crag and Tail Wildland Provincial Park was definitely the highlight of mammalian observations during the field survey in this area. This record and a couple of records further south suggest a possible eastern reoccupation of former range in the province.

Based on trapping results of small mammals and observation of all mammal species within or near the three wildland provincial parks, it is apparent that the most important areas for mammalian biodiversity occur in those relatively narrow riparian habitats that surround lakes, wetlands, streams and rivers.



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## INTRODUCTION

Alberta's protected areas initiative, known as "Special Places" aimed to complete a network of protected areas that would preserve the environmental diversity of the six Natural Regions in the province. As a part of this initiative, eight wildland provincial parks were established in 1998. Three of these - Marguerite Crag and Tail, Maybelle River and Richardson River Dunes - situated in the north-east corner of Alberta, were prioritised for the collection of baseline biophysical data in the year 2000. Two of the parks (Marguerite Crag and Tail and Richardson River Dunes) are located in the Boreal Forest Natural Region, and one (Maybelle River) is in the Canadian Shield Natural Region (see Figure 1). Although these parks are close to the Athabasca River, one of the first rivers in the Province visited by a European, little data exists on mammalian fauna for this area. Surveys conducted by Richardson (1829), Preble (1908), Harper (1938) and Soper (1942) focused on the Athabasca River lowlands and Wood Buffalo National Park, could be relevant to the three parks and surrounding area, however, no data existed for the upland area, east of the Athabasca River. During 1978 and 1979, Green (1980) surveyed small mammals at the Athabasca Oil Sands study area in northern Alberta, about 100 km south of our study area. Two of the described habitats - jack pine forest and black spruce bog forest - were similar to those found in the wildland provincial parks during the 2000 survey. In addition to the aforementioned surveys, two surveys have been done within the Kazan Upland Natural Subregion, north of Lake Athabasca (Smith 1988, Wallis and Wershler 1984). However, the only mammalian information directly related to the 2000 survey area is found in Landals (1978) who provided short casual observation notes for the Athabasca Dunes Ecological Reserve, a site that is surrounded by the Maybelle River Wildland Provincial Park.

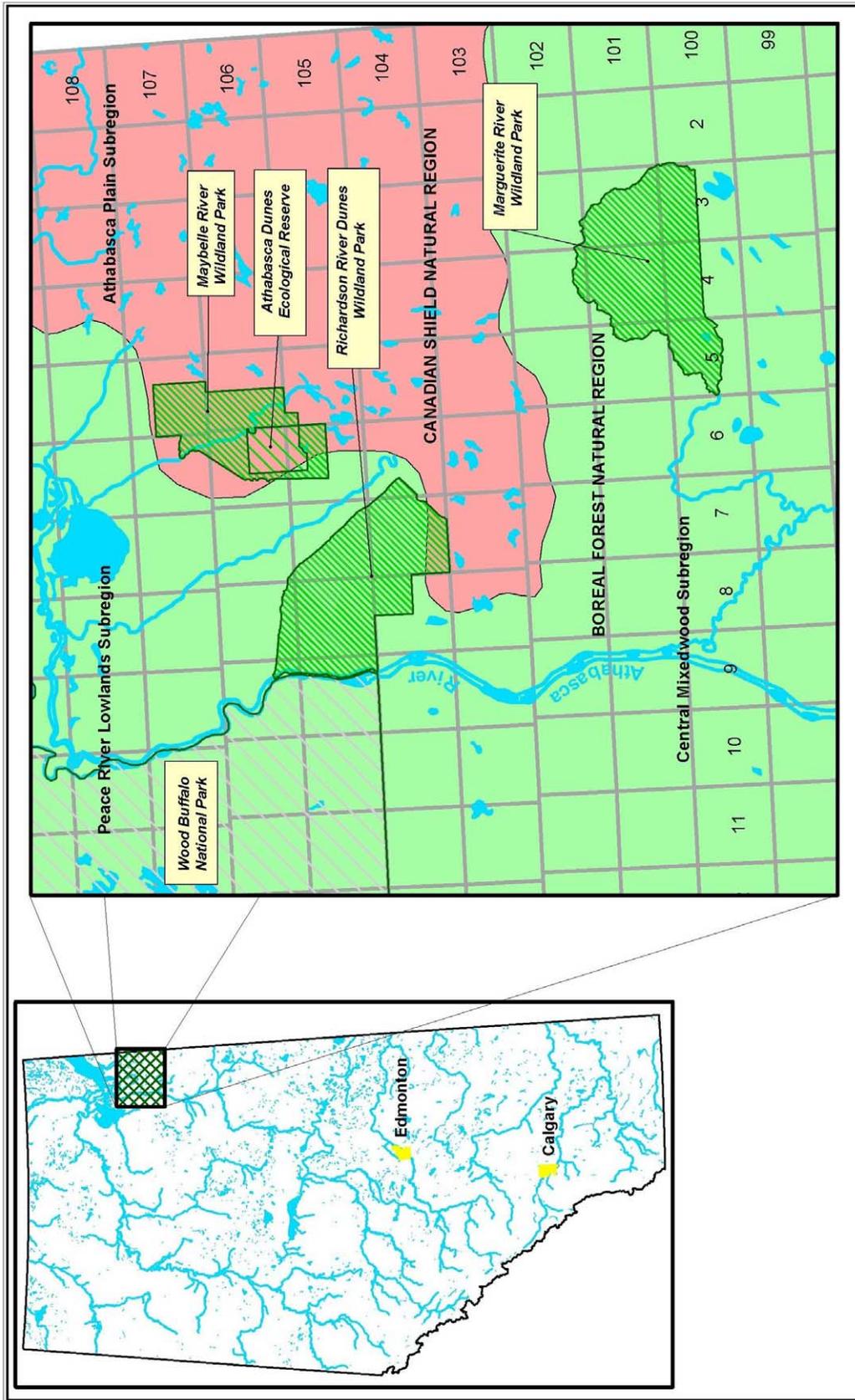


Figure 1. Map of the Study Area

## STUDY AREA AND METHODS

### STUDY AREA

The three wildland provincial parks surveyed in 2000 - Marguerite Crag and Tail, Maybelle River and Richardson River Dunes - are situated in the northeastern part of Alberta, south of Lake Athabasca (Figure 1). Although two wildland provincial parks (Marguerite and Richardson) are situated within the Boreal Forest Natural Region, and one (Maybelle) belongs to the Canadian Shield Natural Region, the geomorphology, climate and vegetation for all three sites are quite similar, and correspond to characteristics of the Athabasca Plains Subregion, Canadian Shield Natural Region.

#### - *Geology and Landforms*

All three study areas are characterised by generally low relief with elevations ranging from 230 to 640 m. Canadian Shield bedrock includes two bedrock formations - Cretaceous Middle Devonian (mostly in Richardson River Dunes Wildland) and Precambrian Granitic plutonic rocks (mostly in Maybelle and Marguerite River Wildlands) (Carrigy and Green 1965, Bayrock and Godfrey 1969). Material eroded from the Canadian Shield bedrock by the Keewatin ice sheet formed the major part of glacio-fluvial deposits (Bayrock 1969, 1970). The aeolian rework of these glacio-fluvial deposits resulted in the formation of sand dunes (Landals 1978). A very extensive dune system covers much of the three study areas and mainly consists of parabolic dunes, with some fish-hook (Richardson River Wildland Provincial Park), transverse (includes two active dunes migrating southeastwards) and paleodunes (Achuff 1992). The Athabasca Sand Dune Ecological Reserve contains the biggest active sand dune in the Province. The Marguerite Wildland Provincial Park includes an area of crag and tail. Resistant granite outcrops (crag) have "tails" of till, which were protected in the lee of the crag during glacial movements (Achuff 1992). This area is dotted with numerous lakes of different sizes. Four rivers occur within the three study areas: Athabasca, Richardson, Maybelle and Marguerite. Most of the streams are slow-moving and of the "muskeg" type (Achuff 1992).

#### - *Climate*

Climate of the Canadian Shield Natural Region is characterised by warm, moderately dry summers, and long, cold winters (Achuff, 1992), with only a moderate snowfall (Landals 1978). The mean May - September temperature is about 13 °C, and precipitation for this period averages 300 mm (Achuff 1992).

#### - *Vegetation*

Extensive forests dominated by *Pinus banksiana* (jack pine) occur on the upland sites, which are characterized by sandy, coarse-textured, glaciofluvial, glaciolacustrine, ice-contact stratified drift, and aeolian deposits. *Picea glauca* (white spruce) is codominant with jack pine on some sites. Typical understory species on dry sites include *Arctostaphylos uva-ursi* (bearberry), and *Cladina* spp. (reindeer lichens). On more mesic sites, species such as *Vaccinium myrtilloides* (common blueberry) and feathermosses (*Hylocomium splendens*, *Pleurozium schreberi*) are common.

Peatlands range from relatively dry bogs dominated by jack pine, *Picea mariana* (black spruce), *Ledum groenlandicum* (Labrador tea) and reindeer lichens to wetter peatlands with black spruce, *Larix laricina* (tamarack), Labrador tea, and *Sphagnum* spp. (peatmosses). Shrubby peatlands typically contain Labrador tea, *Kalmia polifolia* (northern laurel), *Chamaedaphne calyculata* (leatherleaf), *Carex aquatilis* (water sedge), *Calamagrostis canadensis* (bluejoint) and peatmosses.

