LONG-TAILED WEASELS (*MUSTELA FRENATA*) IN MANITOBA - A STATUS REPORT

by

© Kay Harvey

A Practicum Submitted
in Partial Fulfillment of the
Requirements for the Degree,
Master of Natural Resources Management

Natural Resources Institute
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Ms. Kay Harvey

A practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of Master of Natural Resources Management.

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ABSTRACT

Concern regarding reduced pelt harvests of long-tailed weasels (Mustela frenata) in the prairie provinces, together with research suggesting that this species was becoming rare in parts of Manitoba, resulted in the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) placing it on the list of animals classified as "threatened". This study was undertaken to determine whether there had been a decline in long-tailed weasels numbers in Manitoba, and if so, to identify possible causes and suggest management strategies to stabilize and encourage population growth of the species.

The main avenue of data collection was a trapper questionnaire. Carcass analysis was used to collect biological (age, sex, size) and toxicological data. Conclusions were that long-tailed weasel numbers are much lower than 30 years ago, but that reduced pelt harvests are largely due to lack of trapper interest in the species commercially. The most probable causes of reduction in the numbers are habitat loss due to land clearing for agriculture, and food loss due to similar habitat loss of the prey species. Toxicological studies showed no accumulation of organochloride pesticides or PCB in the tissues, but the study was inconclusive concerning pesticide impact as carcasses were only available from areas with low pesticide usage.

Suggested management strategies include closing the trapping season for the species; providing increased information on habitat protection for the species to everyone concerned with agriculture, and establishing a wildlife refuge in an area where they are still relatively abundant. Suggestions are made as to the need for further studies of the species.

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CHAPTER 1

INTRODUCTION

Concern was expressed about declining populations of long-tailed or prairie weasels (Mustela frenata) in the southern prairies in a report prepared by the Canadian Department of Industry, Trade and Commerce (1977). Research carried out by Gamble (1981) suggested that this concern was justified and that long-tailed weasel numbers were much lower than in the past. These factors, together with the low number of pelts taken in previous seasons, led to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) placing the long-tailed weasel on the list of animals classified as "threatened" (1982 April 6).

1.1 PROBLEM STATEMENT

In Manitoba, there are three species of weasel, though only two are trapped for their fur, the bush or short-tailed weasel (M. erminea), and the prairie or long-tailed weasel. The least weasel (M. rixosa) is caught rarely and is of low value due to its small size. There are a number of sub-species of long-tailed weasel in Canada, Mustela frenata longicauda being the one most commonly found in Manitoba (Hall 1951).

At present, neither the distribution nor population densities in Manitoba are well known. Accurate estimates of trapper harvests

for long-tailed weasels have not been available from records of pelt takes because trappers have traditionally caught both species of weasel, with no separate records being kept of the numbers of each type. Official records for weasel harvents list "weasels" as one category, with a ratio of 10:1 short-tailed to long-tailed weasels being suggested as a method of estimating the number of long-tailed weasels trapped per season (pers. comm. R. Chin, Dominion-Soudack 1987, Simms 1979). Therefore, the estimated numbers are very approximate. However, the total number of weasel pelts taken in the 1985-86 season is approximately one tenth of the number taken in 1945-46 (Table 1.1), implying that both long-tailed and short-tailed weasel populations may be much smaller than in the past, or that trapper effort in taking weasels is much reduced. (From 1974 to 1981 there was a slight increase in the pelts taken but after this the numbers continued to decrease. As short-tailed weasel populations exhibit periodic fluctuations this may account for the increase and following decrease (Osgood 1935, Lakemoen and Higgins 1972)).

Numerous factors may have contributed to the decline in the take of long-tailed weasels. Changing farm practices, for example, reduction in grain sheaves and haystacks, land clearing, and pothole draining may have been responsible by reducing den sites, prey availability and drinking water (Hall 1951, Gamble 1981). Due to reduced habitat and prey availability there may be increased competition from mink (Mustela vison) and badger (Taxidea taxus), which occupy the same range and utilize the same prey species (Banfield 1974). There may also be increased mortality or reduced reproductive capacity as a result of pesticide build-up in body tissues (Moore 1977). It is also

TABLE 1.1

ESTIMATED TOTAL HARVEST FIGURES FOR LONG- AND SHORT-TAILED WEASELS IN MANITOBA

(Department of Natural Resources records)

Season	RTL Area	Open Area	Provincial Total
1945/46			109,613
1947/48			91,600
1949/50			152,800
1951/52			79,049
1953/54			62,578
1955/56			95,641
1957/58			61,002
1959/60			45,205
1961/62			29,600
1963/64			24,527
1965/66			32,034
1967/68			26,394
1969/70			10,613
1970/71	720	4,323	5,043
1971/72	1,067	2,698	3,765
1972/73	5,825	4,308	10,133
1973/74	2,149	3,720	5,869
1974/75	5,958	12,247	18,205
1975/76	6,544	6,386	12,930
1976/77	5,368	11,570	16,938
1977/78	4,122	6,876	10,998
1978/79	4,901	9,958	14,859
1979/80	7,397	13,917	21,314
1980/81	5,796	9,724	15,520
1981/82	3,921	5,957	9,878
1982/83	2,839	3,152	5,991
1983/84	2,218	2,994	5,212
1984/85	5,084	5,575	10,699
1985/86	5,352	3,656	9,011

A 10:1 proportion can be used to estimate long-tailed weasel numbers (R. Chin, Dominion-Soudack 1987, Simms 1979) in the Open Area (area surveyed consisted mostly of Open Area - Duck Mountain and Porcupine Mountain were the only registered trapline areas included - see Fig. 1.2).

possible that the improved standard of living of most trappers (Appendix 1), together with relatively low pelt prices, have resulted in low trapper effort with a correspondingly low number of pelts taken. These factors, combined with a lack of historical records of previous population levels, make it difficult to ascertain whether a population decline indeed occurred.

This study was motivated by the need for more information to allow rational decisions to be made concerning harvest and habitat.

1.2 RESEARCH OBJECTIVES

The purpose of this study was to clarify whether the long-tailed weasel population in Manitoba has declined over the past 40 years, and if so, to identify some possible contributory factors.

Research objectives were:-

(i) to estimate present distribution and relative abundance of long-tailed weasels in Manitoba, and any changes that may have occurred over the past 40 years.

(ii) to estimate the number of long-tailed weasels being trapped at present in comparison to previous years, and current trapper interest in the species.

(iii) to identify habitat changes that may have contributed to a decline in long-tailed weasel numbers.

(iv) to determine age, sex, and size of carcasses donated by trappers, and the level of organochloride pesticide and polychlorinated biphenyl (PCB) accumulation in the tissues of a sample of the carcasses.

(v) to determine whether special status for long-tailed weasels is warranted, to recommend management strategies that would help to stabilize long-tailed weasel populations, and to suggest land management practices that would enhance weasel habitat.

1.3 BACKGROUND INFORMATION

1.3.1 General Description

Long-tailed weasels are small, slim, long-bodied carnivores belonging to the family Mustelidae (includes mink, otter (Lontra canadensis), skunks (Mephitis mephitis). Adult males weigh 184 to 345g and reach lengths of 33 to 56 cm, while adult females weigh from 71 to 198 g and attain lengths of 28 to 38 cm (Deems and Pursley 1983). They are easily recognized by their very long black-tipped tail (at least one-third of the body length), and in summer by their rich, buffy-yellow underparts. The rest of the pelt is a yellowish chocolate brown (Fig. 1.1). In winter, the pelt is pure white except for the tip of the tail which remains black. It is during winter, when the pelage is white and weasels are known as ermine, that they are trapped for their pelts (during the summer short-tailed weasels are usually called bush weasels and long-tailed weasels, prairie weasels). Both males and females have

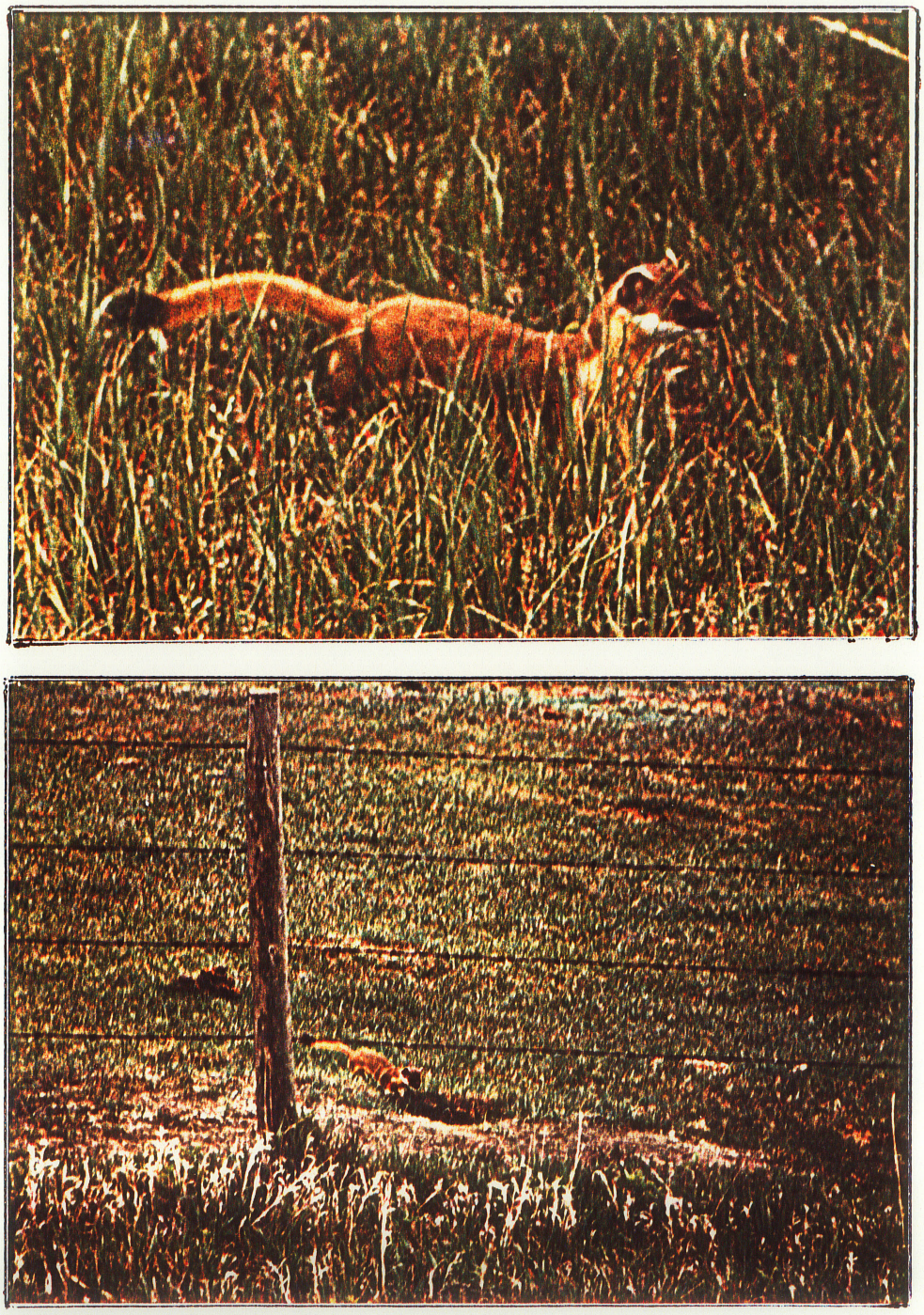


Fig. 1.1 Long-tailed weasel showing black-tipped tail and natural habitat.

the same coloring, with males being much larger than females (Seton 1909, Soper 1919, Hamilton 1939, Hall 1951).

1.3.2 Distribution

There is little literature documenting the distribution of long-tailed weasels in Manitoba in any detail. Short-tailed weasels are found throughout Manitoba, whereas long-tailed weasels are thought to occur throughout southern Manitoba from approximately 75-km west of the Ontario border to Saskatchewan. Northern limits of their range are the lower edges of Lakes Winnipeg and Manitoba, along the western side of Lakes Manitoba and Winnipegosis to The Pas (Fig. 1.2). The northern coniferous forest forms the northernmost limits of its range (Banfield 1974, Gamble 1981, Hall 1981). In 1909, Seton reported that the long-tailed weasel was abundant on the prairies. Soper (1961) stated that it was seen mostly on the treeless prairies, but occasionally in aspen groveland and mixed forests.

Hall (1951), Banfield (1974) and Gamble (1980) produced general distribution maps of long-tailed weasels in Manitoba (Fig. 1.3). Examination of these maps shows there have been some changes over recent years. However, long-tailed weasels are not present uniformly throughout the area, but tend to occur in "pockets" (Gambel 1980). There is no documentation that gives any indication of where there are concentrations of any consequence. Gamble (1980) claimed that the actual area of distribution is almost twice that recorded by Banfield (1974).

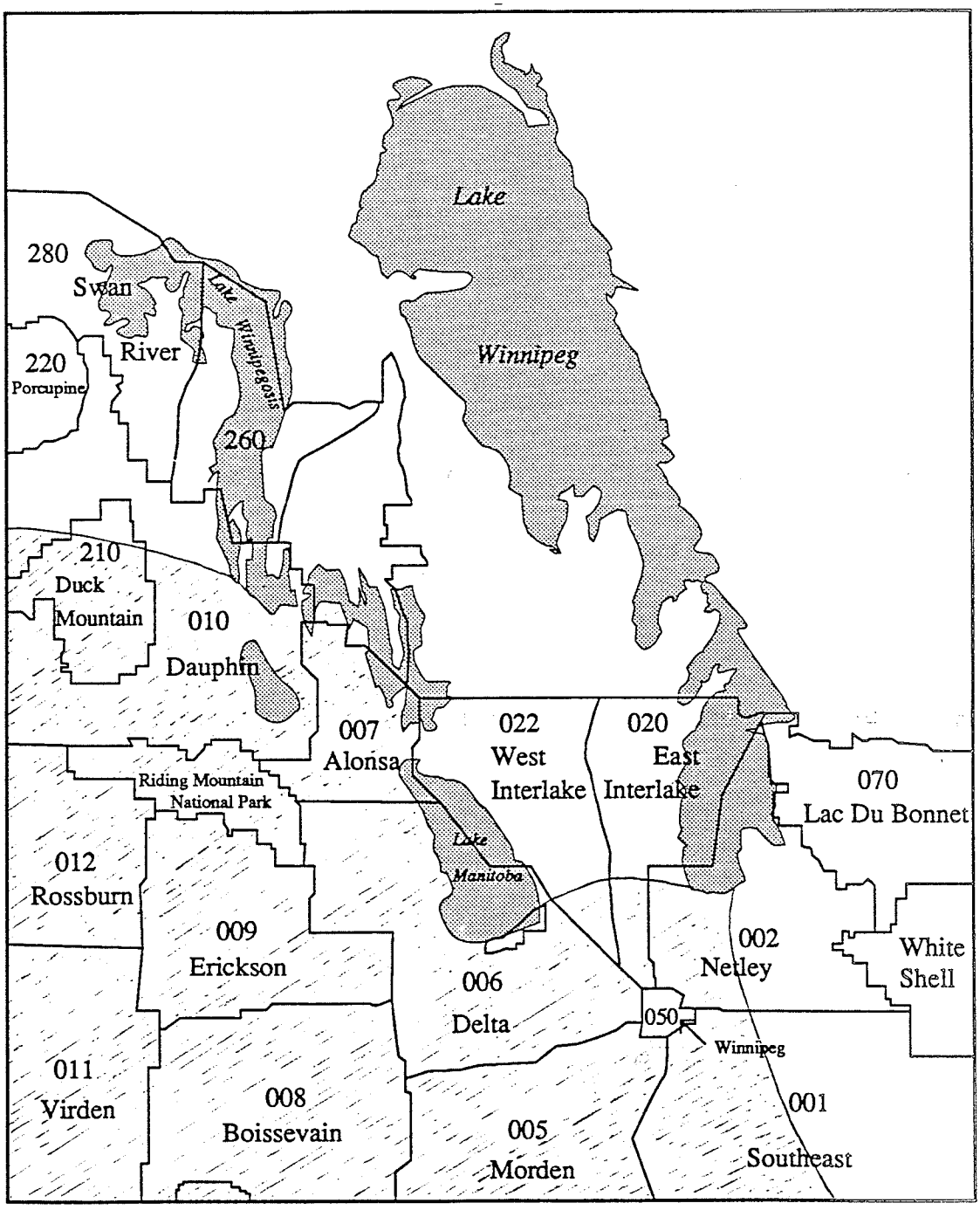
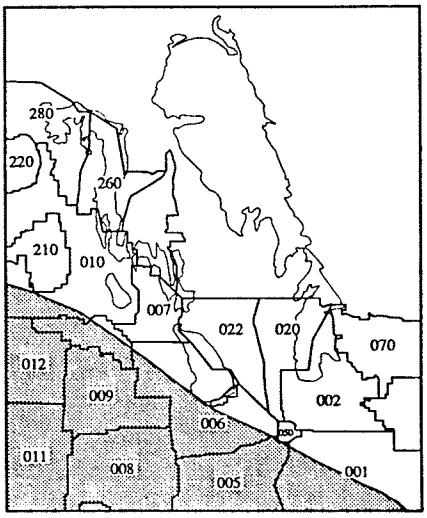
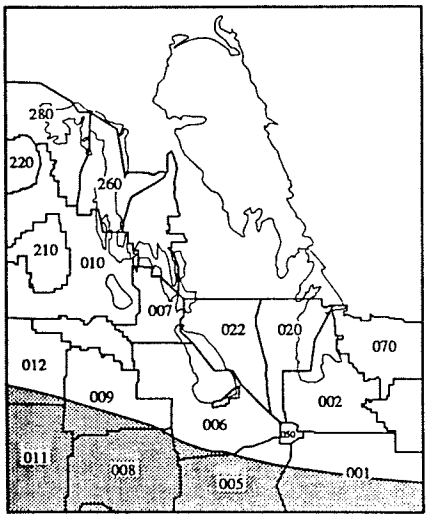


Figure 1.2 The range of the long-tailed weasel in Manitoba. (Deems and Pursley 1983)



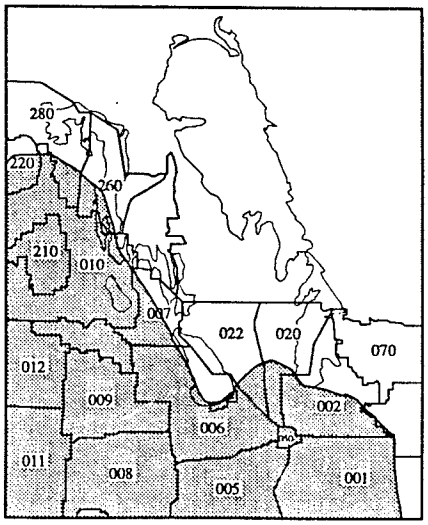
Distribution map of *Mustela frenata longicauda*.
From Hall and Kelson - 1959.

Figure 1.3(a)



Distribution map of *Mustela frenata longicauda*.
From Banfield - 1974.

Figure 1.3(b)



Distribution map of *Mustela frenata longicauda*.
From Gamble - 1981.

Figure 1.3(c)

Figure 1.3 Distribution maps of Mustela frenata longicauda in Manitoba.

1.3.3 Habitat

Long-tailed weasels are ecotonal (transitional) species and occupy a wide variety of habitats, such as coniferous and deciduous forest edges, brushland, marshes and agricultural areas. They are found in short-grass plains, the more northern prairies and parkland, and are described as typical species of the transition zone which coincides with the Aspen parkland area (Soper 1964). The parkland area is also well suited to agriculture, and botanists have estimated that 95% of this biome has been removed (Bird 1930 and 1961, Kiel et al. 1972, Merriam 1978) due to agricultural activities. This is a severe reduction in habitat and may have caused the species to become fragmented over the prairies (COSEWIC 1982). River banks and wetlands provide habitat where a diversity of prey are found, but these are also being drained and cleared (Kiel et al. 1972).

1.3.4 Food Habits

Long-tailed weasels are generalist feeders utilizing a wide variety of prey such as pocket gophers (Geomyidae), rabbits (Leporidae), mice and voles (Cricetidae), squirrels (Sciuridae), grasshoppers (Orthoptera), beetles (Coleoptera), and earthworms (Lumbricidae) (Osgood 1935, Hamilton 1939, Hall 1974). Garter snakes (Thamnophis sirtalis), muskrats (Ondatra zibethicus), ground-nesting birds (particularly the red-winged blackbird (Agelaius phoeniceus) and their eggs also form part of their diet (Hamilton 1933, Errington 1936, Hall 1951, Simms 1979, Gamble 1980). It has been suggested that a source of free-standing water is also necessary (Gamble 1980).

CHAPTER 2

METHODS OF INVENTORY

Methods of data collection can be divided into four sections:-

1. Trapper survey;
2. Personal interviews;
3. Analysis of museum and auction records; and
4. Carcass analysis.

2.1 TRAPPER SURVEY

A trapper survey (Appendix 2) was used as the main avenue of data collection for a number of reasons:-

(i) the area to be considered was very large (more than a quarter of the province);

(ii) because long-tailed weasels tend to be fragmented throughout their range (COSEWIC 1982) rather than uniformly distributed, studying a small area would not produce results that could be applied to the whole of the long-tailed weasel range;

(iii) trappers are usually very observant and aware of their surroundings when trapping;

(iv) trappers are active continuously in all areas of the province at the same time allowing comparison of a wide area simultaneously;

(v) many trappers have been active for 40 or more years and can provide valuable information of past population distribution and levels of abundance;

(vi) it is an advantage to know trapper attitudes before designing a management plan for a species (these attitudes can be the difference between success and failure of any management plan (Bailey 1980)).

Based on Manitoba Registered Trappers Association Local Fur Council (LFC) sections (Fig. 2.1), areas were identified where long-tailed weasels were known to have occurred. In November, 1986, a questionnaire was prepared and mailed to a random 25% sample of trappers from each of these LFC areas (approximately 2,500 total). By the end of April 1987, a total of 856 questionnaires had been returned. Surveys were sorted into LFC areas and responses for each area analyzed. The results were used:-

(i) to estimate present distribution and relative abundance compared to previous years, and trapper opinions as to possible causes for any changes that may have taken place;

(ii) to estimate the numbers of long-tailed weasels being trapper now compared with previous years, and to estimate whether trappers are interested in trapping them at present; and

(iii) to identify habitat changes that may have contributed to a decline in the long-tailed weasel.

Preferred habitat for each LFC area was estimated and some indication obtained of habitat changes over the years from trapper observations. Other information such as whether trappers normally sold their pelts, and if not, what they did with them, and number of years they had been trapping was also obtained.

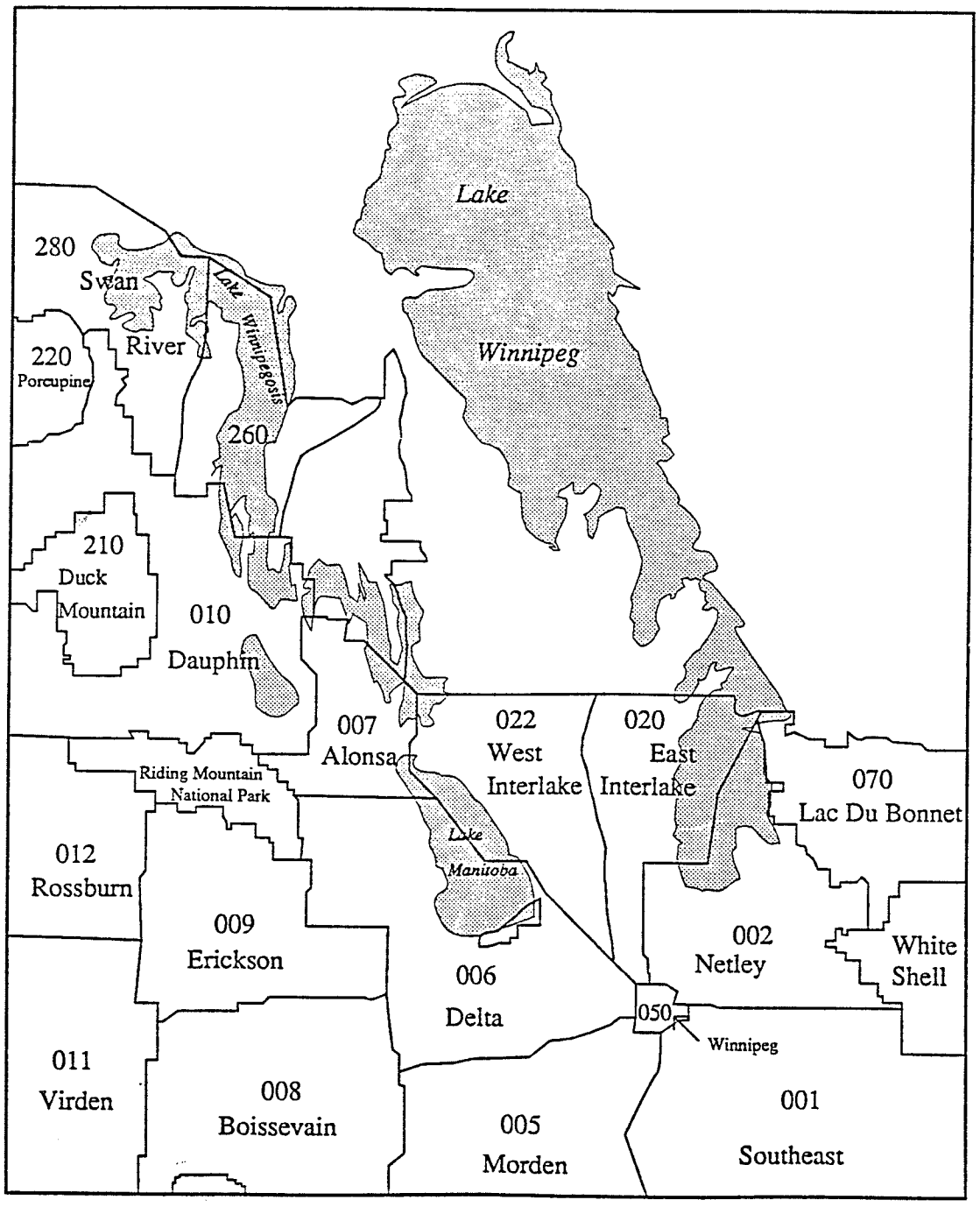


Figure 2.1 Local Fur Council Areas - Manitoba

A map (Appendix 2) was included with each survey and the trapper was requested to mark his trapping area so that a more accurate distribution range could be calculated.

A question was included concerning sightings of badgers in the same areas. The Department of Natural Resources has received numerous reports in recent years that badgers have declined considerably (pers. comm. C. Johnson, Department of Natural Resources, 1987). As badgers occupy similar habitat and utilize some of the same prey species as long-tailed weasels, this was used as a cross-reference to determine possible changes in abundance of badgers and factors that may be affecting both species. Information received for badgers has been recorded in Appendix 7.

Responses to all questions were calculated as a percentage of total responses for that LFC area. Results were tabulated and presented as bar charts for easier visual comparison. General distribution maps were prepared showing the variation in density of long-tailed weasels in different time periods, and a more specific map showing areas where long-tailed weasels were seen or caught over the 1985-86 and 1984-85 seasons (i.e., the present range).

2.2 PERSONAL INTERVIEWS

Survey results were supplemented by personal interviews at Trapper Workshops (held by the Department of Natural Resources) as follows:-

(i) Ashern, West Interlake, on 1986 October 11, which was attended by 22 trappers;

(ii) Ste. Rose du Lac, Dauphin area, on 1986 November 13, which was attended by 27 trappers.

Other trappers were interviewed at a Trapper Association annual meeting held in Rennie, Whiteshell, on 1986 October 15. Approximately 50 trappers were present at this meeting.

Individual trappers were also interviewed, four in the Whiteshell/Lac du Bonnet area, three in the Altona/Morden area, one in Virden, two in Boissevain, and one in The Pas. The original intention had been to follow up, by telephone, any trappers whose survey showed considerable knowledge of the species. However, after the surveys were analyzed, it was noted that any trappers with detailed information had taken the time to write extra information either on the questionnaire or as separate letters. Thus, a follow-up was an unnecessary expenditure of time and money.

2.3 ANALYSIS OF MUSEUM AND AUCTION RECORDS

A batch of large pelts (from Manitoba) at Dominion-Soudack Fur Auction, Winnipeg, were measured and their sex determined where possible (position of the nipples on a female, and in males the mark on the pelt indicating the presence of the penis, but these marks are not always easy to identify once a pelt has been formed). Measurements were also difficult to determine accurately after forming as forming methods and boards differ considerably amongst trappers.

Manitoba Museum of Man and Nature maintains a collection of long-tailed weasel specimens donated to them, and capture locations from 1970 to 1984 were analyzed. A distribution map resulted which was compared with results from the trapper survey.

2.4 CARCASS ANALYSIS

A request was sent out with the questionnaire for trappers to donate any carcasses of long-tailed weasels thay may acquire to the Department of Natural Resources for analysis. At the same time, posters (Appendix 3) were distributed to all area offices of the Department, and posted in as many places as possible. A shorter version of the poster (Appendix 4) was placed in community newspapers in the LFC areas (Appendix 5), and a radio broadcast made from the Brandon studios (December 1986) describing the study being done and requesting carcasses and any information regarding sightings.

A total of 45 carcasses were donated, 21 during the 1986-87 season and a further 24 in the 1987-88 season. These were measured and the ratio of tail to body length calculated (ratio for long-tailed weasels is 1:3). Two male carcasses with the tails equalling 30% of the body length were likely short-tailed and not long-tailed weasels (these were not included in the analysis). The sex of the carcasses was also recorded.

Carcasses were aged using two methods:-

(i) Tooth sectioning

This method is based on the progressive closure of the root of the canine teeth which leaves a series of distinct annuli which can be used to determine the age of the animal (van Nostrand 1964, Marks and Erickson 1966). The method can distinguish between juveniles (young of the year) and young adults (one to one and a half years) and adults, and is 95% accurate (Matson's laboratory standards).

The canine teeth were removed, after first boiling the carcass head to loosen them, then sent to Matson's laboratory, Milltown, Montana, to be sectioned and aged.

(ii) Baculum measurements

The baculum is the penis bone found in all male members of the genus Mustela. Bacula of juvenile weasels are small and light-weight, those of the mature animals being much larger and heavier (Wright 1947 and 1951, Petrides 1950). Weight is considered a more reliable criterion for aging than length with an 85 to 90% accuracy being quoted (Elder 1951).

Bacula were cleaned by boiling in an enzyme solution, then dried, weighed and measured. The weights were then plotted against the length which shows an obvious separation between juveniles and adults.

To determine the levels of organochloride pesticides and PCBs in the tissues, the livers were removed from the carcasses and a sample of 20 (10 from the 1986-87 season and 10 from the 1987-88 season) sent to Zenon Environmental Inc. laboratories, Burlington, Ontario, for analysis. The analytical method, gas chromatography, was carried out as follows:-

Approximately 2 g of each liver was spiked with hexabromobenzene as surrogate to monitor extraction. The samples were digested with hydrochloric acid and the resulting solution was extracted with 1:3 dichloromethane/hexane. The extract was cleaned up by gel permeation chromatography (GPC) and silica gel column chromatography prior to analysis by gas chromatography/electron capture detection (GC/ECD). (Most of the p,p'-DDT is converted by the acid digestion to

p,p'-DDD, so results will show a low recovery of p,p'-DDT and a high recovery of p,p'-DDD).

The analysis was able to indicate the presence or absence of 14 organochloride residues and PCBs.

CHAPTER 3

RESULTS AND DISCUSSION

3.1 POPULATION ABUNDANCE AND DISTRIBUTION

A combination of the information from the trapper survey, interviews, museum and auction records, and trapping location of donated carcasses was used to estimate long-tailed weasel population abundance and distribution. Unless specifically stated otherwise, all results of the survey were expressed as a percentage of the total trapper response for that LFC area. Names of the LFC areas have been used in the text rather than number codes to facilitate area recognition without constant referral to the guide map.

3.1.1 Trapper Survey Respondent Data

A survey was mailed to approximately 25% of trappers from each LFC area. The response varied from 92% in the East Interlake to 4% in Duck Bay (LFC area 260) in the northwest. Duck Mountain and Netley response was fairly high (79% and 60% respectively), with the majority in the southern half of the province having about 30% response. All areas north of Dauphin LFC area had a low response, with Swan River 10% (three responses), Duck Bay 4% (one response), and Porcupine Mountain 13% (one response), as did Lac du Bonnet with 18% (two responses) in the east of the province. As the actual number of responses were so low for

these northwestern areas and Lac du Bonnet, the results may not accurately represent those areas. Table 3.1 summarizes the numbers of trappers surveyed, the number of responses for each LFC area, and the percentage response.

TABLE 3.1

SAMPLE NUMBERS, AND RESPONSES OF TRAPPERS SURVEYED

LFC Area Code	Total No. Trappers in LFC Area	Number Sampled	Number of Responses	Percent Response
001	1879	473	143	30
002	240	60	36	60
005	966	222	78	35
006	832	208	61	29
007	424	101	18	18
008	1916	413	127	31
009	523	117	54	46
010	1752	430	119	28
011	960	243	66	27
012	548	141	45	32
020	100	25	23	92
022	440	110	42	38
050	608	142	16	11
070	44	11	2	18
210	50	14	11	79
220	25	8	1	13
260	91	23	1	4
280	116	29	3	10

Trappers were asked to record their number of years trapping experience. The length of time that respondents had been trapping varied from one year to over 70 years (Appendix 6, Table 6.1). The largest percentage of trappers were in the "less than 10 years trapping" category, with an average of 36%. In most areas around 30% of the trappers had been trapping for 30 or more years. In the Netley and Duck Mountain areas the percentage of trappers with more than 30 years

experience was high (47% and 66% respectively). The percentage of older trappers (those with more than 30 years experience) in each section was a useful cross-reference when analyzing data for previous time periods.

3.1.2 Long-Tailed Weasel Distribution and Population Abundance

In most LFC areas, the response for sightings was mixed. However, it was possible to detect certain trends, and by grouping LFC areas in parts of the province the overall pattern for larger areas could be seen (Fig. 3.1 and Appendix 6, Tables 6.2 and 6.3, and Figs. 6.1 and 6.2). In the southwestern corner of the province (Virden, Boissevain, Rossburn, and Erickson), there appears to have been an upward trend in the number of sightings in recent years, particularly in the last season (1985-86). This increase in sightings is also apparent in other areas, such as Morden and Delta (South Central), Alonsa, Dauphin and Duck Mountain (East Central), but to a lesser extent. However, there has not been a corresponding increase in pelt takes.

