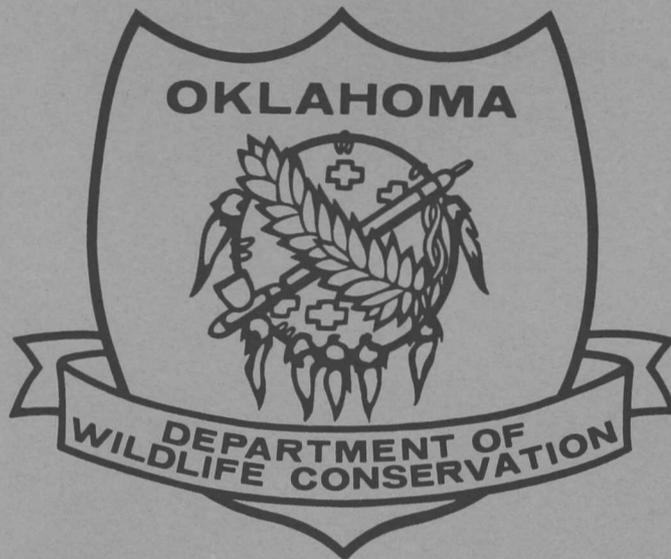


FINAL REPORT

SECTION 6

ENDANGERED SPECIES ACT



FEDERAL AID PROJECT E-47

Public Survey for Information Related to
Eastern Spotted Skunk Sightings

SEPTEMBER 1, 1997 - AUGUST 31, 1998

FINAL REPORT

STATE: Oklahoma GRANT NUMBER: E-47

GRANT TYPE: Research

SEGMENT DATES: September 1, 1997 - August 31, 1998

PROJECT TITLE: Public Survey for Information Related to Eastern Spotted Skunk Sightings

ABSTRACT

One thousand black and white posters depicting spotted skunks (*Spilogale putorius interrupta*) were produced and distributed to appropriate rural facilities statewide. Additionally, a mail survey was sent to 840 individuals believed to be familiar with spotted skunks requesting sighting information from the last 10 years. The poster along with an article in the Outdoor Oklahoma Magazine generated 60 sighting reports, consisting of 80 spotted skunks seen. Seventy-one of these skunks were considered possible sightings since callers had difficulty describing the spotted skunk accurately. The mail survey generated 122 confirmed or probable spotted skunk sightings, representing 135 individual animals seen. Spotted skunks were seen in nine habitat categories: roadside (25), pastureland (19), edge (17), urban/industrial (15), riparian (14), farmstead (10), rocky areas (8), cropland (8), and woodland (7). A majority of the mail survey respondents believed the statewide population of spotted skunks to be declining. Priority conservation areas for spotted skunks in Oklahoma appear to be the Ouachita Highlands, Boston Mountains, eastern tall-grass prairie, and north central tall-grass/mixed-grass plains, and southwest mid-grass/mixed-grass plains.

I. OBJECTIVES:

- 1) Solicit data, relative to recent and historical records of spotted skunks, from target groups in Oklahoma.
- 2) Identify remaining populations and delineate the species' current range.
- 3) Identify and delineate possible habitat affinities of this species.

II. INTRODUCTION:

The frequency of eastern spotted skunk (*Spilogale putorius interrupta*) records (sightings and specimen collections) in Oklahoma has declined dramatically in the latter half of this century. The number of spotted skunk pelts in the fur market dropped from a high of 19,565 in 1938 to 4,958 by 1942, despite increasing pelt prices. By the late 1950's, spotted skunk harvest had declined to double digits. Harvest rebounded during the mid-1970's through mid-1980's in response to an extremely bullish fur market. During the peak fur market year of 1986-87,

however, spotted skunk harvest was only 53 animals. By 1988, reported harvest was down to single digits or none at all (Hoagland 1995).

Spotted skunks are not very important furbearing mammals either in terms of number harvested or economic importance (Schmidley 1983). Since the 1940's, spotted skunks have not been considered a target species, but were usually trapped incidentally to the harvest of other species. If a reasonable market existed for skunks, these incidental catches were skinned and sold (Hatcher 1986). But with the collapse of the fur market in the late 1980's, most skunks harvested have not been sold and therefore, no record made of their collection. A rabies epidemic in skunks has also discouraged individuals from handling skunk carcasses of any species (Hatcher 1986). A comparison of spotted to striped skunks in the total harvest revealed the highest proportion (1 spotted to 5 striped) in the first season of record (1938-39), and gradually dropping to its lowest value in the late 1950's (1957-58) 1 spotted:54 striped (Hatcher 1986). Since then the proportion has fluctuated considerably (Hatcher 1986, Hoagland 1995). Unfortunately, no reliable population indicators of abundance are available.

