

Status and Habits of the Cougar in Manitoba

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Abstract. A cougar (*Felis concolor missoulensis*), collected at Stead, Manitoba in 1973, and 281 well documented sightings establish the species as resident in the province for the first time. Though there are cougar sightings from 1879 to 1975, the majority are recent (40 in 1974). Prior to 1940, the cougar was restricted to the grassland and aspen-oak transition of extreme southwestern Manitoba—within the ranges of mule deer and American elk. After 1940, these two prey species became rare and localized, and white-tailed deer became the dominant big-game animal, spreading far north into the boreal forest. Recent cougar distribution is closely associated with that of the white-tailed deer, an apparent doubling of the cougar's range. A rough estimate of the cougar population in Manitoba is 50, and it seems likely that some individuals have been observed in adjacent Saskatchewan, North Dakota, Minnesota, and Ontario.

Until recently, it was generally assumed that the cougar had been exterminated east of the Rocky Mountains, except for a small Florida population of between 50 and 100 animals (Wright 1972). Occasional sightings continued, however, in every Canadian province (e.g., Saskatchewan, White 1967; New Brunswick, Wright 1959, 1972) except Prince Edward Island and Newfoundland, and in many central and eastern states (e.g., Pennsylvania, Douthett 1969; Maine to Alabama, Wright 1972). Most reports (from non-biologists) were not taken seriously, and consequently, valuable information that should have been accumulating on this endangered species has been lost.

The objectives of this paper are to describe the history and present status of the cougar in Manitoba (and to a lesser extent in adjacent regions), relate its distribution in the province to prey and cover, and examine the animal's habits in this part of its range.

Early historical accounts offer little information on the presence of cougars in Manitoba. The fur trader, Alexander Henry, made no mention of this cat in his extensive travels throughout the southern part of the province and adjacent states during the years 1799 to 1808 (Coues 1897). A possible reference to cougars was the name, Tiger Hills, given by early settlers to a plateau situated south of the Assiniboine River between the Cypress River, Wawanessa, and Ninette.

The first accounts of Manitoba mammals by Thompson [Seton] (1886) and Seton (1909) did not include the cougar, but in a subsequent work Seton (1925–1928) listed seven localities in southwestern Manitoba where the animal had been seen or shot. A few additional records found their way into the literature, but despite the availability of a specimen taken just over the border in Saskatchewan in 1948 (Beck 1958), the absence of any authenticated Manitoba specimen in a museum resulted in this province being omitted from northern distribution limits plotted for the species by Young and Goldman (1946) and by Hall and Kelson (1959).

In 1973 a cougar was shot in a farmyard at Stead, 56 km northeast of Winnipeg. The specimen, which is now in the Manitoba Museum of Man and Nature, gives substantial support to the mounting evidence that Manitoba and adjacent regions of midwestern Canada and the United States support a resident cougar population, almost 1000 km east of the recently accepted range for the species.

Methods

Most of the early records from Manitoba were published by Seton (1925). Thereafter, reports were investigated and recorded by two former directors of the Manitoba Museum, L. T. S. Norris-Elye (1951) and his successor, Richard W. Sutton (1960). W. Harvey Beck, an assistant curator at the Manitoba Museum of Man and

Nature, started a card file on cougar records in 1968 to which were added records gathered by Charles H. Buckner, Federal Forest Biology Laboratory in Winnipeg. In 1972 the senior author initiated a program to obtain and record additional past and new cougar observations in order to document further the status of this species in Manitoba. At that time the cougar was not identified as a game species or as a predator and, if anything, was regarded as a rare transient. Letters and a preliminary report were sent to field staff of the Department of Renewable Resources and Transportation Services, requesting their cooperation in the project, and a questionnaire was sent to Provincial Game and Fish associations. No attempt was made to advertise broadly our interest in receiving further reports from the general public. Many reports were investigated further by a letter, telephone call, or personal contact with the original observer, in the hope of obtaining date, location, time, lighting conditions, length of observation, distance to animal, color, description, behavior, reasons for suspecting cougar, and number of observers. Most observers indicated a reluctance to publicize their observation for fear of inviting ridicule, and it was learned that a number of sightings had been reported to local authorities at an earlier date, but went unrecorded before our survey owing to a general skepticism regarding the occurrence of the cougar in Manitoba.

Finally, cougar data were requested from wildlife agencies, museums, and universities in Saskatchewan, Ontario, North Dakota, and Minnesota to compare trends of sightings and the extent of adjacent cougar populations.

This study is based on observations by people with a wide range of occupations and backgrounds. How credible are these sightings? Obviously, there is no way to prove the reliability of a report short of obtaining a specimen or photograph. Most reports accepted by us as valid and used in this study consisted of a good description of the animal, including its behavior, and pertinent details regarding the circumstances of the sighting. Our judgment was also based on other factors; for example, when a number of people saw cougars in the same region, unknown to each other, the evidence became more convincing. Other kinds of evi-

dence such as tracks, calls, and the presence of partly eaten wild or domestic prey, provided support for some records, but otherwise were not used to establish the occurrence of the species. Knowing that certain other species may be confused with the cougar, namely, deer, wolf, coyote, dog, and lynx, particularly if the observation is made at a great distance or under poor conditions, we made a special effort personally to check reports. Many sightings were rejected on the basis of insufficient evidence.