The more eastern areas, such as the Southeast and Netley, show that the number of sightings has never been very high (long-tailed weasels were fairly common more than 20 years ago in the Netley area). A small number of sightings were reported in the Interlake area (17% in East Interlake, 21% in West Interlake in the last season), but most respondents (including those interviewed) had never seen long-tailed weasels in this area. Sightings in the Duck Mountain area were reasonably consistent over the years, but with a small drop around 15 years ago, and again in the last five years. In the more northern areas of Porcupine Mountain and Swan River, long-tailed weasels were seen 20 or more years ago, but not since, and Duck Bay responses were negative

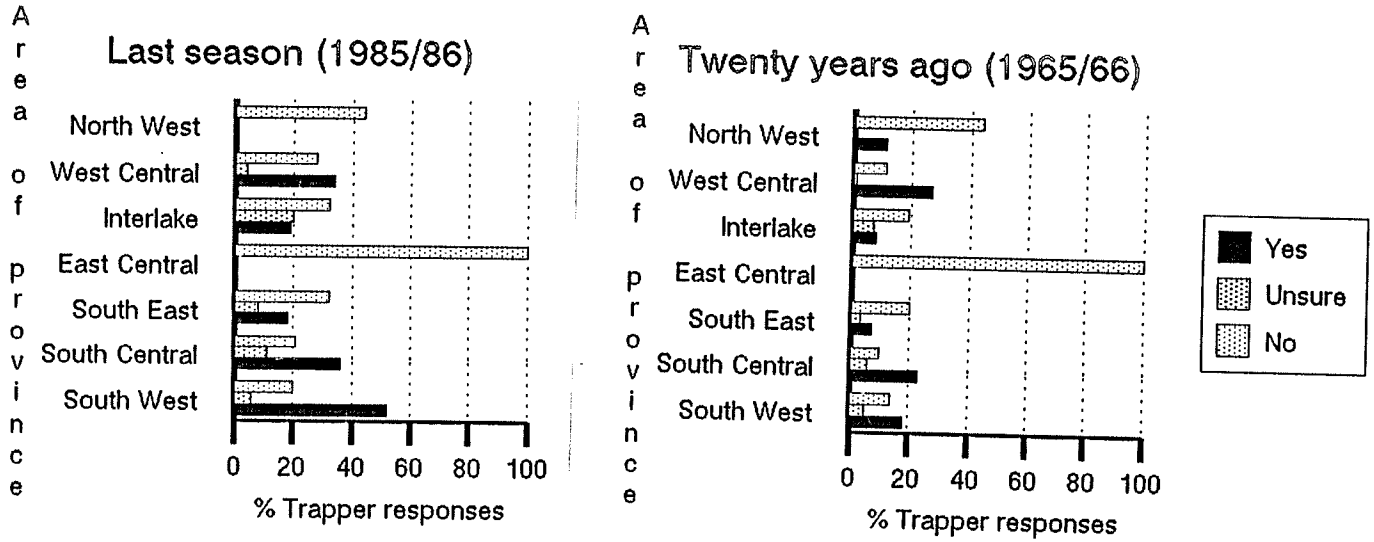


Figure 3.1 Trapper sightings of long-tailed weasels in Manitoba in the 1985-86 and 1965-66 seasons

for all time periods. The occasional sighting has been reported from The Pas, but this appears to be the limit of their range (it is possible that these animals have crossed over from Saskatchewan). One trapper who has been trapping for over 30 years, and was raised in the Churchill area, was adamant that long-tailed weasels were common almost as far north as Churchill until DDT spraying in the 1950s killed them all, but there are no other records of sightings in this area. Only a very small percentage of respondents in the Winnipeg area reported sightings (6%), with the vast majority never having seen a long-tailed weasel either recently, or in the past.

Generalized distribution maps (Fig. 3.2) show that (with the exception of the mid-1960s) long-tailed weasels have always been seen frequently in the southwestern corner of the province, and likewise have always been more uncommon in the southeastern corner. Areas where the most fluctuations appear to have occurred are Dauphin and Alonsa, near the northernmost part of the species range.

A map was included with the survey and trappers asked to mark their trapping area, and also to name their trapping area on the survey. Where trappers had reported sightings during the last two seasons (1984-85 and 1985-86), this information was used to produce an up-to-date distribution map (Fig. 3.3). Comparison of the range of long-tailed weasels indicated by this map with those of Hall and Kelson (1959) and Banfield (1974), (Fig. 1.3), suggests that they actually occur much further north than earlier records indicated. In particular, Banfield's map shows them occurring only across the southern part of the province, in the Virden, Boissevain, Morden, and the southern half of the Southeast areas. The distribution according to the current study appears to agree more with Gamble (1981) (Fig. 1.3c), and with Deems and

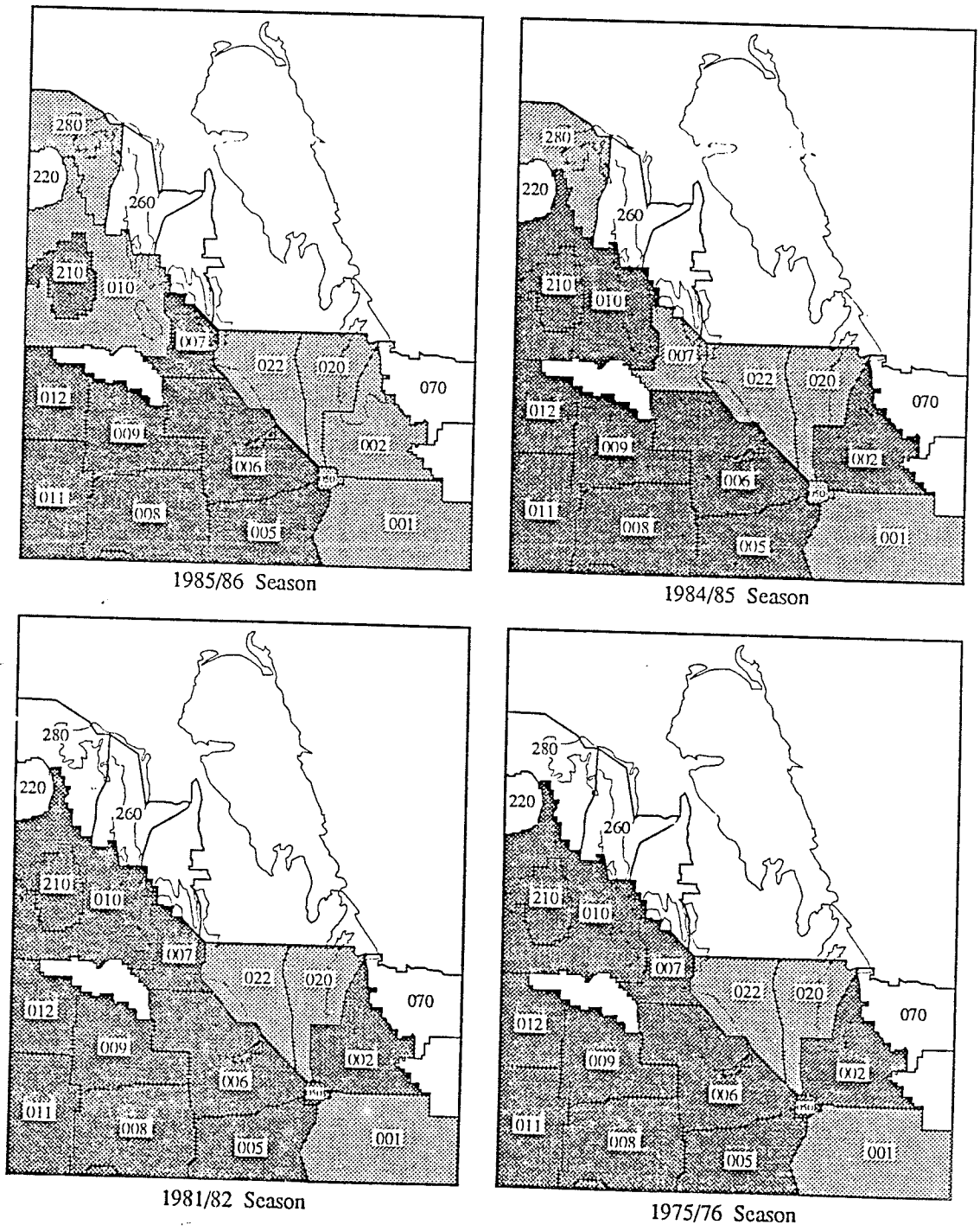
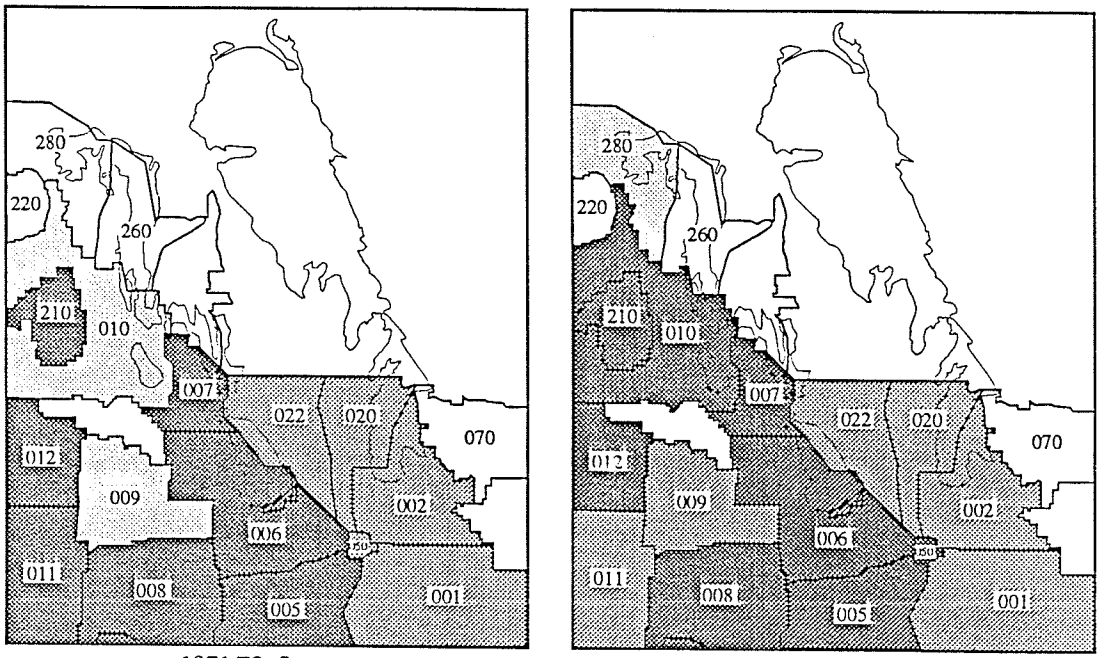


Figure 3.2 Long-tailed Weasel Sightings in Manitoba

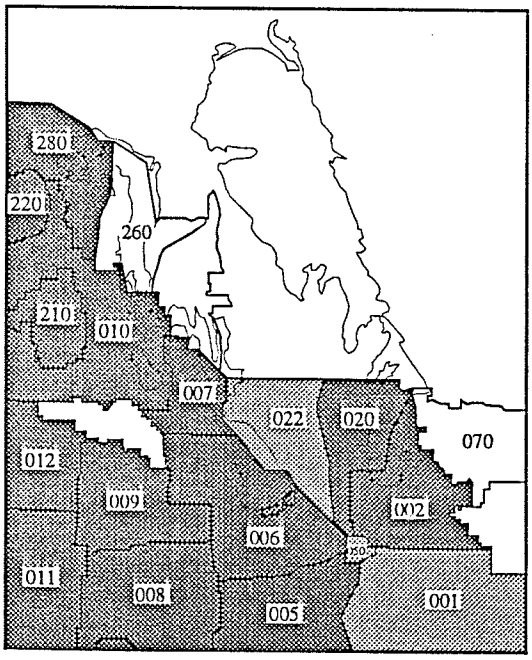
Local Fur Council Areas, Manitoba

- Areas where majority of trapper responses +'ve
- Areas where majority of trapper responses -'ve
- 50/50 response
- 100% -'ve response or no +'ve response



1971/72 Season

1965/66 Season



Before 1960

Figure 3.2 (continued) Long-tailed Weasel Sightings in Manitoba

Local Fur Council Areas. Manitoba

Areas where majority of trapper responses +'ve

Areas where majority of trapper responses -'ve

50/50 response

100% -'ve response or no +'ve response

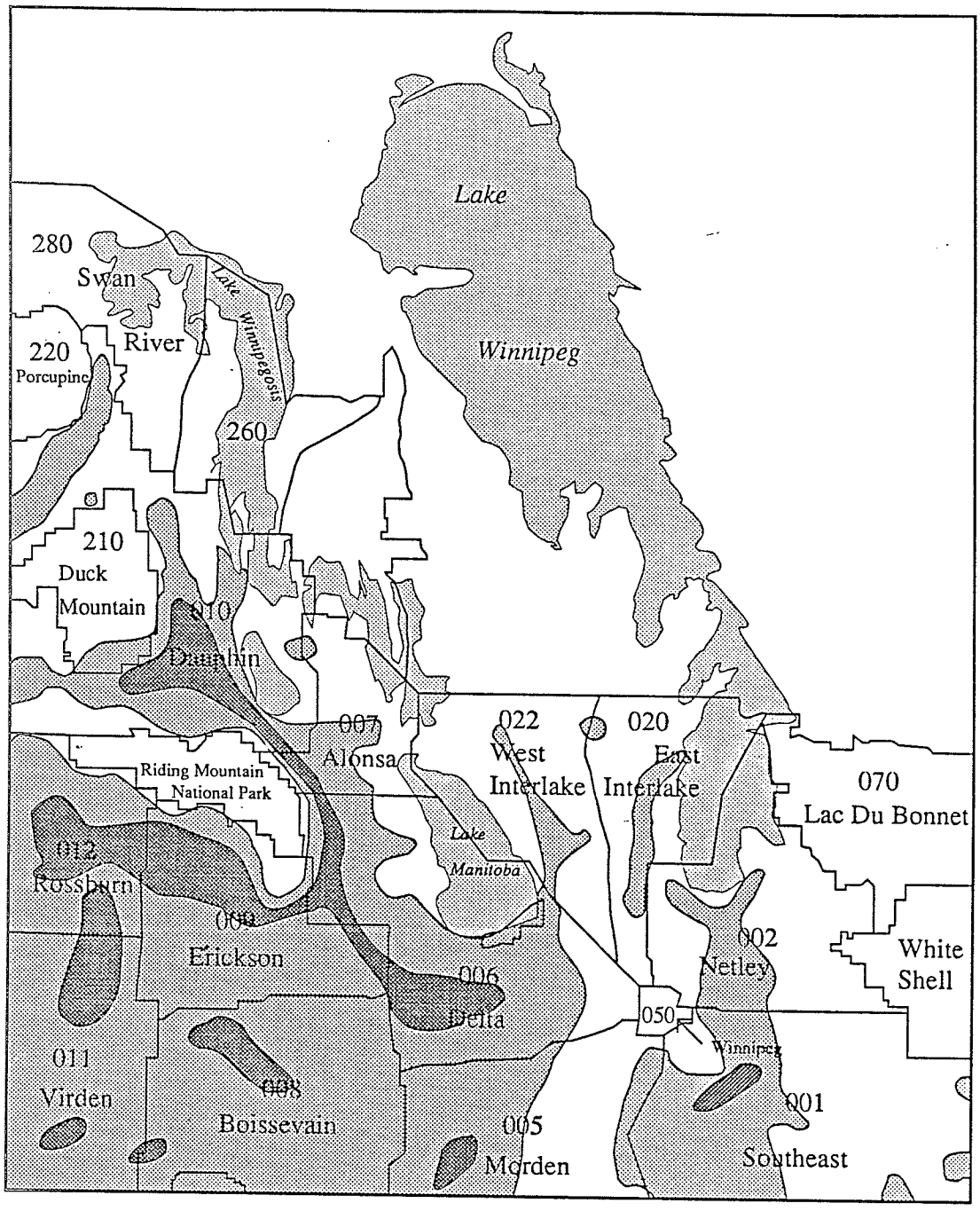


Figure 3.3 Present Distribution of Long-tailed Weasels in Manitoba According to Trapper Sightings

(1984/85 and 1985/86 seasons)

present range areas of greater density

Pursley (1983) (Fig. 1.2), with the exception that Gamble showed long-tailed weasels occurring further north on the western side of the province, extending into Porcupine Mountain, and slightly further east into the Southeast area, but not quite so far into the Interlake area.

From the sightings recorded, long-tailed weasels are obviously still present in many areas of the province, and if examined in isolation, they seem to imply that there has not been any marked decrease in sightings over the past 20 years (Appendix 6, Table 6.3 and Figs. 6.1 and 6.2.). However, these results may be misleading in that the proportion of older trappers (those with more than 30 years trapping experience) in the respondents is only about 30%, so records of sightings in the past are correspondingly smaller. If this is taken into account and the results weighted accordingly, it seems likely that the number of sightings has indeed declined over the last 20 or so years. It must also be realized that this question asked for sightings in different seasons, but not for how many, so gives no indication of population abundance.

Table 3.2 and Appendix 6, Table 6.4 and Fig. 6.3, are better guides to trapper opinions of the abundance of long-tailed weasels, and show that trappers, in all areas, without exception, are overwhelmingly of the opinion that there are less now than at any time in the past. Trappers interviewed confirmed this opinion.

TABLE 3.2

OVERALL TRAPPER OPINION AS TO WHETHER THERE ARE MORE, THE SAME NUMBER, OR LESS LONG-TAILED WEASELS NOW THAN IN PREVIOUS YEARS

Time Period	% Trapper responses		
	More	Same	Less
5 years ago	4	14	32
10 years ago	3	6	26
20 years ago	3	4	27
30 years ago	2	4	25
More than 30	2	4	26 years ago

3.1.3 Museum and Auction Records

Museum records

The Manitoba Museum of Man and Nature keeps all long-tailed weasels donated to them over the years. Records from 1970 to 1984 (the majority were between 1977 and 1979), show that a considerable number of long-tailed weasel specimens were acquired just south of the Porcupine Mountains, in the Dauphin area south and east of Duck Mountain, and in the Virden and Boissevain areas (Appendix 6, Table 6.5). There were fewer records of specimens from the Delta, Morden and Southeast areas. One specimen was reported from the Netley area, and one just south of Riding Mountain. In all areas, except Morden, records showed that approximately two-thirds of the specimens were males. A distribution map (Fig. 3.4) shows the range of long-tailed weasels according to these records.

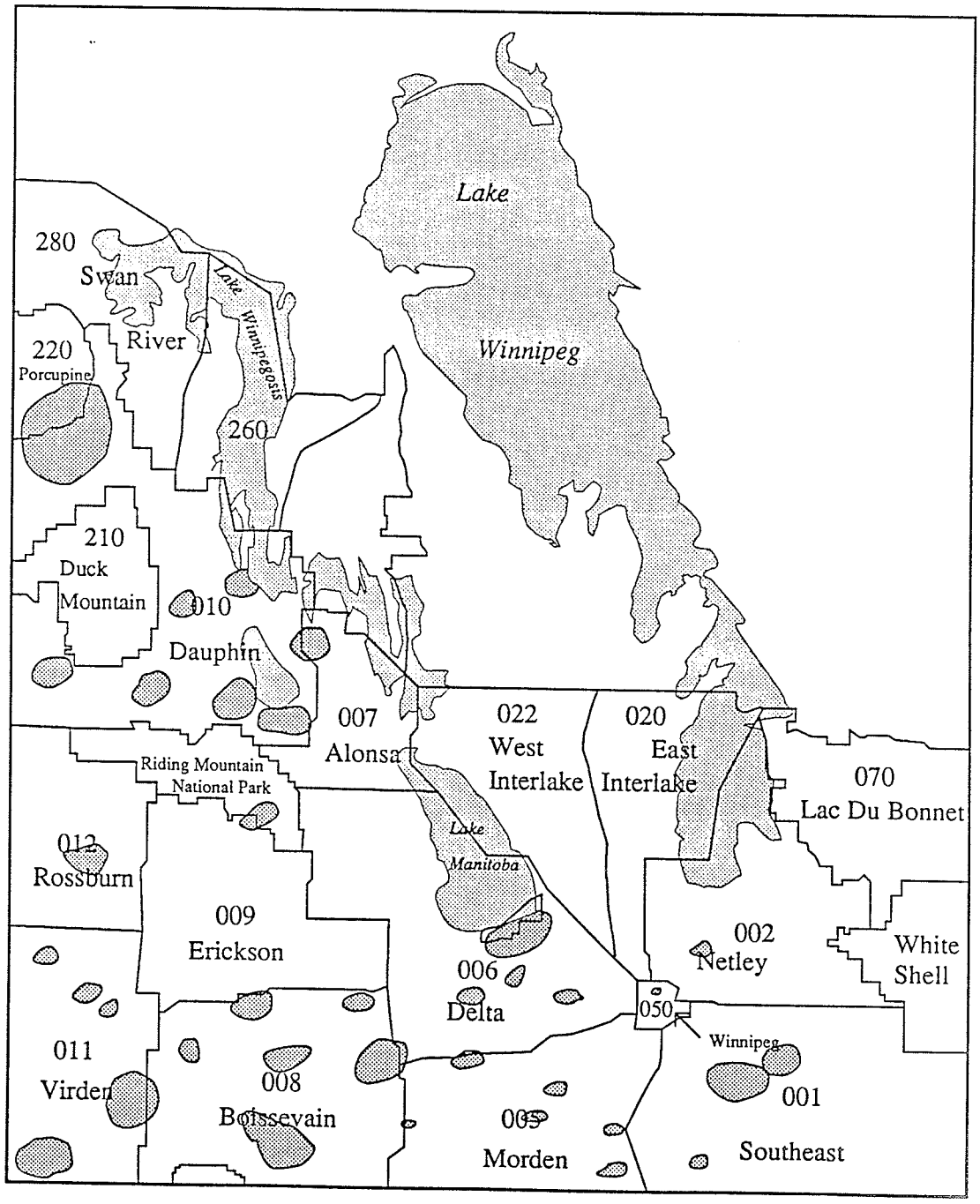


Figure 3.4 Manitoba Museum of Man and Nature Records of Long-tailed Weasel Specimens From 1970 to 1984.

areas where specimens recorded

Auction records

Domonion-Soudack auction is the major fur handling and sales facility in Manitoba. Their records do not differentiate between long-tailed and short-tailed weasels, but measurements of one batch of large pelts (from Manitoba) showed approximately 20% in the 1986-87 season were long-tailed (57 to 222 short-tailed) (Appendix 6, Table 6.6). All of the pelts examined were males. However, this batch was not representative of the overall take as it was a collection of large pelts. The company quoted approximately 10% long-tailed weasels as the usual proportion (pers. comm. R. Chin, 1987). The capture location (either registered trapline area, or address of trapper when more specific locations were absent) of these weasels were incorporated into the distribution map for recent sightings (Fig. 3.3). As in the museum records, the highest number came from the Boissevain and Dauphin areas.

3.1.4 Trapping Data

The data gathered about trapping habits indicated that the majority of trappers had not been setting traps for long-tailed weasels for more than 30 years, in most cases 50% to 75%, and in recent years as many as 90% (Appendix 6, Table 6.7). The number of trappers trapping the species was slightly higher 15 or more years ago (in the northwestern areas, the majority of trappers who responded were setting traps 30 years ago). However, there are still a small number of trappers who intentionally trap long-tailed weasels, in particular in the Alonsa (17%) and Duck Mountain (10%) areas. In other LFC areas, less than 10% intentionally trap the species (Appendix 6, Figs 6.4 and 6.5). Table 3.3 shows the overall trend for the province.

TABLE 3.3

OVERALL TRAPPER RESPONSES AS TO WHETHER THEY WERE SETTING OR NOT SETTING TRAPS FOR LONG-TAILED WEASELS IN MANITOBA

Trapping Season	% Trapper Response	
	Yes	No
1986-87	8	90
1985-86	8	80
1984-85	9	77
1983-84	11	74
1982-83	11	72
1981-82	11	71
1980-81	10	70
1975-80	11	67
1970-75	11	65
1965-70	13	63
1955-65	15	53
1945-55	15	54
Before 1945	21	54

The main reasons (Appendix 6, Table 6.8) given for not trapping were:-

(i) too few around and wish to conserve;

(ii) uneconomic; and

(iii) more valuable alive than dead for rodent control.

In all areas, between 4% and 20% of all respondents bought a trapping licence to allow them to carry a firearm (to shoot coyote and fox), not to trap. In the Winnipeg area more than 60% of the respondents were not true trappers.

Data gathered from the questionnaire shows that the number of long-tailed weasels trappers remember catching each season decreased considerably during the late 1960s and early 1970s (Appendix 6, Table 6.9). Areas where the greatest number appear to be taken at present are

Dauphin and Boissevain, where the catch is about 25% of the number that trappers remember taking in the seasons between 1945 and 1955. In Virden and the Southeast, the number caught at present is about one-third the number taken between 1945 and 1955, and in Erickson, one-sixth. Trappers in the Duck Mountain area recall catching as many as 250 per season before 1945, but in 1986 were only catching around seven. These results correspond to Table 1.1, where pelt takes show a marked reduction from the 1950s to the present.

In most areas about 35% of trappers reported that they had caught long-tailed weasels accidentally in traps set for other animals (Appendix 6, Table 6.10). All types of traps, for all sorts of target animals from barn rats (Rattus norvegicus) to wolves (Canis lupus), had caught long-tailed weasels accidentally, but traps set for mink (33%), fox (Canidae), (13%), coyote (Canis latrans) (10%), and squirrel (9%) seem to be where they are most often caught (Appendix 6, Tables 6.11, 6.12, and 6.13).

When trappers caught long-tailed weasels, almost all of the pelts were sold. The few not sold were those damaged by predators, road kills, or were not prime. The occasional one was kept and mounted (Appendix 6, Table 6.14).

3.2 HABITAT DATA

3.2.1 Habitat Types Where Long-Tailed Weasels Were Sighted Or Caught

As for population abundance and distribution, all survey data were calculated as a percentage of total trapper responses for that LFC area. Bar charts comparing sightings and catches for different habitat

types for each LFC area are shown in Appendix 6, Fig. 6.6. Table 3.4 and Fig. 3.5 show the overall habitat types where long-tailed weasels have been seen or caught in Manitoba.

TABLE 3.4

OVERALL RESPONSES FOR TYPES OF HABITAT WHERE LONG-TAILED WEASELS WERE USUALLY SEEN OR CAUGHT BY TRAPPERS

	% Trapper Response	
Habitat Type	Seen	Caught
Never seen or caught	21	33
Cultivated field	15	9
Uncultivated field	21	10
Ditch	37	15
Shelterbelt	15	9
Marsh	33	21
Pothole	9	7
Creek	25	21
Forest	19	13
Farmyard	34	17

In most LFC areas, long-tailed weasels were reported either sighted or caught in all the habitat types listed. Most frequently mentioned were farmyards (25% to 55%), except in the East Interlake and Winnipeg, where the most frequent sightings were in marshland and ditches (25% to 52%), (Appendix 6, Tables 6.15 and 6.16). Marshes and riparian areas also seem to be popular habitat. Sightings around potholes and in cultivated fields were low (18% for potholes in Boissevain and Erickson areas and lower in all other areas, and 10 to 23% for cultivated fields), whereas sightings in uncultivated fields and pasturelands were slightly higher.

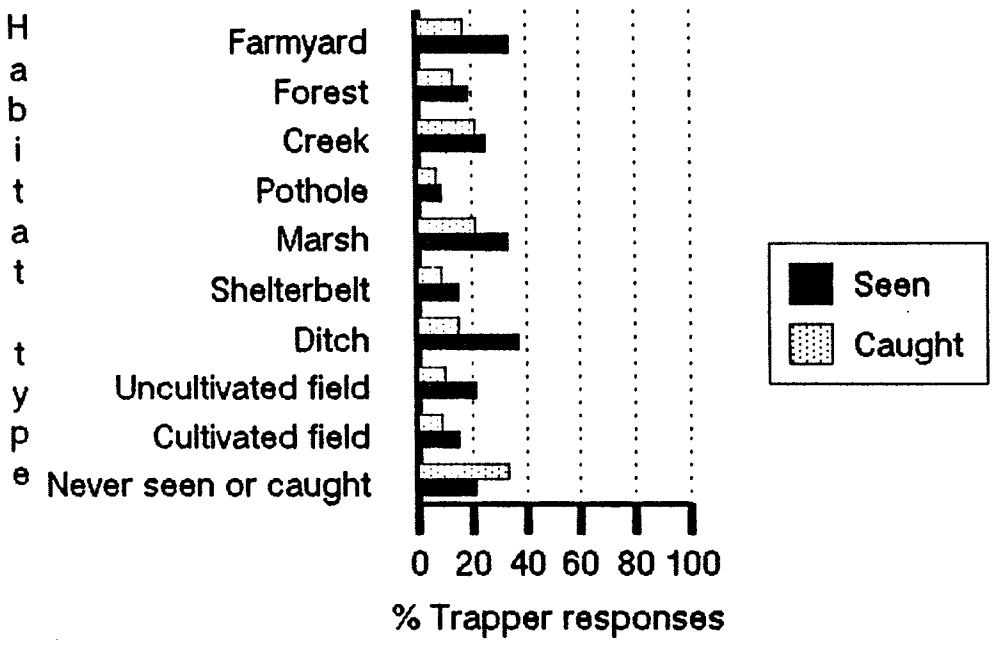


Figure 3.5 Habitat types where long-tailed weasels usually seen or caught by trappers

Other habitat types that trappers frequently added to those listed in the survey were stone piles, brush piles, field edges, and along fence lines. Modern machinery enables large scale intensive farming which involves clearing and levelling extensive areas of land, removing these field edges, stone piles, small patches of bush, potholes, and sloughs. These all appear to be habitat frequented by long-tailed weasels.

The change most often noted in areas where trappers usually saw or caught weasels was bush clearing (Table 3.5 and Fig. 3.6). Pothole draining and new roadways were the next most frequently mentioned. More houses and different crops were noted only by a small number of trappers.

TABLE 3.5

OVERALL TRAPPER RESPONSES TO CHANGES IN HABITAT

NOTICED IN AREAS WHERE LONG-TAILED WEASELS USUALLY SIGHTED

Habitat Change	% Trapper Response
Bush clearing	38
Pothole draining	30
New roadways	22
More houses built	15
Different crops	8
No changes	22

Other changes specifically noted by trappers were draining of marshes and wetlands; fire damage, particularly burning of brush piles, roadsides, and stubble; and more intensive farming with changed methods (e.g., no haystacks, no free-range hens). Some of these practices such

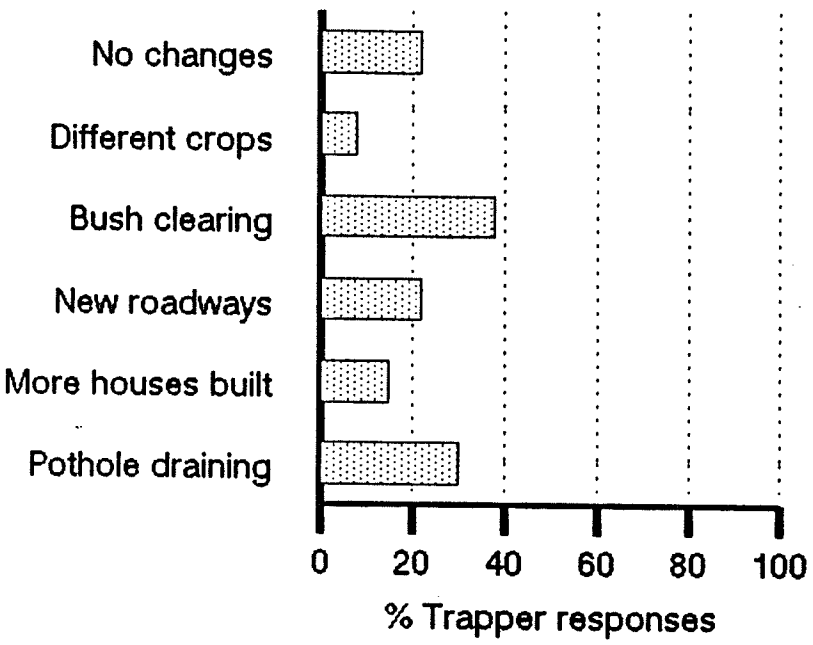


Figure 3.6 Overall habitat changes noticed by trappers in areas where they are active

as clearing rock piles and bulldozing and burning brushpiles remove habitat along with the prey species that were abundant in those areas.

Land use change causing loss of habitat and its associated food is considered to be one of the major problems for wildlife (Smith 1980, Storm and Tzilkouski 1982). Changes in agricultural practices and their impact on long-tailed weasels were first noted by Ruttle (1968). In the prairie provinces, from 1971 to 1981, there was a 10% increase in cropland area from 18,121,909 ha to 19,934,100 ha (Bird and Rapport 1986). This provides some insight into the sort of changes that have occurred, but, generally, information on land use changes tends to be fragmented, with a few detailed studies concentrated on specific areas or problems, but with no overall picture. A study carried out by the Manitoba Surveys and Mapping Department used Landsat data to calculate land use changes in the Valley River watershed (this area drains into the western side of Lake Dauphin) between 1948 and 1981 (Pokrant and Gaboury 1983). As long-tailed weasels are frequently seen in this area, the results of this study provide relevant information for changes that may affect them. The study showed that the amount of cultivated land in that area increased dramatically from 37% in 1948 to 60% in 1981, resulting in a reduction in woodlands from 37% to 21%, pasture and grazing land from 22% to 18%, and wetlands and lakes from 4% to 1% (Fig. 3.7). The study concluded that with larger farm implements and increased economic incentives, land owners were clearing land much closer to tributary edges, and clearing small bluffs and agriculturally unproductive potholes. Improved machinery also allowed farmers to clear land much closer to streams and creeks, removing cover and small rodent habitat (a major long-tailed weasel food source). This appears to be comfirmed by the observations of trappers as to changes noticed in areas

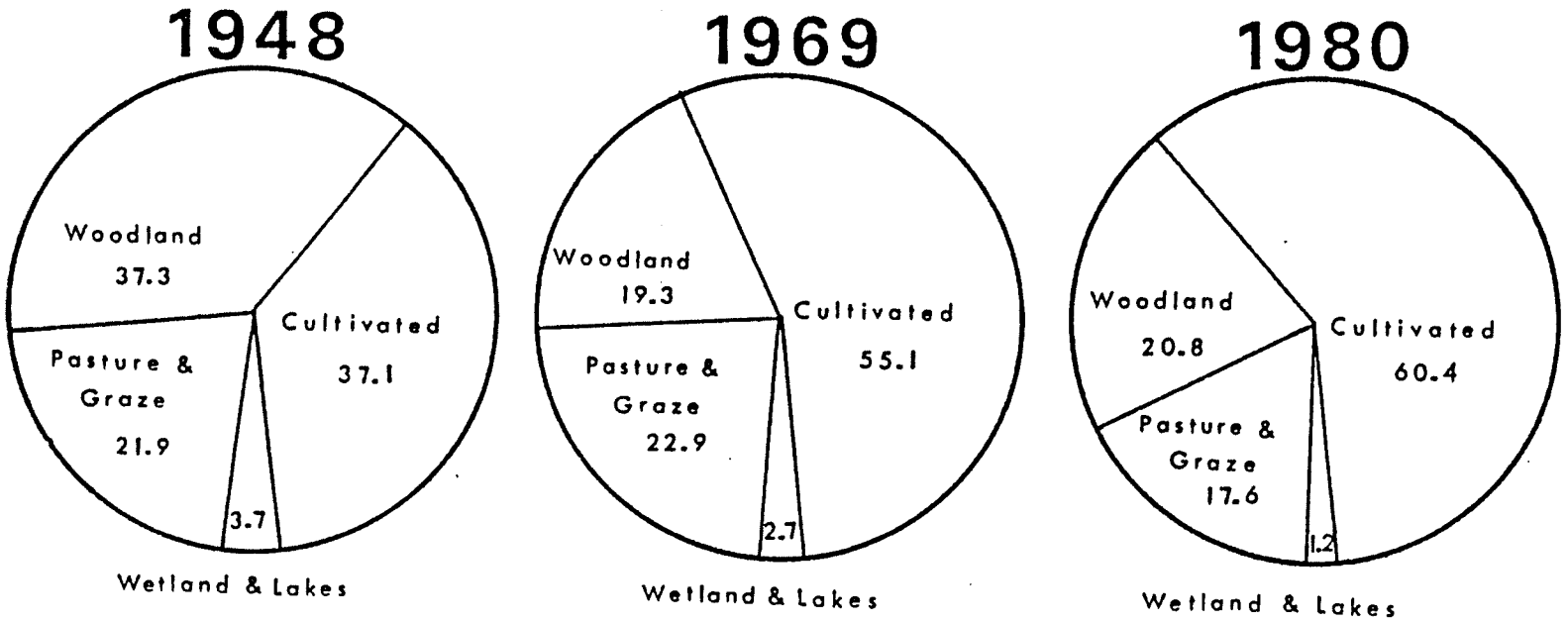


Figure 3.7 Land use changes in the Valley River watershed

(from Pokrant and Gaboury 1983)

where they are active (Appendix 6, Table 6.17 and Figs. 6.7 and 6.8). Habitat loss due to increased agricultural land use, and the bush clearing that accompanies it, was also the major habitat change mentioned by those interviewed.