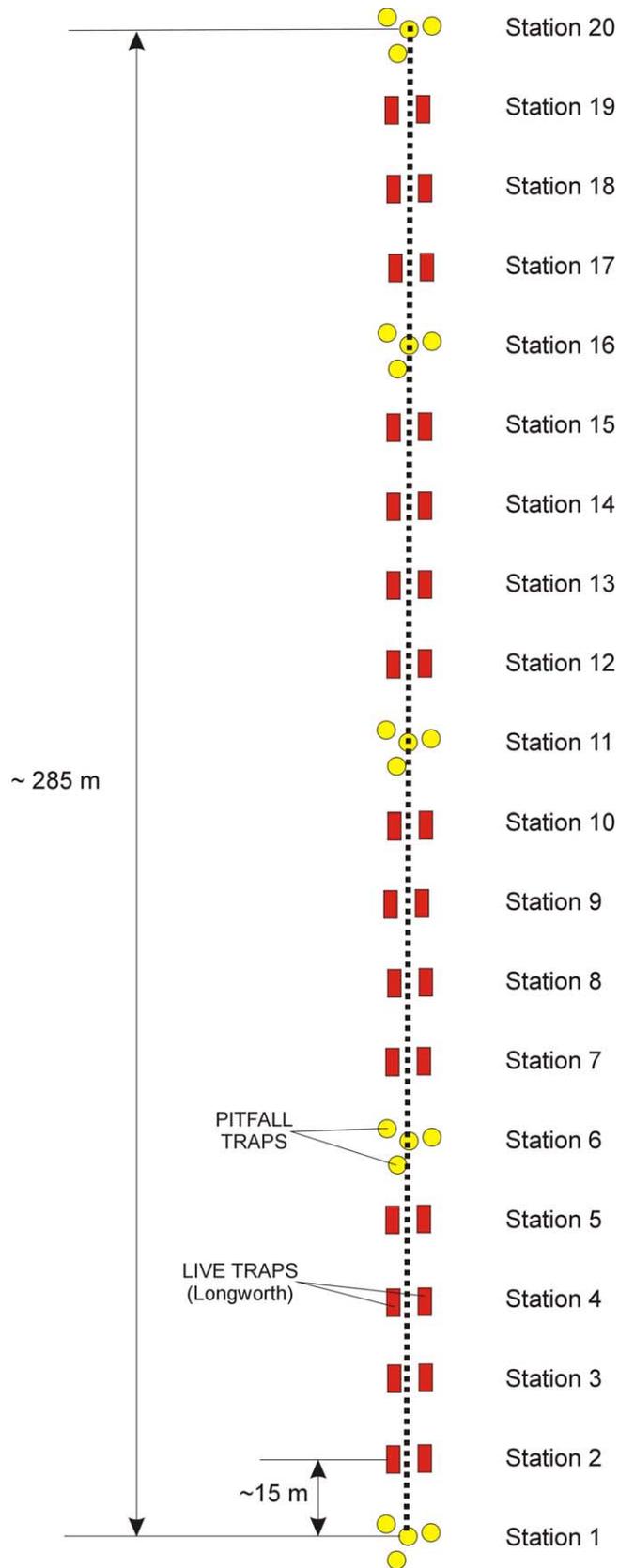
Riparian habitats are not extensive, but they contain mixed forests of *Populus tremuloides* (aspen), *Populus balsamifera* (balsam poplar), *Betula neoalaskana* (Alaska birch) and white spruce that are similar to those of the Central Mixedwood Subregion.

A number of significant (rare, endemic, disjunct) plant species occur in the Subregion including *Elymus mollis* (American dune grass), *Tanacetum huronense* var. *bifarium* (tansy), *Utricularia cornuta* (bladderwort), *Juncus brevicaudatus* (rush) and *Stellaria arenicola* (starwort) (Achuff 1992).

## METHODS

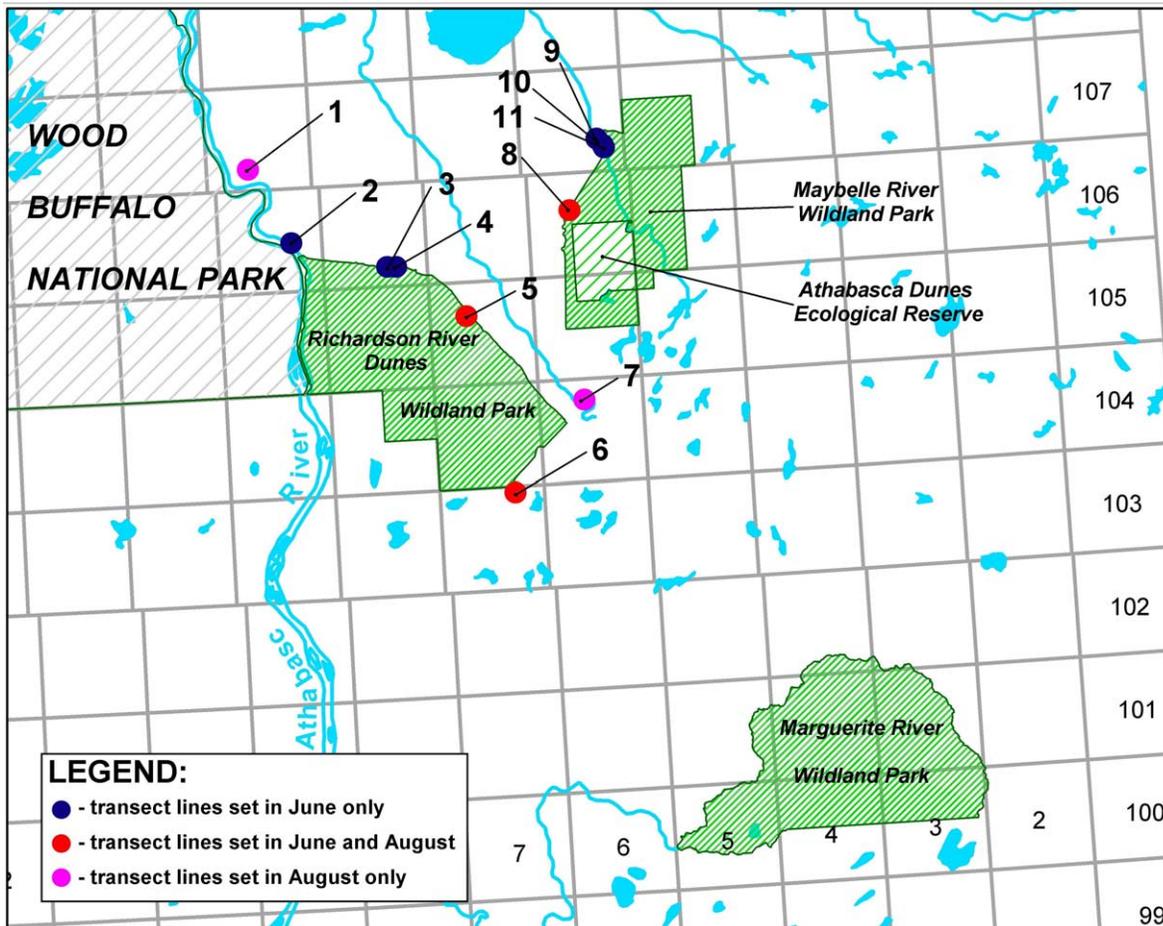
Mammal surveys were conducted during June (12 - 24) and August (22 - 25), 2000. The goal was to collect presence/absence (not recorded) data (Wilson *et al.* 1996) on mammalian fauna in the Marguerite Crag and Tail, Maybelle River and Richardson River Dunes Wildland Provincial Parks. Data for small mammals were collected using live and pitfall traps set in linear transects. There was one attempt to do an acoustical survey of bat species using a bat detector, but because of long days and very late dusk period we did not continue with it and only incidental observations of bat species were recorded. For those species the size of chipmunk or bigger, the data were collected by either direct observations or by noting indirect evidence of animal's presence such as animal calls or other sounds, tracks, structures and scat. For the fur bearing animals, additional information has been extracted from the trapper survey databases, housed with Alberta Environment. The data were examined for all trap lines crossing the wildland provincial parks and ones in close proximity to the parks. Because the fur trapping data are potentially biased, they were used cautiously. The observed differences in some of that data may be a result of the difference in fur price from year to year, errors in reporting, or errors in data entry.

Small mammals were inventoried using a linear trap transects (Drickamer 1978, Wilson *et al.* 1996). To achieve the most complete multiple species inventory possible, a combination of the two trapping methods (live traps [Longworth] and pitfall traps [plastic cans]) were used during the June part of the field survey. Each transect consisted of a 285 m straight or meandering transect line, with 20 capture stations per line (15 m spacing). Five arrays of four pitfall traps were regularly spaced along the trapping transect as shown on Figure 2 (stations 1, 6, 11, 16 and 20). Fifteen pairs of live traps/stations were placed between the five arrays of four pitfall traps as shown on Figure 2 (stations 2-5, 7-10, 12-15 and 17-19). In August, 285 m straight or meandering transect lines were set using a live trap set-up only. The decision to abandon usage of pitfall traps in August surveys was based on low catching success of these traps during the June trapping period. The 20 live trap stations were spaced at 15-m intervals. The placement of transect lines across the landscape was non-random. Transect lines were placed to survey as many different habitat types as possible and with the highest possible chance of catching small mammals. Each transect line, however, was placed so that it included only one habitat type. Because of the presence of a black bear in the vicinity of transect line #1, (set in August), this transect had



**Figure 2.** Trap set design of small mammal transect line during the June survey. For the August surveys, only live traps were employed.

only 13 trap stations. All live traps were baited with a mixture of peanut butter and rolled oats, and cotton bedding was put inside each live trap. Traps in each transect line were active for 2 to 4 trap nights, resulting in a total of 1440 trap-nights for live traps and 600 trap-nights for pitfall traps.



**Figure 3.** Locations of the small mammal transect lines that were set at the two wildland provincial parks during June and August 2000.

Eleven transect lines were set in or adjacent to two of the wildland provincial parks - Richardson River Dunes and Maybelle River (Figure 3). Transect lines were not set in Marguerite Crag and Tail Wildland Provincial Park because of logistical constraints in being able to access the site on a regular daily basis. A brief description of each transect follows:

**1 - Mixed riparian forest along Athabasca River** - spruce, balsam poplar, aspen, alder, mosses; transect line was active in August only for three nights; because of a black bear presence in the area it was set with only 13 trap stations Appendix 1 - figure 5);

**2 - Top of steep bank along Athabasca River** - open forest of aspen and jack pine with grass understory; heavily disturbed area in the past; transect line was active in June only for two nights (Appendix 1 - figure 6);

**3 - Wet open area** - *Carex* spp. (sedges), *Salix* spp. (willows) (2.5 m tall), some islands of jackpine, and, at east end of the transect, a peatmoss area with small (about 1 m tall) black spruce trees; transect line was set in June only for two nights (Appendix 1 - figure 7);

**4 - Dry creek bed** - mixture of willows, deadfall jackpine, grasses and sedges; transect line was set in June only for two nights (Appendix 1 - figure 8);

**5 - Wet, narrow sedge meadow between sand ridges** - covered with *Carex oligosperma* (few-seeded sedge), water sedge, bluejoint, *Scirpus cyperinus* (wool grass), *Sphagnum subsecundum* (twisted bog moss) and *Drepanocladus exannulatus* (marsh hook moss); transect line was set in June for four nights and in August for three nights (Appendix 1 - figure 9);

**6 - Lake shoreline in Six Lakes area** - vegetated with sedges, grasses, *Rosa* spp. (roses), willows (up to 2 m tall) and blueberries; transect line was set in June for four nights and in August for three nights (Appendix 1 - figure 10);

**7 - Richardson River shoreline** - dominated by willows and *Alnus tenuifolia* (river alder), with dense grass/sedge understory; transect line was set in August only for three nights (Appendix 1 - figure 11);

**8 - Peatland** - vegetated with peatmoss, Labrador tea, northern laurel and sparse black spruce and tamarack; transect line was set in June for four nights and in August for three nights (Appendix 1 - figure 12);

**9 - Open jackpine forest on top of Maybelle River valley** - *Alnus crispa* (green alder), lichens and some deadfall; transect line was set in June only for four nights (Appendix 1 - figure 13);

**10 - Maybelle River valley slopes** - along tributary creek to the river, upper slopes with balsam poplar and white spruce, and very few, big jack pine trees (mostly near very top of slopes); flat area near river mostly with Alaska birch and grasses; transect line was set in June only for four nights (Appendix 1 - figure 14);

**11 - Maybelle River shoreline** - dominated by mixture of willows, river alder and black spruce stands with feathermosses; transect line was set in June only for four nights (Appendix 1 - figure 15).