Results

Cougar Sightings

There are now records of 281 sightings of cougars in Manitoba for the period from 1879 to 1975, four prior to 1900, and including three in which the animal was allegedly killed (Table 1). From 1900 to 1950 there are one to seven reports per decade; however, 10 cougars were supposedly killed during those 50 years (Figure 1). Unfortunately none of these specimens was saved (several were exhibited for a time in local store windows), partly because the provincial museum was not established until 1932. Since 1950 there has been a great increase in the number of reports received, with 159 during the 1970s and 40 for 1974 alone. Numerous sightings have

TABLE 1—Number of cougars seen and reported killed in Manitoba from 1879 to 1975

Year	Number of sightings	Number of kills
1870-1879	1	1
1880-1889	1	1
1890-1899	2	1
1900-1909	7	4
1910-1919	1	1
1920-1929	5	3
1930-1939	6	2
1940-1949	4	0
1950-1959	27	0
1960-1969	68	1
1970	8	0
1971	14	0
1972	37	0
1973	35	1
1974	40	0
1975	25	0
Totals	281	15

undoubtedly gone unreported from earlier years.

Many observers supplied surprisingly good descriptions of the cougar. The following two reports, for example, are typical of many in our files: Murray Thompson, describing an animal he observed in Riding Mountain National Park in midafternoon in August 1972, wrote as follows: "The animal appeared to be tawny brown or light brown, about 4.5 to 5 feet [1.4–1.5 m] long, with a long, long tail like a piece of heavy rope. It had heavy limbs and large paddy feet, and its head appeared about two sizes too small for its body. The animal was seen walking down the road, then it crossed a ditch and disappeared into the bush. It seemed to pay little attention to the car."

In September 1972, RCMP Constable John Ireland noticed a road-killed deer in the ditch while he was on patrol on Highway 59 at Birds Hill Park, just 13 km northeast of Winnipeg. Returning at 0200 hours, he observed a cougar standing over the deer only 5 m away — so close that the whiskers on the cat's upper lip were clearly visible. Constable Ireland guessed the weight of the cougar to be about 35 kg. The cat looked into the headlights for several minutes before it ran a few metres, then came back and tried to drag the deer away. After two attempts failed, it ran off into the bush. The following morning the deer was found where it had been dragged 70 m into the bush; it was partly eaten around the rib cage and was covered with leaves — typical cougar signs. By the next day the deer had been all eaten except the vertebral column, head, legs, and skin.

Cougars Killed in Manitoba

On the night of 25 December 1973, three men investigated a commotion caused by a barking dog and disturbed cattle in the farmyard of William Kowalke at Stead, 56 km northeast of Winnipeg. A large animal was spotted with the flashlight and, believing it to be a wolf intent on the livestock, the men shot what turned out to be an adult cougar. The specimen was eventually obtained by the Manitoba Museum of Man and Nature (Cat. No. 4725), and is the first confirmed record of the cougar in Manitoba. The animal was a thin, 2-year-old male (aged by M. G. Hornocker, University of Idaho), measur-

ing as follows: total length, 2108 mm; tail length, 800 mm; hind foot, 292 mm; ear, 95 mm; testes length, 25 mm; weight, 43 kg. Male cougars (*F. c. missoulensis*) from western Canada average 73 kg and 2413 mm in total length (Cowan and Guiguet 1956).

There may have been at least 14 other cougars killed in Manitoba since 1879 (Table 1), but none has been substantiated by a museum specimen. A mounted cougar in the J. B. Hales Museum in Brandon may be the animal that was shot 19 km southeast of Brandon in the early 1920s, but this has not yet been proved. The following cougar kills are listed according to date: Pembina Hills (1879); "Plum Coulee in the Souris Country" [probably Plum Creek] (1887); Birtle (about 1895); Makinak (1901–1902); Elphinstone (1904); Brandon (two killed in 1904, skins on exhibit in general store but now lost); Duck Mountain ("early days"); Little Souris River, 19 km SE Brandon (early 1920s); Birtle (1922); Alexander (1926); Pendennis, 15 km N, 16 km W Brandon (early 1930s, skin exhibited in general store); Souris River Bend area, about 6 km N, 3 km E Margaret (1936–1937); 3 km N, 15 km W Hadashville (1969); 15 km S, 5 km E Stead (1973).

Season and Time of Sightings

Sightings were recorded from every month, and 220 could be assigned to particular seasons as follows: 40%, summer (June to August); 33%, autumn (September to November); 14%, winter (December to February); 13%, spring (March to May). These results are expected, since summer and autumn are the seasons when people spend the most time travelling on back roads and working on the land. In New Brunswick, Wright (1959) also reported sightings during every month, with 71% observed from June to November, compared to 73% in this study.

The exact time of sighting was recorded in 86 cases. Cougars were seen during every hour of the day and night; from 2100 hours to 0600 hours (sun generally at or below the horizon) there were only one to four reports each hour, whereas the peak periods were 1100 hours and 1600 hours (nine reports each) and 0800 hours (seven). There were 26 (32%) reports from 0700 to 1100 hours and 42 (50%) from 1400 to 2000 hours. Cougar activity periods vary according to prey