The spotted skunk is seldom observed because of its secretive nocturnal habits (Caire et al. 1989). Spotted skunks are found in diverse habitats over the entire state in all physiognomic regions, but local populations apparently are small and fluctuate in size with changes in agricultural practices and other habitat alterations (Caire et al. 1989). The spotted skunk was formerly common in the vicinity of farmsteads and brush piles, and was well known by many older, rural residents of the state. Anecdotal records from older rural Oklahoma residents may be able to provide historic and current distribution information for the spotted skunk. This project is designed to solicit public sightings of spotted skunks from target groups in the state. This information should provide a more comprehensive assessment of the species' current range than currently exists.

III. PROCEDURES:

A black and white poster depicting spotted and striped skunks and describing how each can be distinguished was produced (Figure 1). The posters were distributed to county game wardens who in turn, disseminated them to appropriate facilities within their counties for display. Posters were displayed at feed stores, farmer's cooperatives, and other locations where rural residents would be able to see them. Posters were also sent directly to license dealers in rural locations. Sightings generated from the poster were reviewed and compiled.

In addition to the poster, a mail survey (Figure 2) was sent to specific groups of individuals including, fur dealers, members of trapping associations, nuisance beaver trappers, fur harvester education graduates, professional mammalogists, museums and universities, and field personnel with the Oklahoma Department of Wildlife Conservation (ODWC), the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and U.S. Department of Agriculture's Wildlife Services (WS) Program. Individuals targeted to receive the mail questionnaire were believed to be familiar with the species, and thus to know the difference between striped skunks and spotted skunks.

Relevant data from survey respondents and reported sightings were recorded, including location of sightings, date (year and season) of sightings and habitat types at locations of sightings (e.g. woodlands, farmsteads, rock outcrops, riparian habitat). All sightings were categorized based upon the reliability of the observer (e.g. confirmed, probable, possible). Maps were produced which summarized the confirmed and probable sightings received, possible sightings, and the counties for which data was received for analysis.

IV. RESULTS:

Two thousand posters were printed. Five hundred posters were distributed to ODWC field law enforcement personnel and biologists for distribution to local facilities for display. An additional 500 posters were sent directly to ODWC license dealers that were located at small business establishments in small towns throughout the state. The poster, along with an article in the Outdoor Oklahoma Magazine generated 60 sighting reports, consisting of 80 individual skunks sighted. The majority of the sightings generated from these media (51) were considered to be possible sightings, representing 71 individual animals (Figure 3). Although callers clearly stated that the sightings being reported weren't of the "usual striped skunks", they had difficulty describing the spotted skunk accurately.

Mail survey questionnaires were sent to 840 persons who were believed to be able to identify spotted skunks. Surveys were sent to licensed fur buyers, members of trapping organizations, permitted nuisance beaver trappers, graduates of the fur harvester education course, field personnel with ODWC, USFWS, USFS, and WS, state parks personnel, and academicians at all Oklahoma universities and colleges specializing in mammals or nongame wildlife species. Questionnaires were unable to be delivered to 47 addresses. Responses were received from 344 recipients, a response rate of 43.4%. Sixty-five persons responded that they had seen a spotted skunk within the last 10 years within the county of their residence or work, while 279 responded that they had not seen any spotted skunks.

Surveys were returned from every county except Washita and Lincoln. The distribution of surveys returned where spotted skunks have been seen in the last 10 years occurred primarily in the southeastern Ouachita Highlands, eastern tall-grass prairie, and western mixed grass plains regions (Figure 4). Surveys returned where spotted skunks were not seen within the last 10 years occurred in the panhandle, western shortgrass plains, eastern Ozark Plateau, and a large portion of the central cross timbers regions (Figure 4).

A total of 122 sightings was reported from the 65 "yes" responses, representing 135 individual animals seen. Because persons receiving the questionnaire were believed to be competent in identifying spotted skunks from striped skunks, all sightings were deemed to be confirmed or probable (Figure 5). Of the 135 spotted skunks seen and reported by questionnaire recipients, 62 were of dead animals, 68 were seen alive, and 5 did not have the life status recorded. Reported sightings were classified into nine habitat categories: roadside (25), pastureland (19), edge (17), urban/industrial (15), riparian (14), farmstead (10), rocky areas (8),

cropland (8), and woodland (7). Thirteen responses did not list habitat information.

When questioned about the species' population status, of those survey respondents who had seen a spotted skunk within the last 10 years, 32 (49%) believed the population status to be declining, 14 (22%) remaining stable, 6 (9%) increasing, and 13 (20%) did not answer the question. Of those survey respondents who had not seen spotted skunks within the last 10 years 122 (44%) believed the population status of spotted skunks to be decreasing, 73 (26%) remaining stable, 6 (2%) increasing, and 78 (28%) did not answer the question. These proportions did not vary appreciably between those who had seen spotted skunks within the last 10 years and those who had not.