A study undertaken by the Canadian Wildlife Service (Caswell 1987) has shown that drainage of ponds and cultivation of drained areas has also removed large areas of habitat. This study monitored the ponds of southwestern Manitoba from 1980 to 1987 to estimate the impact of agriculture on the basins and margins of these ponds. In 1980, 8.4% of pond basins and 43.7% of pond margins had been impacted (out of 465 ponds sampled). By 1987, 35% of pond basins and 90.3% of pond margins had been impacted (out of 899 ponds sampled) (Fig. 3.8). This demonstrates the impact of farm practices on weasel habitat in the southwest of the province over a very short period of time.

In addition to increased agricultural use, there has also been a large increase in the amount of land used for building, with an overall increase of 63% from 1951 to 1981. This includes land used for rural and urban development, road building, and farmsteads (Bird and Rapport 1986).

For long-tailed weasels, the bush clearing, pothole and wetland draining, removal of stone piles, and clearing close to field and stream edges associated with intensive farming and modern machinery have all impacted on their habitat. The result is either loss of cover, loss of areas where they build their dens, or the removal of habitat of their prey species (thus losing their food source). This has undoubtedly caused them to have become concentrated in the remaining areas of suitable habitat.

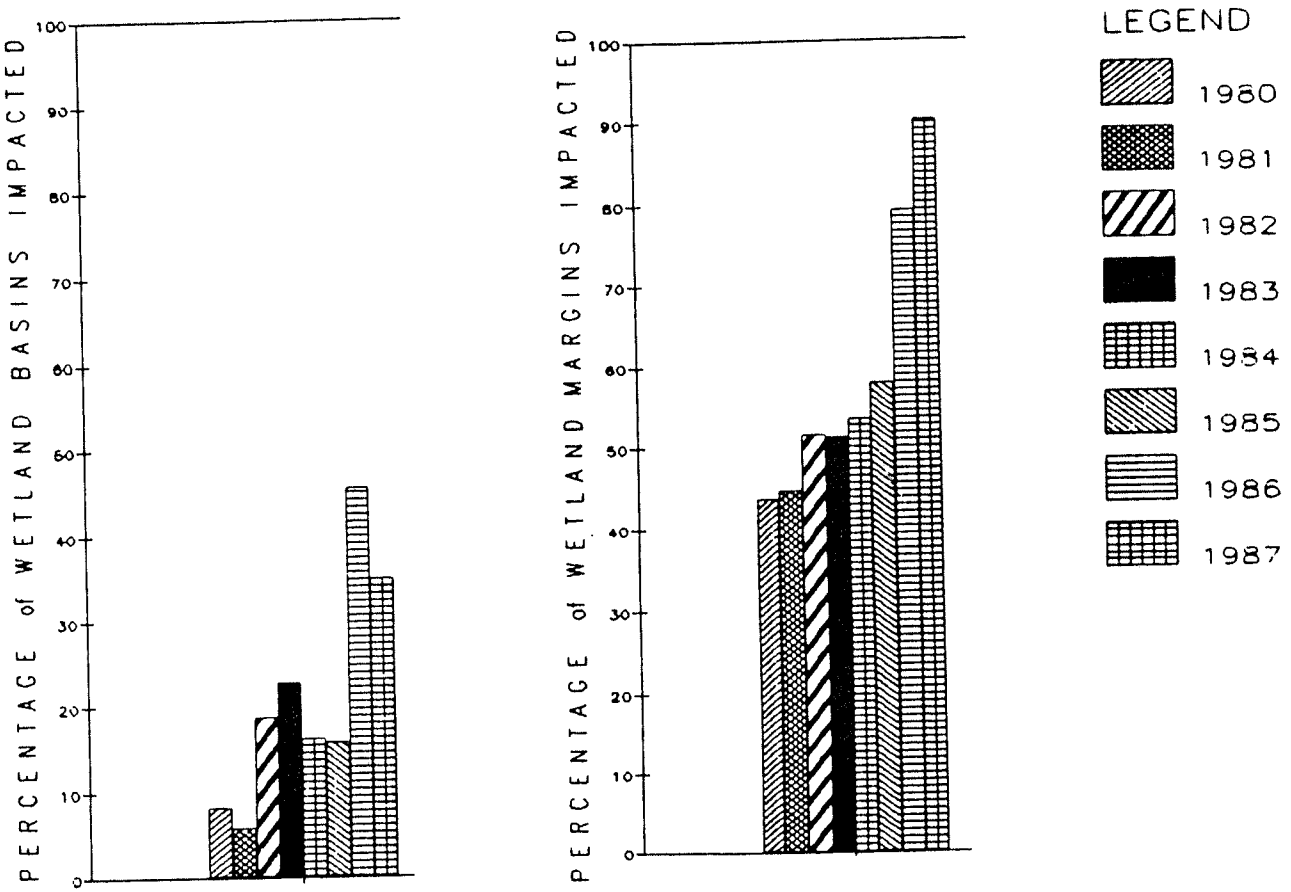


Figure 3.8 Agricultural impactions on the basins and margins of ponds in southwestern Manitoba (from Caswell 1987)

3.2.2 Trapper Opinions as to Possible Causes of a Reduction in Long-Tailed Weasel Numbers

Trappers considered the main causes of a reduction in long-tailed weasel numbers to be (Table 3.6, Fig. 3.9, Appendix 6, Table 6.18 and Fig. 6.9):-

(i) Changes in the countryside (36%) - such as no haystacks, fewer field edges, less bush;

(ii) Increased use of pesticides (31%) - all the people interviewed considered the enormous increase in the use of insecticides and herbicides to be a major factor in the decline of weasels, and all other forms of wildlife;

(iii) Pest control (for example, poisoning of gophers and barn rats) (31%);

(iv) A large increase in ravens and all owls and hawks were thought to be a contributory cause (27%), with a number of trappers commenting that raptors were often seen killing weasels, but did not eat them. A considerable number of respondents added comments in the survey margins to the effect that until the last few years ravens were relatively uncommon, but had increased enormously since then. One trapper (who was around 75 years old) reported that he had watched a raven kill a weasel in his farmyard; and

(v) Loss of food (partly from poisoning and partly due to pesticides) (21%) - a few trappers who considered that loss of food was not a problem added that there were lots of mice in the last couple of years, and also that gophers were re-establishing themselves in areas where farmers had stopped

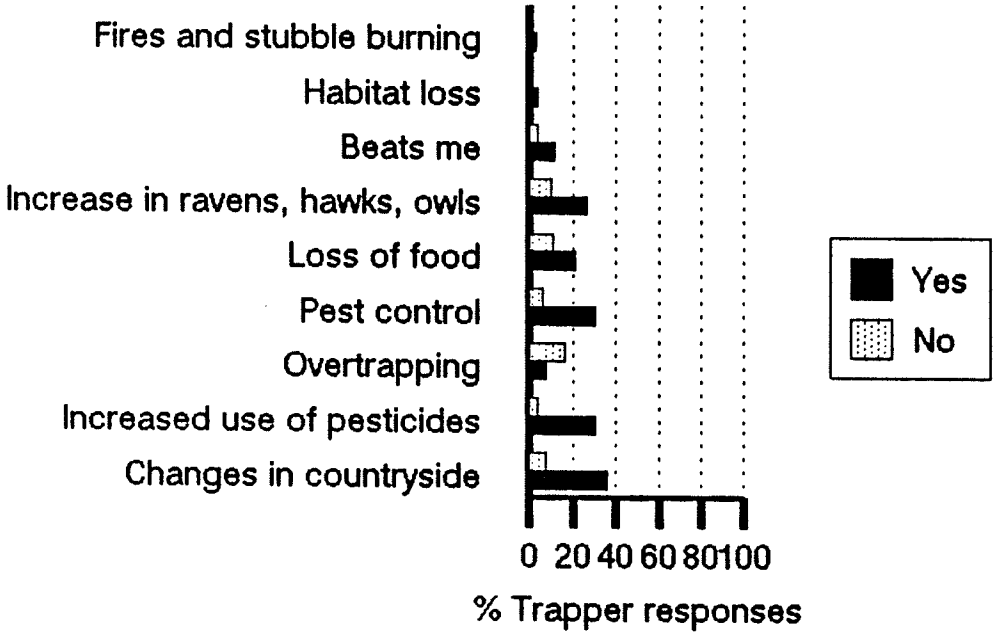


Figure 3.9 Trapper opinions as to the main causes of reduction in long-tailed weasel numbers in Manitoba

poisoning. As small mammals such as microtine rodents exhibit population cycling (Southern 1979), it is possible that recent years have been on the up-side of the population cycle.

TABLE 3.6

OVERALL TRAPPER OPINIONS AS TO POSSIBLE CAUSES OF A REDUCTION IN LONG-TAILED WEASEL NUMBERS

	% Trapper Response	
Habitat Changes	Yes	No
Changes in countryside	36	8
Increased pesticide use	31	4
Pest control	31	6
Increase in ravens, owls and hawks	27	10
Loss of food	21	11
Overtrapping	8	17
Beats me	12	4

Few trappers (6%) considered overtrapping to be a problem except in the Delta area where 18% considered overtrapping a contributory cause, against 13% who considered it to be no problem. Spring amd fall stubble and peat moss burning, and burning of brush piles were specifically mentioned as a serious problem, particularly in the spring when the young were born. Brush piles were cited as places where weasel often make their dens, and are favorite homes of mice and other small mammals. Thus, it is likely the weasel and its young are destroyed, together with its prey and their young.

One respondent in the Duck Mountain area pointed out that fire control had changed the habitat in that area totally. Where it was once open areas within forest, and ideal long-tailed weasel habitat, it had

changed to full forest cover, with the result that a whole area of suitable habitat had been removed.

3.3 CARCASS ANALYSIS

3.3.1 Carcass Measurements

Twenty-one carcasses were donated to the Department of Natural Resources during the 1986-87 season, and a further 24 in the 1987-88 season.

Of those donated in 1986-87 the majority were male, and all but one were juveniles (Table 3.7). However, the adult identified by the baculum measurements was different from that identified by the tooth cementum measurement. It is likely that the baculum measurements were more accurate, as there was a considerable difference in the weight of the adult baculum from all the others, and tooth measurements are more prone to error due to irregularities in the annuli. Baculum weights were plotted against their length, when the adult weasel was easily identified (Fig. 3.10).

Carcasses donated in the 1987-88 season had a higher percentage of females (almost a third). Baculum measurements showed that four of the males were adults (Table 3.8 and Fig. 3.11). As these carcasses were received at the end of this study, tooth analysis for the 1987-88 season will not be included.

The presence of such a high proportion of juveniles in the carcasses donated for both seasons was considered by the Department of Natural Resources to be a sign of a viable population (pers. comm. R. Stardom). However, it could also be a sign of an exploited population

TABLE 3.7

CARCASS ANALYSIS (1986-87)

Laboratory Specimen Number	Measurement (cm)		Sex	Baculum Measurement		Age from	
	Total	Tail		Weight(g)	Length(cm)	Baculum	Teeth
1214	44	15	M	0.0032	2.3887	J	J
1215	28	-	M	0.0118	2.5056	J	J
1216	41	14	M	0.0014	2.4465	J	J
1217	43	15	M	0.0006	2.4418	J	J
1218	23		F	-	-	-	J
1219	43	14	M	0.0012	2.4415	J	J
1220	34	10	M				J
1221	42	14	M	0.0002	2.2776	J	J
1222	42	15	F	-	-	-	J
1223	37	13	F	-	-	-	J
1224	46	19	M	-	-	-	J
1225	43	15	M	0.0057	2.3894	J	IA
1226	36	11	F	-	-	-	J
1227	40	14	M	0.0102	2.3869	J	J
1228	39	16	M	-	-	-	J
1229	44	17	F	0.0408	2.5015	A	J
1230	42	15	M	0.0019	2.0011	J	J
1231	38	13	F	-	-	-	J
1232	39	14	F	-	-	-	J
1233	43	15	M	0.0002	2.3295	J	J
1234	40	16	M	-	-	-	J

IA = Immature adult approximately 1.5 years
A = Adult
J = Juvenile

TABLE 3.8

CARCASS ANALYSIS (1987-1988 SEASON)

Lab Specimen Number	Measurement (cm)		Sex	Baculum Measurements		Age From Baculum
	Total	Tail		Weight (g)	Length (cm)	
1474	47	18	M	0.0308	2.4431	Juvenile
1475	46	18	M	-	-	-
1476	48	18	M	0.0661	2.7185	Adult
1477	36	13	F	-	-	-
1478	40	13	M	0.0206	2.3307	Juvenile
1479	42	18	F	-	-	-
1480	43	17	M	-	-	-
1481	44	18	M	0.0657	2.7245	Adult
1482	41	15	M	0.0247	2.2188	Juvenile
1483	43	16	M	0.0335	2.2780	Juvenile
1484	41	17	M	0.0202	2.2236	Juvenile
1485	44	16	M	0.0333	2.4964	Juvenile
1486	40	15	M	0.0219	2.3290	Juvenile
1487	40	15	F	-	-	-
1488	45	17	M	0.1004	2.9384	Adult
1489	42	16	M	0.0749	2.8382	Adult
1511	42	15	M	0.0295	2.3980	Juvenile
1512	42	14	F	-	-	-
1513	42	14	M	0.0265	2.3304	Juvenile
1514	34	12	F	-	-	-
1515	42	17	M	0.0303	2.4416	Juvenile
1516	46	18	M	0.0299	2.5548	Juvenile
1517	25	14	F	-	-	-
1518	43	16	F	-	-	-

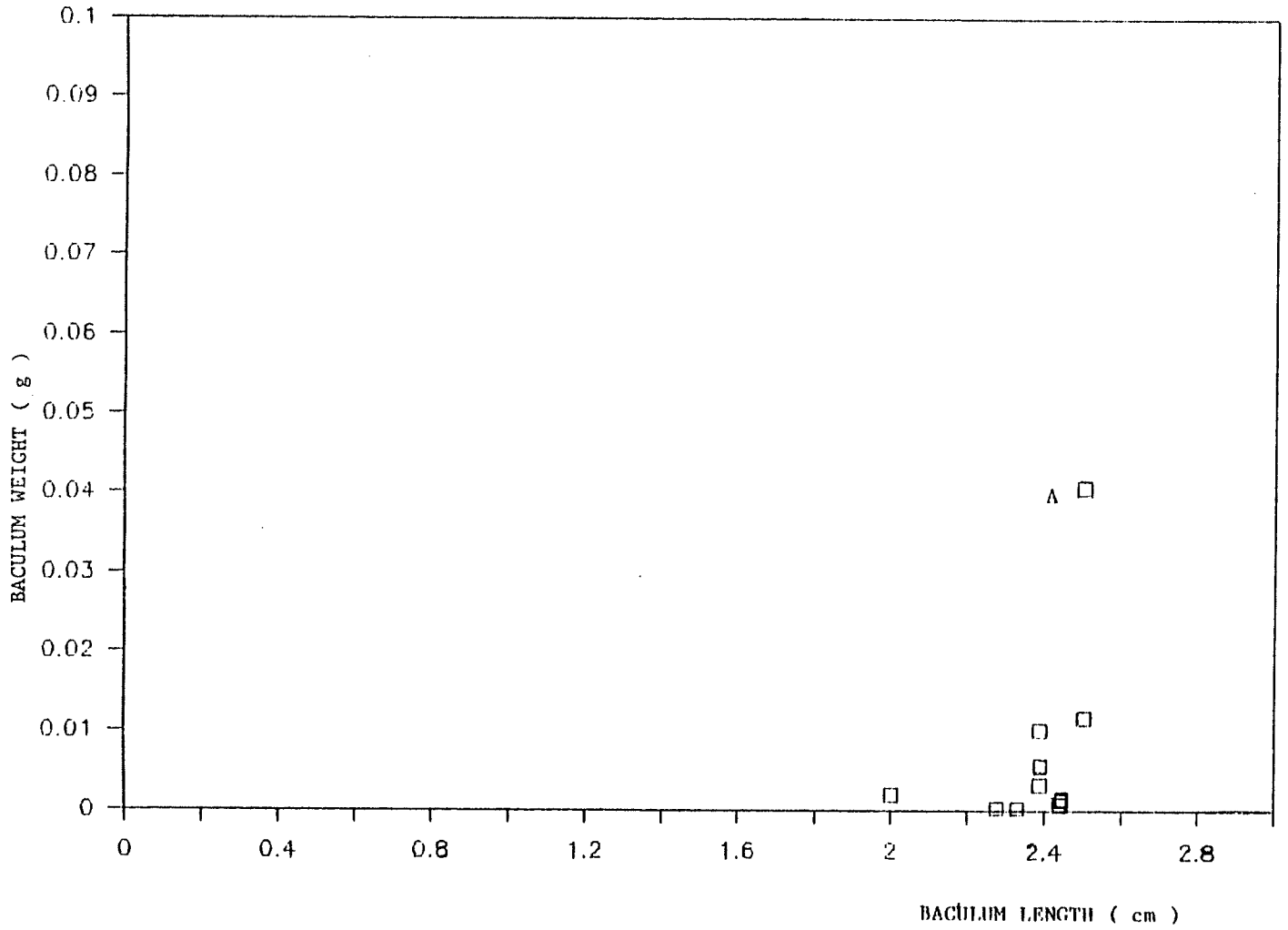


Figure 3.10 Baculum weight (g) v. length (cm), showing one adult (A) (1986-87 season)

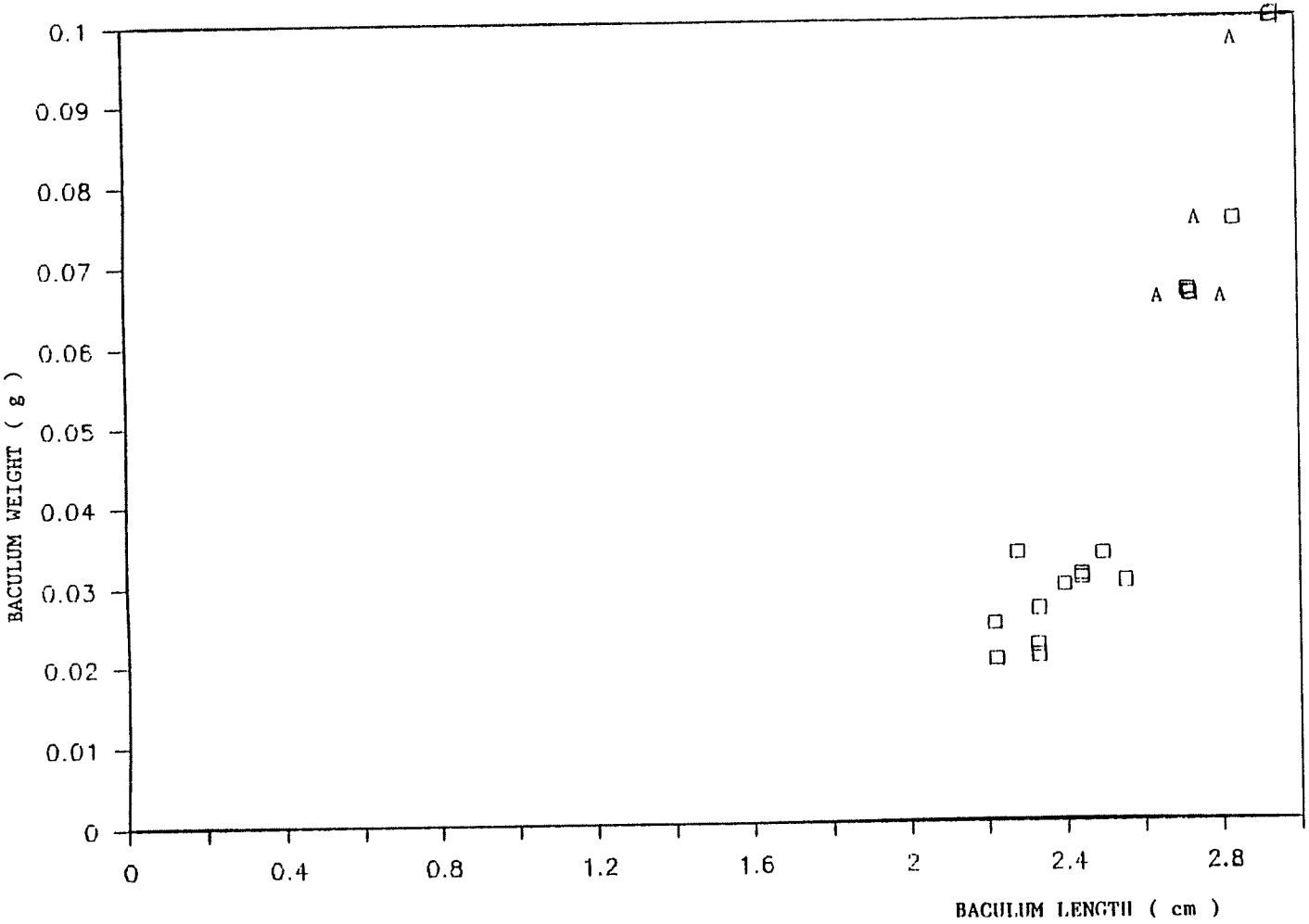


Figure 3.11 Baculum weight (g) v. length (cm), showing four adults (A)

(1987-88 season)

(Smith 1980), or that young weasels may be less wary than adults, and are caught more easily.

3.3.2 Pesticide and PCB Analysis

At the end of the 1939-45 war, there was a very limited number of pesticides available, but since the introduction of DDT at that time, the number of products on the market has increased to hundreds of different chemicals (Sly 1977). There are over 500 pesticides registered at present in Manitoba alone (Federal Dept. Agriculture 1988). From 1971 to 1981 there was a 95% increase in the area treated with insecticides in the prairie provinces (from 456,923 ha to 891,000 ha) (Bird and Rapport 1986). The increase since the early 1950s has been cited as a factor that could have contributed to the decline in long-tailed weasel populations (COSEWIC 1982).

In the past, the most widely used, least expensive, and probably the most harmful insecticide to wildlife generally, was DDT. This insecticide was first available in the early 1940s, but was not widely used in Canada until the early 1950s. It would seem to be more than coincidence that the pelt takes of long-tailed weasels began to drop quite rapidly around 1955 (Table 1.1). (Total weasel pelt takes per season dropped from approximately 60,000 to 10,500 in the twelve years from 1957 to 1969). The persistence of DDT in the soil (its degradation products are still being found in almost all biological analyses (pers. comm. E. Chorniuk, Technical Services Laboratories, Winnipeg, 1988)), toxicity to non-target organisms (Dimond and Sherburne 1969, Herman and Buglar 1979), and the build-up of resistance to the chemical by some insects, led to its being banned from widespread use in

Canada in 1972 (Bird and Rapport 1986). Organochloride pesticides such as aldrin, dieldrin, endrin, and endosulfan (DDT and its degradation products are included in this group) are readily absorbed in fat, and are known to build up in the body tissues through each level of the food chain, so that the long-tailed weasel, at the top of a food chain, would be expected to be particularly vulnerable to this type of build-up (Aulerich et al. 1986). They include some of the most toxic chemicals and, in general, their use was discontinued in Canada in the mid-1970s (pers. comm. D. Smith, Manitoba Dept. of Entomology 1987). Dieldrin is still registered for commercial use for mite control (Bird and Rapport 1986), and like DDT and other organochlorides, is persistent in the soil for at least 15 years (McEwan and Stephenson 1979). Endrin, the most toxic organochloride, is 80 times as toxic (to rats) as DDT (Fleming et al. 1982).

PCBs and Mirex belong to the group of synthetic substances known as chlorinated organic compounds, and similarly become more concentrated as they rise through the food chain (Envir. Canada 1979, Bird and Rapport 1986). These substances have been manufactured commercially since 1929, but were not widely recognized as potentially toxic until around 1970. Mirex, which has very similar chemical and biological properties to PCB, has not been manufactured in or imported into Canada since 1969, and its use has been controlled since 1978 (Bird and Rapport 1986). Both PCBs and Mirex are extremely persistent and mobile in the environment, and are fat-soluble, so are dissolved and accumulated in the fatty tissues of animals (Envir. Canada 1979). In animals at the top of the food chain (weasels, mink), PCBs and organochlorides can cause impaired reproductive capacity or total reproductive failure (Proulx et al. 1987, Moore 1977).

Much of the literature relating to pesticide toxicity deals with laboratory rats, birds, and other small mammals (Dimond and Sherburne 1969, Herman and Buglar 1979, Cholakis et al. 1980, McCann et al. 1980, Havera and Duzan 1982, Heinz and Johnson 1980, Henny et al. 1983, May 1983). As many of these small mammals are herbivores (feeding mainly on seeds), or insectivores, and the birds are mostly raptors with very different metabolic reactions than weasels, the results may not be directly applicable when attempting to assess the probable toxic levels in long-tailed weasels. Some work has been done on the effects of organochlorides and PCBs on mink (Aulerich and Ringer 1977, Frank et al. 1979, Henny et al. 1980, Aulerich et al. 1986, Proulx et al. 1987) which are more likely to approximate the effects on long-tailed weasels. Mink are members of the same family (Mustelidae) and are not very much larger than a long-tailed weasel, so that it is possible that their response to these chemicals could be similar.

However, the few studies that have been carried out on mink provide only very limited data. A study by Aulerich and Ringer (1970) showed that mink reproduction was unaffected by levels of 100 ppm DDT, but Bleavins et al. (1984) showed that HCB (Lindane) had adverse effects on kit survival even at levels as low as 1 ppm. Other organochloride pesticides have not been evaluated experimentally, so tolerance levels are not known (Proulx et al. 1987). Studies on wild mammals in Ontario found that mink were contaminated with organochlorides, but below the level where reproduction was inhibited (Frank et al. 1979). Other studies carried out on mink (Aulerich and Ringer 1970) found that they were much more sensitive to PCBs than to organochloride pesticides. Aulerich and Ringer (1977) showed that PCB (Aroclor 1254) at a level of 1 ppm resulted in depressed reproductive success, and total reproductive

failure at 2 ppm, or when fed a diet containing 0.64 ppm over a period of 160 days.

Other insecticides, such as the carbamate group of chemicals, may also be toxic to long-tailed weasels. Carbaryl and Carbofuran are the main carbamate insecticides used, mostly in southwestern Manitoba, for grasshopper control, and for roadside spraying as this is where many insects breed (in long grasses). When controlled in this area, crop spraying can often be prevented (pers. comm. Gadawski 1988). The oral toxicity for rats, expressed as LD50, for some organochlorides and carbamates are listed in Table 3.9 (from Pimental 1971).

TABLE 3.9

LD50 VALUES FOR RATS OF SOME ORGANOCHLORIDE AND CARBAMATE INSECTICIDES

Organochlorides	LD50
Chlordane*	200-590 mg/kg***
Heptachlor	100-162 mg/kg (very high)***
Endrin	<5-43 mg/kg (extremely high)
Dieldrin	50-55 mg/kg (very high)
Aldrin	54-56 mg/kg (very high)
Lindane	125-200 mg/kg
Mirex	300-600 mg/kg
Endosulfan	100 mg/kg
Methoxychlor	5,000-6,000 mg/kg
Carbamates	
Carbaryl (Sevin)	850 mg/kg***
Carbofuran (Furadan)	14 mg/kg (extremely high)**
Aldicarb	0.9 mg/kg (extremsly high)**
Propoxur (Baygon)	90-128 mg/kg (very high)***

* some forms of technical chlordane are much more toxic.
** values from Moore (1977).
*** values from Taylor (1983).
(Most studies are carried out using laboratory animals, when toxicity is expressed as the LD50 (mg/kg of body weight of the test animal), which is the dose that kills 50% of the experimental population).

Pesticides may be applied by aerial spraying, which does not discriminate between crops and the surrounding bush, streams, ponds, or field edges, or at ground level, where there is slightly more control over the target area. In 1985, the Manitoba Department of Agriculture carried out a census of agricultural practices which lists the number of farms that reported spraying to control insects and disease, together with the acreage covered for the southern half of Manitoba. The area is divided into crop districts, which are not the same as LFC areas, but can be used to estimate approximate spraying activities in these areas, as shown in Table 3.10.

TABLE 3.10

SPRAYING ACTIVITY FOR INSECTS AND DISEASE IN SOUTHERN MANITOBA DURING 1985

Crop District #	LFC #	# Farms reporting	Acreage sprayed
1 & 2	011 & 008	1,346	289,399
7	006 & 007	988	208,280
8	005	1,338	256,316
10	001 & 070	90	17,761
11	020 & 022	152	24,271

Although no figures were listed for crop districts further north, this table shows that the highest proportion of farms spraying in the southern half of the province were in the southwest (Virden, Boissevain and Morden - LFC areas 011, 008 and 005), with much less spraying activity in the Southeast (LFC 001 and 070) and Interlake areas (LFC 020 and 022). This would be expected, as the areas which were most extensively sprayed are predominantly crop farms, whereas the other

areas are more mixed farming and require less insect control. In all, over a million acres were sprayed or dusted for control of insects or disease, a total of 5,300 farms (Manitoba Dept. Agric. 1986).

There are no details in the census as to which chemicals were used, but the City of Winnipeg Insect Control Branch (pers. comm. Gadawski 1988) stated that only two organochloride insecticides are still used in Manitoba, Lindane (HCB), and Methoxychlor. Lindane is used to treat seeds to prevent wireworm, but is not used on the soil, and although still recommended, Methoxychlor is not as widely used as in the past.

Thomson (1988) found that spraying was done by municipalities as well as by farmers. Pesticide spraying for two rural municipalities in the Virden area are shown in Table 3.11 (Thomson 1988).

TABLE 3.11

1985 PESTICIDE SPRAYING IN MANITOBA RURAL MUNICIPALITIES

	R.M. Edward	R.M. Brenda
Carbaryl 7XLR (Sevin) (sprayed aerially)	5437 litres	4100 litres
Carbofuran (Furadan) (sprayed roadside)	850 litres	NIL

As was seen in Table 3.9, Carbofuran is much more toxic to rats than Carbaryl. It is also very toxic to burrowing owls (Athene cunicularia). James and Fox (1986) found that reproductive success was reduced significantly when Carbofuran was sprayed close to the nests

(Table 3.12), whereas Carbaryl was equally effective for the control of grasshoppers, but was much less toxic to the burrowing owls.

TABLE 3.12

REPRODUCTIVE SUCCESS OF BURROWING OWLS IN THREE PASTURES NEAR REGINA, TWO OF WHICH WERE AERIALLY SPRAYED WITH INSECTICIDES

(FROM JAMES AND FOX 1986)

	Insecticide aerially sprayed		
	Carbofuran	Carbaryl	None
Number of active nest burrows at time of spraying	5	10	14
Proportion of nests producing one or more young	0%	70%	93%
Maximum number of young per nesting attempt	0	2.9	4.3

The effect of these carbamate insecticides on long-tailed weasels is not known, but it would be reasonable to assume that Carbofuran is toxic to this species also. Riegert (1968) and Gage and Mukerjie (1978) reported that despite their extensive use, insecticides have not reduced the frequency or intensity of regional grasshopper infestations; they have merely conferred a measure of crop protection or salvage. Weather, parasites, disease and natural predators were considered to have been the primary instruments reducing populations. It would seem that substituting Carbaryl for Carbofuran for grasshopper control, and using only when absolutely necessary, would benefit

burrowing owls, and may also benefit long-tailed weasels and other wildlife. It would also reduce the costs of spraying when, at best, the resulting success is dubious.

Other chemicals which may have an impact on long-tailed weasels are rodenticides such as strychnine and warfarin (sold under trade names such as Ratak, Mouser and Gopher-cop), commonly used to kill gophers and barn rats (pers. comm. D. Plewes, Manitoba Department of Environment). These have a two-fold effect on long-tailed weasels:

(i) eating a poisoned carcass causes secondary poisoning of the weasel if it consumes the stomach contents (Hegdal et al. 1980); and

(ii) it removes an important food source (COSEWIC 1982).

If rat poisoning is a necessity (according to survey comments from trappers, if long-tailed weasels are present they will keep a barn clear of rats), zinc phosphide has been shown to produce little secondary poisoning of mammalian predators such as domestic cats and mink (Hegdal et al. 1980).

Data on quantities used in Manitoba are difficult to obtain for two reasons:-

(i) This data is commercial information and is potentially useful to competitors, so companies are unwilling to provide it; and

(ii) Even if the data were available, it would not be particularly useful for this study because much of these compounds are sold for domestic use, so would provide no information as to how much is used by farmers.

There are other chemicals, such as fertilizers, herbicides, fungicides, and heavy metals (such as cadmium and mercury), and other insecticides such as organophosphates, that may impact on long-tailed

weasels, but these have not been included in this study for a number of reasons:-

(i) To carry out an analysis, approximately five grams of tissue sample is required. Livers of many of the carcasses were small and shrivelled from being kept too long before freezing, so that there was only enough tissue for one group of chemicals to be analyzed;

(ii) Each analysis is extremely expensive, so a decision was needed as to which group of chemicals was most likely to have caused problems; and

(iii) Even without the financial constraints, to cover all chemicals that may impact on long-tailed weasels is beyond the scope of this study.

To date no studies have been done to evaluate the effects of any chemicals on long-tailed weasels. As organochloride pesticides and PCBs are so persistent in the environment and accumulate through the food chain, they were chosen for analysis.

To establish levels of pesticides in tissues, the liver is the organ most frequently analysed, using gas chromatography (Heinz and Johnson 1980). Livers from a sample of the carcasses donated by trappers were removed and sent to the laboratories of Zenon Environmental Inc., Burlington, Ontario, for analysis. They were analysed for the organochloride pesticides and PCBs listed in Table 3.13 at the minimum detection limits shown.