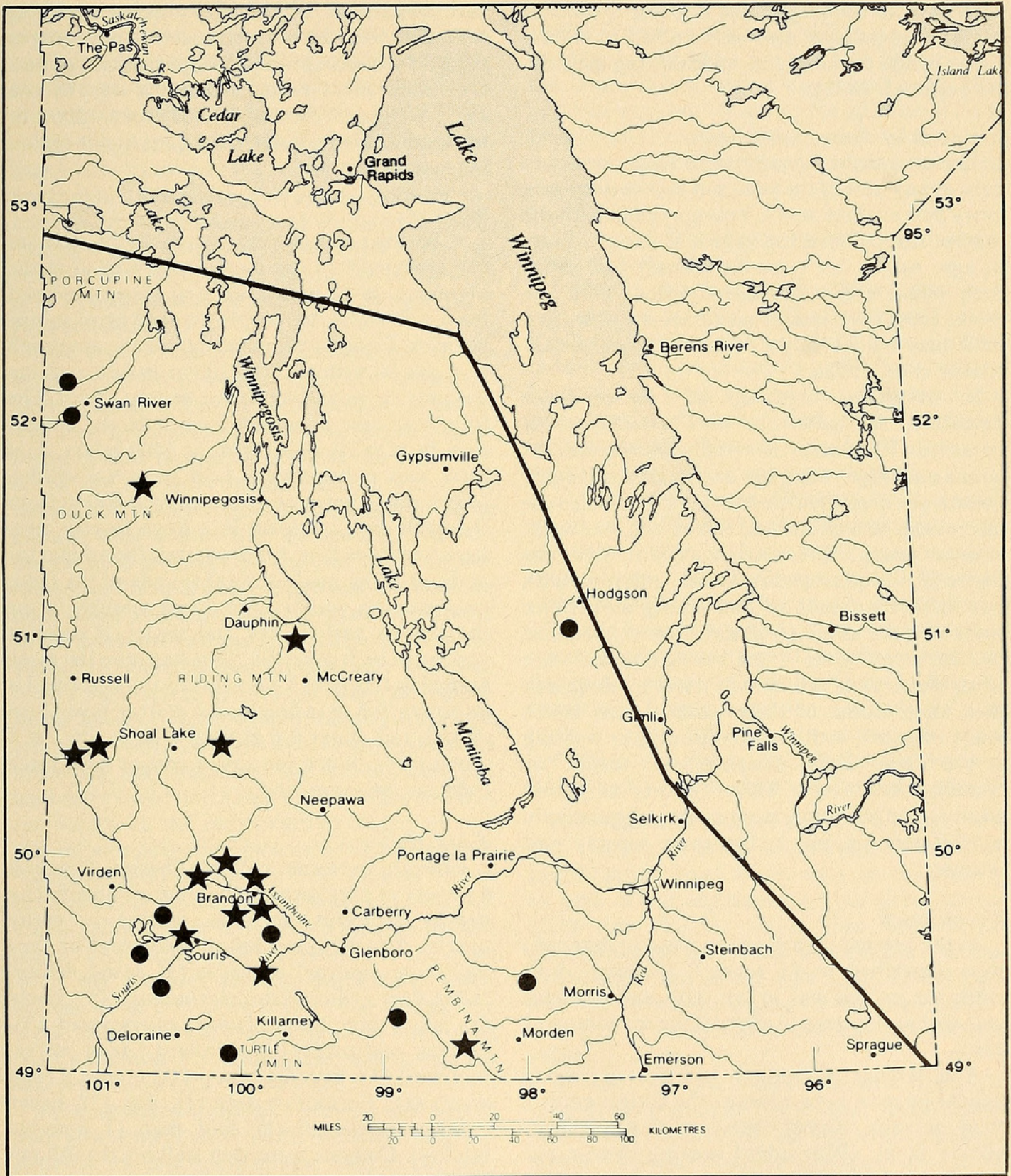


FIGURE 1. Map of southern Manitoba showing the maximum distribution of mule deer and American elk (solid line) (after Seton 1909), and cougar sightings (dots) and reported kills (stars) prior to 1940.

activity, and although most hunting is done at night, cougars have also been known to kill big game in the evening and midmorning (Seidensticker et al. 1973).

Sightings of Pairs and Young

The cougar may give birth to from one to six cubs at any time of the year, but breeds only once every two or three years. Young remain with the mother until almost full grown at about 2 years of age. Adults are typically solitary and avoid each other, except for short periods of a few weeks when two females may associate or when a male may be courting a female in heat (Seidensticker et al. 1973).

In Manitoba, sightings of two or more animals at the same time were reported on 14 occasions. Four cases involved pairs of adults, or adults and large young not distinguished as such; three cases of adult(s) and young (two adults and one young, two adults and five young, one adult and one young); three cases of an adult with cubs (twice of one adult and two cubs, one adult with one cub); two cases of two young alone; two cases of cubs alone (four cubs, two cubs); and two instances when single young cougars were observed, one of which was treed by dogs and then shot. Some of these observations lasted many minutes, with cougars running or walking across open fields, jumping over fences, or climbing into trees. Three reports of paired adult(s) and/or young were made independently by different people in the same vicinity and season.

Vocalization

In the present investigation, loud cougar calls were described in 15 reports, including four while the animal was in full view, and a cougar was seen in the area in eight of the remaining 11 cases.

A difference of opinion has existed among cougar experts as to whether the cougar emits a loud scream. Some observers (e.g., Seidensticker et al. 1973) admit hearing close-range vocalizations, but never roaring and screaming such as is abundantly described in the literature (Young and Goldman 1946; Barnes 1960). Although calls of bobcats (*Lynx rufus*) and owls have probably been ascribed incorrectly to cougars on some occasions, there is no doubt

that cougars are capable of producing terrifying calls, since they have been observed screaming in the wild and in captivity. It appears that cougars are rather silent except at mating time (Seton 1925; Wright 1959), and this may partly account for the fact that cougars are heard in one region but not in another.

Behavior

A peculiar aspect of cougar behavior, pointed out repeatedly in these reports as well as in the literature, is its indifference to being observed from a distance by people on foot or in motor vehicles. Cougars often permitted the approach of a car to within 10 to 100 m before walking leisurely or bounding to the nearest cover. The following case illustrates how bold the cougar may be. On 30 June 1974, at 1400 hours, Tim Sims was cultivating a field near Snowflake, Manitoba, when a cougar came out 400 m from the bush and lay down in a fresh furrow, perhaps to escape flies. Sims watched the animal for an hour as he made several rounds of the field, once passing within 12 m (close enough to see the cougar curl its lips and snarl). It did not appear to be frightened. Sims had seen the same animal in this field 3 days earlier and described it as brown, 0.8 m in height, 2.7 m from nose to tip of tail, tail about 0.6 m with a dark tip. On 8 August Mr. Sim's son saw a cougar with three cubs on the same land.