Based on this survey and past information, priority conservation areas for spotted skunks appear to be in the southeastern Ouachita Highlands, Boston Mountains, the eastern tall-grass prairie, and north central tall-grass/mixed-grass plains, and southwest mid-grass/mixed-grass plains (Figure 6).

V. DISCUSSION:

According to reports from fur dealers from the 1930's through 1950's, the largest populations of eastern spotted skunks have been in the central and northeastern parts of the state, and the smallest in southeastern and extreme western portions, particularly the Panhandle (Caire et al. 1989). Harvest distribution since the late 1970's has been widespread, but heaviest in the eastern 1/3 of the state (Hatcher 1986). ODWC records based on incidental fur harvester captures since 1986 indicated that the most recent sightings and collections were concentrated in the Ozark and Ouachita uplifts in extreme eastern Oklahoma. Spotted skunk sightings reported in this study occurred primarily along the eastern one-third of the state, particularly in the Ouachita Highlands, the tall-grass prairie and Boston Mountains regions. Confirmed/probable sightings occurred only in the extreme western part of Cherokee County in the Ozark Uplift region. Sightings of spotted skunks were also conspicuously absent from much of the cross timbers region. Concentrations of sightings were also reported in the extreme southwest and the north central tall-grass prairie areas of the state.

Information from three of Oklahoma's neighboring states have found some similar regional and habitat affinities for the species, as well as some differences. A recent survey in Missouri indicates that the Ozark Plateau is the stronghold for this species in that state (Rick Thom, pers. comm.). Currently, critical habitat in Kansas for the spotted skunk (as defined by the Kansas Department of Wildlife and Parks and the U.S. Fish and Wildlife Service) includes four areas in west central, south central and east central counties (Collins et al. 1995). The area within the Cowskin Creek and Big Slough drainages in Sedgwick and Sumner counties, Kansas, is just north of the concentration of sighting locations in the north central part of the tall-grass prairie region of Oklahoma. In Texas, the eastern spotted skunk is considered to occur in the eastern 1/2 of the state, east of the Balcones Escarpment, westward through north-central Texas, to the Panhandle as far south as Garza County (Davis and Schmidley 1994). Spotted skunks in Texas occur largely in wooded areas and tall-grass prairies, preferring rocky canyons and outcrops when

such sites are available, and are less common in the short-grass plains (Davis and Schmidley 1994).

This project collected new information on the distribution of and habitats used by the eastern spotted skunk in Oklahoma. These data came from a previously unrecognized source - the sightings and anecdotal records of rural residents. This project provided a more comprehensive assessment of the spotted skunk's current range and priority conservation areas were identified.

VI. Prepared by: Julianne W. Hoagland
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Oklahoma Department of Wildlife Conservation

VIII. Date: February 12, 1999

IX. Approved by: Harold Namminga
Harold Namminga, Federal Aid Coordinator
Oklahoma Department of Wildlife Conservation

X. LITERATURE CITED

Caire, W., J. D. Tyler, B. P. Glass, and M. A. Mares. 1989. Mammals of Oklahoma. University of Oklahoma Press, Norman. 567 pp.

Collins, J. T., S. L. Collins, J. Horak, D. Mulhern, W. Busby, C. C. Freeman, and G. Wallace. 1995. An illustrated guide to endangered and threatened species in Kansas. University of Kansas Press, Lawrence. 140 pp.

Davis, W. B. and D. J. Schmidley. 1994. The Mammals of Texas. University of Texas Press, Austin. 338 pp.

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Hoagland, J. W. 1995. Furbearer population and harvest distribution and trends. Oklahoma Department of Wildlife Conservation, Federal Aid in Wildlife Restoration Project W-82-R-34, 7. 27 pp.

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WANTED:



Sightings of Spotted Skunks

(AKA: Civet Cats)



Spotted Skunk
(*Spilogale putorius*)

- ⇒ **Spotted Skunk** numbers have been declining over the past 50 years.
- ⇒ **Spotted Skunks** can be distinguished from the much more common striped skunk by their markings; **Spotted Skunks** have a white spot on their forehead, a white spot under each ear, and four or more interrupted white "stripes" on the back and sides. In contrast, the striped skunk has a thin white stripe on its forehead and usually one or two parallel stripes down the length of the back.
- ⇒ If you have seen any **Spotted Skunks** -- dead or alive -- in the last five years and can provide the general location and year of sighting, please contact:



Oklahoma Department of Wildlife Conservation
1801 N. Lincoln
Oklahoma City, OK 73105
405/521-4616
email: naturai@okiaosf.state.ok.us.



Figure 1. Spotted skunk wanted poster.