All captured individuals of mice and voles were identified to the species level at the trap location and released. Shrews, except the water shrew, were kept and later taken to the University of Alberta Zoology Museum for positive identification.

## RESULTS

A comprehensive literature search suggested that 44 mammalian species could be expected to inhabit the three wildland provincial parks. (Preble 1908, Harper 1932, Soper 1964, van Zyll de Jong 1983, Wallis and Wershler 1984, Banfield 1987, Smith 1990, Smith 1993).

The 11 transect lines yielded nineteen small mammals representing four insectivore species (*Insectivora*) and four species of rodents (*Rodentia*) (Table 1 and 2).

**Table 1.** Number of captured individuals of the eight species of small mammals during the 2000 survey on 11 transects.

Transect Line	Masked Shrew	Dusky Shrew	Water Shrew	Arctic Shrew	Deer Mouse	Meadow Vole	Southern Red-backed Vole	Meadow Jumping Mouse
1							1	
2					6			
3								
4								
5								
6	2	1	1				2	1
7	2							
8				1				
9								
10						1		
11								1

**Table 2.** Number of active trap nights per transect and number of catches per 100 traps night for live traps, pitfall traps, and traps in total.

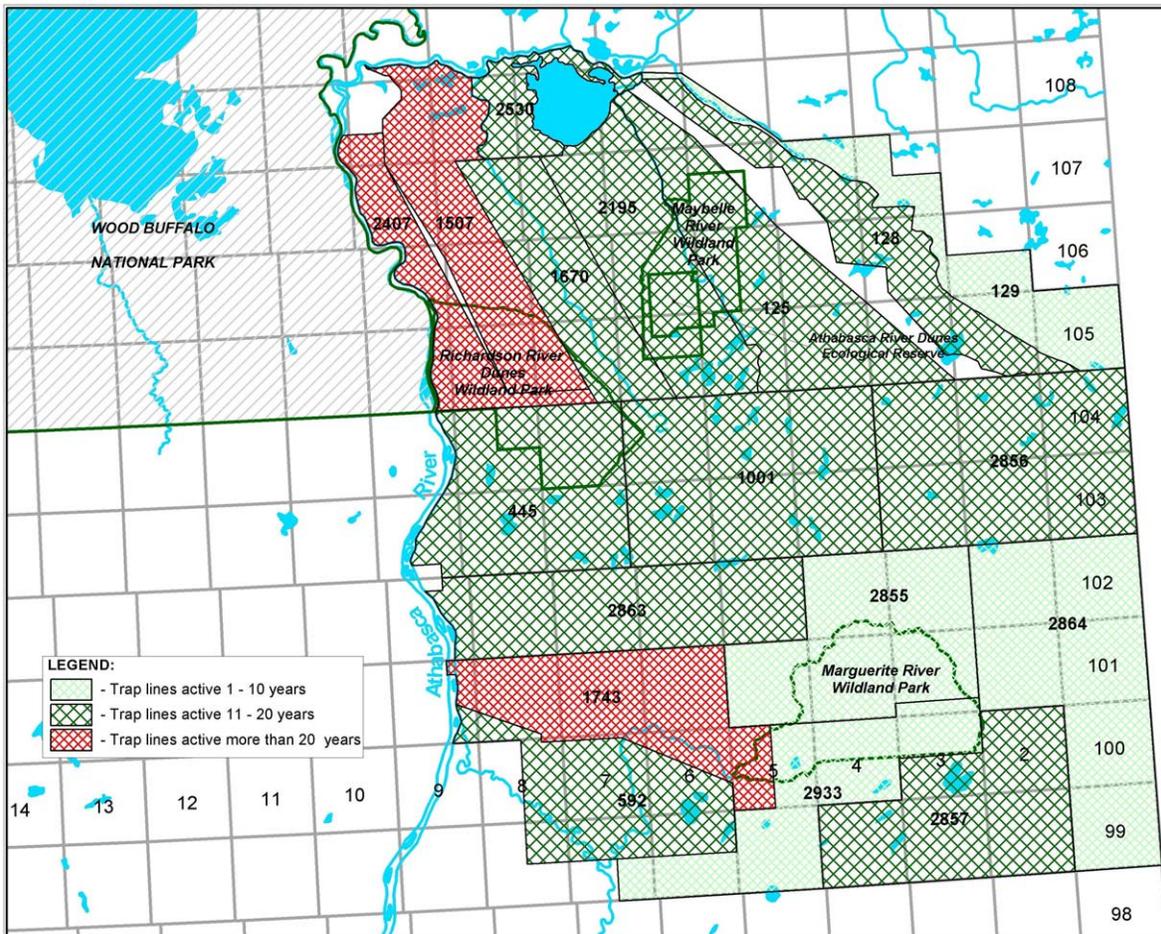
Transect Line	Live Trap Nights	Pitfall Trap Nights	Total Trap Nights	Catch/100 Live Trap Nights	Catch/100 Pitfall Traps	Catch/100 All Trap Nights
1	78	0	78	1.28	0.00	1.28
2	60	40	100	10.00	0.00	6.00
3	60	40	100	0.00	0.00	0.00
4	60	40	100	0.00	0.00	0.00
5	240	80	320	0.00	0.00	0.00
6	252	80	332	2.77	0.00	2.11
7	120	0	120	1.66	0.00	1.66
8	210	80	290	0.00	1.25	0.34
9	120	80	200	0.00	0.00	0.00
10	120	80	200	0.83	0.00	0.50
11	120	80	200	0.83	0.00	0.50
<b>Total</b>	1440	600	2040	1.25	0.17	0.93

Species recorded by direct observations, tracks, animal calls or other sounds, structures and scats yielded an additional 21 species, including two bat (*Chiroptera*), one hare (*Lagomorpha*), six rodent (*Rodentia*), nine carnivore (*Carnivora*), and three species of cloven-hoofed mammal (*Artiodactyla*) (Appendix 3).

Fifteen different species of fur bearing animals have been trapped over a period of 23 years (1978 - 2000) in the three study areas (Figure 4). Five species of carnivore reported in fur trapping records were not recorded during the course of this survey (Appendix 3).

Ten expected species, representing one insectivore, three bat, four rodent, one carnivore, and one species of cloven-hoofed mammal, were not detected in the study areas during this survey.

One grizzly bear (*Ursus arctos*) was observed during survey (Picture 3). Its historical distribution extended into the general survey area and the species was thought to have been extirpated.



**Figure 4.** Location of registered trap lines in or adjacent to the three wildland provincial parks.

## DISCUSSION

Few animals were caught in the live and pitfall even in habitats with relatively good potential for small mammals. Smith (1990) also reported an extremely small number (3) of small mammals during trapping in the Andrew Lake area. Wallis and Wershler (1984) did not report any observations of small mammals in the Colin and Woodman Lakes area. The authors only mentioned deer mouse and southern red-backed vole quoting Harper's work (Harper 1932) from Saskatchewan.

Green (1979) did snap trapping of small mammals at an area of "Richardson sand dunes" between 19 to 22 September 1978. In his report he did not provide exact locations or habitats for his trap lines, but presumably the site was somewhere along the winter road in the vicinity of the Richardson sand dunes. Green set traps for 1012 nights and over that time, 26 individuals were captured representing four different species of small mammals, namely: masked/pygmy, shrew (3), least chipmunk (1), deer mouse (14) and southern red-back vole (8) were trapped. The overall number of animals caught was higher than in our survey. This may be explained by timing, as Green's study was late in the season when there are a much higher number of juvenile and subadult animals in the population (Krebs and Wingate 1985). However, the number of caught animals in the Richardson area was considerably smaller than in the rest of his survey sites located further south in the Boreal Forest Natural Region (especially along the Athabasca River Valley between Fort McMurray and Fort MacKay).

The literature indicates three possible explanations for the low numbers of small mammals caught and observed during 2000 field study. Firstly, population cycles are believed to be a characteristic of small mammals in the north (Krebs and Wingate 1985, Koshkina and Korotkov 1975). Perhaps the year 2000 was a low year in the population cycle for the study area.

Smith (1990) noted that small mammal numbers in the Andrew Lake area are consistently low, and attributed it partially to the role of fire and to a thin soil layer that is unable to protect animals from heat during wildfires.

The third explanation for the low number of small mammals could be provided by a theory that riparian habitats act as species source and upland areas act as a dispersal sink (Doyle 1990). Riparian habitat in our study area represents just a small fraction of a total area, so perhaps the source is not big enough to support good numbers of individuals for dispersal into upland areas. In addition, the uplands of the study area tended to be very open, this likely contributes to higher predation rates (Miller and Getz 1977) on animals dispersing into and inhabiting upland habitats.

Good habitats for small mammals are along river valleys, lake shorelines and different types of wetlands. These have a much higher habitat complexity plus a well developed vegetation structure. Doyle (1990) reported that species richness and total number of individuals were greater in riparian areas than in upland areas. Miller, D. M., and L. L. Getz (1977) found that species diversity and to some degree relative abundance of small mammals increases in areas with higher vegetation cover and vegetation stratification.

All animals caught during the 2000 field study were caught in transect lines set in the riparian habitats. A transect line set in an open jack pine-lichen forest did not yield any animal even though it was set very close to the river valley edge with diverse plant cover. Most of the jack pine forest floor was covered with lichens. Although green alder, *Vaccinium uliginosum* (bog cranberry) and common blueberry are present in some areas, this forest has a very open appearance. This overall lack of cover almost automatically excludes vole species that need a well developed vegetation understory of grasses, sedges and shrubs, (Getz 1985, Merkens *et al.* 1991). Deer mouse, however, are mostly nocturnal and omnivorous (Wilson and Ruff 1999), and could be expected to inhabit more open areas such as jack pine-lichen forests. On two occasions deer mouse were observed in the open jack pine-lichen forest, and in both cases the animal was relatively close (about 20-50 m) to lakeshore.