Food Habits

Cougars were seen stalking, chasing, or eating a variety of prey species, and were implicated (by nearby sightings, screams, tracks) in many others. Attacks (prey killed, wounded, or fleeing) were reported on cattle (13 cases), white-tailed deer (*Odocoileus virginianus*) (9), horse (3), snowshoe hare (*Lepus americanus*) (3), chicken and turkey (2), Mallard (*Anas platyrhynchos*) (1), hog (2), sheep (1), moose (*Alces alces*) (1), Formosan deer (1), dog (2), fisher (*Martes pennanti*) (1), and man (1 possible fatality). Cougars were seen stalking the following: cattle (3 cases), white-tailed deer (3), beaver (*Castor canadensis*) (1), pheasants (*Phasianus colchicus*) (1), and ravens (*Corvus corax*) scavenging on a muskrat (*Ondatra zibethicus*) carcass (1). Cougars were seen scavenging on a white-tailed deer carcass, a trapper's cache of

carcasses, a trapline (tracks and other sign indicated scavenging on a snared snowshoe hare, and killing and eating a fisher caught in a trap), and in a refuse dump. There were three instances of cougars observed drinking.

The Stead cougar had striped skunk (*Mephitis mephitis*) hairs in the digestive tract, and porcupine (*Erethizon dorsatum*) quills in the muscles of the forearms and shoulder regions. Traces of both species are often found in scats of cougars, and porcupines appear to be favored prey (Young and Goldman 1946; Wright 1959; Barnes 1960).

One report is of exceptional interest. In the summer of 1972, Walter Larocque herded 32 horses into an old pasture surrounded by bush at The Pas. In an abandoned house on the site, he found moose droppings all over the floor and blood on the door jamb, and concluded the moose had been chased into the house by some animal. One month later he noticed that two horses were missing, and the depredations continued until a total of six mares and one colt had been killed and eaten. The carcasses were found in the bush with all the meat stripped from the bones. It appeared that attacks were launched from a big elm tree that leaned over a path taken by the horses. The horses were herded into a wire corral and when two men went to check them the following morning, they had broken out. The men went to the north end of the pasture and met the horses on the run, followed closely by two tan-colored cougars which came to a halt, their "tongues sticking out of their mouths" from exhaustion of the chase. The larger cat crouched and crawled within 30 m before the men backed away. The horses were gathered and removed from the pasture. Horses, particularly colts, appear to be a favorite prey of the cougar; the large, nearby race of cougar formerly inhabiting North Dakota, *F.c. hippolestes*, was named for this reputation as a "horse killer."

Because many livestock losses go unreported and government field staff presently lack experience in identifying cougar kills or damage, there may be a larger incidence of cougar predation on livestock than is presently known.

There is a single reported case of a cougar stalking people in Manitoba, which ended in tragedy. The following account was published by V. W. Jackson (a University of Manitoba

zoologist) in the *Winnipeg Tribune* (14 February 1942): "Twenty years ago [1922] a mountain lion attacked a boy and a girl at Birtle, Man., killing the latter. When shot it was found to be blind and half-starved." A search for additional information on this case, including a local history of the area (Abra 1974), produced no substantiating evidence.

Habitat and Distribution of the Cougar and its Prey in Manitoba

Remarks on habitat in 255 reports were grouped as follows: 40% "wilderness" (true wilderness and heavily wooded regions with few roads or human habitations), 30% "mixed land" (agricultural lands and towns interspersed with large tracts of forest), and 30% "farmland" (cropland and pasture with forest cover restricted to woodlots and river valleys).

The pre-1940 records (Figure 1) cover an area of about 87 000 km² and are restricted to the grassland region and the aspen-oak transition (now largely farmland and mixed land) in extreme southwestern Manitoba. From 1941 to 1975 the cougar appears to have extended its range (Figure 2) northward into the boreal forest region and eastward into the Great Lakes - St. Lawrence forest transition (Figure 3). The species now inhabits an area of about 200 000 km² in the southern half of the province, more than twice its apparent former range.

Although the cougar accepts an extremely wide variety of prey species (e.g., mice, fish, grasshoppers, small birds, etc.), its residence in an area is still dependent on big game, particularly deer (Barnes 1960). "The range of the panther [cougar] has always coincided with that of the deer, and as the deer have flowed back over the eastern ranges, so has the panther returned to many of its old haunts" (Wright 1959).

In early historic times southern Manitoba supported abundant mule deer (*Odocoileus hemionus*), American elk (*Cervus elaphus*), moose, caribou (*Rangifer tarandus*), pronghorn (*Antilocapra americana*), and American bison (*Bison bison*). Rather surprisingly, of these species, only mule deer and elk have been found to play a role in the cougar's diet. Reported attacks or predation on the other four species are completely absent or restricted to a few isolated