WILDLIFE CONSERVATION COMMISSION
WILLIAM CHAWFORD
CHAIRMAN
HARLAND STONECIPHER
VICE CHAIRMAN
MARK PATTON
SECRETARY
DON FILLER
MEMBER
ED ABEL
MEMBER
JOHN S. "JACK" ZINK
MEMBER
JOHN D. GHOENYKE
MEMBER
VYBE KELTER
MEMBER



FRANK KEATING, GOVERNOR
GREG D. DUFFY, DIRECTOR

DEPARTMENT OF WILDLIFE CONSERVATION

1801 N. Lincoln P.O. Box 53465 Oklahoma City, OK 73152 PH 521-3851

1 May 1998

Dear Wildlife Enthusiast,

The Oklahoma Department of Wildlife Conservation's Wildlife Diversity Program is conducting a study that we hope will provide needed information on the distribution and status of spotted skunks (also known as civet or civet cat) in Oklahoma. One portion of this study is a survey of individuals who are knowledgeable about wildlife, and who may have had the opportunity to see spotted skunks either alive or dead. Your help in completing the enclosed questionnaire is requested.

If you have seen a spotted skunk, either alive or dead, please complete the enclosed survey and return it in the postage paid envelope. Even if you have not seen a spotted skunk, please return the survey so that this information may be recorded as well. The information that you are asked to provide will be held strictly confidential. Also, please be as accurate as possible when filling out the information concerning locations of spotted skunk sightings, as this is a major component of this study.

Since spotted skunks are secretive and difficult to observe, we believe a mail survey questionnaire of knowledgeable people is an effective approach for gathering base-line information on its status and distribution. Although this study will not indicate the exact number of spotted skunks or population density in Oklahoma, it should provide a measure of their relative abundance throughout the state.

If you have any questions or problems completing this survey, please contact Julianne Hoagland at the Oklahoma Department of Wildlife Conservation, Wildlife Diversity Program at (405) 522-0189. Please return the completed survey in the provided postage paid envelope. Your help with this study is very much appreciated.

Sincerely,


Julianne Hoagland
Wildlife Diversity Biologist

An Equal Opportunity Employer



SPOTTED SKUNK (CIVET)



STRIPED SKUNK

Figure 2. Spotted skunk mail survey questionnaire.

SPOTTED SKUNK (CIVET) SURVEY QUESTIONNAIRE

1. Have you seen a live or dead wild spotted skunk in Oklahoma at any time during the last 10 years (1987-1997)?

- NO** If your answer is no, please continue with question 3.
 YES If your answer is yes, please give your best account of the following information for each sighting:

1. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

2. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

3. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

4. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

5. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

6. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

7. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

8. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

9. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

10. Date (year and month/season): _____
 County: _____
 Distance to Nearest Town and Town Name: _____
 Township: _____ Range: _____ Section: _____
 Habitat description where seen: _____
 Life Status (please circle one answer): LIVE DEAD

2. In what Oklahoma county or counties do you currently work or live, or have you worked or lived during the past 10 years? _____

3. In your opinion, over the past 10 years, the number of spotted skunks in Oklahoma has: (Please circle the most appropriate answer)

1 Increased

0 Remained Stable

Decreased

4. Do you know of another person (or persons) in your area who might be able to provide additional information on spotted skunks? Please provide names and hometown (and address if possible).

5. Please provide us with your name, address and telephone number so that we can contact you if we need to clarify any of the information you provided.

Name: _____

Address: _____

Telephone: _____

6. If you have additional knowledge of spotted skunks in Oklahoma, or comments to add to the questions above, please provide this information below or on additional paper:



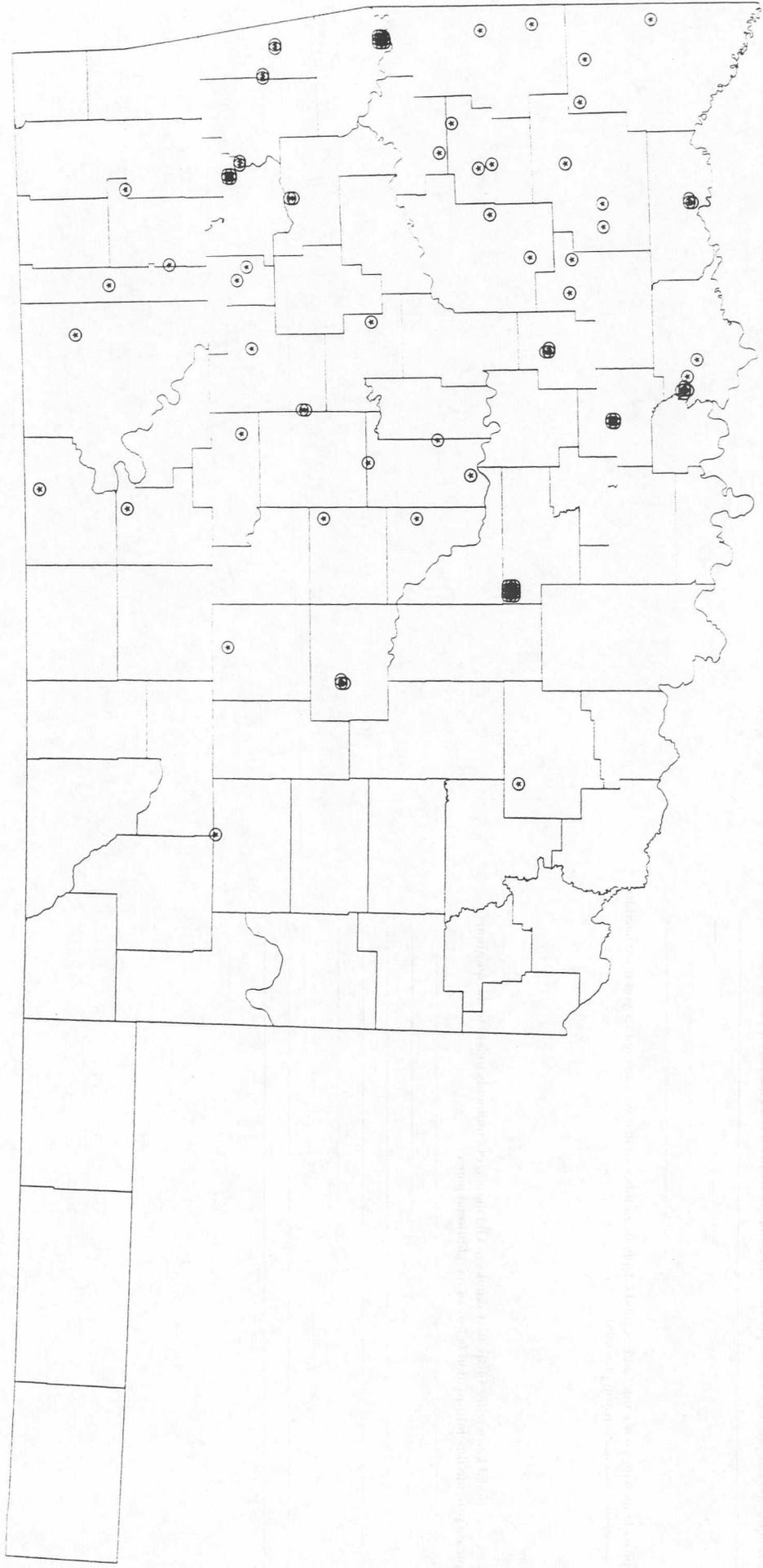


Figure 3. Possible sightings generated by Outdoor Oklahoma Magazine and Poster.

Figure 2. Counties with bioprospecting activity in 2000-2001. (Map not shown)

