

STATUS OF BADGERS IN WISCONSIN, 1975

By

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DEPARTMENT OF NATURAL RESOURCES

RESEARCH

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ABSTRACT

A study of the geographic distribution and relative abundance of badger (Taxidea taxus jacksoni) in Wisconsin was conducted in 1975-76. Methods included the use of mailed questionnaires, public appeals for observational locations and opinions on current population status.

Badgers have expanded their occupied range in Wisconsin over the last 20 years, and the current population was estimated at 8,000 to 10,000 animals. While the badger population is stable to increasing throughout Wisconsin, an open season is not recommended. An index to future badger populations can be adequately obtained from a 2-3 year collection of observations at 10-year intervals through the DNR Endangered Species Program.

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INTRODUCTION

The Wisconsin Endangered Species Law (Chap. 29.415 Wis. Stats.) gives responsibility to the Department of Natural Resources for recommending necessary changes in management for species whose status is not clarified. Management plans cannot be sharpened until basic population trends and distribution information are available.

The population status of the badger (Taxidea taxus jacksoni) in Wisconsin was still classified as "unknown", i.e. "Sufficient information is not available to make a decision as to status in Wisconsin" (Hine et al. 1975:1). This study was designed to provide base data necessary for establishing the status of this species. No consideration is being given to trapping or hunting badger now or in the near future. However, documentation of their present status will allow an appraisal of management needs for their continued well being.

PROCEDURES

Procedures to determine the present geographic distribution of badgers in Wisconsin involved the collection of observational locations from the following sources:

- 1. Wisconsin Trappers Association (WTA). Questionnaires requesting observations of badgers seen during the 1974-75 and 1975-76 trapping seasons were enclosed in the 1975 and 1976 WTA spring newsletter, the "Voice". The WTA provided a membership mailing list of 853 different addresses (two or more members with the same last names and addresses were counted as one). The printed questionnaires consisted of a pre-paid, self-addressed return portion, separated by perforations for removal from the explanation portion (Append. A and B).

2. County Conservation Congress (CCC) delegates. Mimeographed 1-page questionnaires were mailed to 359 County Conservation Congress delegates and their alternates requesting 1975 sightings and population status opinions for badgers (Append. C).

3. Public observations. Appeals for observational assistance were made in "Wisconsin Sportsman" (a Wisconsin-oriented bimonthly magazine for outdoor enthusiasts) (January-February 1976, Vol. 4, No. 1, p. 51 and March-April 1976, Vol. 4, No. 2, p. 32) and the "Wisconsin Natural Resources Bulletin" (a bimonthly publication by the Wisconsin Department of Natural Resources) (January-February 1976, Vol. 41, No. 1, pp. 15-16) (Append. D).

4. The Wisconsin DNR's "Endangered and Threatened Animal Observation" records. Compiled observations for 1974 were examined, and additional observations were requested for 1975. Agencies cooperating with DNR personnel in collecting field observations were the U. S. Forest Service, U. S. Soil Conservation Service, U. S. Fish and Wildlife Service, and College and University personnel.

5. Wisconsin DNR Conservation Wardens. Questionnaires were sent to all DNR conservation wardens requesting 1975 field observations and subjective opinions on the status of badgers in their respective areas (Append. E). Status opinions were asked only from wardens who had resided at their station for at least 5 years.

6. Taxidermist reports. Taxidermist reports for 1973-75 were used to examine the extent of badger take not available from furbuyer records.

Reported observations from all sources were plotted on a state map to the nearest civil town (town and range). Land use and cover maps, as compiled by the U. S. Geological Survey (Hindall and Flint 1970) and the U. S. Forest Service (Spencer and Thorne 1972) were compared with habitat preferences of badgers to determine geographic distribution.

Relative geographic abundance estimates were determined from frequency of collected observations, expressed on the basis of county area. Available literature on habitat preferences and food habits was examined in order to establish isolines of abundance.

DISTRIBUTION AND ABUNDANCE

Historic

The American badger is a fossorial, nocturnal mustelid, which has long been associated with the state of Wisconsin. Early miners were called "badgers" for their digging and burrowing activities to secure lead and zinc ores, hence the state's nickname, the Badger State (Jackson 1961:365, Clark 1976:26). Badgers preferred open country and were once commonly found throughout the Great Plains, closely associated with prairie dogs (Cynomys ludovicianus) (Martin et al. 1951:226). In Illinois, badgers preferred sandy prairies and were less commonly found in prairies with heavier soils (Hoffmeister and Mohr 1957:110). Jackson (1961:365) stated that Wisconsin badgers preferred grasslands, sandy fields and pastures, but were also found in sparse brushland and open woodlots.