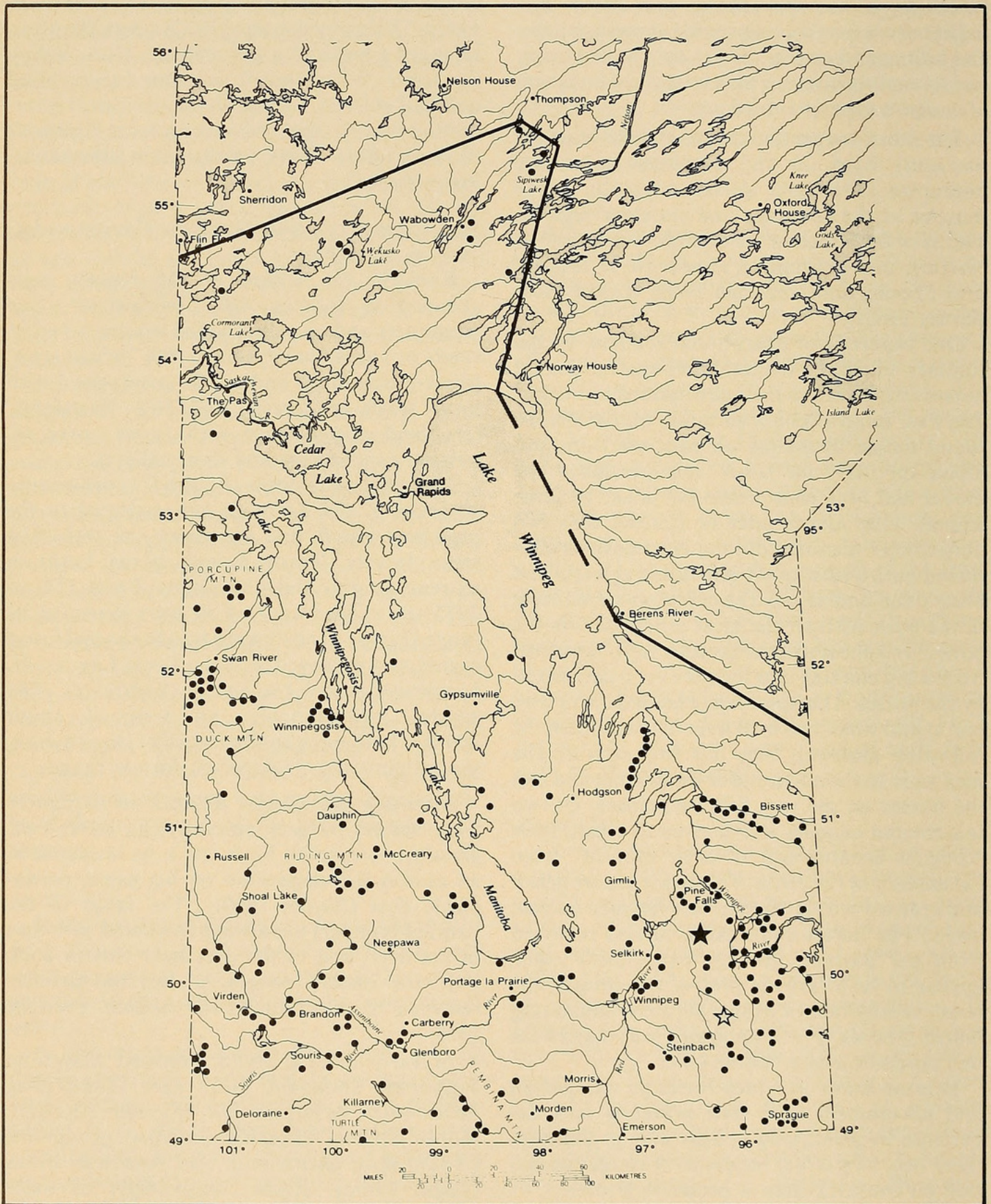


FIGURE 2. Map of southern Manitoba showing the maximum distribution of white-tailed deer (line) and cougar sightings (dots) from 1941 to 1975. The hollow star indicates the location of the 1969 cougar kill, and the solid star, the Stead specimen killed in 1973.

observations (Young and Goldman 1946; Barnes 1960).

Mule deer and elk recovered from overexploitation of the 1870s and 1880s in Manitoba, and both became numerous throughout the grassland and aspen-oak transition at the turn of the century (Seton 1909). By the end of the 1930s, however, both species were drastically reduced to relatively isolated populations, mostly in the Interlake region between Lakes Manitoba and Winnipeg, the rugged country of the Manitoba Escarpment (Pembina Hills; Turtle, Riding, Duck, and Porcupine Mountains), and the Carberry Sandhills. Probably as a result of competition with white-tailed deer, habitat destruction, and hunting, the mule deer has now been all but extirpated in Manitoba.

At present there are six herds of elk in Manitoba, totalling 5540, of which about 55% (2300–3000 animals) inhabit Riding Mountain. The Duck Mountain herd (1500–2000 animals) and the Porcupine Mountain herd (125–150) often move back and forth from adjacent rugged hill country in Saskatchewan. The Carberry Sandhills herd numbers about 150; the Mantagao herd west of Hodgson, up to 160; and the northern Interlake herd northwest of Gypsumville, 80. All but the latter two areas are regions of concentrated cougar sightings. Figure 1 illustrates the maximum ranges of mule deer and elk in Manitoba (Seton 1909). Cougar sightings from the late 1800s to 1940 are confined to the former ranges of these big-game prey species.

The white-tailed deer invaded Manitoba from the Red River Valley of Minnesota and North Dakota around 1881 and became common in many areas by the early 1900s (Seton 1909; Criddle 1929). By the 1940s this species had completely replaced the mule deer as the common deer of the province. According to provincial wildlife biologists, light hunting pressure and ideal habitat conditions of the 1940s allowed deer populations to peak in the early 1950s, perhaps numbering close to one-quarter million animals. Typical of most species invading new range, their numbers soon leveled off and then began to recede. Continued clearing of forest for farmland, severe winter climate, and heavy hunting pressure caused a steady decline through the late 1960s, culminating in the brutal winter of 1973–1974 which left a remnant herd of

less than 50 000 animals.

Figure 2 shows the white-tailed deer's maximum distribution (far into the boreal forest), and sight records of cougars from 1941 to 1975. About 85 cougar reports are outside the cougar's former range and the pre-1940 ranges of mule deer and elk, and closely approximate the distribution of white-tailed deer. North of The Pas and Grand Rapids, deer are scarce and localized. The poor correlation in eastern Manitoba north of Bissett is probably due to the absence of roads (and hence observers) in this wilderness region, as well as to the scarcity of deer and cougar along this northern boundary of their range. In interpreting the correlations of cougar distribution with that of mule deer, elk, and white-tailed deer, it should be kept in mind that population estimates of these prey species were not well known until recently, and that there are presently many more observers in the northern parts of these ranges than in the past.