TABLE 3.13

ORGANOCHLORIDE INSECTICIDES AND PCBs,

SHOWING MINIMUM DETECTION LIMITS

Compound	Minimum Detection Limits (ppm)
Hexachlorobenzene	0.005
a-benzenehexachloride	0.005
Lindane	0.005
Heptachlor	0.005
g-Chlordane	0.005
a-Chlordane	0.005
p,p'-DDE	0.005
p,p'-DDD	0.005
o,p'-DDT	0.005
p,p'-DDT	0.005
Methoxychlor	0.02
Mirex	0.005
Photomirex	0.005
Toxaphene	0.1
Total PCB	0.02

Ten samples were analyzed from the carcasses donated in the 1986-87 season, and 10 from the 1987-88 season. The samples were chosen to represent as many areas of the range as possible, but the carcasses donated came almost exclusively from an area covering a large circle around Riding Mountian National Park. The few exceptions were one from the northwest side of Duck Mountain, one from just south of Brandon, two from the area between Neepawa and Gladstone, and two from Birtle, in the Rossburn area. Table 3.14 shows the area where the carcasses originated, and the corresponding LFC area code.

For all samples, excepting one from Gilbert Plains - sample number 1223 (LFC area 010, in the Valley River watershed), the analysis for all organochlorides and PCBs was negative, with no compounds being observed about the detection limit. The one exception showed 0.006 ppm

of p,p'-DDE, a degradation product of DDT, and this was only just above the detection limit. Thus, within the limits of the analysis, there was no detectable buildup of organochloride insecticides or PCBs in the samples analysed.

TABLE 3.14

AREA WHERE SPECIMENS FOR PESTICIDE ANALYSIS WERE CAUGHT

Sample #	Area Where Caught	LFC Code
1986-87 season		
1214	Ste. Rose du Lac	007
1219	Makinak	010
1222	Grandview	010
1223	Gilbert Plains	010
1224	Birtle	012
1225	Sandy Lake	009
1228	Birtle	012
1229	Riding Mountain	010
1233	Grandview	010
1234	Duck Mountain	210
1987-88 season		
1474	Strathclair	009
1477	Ste. Rose du Lac	007
1480	Durban	010
1483	Edrans	006
1484	Brandon	008
1487	Arden	006
1511	Mountain Road	009
1516	Birtle	012
1517	Shellmouth	012
1518	Mountain Road	009

There are a number of possible explanations for the low levels of these compounds in the samples:-

(i) Most of the farming in the areas where the samples were caught is mixed farming with quite a large amount of livestock, where

less spraying and less intensive farming methods are used. Therefore, the results from the pesticide analysis may not be truly representative of other areas of the province, in particular the southwest, where the majority of intensive crop farming is done;

(ii) All but one of the samples were juveniles, so that there may have been insufficient time for a buildup of chemicals to take place; and

(iii) For efficient analytical results, samples should have been freshly caught, and must be stored at between -35°C and -40°C. If stored above -18°C there is a steady loss due to chemical breakdown, particularly in chemicals such as Methoxychlor, which breaks down fairly rapidly. Many of the samples received from trappers had been kept for some time before freezing, as was apparent from their dessicated condition, and household freezers generally operate at around -15°C, so this would have affected the efficiency of residue recovery (pers. comm. B. Webster, University of Manitoba 1988).

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 SUMMARY

The general distribution map developed from results of the survey shows that the present distribution of long-tailed weasels in Manitoba agrees largely with the maps shown by Gamble (1980) (Fig. 1.3) and Deems and Pursley (1983) (Fig. 1.2). Swan River, Duck Bay and Porcupine Mountain in the far northwestern part of their range all reported that long-tailed weasels had not been seen there for at least twenty years. However, records from the Museum of Man and Nature showed that a considerable number of their specimens came from the area on the south side of Porcupine Mountain during 1978 and 1979, so the opinion of the single trapper who responded from Porcupine Mountain may only represent a small part of that area. There has been the occasional sighting in the area around The Pas, which is even further north (pers. comm. A. Sanderson 1987). This suggests that there may still be a small number present in this area, or that these animals are coming from Saskatchewan.

Within the range, there are areas where long-tailed weasels are more commonly seen, and similarly, areas where there appear to be very few. For example, there were no sightings reported for an area approximately 50-km wide stretching directly south from Winnipeg to the

American border, even though they were present on either side of this strip. On the other hand, there appears to be viable populations around the southern side of Duck Mountain in the Dauphin region, and in a large horseshoe-shaped area around Riding Mountain National Park (the base of the horseshoe being on the eastern side of the park). In general, they are more abundant on the western side of the province, where they have always been more common.

The opinion of the vast majority of trappers, both in the survey and those interviewed, was that long-tailed weasel numbers were very much reduced from 30 or more years ago. In some areas, such as the Southeast, numbers were never very high, and the situation is the same at present.

Only a small number (around 5% of the total trapper response) actively trap the species at present. Even though more people trapped them in the past, the majority had not trapped them for over 30 years. However, most trappers reported having caught them accidentally in traps set for other animals. Mink traps showed the highest proportion of accidental catches but they were also found in traps set for anything from barn rats to wolves. The type of set and trap appeared to be unimportant, with accidental catches in all sorts of traps and sets. Apart from the 5% who still trap long-tailed weasels, trappers in general are not interested in trapping the species. Many are aware of the reduced numbers and are interested in conserving the species. Those who are farmers also appreciate the potential of weasels for rodent control on their property. Last but not least, most trappers consider the pelt value to be too low to be worth the effort of trapping and skinning.

The most obvious environmental change, in all areas surveyed, that occurred coincidentally with the decline of long-tailed weasels was habitat loss resulting from the use of modern farm machinery and the clearing and levelling of large areas of land. Trappers considered the bush clearing and bulldozing of stone and brush piles that occurs during land clearing to be the main reason for the drop in weasel numbers. The work of Caswell (1986) (showed that since 1980 there had been an increase from 8% to 44% of pond basins and from 35% to 90% of pond margins that had been affected by agricultural practices) reinforces this perception. Even though viable populations still appear to be present in the area north of Riding Mountain National Park (Valley River watershed) the work of Pokrant and Gaboury (1983) (Fig. 3.9) showed that agricultural practices are also impacting on that area. Unless practices that conserve habitat for long-tailed weasels are encouraged in that area, the situation will soon be the same as other areas of the province where long-tailed weasel habitat is much reduced.

Other concurrent factors were increased use of pesticides, and, in the opinion of trappers, loss of food as a result of poisoning by farmers for rodent control. However, pesticides are not used with uniform intensity across the province, but tend to be highest in areas of intensive crop farming, such as the southwest. Unfortunately, no carcasses were donated from this area (Virden, Boissevain, Morden), the Southeast, or the Interlake areas. All the carcasses were from the west central area (surrounding Riding Mountain National Park), where there is less crop and more livestock farming. Analyses for organochloride pesticides and PCBs on the liver samples showed there were no detectable pesticide residues or PCBs present (with the exception of one sample

that showed 0.006 ppm of p,p'-DDE, a DDT metabolite, which was only just above the detection limit). It is not possible to draw conclusions from these results as to the effect of pesticide use for the whole range, as this area, being predominantly mixed farming, would be assumed to have a lower level of pesticide usage than the southwest (Man. Dept. Agric. census, 1986, does not record any farms reporting spraying for insects in this area).

Data on rodenticide use was not available, but the Department of the Environment stated that the use of warfarin and strychnine for pest control was common practice, with strychnine being the most commonly used (pers. comm. D. Plewes 1988), so potential food loss and the possibility of secondary poisoning may be a problem.

Carcass analysis showed a high proportion of juveniles to adults (five adults to 40 juveniles over two seasons) which has been assumed to indicate that, in the west central areas of the province, there are viable populations. This seems to contradict the opinions that long-tailed weasels are "threatened". However, a high proportion of juveniles can also indicate an exploited population (Smith 1980). Due to the lack of carcasses, it is not possible to draw any conclusions concerning other areas of the range.

Possible causes for the reduction in pelt takes may be:-

(i) long-tailed weasel numbers are reduced due to habitat loss and pesticide use;

(ii) trapper effort may have been reduced as employment opportunities with higher salaries increased;

(iii) the value of the pelt is low; and

(iv) during the years from 1960 to 1969, Manitoba began closing small country schools and transporting children by bus to larger centres for schooling (pers. comm. R. Ledoux, Superintendent, Pinawa School District, 1988). As many of these children checked their traps on their journey to and from school when school was within walking distance, this change may have caused a reduction in schoolboy trapping (pers. comm. R. Stardom, Manitoba Dept. Natural Resources 1988).

4.2 CONCLUSIONS

(1) According to trapper sightings, museum and auction records, the range of the long-tailed weasel in Manitoba appears to be roughly the same as that shown in Fig. 1.2 by Deems and Pursley (1983). For all practical purposes, the range along the western side of the province extends to the northern edge of the Porcupine Mountains, any sightings further north are occasional. Some sightings have been reported in the Interlake area, but these have not yet been substantiated with either a carcass or a photograph - until then it would be reasonable to consider their range to stop at the lower edge of the region (however, these sightings have been included in Fig. 3.3).

The distribution of long-tailed weasels, according to trapper sightings, has not changed over the past 20 years, apart from some fluctuations at the northernmost part of their range.

(2) Total weasel pelt takes have dropped from approximately 110,000 in 1946 to 9,000 in 1986. Four hundred long-tailed weasels were estimated to have been taken during the 1985 to 1986 season. (A breakdown of pelt takes into Open Area and Registered Trapline Areas is not available for before 1970, but it is assumed that the decline in takes is represented by the total figures). The vast majority of trappers in all areas considered the number of long-tailed weasels to be much reduced from 30 or more years ago. Trappers recall trapping from three times to nearly 40 times as many long-tailed weasels at that time. Thus, it is concluded that long-tailed weasels have declined considerably during the past 30 to 40 years.

(3) Although about 5% of trappers still set traps for long-tailed weasels, in general they are not interested in trapping the species, most animals being caught accidentally in traps set for other animals. Trapping pressure in the last 30 years has not contributed to the decline of long-tailed weasels. However, if population numbers are reduced to critical levels, even a small amount of trapping could be an important factor.

(4) The most important environmental changes that have coincided with the reduction in numbers of long-tailed weasels are habitat loss due to increased agricultural land use, increased pesticide use, and, in the opinion of trappers, pest poisoning. Pesticide use is a potential problem in that it

has been shown to cause reproductive problems and cancers in mink, a closely related species. However, for the area represented by the carcass analyses, there was no detectable accumulation of organochloride pesticides or PCBs, but these samples were from areas where farming is mixed, and pesticide use is assumed to be lower. Therefore, these samples may not be representative of the range as a whole. Little data was available on the use of rodenticides for barn rat and gopher control, but trappers considered their use to be a contributary cause in the reduction of long-tailed weasel numbers. The Department of the Environment agreed that strychnine and warfarin are still commonly used, so it is possible there is some food loss and secondary poisoning of long-tailed weasels resulting from this practice which may be contributing to their decline.

(5) Of the 45 carcasses donated over two seasons, five were adults, and the majority males (approximately one third females). The high proportion of juveniles can be considered as indicative of growing populations, or alternatively, as a sign of exploited populations. It is possible that in areas where suitable habitat remains, the numbers are compatible with the carrying capacity of the area, but, as numbers are very much reduced from 30 years ago, it would seem reasonable to be sceptical that these results indicate growing populations.

4.3 RECOMMENDATIONS

(1) The Department of Natural Resources should establish a Wildlife Refuge where long-tailed weasels are reasonably abundant at present, and where there is still suitable habitat. It is suggested the area between Duck Mountain and Riding Mountain National Park would be a good area for the establishment of such a refuge, as there are no other wildlife projects in that area, and long-tailed weasels are still relatively abundant in the area at present. Other refuges should also be established in areas where long-tailed weasels were once abundant, such as the southwestern corner of the province, in the Pierson area. Inclusion of long-tailed weasel habitat requirements into current enhancement programs such as Wildlife Management Areas and refuges is also recommended. Ducks Unlimited projects also frequently provide enhanced habitat for long-tailed weasels.

(2) It is recommended that the Department of Natural Resources close the season for long-tailed weasels for at least five years to monitor what effect this action would have. Even though many long-tailed weasels are caught accidentally, there are still about 5% of trappers who trap the species intentionally. Closing the season would remove the incentive for this 5%, and is an important part of public education when attempting to protect a species.

(3) The COSEWIC "threatened" status for the species should be retained. It is possible that present numbers are consistent with the carrying capacity of the remaining suitable habitat, but this does not change the fact that present long-tailed weasels populations are "threatened".

(4) Development of an information package by the Departments of Natural Resources and Agriculture, (a booklet or leaflet) for distribution to farmers (through the Department of Agriculture), and to trappers (handed out with the trapper licence and at Trapper Education Workshops), to draw attention to the situation of long-tailed weasels, and the need to conserve their habitat. Emphasis should be put on the long-tailed weasels' potential for rodent control which provides economic benefits for the farmer in reduction of crop losses, lower repair costs to buildings, and reduction in costs of pest control products. The provision of a "one species" leaflet will provide more impact for the long-tailed weasel than a multi-species book, but this information could also be included in a book developed by the Department of Natural Resources that provides information on all wildlife that is either threatened or endangered in Manitoba at present.

Specific information concerning long-tailed weasels should be incorporated with other information circulated through such projects as Project Wild provided through the Department of Education by Department of Natural Resources.

Information leaflets or booklets describing land management

practices that enhance wildlife habitat should be distributed to secondary school science teachers to encourage inclusion of this information in the classroom.

(5) The Department of Natural Resources should recommend that the insect and weed control guide published by the Department of Agriculture includes adequate information on toxicity of the recommended chemicals to wildlife. As municipalities are often responsible for spraying to control grasshoppers, the Department of Natural Resources should also ensure the Pest Control Branch, Department of Agriculture, circulates information concerning toxicity levels of pesticides, and alternatives with lower levels, to all local government offices, together with background information describing the effects of certain chemicals on wildlife.

(6) Further studies are necessary to establish pesticide levels in long-tailed weasels in areas of the province where intensive farming is practiced (in particular, in the southwest). As the results in this study covered only a limited area of the range, they are not useful for establishing levels in other areas. It is recommended that the Department of Natural Resources, Wildlife Branch, carry out a very small amount of strictly controlled trapping in the southwest of the province, preferably in the fall, so that there is less risk of removing a nursing female, and at the end of the crop spraying season. Adult carcasses should be stored immediately at below -35°C

and tested as soon as possible to prevent any loss of chemicals.

Analysis for chemicals other than organochlorides and PCBs are also necessary, for example, heavy metals such as cadmium and lead, organophosphates and rodenticides.

At the same time, laboratory studies should be carried out to establish toxicity of insecticides, herbicides and fertilizers to long-tailed weasels.

Research is also necessary to establish a database of information on the amounts of pesticides, fertilizers, rodenticides and fungicides used annually in Manitoba.

(7) Other studies needed include:

(i) A follow-up trapper survey in five or ten years time is essential to indicate whether the strategies employed prove successful;

(ii) Field studies on census methods to determine actual population levels as compared with pelt returns;

(iii) The relationship of fur returns with socio-economic trends, such as school consolidation, rural population trends, pelt values and the cost of living index;

(iv) Detailed habitat studies that would establish minimum habitat requirements for long-tailed weasels; and

(v) Evaluation of present habitat retention and enhancement programs to assess their suitability for long-tailed weasels, for example, provincial government programs, HELP programs, and Ducks Unlimited projects.

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APPENDICES

APPENDIX 1

ECONOMIC DATA

Based on an industrial aggregate:

Average weekly wage in 1939 = $ 23.44

Average weekly wage in 1961 = $ 73.66

Average weekly wage in 1976 = $208.55

Average weekly wage in 1977 = $227.95

Average weekly wage in 1978 = $239.71

Average weekly wage in 1979 = $259.00

Average weekly wage in 1987 = $443.29

Unemployment rate in 1939 = 14.1%

Unemployment rate in 1987 = 7.0%

If they are employed, trappers enjoy a much higher standard of living than fifty years ago, and the chances that they are employed are much higher.

Average pelt prices for weasels have remained fairly constant over the years, so the relative values in the 1930s would be much higher than today. The lowest value for pelts experienced was in 1920/21, when the average price was 42 cents and the highest in 1945/46, with an

average price of $3.05 (these values are averages for both long and short-tailed weasels).

At $2.00 per pelt, one long-tailed weasel provided 8.5% of the weekly wage in 1939. Twelve pelts equalled a weeks' wage. As trappers reported, in some instances, catching as many as two hundred in a season, this could represent a third of a years earnings.

At present, a good pelt sells for around $15.00. This is 3.4% of the average weekly wage, and few trappers catch more than six long-tailed weasels in a season, so that represents a mere 20% of one weeks wage.

Thus, it can be seen that long-tailed weasels are not really worth the effort to trap and skin.

The information quoted in this appendix was supplied by Statistics Canada Information Service, Winnipeg, 1987, and Readers Digest Atlas of Canada, Ed. A.R. Byers, 1981.

APPENDIX 2

TRAPPER QUESTIONNAIRE

Long Tailed or Prairie Weasel Survey

Even long-time trappers and scientific experts sometimes find it difficult to know the difference between prairie and bush (short-tailed) weasels. To help you be sure of identifying the prairie weasel, attached to this questionnaire is a sheet with the measurements of the two weasels.

For each question, please check as many answers as apply.

1. Have you ever seen a prairie weasel in Manitoba?

	Yes Definitely	Not Sure	No Definitely
last season	_____	_____	_____
2 years ago	_____	_____	_____
5 years ago	_____	_____	_____
10 years ago	_____	_____	_____
15 years ago	_____	_____	_____
20 years ago	_____	_____	_____
Before that	_____	_____	_____

2. In what sort of surroundings did you see them? (Check as many as apply)

[ ] I have never seen one
[ ] Cultivated field
[ ] Uncultivated field
[ ] Ditch
[ ] Shelter belt
[ ] Marsh
[ ] Pothole
[ ] Creek
[ ] Forest
[ ] Farmyard
[ ] Other (please explain)_____

_____

_____

_____

3. Are you setting traps for prairie weasels in the 1986/87 season?
[ ] Yes [ ] No

If not, is there a particular reason why not? Please explain:

_____

_____

_____

4. Did you set traps for prairie weasels in:

1985/86 season	[ ] Yes	[ ] No
1984/85 season	[ ] Yes	[ ] No
1983/84 season	[ ] Yes	[ ] No
1982/83 season	[ ] Yes	[ ] No
1981/82 season	[ ] Yes	[ ] No
1980/81 season	[ ] Yes	[ ] No
Between 1975 - 1980	[ ] Yes	[ ] No
Between 1970 - 1975	[ ] Yes	[ ] No
Between 1965 - 1970	[ ] Yes	[ ] No
Between 1955 - 1965	[ ] Yes	[ ] No
Between 1945 - 1955	[ ] Yes	[ ] No
Before 1945	[ ] Yes	[ ] No

5. How many prairie weasels did you catch in each of the following seasons?

1985/86 _____

1984/85 _____

1983/84 _____

1982/83 _____

1981/82 _____

1980/81 _____

Average catch each season between 1975 - 1980 _____

Average catch each season between 1970 - 1975 _____

Average catch each season between 1965 - 1970 _____

Average catch each season between 1955 - 1965 _____

Average catch each season before 1955 _____

6. Did you catch any accidentally in traps set for other animals:
[ ] Yes [ ] No

In what kind of trap and set for what animal did they get caught?
Trap Type: _____
Set Type: _____
Target Animal: _____

7. In what sort of surroundings did you catch them?
(Check as many as apply)
[ ] I have never caught one
[ ] Cultivated field
[ ] Uncultivated field
[ ] Ditch
[ ] Shelterbelt
[ ] Marsh
[ ] Pothole
[ ] Creek
[ ] Forest
[ ] Farmyard
[ ] Other, please explain _____

8. Were your weasel pelts sold?
All _____
Some _____
None _____
If not sold, please explain what happened to them _____

9. During your years as a trapper have you noticed any changes in the areas where you catch or see prairie weasels, such as (check as many as apply):

[ ] Pothole draining

[ ] More houses being built

[ ] New roadways

[ ] Bush clearing

[ ] Different crops planted

[ ] No change

[ ] Other, please explain _____

_____

_____

_____

10. If you have been trapping for five years or more would you say there has been a change in prairie weasel numbers? Are there

more_____ less_____ same number_____ as 5 years ago

more_____ less_____ same number_____ as 10 years ago

more_____ less_____ same number_____ as 20 years ago

more_____ less_____ same number_____ as 30 years ago

more_____ less_____ same number_____ as more than 30 years ago

If you think there are less now, do you think any of the following could have caused this? (Check as many as apply)

Changes in the countryside	[ ] Yes	[ ] No
Use of pesticides/herbicides	[ ] Yes	[ ] No
Overtrapping	[ ] Yes	[ ] No
Pest Control (poisoning)	[ ] Yes	[ ] No
Loss of food (less gophers)	[ ] Yes	[ ] No
Increase in ravens	[ ] Yes	[ ] No
Beats me	[ ] Yes	[ ] No

Other, please explain_____

_____

_____

_____

11. Have you noticed if there has been a change in the number of badgers in your area? (Check as many as apply)

[ ] Increase

[ ] Decrease

[ ] Don't know

[ ] There are no badgers in my area.

If there has been a change has this occurred:

[ ] in the last 5 years

[ ] 5 - 10 years ago

[ ] 10 - 20 years ago

[ ] 20 - 30 years ago

[ ] before that

Please add any comments you think may be helpful_____

_____

_____

12. How long have you been trapping? _____ Yrs.

13. Where do you trap? Please give names of nearest town, general area, or trapline section and mark it on the attached map._____

_____

_____

14. Have you ever changed your trapline section? [ ] Yes [ ] No

If yes, when did you change your section? Year_____

What was your previous trapline section or area?_____

_____

15. Would you be willing to give us further help if needed?

[ ] Yes [ ] No

Name:_____

Phone number: _____

Address:_____

_____

_____

16. General comments: _____

_____

_____

_____

_____

_____

_____

In the coming year please donate the carcasses of prairie weasles to your local Department of Natural Resources Office so that studies can be done to check the levels of chemicals in their bodies, and measurements taken. Please tag your carcasses with your name, the area and the type of surroundings where caught, trap type, and keep it frozen.

You will be supplied with the results on your donation and be acknowledged for your contribution.

Please keep and use the enclosed sheet so that you can be sure of separating prairie (long-tail) and the bush (short-tail) weasel or ermine.

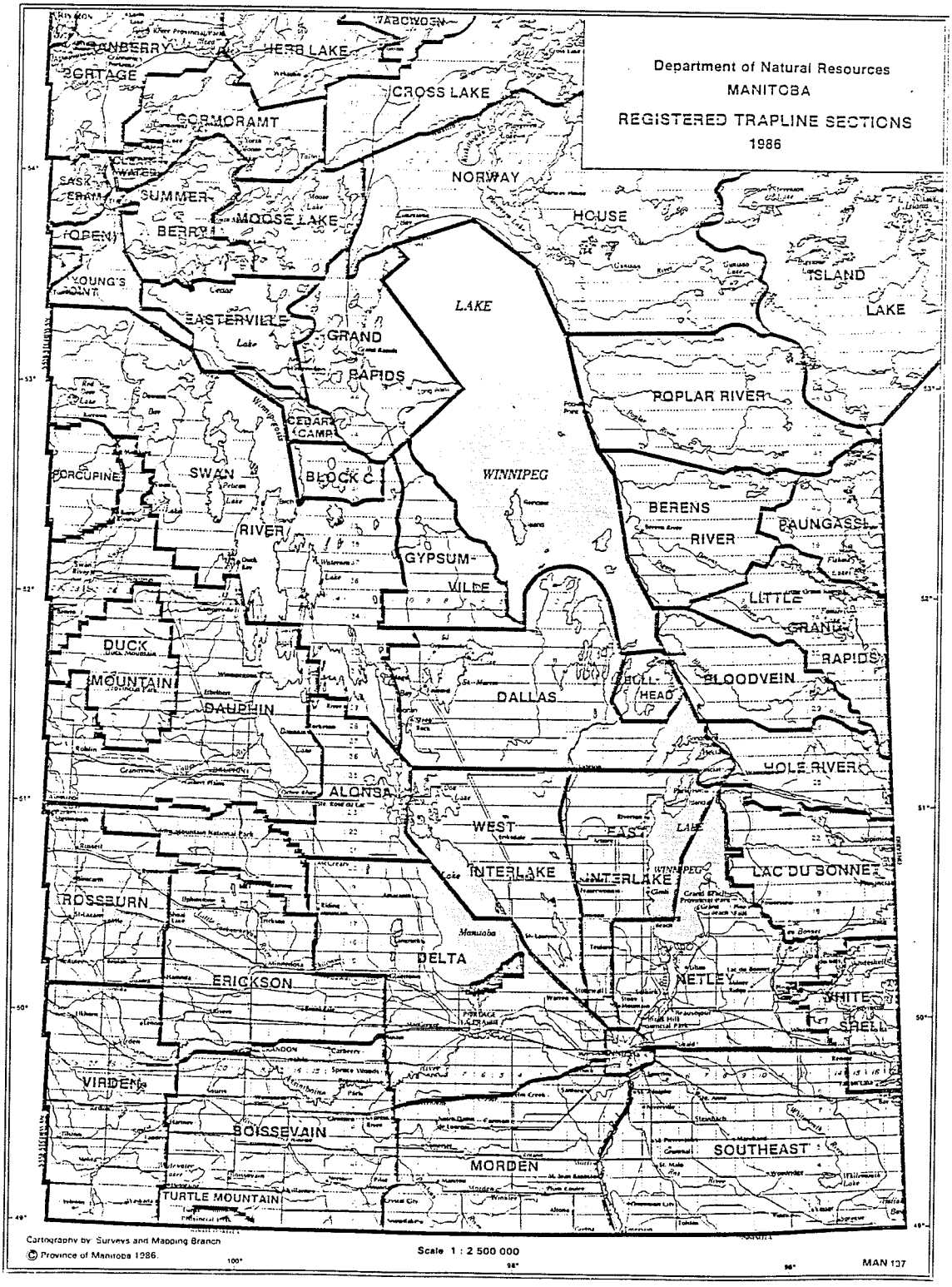
Thank you for your co-operation.

SHORT-TAILED (BUSH) WEASEL

Female	overall length LESS than 12 inches
	body length LESS than 8 inches
Male	overall length LESS than 14 inches
	body length LESS than 10 inches

LONG-TAILED (PRAIRIE) WEASEL

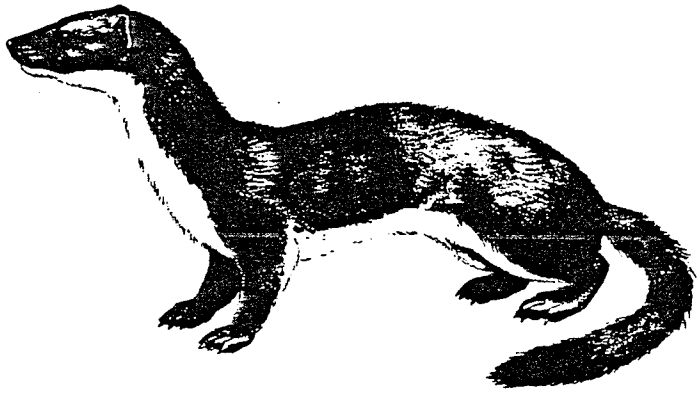
Female	overall length MORE than 12 inches
	body length MORE than 8 inches
Male	overall length MORE than 14 inches
	body length MORE than 10 inches


Department of Natural Resources
MANITOBA
REGISTERED TRAPLINE SECTIONS
1986
TADOULE LAKE
SUNBERRY
HERB LAKE
PORTAGE
CROSS LAKE
GODMORAMT
CLEAR WATER
SASK-ERAM
SUMMER
MOOSE LAKE
NORWAY HOUSE
(OPEN)
BERRY
YOUNG'S POINT
ISLAND LAKE
LAKE
EASTERVILLE
GRAND RAPIDS
POPLAR RIVER
CEDAR LAKE
PORCUPINE
SWAN RIVER
BLOCK C
WINNIPEG
BERENS RIVER
BAUNGASSI
GYPSUM-VILLE
LITTLE GRAND RAPIDS
DUCK MOUNTAIN
DAUPHIN
DALLAS
BULL HEAD
BLOODVEIN
HOLE RIVER
ALONSA
WEST INTERLAKE
EAST INTERLAKE
LAC DU BONNET
ROSSBURN
DELTA
ERICKSON
METLEY
WHITE SHELL
VIRDEN
BOISSEVAIN
SOUTHEAST
MORDEN
TURTLE MOUNTAIN
Cartography by Surveys and Mapping Branch
© Province of Manitoba 1986.
Scale 1 : 2 500 000
MAN 137

APPENDIX 3

TRAPPERS

LEND A HAND TO SCIENCE



GET INVOLVED IN A FURBEARER STUDY:

This trapping season, 1986-87, the Department of Natural Resources will be co-operating with a University of Manitoba student to obtain more information on the distribution of the prairie long-tailed weasel in Manitoba. All trappers are asked to save the carcasses of every long-tailed weasel caught. Guideline measurements are as follows:

Females: total length, including the tail, 30cm (12 inches), body length 20cm (8 inches)

Males: total length, including the tail, 35cm (14 inches), body length 25cm (10 inches)

Please take all carcasses in a frozen state to your local Natural Resources office with the following information:

1) Your name and address
2) Date of capture
3) Location and habitat caught in
4) Trap type and set

You will be acknowledged for your contribution.

For further information contact your Fur Manager or Natural Resources Officer.

Please note that all current trapping regulations apply to this project.

Manitoba
Natural Resources

MG-4214

APPENDIX 4

NEWSPAPER ADVERTISEMENT

Weasels Wanted

Manitoba Natural Resources is currently trying to learn more about the distribution of prairie long-tailed weasels. Trappers can assist this study by taking the frozen carcass of every long-tailed weasel they catch to the nearest Natural Resources Office.

Each carcass should be identified as to when and where it was taken, the type of habitat where it was taken, and a description of the habitat where it was caught, the type of trap and the set used.

The easiest way to recognize a long-tailed weasel is by size. Adult males have an average body length of 25 cm (10 inches), a total length of 35 cm (14 inches) including tail. Females have an average body length of 20 cm (8 inches), with a total length of 30 cm (12 inches).

For further information, contact a Fur Manager or Natural Resources Officer.