Logically, the distribution of badgers in Wisconsin during pre-settlement times would have been closely associated with the prairie and oak savanna floristic provinces as described by Curtis (1959). The opening of forested areas by logging, mining, and farming during the late 1800's provided the badger with additional habitat. However, range expansion was delayed by overexploitation by trappers and the belief by settlers that farming and native predators were not compatible. In Iowa, for example, where extensive conversion of native prairies to cropland took place, the badger was almost extirpated in the early 1900's (Scott 1937:43-4).

During the late 1950's, Hine (1961:11) used subjective opinions of DNR personnel and fur harvest records to determine badger distribution and relative abundance in Wisconsin (Fig. 1). By 1960, Jackson (1961:365) wrote that badgers were "...fairly regular and not scarce in some of the eastern and central counties, and at times showing trends towards becoming more plentiful in some of the southern and eastern parts." The same author found badgers distributed irregularly throughout the state except for the heavily forested northern areas, and the species was rather scarce in the counties along Lake Michigan.

The badger is the designated state animal of Wisconsin, and has been protected since 1955. The harvest of badgers for pelts has averaged 798 annually over a 28-year span, ranging from a low of 128 in 1955 to a high of 4,597 in 1939 (Table 1). Badger pelts were never utilized as extensively as furs from other members of the weasel family. Furs were used chiefly as trim for collars and cuffs, and badger hair was once used in the manufacture of shaving and other brushes (Gilbert 1970:75). Banfield (1974:336) stated that badger hides are of little use in today's fur market and during the 1971-72 Ontario fur season, the average badger pelt sold for \$11.02. The United States produced an estimated 5,000 to 10,000 pelts annually during the 1960's, with no reported international exporting of badger (U. S. Department of Commerce 1966).