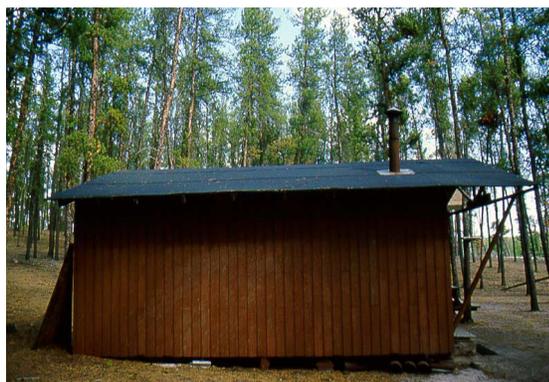
Although some transect lines were set in wet sedge meadows with willows and other shrub species where some small mammal signs of winter activity were observed, they did not yield any animals. Trapping in the big peatland area, situated within the northwest part of the Maybelle River Wildland Provincial Park resulted in only one shrew species being taken (Arctic shrew), but no mouse or vole species were caught. Observations during our visits to peatlands did not reveal any signs of recent small mammal activity (runways, holes, droppings, plant clipping etc.).

The number of trapped animals was low, but the overall species richness of the sample was relatively high. Among 19 small mammals captured in the live and pitfall traps, eight different species were represented. During our trapping period, we recorded 67% of all expected small mammal species. The percentage was higher for shrew species (80%), and somewhat lower for vole and mice species (57%).

Two species of bat were observed during the field survey. Northern long-eared bats (Picture 1) were found in three cabins on the west side of Net Lake (Picture 2). These bats were using the sidewalls of the cabins for day roosting. The number of individuals in each cabin was five, 50 and 75. One hoary bat was observed along the lakeshore in the vicinity of the campsite during the August trip (Joyce Gould, pers. comm.). There were a few more observations of unidentified small bats in flight made by other members of the field crew around wet areas in the vicinity of the winter road.



**Picture 1.** Northern long-eared bat (Photo by D. Vujnovic).



**Picture 2.** Cabin with northern long-eared bats rusting during the day (Photo by D. Vujnovic).

Since Preble's collection (Preble 1908) of a taiga vole along the Athabasca River, at the beginning of the last century, there have been no records for this species in the province. One area that appeared to contain preferred habitat for this species in the Richardson River Dunes Wildland Provincial Park was exceptionally difficult to access. In an attempt to relocate this species, one transect line (transect line #1) was set in the floodplains of the Athabasca River, just outside the boundary of Richardson River Dunes Wildland Provincial Park, in an area that was accessible. This attempt was unsuccessful. The number of trap stations on this transect line were reduced from 20 to 13, due to bear encounters in this area.

The historical range of the grizzly bear extends into the study area, but for a long period of time records of this species from this area are lacking. Observation of one animal in the Marguerite Crag and Tail Wildland Provincial Park (Picture 3) by Richard Thomas and Bob Carroll, as well as couple of records of this species further south during the past year (Richard Chabaylo, pers. comm.) suggest that this species may be moving back into this part of its former range. The grizzly bear observation was definitely the highlight of mammalian observations during the field survey in this area.



**Picture 3.** Grizzly bear feeding on shore of an unnamed lake in Marguerite River WPP (Photo by B. Carroll).

Based on trapping results of small mammals and observations of all mammal species within or near the three wildland provincial parks, it is apparent that the most important areas for mammalian biodiversity occur in those relatively narrow riparian habitats that surround lakes, wetlands, streams and rivers. With the exception of river valleys, most of these riparian habitats are not connected, and they can almost be seen as islands in a matrix of open jack pine-lichen forest. It is important, therefore, that detailed surveys and impact assessments are completed before any developments be considered in these areas. In addition, a more intensive survey of mammalian fauna in peatland areas of the parks is needed to substantiate their role in a general habitat assembly for this area. Since small mammals are a major food source for a variety of avian and mammalian predators (Getz 1985), they are one of the important animal groups to consider when establishing management goals and plans for protected areas.

## ANNOTATED CHECKLIST OF MAMMALIAN SPECIES

This list comprises 33 mammal species recorded during field work, trapping activities between years 1978 and 2000, and observations of M. Landals (1978) in the Marguerite River, Maybelle River and Richardson River Sand Dunes Wildland Provincial Parks. A tabular view of the mammal species can be seen in Appendix 3 - Table 3.

For each species, the provincial Srank (**S1** to **S5**) is provided as well as whether or not the species is on the tracking or watch lists (**Y** = tracking list; **W** = watching list; **N** = not on tracking or watching list). This information was extracted from the datafiles of the Alberta Natural Heritage Centre (<http://www.gov.ab.ca/env/parks/anhic/>) (last update, 16 June, 2000). An explanation of Srank, tracking and watch lists are also provided at the above website.

The relative status of the each species in the study area is also provided (common, uncommon, rare, etc.). Relative status of a particular species was based on: (1) the number and frequency of observations, (2) trapping results obtained during the field survey, and (3) trapping records from registered fur trap lines in the study area. An additional qualifier - "**probably**" - was used when not enough information was available to assign a relative status to the species.

1. **Masked shrew** (*Sorex cinereus*) - **S5, N - Probably common**. Second most common small mammal caught in traps. Four specimens were obtained - two from transect line 6 (Appendix 1 - Figure 9), and two from transect line 7 (Appendix 1 - Figure 10). All traps that provided individuals of this species were in dense stands of sedges or grasses with willow, rose or alder. Potentially good habitats for this species exist around margins of lakes, peatlands and along river valleys in the study area.
2. **Dusky shrew** (*Sorex monticolus*) - **S5, N - Uncommon**. One specimen was caught in a trap in transect line 6 (Appendix 1 - Figure 9). Habitat is the same as for the previous species.
3. **Water shrew** (*Sorex palustris*) - **S4, N - Uncommon**. One animal was caught at transect line 6 (Appendix 1 - Figure 9). The trap was placed in a belt of shallow water with a dense stand of sedges.
4. **Arctic shrew** (*Sorex arcticus*) - **S5, N - Probably rare**. Only one specimen taken from a peatland (Figure 11). According to Soper (1964) this is one of the typical habitats for this species. Future, more detailed surveys in this habitat may show that this species is more common than these preliminary results suggest.
5. **Northern long-eared bat** (*Myotis septentrionalis*) - **S2S3, Y - Uncommon to rare**. The walls of three cabins on the west side of Net Lake (Pictures 1 and 2) were day roost places for at least 126 individual animals (45, 6 and 75 counted individuals).
6. **Hoary bat** (*Lasiurus cinereus*) - **S2B, Y - Rare**. J. Gould saw one animal flying around our campsite at unnamed lake (UTM coordinates - NAD83 Zone 12 E505700 and N6436800) on the evening of August 24<sup>th</sup>.

7. **Snowshoe hare** (*Lepus americanus*) - **S5, N - Common, but not numerous.** Signs and observation of this species were collected from all three wildland provincial parks. The total number of individuals was relatively low, but not as low as it was reported for areas north of Lake Athabasca (Smith 1990, Wallis and Warshler 1984). Most often, hare has been observed in the river valleys (especially Richardson River) and in areas with a well developed understory layer (creek beds, jack pine forest with a shrub understory, and sedge meadows). There were no signs of this species in the peatland area in Maybelle River Wildland Provincial Park, but during the August visit to a peatland in the southeastern 'corner' of Marguerite River Wildland Provincial Park, there were lots of tracks, droppings and other signs of its presence.
8. **Least chipmunk** (*Tamias minimus*) - **S5, N - Uncommon.** Very few observations of this species were recorded. One observation occurred on June 15<sup>th</sup> in a jack pine stand along the winter road before its junction with Embarras Road. Also on June 15<sup>th</sup>, one animal was observed in willow/alder thicket at Maybelle River Wildland Provincial Park. On June 20<sup>th</sup>, one animal was observed along Embarras Road in a mature jack pine stand with alder, bearberry, and blueberry in the understory.
9. **Woodchuck** (*Marmota monax*) - **S5, N - Uncommon.** This species was observed on north side of the Richardson airstrip in a very open, young jack pine forest. One female with young was spotted at the Richardson Fire Tower. In the Maybelle River valley, holes and signs were observed.
10. **Red squirrel** (*Tamiasciurus hudsonicus*) - **S5, N - Common.** The most common mammal species in the study area. Most often observed in open jack pine-lichen forest. Most signs of activity were noted in stands close to water. Some middens were huge and must have been used for generations (Picture 4). Trappers regularly catch red squirrel in all the registered traplines in the study area (Appendix 2 - graphs 1 and 2).



**Picture 4.** Squirrel midden in young jack pine forest in Richardson River Dunes WPP (Photo by D. Vujnovic).

11. **Beaver** (*Castor canadensis*) - **S5, N - Common**. Beaver activities were noted throughout the study area. Lodges were observed in the lakes as well as along rivers, especially the Marguerite and Maybelle Rivers. In many places beavers cut down jack pine trees, possibly because of the lack of deciduous tree species. Trapping data are presented in Appendix 2 - graphs 3 and 4.
12. **Deer mouse** (*Peromyscus maniculatus*) - **S5, N - Common**. Deer mouse was the most common species caught in live traps (six individuals, Table 1). This species was trapped only in the transect line 2 that was placed along the Athabasca River, in an area of heavy human disturbances (Appendix 1 - Figure 5). In addition to trapping data, this species was observed on two occasions in jack pine forest close to lakeshores. Green (1979) reported 14 animals caught in his "Richardson sand dunes" study area.
13. **Southern red-backed vole** (*Clethrionomys gapperi*) - **S5, N - Uncommon**. Three animals were caught in two trap lines. One was taken in transect line 1 located in the old growth forest on the Athabasca River floodplain. This forest had a dense shrub layer and high moss cover. The other two animals were taken in transect line 6 set along the lake shoreline (Appendix 1 - Figure 9).
14. **Meadow vole** (*Microtus pennsylvanicus*) - **S5, N - Uncommon**. One individual was caught in a trap in transect line 10 in a river valley balsam poplar forest, with alder understory, deadfall and a well developed leaf-litter (Appendix 1 - Figure 13). One individual was observed in the edge area between an open sedge wetland-lake and a jack pine forest in the central part of the Richardson River Dunes Wildland Provincial Park.
15. **Muskrat** (*Ondatra zibethicus*) - **S5, N - Probably common**. Muskrat is one of the most important fur bearing animals in the study area, and it is regularly represented in the fur trapping data with high numbers (Appendix 2 - graphs 1 and 2). However, our field observations did not confirm this. Muskrat were observed in all three wildland provincial parks, but it seems to be much less common than beaver. Landals (1978) also noted the absence of muskrat during her field work in the vicinity of Athabasca Dune Ecological Reserve.
16. **Meadow jumping mouse** (*Zapus hudsonius*) - **S4, N - Uncommon**. Two animals were trapped in transect line 6 and 11 (Appendix 1 - Figures 9 and 14) in traps set in: a) very wet sedge covered lake shoreline; and b) at the edge between black spruce-feather moss and the alder/willow-grass habitat, along a shore.
17. **Porcupine** (*Erethizon dorsatum*) - **S5, N - Rare**. Fresh tooth marks were observed on willows in one location along the shore of the Maybelle River.
18. **Coyote** (*Canis latrans*) - **S5, N - Uncommon**. Tracks were observed sporadically on the winter and Embrass roads. Howling was not heard during the time of field survey. Wolves may be keeping coyote populations low in the study area. Fur trapping data are presented in Appendix 2 - graphs 7 and 8.
19. **Gray wolf** (*Canis lupus*) - **S3, N - Common**. Tracks and scats were observed every day along roads, the tracks of one wolf were observed on the eastern edge of the Athabasca Dunes. Dave Crossland reported seeing four adult animals on the road northwest of the northwestern 'corner' of Richardson River Dunes Wildland Provincial Park. While checking transect line 1, numerous tracks of wolves were observed in the sand each day. Trappers' data is shown Appendix 2 - graphs 5 and 6.