MANITOBA NATURAL RESOURCES

APPENDIX 5

Manitoba Community Newspapers where the long-tailed weasel advertisement was placed

Boissevain Recorder

Melita New Era

Minnedosa Tribune

Shoal Lake Star

Rossburn Review

Gladstone-Neepawa Press

Altona-Red River Valley Echo

Morris River Scratching Post

Steinbach Carillon

Swan River Star and Times

Interlake Spectator

Stonewall Argus and Teulon Times

APPENDIX 6

ADDITIONAL TABLES AND FIGURES FOR CHAPTER 3

CONTENTS

TABLE 6.1

NUMBER OF YEARS TRAPPING EXPERIENCE

LFC Area Code	Actual Number of Trapper Responses	Percent of Total Trapper Responses	Number of Years Trapping				Average No. of Years Trapping
			Over 30 yrs	20-30 yrs	10-20 yrs	Under 10 yrs	
001	107	75	19	14	22	52	15
002	32	89	15	03	04	10	26
005	58	74	14	12	12	20	20
006	45	74	11	05	09	20	17
007	15	83	05	02	03	05	21
008	92	72	21	15	19	37	18
009	48	89	14	06	12	16	20
010	92	77	26	08	27	31	18
011	51	77	07	06	14	24	13
012	39	87	15	11	02	11	25
020	19	83	06	-	06	07	19
022	39	93	15	07	06	11	25
050	03	19	-	01	-	02	09
070	-	-	-	-	-	-	-
210	09	82	06	-	02	01	34
220	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-
280	03	100	01	01	01	-	25

TABLE 6.2

TRAPPER SIGHTINGS OF LONG-TAILED WEASELS IN MANITOBA

IN THE 1965-66 AND 1985-86 SEASON

	Trapping Season					
	Last Season (1985/86)			Twenty Years Ago (1965/66)		
Area of Province	Yes	Unsure	No	Yes	Unsure	No
South West (Virden, Rossburn, Boissevain, Erickson)	52	06	20	10	05	14
South Central (Morden, Delta)	36	11	21	23	06	10
South East (South East, Netley)	18	08	32	07	03	20
East Central (Lac du Bonnet)	-	-	100	-	-	100
Interlake (West & East)	19	20	32	08	07	19
West Central (Alonsa, Dauphin, Duck Mountain)	34	04	28	27	01	11
North West (Porcupine Mountain, Duck Bay, Red Deer)	-	-	44	11	-	44

TABLE 6.3

TRAPPER SIGHTINGS OF LONG-TAILED WEASELS IN MANITOBA

	Trapping Seasons																				
	Last Season			2 Years Ago			5 Years Ago			10 Years Ago			15 Years Ago			20 Years Ago			Before That		
LFC	Yes	Unsure	No	Yes	Unsure	No	Yes	Unsure	No	Yes	Unsure	No	Yes	Unsure	No	Yes	Unsure	No	Yes	Unsure	No
001	17	13	41	19	11	34	20	10	27	12	07	31	10	05	29	08	06	29	09	06	28
002	19	03	22	22	03	17	19	06	14	17	06	08	06	–	11	06	–	11	39	–	14
005	31	14	21	24	13	17	30	14	13	21	13	10	17	12	09	15	09	08	14	08	08
006	41	08	21	39	07	20	39	08	15	30	08	13	28	07	15	30	03	12	25	07	13
007	39	11	28	22	–	33	28	06	17	33	–	06	17	06	11	17	–	06	33	–	06
008	46	10	14	33	05	13	33	06	10	28	08	09	17	07	10	14	04	12	16	03	10
009	48	04	22	32	06	22	35	06	22	26	02	20	20	04	20	15	02	17	22	04	13
010	28	01	30	31	04	23	29	08	15	20	04	17	18	04	18	19	03	17	19	03	15
011	56	08	15	33	12	15	27	15	14	24	09	11	14	06	12	11	08	12	15	06	11
012	58	02	30	36	11	16	40	11	18	36	07	16	33	04	16	31	04	16	29	04	13
020	17	26	35	09	13	35	13	09	26	04	09	22	09	09	17	04	09	17	22	09	13
022	21	14	29	–	07	31	12	10	26	12	12	24	10	05	21	12	05	21	19	02	21
050	06	–	56	–	–	56	13	–	56	–	06	56	–	–	56	–	–	56	06	–	56
070	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100
210	36	–	27	46	–	18	55	–	09	55	–	09	36	–	09	46	–	09	55	–	–
220	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	–	–
260	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100	–	–	100
280	–	–	33	–	–	33	–	–	33	–	–	33	–	–	33	33	–	33	67	–	33

TABLE 6.4

TRAPPER OPINIONS AS TO POPULATION ABUNDANCE OF LONG-TAILED WEASELS IN MANITOBA

	5 Years Ago			10 Years Ago			20 Years Ago			30 Years Ago			Over 30 Years		
LFC	More	Less	Same	More	Less	Same	More	Less	Same	More	Less	Same	More	Less	Same
001	01	30	08	01	17	04	01	14	02	–	09	04	–	09	04
002	–	31	11	–	27	–	–	19	–	–	14	06	–	25	06
005	03	34	13	01	35	04	01	28	03	01	24	01	01	22	01
006	02	34	21	03	23	08	02	23	03	02	21	02	02	21	02
007	06	22	22	–	17	11	–	17	–	–	17	06	–	17	–
008	03	29	21	03	24	09	02	16	06	02	15	02	02	14	02
009	04	37	17	–	30	06	–	24	04	02	15	02	–	22	02
010	03	38	10	01	31	04	02	21	03	03	18	03	03	14	03
011	02	36	17	02	20	06	–	12	05	–	14	05	–	15	05
012	07	43	11	02	36	04	02	39	02	02	34	–	02	23	02
020	09	17	–	04	09	–	–	04	–	–	09	–	–	17	–
022	07	31	02	02	24	02	02	21	–	–	17	–	–	21	–
050	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
210	–	36	18	09	36	–	09	27	–	–	27	09	–	36	09
220	–	–	–	–	–	–	–	100	–	–	100	–	–	100	–
260	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
280	–	33	–	–	33	–	–	33	–	–	33	–	–	33	–

TABLE 6.5
MANITOBA MUSEUM OF MAN AND NATURE RECORDS OF
LONG-TAILED WEASEL SPECIMENS FROM 1970 TO 1984

Local Fur Council Area	Place	Date	Number Caught	Number Males	Number Females
001 (South East)	Ross	Nov 1977	05	02	03
	Ross	Nov 1978	03	03	-
	Steinbach	Dec 1977	10	05	05
	Rosa	Dec 1977	01	01	-
	Marchand	Jan 1978	01	01	-
		TOTALS	20	12	08
002 (Netley)	Libau	Nov 1984	01	01	-
		TOTALS	01	01	-
005 (Morden)	Altona	Nov 1977	02	-	02
	Rathwell	Nov 1977	03	02	01
	Sperling	Dec 1979	01	-	01
	Morris	Mar 1981	01	01	-
		TOTALS	07	02	04
006 (Delta)	Delta	Jul 1977	01	-	-
	Delta	Nov 1977	01	-	-
	Delta	-	01	01	-
	Delta	Jun 1978	01	01	-
	Delta Oxbow	Aug 1978	01	01	-
	Delta Field Station	Aug 1978	02	02	-
	Delta Field Station	Nov 1978	01	-	01
	Rossendale	Dec 1977	02	02	-
	Oakville	Dec 1978	01	-	-
	Portage la Prairie	Aug 1979	01	01	-
		TOTALS	12	08	01
007 (Alonsa)	Ste. Rose du Lac	Jan 1978	01	01	-
	Ste. Amelie	Jan 1978	01	-	01
	Rorketon	Jan/Feb 1978	03	02	01
		TOTALS	05	03	02
008 (Boissevain)	Dunrea	Nov 1977	01	01	-
	Ninette	Dec 1977	01	-	01
	Wawanesa	Dec 1977	01	-	01
	Holland	Dec 1977	13	11	02
	Killarney	Dec 1977	03	02	01
	Killarney	Jan 1978	04	04	-
	Swan Lake	Jan 1978	01	01	-
	Brandon	Feb 1978	03	02	01
	Cypress River	Nov 1980	01	01	-
	Sidney	Oct 1984	02	02	-
	Treesbank	-	01	01	-
		TOTALS	31	25	06

TABLE 6.5 (continued)

Local Fur Council Area	Place	Date	Number Caught	Number Males	Number Females
009 (Erickson)	*	Nov 1977	01	01	-
		TOTALS	01	01	-
010 (Dauphin)	Brokenpipe Lake	Dec 1977	01	-	01
	Swan River	Nov 1977	05	05	-
	Swan River	Dec 1977	04	03	01
	Swan River	Jan 1978	05	04	01
	Swan River	Feb 1978	02	02	-
	Dauphin	Nov 1977	05	04	01
	Dauphin	Dec 1977	02	01	01
	Dauphin	Jan 1978	01	-	01
	Bowsman	Nov 1977	06	05	01
	Bowsman	Dec 1977	09	06	03
	Bowsman	Jan 1978	10	10	-
	Bowsman	Dec 1978	02	02	-
	Venlaw	Nov 1977	02	01	01
	Venlaw	Jan 1978	01	01	-
	Venlaw	Feb 1978	01	-	01
	Winnipegosis	Dec 1977	01	01	-
	**	Dec 1977	01	-	01
	Roblin	Dec 1977	05	04	01
	Makinak	Dec 1977	02	01	01
	Grandview	1977-1978	02	-	02
	Ethelbert	Feb 1978	03	02	01
		TOTALS	70	52	18
011 (Virden)	Pierson	1970	01	01	-
	Pierson	Jan 1974	01	01	-
	Pierson	Dec 1974	01	-	01
	Pierson	Aug 1975	01	-	01
	Pierson	Jan 1979	01	-	01
	Pierson	Aug 1979	01	01	-
	Oak Lake	Nov 1970	01	01	-
	Lyleton	Jun 1975	01	01	-
	Lyleton	Aug 1977	01	-	01
	Elkhorn	Nov 1977	01	-	01
	Virden	Dec 1977	01	-	01
	Lauder	Dec 1977	09	07	02
		TOTALS	20	12	08

TABLE 6.5 (Concluded)

Local Fur Council Area	Place	Date	Number Caught	Number Males	Number Females
012 (Rossburn)	Birtle	-	02	01	01
	Shell Valley	Dec 1977	01	-	01
		TOTALS	03	01	02
050 (Winnipeg)	Little Mountain Park	Dec 1979	01	01	-
	St. James	-	01	-	-
		TOTALS	02	01	-
220 (Porc. Mtn.)	Porcupine Hills	Nov 1977	04	04	-
	Porcupine Hills	Dec 1977	10	06	04
	Porcupine Hills	Feb 1978	01	-	01
		TOTALS	15	10	05

* Stony Point Beach on Lake Dauphin
** South edge of Riding Mountain National Park

TABLE 6.6
ANALYSIS OF WEASEL PELTS AT DOMINION-SOUDACK FUR AUCTION (JAN. 1987)

LFC Code	Place	Sex of LT	# LT Pelts	# ST Pelts
001	Vita	-	-	01
	St. Peirre Jolys	M	02	-
	Steinbach	M	03	06
005	St. Claude	M	01	-
006	Gladstone	M	01	-
	Elie	M	01	-
	Delta Marsh	-	-	28
	Garland/Delta Marsh	-	-	10
	Oakville	M	01	-
007	Ste. Rose du Lac	M	01	03
008	Brandon	M	03	-
	Cartwright	M	01	-
	Kemnay	M	01	01
	Wawanesa	M	13	59
	Souris	M	06	07
009	Sandy Lake	M	01	01
	Erickson	M	03	-
010	Dauphin	M	03	04
	Roblin	M	01	02
	Cowan	-	-	07
	Grandview	M	02	10
	Bowsman	M	03	10
	Swan River	M	01	07
	Makinak	M	01	-
	Durban	M	02	32
012	Russel	M	01	08
	Birtle	M	03	02
	Angusville	M	01	-
	Rossburn	M	01	-
022	Chatfield	-	-	01
Other	Flin Flon	-	-	05
	Oxford House	-	-	06
	Matheson Island	-	-	09
	Thompson	-	-	02
	Berens River	-	-	01
TOTALS			57	222

ST = Short-tailed weasel, LT = Long-tailed weasel

TABLE 6.7

PERCENTAGE OF TRAPPERS TRAPPING LONG-TAILED WEASELS

	Trapping Seasons																							
	86/87		85/86		84/85		83/84		82/83		81/82		80/81		75-80		70-75		65-70		55-65		45-55		45*	
LFC	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
001	04	93	08	71	11	67	09	67	08	65	06	64	07	62	07	62	06	60	09	58	09	57	07	59	06	88
002	08	86	03	61	08	58	11	53	14	50	11	50	11	50	06	44	03	47	-	44	06	42	17	36	19	36
005	04	95	04	89	06	87	08	86	09	80	10	77	13	72	17	67	14	63	17	58	17	53	17	51	14	51
006	07	85	10	74	08	74	13	69	13	71	12	67	10	68	13	66	13	57	10	56	16	44	08	51	08	51
007	17	78	17	72	11	72	17	61	11	61	11	61	11	61	17	44	11	50	06	50	11	44	22	39	06	50
008	04	91	03	79	07	73	10	73	08	71	06	71	08	69	10	65	09	61	07	65	12	54	11	54	11	55
009	06	94	07	80	11	72	15	67	11	69	15	65	17	63	11	59	15	56	19	46	17	46	11	54	13	52
010	07	89	11	61	14	57	15	55	14	53	17	49	13	47	15	48	17	41	14	40	14	39	08	39	11	40
011	-	97	03	82	08	73	05	74	03	76	03	76	02	74	06	74	09	68	06	68	15	58	11	61	09	64
012	04	91	02	80	04	78	09	76	09	71	07	71	04	73	09	76	16	62	16	60	22	49	13	51	16	49
020	-	100	-	91	09	70	09	70	09	65	13	57	13	52	09	52	04	52	-	52	04	48	04	48	13	44
022	07	91	12	60	07	57	07	57	10	57	07	57	10	50	07	50	07	48	05	48	12	41	12	41	10	43
050	-	100	-	88	-	81	-	81	-	75	-	75	-	75	-	75	-	75	-	75	-	75	-	63	-	63
070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210	18	73	18	73	18	73	18	73	27	64	27	64	09	73	18	64	18	64	36	46	27	46	36	18	36	18
220	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	100	-
260	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100
280	-	67	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	33	-	33	-	33	-

* Before 1945

TABLE 6.8
TRAPPERS' REASONS FOR NOT TRAPPING LONG-TAILED WEASELS

Reasons for not Trapping Long-Tailed Weasels	Local Fur Council Area Codes																	
	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
Good for rodent control	02	03	08	04	06	13	07	09	23	33	04	05	–	–	09	–	–	–
Uneconomic	13	14	09	10	11	10	22	13	24	16	09	17	–	–	–	–	–	–
None in area	16	–	–	–	22	05	04	13	–	–	22	19	–	–	27	–	–	67
Not a trapper	13	08	21	07	–	13	07	13	05	04	13	–	63	–	–	–	–	–
Don't trap weasels	08	11	06	04	28	07	06	08	17	13	04	10	06	–	09	–	100	–
Retired or ill-health	04	–	–	–	–	02	02	–	–	–	–	–	–	–	–	–	–	–
Too few and wish to conserve	17	45	26	38	17	17	20	17	14	36	–	21	13	–	27	–	–	–
Only trap larger animals (fox, coyote, etc.)	05	07	08	10	–	09	02	09	08	07	09	07	25	–	–	–	–	–
Not interested	04	–	03	–	–	–	–	–	02	04	–	–	–	–	–	–	–	–
Don't know anything about long-tailed weasels	01	03	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
No time	03	03	01	05	–	05	07	02	03	04	–	05	–	–	–	–	–	–

TABLE 6.9
NUMBER OF LONG-TAILED WEASELS CAUGHT EACH TRAPPING SEASON

Local Fur Council Area	Trapping Season											
	85/86	84/85	83/84	82/83	81/82	80/81	75-80	70-75	65-70	55-65	45-55	Before 1945
001	25	53	28	26	39	33	41	21	61	68	80	04
002	02	14	20	19	24	22	05	-	01	21	37	18
005	20	25	25	39	30	34	66	40	64	75	112	58
006	07	08	05	09	28	24	44	35	37	90	66	-
007	14	07	51	01	02	08	46	50	65	102	115	100
008	37	44	68	67	62	60	105	111	89	106	131	19
009	25	34	38	38	48	44	42	59	56	84	158	162
010	55	45	86	69	34	31	43	183	123	179	263	-
011	28	12	13	16	08	06	13	19	28	75	64	-
012	01	02	04	06	07	04	17	33	60	141	40	-
020	-	17	20	10	11	40	34	03	-	02	-	25
022	14	01	-	-	-	05	15	13	12	80	49	50
050	-	-	-	-	-	-	-	-	-	-	-	-
070	-	-	-	-	-	-	-	-	-	-	-	-
210	07	04	03	05	03	07	25	33	42	24	52	250
220	-	-	-	-	-	-	-	-	-	-	-	-
260	-	-	-	-	-	-	-	-	-	-	-	-
280	-	-	-	-	-	-	-	-	01	10	01	01

TABLE 6.10

ACCIDENTAL CATCHES OF LONG-TAILED WEASELS IN TRAPS SET FOR OTHER ANIMALS

Local Fur Council Area Code	Yes	No
001	26	63
002	31	64
005	30	56
006	31	57
007	39	56
008	24	66
009	37	52
010	35	53
011	30	61
012	40	51
020	39	39
022	26	62
058	-	58
070	-	-
210	46	46
220	-	-
260	-	100
280	-	100

TABLE 6.11

TRAP TYPES USED WHEN LONG-TAILED WEASELS WERE CAUGHT ACCIDENTALLY

1. Leghold (long spring).

#2	Newhouse	#3	Coyote trap
#1	leghold	#4	Coyote-wolf trap
#1½	leghold	#0	long spring
#2½	leghold	#1	long spring
#1½	Victor	#1½	long spring
#2	Victor	#2	long spring
		#3	double spring

2. Leghold (coil spring).

#1	jump trap	#1½	jump trap
#2	jump trap	#4	jump trap
#1½	coil spring	#2	coil spring
#3	coil spring		

3. Stoploss.
   Modified leghold used for drowning set only (for muskrat and mink).

4. "Humane" trap
   1½ coil soft catch (padded jaws - used for fox).

5. Conibear.
   #110 - muskrat size.
   #220 - fisher, underwater beaver, lynx.

6. Live trap - a box or cage.

TABLE 6.12

SET TYPES WHERE LONG-TAILED WEASELS HAVE BEEN CAUCHT ACCIDENTALLY

1. Cubby
2. Box
3. Skunk den
4. Runway
5. Under willows
6. Runs in creeks
7. Tunnel entrance
8. Snare
9. River banks
10. Beaver dams
11. Mink entrance
12. Dirt cellar
13. Under wood floors
14. Hollow logs
15. Drainage ditches
16. Old shed

TABLE 6.13

TARGET ANIMAL AND PERCENTAGE OF TRAPPERS WHO CAUGHT LONG-TAILED WEASELS IN SETS FOR THESE ANIMALS

Target Animal	% Trappers
Mink	32.5
Fox	13.6
Coyote	9.5
Squirrel	8.8
Rat	5.9
Raccoon	5.9
Muskrat	4.7
Fisher	2.4
Short-tailed weasel	2.4
Skunk	1.8
Gopher	1.8
Marten	1.8
Lynx	1.2
Rabbit	1.2
Beaver	0.6
Magpie	0.6
Badger	0.6

TABLE 6.14

PERCENTAGE OF TRAPPERS SELLING THEIR PELTS

LFC Area Code	All	Some	None	Discarded/ Damaged	Mounted	Other
001	32	06	02	04	04	Not prime 01
002	47	03	11	-	-	-
005	40	03	03	04	01	Not prime 01
006	43	-	05	03	-	Not prime 02
007	67	-	-	-	-	-
008	39	02	03	01	01	Not prime 02
009	50	04	06	-	-	Not prime 02, Kept 02
010	51	04	-	02	01	Given away 01
011	33	-	05	05	-	-
012	47	04	11	09	-	Road kill 02, Kept 02, Released 04
020	30	09	09	-	-	-
022	43	02	05	-	-	-
050	-	-	-	-	-	-
070	-	-	-	-	-	-
210	73	-	-	-	-	-
220	-	-	-	-	-	-
260	-	-	-	-	-	-
280	33	-	-	-	-	-

TABLE 6.15

TYPE OF SURROUNDINGS WHERE LONG-TAILED WEASELS WERE MOST FREQUENTLY SIGHTED

Types of Areas Where Long-Tailed Weasels Sighted	Local Fur Council Area Codes																	
	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
Never seen or caught on	33	17	12	10	06	09	13	18	09	09	22	21	31	100	09	-	-	33
Cultivated field	10	14	12	23	17	17	20	16	17	16	-	02	-	-	18	-	-	33
Uncultivated field	12	14	22	26	28	28	13	15	31	47	09	10	06	-	36	-	-	-
Ditch	14	39	39	49	39	43	44	25	52	33	13	10	06	-	46	100	-	33
Shelterbelt	12	14	17	30	06	21	20	16	18	11	04	02	06	-	18	-	-	-
Marsh	23	28	19	23	39	24	20	26	24	31	35	43	19	-	36	-	-	67
Pothole	04	06	15	05	06	05	19	06	18	16	-	05	06	-	09	-	-	-
Creek	17	17	32	23	17	26	33	33	31	31	17	05	06	-	55	-	-	33
Forest	23	17	08	23	22	13	15	18	06	16	13	19	-	-	36	-	-	33
Farmyard	25	28	45	34	39	43	41	40	41	56	13	29	13	-	27	-	-	33

TABLE 6.16
TYPE OF SURROUNDINGS WHERE LONG-TAILED WEASELS WERE MOST FREQUENTLY CAUGHT

Habitat Type Where Long-Tailed Weasels Usually Caught	Local Fur Council Area Code																	
	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
Never caught a long-tailed weasel	32	31	37	25	17	29	19	21	27	16	22	36	25	100	18	–	–	67
Cultivated field	04	08	06	05	06	05	02	04	09	07	04	–	–	–	18	–	–	33
Uncultivated field	07	08	06	10	17	07	02	03	11	16	09	05	–	–	27	–	–	–
Ditch	12	14	10	18	22	15	19	14	12	16	13	05	–	–	18	–	–	–
Shelterbelt	08	06	10	20	06	10	13	09	02	07	13	02	–	–	–	–	–	–
Marsh	17	17	14	10	39	10	28	24	14	21	35	19	–	–	18	–	–	–
Pothole	04	03	09	03	11	06	07	04	09	11	04	–	–	–	–	–	–	–
Creek	16	11	22	21	22	20	28	31	20	31	13	05	–	–	36	–	–	–
Forest	18	11	12	12	11	07	17	20	03	07	13	07	–	–	36	–	–	–
Farmyard	16	19	21	15	17	19	20	23	08	22	13	02	–	–	09	–	–	33
Stone piles	–	–	01	02	06	03	07	–	02	02	04	02	–	–	09	–	–	–
Fence lines and field edges	–	03	01	03	–	03	06	01	–	04	–	02	–	–	–	–	–	–
Brush piles	–	03	–	–	06	–	–	01	02	–	–	02	–	–	–	–	–	–
Old farm buildings	–	–	01	–	–	02	–	–	–	–	–	–	–	–	–	–	–	–
Roads and railway lines	–	–	03	–	–	–	02	–	–	–	–	–	–	–	–	–	–	–
Riverbanks	–	–	–	–	–	–	–	02	05	02	–	–	–	–	–	–	–	–
Haystacks	–	–	–	–	–	–	–	–	–	–	–	–	–	–	09	–	–	–
Open ridges	01	–	–	–	–	–	–	–	–	–	04	–	–	–		–	–	–
Bush swamp	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	02	–	–
Curling rink	01	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Culvert	–	–	–	–	–	–	–	01	–	–	–	–	–	–	–	–	–	–
Willow buff	–	–	–	–	–	–	–	01	–	–	–	–	–	–	–	–	–	–
Gravel pit	–	–	–	–	–	–	–	01	–	–	–	–	–	–	–	–	–	–
Beaver dam	–	–	–	–	–	–	–	–	02	–	–	–	–	–	–	–	–	–
Car garage	–	–	–	–	–	–	–	–	02	–	–	–	–	–	–	–	–	–
Ground-hog holes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	09	–	–	–

TABLE 6.17

HABITAT CHANGES NOTICED IN AREAS WHERE LONG-TAILED WEASELS USUALLY SIGHTED

Changes / Survey Categories	Local Fur Council Area Codes																	
	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
Pothole draining	12	14	23	23	22	23	30	14	24	31	70	21	–	–	36	100	–	–
More houses built	11	14	05	08	–	05	06	06	02	02	22	02	–	–	–	100	–	–
New roadways	13	19	10	13	28	12	17	13	14	16	22	10	–	–	36	100	–	–
Bush clearing	29	42	35	41	33	32	37	34	35	44	35	31	06	–	46	100	–	33
Different crops	07	06	08	10	11	09	09	11	03	09	04	02	–	–	09	–	–	–
No changes	20	11	18	23	28	23	30	22	26	31	09	17	–	–	09	–	–	33

Other Changes Mentioned	001	002	005	006	008	009	010	011	012	020	022	210
Wetlands drained	01	–	–	–	01	–	01	–	–	04	02	–
Fire damage	01	–	01	–	02	–	02	–	–	04	02	–
Out-of-Season trapping	01	–	–	–	–	–	–	–	–	–	–	–
More old farm buildings	–	–	01	–	02	–	–	–	–	–	–	–
More intensive farming	–	–	–	–	01	02	01	02	–	–	02	–
Increased pesticides	–	–	–	–	01	02	–	–	02	–	–	09
Fewer free-range hens	–	03	–	–	–	–	–	–	–	–	–	–
Drought damage	–	–	–	–	–	–	–	02	–	–	02	–
Brush pile burning	–	–	–	–	–	–	–	–	–	–	02	–
Fence line, creek, and road side clearing	–	03	–	–	–	02	03	–	–	–	–	–
No haystacks	–	–	–	–	–	–	01	–	–	–	–	–
Forest fire control	–	–	–	–	–	–	–	–	–	–	–	09
More pastureland and livestock spoiling creeks	–	–	–	02	–	–	–	–	–	–	–	09

TABLE 6.18
POSSIBLE CAUSES FOR CHANGES IN NUMBERS OF LONG-TAILED WEASELS

Possible Causes	Local Fur Council Area Codes																		
	Yes/No	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
Changes in countryside	Yes	22	36	33	31	28	31	37	31	36	38	30	36	13	–	36	100	–	33
	No	09	06	05	–	17	06	11	08	05	07	–	05	–	–	09	–	–	–
Increased pesticide use	Yes	25	33	33	28	39	22	35	35	30	40	30	21	06	–	55	–	–	–
	No	05	03	04	03	06	06	02	03	03	04	04	02	–	–	09	–	–	–
Over-trapping	Yes	08	03	04	18	06	10	09	07	05	11	04	10	06	–	–	–	–	–
	No	13	14	13	13	11	14	20	19	18	20	17	14	–	–	36	–	–	–
Pest control (poisoning)	Yes	24	19	30	18	17	26	26	29	33	38	09	24	06	–	64	100	–	33
	No	05	06	03	08	06	08	07	06	08	04	04	05	–	–	09	–	–	–
Less food (gophers, mice)	Yes	18	22	13	18	28	04	17	25	17	13	26	24	06	–	55	–	–	33
	No	08	11	10	10	11	13	15	06	17	16	–	05	–	–	09	–	–	–
More ravens, hawks, owls	Yes	18	19	09	21	28	11	33	33	05	22	26	19	13	–	36	100	–	33
	No	08	06	08	12	06	10	11	03	18	11	04	05	–	–	27	–	–	–
Beats me	Yes	11	19	13	10	11	16	11	13	18	07	09	12	–	–	09	–	–	–
	No	06	–	01	–	11	02	04	03	03	02	–	07	–	–	–	–	–	–
Habitat loss	Yes	03	–	06	03	–	01	06	–	02	–	04	02	–	–	09	–	–	–
	No	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stubble burning	Yes	01	03	01	02	06	01	–	–	–	02	04	02	–	–	18	–	–	–
	No	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

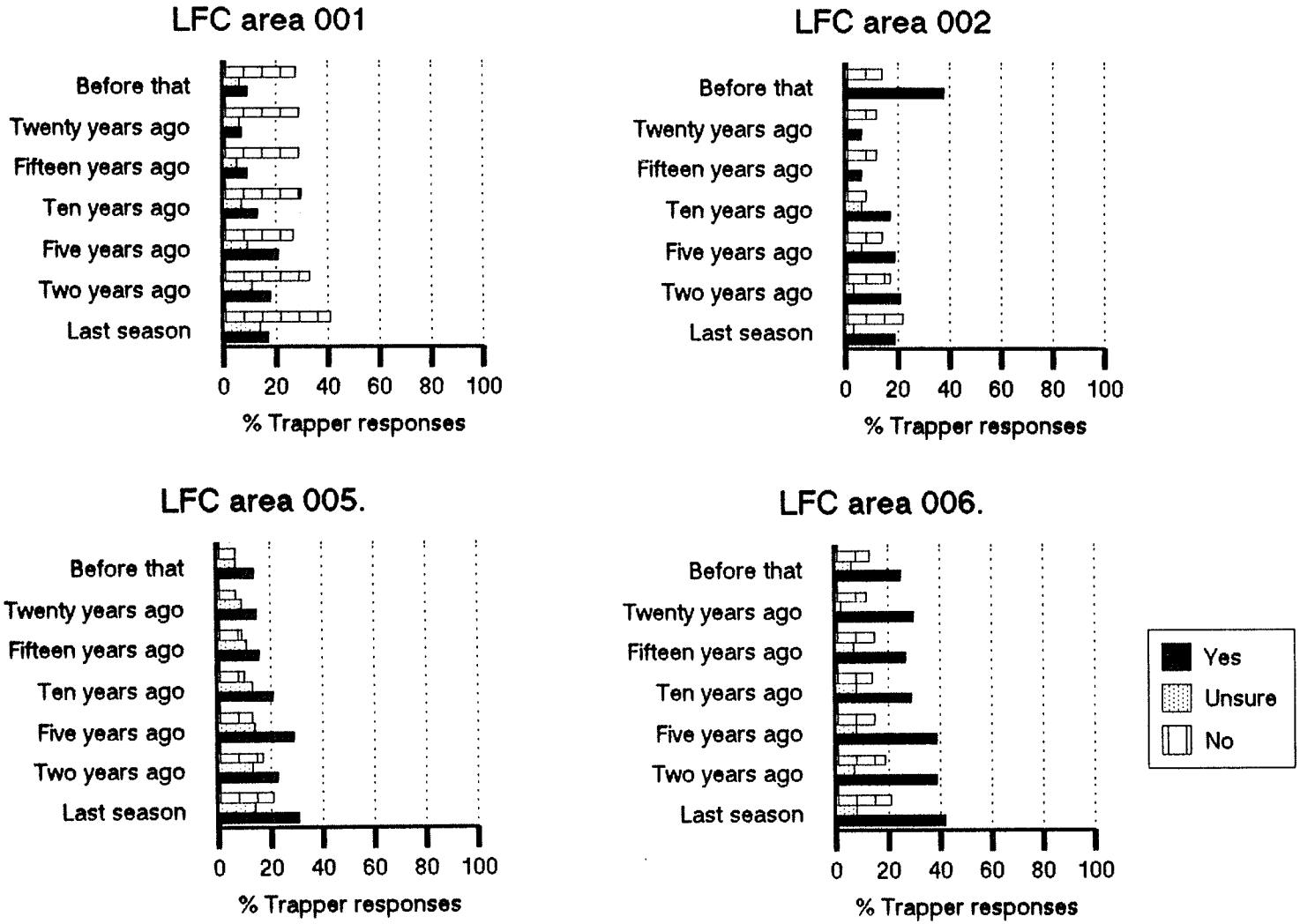


Figure 6.1 Trapper sightings in each LFC area in different time periods

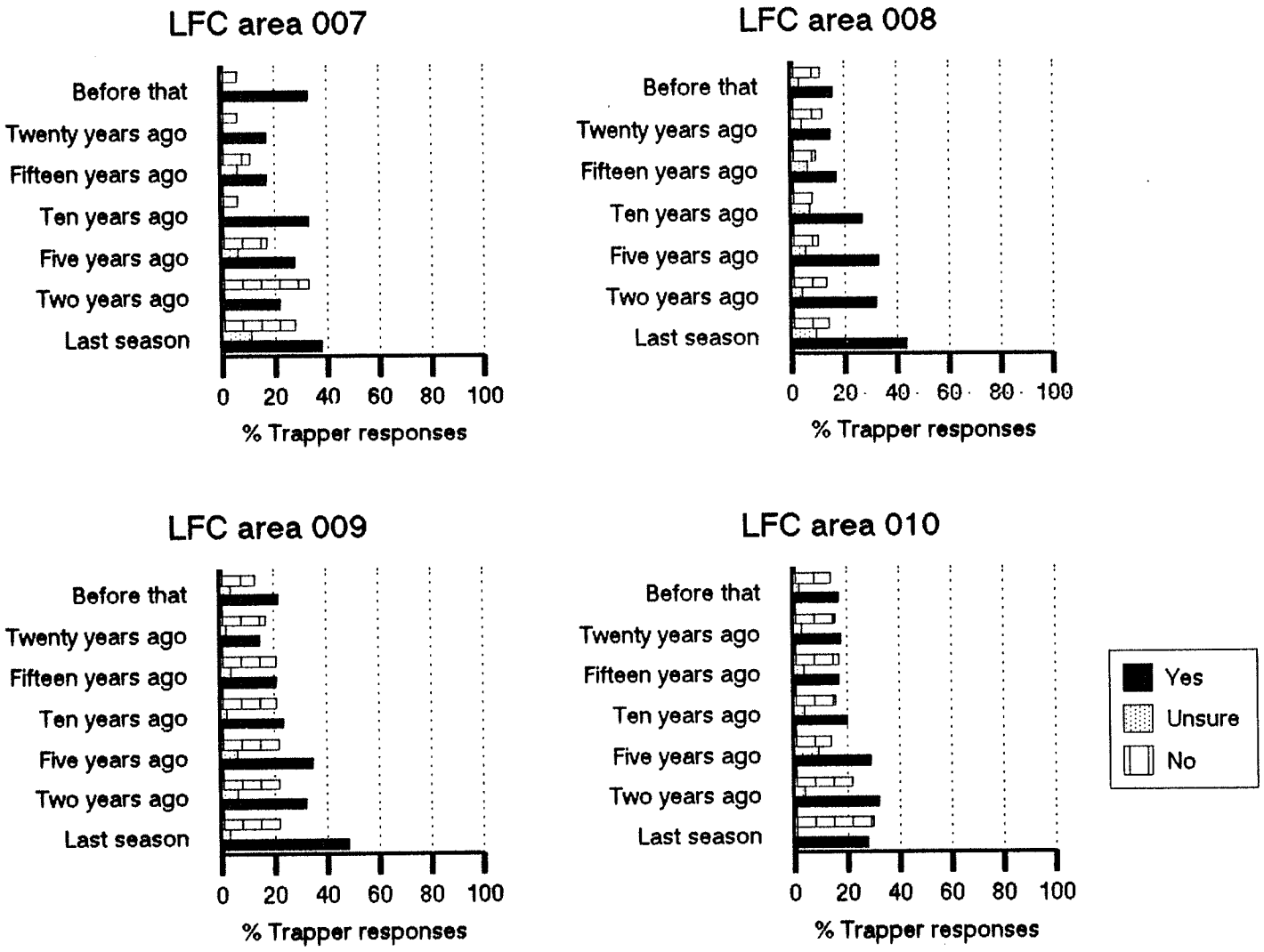


Figure 6.1 (continued)

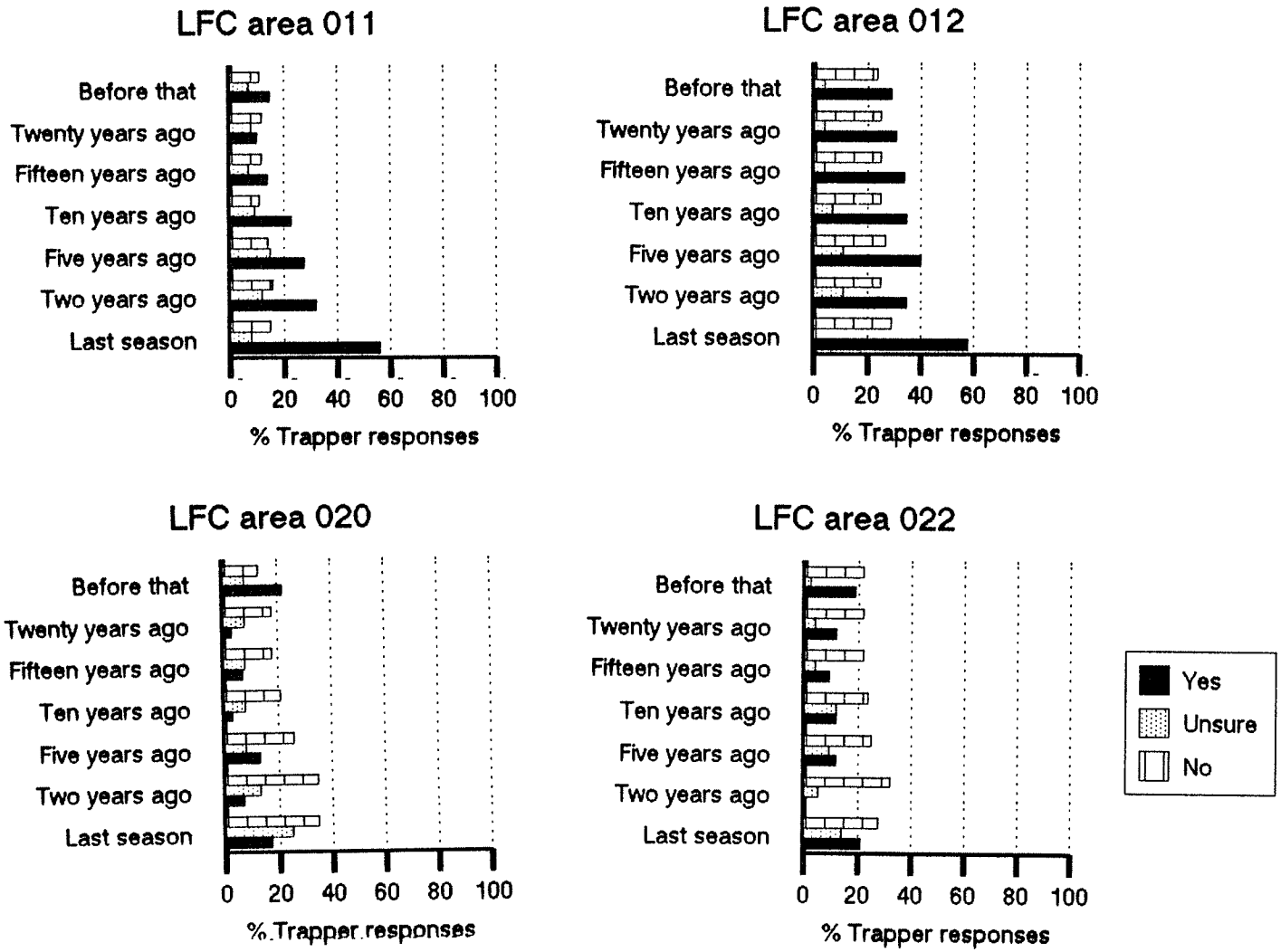


Figure 6.1 (continued)