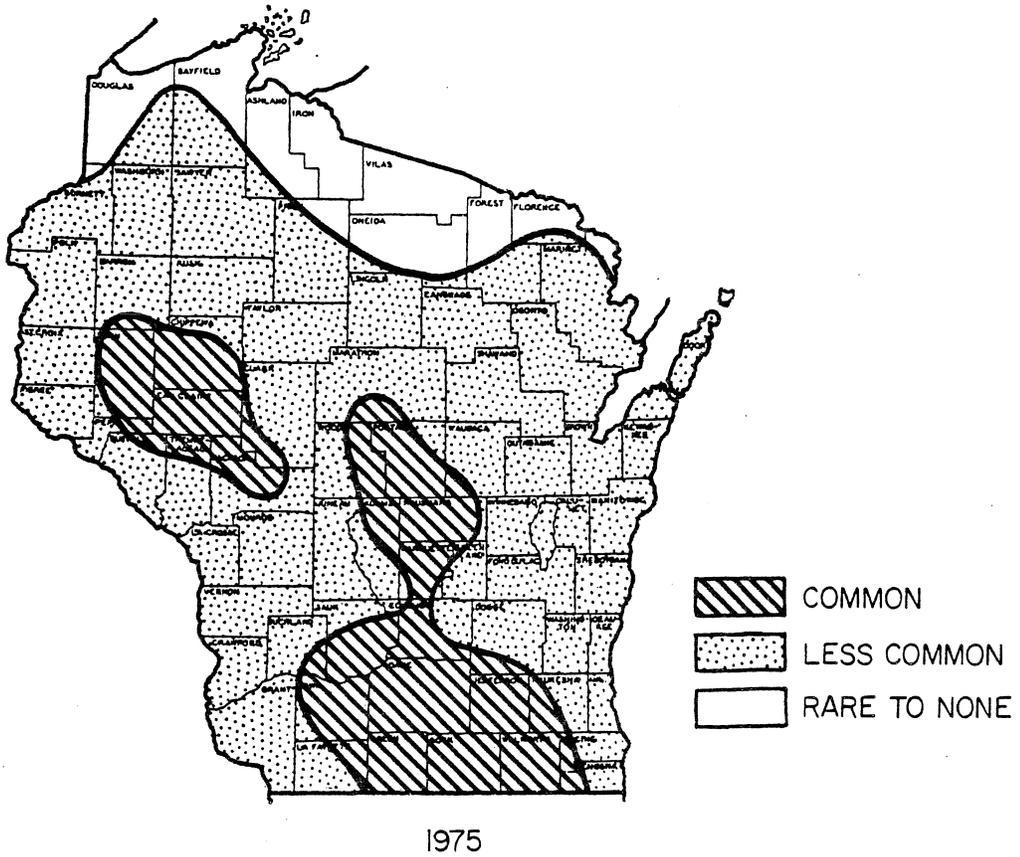
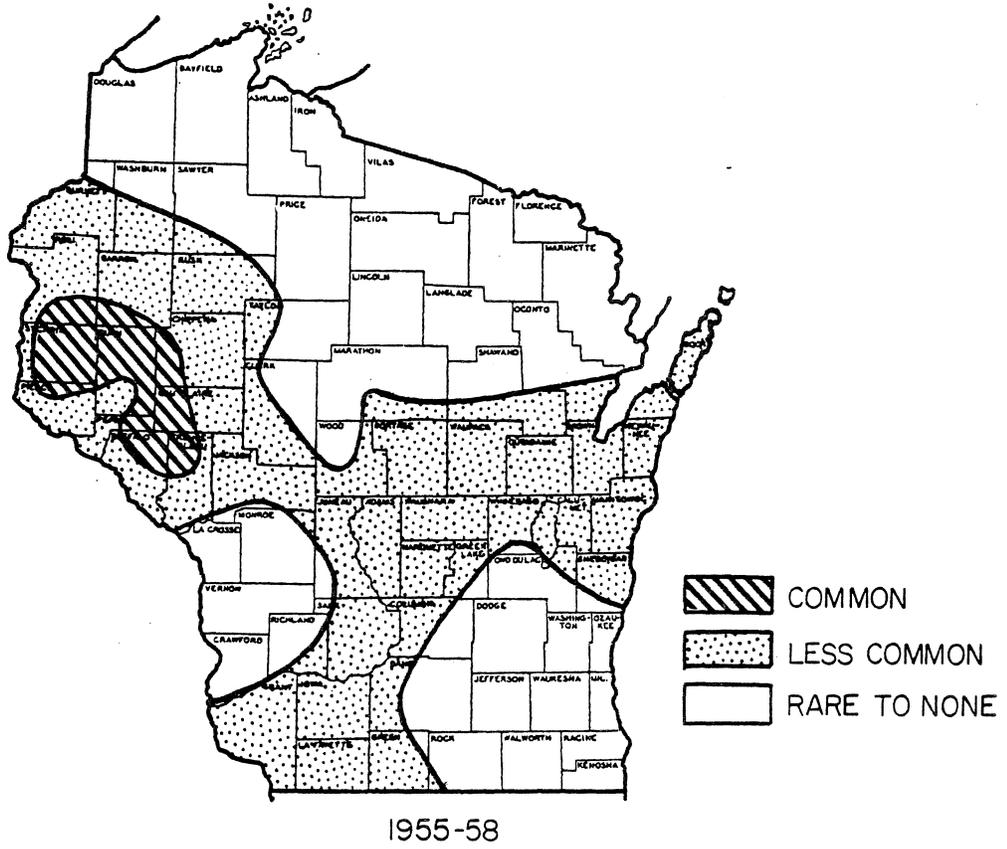


FIGURE 1. Badger distribution and abundance in Wisconsin.

TABLE 1. Summary of badger harvests in Wisconsin, 1928-55*.

Trapping Season	Estimated Number of Badgers	Estimated Price Per Pelt
1927-28	288	5.06
1928-29	436	7.33
1929-30	393	5.25
1930-31	524	5.61
1931-32	419	3.86
1932-33	347	1.80
1933-34	225	3.98
1934-35	328	3.79
1935-36	219	4.41
1936-37	487	4.55
1937-38	513	3.20
1938-39	4,597	1.95
1939-40	1,142	Unknown
1940-41	2,662	Unknown
1941-42	1,621	Unknown
1942-43	697	Unknown
1943-44	1,227	Unknown
1944-45	1,604	Unknown
1945-46	1,684	1.24
1946-47	908	0.86
1947-48	221	0.88
1948-49	210	0.72
1949-50	275	0.46
1950-51	313	0.59
1951-52	190	0.80
1952-53	435	0.45
1953-54	239	0.50
1954-55	128	0.29
1955-56	Closed Season	Closed

*Unpublished data, Wis. Dep. Nat. Resour.