**20. Red fox (*Vulpes vulpes*) - S5, N - Common.** Tracks were observed in the majority of habitats, except in peatlands. They were especially common in the complex of lakes and wetlands in the area, as well as along creeks. On two occasions, animals were observed along the winter road. Lorna Allen and Derek Johnson found an active fox den on a southeast facing dune slope with clumps of *Betula neoalaskana* (Picture 5). Landals (1978) observed a family of fox inhabiting an area near the edge of the dune field. These animals were very skillful in preying on eggs and chicks of Arctic or common terns nesting on the dune. Red fox has been regularly taken in fur traps (Appendix 2 - graphs 9 and 10).



**Picture 5.** An active red fox den in sand dune in Richardson River Dunes WPP (Photo by L. Allen).

**21. Black bear (*Ursus americanus*) - S5, N - Common.** Many signs, tracks, scats and direct observations of animals of different age and sex categories were noted during the field survey. Black bear were observed in all types of habitat. Most often, signs and observations were recorded in river valleys. There were a number of observations of day-bedding sites in the dunes of the study area. In the Athabasca Dune Ecological Reserve, Landals (1978) reported use of dunes with birch clumps as easily dug winter dens. During the August trip, there was considerable bear activity in and around the areas that had blueberry. Just outside of Richardson River Dunes Wildland Provincial Park, there were four active bear baiting stations. Eight skinned carcasses were discovered on the north side of the Embrass Airstrip. Trapping data are presented in Appendix 2 - graphs 5 and 6.

**22. Grizzly bear (*Ursus arctos*) - S3, N - Very rare.** Definitely the most significant mammalian observation happened on June 13<sup>th</sup>, in the Marguerite River Wildland Provincial Park, when Richard Thomas and Bob Carroll observed a cinnamon grizzly bear foraging on the lake shore (Picture 3). The bear was observed for about 25 minutes, from 750 to 250 m distances with the use of a spotting scope. The two observers have no doubts concerning the identification of this species. This grizzly bear observation represents the most northeastern record for the province in recent history.

- 23. Marten (*Martes americana*) - S5, N - Probably common.** During field surveys there were no reports for this species or any sign of it. However, fur trapping data suggests there is a healthy population in the study area (Appendix 2 - graphs 3 and 4).
- 24. Fisher (*Martes pennanti*) - S4, N - Probably uncommon.** Gabe Durocher observed one individual in a jack pine forest on a dune at the edge of Richardson River Dunes Wildland Provincial Park. According to fur trapping data, fisher has been regularly trapped in the period between 1988 and 2000, but only averaged two animals per year (Appendix 2 - graphs 9 and 10).
- 25. Weasels (*Mustela* spp.) - Probably uncommon.** There was some sign of weasel species in area of 'riparian' zone as well as along roads and in jack pine forests. No direct observations of these species were made during field survey. According to fur trapping (Appendix 2 - graphs 11 and 12), five animals have been trapped on average each year. In the fur trapping data set, the data for small members of weasel family are shown collective as "weasel". Distribution of ermine (*Mustela erminea* - S5, N) and least weasel (*Mustela nivalis* - S5, N) include area of the three wildland provincial parks, and probably these two species represent "weasels" from the fur trapping data.
- 26. Mink (*Mustela vison*) - S5, N - Probably common.** Only one observation of this species was made during field survey, that being south of Richardson River Dunes Wildland Provincial Park. One individual was observed in a shrubby area along a creek. Good habitats for this species exist along rivers and around most of lakes in the study area. From fur trapping data (Appendix 2 - graph 11 and 12) it is apparent that a much denser population exists in Peace-Athabasca Delta that occurs in the wildland provincial parks.
- 27. Wolverine (*Gulo gulo*) - S3, W - Rare.** No observations or signs of this species were noted in the study area. There was one possible observation of wolverine tracks on Embrass Road, but this observation could not be confirmed. Fur trapping data indicate that some animals have been taken in trap lines in Marguerite Crag and Tail and Maybelle River Wildland Provincial Parks (Appendix 2 - graphs 13 and 14).
- 28. Striped skunk (*Mephitis mephitis*) - S5, N - Rare.** No signs of this species were recorded during field survey. Landals (1978) reported seeing one young animal around her camp in Athabasca Dunes Ecological Reserve. Harper (1914) and Soper (1942) reported this species to be common along the Slave River. Fur trapping data reveal only one animal trapped over a 23-year period (Appendix 2 - graphs 13 and 14).
- 29. River otter (*Lontra canadensis*) - S3, N - Common.** Signs (fresh scat and slides) and observations of otter were reported from all three wildland provincial parks. The species was seen along rivers as well as around lakes. Trapping results also suggest a healthy population of this species in the study area (Appendix 2 - graphs 7 and 8).
- 30. Canada lynx (*Lynx canadensis*) - S4, N - Uncommon.** This species was observed on two occasions, once in a jack pine forest along the winter road in Richardson River Dunes Wildland Provincial Park, and once by Richard Thomas and Bob Carroll who watched a lynx chasing a snowshoe hare in Marguerite Crag and Tails Wildland Provincial Park. Lynxy has been regularly trapped over a 23-year period but in low numbers (Appendix 2 - graphs 9 and 10). Soper (1942) noted that lynx was a common animal during "normal years". Harper (1932) recorded only three observations of this species along Slave and Athabasca River during his travels.



**Picture 6.** Moose cow in lake partly filled by active dunes in Athabasca Dunes ER (Photo by J. Gammer).

**31. White-tailed deer (*Odocoileus virginianus*) - S5, N - Uncommon.** Two females were observed on the Embrass Road in a jack pine forest just before the Airstrip, on August 25<sup>th</sup>. On June 17<sup>th</sup>, tracks were observed on the east side of Maybelle River Wildland Provincial Park, in the jack pine forest, and on June 19<sup>th</sup>, Lorna Allen saw deer droppings in a white spruce forest in Athabasca River floodplain. It is possible that the tracks and droppings were from mule deer too.



**Picture 7.** Well defined a wildlife trail in jack pine forest in Marguerite Crag and Tail WPP (Photo by D. Vujnovic).

**32. Moose (*Alces alces*) - S5, N - Common.** Signs of moose were seen regularly throughout the study area, with the major concentrations occurring near lakes and wetlands (Picture 7). Some signs were even observed in the middle of the active dunes in the Athabasca Dunes Ecological Reserve. Landals (1978) suggested that the population of this species is low in the area. Moose tracks were observed regularly on well-defined wildlife trails that traversed jack pine forests in study area (Picture 6).

**33. Caribou (*Rangifer tarandus*) - S2, Y - Rare.** Tracks of this species were noted regularly along the Embrass Road in jack pine forest. Apparently, a few animals were using this road as travel route. In most cases, only single animal tracks (probably a male) were observed. On the morning of June 21<sup>st</sup>, a set of tracks belonging to a cow and calf were observed on the road. The tracks were followed for more than 4 km before they disappeared into a jack pine stand. Presumably tracks of these animals belong to woodland caribou - boreal ecotype (*R. t. caribou*) - because of the time of year when the tracks were noted. On June 21<sup>st</sup>, an old antler was noted on the active dunefield called the Richardson Dunes located north of the study area. In the middle of the last century, 12,000 to 20,000 barren-ground caribou (*R. t. groenlandicus*) wintered in the area south of Lake Athabasca (Kelsall, 1968). Landals (1978) reported observations of cast-off antlers and feeding craters in jack pine park-like forests, which can probably be dated back to when barren-ground caribou used this area as a wintering ground. From the aerial view of the study area, well-worn trails are visible on many of the dunes. They were probably established by generations of migrating caribou through this area. There have been no recent signs of use of this area by barren-ground caribou. This could be explained by a major fire in the Lake Athabasca area that changed migration patterns (Landals, 1978) or by a change of a migration patterns with no apparent reason (Kelsall, 1968).

## **ACKNOWLEDGEMENTS**

My thanks to Jeniffer Gammon, Renessa Cooper, Dave Crossland, Gabe Durocher, and Ted Johnson for help in the field. I am very grateful to Richard Mosses and Wayne Roberts from the University of Alberta for providing traps and doing small mammals (especially shrew species) identification. Bev Fetter - Alberta Corporate Service and Bruce Treichel - Alberta Fish & Wildlife Service kindly and timely provided me with data for fur bearing animals in the study area. Thank you to Lorna Allen, Ksenija Vujnovic and Wayne Nordstrom for useful suggestions during writing the report as well as editing it.