The distribution of cougar records is closely associated with hilly country (e.g., Riding Mountain) and well-forested river valleys (e.g., Assiniboine River and its tributaries), especially in the grassland region. Sightings appear to be especially numerous over the years in certain locations — the region between Swan River and Duck Mountain, Winnipegosis, Brandon, the Pine Dock road along the west shore of Lake Winnipeg, Bissett, the Winnipeg River, and Sprague — most of which offer dense forest cover and concentrations of white-tailed deer.

Status of the Cougar in Adjacent Provinces and States

Transient cougars have been known to make incredibly long journeys in search of new range. Percy and Penelope Dewar reported (*in* Gregg 1974) one travelling 64 km in one night in British Columbia. Cougars are therefore effective colonizers, but will not remain in an area for long without other cougars nearby, even though each individual is solitary (Seidensticker et al. 1973). These facts may explain why cougars are occasionally observed by a number of people in an area far from known cougar range, and then are never seen again.

Resident cougars also travel over extensive areas. Seidensticker et al. (1973) followed five cougars over a full year in Idaho and found

home ranges were from 173 to 453 km². The vegetation-terrain/prey abundance-vulnerability complex was important in determining the range of a resident's movements through the seasons.

Since many of Manitoba's cougar sightings are within the animal's range capability of Saskatchewan, North Dakota, Minnesota, and Ontario, we examined cougar records in these adjacent regions. The following reports, which

include published and unpublished accounts, probably do not present a complete picture of the species' occurrence in the Midwest (Figure 3).

Saskatchewan

There are four records of cougars killed (authenticated by specimens) during the 1900s in Saskatchewan: Fort Walsh in the Cypress Hills, 1912 (Soper 1961); Kindersley, 1939 (Clarke

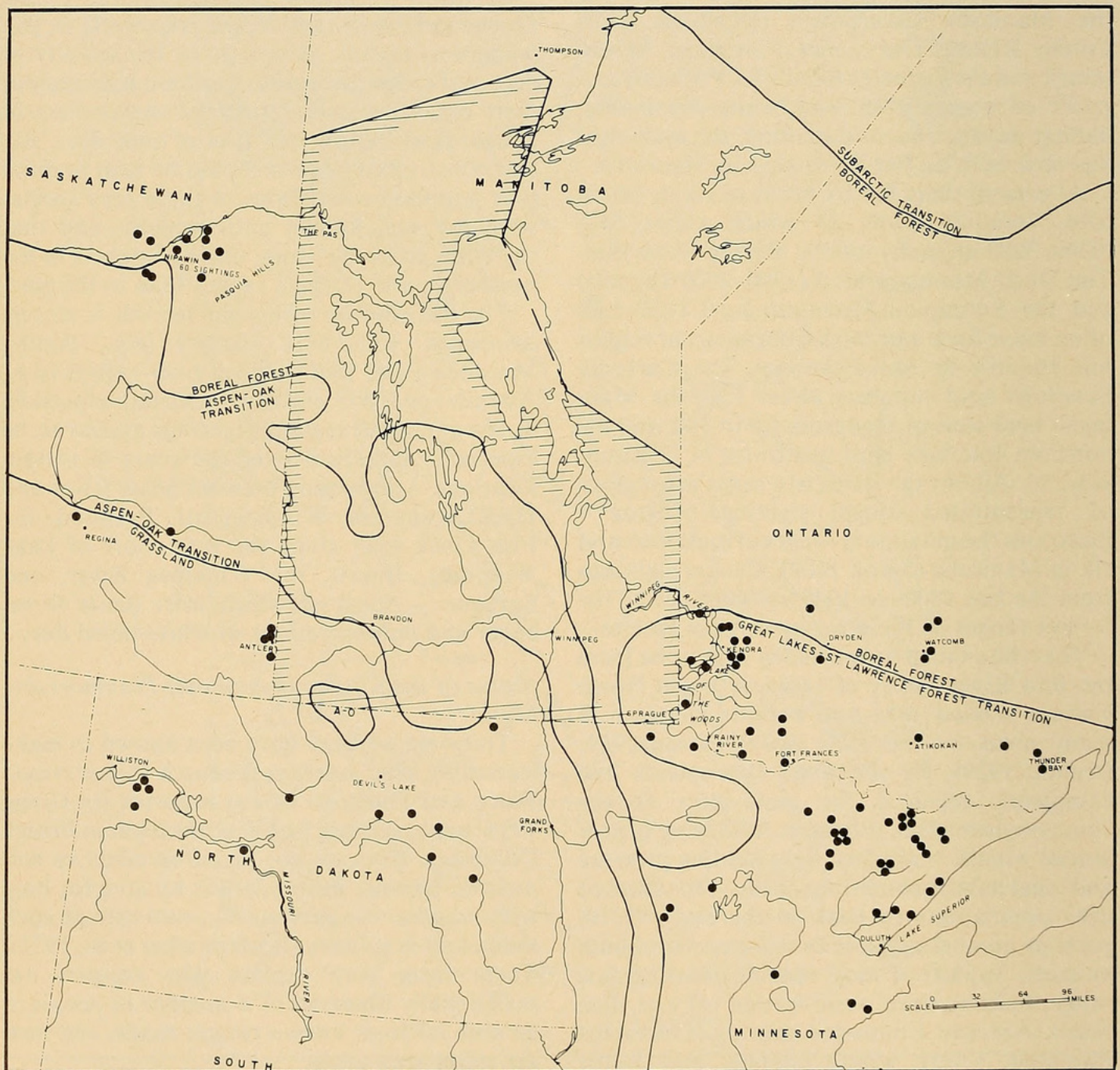


FIGURE 3. Map illustrating the recent distribution of the cougar in Manitoba (hatched area), cougar reports from Saskatchewan, North Dakota, Minnesota, and Ontario (dots), and the major vegetation zones of this region.