Current

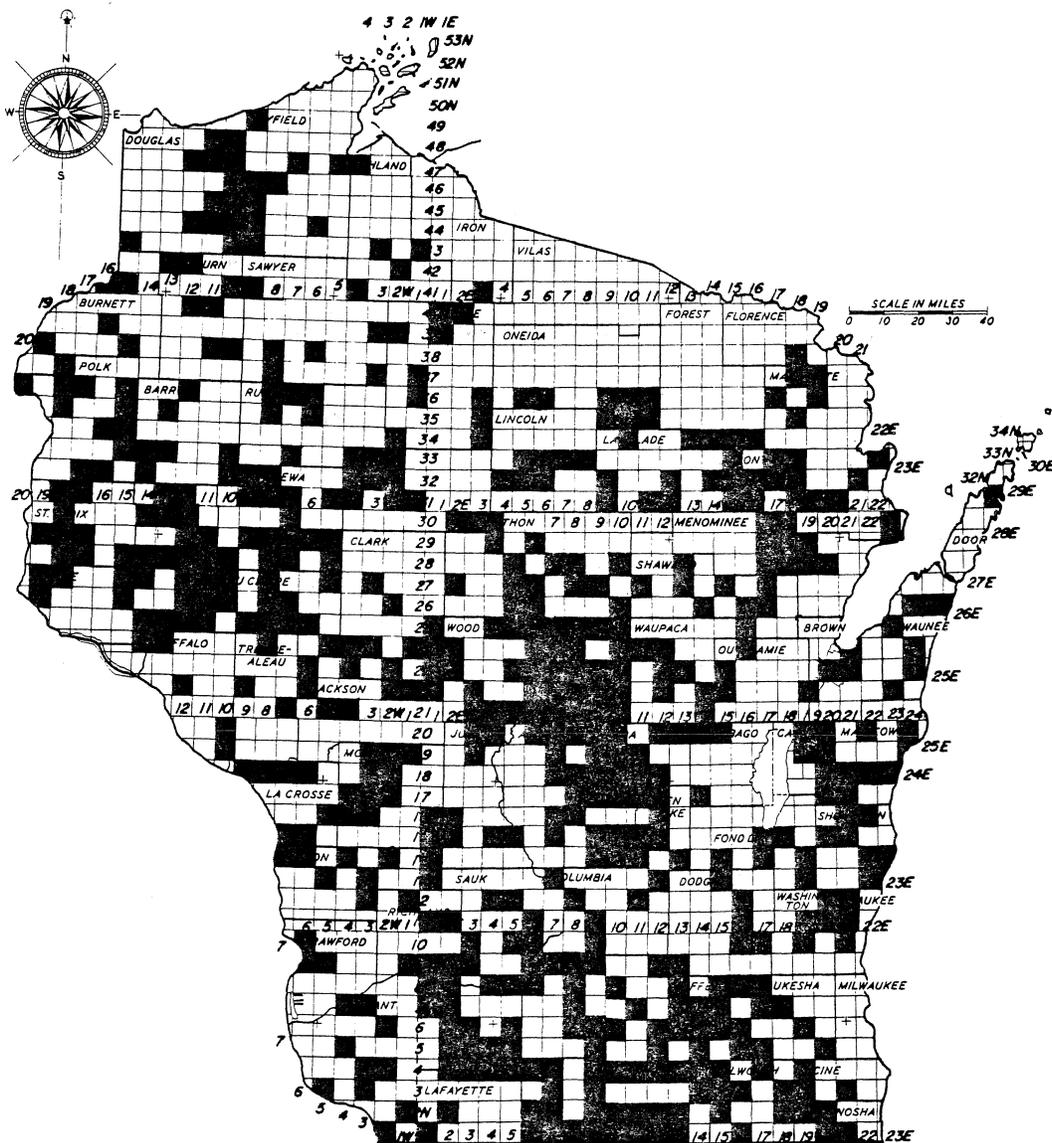
Members of the Wisconsin Trappers Association reported 93 badger observations from 1974-75, and 257 badger observations in winter 1975-76. County Conservation Congress delegates and alternates responded with 137 locations of badgers in 1975. Letters in response to printed requests for 1975 badger sightings in the "Wisconsin Sportsman" and "Wisconsin Natural Resources Bulletin" produced 299 badger observations. Field records from the DNR Endangered Species Program included 49 badger observations in 1974 and 87 in 1975. The DNR Conservation Wardens reported 89 actual observations or reliable sign of badger. State bounties never existed for badgers in Wisconsin. Only 30 were found in the 1972-75 review of taxidermist reports and these records provided no specific locations of badgers other than county of origin. Due to the year-around protection given the badgers in Wisconsin, the animals must be marked (known as "red-tagging") by DNR Conservation Wardens, before they can be handled by licensed taxidermists.

