Conservation Biology Research Grants Program
Natural Heritage & Nongame Research Program
Division of Ecological Services
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DISTRIBUTION OF THE SPOTTED SKUNK (*Spilogale putorius*) IN MINNESOTA

a final report submitted to
The Minnesota Department of Natural Resources
and
The Zoological Society of Minnesota

by

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January 20, 1994

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Abstract

Spotted skunk (*Spilogale putorius*) populations have appeared to steadily , decline over the last 50 years in Minnesota. In January 1993 a study to determine the status and distribution of this species in Minnesota was undertaken by the Minnesota Department of Natural Resources' Nongame Wildlife Program. A "Wanted" poster was developed and distributed across the state to solicit information from the public and from various agencies and institutions about this species' current distribution. Trapper records reporting. spotted skunk takes from the last 5 years were reviewed. Information regarding the survey was released to the press, and ads we're run in magazines and newsletters. Letters requesting information were sent to all licensed furbuyers in the state, and to several museums and universities around the midwest . A map showing the species' current distribution by county was developed based . on these data, and habitat types where skunks were seen were recorded. Efforts were made to verify spotted skunk sightings by telephone calls, and by various trapping efforts in counties with strong reports. Potential areas to search for spotted skunk populations were found. Because of the species apparent rareness, we recommend that the spotted skunk's status be changed from "Special Concern" to "Threatened".

Introduction

Status

The spotted skunk (*Spilogale putorius*) was first recorded in Minnesota in, Winona County in 1914 (Coffin and Pfannmuller, 1988). Its range expansion northward was probably facilitated by a combination of favorable climatic . changes and human activities, such as land drainage, agricultural practices, construction, and the elimination of other predaceous animals which may have. functioned as competitors and or predators of spotted skunks (VanGelder, ,1959). By 1945 it was taken regularly in much of the state, with the exception of the northeast corner and the westernmost counties between Big Stone and Polk counties (Figure 1, Hazard 1982). In 1946, the state's spotted skunk population was estimated at an all time high, with 19,446 animals harvested that year (Johnson et al, 1967): The following year, however, the population appears to have sharply declined, with less than 3000 animals harvested (Johnson et al,. 1967). For the next 18 years, the estimated number of animals harvested annually remained below 3000 (Johnson et al, 1967). Then, in 1965, the yearly harvest estimate dropped below 1000 and has stayed below that number to the present time (the number actually harvested ranged from about 400 to one animal), with the exception of one year, 1982-1983, when the number was estimated at 1000 (Johnson et al, 1967; Joselyn, 1977; Landwehr, 1982; and Dexter, 1992).

Spotted skunk populations appear to be declining across the Midwest, where the species had once been quite abundant. The spotted skunk is now listed as endangered

in Missouri, and as threatened in Kansas and Iowa. It is also listed as "a species of special concern" in Montana, a "species in need of conservation" in Nebraska, and is considered "rare" by the states of North. Dakota and Oklahoma. Its status is unknown in Louisiana, South Dakota, Mississippi, Arkansas and Texas (Mead, 1991). In Minnesota, the species was given "Special Concern" status in 1984, due to its continuing decline. While this status confers no protection, it does point out the uncommonness of this species and highlights the need to monitor populations for status and distributional information.

In January 1993, the Minnesota Department of Natural Resources' Nongame Wildlife Program decided to conduct a survey on the status and distribution of the spotted skunk in Minnesota. This work was supported by a grant from the Zoological Society of Minnesota, and by the Minnesota Nongame Wildlife Fund.

Methods

Poster Survey

Given the relative rarity of the spotted skunk in Minnesota, along with a very sparse data base regarding the animal's current distribution, a "Wanted" poster was chosen as the principal survey method. It was thought that this method could reach the widest number of people and possibly identify an "expert" group for the spotted skunk, that is, a specific group of people that have detailed knowledge about this species' distribution and abundance, such as trappers, farmers, etc.