1942); Connell Creek in the Pasquia Hills, 1948 (Beck 1958); and Cutknife, 17 November 1975 (56-kg female, specimen now in the Saskatchewan Museum of Natural History) (personal communication, F. W. Lahrman). White (1963) believed that Saskatchewan afforded suitable conditions for cougars in two areas, the semi-arid grassland and forest of the Cypress Hills in the southwest, and the heavily forested region of the Pasquia Hills in east-central Saskatchewan adjacent to the Manitoba border. He recorded more than 60 sightings in the latter region, and in a subsequent paper (1967) described at least two kills in these hills, including the 1948 record of a cougar shot while caught in a wolf trap. Riome (1973) recorded an additional 10 sightings in the Nipawin-Pasquia Hills area from 1934 to 1973. These reports tie in to numerous records within 160 km of the elevated escarpment and valleys of adjacent Manitoba.

Further south are records at Regina (Brazier 1960), Qu'Appelle Valley north of Wolseley (White 1967), and four separate sightings including an adult and cubs, between 1970 and 1972 at Antler on the Saskatchewan border (White 1973). These latter sightings were within 16 km of six sightings in Manitoba during the years 1966, 1967, 1970, 1972–1974, and probably represent the same animals.

North Dakota

C. R. Grondahl (personal communication 1974), of the North Dakota Game and Fish Department, mentioned that an average of six reports of cougars are received per year, mostly from the western and northwestern parts of the State, remote areas with good populations of mule and white-tailed deer as well as domestic cattle.

The most recent authenticated cougar kills were reported by Bach (1943) in 1902, 40 km down the Missouri River from Williston: one was shot, and a second adult and a subadult were trapped. In the northern half of the state, files of the Game and Fish Department record sightings at Watford City (1965), Pick City (1959), Velva (1962), two in the Fort Totten Indian Reservation (both in 1959), and three in nearby areas — Maddock (1959), Grace City (1959), and Cooperstown (1960). One final sighting came from Walhalla (1969), reported by Paul Crary

(personal communication 1974). These records are within 8 to 190 km of the Manitoba border.

Minnesota

No cougar is known to have been killed in Minnesota in the 1900s, but Bue and Stenlund (1952) stated that there are many sightings which seem authentic. "The observations came from two general regions, the northeastern part of the state [heavily forested], and agricultural southwestern Minnesota." These northeastern sightings plus additional ones listed by William H. Longley (personal communication 1974 and 1975, including list supplied by Patrick Karns in 1964) of the Minnesota Department of Natural Resources, may be summarized as follows: one sighting in Koochiching County (1950), 17 in St. Louis County (1945–1974), nine in Lake County (1948–1962). These records come from the hilly and well forested region between Lake Superior and Manitoba, and range within 190 to 360 km of the border. About 200 km south of Sprague, Manitoba are three records from central Minnesota: Cass Lake, Cass County (1950); Itasca State Park, Clearwater County (1971); and Many Point Lake, Becker County (1956).

Closer to Manitoba are these: a sighting at Williams in 1954 (Magnus 1956), and two 1974 sightings at Salol and Northwest Angle (W. S. Adams, personal communication 1974). The last two records are both within 40 km of Sprague, Manitoba, and quite likely represent the same individual(s) seen around Sprague on six occasions from 1973 to 1975.

Ontario

No cougar is known to have been killed in Ontario during the present century, but there are numerous sightings during the last 22 years in northwestern Ontario, just north of Lake Superior. Dear (1955) mentions four records in the Thunder Bay area during 1953–1954. In 1966, C. H. D. Clarke, Chief of the Ontario Fish and Wildlife Branch, was quoted by Wright (1972, p. 96): "The other area [in Ontario] for which I give credence to reports [of cougars] is on the Manitoba boundary."

Most of the following records from Ontario were supplied by Ken J. Chambers of the Ontario Ministry of Natural Resources. In the Kenora District are sightings at Camp Robinson

(1959), Contact Bay south of Dryden (1975), four places near Watcomb (1966–1971), and 10 around Kenora (1961–1974). These Kenora-area reports are within 16 to 70 km of Manitoba, and likely represent the same cougar population occupying the Winnipeg River drainage and, in particular, the Whiteshell Provincial Park region of Manitoba where there are numerous sightings. The Stead, Manitoba cougar was killed only 82 km from the Ontario border.

Farther south, in the Rainy River District, are the following: a single 1965 record at Atikokan and a cluster of five others between Fort Frances and Lake of the Woods (1966–1972), 80 to 130 km from Manitoba and just across the international boundary from the numerous records in Minnesota.

Geographic Affinities of the Stead Cougar

Though one specimen is insufficient to make a definite subspecific determination of the local populations, it does shed some light on the geographic affinities of Manitoba cougars. Four races have been described from regions adjacent to the province. *Felis concolor cougar* occupied the northeastern quarter of the range in North America (from Wisconsin eastward) and was long thought to be extinct. But, it has survived in New Brunswick and possibly in other areas as well, and appears to be reinvading former territory (Wright 1972).

An extinct race, *F. c. schorgeri*, was described from central North America (Kansas to Minnesota) on the basis of a 100-year-old mounted specimen and two other skulls. The lack of specimens has prevented a satisfactory study of this race's taxonomic features or its former range. Recent surveys from the region have not used the name *schorgeri* for the race formerly occurring there (Jones 1964 (Nebraska)), or have accepted it with strong reservations (Bowles 1975 (Iowa)).