All sources provided 1,011 usable badger observational locations (Table 2). All sightings were plotted by civil town for indexes to distribution, and number of sightings per town along with degree of blocking of occupied towns was used to indicate relative geographic abundance.

TABLE 2. Summary of questionnaires for badger.

Sources	Questionnaires (or Letters)			Number Reported Badger Observations
	No. Mailed	No. Received	Percent Received	
WTA, 1974-75	853	73	8.5	93
WTA, 1975-76	853	182	21.3	257
County Conservation Congress Magazine Requests	359	200	61.3	137
Endangered Species Program, 1974	Unknown	340	-	299
Endangered Species Program, 1975	-	-	-	49
WDNR Conservation Wardens	139	83	59.7	87
Total				89
				1,011

Current badger distribution and abundance in Wisconsin was believed determined by: (1) soil type, (2) cover type or land use, and (3) preferred prey distribution. The plotting of the observations by civil town shows widespread geographic badger distribution in Wisconsin (Fig. 2). A comparison of the current distribution map with the 1950 map (Hine 1961:11) indicates a definite range expansion and increase in abundance of badgers over the past 20 years (Fig. 1). Particularly noticeable is the occupation in recent years of range labeled by Hine (1961:7, 11) as "rare to none". The heavily forested areas of northeastern Wisconsin were the only region where badgers were not currently reported. Throughout the northern quarter of the state, badger sightings were irregularly distributed except for small pockets of greater abundance in Douglas-Bayfield and Marinette-Oconto Counties. These small pockets of uniformly blocked towns overlay soils of the Northern Sandy Upland and Plains (as described by Beatty et al. 1964). In contrast, heavier and wetter soils (Northern Silty and Loamy Uplands and Plains) were avoided by badgers. Current "common" range in the central and west central portion of the state overlays sandy or light soils (soils of the Central Sandy and Western Sandstone uplands, valley slopes and plains).



WISCONSIN INDEX MAP H. F. WILLIAMS 1963

FIGURE 2. Badger distribution in Wisconsin, 1975.

The striped ground squirrel (*Citellus tridecemlineatus*) is by far the most important prey species of the badger in the Great Lakes region (Errington 1937:215, Snead and Hendrickson 1942:390, Jackson 1961:368). Striped ground squirrels are strongly associated with grassland vegetation, and are found throughout Wisconsin except for dense forests or low wet ground (Jackson 1961:132). Snead and Hendrickson (1942:388-9) reported heavy badger utilization of striped ground squirrels well into late fall with a gradual shift towards a more diversified diet of primarily mice and cottontails (*Sylvilagus floridanus*) as ground frost accumulates.

The expansion of occupied badger range over the last 20 years was possibly due to the complete protection afforded the badger since 1955. Estimated pelt harvest levels for badger suggested a decline in badger abundance during the late 1940's to early 1950's (Table 1). The annual 1948-55 harvest mean was 251 badgers as compared to the 1938-47 average of 1,794 animals. In addition, the annual harvests of badgers, while seemingly low, would have had a greater impact if population densities were also low.

Jackson (1961:365) considered badger density heavy at one animal per 2-3 square miles. In the extensive "less common" range as described by Hine (1961:11), a density of one badger to 6-10 square miles seemed realistic. The number of badger sightings in "less common" range was approximately one-third the number in "common" range, suggesting a 1:3 ratio in badger density. Harvest levels could have conceivably kept badgers at low densities in the less common range or virtually absent in some regions.