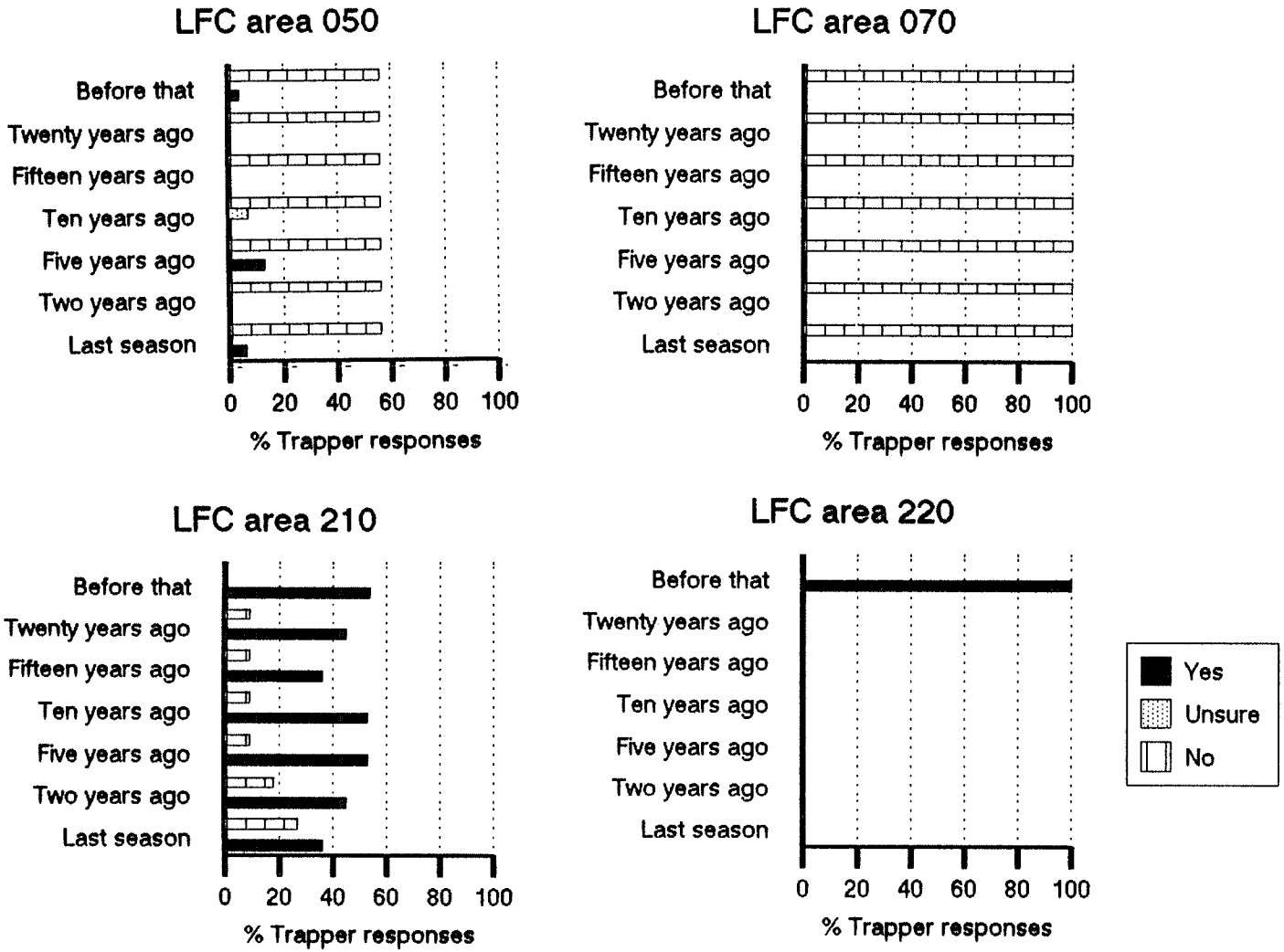


Figure 6.1 (continued)

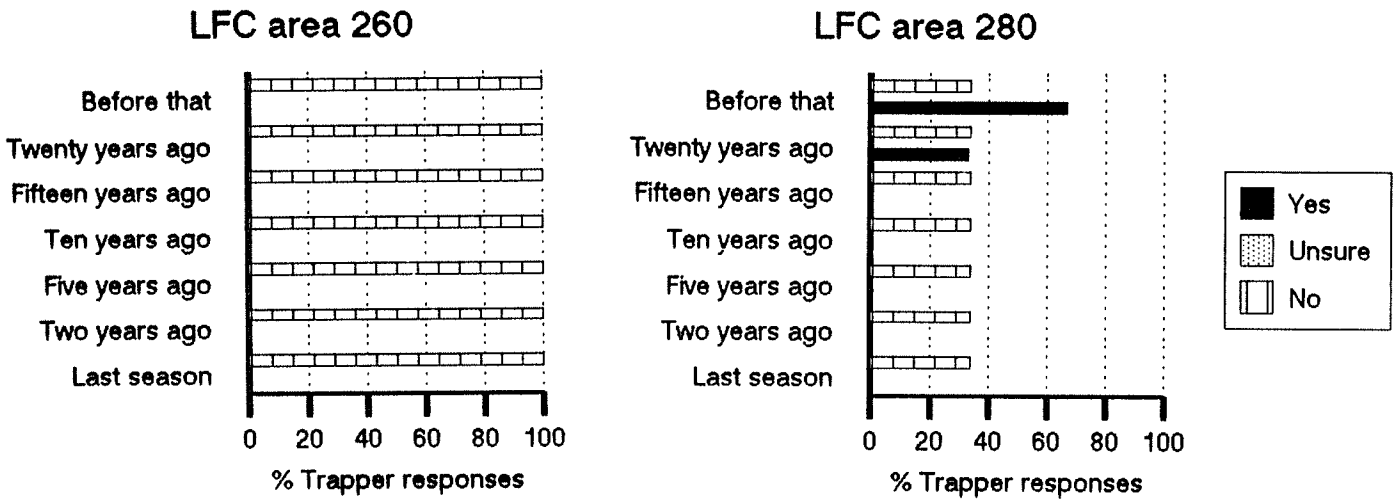


Figure 6.1 (continued)

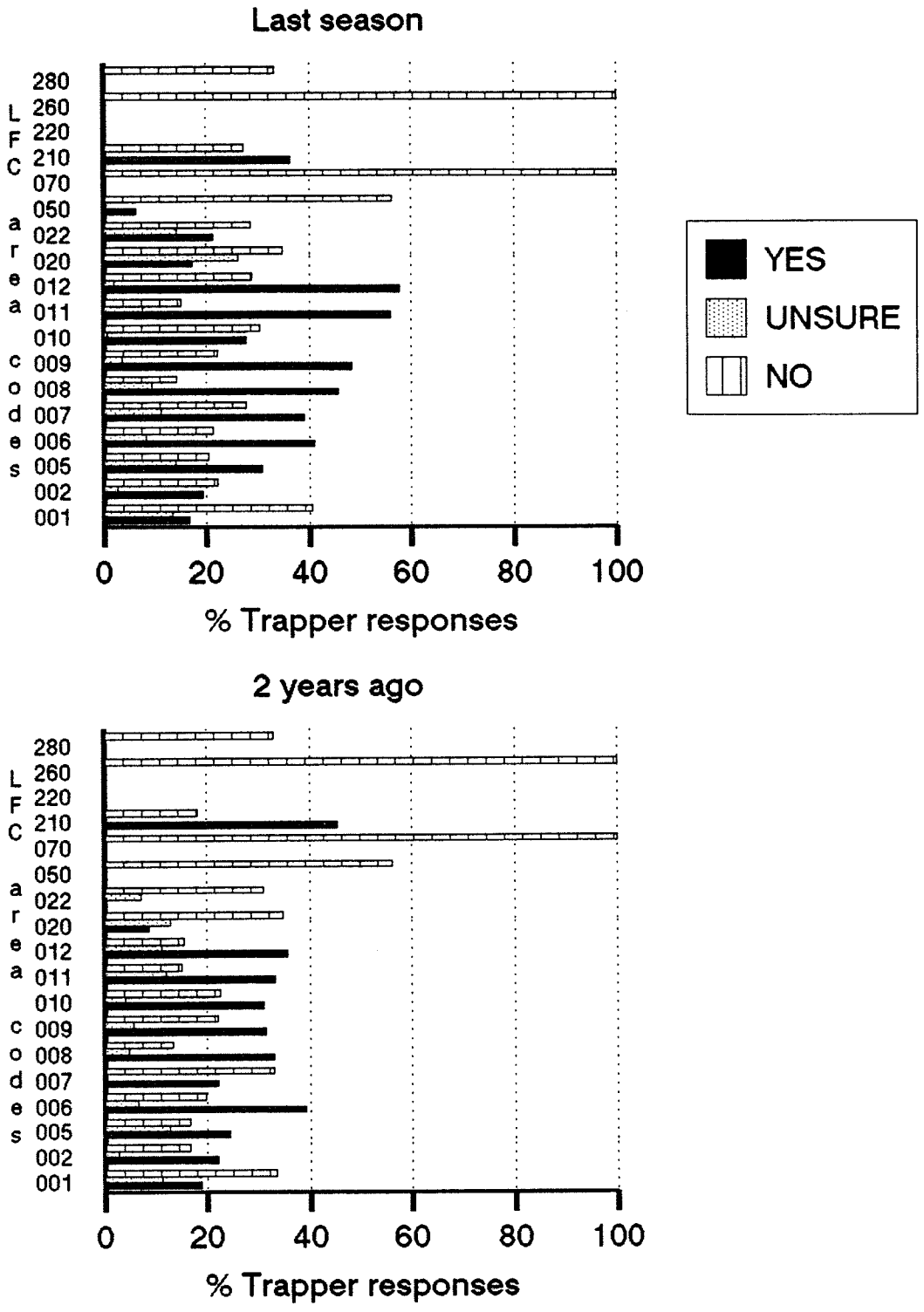


Figure 6.2 Trapper sightings of long-tailed weasels in Manitoba

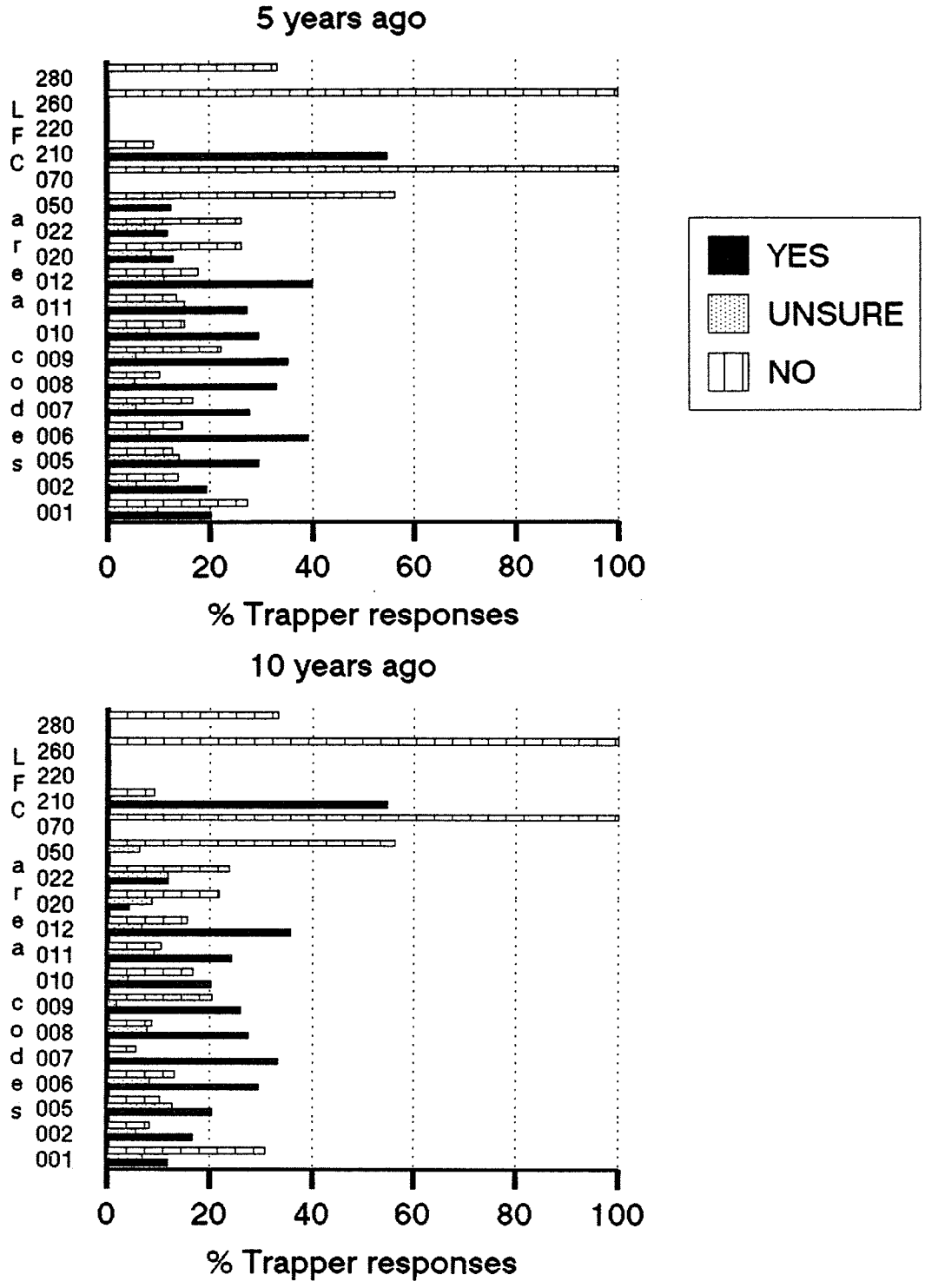


Figure 6.2 (continued)

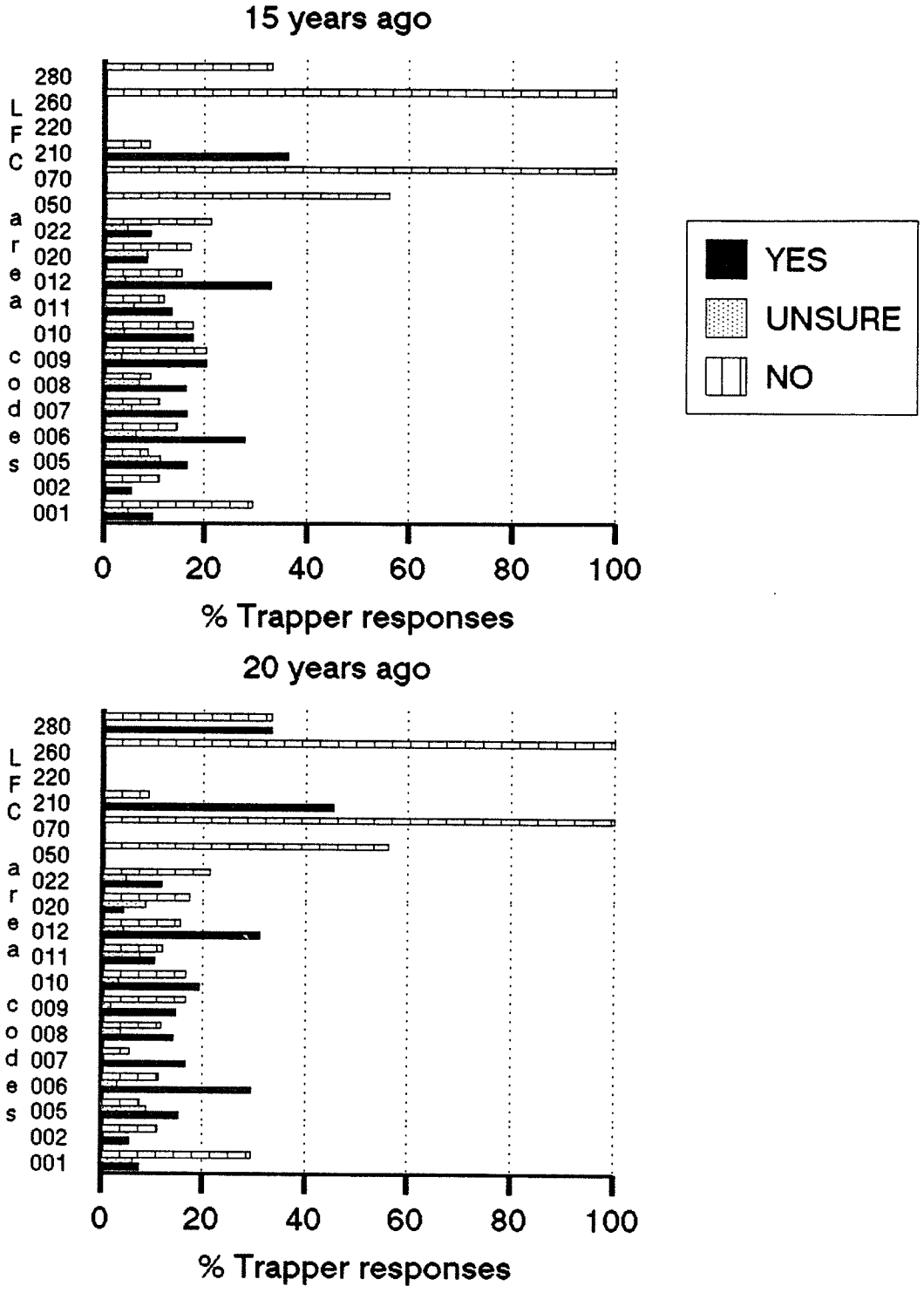


Figure 6.2 (continued)

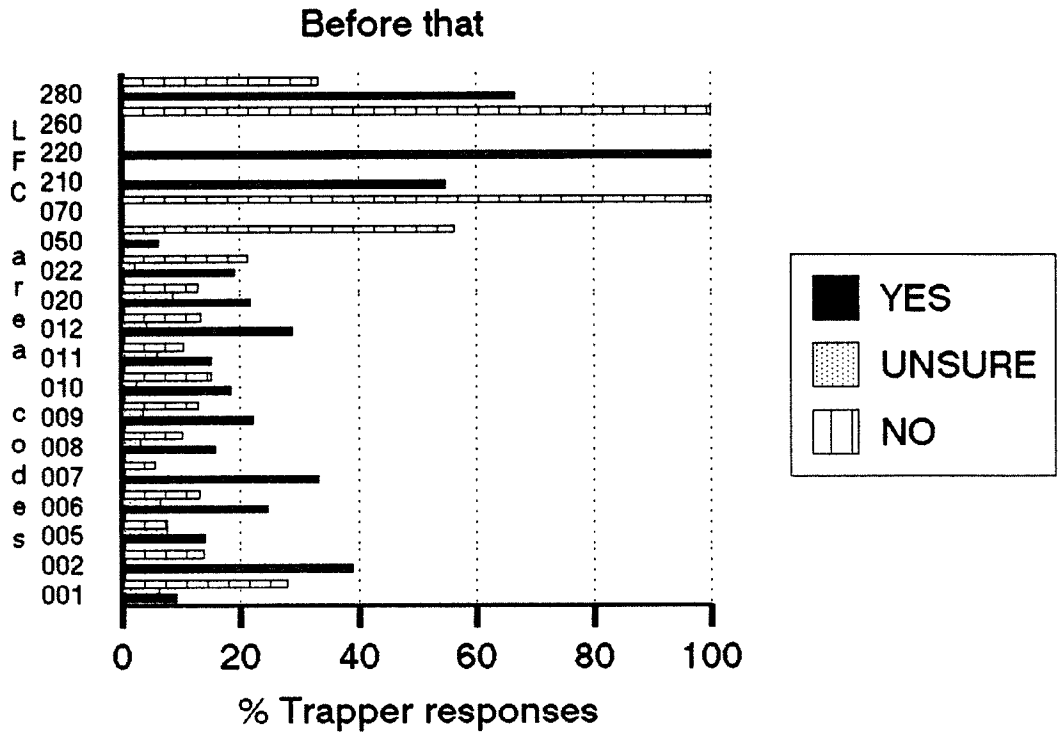


Figure 6.2 (continued)

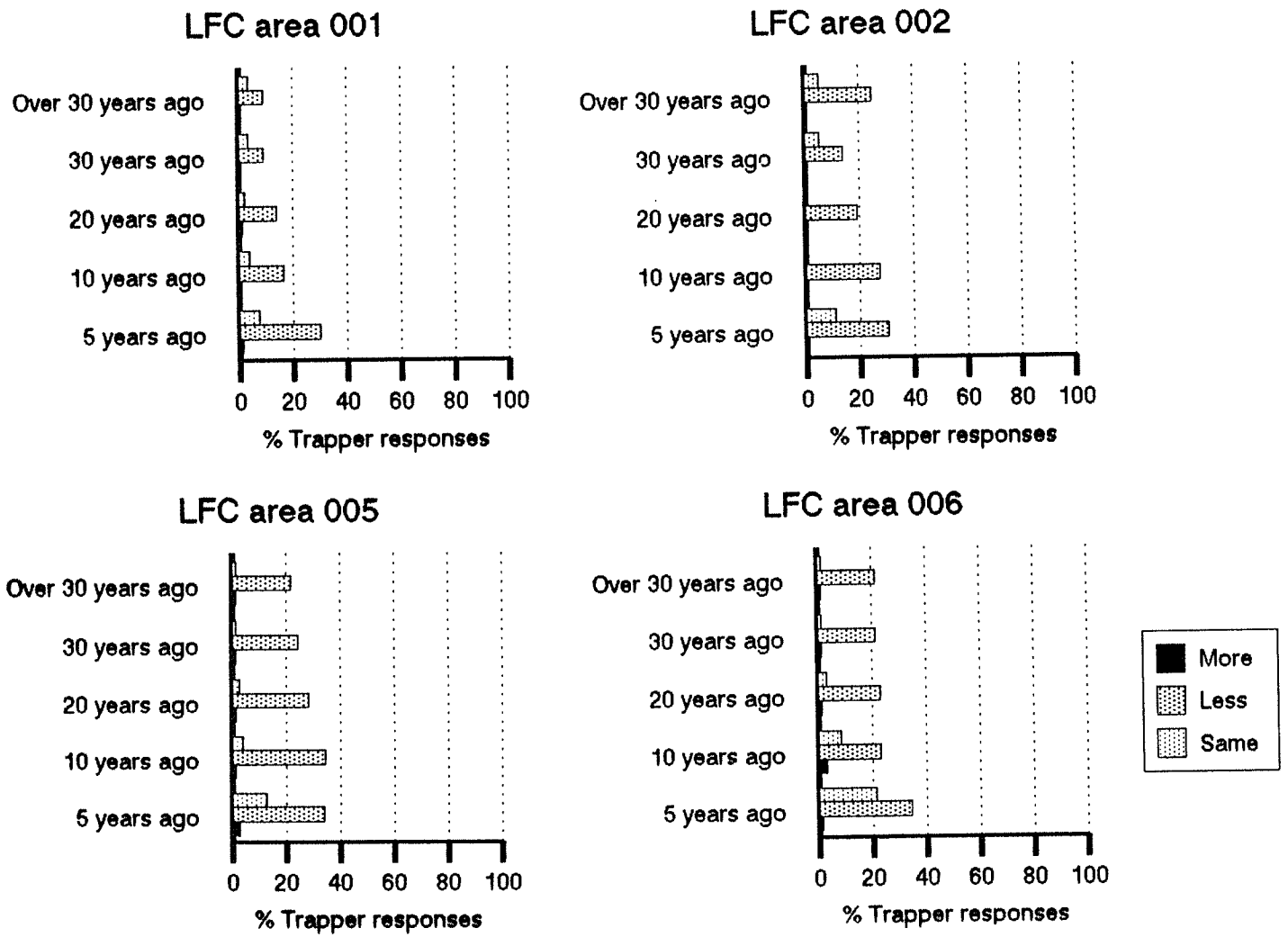


Figure 6.3 Trapper opinions of long-tailed weasel population abundance over different time periods

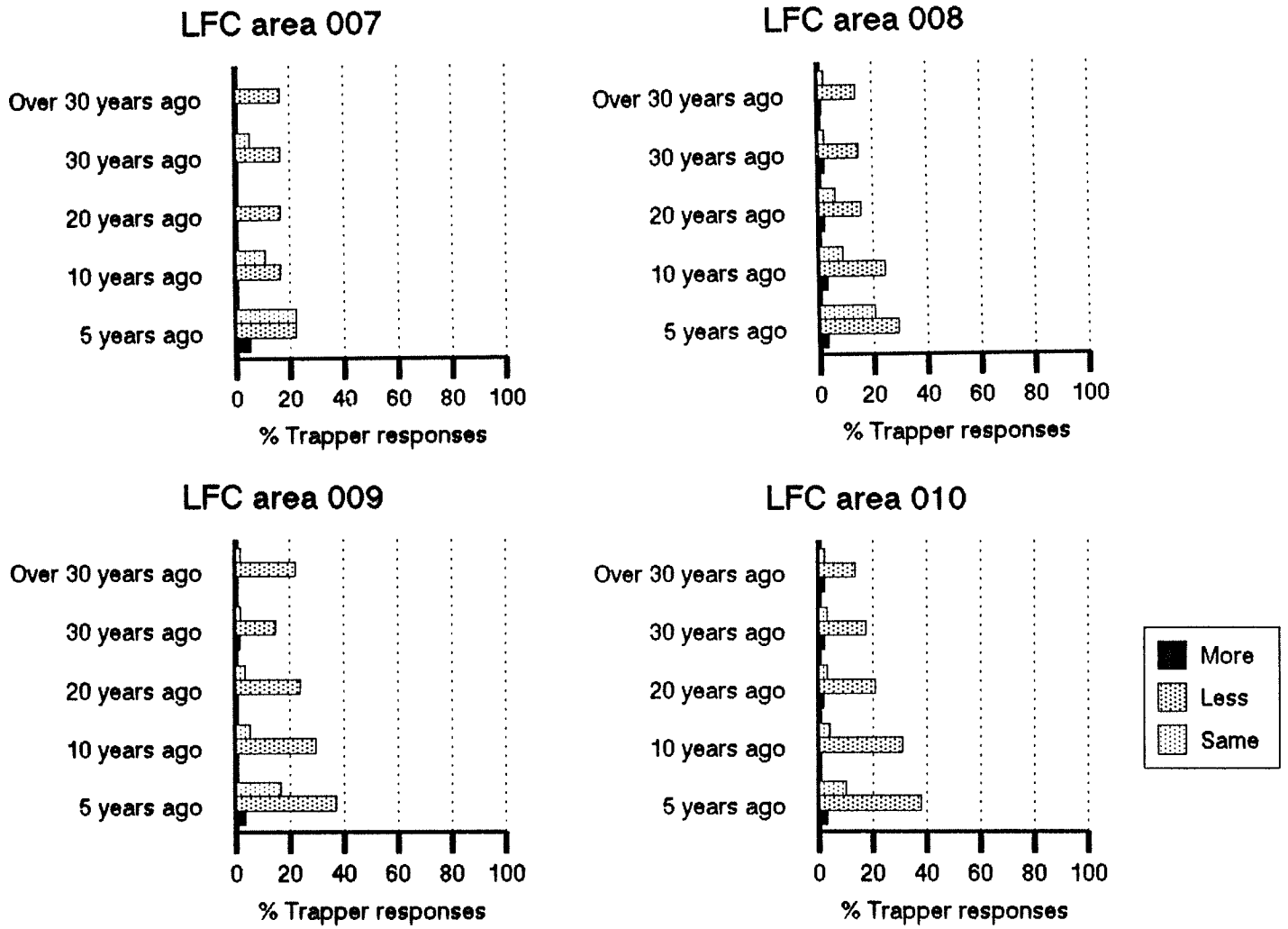


Figure 6.3 (continued)

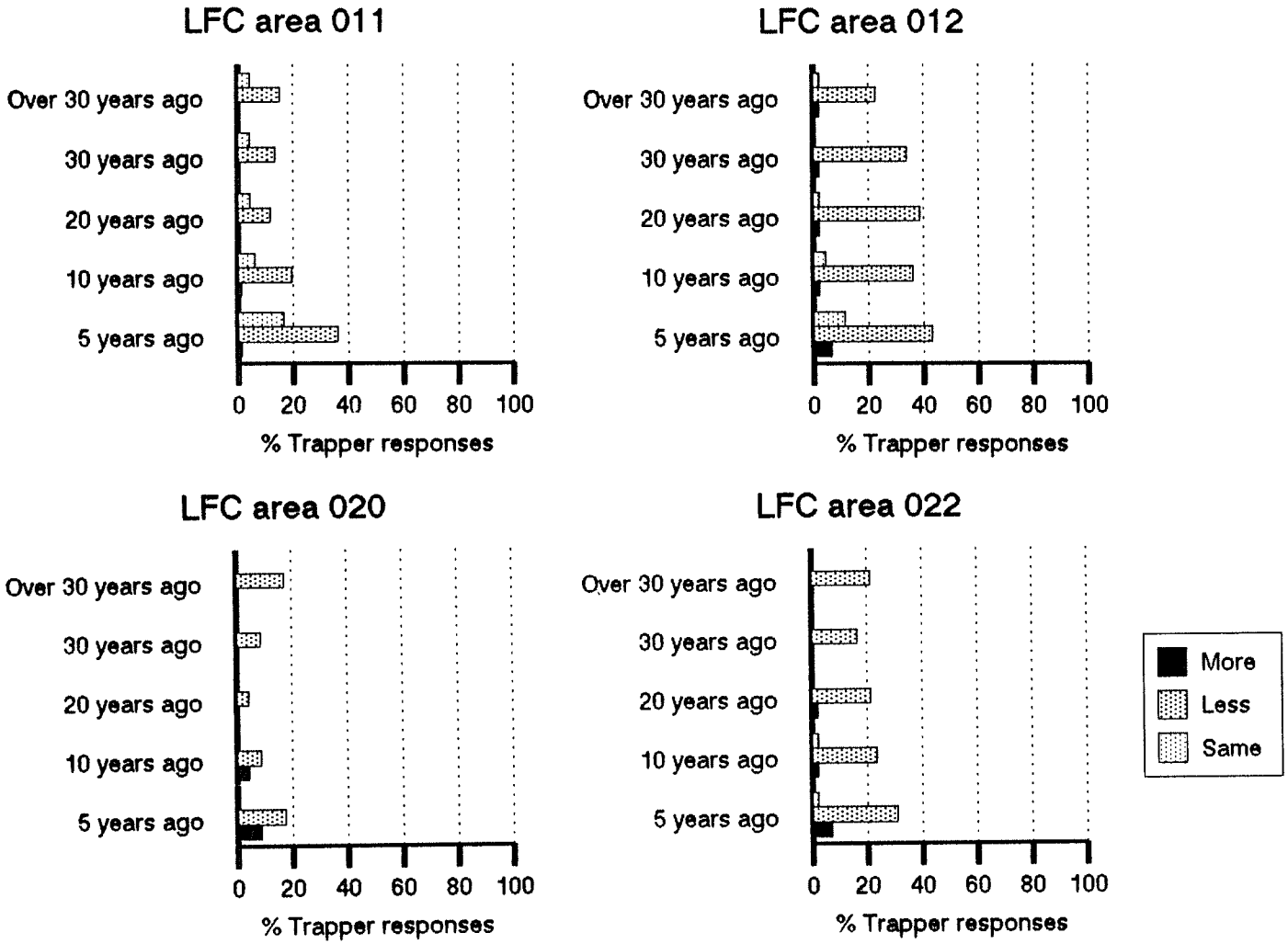


Figure 6.3 (continued)

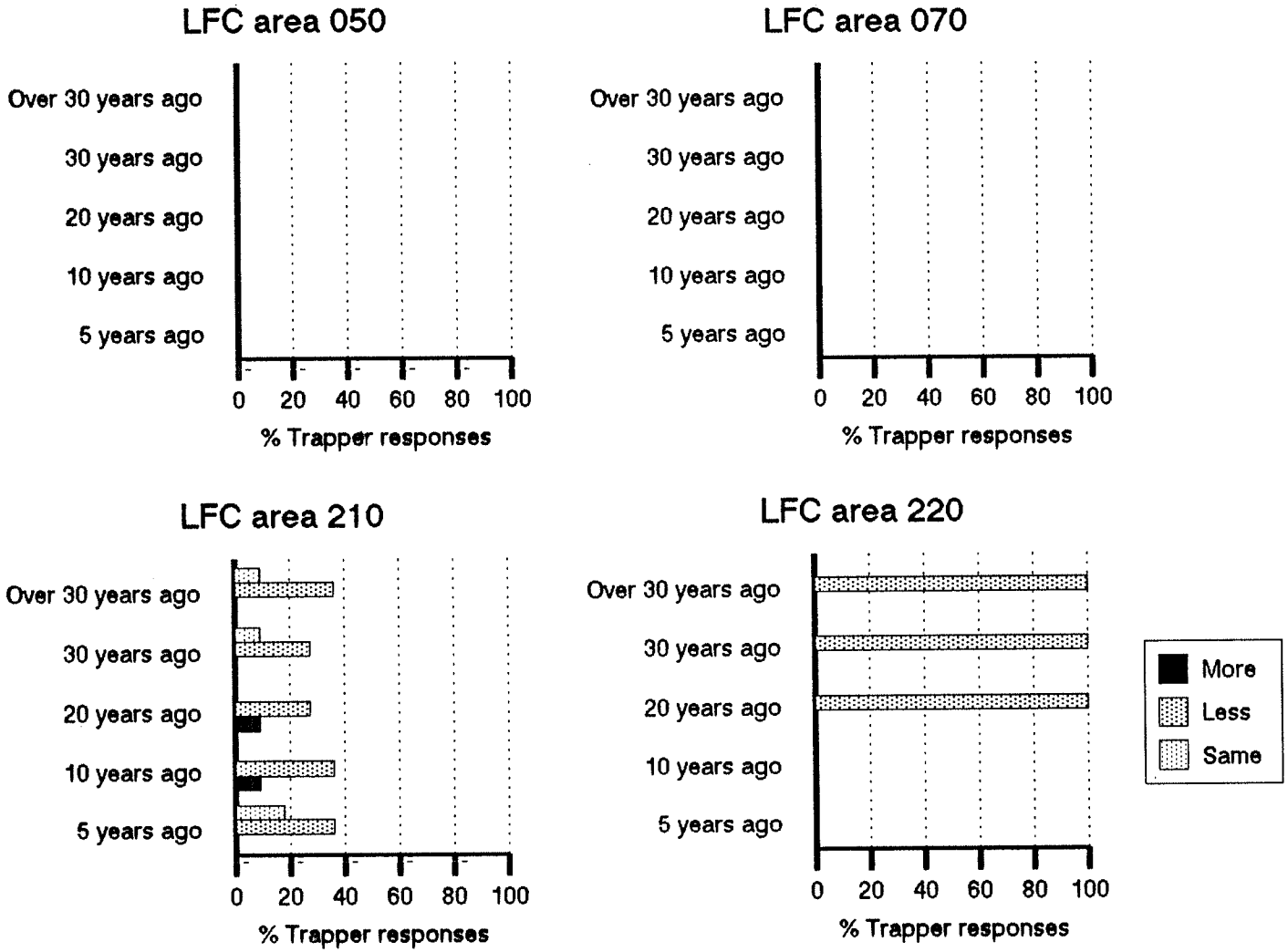


Figure 6.3 (continued)