Felis c. hippolestes occurs to the southwest of Manitoba as far as the Rocky Mountains of Utah and Colorado. The closest specimen to Manitoba taken recently was one in the Black Hills of South Dakota in 1958, where the species remains an uncommon inhabitant of this rugged and remote area (Turner 1974). *Felis c. missoulensis* is a western race ranging from British Columbia to Saskatchewan and adjacent states.

The Stead specimen was sent to the Mammal Section of the National Museum of Natural History, Washington, D.C., and Wildlife Biologist A. L. Gardner returned the following identification: "We have examined your specimen of *Felis concolor* and have directly compared it with specimens of *F. concolor missoulensis*, *F. concolor hippolestes*, and *F. concolor cougar*. In our opinion, your specimen is much closer to *F. concolor missoulensis* than it is to any of the other named forms. The broadly flaring zygomatic arches, the large auditory bullae, large skull, and the color pattern of the skin are characters that are found in *F. c. missoulensis* but are not matched in this combination in the other named subspecies." Whether this race originally inhabited or recently invaded Manitoba is of course not known without earlier comparative specimens.

Discussion

The cougar has been characterized as a shy, secretive creature, and many outdoorsmen have spent a lifetime in the western mountains of North America without ever seeing a cougar that was not treed by dogs. In the Rocky Mountains of Idaho, Seidensticker et al. (1973) seldom saw an animal while he was radio-tracking; even at 180 m cougars sneaked away or froze until the investigators passed. Cougars did not avoid the sign of man, but made short-term shifts in their home ranges, depending on the intensity of human disturbance. Conversely, the literature on cougars is full of accounts describing cougar sightings; indeed, most of what is known about this animal comes from such chance encounters.

Several explanations are possible for the large numbers of Manitoba observations. For decades cougars on the western open range and in the mountains were hunted under the bounty system; only recently have they been afforded relief through management as a big-game animal. Even today, only Florida, New Hampshire, New Brunswick, and Manitoba offer this species complete protection. It is possible that individuals from the western regions may be more secretive than their counterparts in areas like Manitoba where they are seldom pursued by man or dogs.

Thousands of kilometres of backroads (many new) with limited traffic in wilderness and mixed

lands of Manitoba offer cougars easy travel routes and excellent hunting grounds for the deer that are also attracted to roadsides (e.g., six reports on file were of cougars in active pursuit of deer along roads). More people travelling on an ever-expanding network of backroads increases the probability of such a rare event as sighting a cougar. In agricultural regions, cougars crossing flat open areas from one woodlot to another may be spotted from a long distance (particularly transients traversing unknown lands), unlike in rolling or mountainous country where visibility is more restricted.

During the 1970s, over 150 cougar sightings were reported in Manitoba. This should not be interpreted as representing 150 different cougars, since it appears that in many cases the same individual or family was observed a number of times. For example, within 40 km south of Swan River, cougars were seen by different people on seven occasions from the summer of 1971 to the fall of 1972, two instances involving an adult with two cubs.

Though the availability of specific prey species has changed in the last 60 years (mule deer and elk to white-tailed deer), there has been no period, perhaps with the exception of the last few years, when there existed a shortage of important wild prey, not to mention the continual easy access to domestic livestock. Abundant food and cover might imply relatively stable numbers of cougars per unit area in southern Manitoba during this century. The influx of white-tailed deer, however, throughout the former range of mule deer and elk, and far into the boreal forest, apparently has allowed the cougar to expand its distribution to perhaps more than twice its pre-1940 range. In the last several decades the cougar population in Manitoba has probably been larger than at any other time, and it may still be expanding at some localities. This hypothesis agrees with White's (1967) view that the turning point in the status of the cougar in Saskatchewan was in the late 1940s, when it changed from being an extremely rare animal and began expanding its range. Our estimate of recent (1970s) numbers of cougars in Manitoba is about 50, based on the wide distribution of reports of single animals and family units. The presence of females with young confirms the existence of a resident population, since only after establishment of a

home range does the cougar end its transient phase and enter the reproductive phase of its life (Seidensticker et al. 1973).

The decline of the deer herds in Manitoba, particularly in the 1970s, to perhaps only 20% of their peak abundance in the 1950s, must have affected cougar numbers and movements. The great increase in cougar sightings in recent years may partly reflect this carnivore's wider forays in search of its favorite prey, and its attraction to livestock. The continued existence of cougars in Manitoba, as elsewhere, is intricately bound to the proper management of white-tailed deer and the maintenance of suitable habitat.

The cougar was given protection in Manitoba as a rare animal through a regulation to the Wildlife Act passed on 7 January 1974. The Regulation states: "Except under authority of a permit issued by the Minister, no person shall hunt, kill, take or capture a cougar." Moreover, a person accidentally trapping a cougar must report to provincial wildlife authorities and surrender the animal since, under The Wildlife Act, the carcass is Crown property. The cougar may, however, still be taken by a farmer or stockman to protect his animals if it can be shown that the animal has actually endangered livestock.

Reports from certain western and southwestern states show an upsurge in known populations of cougars, e.g., they have doubled in California in the past decade (Williamson 1973), and there is also a renewed interest by resource agencies in determining the status and ecology of this species. In Manitoba, limited steps are now being taken to attempt the capture and radio-tagging of cougars. The results of the present study will hopefully provide a further stimulus to individuals and wildlife agencies in other regions, especially where the cougar is not well known, to investigate and record observations of what Young and Goldman (1946) called, this "mysterious American cat."

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Almost all that is known about the cougar in Manitoba is based on observations made through accidental encounters by a large number of persons. We are indebted to these people, and others who directed our attention to them, for providing the basis of this report.

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