Jackson (1961:365) estimated the badger population in Wisconsin at 5,000 to 20,000 animals. The current study did not lend itself to an accurate determination of badger population size. However, if heavy badger density was an animal per 2-3 square miles, the entire state of Wisconsin would have to be considered within the "good" badger population category to reach 20,000 animals (state land area of 54,374 square miles divided by 2.5 square mile/badger equals 21,750 badgers statewide). The 1,000-plus badger sightings in 1975 suggest that a statewide estimate of 5,000 animals was too low. Using one animal per 2 to 3 square miles in the "common" range, one per 6 to 10 square miles in the "less common" range, and less than 100 badgers in the "rare" range; the badger population in 1975 was probably between 8,000 and 10,000 animals.

Opinions as to the current status of badgers in Wisconsin were also requested on the questionnaires. Recipients were asked if the badger population in their area had increased, decreased, or remained unchanged during the past 5 years. Overall opinions indicated a stable population as 70 reported increased badger numbers, 68 reported decreased abundance, and 130 believed the badger population has remained the same. The WTA and DNR returns strongly indicated a stable to increased badger population (combined WTA and DNR: 43 reported increased badgers, 10 decreased, 69 no change), while the CCC respondents reported a stable to decreased badger abundance (27 increased, 58 decreased, 61 no change).

CONCLUSIONS AND MANAGEMENT IMPLICATIONS

In Wisconsin, badgers are more commonly found: (a) on light (usually sandy) soils, (b) in agricultural areas primarily devoted to grassland vegetation, (c) with 15 to 50 percent of the land surface forested and (d) in close association with the striped ground squirrels. Intensive (highly efficient), cash-crop (row crops with little or no grassy vegetation) farming would seemingly not be compatible with badger habitat. The expansion of urban areas (such as Waukesha, Racine, Kenosha and Dane Counties) will probably lead to a reduction of suitable badger habitat. Elsewhere, based upon status opinions and observations, it appears that the badger is currently holding its own or increasing in Wisconsin.

Based on historical fur sales, badger pelts probably will never constitute an important segment of the fur market. With the high fur prices during the 1970's (especially for long furs), Wisconsin Conservation Wardens were aware of "some" illegal trafficking of Wisconsin badgers into Minnesota. At the same time, badgers are frequently taken accidentally in fox sets, and due to the difficulty in removing a live badger from leg-hold traps (or trapper disinterest), badgers are sometimes destroyed. Some trappers have used their trapping basket placed over the trapped animal or an adjustable wire neck loop attached to a 4-foot section of electrical conduit to safely remove badgers from traps. John L. McGaver, DNR Conservation Warden stationed at Wautoma announced in local newspapers his willingness to assist trappers in removing badgers from traps. Through his efforts, approximately 10 badgers were released with a neck loop in 1975.

As Wisconsin's state animal, badgers are worth more from the aesthetic standpoint than as a furbearer. While food habits' research indicated that badgers are helpful in controlling harmful rodents, badger diggings have created problems for some farmers and other landowners. Selective trapping of badgers from problem areas (alfalfa fields, pastures, golf courses, airports, and cemeteries) probably will be necessary in the future. Jackson (1961:368) reported using a few pails of water mixed with a "little" ammonia or nicotine sulphate in encouraging badgers to move their place of operations. "Havahart" style live-traps (12x12x52 inches) baited with natural prey items or canned dog food can also be used. Experienced trappers are capable of live-trapping badgers with No. 2 leg-hold steel jump traps without breaking bones. A live-trapped badger will probably have to be released a considerable distance from the problem area owing to their large home range (1,880 acres in summer, Sargeant and Warner 1972:208). Factors such as mowing, grazing, or grass cover that encourage striped ground squirrels will in turn encourage badgers.

Badger management will revolve around administrative actions, as habitat management is not needed nor feasible. An open badger season is not recommended. The badger population is currently well distributed and

secure throughout Wisconsin. Collected field observations through the DNR Endangered Species Program over a 2-3 year span at 10-year intervals will adequately monitor the status of the badger in the future.

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The authors are in the Farm Wildlife Research Group, Bureau of Research, Madison.

Edited by Ruth L. Hine

APPENDIX A. Wisconsin Trappers Association Questionnaire, 1974-75 Season.