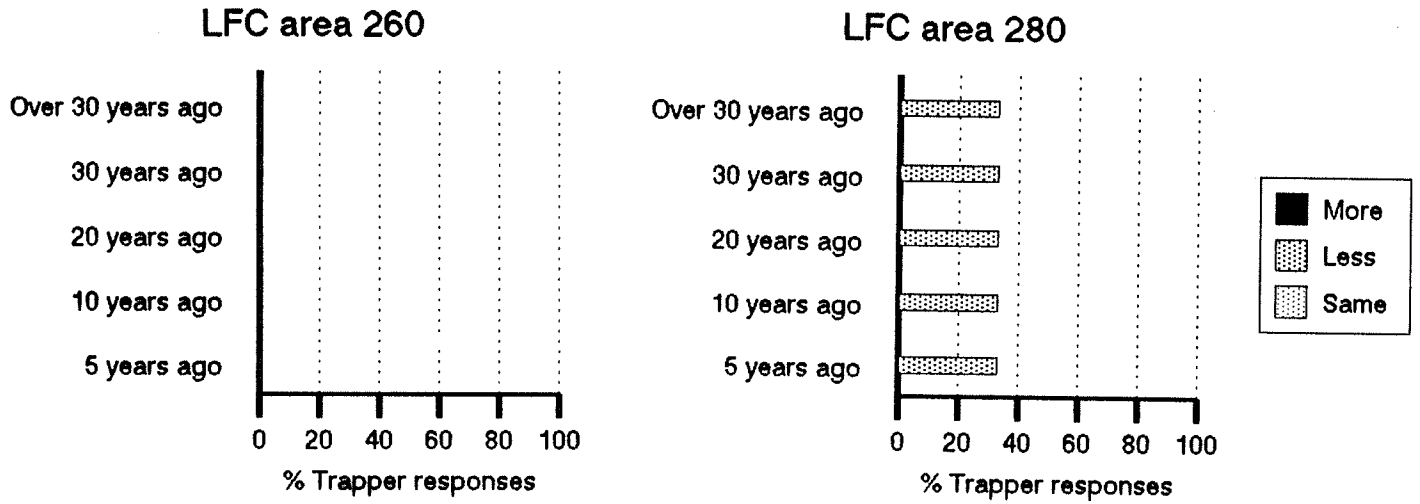


Figure 6.3 (continued)

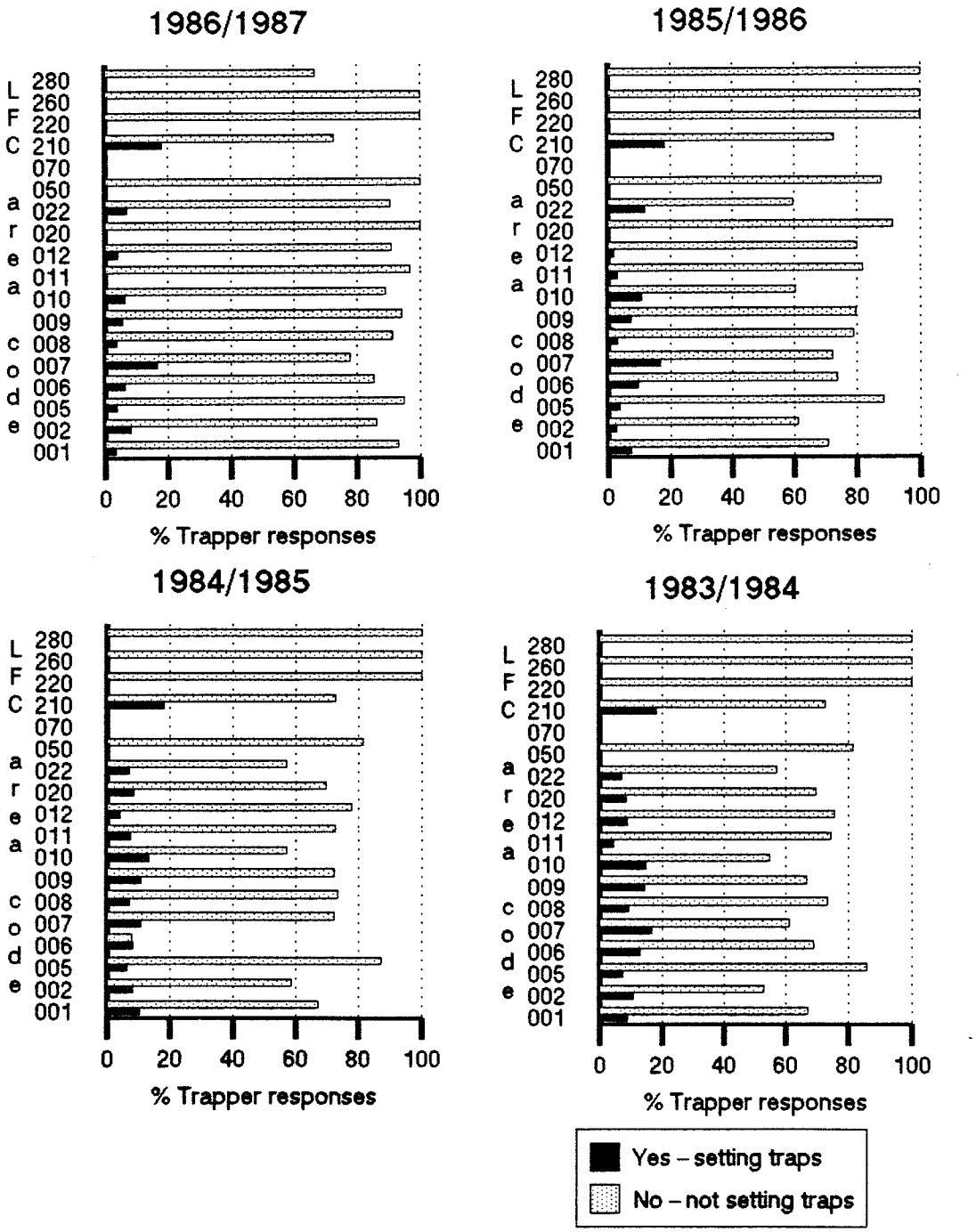


Figure 6.4 Trapper responses as to whether they were or were not setting traps for long-tailed weasels

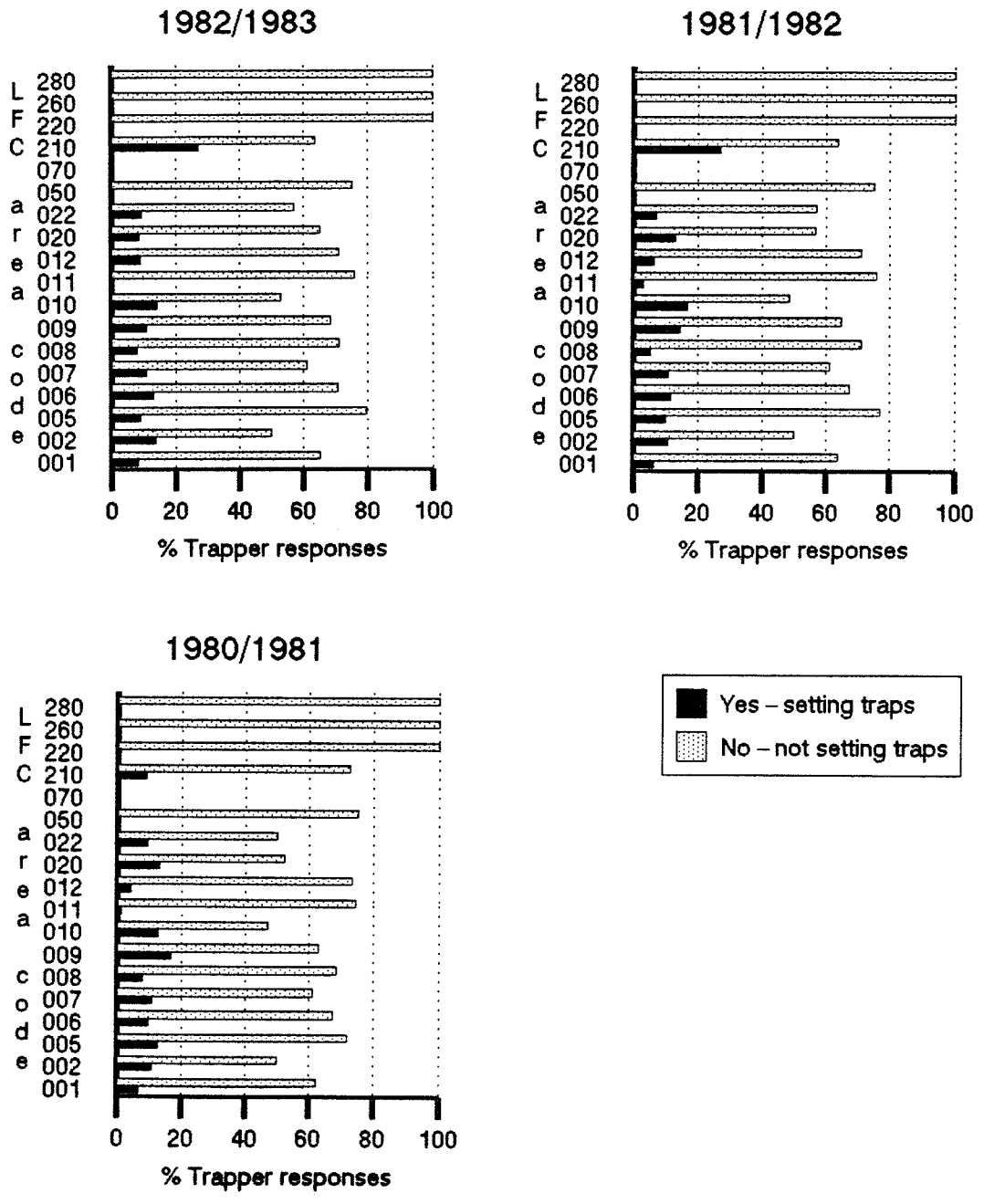


Figure 6.4 (continued)

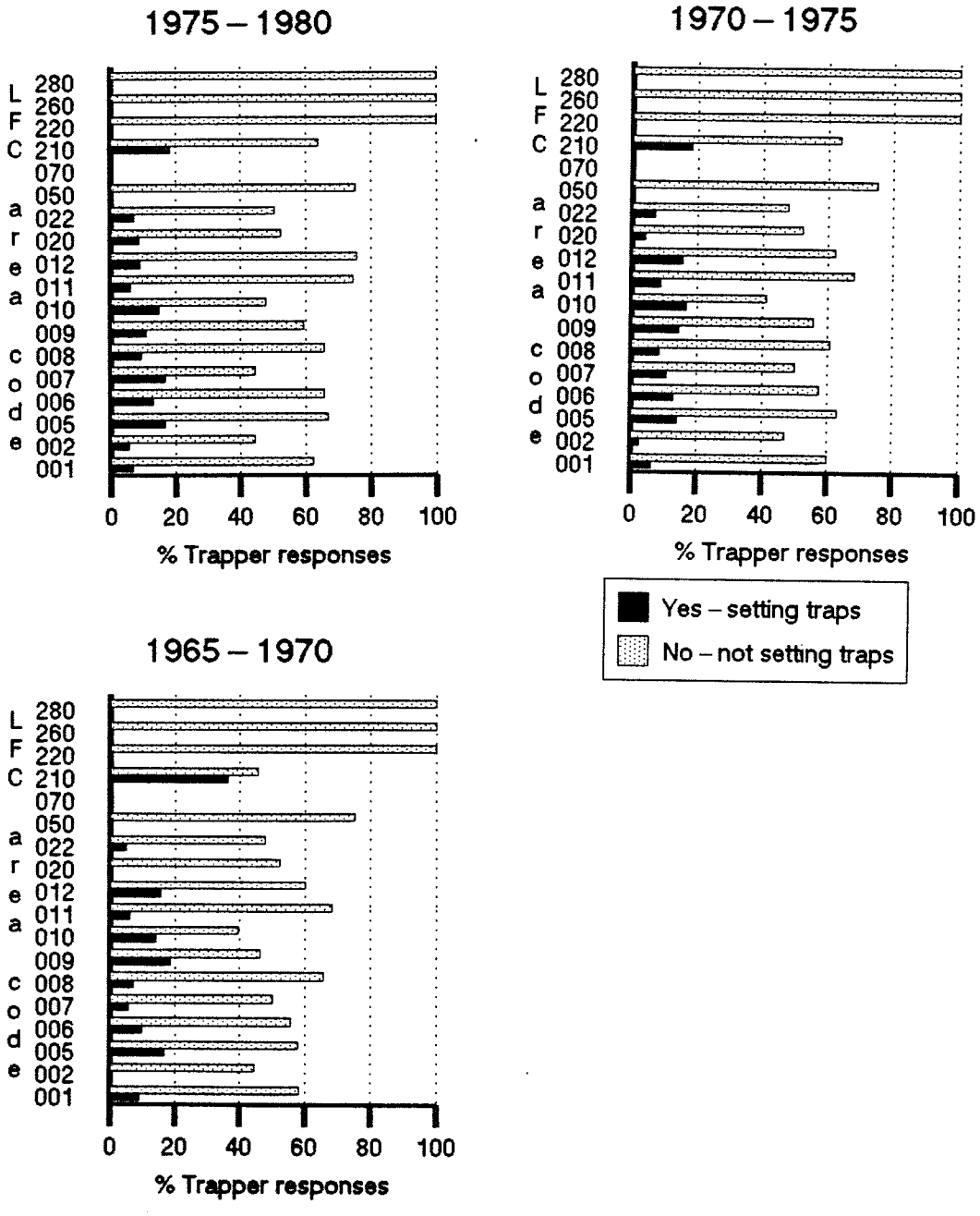


Figure 6.4 (continued)

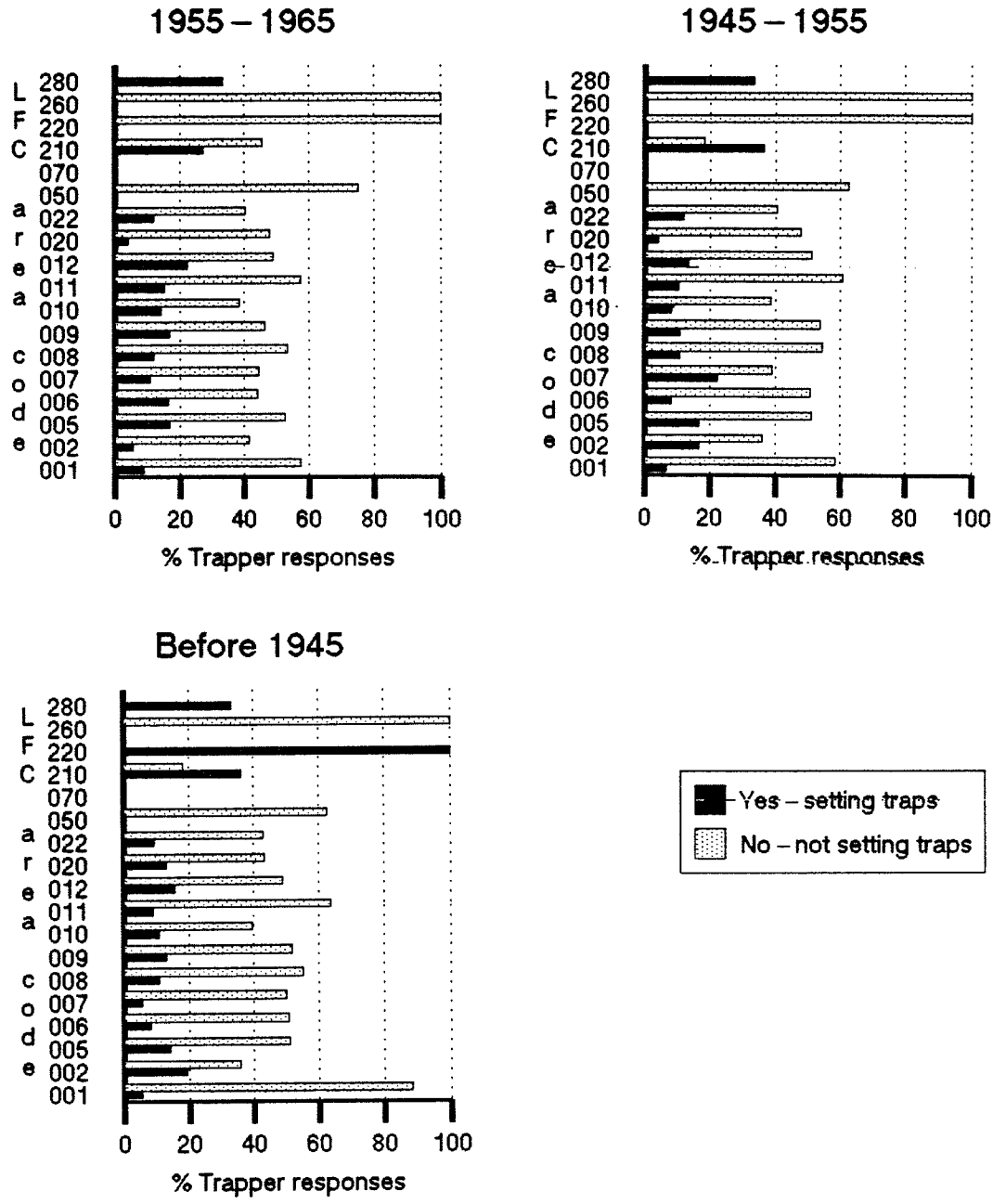


Figure 6.4 (continued)

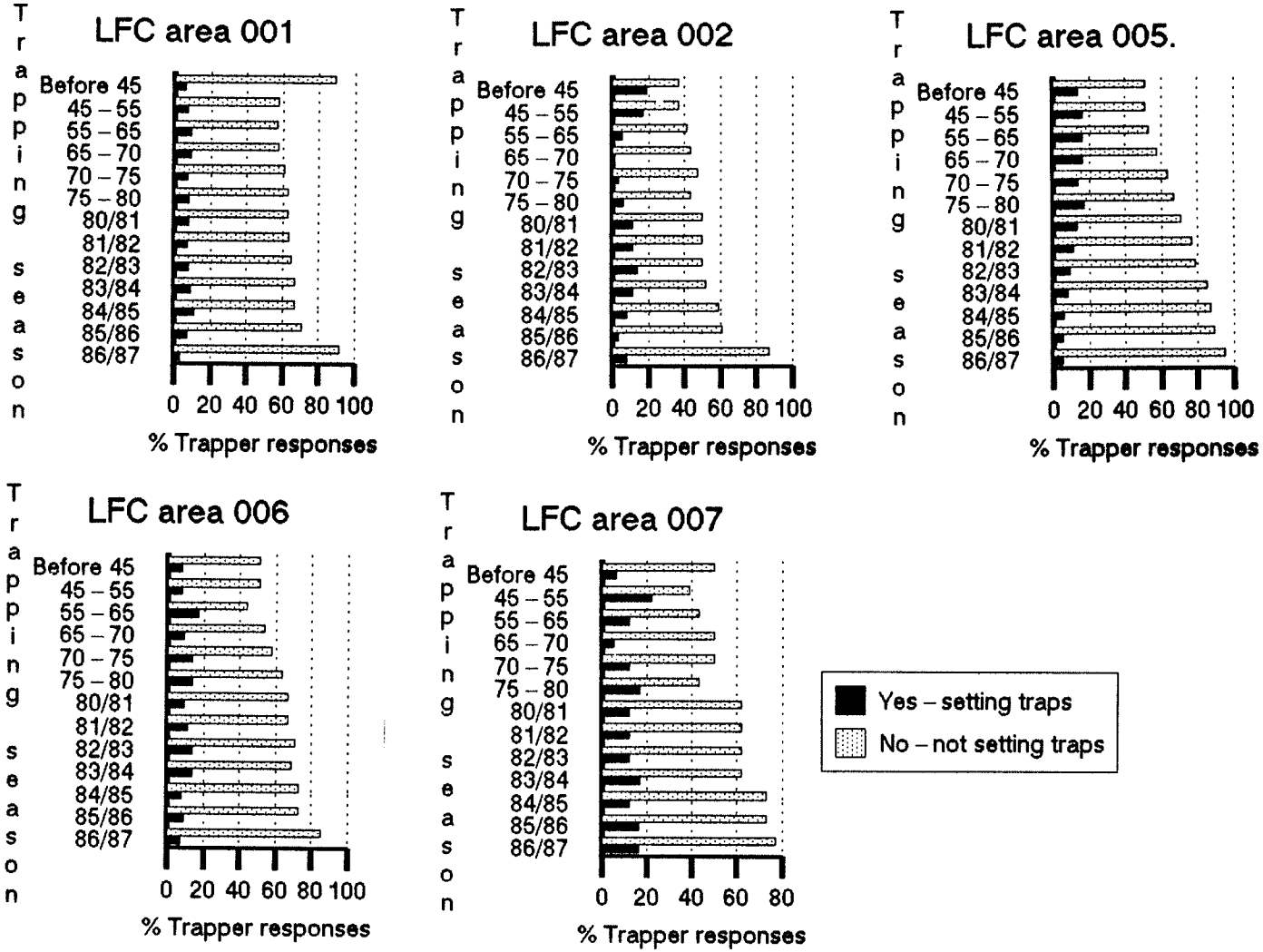


Figure 6.5 Comparison of number of trappers setting traps in each area over different time periods

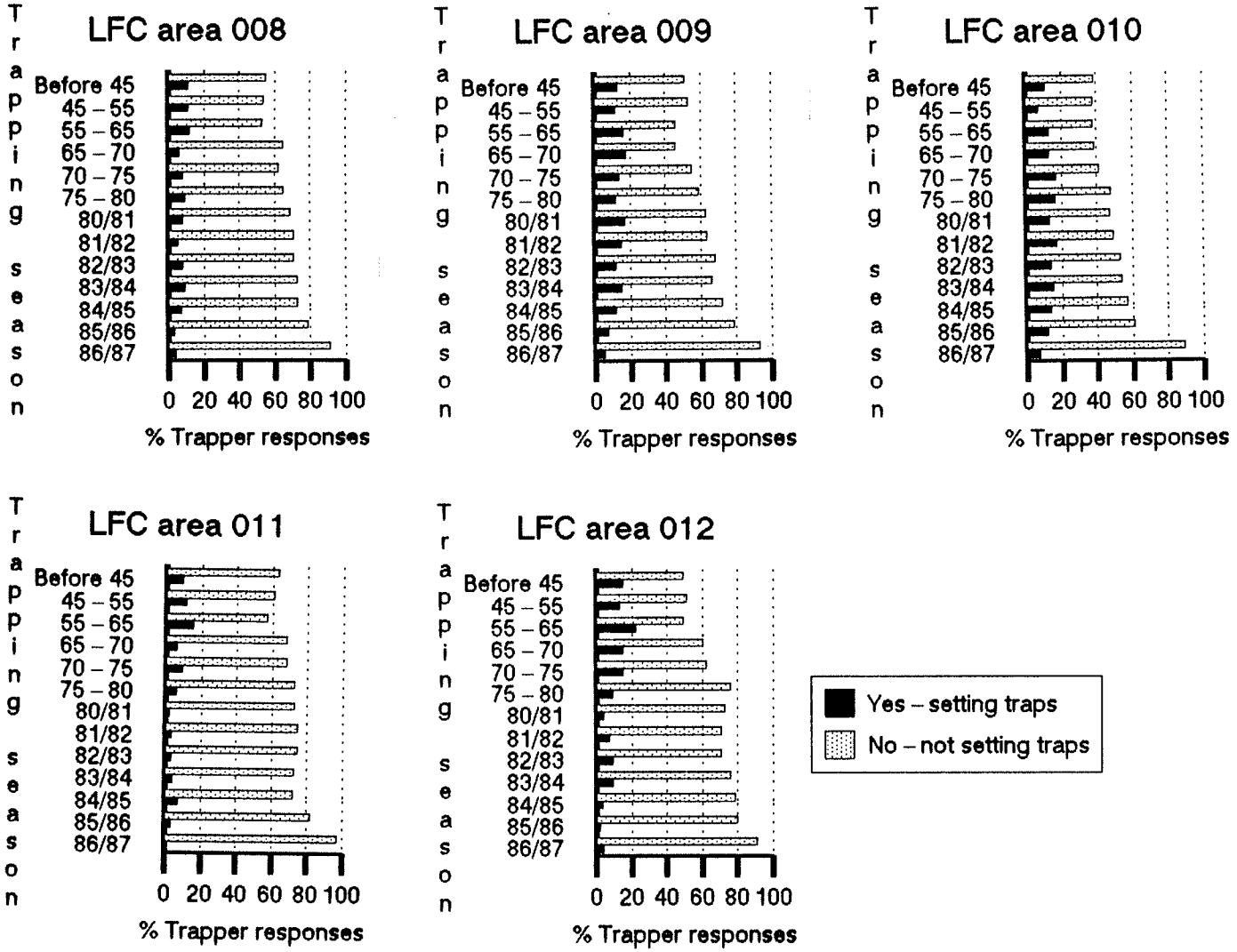


Figure 6.5 (continued)

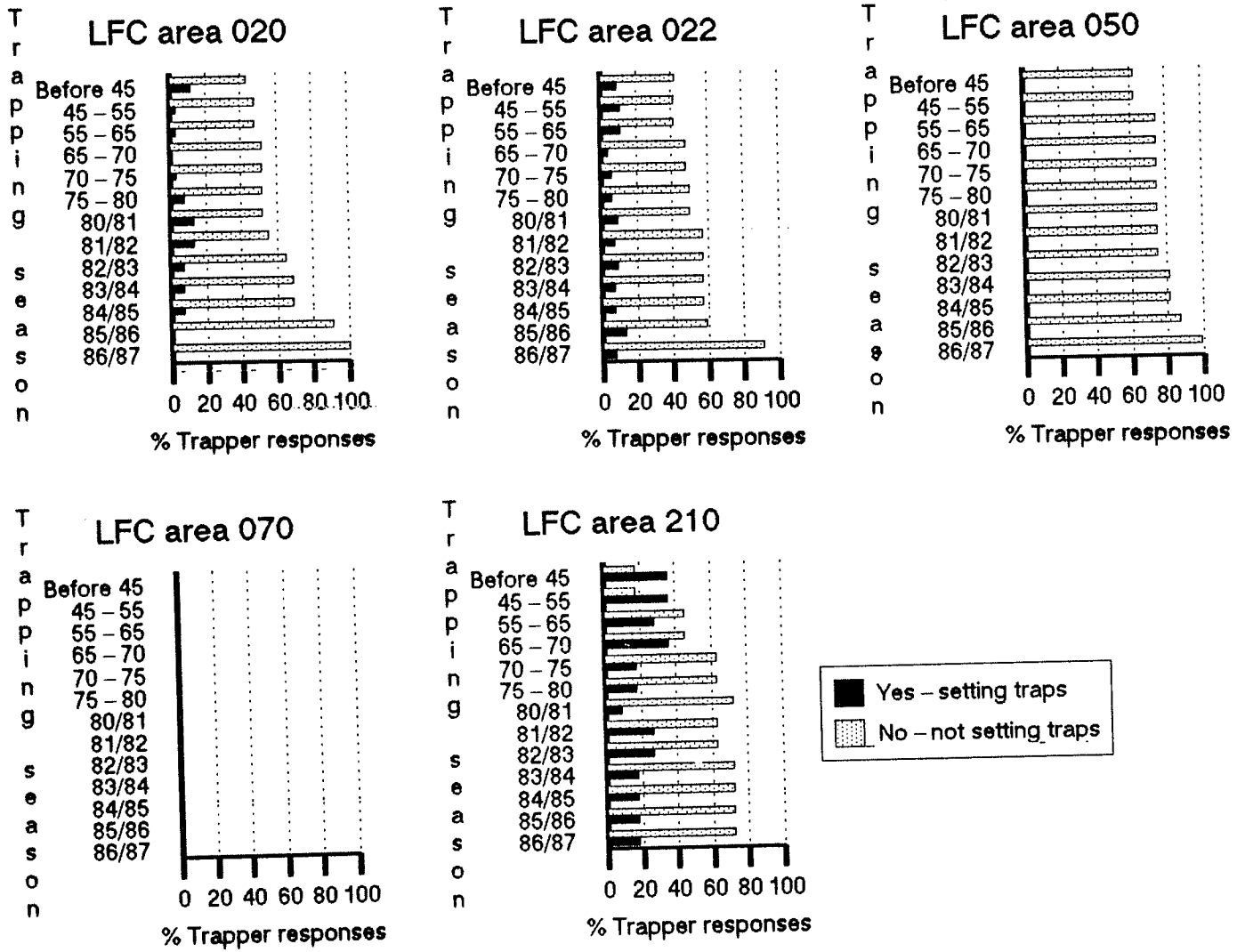


Figure 6.5 (continued)

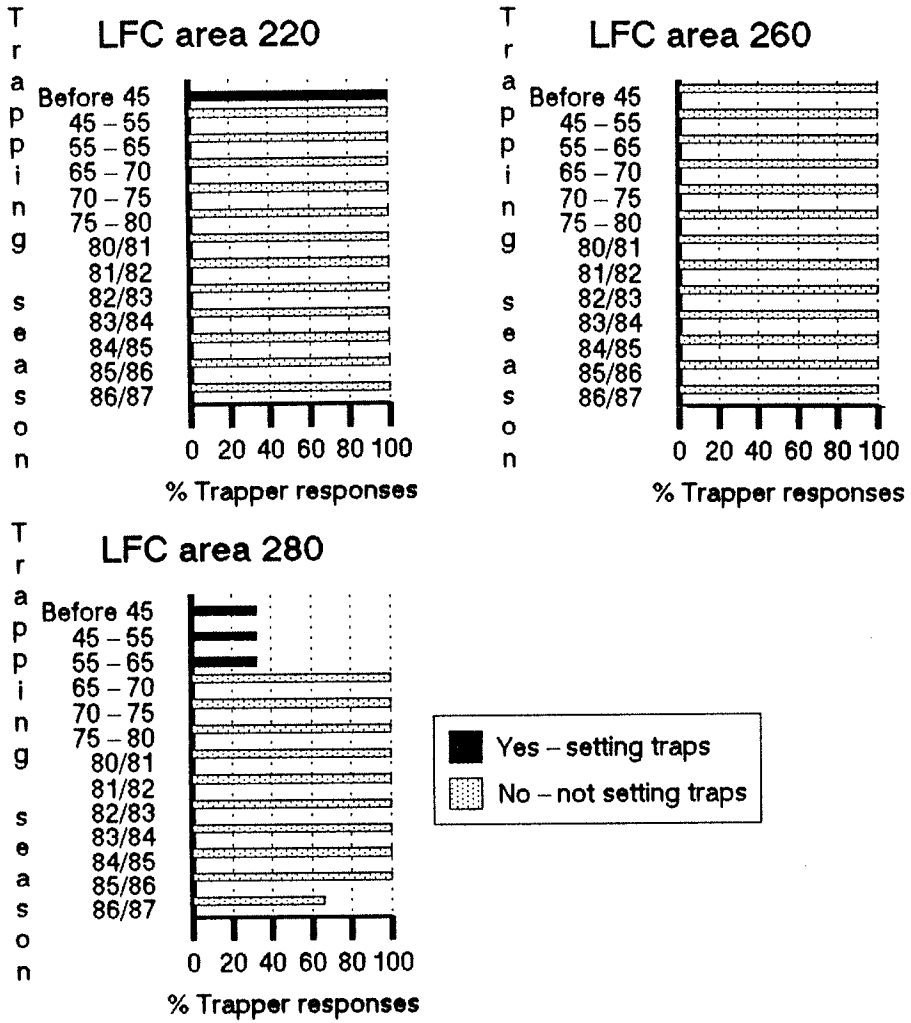


Figure 6.5 (continued)

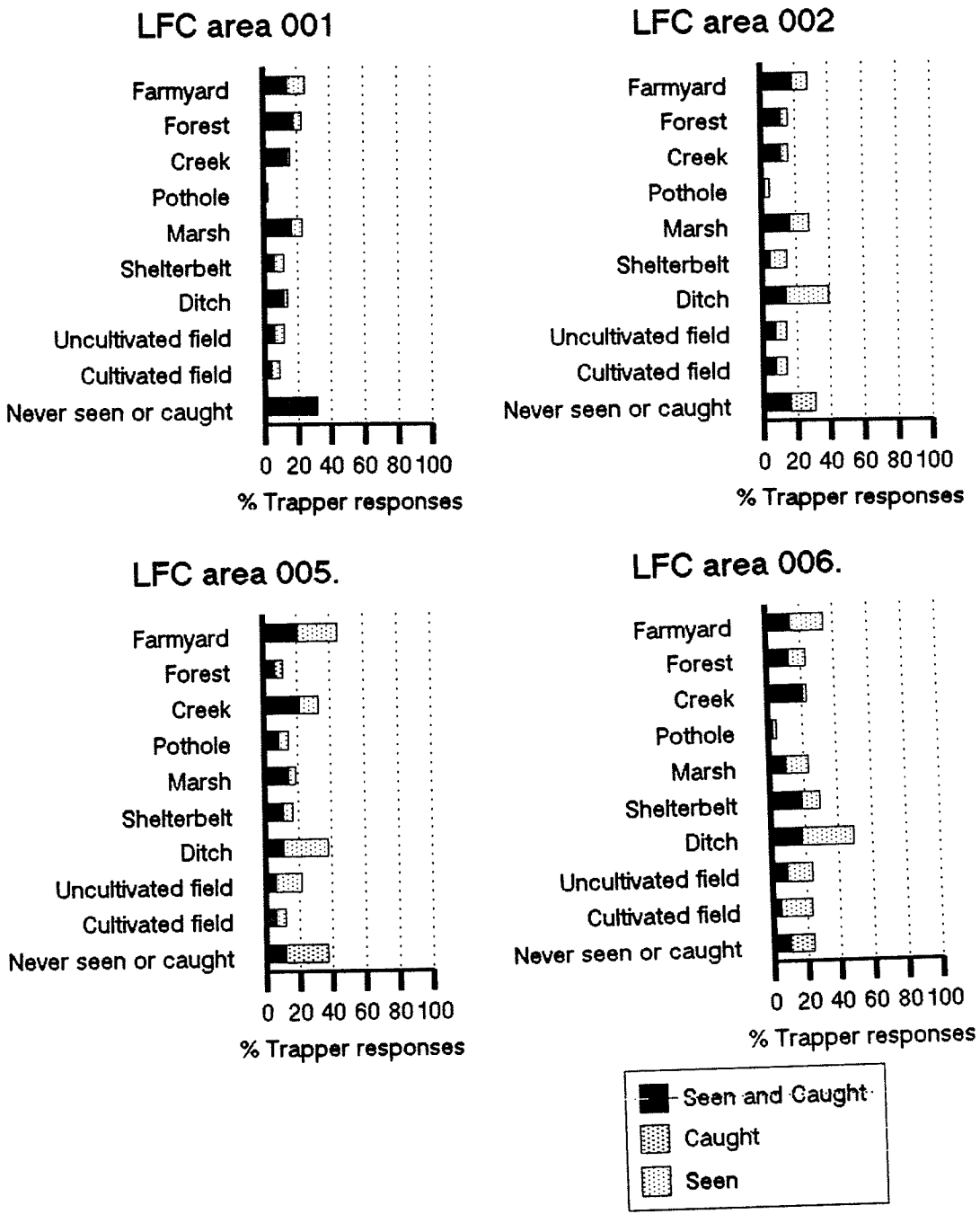


Figure 6.6 Habitat types where long-tailed weasels were usually seen or caught by trappers