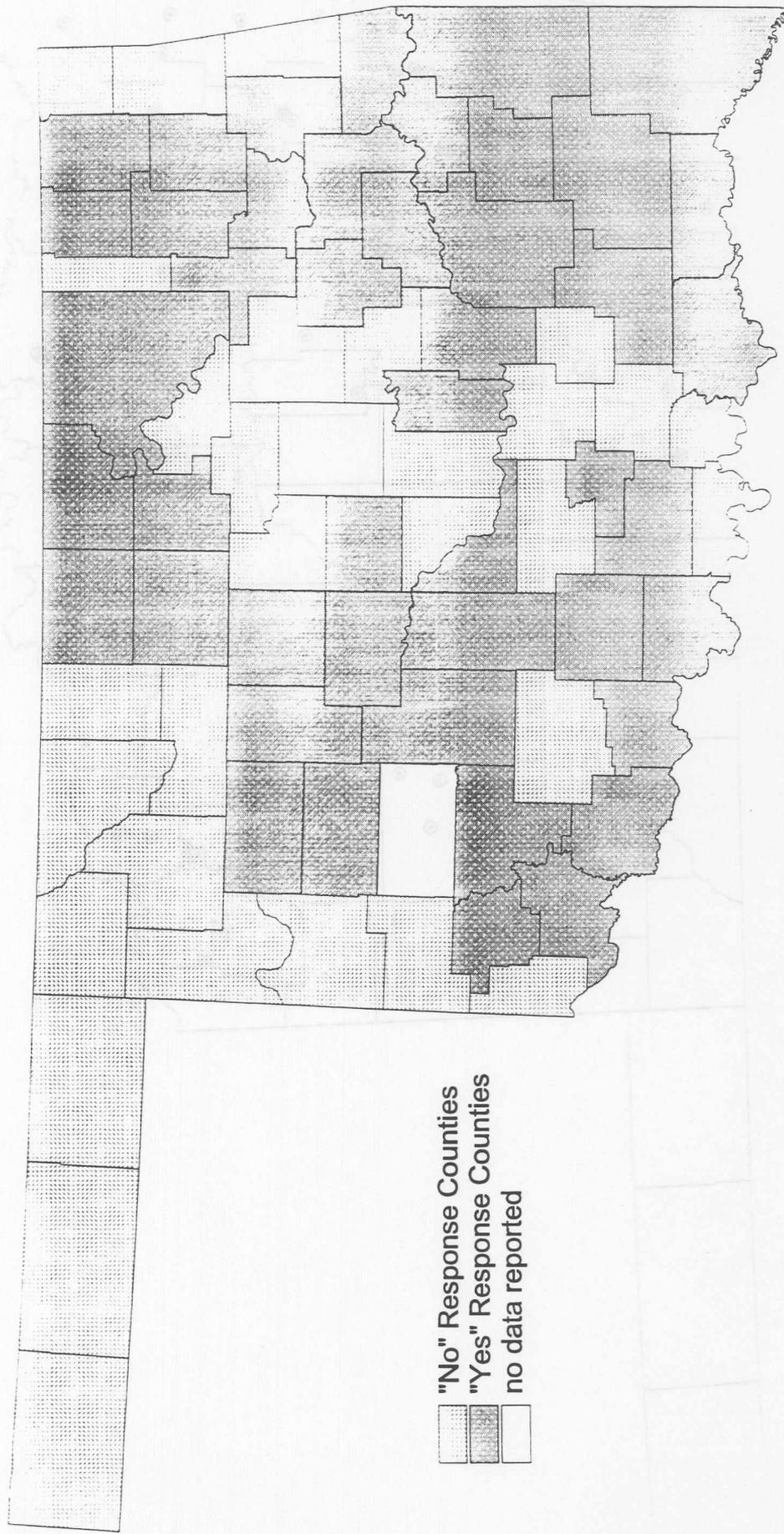


Figure 4. Survey response data by county.

Figure 5. Confirmed and probable spotted skunk sightings generated from survey questionnaire and poster.