INSTRUCTIONS: Please complete the following questions in this section at your earliest convenience; detach from the lower portion and mail. No postage required.

1. If you have observed badger, fisher or gray fox during the 1974-75 trapping season, please complete this chart:

	MONTH & YEAR	LOCATION OF OBSERVATION		COMMENTS
		COUNTY	CIVIL TOWN OR NEAREST ROAD INTERSECTION	
BADGER				
FISHER				
GRAY FOX				

DETACH HERE

2. If you have regularly or occasionally observed badger, fisher, or gray fox in Wisconsin during the past 5 years, please complete the following chart:

Badger Populations Are:			AREA IN WISCONSIN COUNTY OR SECTOR	COMMENTS
DECLINING	RELATIVELY STABLE	INCREASING		

Fisher Populations Are:			AREA IN WISCONSIN COUNTY OR SECTOR	COMMENTS
DECLINING	RELATIVELY STABLE	INCREASING		

Gray Fox Populations Are:			AREA IN WISCONSIN COUNTY OR SECTOR	COMMENTS
DECLINING	RELATIVELY STABLE	INCREASING		

DETACH HERE

BADGER, FISHER AND GRAY FOX QUESTIONNAIRE

MAY 1, 1975

DEAR WISCONSIN TRAPPER:

YOUR COOPERATION IS NEEDED FOR A SURVEY OF BADGER, FISHER AND GRAY FOX DISTRIBUTION AND ABUNDANCE IN WISCONSIN. BADGER AND GRAY FOX HAVE BEEN REPORTED DECLINING WHILE THE FISHER IS APPARENTLY ON THE INCREASE IN THE NORTH DURING THE LAST DECADE. THIS SURVEY WILL ASSIST THE DNR BUREAU OF RESEARCH IN PREPARING A CURRENT RANGE MAP FOR THESE SPECIES.

PLEASE COMPLETE THE UPPER PORTION OF THIS QUESTIONNAIRE AT YOUR EARLIEST CONVENIENCE; DETACH AND MAIL. WE NEED YOUR RESPONSE EVEN IF YOUR REPORT IS NEGATIVE. YOUR ANSWERS TO THE QUESTIONNAIRE WILL BE KEPT IN STRICTEST CONFIDENCE.

VERY TRULY YOURS,
BUREAU OF RESEARCH

Cy Kabat
CY KABAT
DIRECTOR

BADGER, FISHER AND GRAY FOX QUESTIONNAIRE

February 1, 1976

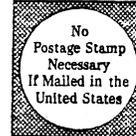
Dear Wisconsin Trapper:

Last year a BADGER, FISHER, AND GRAY FOX questionnaire was mailed to many Wisconsin trappers. We wanted to find out more about where these species are found. We hope that many more of you will answer this year to help us fill out our results.

Did you see any BADGER, FISHER, OR GRAY FOX during the 1975-76 trapping season? Yes or no, please fill out and send back the bottom part of this card. Write in "none" for counties you trapped where animals were not seen.

Sincerely,
 BUREAU OF RESEARCH
Cy Rabat
 CyRabat
 Director

 DETACH HERE



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 448 MADISON, WIS.
 Business Reply

DEPARTMENT OF NATURAL RESOURCES
 BOX 450
 MADISON, WISCONSIN 53701



ATT. LEROY PETERSEN

 DETACH HERE

INSTRUCTIONS – Please complete the following questions in this section at your earliest convenience; detach from the upper portion and mail. No postage required.

1. IF YOU HAVE OBSERVED BADGER, FISHER OR GRAY FOX DURING THE 1975-76 TRAPPING SEASON, PLEASE COMPLETE THIS CHART:

SPECIE	MONTH & YEAR	WHERE WAS ANIMAL SEEN		COMMENTS
		COUNTY	CIVIL TOWN OR NEAREST ROAD INTERSECT.	
BADGER				
FISHER				
GRAY FOX				

APPENDIX C. County Conservation Congress Questionnaire.

Farm Wildlife Research
 Dept. of Natural Resources
 3911 Fish Hatchery Road
 Madison, Wisconsin 53711

1976 BADGER, FISHER, AND GRAY FOX STATUS QUESTIONNAIRE
 Wisconsin Conservation Congress Delegates

Dear Conservation Congress Delegate:

Your assistance is needed to help determine the present population status of badger, fisher, and gray fox in Wisconsin. We want to know the current geographic distribution and relative abundance of the 3 species of furbearers so that solid future management plans can be formulated.