In April, the poster was developed and the Minnesota Department of Natural Resources (MN DNR) 800 number was provided for the submission of reports . A time limit of 5 years was given for the sighting information requested (reports were recorded from 1988 on), in an attempt to weed out and diminish the number of reports potentially impossible to verify or simply too old to be worth investigating. About 1500 posters were distributed in May to wildlife offices, natural resource agencies, libraries, museums, universities, parks and county offices across the state.

Press Release

Concurrent with the distribution of the poster, a press release was distributed to statewide media, and Richard Baker was interviewed on Minnesota Public Radio regarding the survey. There was also an article published about the survey in the MN DNR Volunteer magazine, and an ad was run in the Minnesota Trapper's Association Newsletter requesting sighting information from the last 5 years.

Reviewed MN DNR trapper records from 1988-1992,

All trappers who reported to the MN DNR that they trapped spotted skunks during 1988-1992 were called in an attempt to verify reports and to get location data on animals taken. Other trappers who had not reported taking skunks but who had reputations as very knowledgeable about the state's fauna were also called.

Furbuyer survey

Letters were sent to all licensed furbuyers in the state asking for any information on current spotted skunk distributions. We also offered $10 to any furbuyer who could produce a pelt or carcass taken in the last 5 years, provided that he or she could supply location information.

Museum and University Mammal Collection Survey

Letters were sent to 17 universities and museums in Minnesota and the midwest, with a request for information on any specimens these institutions may hold that were collected in Minnesota.

Habitat Information

All individuals reporting sightings observed between 1988 to 1993 were questioned regarding the habitat type in which they saw the skunk, and this information was recorded.

Follow up visits and verification of reports

Attempts were made to verify promising reports in 4 counties: Hennepin, Wright, Scott and Murray. Both Tomahawk box traps and camera scent stations (Deerfinder) were used in an effort to document spotted skunk presence. The box traps were set over a 2 week period in July for a total of 184 trap nights (1 trap night equals 1 trap set for 1 twelve hour period from 6:00 p.m. to 6:00 a.m.), and were baited with either sardines or canned cat food. Traps were set roughly 100 meters apart in areas where spotted skunks were reported to have been seen and where they were believed to be denning. The camera scent stations were used in the months of October and November at eight different sites. A "trap site" usually had 4 - 6 cameras spaced roughly 150 to 300 meters apart, and again were in areas where spotted skunks sightings were reported. The cameras were out for 3 to 5 nights. Fatty acid scent tablets were used to attract animals to the camera stations. Cameras were set on tripods and angled at the ground to pick up small and-mid sized mammals. The cameras were triggered by an infrared sensing device that picked up an animal's body heat.

In addition to our trapping effort, the Fish and Wildlife Service in Ottertail county had an ongoing predator control operation in place during 1990-1993. They were intensively trapping in their waterfowl management areas in spring of 1993, targeting raccoon, red fox, skunk, Franklin's ground squirrels and badger. They were aware of our search for spotted skunk populations, and were looking closely for signs of this species in their management area.

We also tried to retrieve roadkill animals.

Results

Spotted skunk sightings in the last 5 years

The poster survey and the trapper records from 1988-1992 produced a total of 72 possible spotted skunk sightings in the last 5 years. The poster survey produced 56 of these reports, which came in between late May of 1993 and early January of 1994. Reviewing the trapper records produced only 6 reports that could be verified. However, there were an additional 10 reports that could neither be verified nor ruled out, because the trapper either could not be reached, or he could not remember the animal that he reported trapping (Table 1). Each report was rated after talking with the individual reporting the sighting (or after several unsuccessful attempts were made to reach an individual), and a map of the skunk's present distribution in Minnesota by county was produced (Figure 2). The location of the symbol in the county does not indicate the precise location of the sighting; it indicates only that a sighting was recorded in that county.

Of the 72 reports, 11 were roadkills, and 13 were animals killed by the persons reporting the sightings.

Habitat

Each of these reports was categorized by the habitat type in which the animal was seen, if known (Table 2). The majority of the sightings (about 60%) were seen by individuals driving on a road along a woodland edge or near farmland.