## LITERATURE

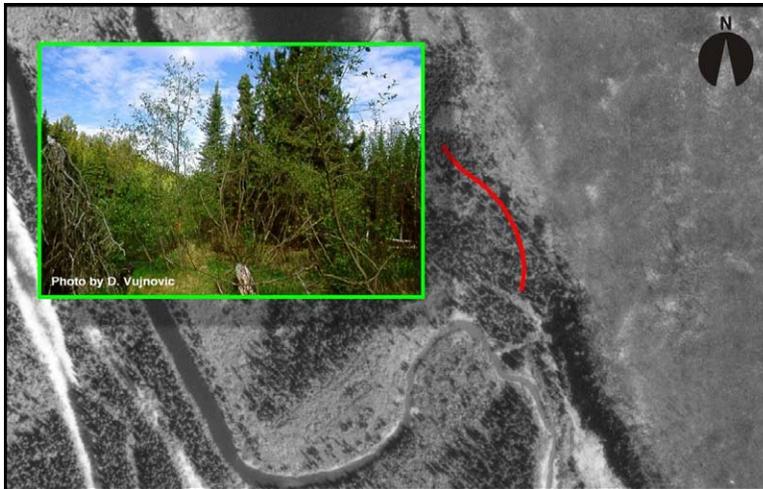
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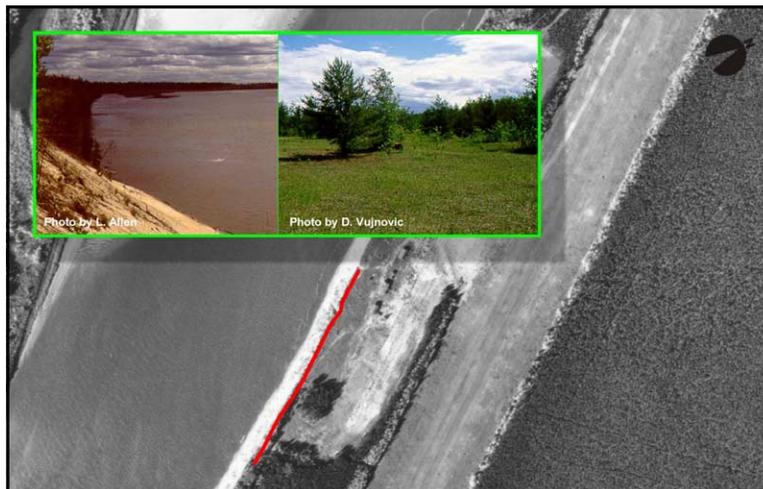
## **APPENDIX 1**

Images and locations of the transect lines that were set during the year 2000 field survey of three wildland provincial parks - Marguerite Crag and Tail, Maybelle River and Richardson River Dunes.

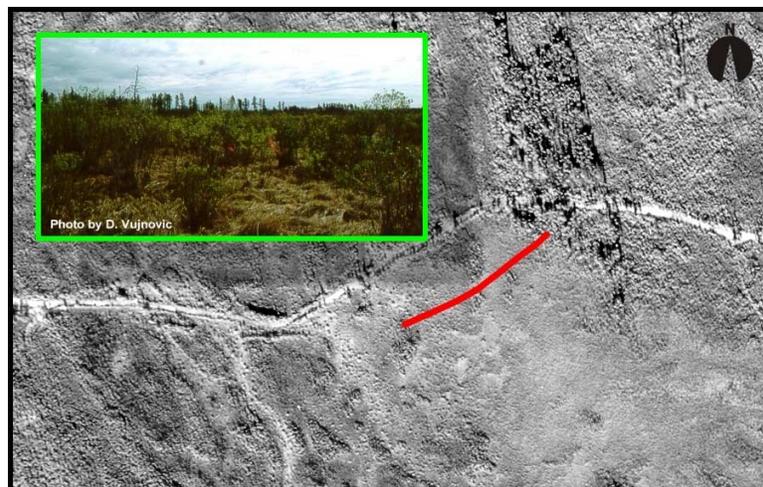




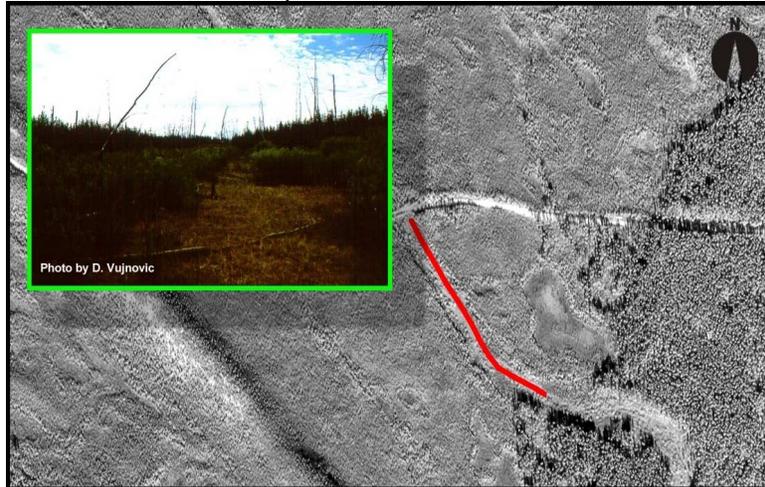
**Figure 5.** Transect line 1 - mixedwood riparian forest along Athabasca River, just NW of Richardson River Dunes WPP.



**Figure 6.** Transect line 2 - top of steep bank along the Athabasca River, Richardson River Dunes WPP.



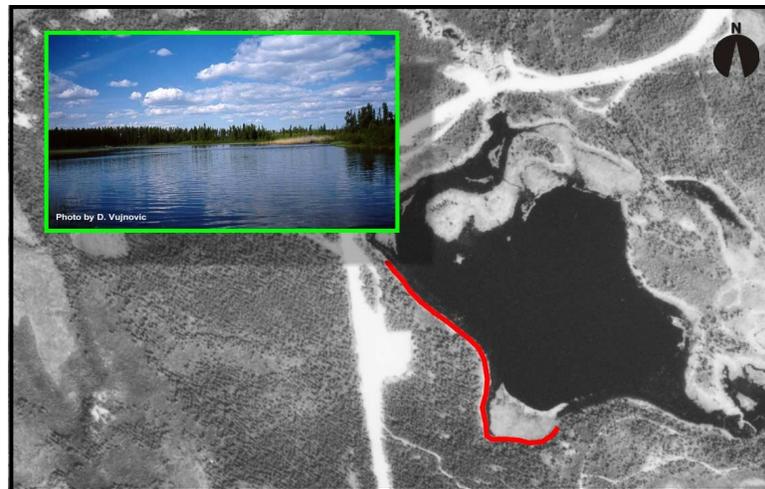
**Figure 7.** Transect line 3 - wet open area, Richardson River Dunes WPP.



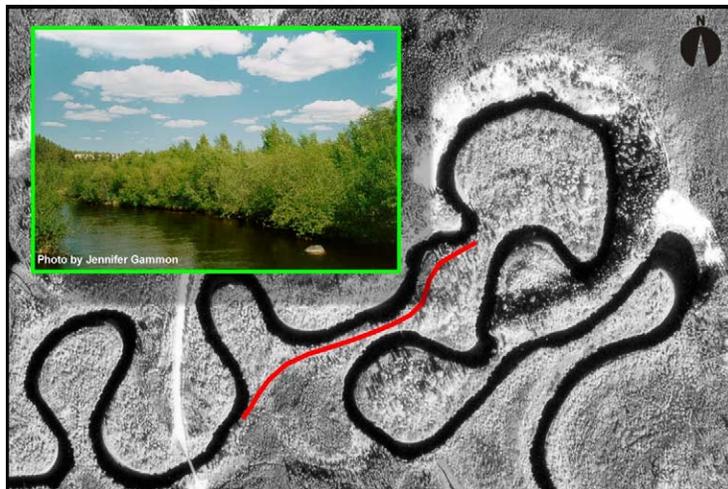
**Figure 8.** Transect line 4 - in a dry creek bed, Richardson River Dunes WPP.



**Figure 9.** Transect line 5 - in a wet, narrow sedge meadow between sand ridges, Richardson River Dunes WPP.



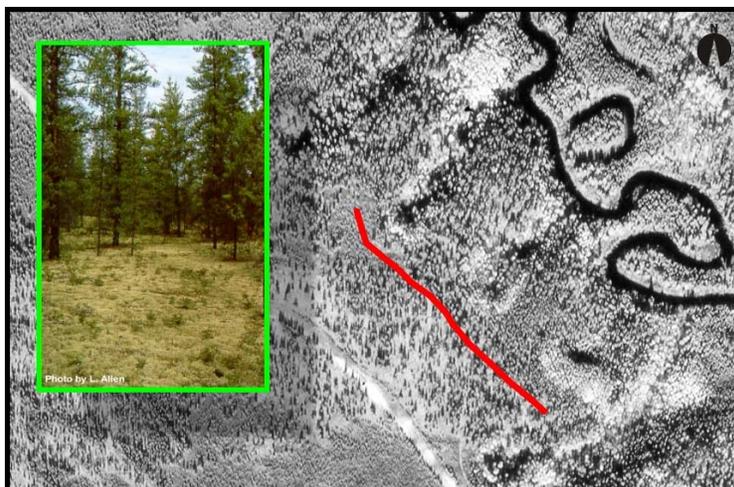
**Figure 10.** Transect line 6 - along a lake shoreline in Six Lakes area, just E of Richardson River Dunes WPP.



**Figure 11.** Transect line 7 - along the Richardson River shoreline, area between Maybelle River and Richardson River Dunes WPPs.



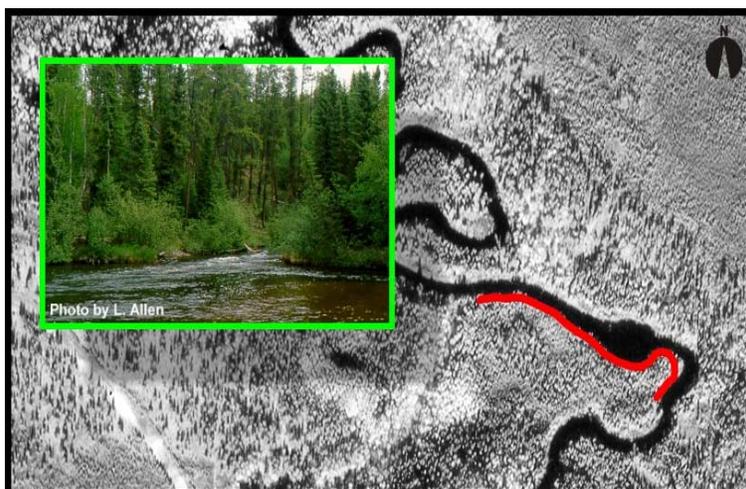
**Figure 12.** Transect line 8 - in a peatland, Maybelle River WPP.