As it stands now:

1. The badger, entirely protected since 1955 and offering little potential value as a furbearer, may not be holding their own in Wisconsin.

2. Fishers, also entirely protected, have been restocked in the Nicolet and Chequamegon National Forests during 1956-66. These stockings in 3 counties have possibly increased fisher numbers and range.

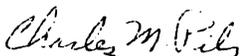
3. A sharp increase in estimated purchases of gray fox during the past 4 years, as compared to years prior to 1971, has caused DNR field personnel to be concerned over a possible reduction in state-wide populations. If the abundance of gray fox is declining in Wisconsin, changes must be made in the current hunting and trapping regulations, and in the status classification.

We encourage you to fill out and return the enclosed questionnaire. The population status of badger, fisher, and gray fox cannot be clarified without your help. Thank you.

Sincerely,



LeRoy R. Petersen



Charles M. Pils

Project Leaders

P:P:jh

1. Have you seen any live badger, fisher, or gray fox since January 1, 1975?

No _____ Yes _____

If yes, where? (Be as specific as possible on locations)

<u>Animal Seen</u>	<u>County</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

2. Have you seen badger, fisher or gray fox "sign" (tracks, scat, diggings) since January 1, 1975? No _____ Yes _____ If yes, where?

<u>Animal Seen</u>	<u>County</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

3. In your opinion, how does the current badger, fisher and gray fox population compare to that of 5 years ago? (check one)

- _____ Badger _____ Fisher _____ Gray Fox now more abundant than 5 years ago.
 _____ Badger _____ Fisher _____ Gray Fox now less abundant than 5 years ago.
 _____ Badger _____ Fisher _____ Gray Fox about the same as 5 years ago.
 _____ No Opinion

4. Any comments you would like to offer regarding badger, fisher or gray fox populations, regulations, or anything else concerning these 3 fur bearers: (Use back or separate sheet if necessary).

WANTED



BADGER



GRAY FOX



FISHER

HAVE YOU OBSERVED ANY BADGER, GRAY FOX, OR FISHER IN WISCONSIN DURING 1975?

IF SO, THEN WE NEED YOUR HELP! THE DNR IS CURRENTLY UPDATING DISTRIBUTION AND ABUNDANCE DATA FOR THESE THREE FURBEARERS.

YOUR OBSERVATIONS SHOULD INCLUDE INFORMATION ON:

- 1. SPECIES OF FURBEARER SEEN**
- 2. DATE SEEN (month in 1975)**
- 3. COUNTY and CIVIL TOWNSHIP OF OBSERVATION**

SEND YOUR OBSERVATIONS BY 6/1/76 TO: LEROY R. PETERSON, WISCONSIN DEPARTMENT OF NATURAL RESOURCES, 3911 FISH HATCHERY RD., MADISON WI 53711.

THE WELFARE OF WISCONSIN'S WILDLIFE IS EVERYONE'S RESPONSIBILITY.

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APPENDIX E. WDNR Conservation Warden Questionnaire.

1976 Badger, Fisher, and Gray Fox Status Questionnaire

Department of Natural Resources Personnel

1. Name _____ Station _____

2. Have you seen any live badger, fisher, or gray fox since January 1, 1975?

No _____ Yes _____ If yes, where?

<u>Animal Seen</u>	<u>County</u>	<u>Township</u>	<u>Town and Range</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Have you seen badger, fisher, or gray fox "sign" (tracks, scat, diggings) since January 1, 1975? No _____ Yes _____ If yes, where?

<u>Animal Seen</u>	<u>County</u>	<u>Township</u>	<u>Town and Range</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Answer this question only if you have been at your present area for the last 5 years. Over the past 5 years:

Badger numbers are: more _____, less _____, about the same _____, in area _____ nonexistent

Fisher numbers are: more _____, less _____, about the same _____, in area _____ nonexistent

Gray Fox numbers are: more _____, less _____, about the same _____, in area _____ nonexistent

5. Any comments you would like to offer regarding badger, fisher, or gray fox populations, regulations, or anything else concerning these 3 fur bearers: (Use back or separate sheet if necessary)

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