Trapping and specimens

The trapping efforts in Wright, Hennepin, Scott and Murray counties did not record spotted skunk presence. However, many other small mammal and carnivore species were picked up, and we felt our methods were quite effective in sampling the diversity in an area (Table 3). The trapping efforts by the Fish and Wildlife Service in Ottertail county did pick up 2 spotted skunks, one male caught in 1990 which was euthanized and pelted by the trapper, and one caught on 2 consecutive days in 1992 in a box trap, sex unknown. This animal was released unharmed on both occasions. No spotted skunks were caught in 1993, though trapping efforts remained as intensive.

Two other specimens were collected or otherwise documented in 1992. One was a roadkill in Minnetonka (Hennepin county), which was given to Dr. E. Birney (University of Minnesota; Department of Ecology, Evolution and Behavior) and prepared as a specimen by L. Wires. That specimen is currently housed in the mammalogy collection at the University of Minnesota: The other specimen' documented was a roadkill seen by L. Wires in the summer of 1992 in Medina (Hennepin County). This specimen was not retrieved because Wires was on horseback when she saw it and was unable to store or carry it.

Ad in Minnesota Trapper's Association Newsletter

We received no replies to the ad in the Minnesota Trapper's Association Newsletter. The majority of the trappers we spoke to who either incorrectly reported a spotted skunk or had not reported one at all commented that they had not seen a spotted skunk in Minnesota in the last 15 years.

Furbuyers

Of the 63 furbuyers we wrote to, only 2 responded; Both of these furbuyers responded similarly: neither had seen a spotted skunk in the last 15 or so years.

Museums and Universities

Of the 17 museums and universities we wrote to, 7 replied (Table 4). None of these held specimens of Spilogale putorius that had been collected in Minnesota. However; one university, the University of Wisconsin at Madison, had 2 specimens that had been collected in Wisconsin in counties adjacent to Minnesota, Polk county and St.Croix county. The specimens were collected in 1949 and 1960, respectively. These counties are across the St.Croix river, and on the Minnesota side would be closest to Chisago and Washington counties, counties where township specimens exist and county records are documented.

Discussion, and Conclusions

Of the 72 reports, 53 were verified and 43 fell in categories. ranging from "specimen obtained" to "promising". But a population of animals was not found. Fundamental to further conservation efforts for this species will be finding a population of animals in the state. The trapping effort we made in the 4 counties listed above was not intense, due to very limited resources. However, the camera scent stations proved to be a reliable survey method for small to midsize mammals. The work done in this study lays the groundwork for locating an extant population of animals, which should be the next step in attempting to conserve this species in Minnesota.

Several areas were identified as potential trap sites, and a number of individuals who reported probable or promising sightings have offered to take us to the site where the animal was seen: There are 4 pockets in particular where trapping efforts should be made in an intense fashion.

The block composed by Wright, Hennepin, Scott, Sibley, Rice and Steele counties (Figure 2), is in the species historic range and may form an island where populations are persisting and where the possibility of genetic exchange may be facilitated by a travel corridor. Twenty one of the reports came from these counties, and 17 of these were either "specimen obtained", "probable" or "promising". Additionally, 4 of the reports from Hennepin county were within approximately one mile of the road kill that was picked up in Minnetonka.

Though no reports were obtained from Todd county, the Ottertail, Todd and Morrison block is promising. Very good reports were obtained in Ottertail and Morrison, ranging from "specimen obtained" to "probable" and "promising" (Figure 2).

The Nobles, Murray and Rock county block shows a density of "probable" reports, and being so close to the Iowa border may very well have persisting populations (Figure 2).

Efforts should also be made in the southeastern corner of the state in the Winona-Fillmore area, as there were "probable" reports from this area along with unverified trapper reports (Figure 2).

While individual trappers proved very helpful, trappers as a group did not turn out to provide the knowledge base that they have provided for many other species. This is at least partly because, as a furbearer, the civet cat appears nearly worthless; there is no market for it other than as the occasional curio item. But it is also due simply to the animal's rareness; trappers just aren't encountering the civet with any frequency.