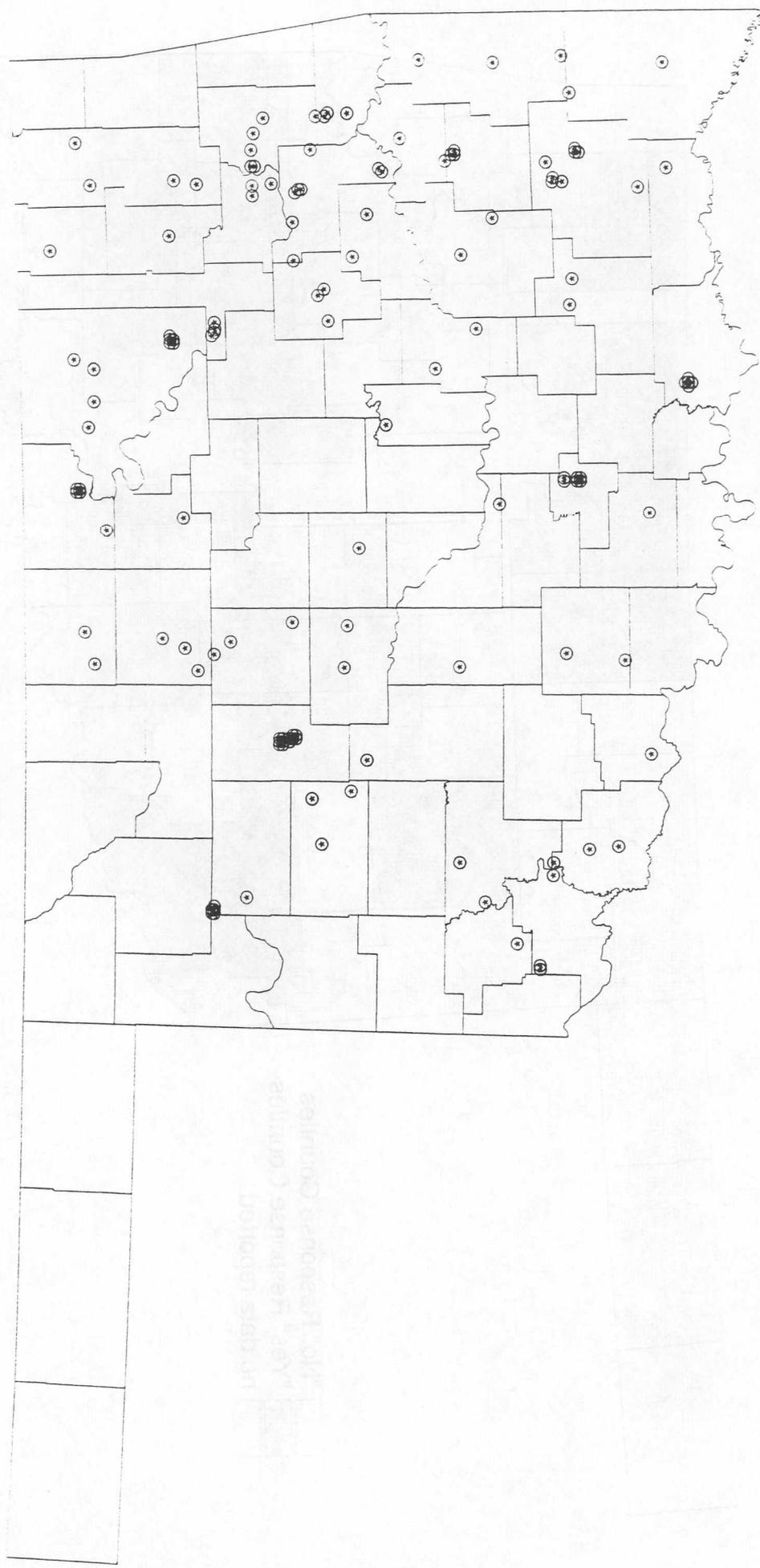


Figure 5. Confirmed and probable spotted skunk sightings generated from survey questionnaire and poster.