**Figure 13.** Transect line 9 - in open jackpine forest above the Maybelle River valley, Maybelle River WPP.



**Figure 14.** Transect line 10 - on the slopes of the Maybelle River valley, Maybelle River WPP.

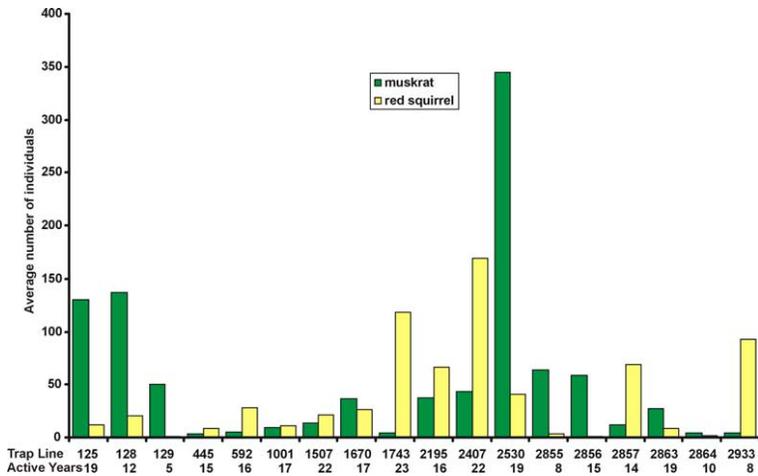


**Figure 15.** Transect line 11 - along the Maybelle River shoreline, Maybelle River WPP.

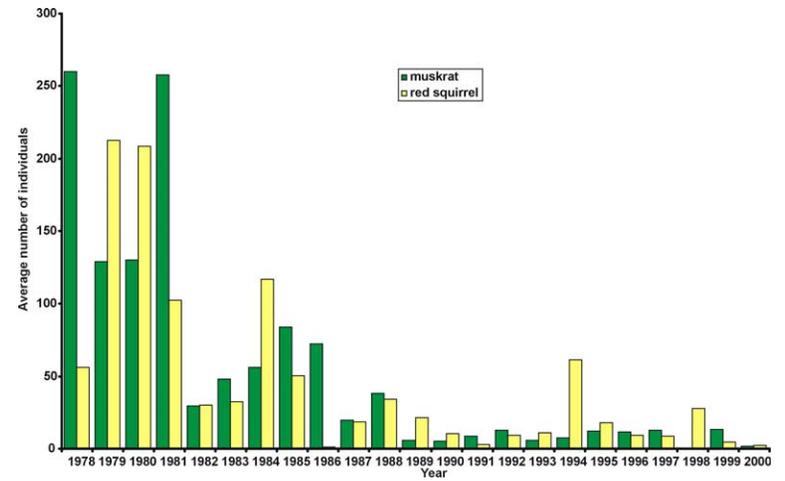
## **APPENDIX 2**

Graphs 1-14 in this appendix depict the trapping success relative to fur-bearing animals on both a yearly basis and an individual trapline basis. Trapping success data is available for the study area for the years 1978 to 2000, a period of 23 years. The graph on the left depicts the average number of individuals of a particular species taken on each registered trapline in the study area. It also shows the number of years each trapline was active. The graph on the right depicts the average number of individuals of a particular species taken each year on all traplines in the study area.

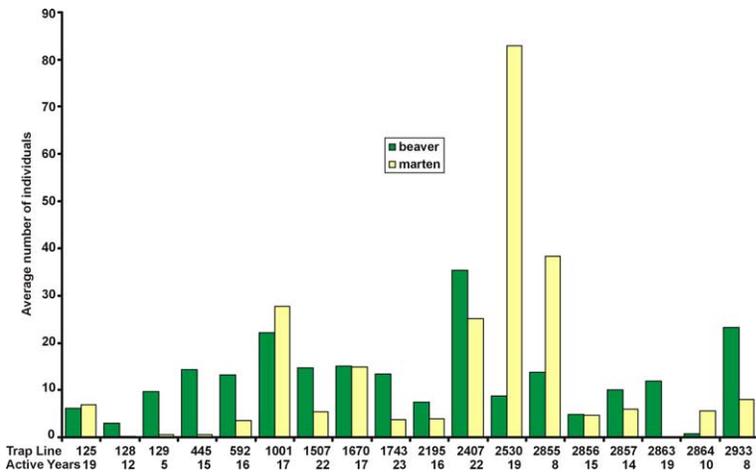




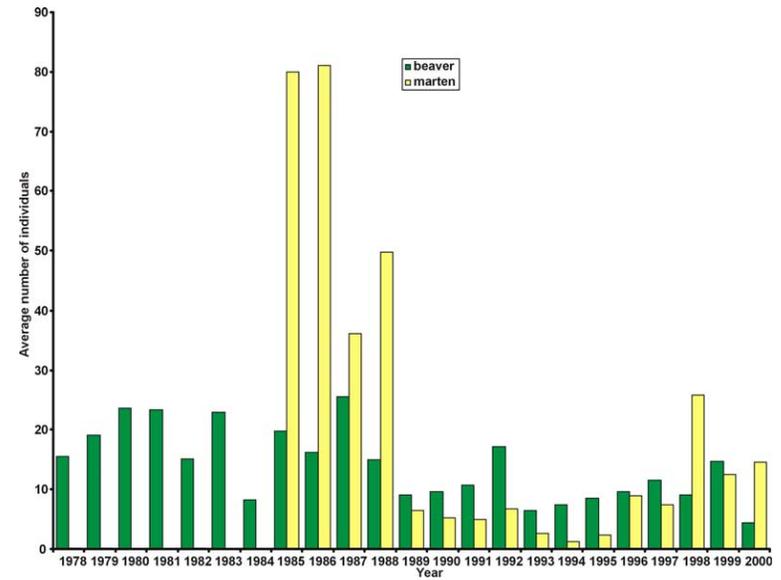
**Graph 1.** Average number of muskrat and red squirrel taken per trap line between 1978 and 2000.



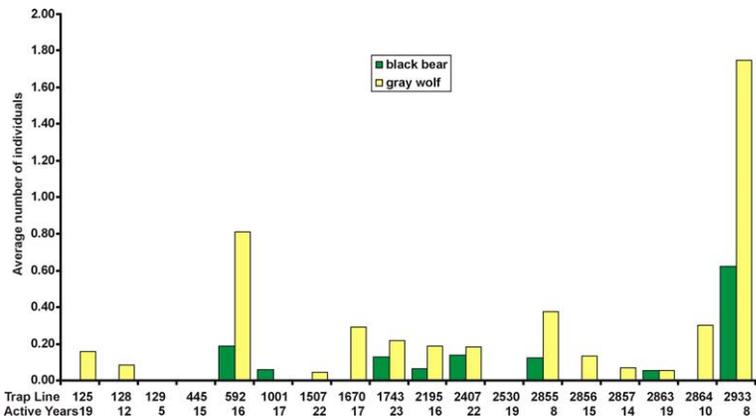
**Graph 2.** Average number of muskrat and red squirrel taken yearly between 1978 and 2000.



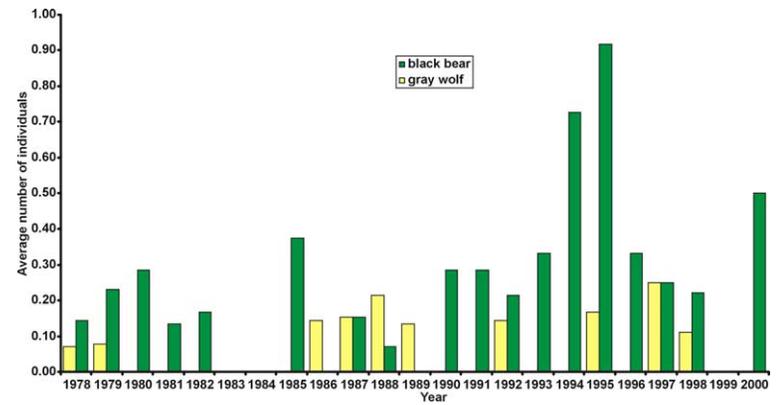
**Graph 3.** Average number of beaver and marten taken per trap line between 1978 and 2000.



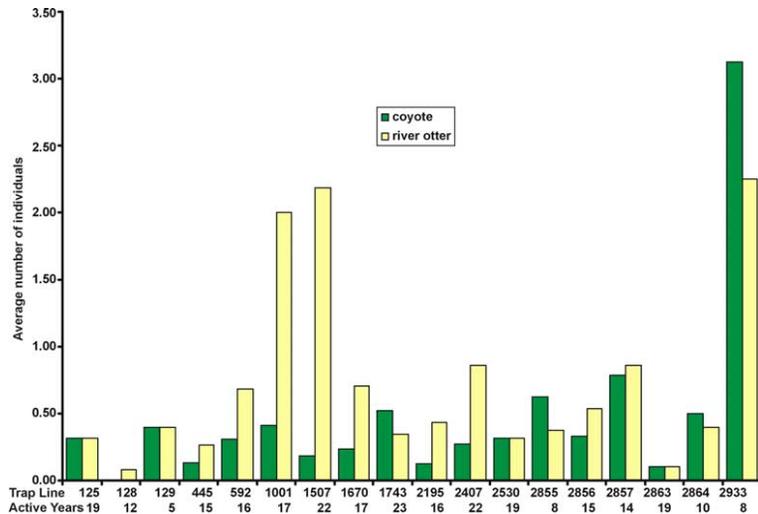
**Graph 4.** Average number of beaver and marten taken yearly between 1978 and 2000.



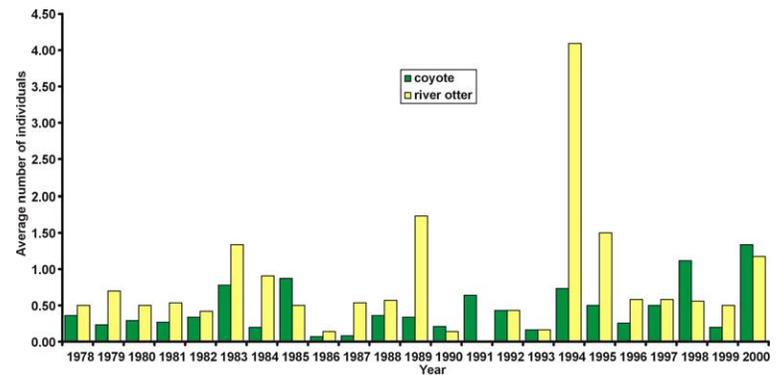
**Graph 5.** Average number of black bear and gray wolf taken per trap line between 1978 and 2000.



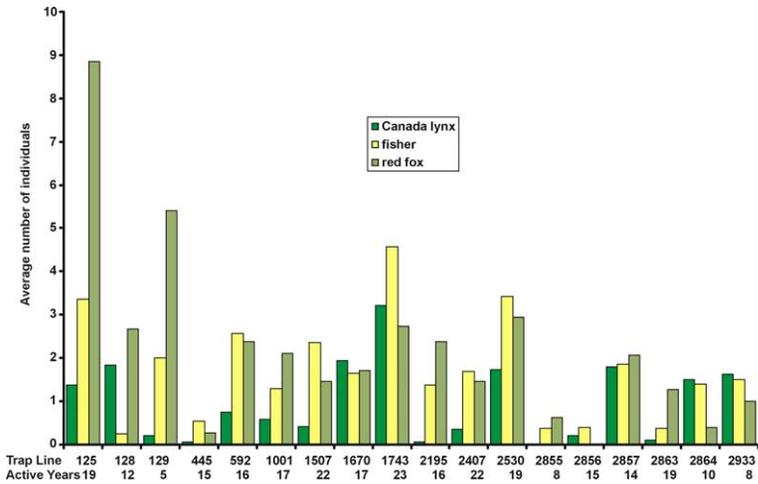
**Graph 6.** Average number of black bear and gray wolf taken yearly between 1978 and 2000.