Small farmers were the apparent "expert" group for this animal. A number of them had civet cats on their farms at one time or another, and their farms provide choice habitat with good prey, especially if the farmer stores ear corn in cribs, and utilizes other practices which support potential prey items for the skunk. A list of small farmers in the state, especially in the southern half, should be put together, and a mailing sent out to these individuals to inquire if they have seen spotted skunks on their farms.

Most people still think of this species as "civet cat". "Spotted skunk" often confused people, and many of the reports that were not included on the map were reports of juvenile striped skunks. If another mailing were done, or another survey, we recommend that the term "spotted skunk" appear nowhere in the writing, nor should there be any comparisons to striped skunk when describing the animal. We feel this will help avoid confusion and the incidence of numerous false reports.

Since we were not able to locate a population of spotted skunks, and talks with trappers and wildlife professionals often resulted in the comment that a civet cat had not been seen in 10 to 20 years, the species appears even more rare and in greater need of protection than its current status of "special concern" indicates. With no knowledge of a reproducing population anywhere in the state, it seems a very real possibility that the species may soon become endangered in part or all of its range in Minnesota. Because of this, we are recommending that the species status be upgraded to Threatened. This status would secure protection for the species; which,

at this point, is an integral . conservation measure to undertake. Though right now we have no idea of spotted skunk population numbers, we suspect existing populations are quite small and fragmented. Thus; removing any individuals could be potentially detrimental to the population as a whole: Additionally, the move to "Threatened" status may help encourage funding for further distributional and ecological studies, studies which would provide crucial information for implementing successful conservation strategies for this species in Minnesota.

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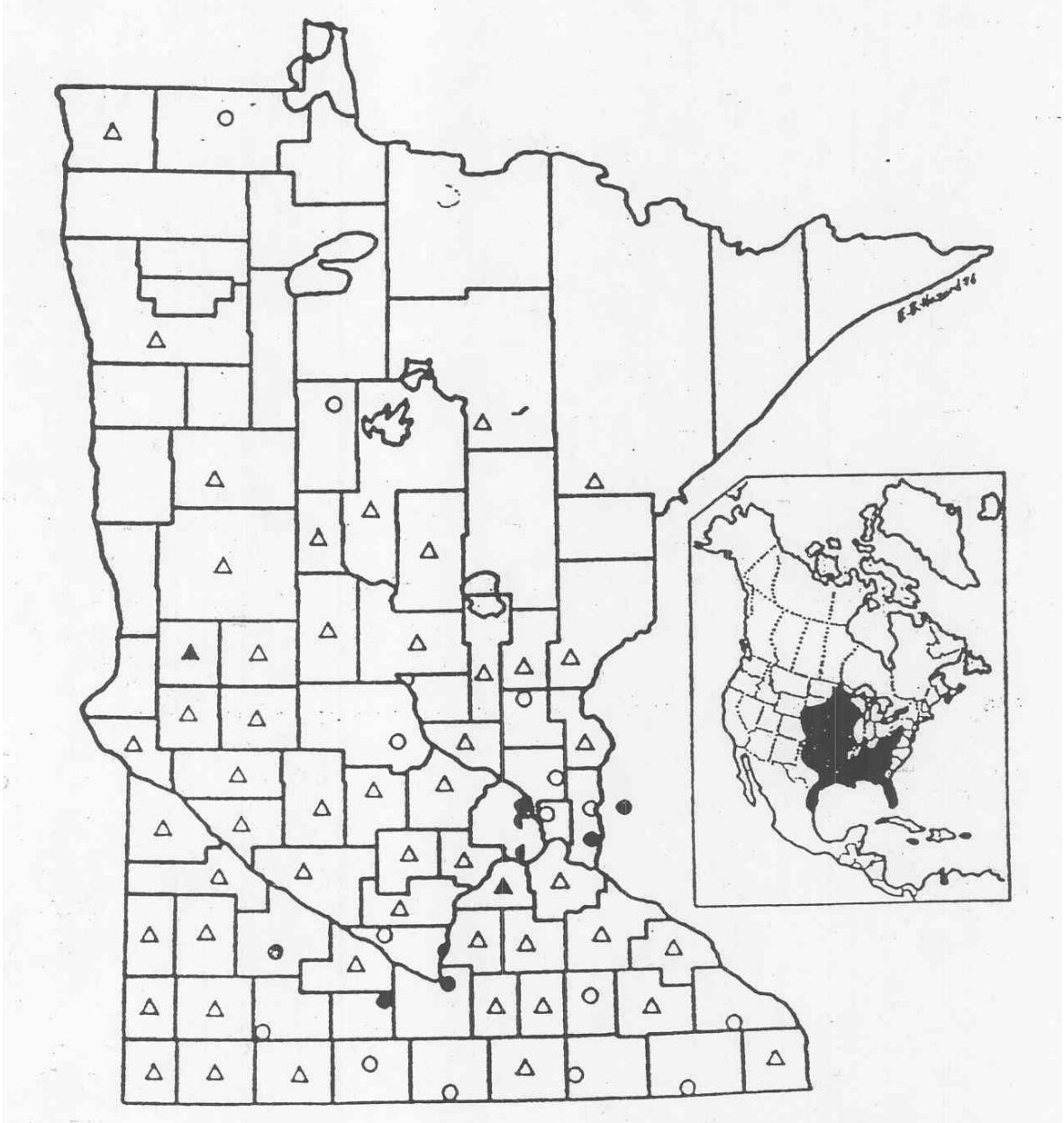
Figure 1. Minnesota counties where spotted skunks have been recorded (from E. Hazard, The Mammals of Minnesota,, 1982).