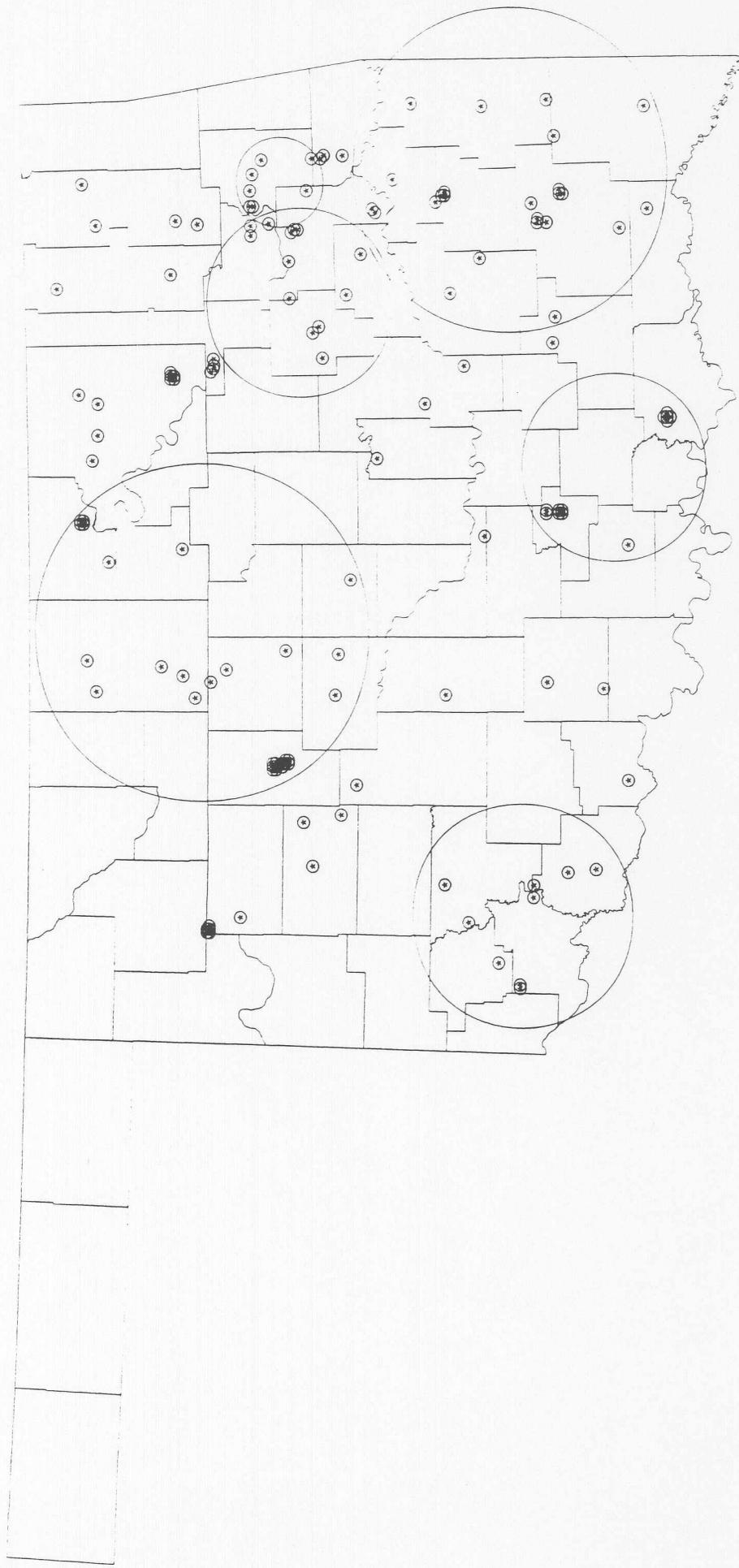
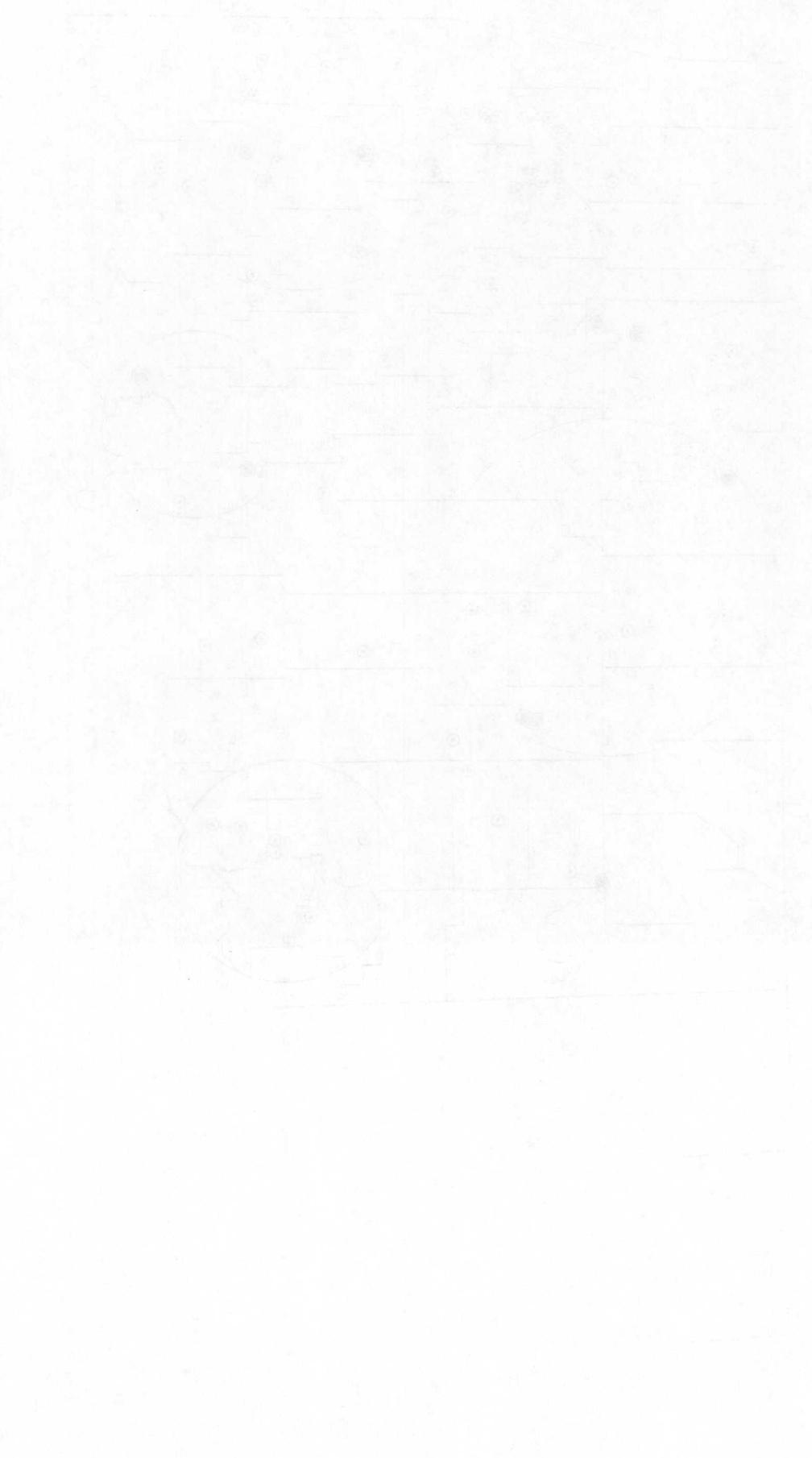


Figure 6. Potential priority areas for conservation of spotted skunks based on confirmed/probable sightings in relation to physiographic region.

1000

Figure 9. The effect of the concentration of the inhibitor on the rate of polymerization.



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