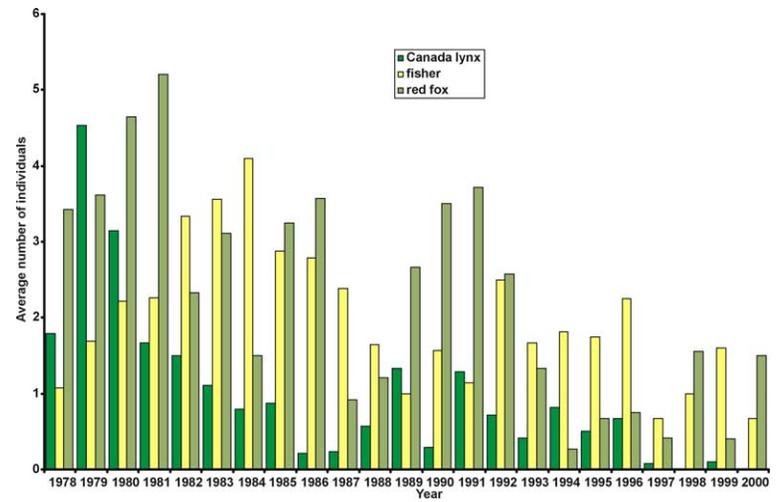
**Graph 7.** Average number of coyote and river otter taken per trap line between 1978 and 2000.



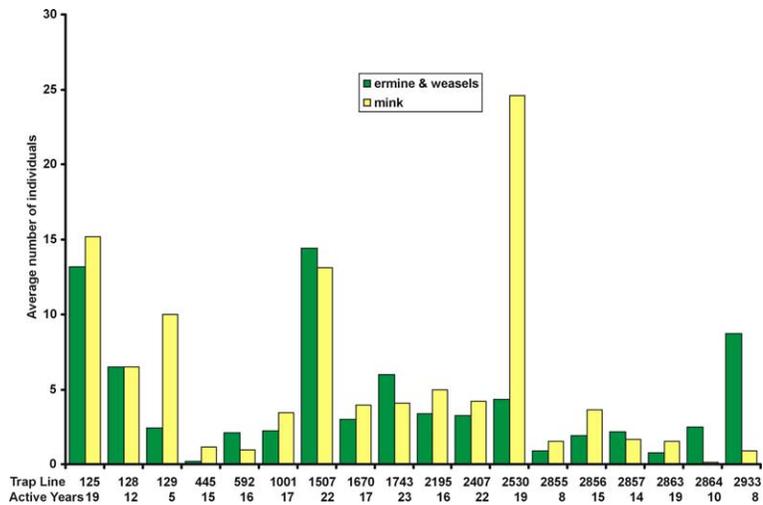
**Graph 8.** Average number of coyote and river otter taken yearly between 1978 and 2000.



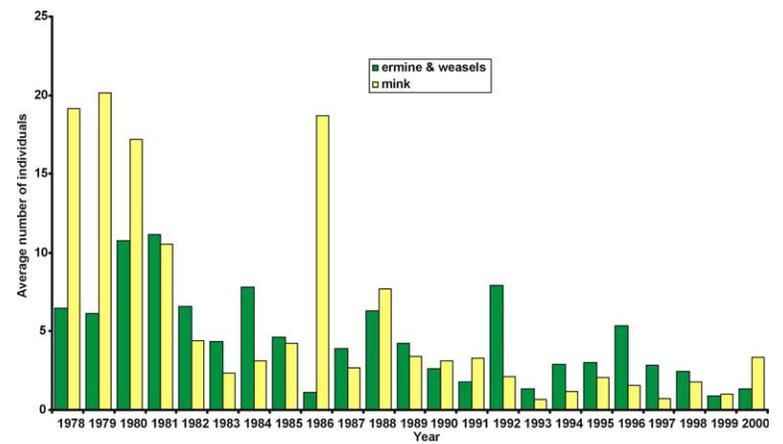
**Graph 9.** Average number of Canada lynx, fisher and red fox taken per trap line between 1978 and 2000.



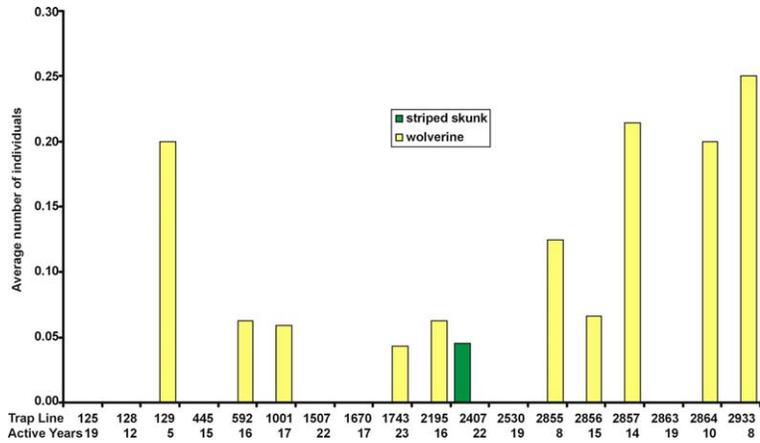
**Graph 10.** Average number of Canada lynx, fisher and red fox taken yearly between 1978 and 2000.



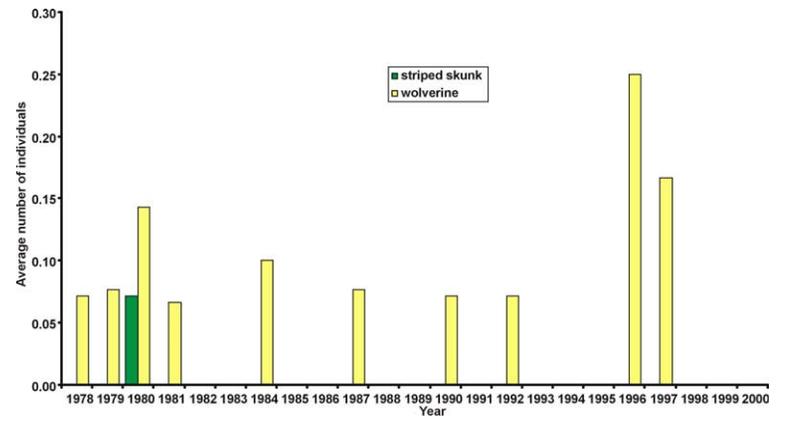
**Graph 11.** Average number of ermine, weasel (combined) and mink taken per trap line between 1978 and 2000.



**Graph 12.** Average number of ermine, weasel (combined) and mink taken yearly between 1978 and 2000.



**Graph 13.** Average number of striped skunk and wolverine taken per trap line between 1978 and 2000.



**Graph 14.** Average number of striped skunk and wolverine taken yearly between 1978 and 2000.

## **APPENDIX 3**

Species list of mammals that were captured or observed in this survey, commercially trapped on registered fur trap lines in the study area, or recorded in literature as confirmed (M. Landals 1978) or potential species within the three wildland provincial parks.



	Species		Richardson River Dunes WPP	Maybelle River WPP	Marguerite River WPP
1	<i>Sorex cinereus</i>	masked shrew	+		
2	<i>Sorex monticolus</i>	dusky shrew	+		
3	<i>Sorex palustris</i>	water shrew	+		
4	<i>Sorex arcticus</i>	Arctic shrew		+	
5	<i>Sorex hoyi</i>	pygmy shrew			
6	<i>Myotis lucifugus</i>	little brown bat			
7	<i>Myotis septentrionalis</i>	northern long-eared bat		+	
8	<i>Lasionycteris noctivagans</i>	silver-haired bat			
9	<i>Eptesicus fuscus</i>	big brown bat			
10	<i>Lasiurus cinereus</i>	hoary bat		+	
11	<i>Lepus americanus</i>	snowshoe hare	+	+	+
12	<i>Tamias minimus</i>	least chipmunk	+	+	
13	<i>Marmota monax</i>	woodchuck	+	+	
14	<i>Tamiasciurus hudsonicus</i>	red squirrel	+	+	+
15	<i>Glaucomys sabrinus</i>	northern flying squirrel			
16	<i>Castor canadensis</i>	beaver	+	+	+
17	<i>Peromyscus maniculatus</i>	deer mouse	+	+	
18	<i>Clethrionomys gapperi</i>	southern red-backed vole	+		
19	<i>Phenacomys intermedius</i>	heather vole			
20	<i>Microtus pennsylvanicus</i>	meadow vole	+	+	
21	<i>Microtus xanthognathus</i>	taiga vole			
22	<i>Ondatra zibethicus</i>	muskrat	+	+	+
23	<i>Synaptomys borealis</i>	northern bog lemming			
24	<i>Zapus hudsonius</i>	meadow jumping mouse	+	+	
25	<i>Erethizon dorsatum</i>	porcupine		+	
26	<i>Canis latrans</i>	coyote	+	+	+
27	<i>Canis lupus</i>	gray wolf	+	+	+
28	<i>Alopex lagopus</i>	Arctic fox			
29	<i>Vulpes vulpes</i>	red fox	+	+	+
30	<i>Ursus americanus</i>	black bear	+	+	+
31	<i>Ursus arctos</i>	grizzly bear			+
32	<i>Martes americana</i>	marten	+	+	+
33	<i>Martes pennanti</i>	fisher	+	+	+
34	<i>Mustela spp.</i>	weasel	+	+	+
35	<i>Mustela erminea</i>	ermine			
36	<i>Mustela nivalis</i>	least weasel			
37	<i>Mustela vison</i>	mink	+	+	+
38	<i>Gulo gulo</i>	wolverine		+	+
39	<i>Mephitis mephitis</i>	striped skunk	+	+	
40	<i>Lontra canadensis</i>	river otter	+	+	+
41	<i>Lynx canadensis</i>	Canada lynx	+	+	+
42	<i>Odocoileus hemionus</i>	mule deer			
43	<i>Odocoileus virginianus</i>	white-tailed deer	+	+	
44	<i>Odocoileus spp.</i>	deer	+	+	
45	<i>Alces alces</i>	moose	+	+	+
46	<i>Rangifer tarandus</i>	caribou	+	+	+

captured	observed	fur tapping data	M. Landals 1978	not detected
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