Distribution of *Spilogale putorius*. ● = township specimens. ʘ = selected other township records. ▲= county specimen. ∆= other county records (mostly from Swanson et al. 1945). (Map produced by the Department of Biology, Bemidji State University).

Figure 2. The distribution of Spilogale putorius in Minnesota, based on results of 1993's "Wanted Poster" and status and distribution survey.

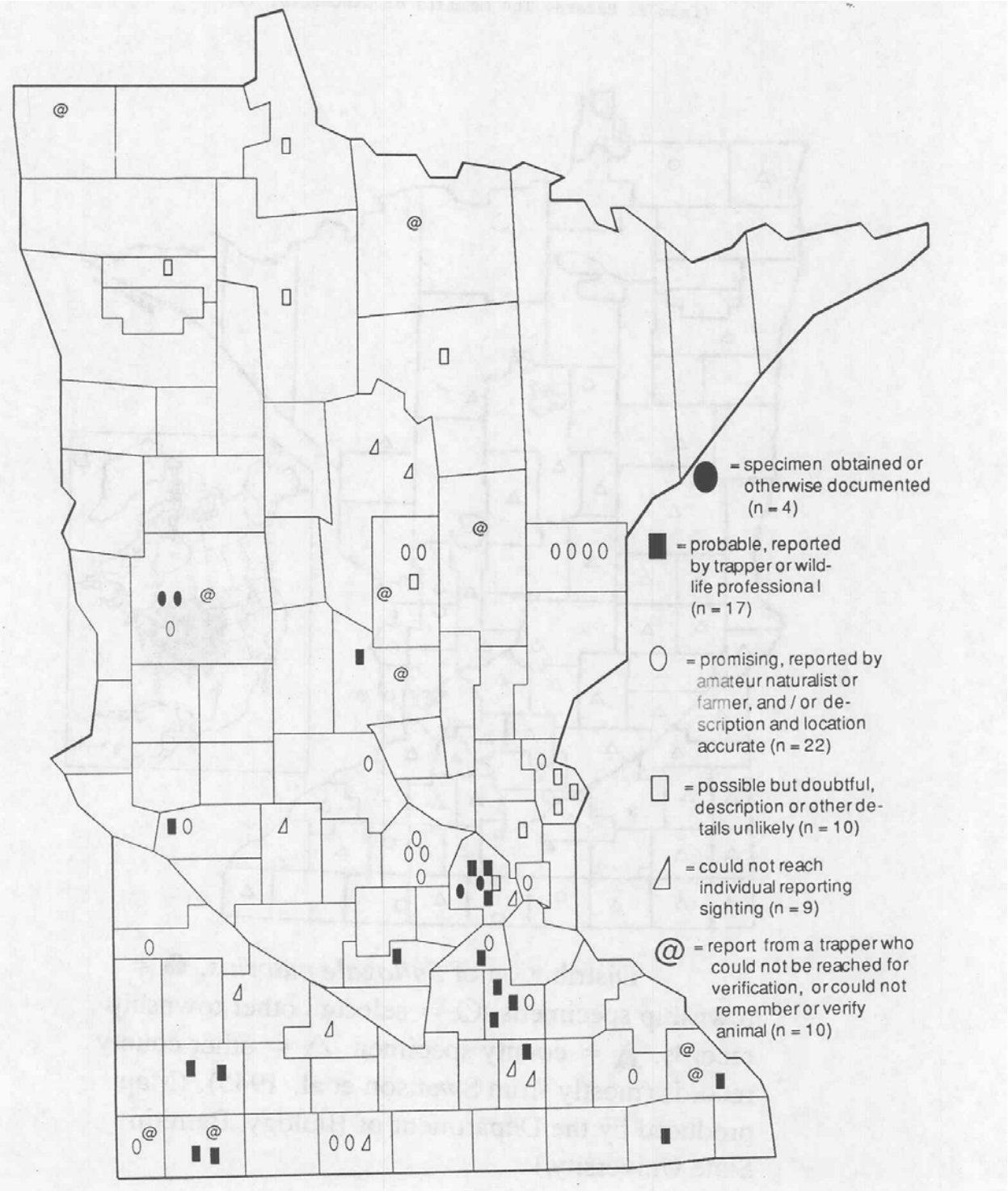


Table 1. Results from trapper reports, 1988-1992.

Year	Number of trappers reporting spotted skunk takes to the MN DNR	Number of animals trapped	Number of trappers who verbally verified report	Number of trappers reporting spotted skunk takes, but who could not be reached, or could not remember or positively identify animal taken	Number of trappers who incorrectly reported spotted skunk takes to the MN DNR
1988	2	NA	2	0	0
1989	13	64	2	6	5
1990-91	8	NA	1	4	3
1992	5	11	1	0	4
Totals	28	NA	6	10	12

Table 2. Habitat types in which spotted skunks were sighted.

	Wetlands\ Lakes\ Streambank	Woods\ Woodland edge (often near creek)	Farmland	Park\ Reserve	Urban	Road-Area Type Unknown
No. of reports	9	20	17	4	8	4

Table 3. Animals trapped, photographed or observed at trap sites.

Animal	Trapped	Photographed	Observed (direct sighting or sign)
Opossum	X		
House cat	X	X	X
Raccoon	X	X	X
Rabbit		X	X
Squirrel		X	X
Deer		X	X
Badger		X	X
Red fox		X	X
Musk rat			X
Woodchuck		X	

Table 4. Museums and universities surveyed.

Museum I University contacted	**Responded to letter**	**Specimens of Spllogale putorlus collected In Minnesota**
North Dakota State University	yes	no records
Concordia College	yes	no records
University of North Dakota	yes	no records
Bemidji State University	yes	1 specimen, locale unknown
University of MN & Bell Museum of Natural History	no	
University of Kansas	no	
St. Cloud State University	no	
University of MN-Duluth	yes	no records
Field Museum of Natural History	yes	no records
The Science Museum of Minnesota	no	
Southwest State University	no	
Winona State University	no	
University of Michigan-Ann Arbor	no	
University of Wisconsin-Stevens Point	no	
Universtiy of Wisconsin-LaCrosse	no	
University of Wisconsin-Madison	yes	(2 from adjacent counties: Polk and St.Croix)