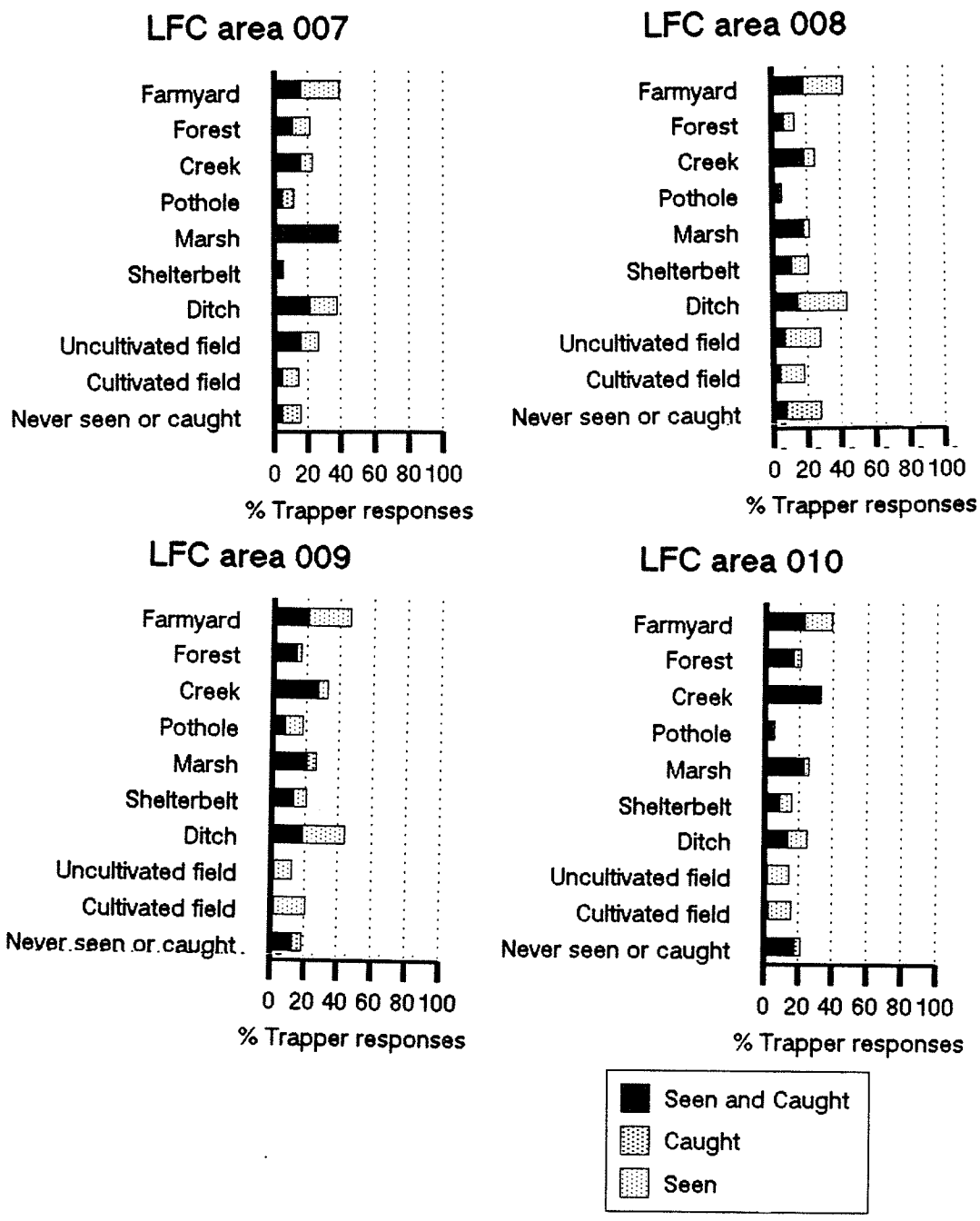


Figure 6.6 (continued)

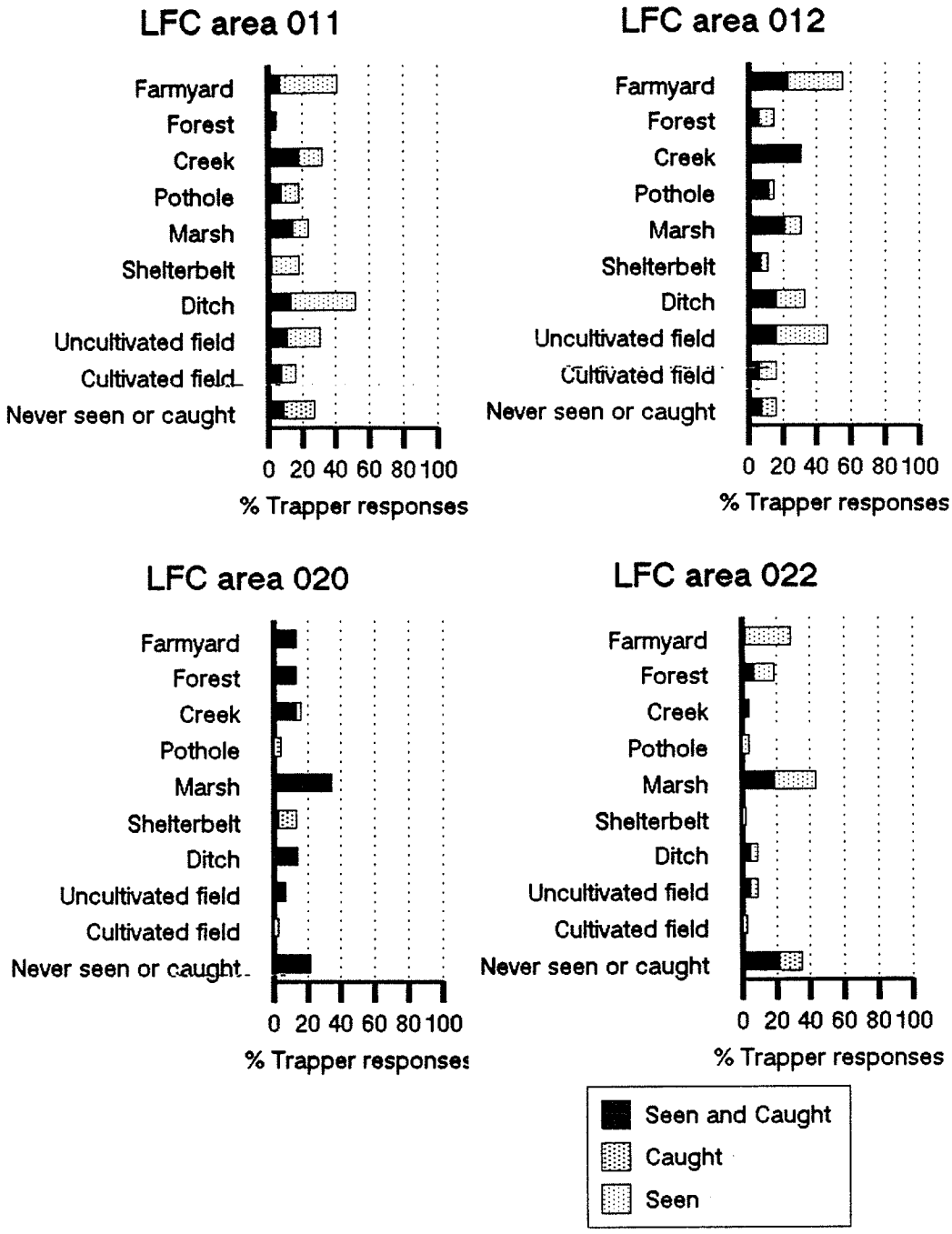


Figure 6.6 (continued)

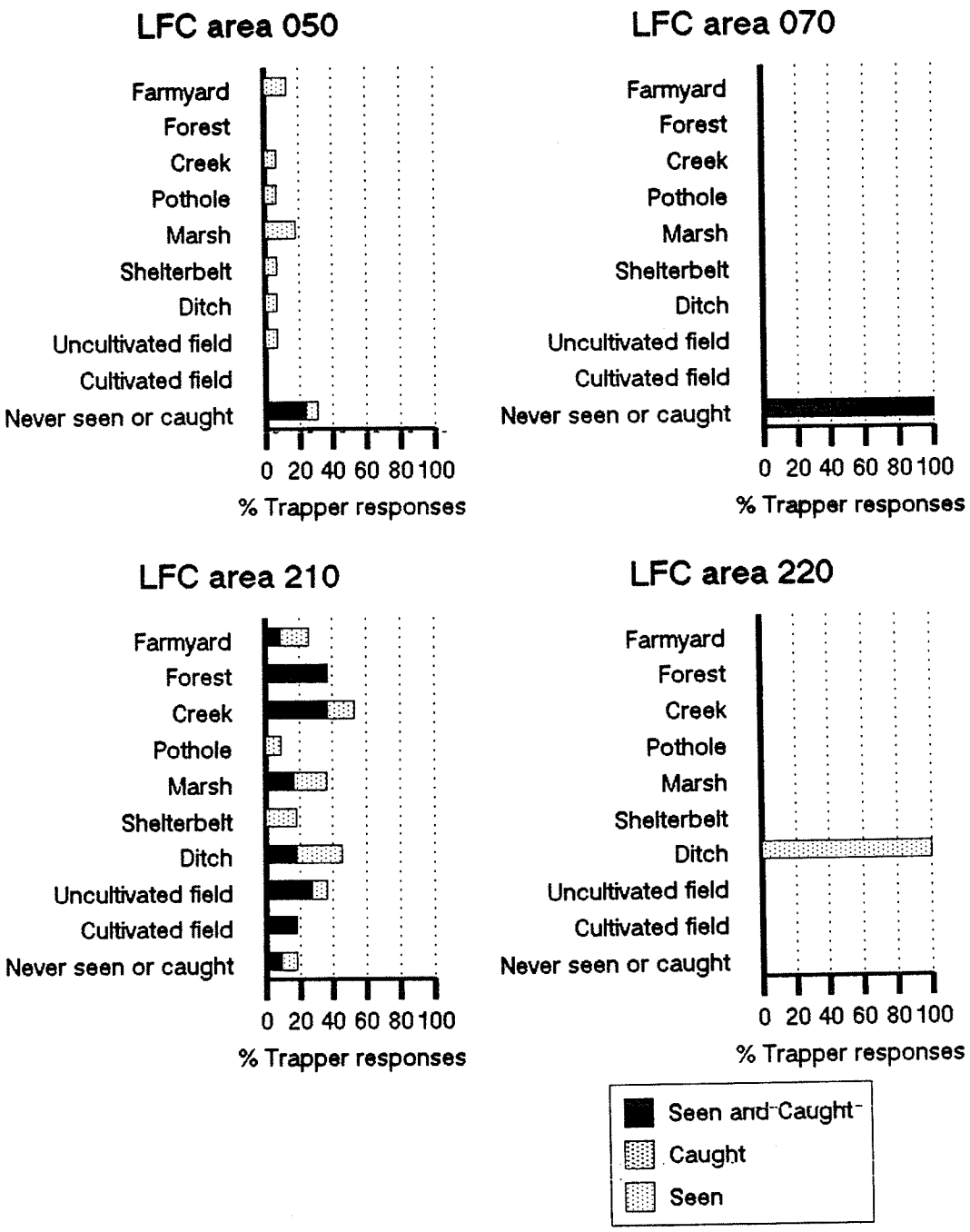


Figure 6.6 (continued)

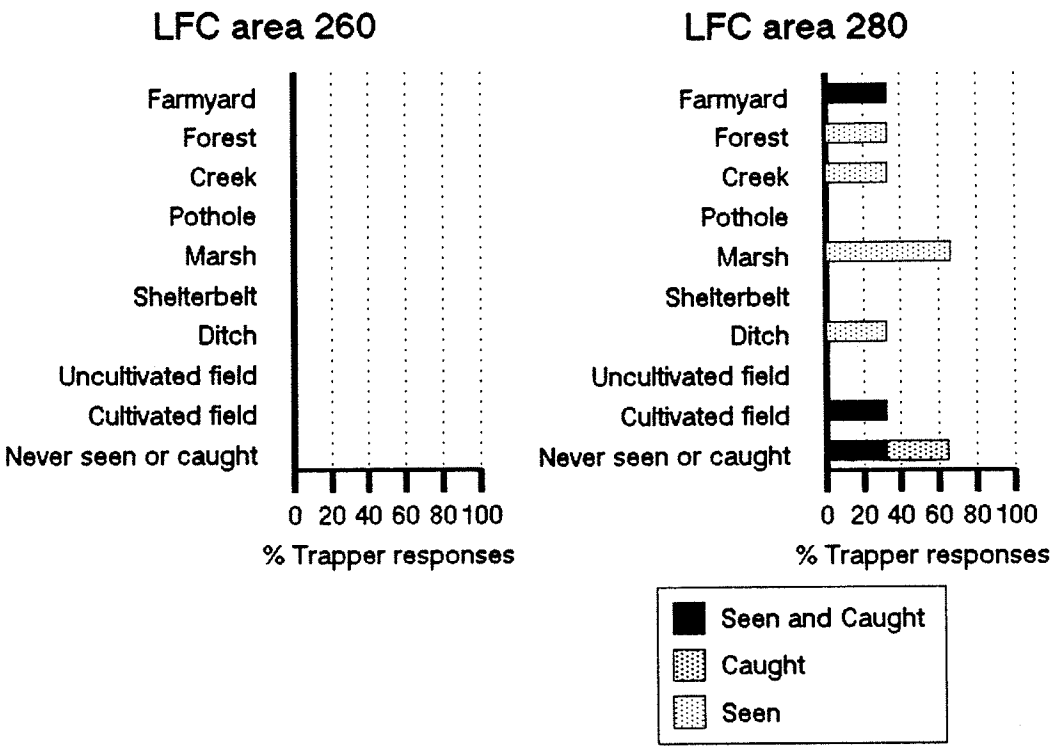


Figure 6.6 (continued)

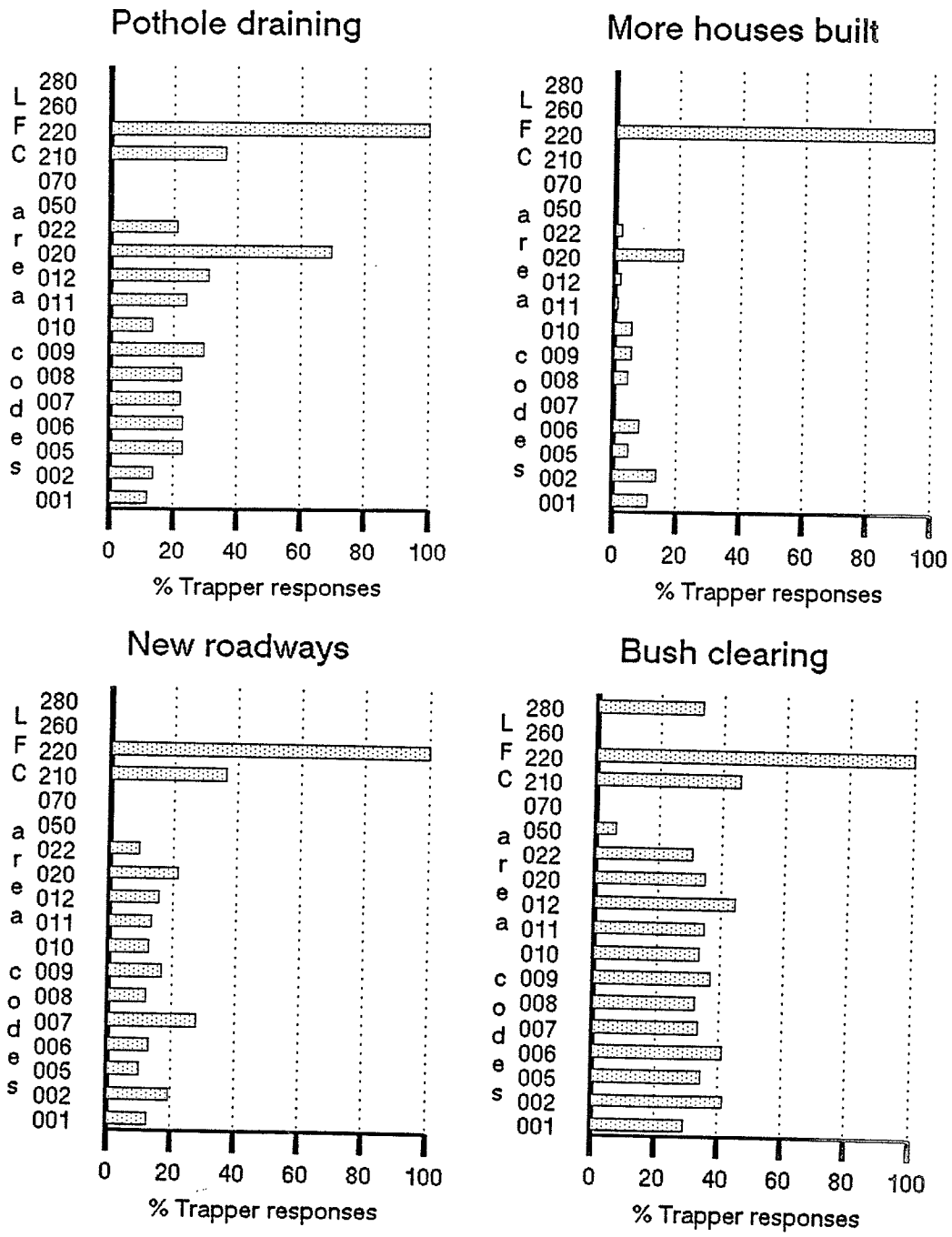


Figure 6.7 Comparison between LFC areas of habitat changes noticed by trappers

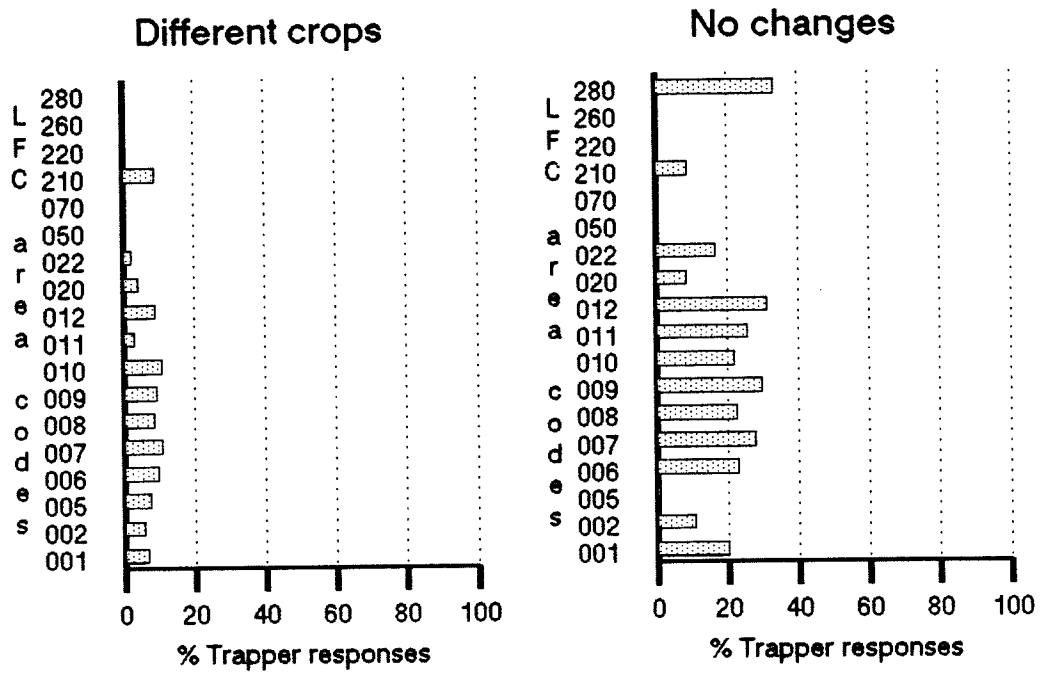


Figure 6.7 (continued)

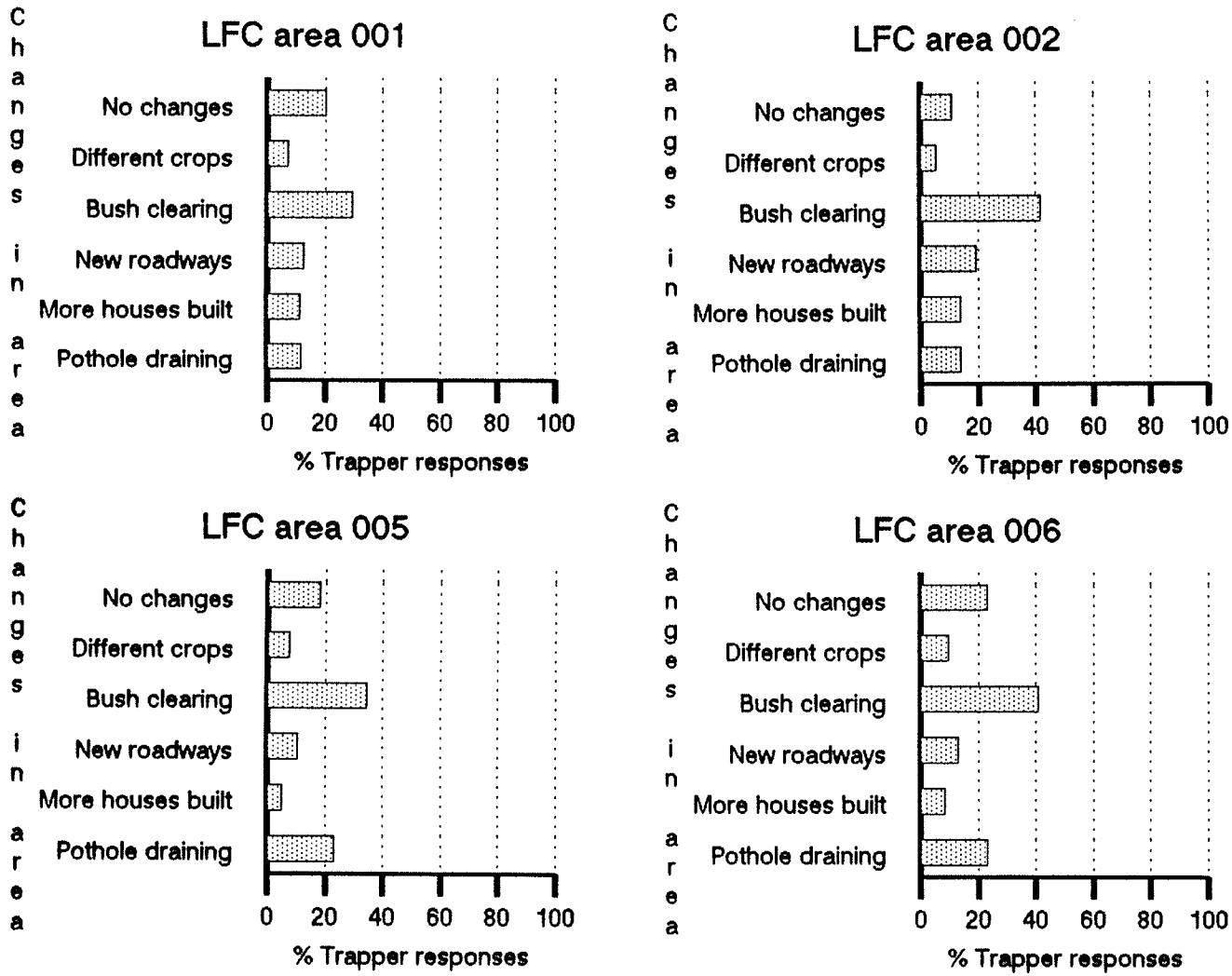


Figure 6.8 Habitat changes noticed by trappers in areas where they trap

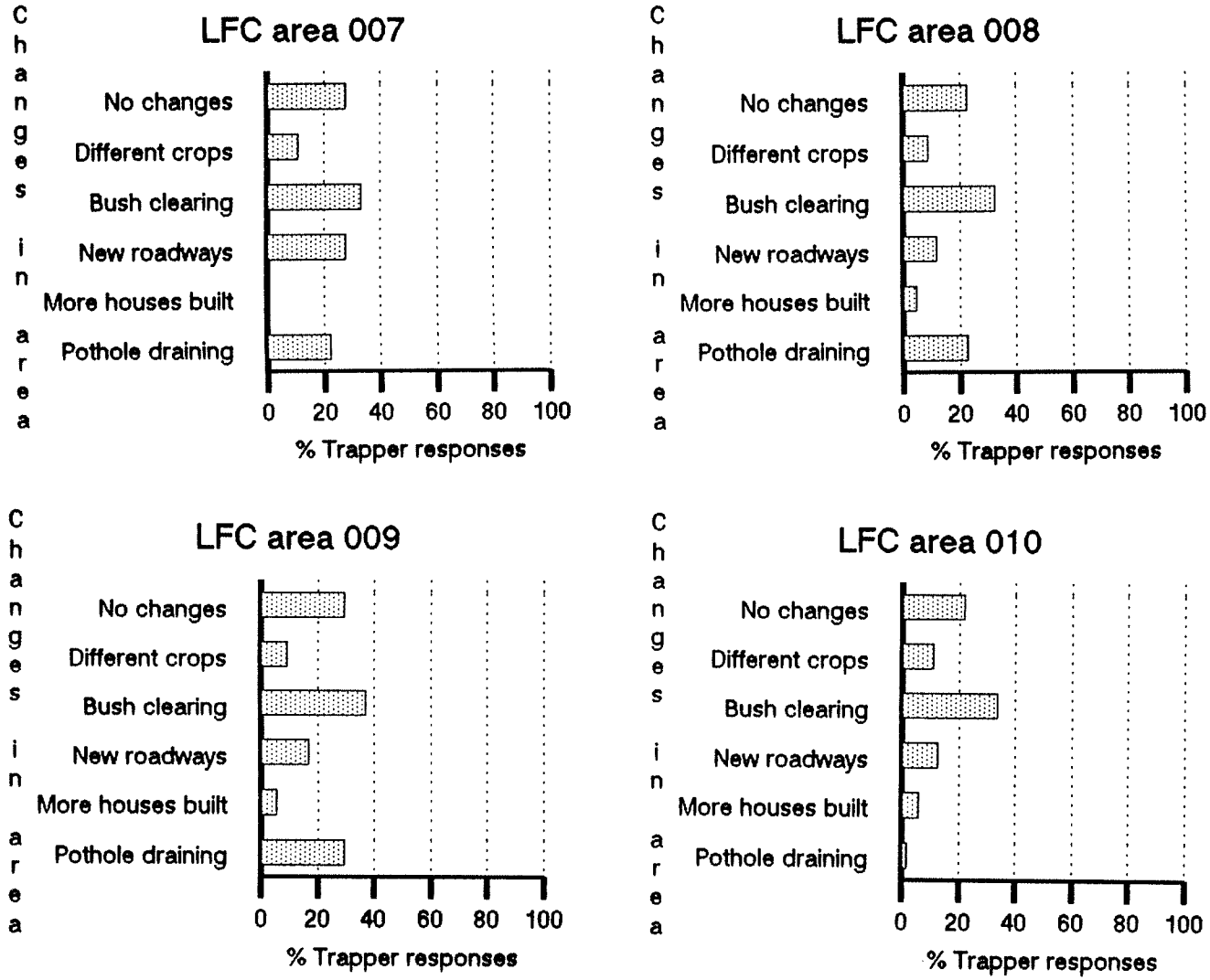


Figure 6.8 (continued)

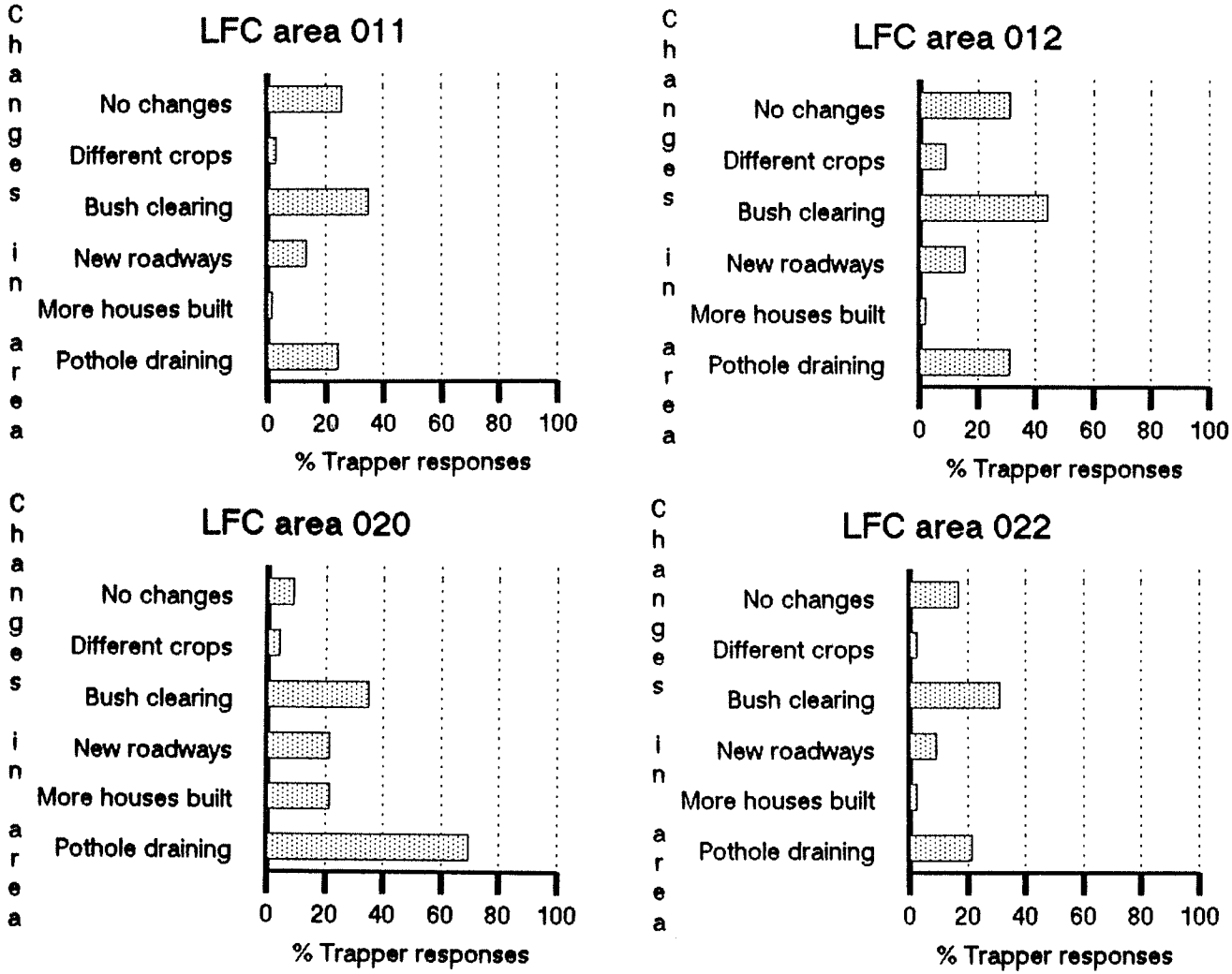


Figure 6.8 (continued)

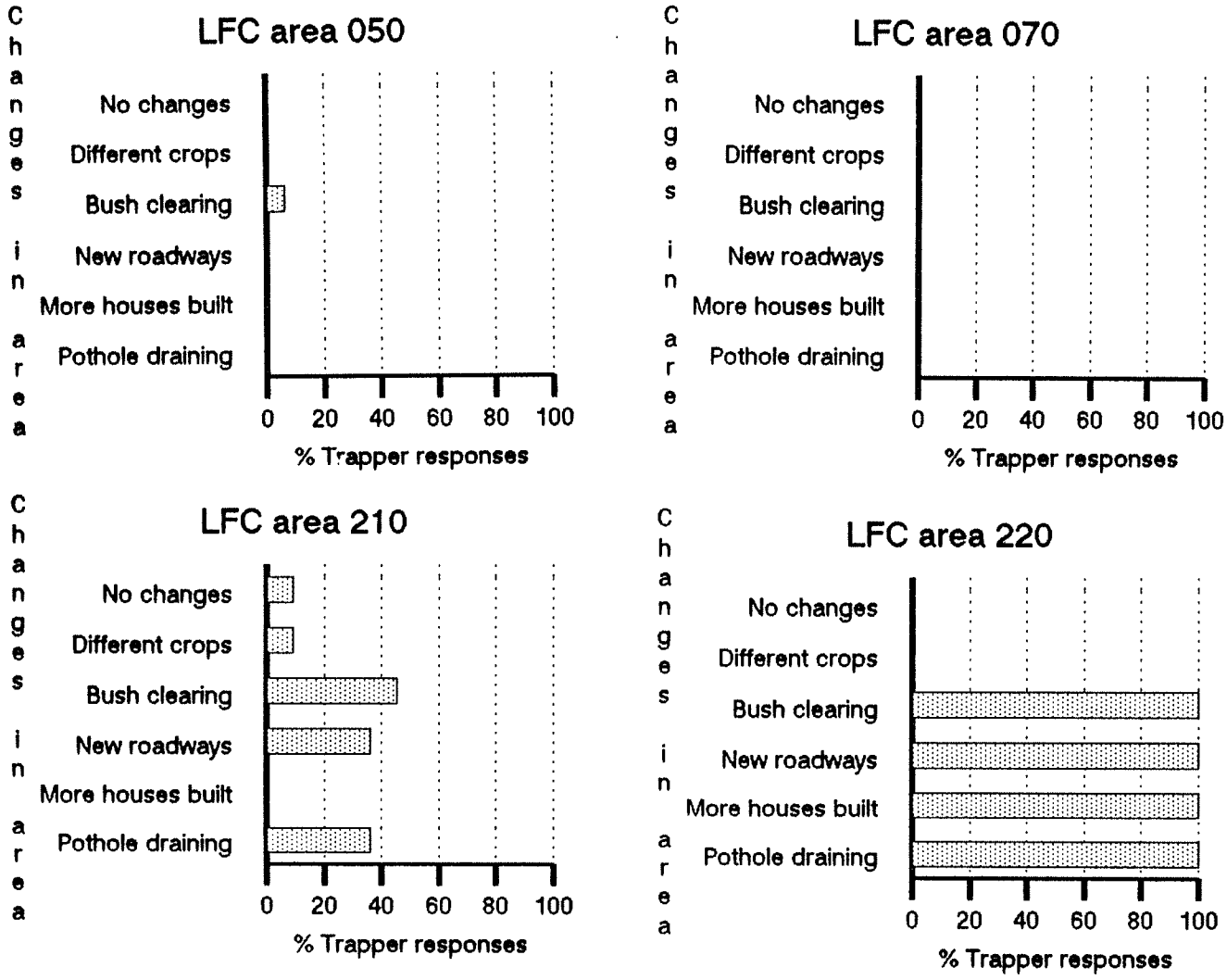


Figure 6.8 (continued)

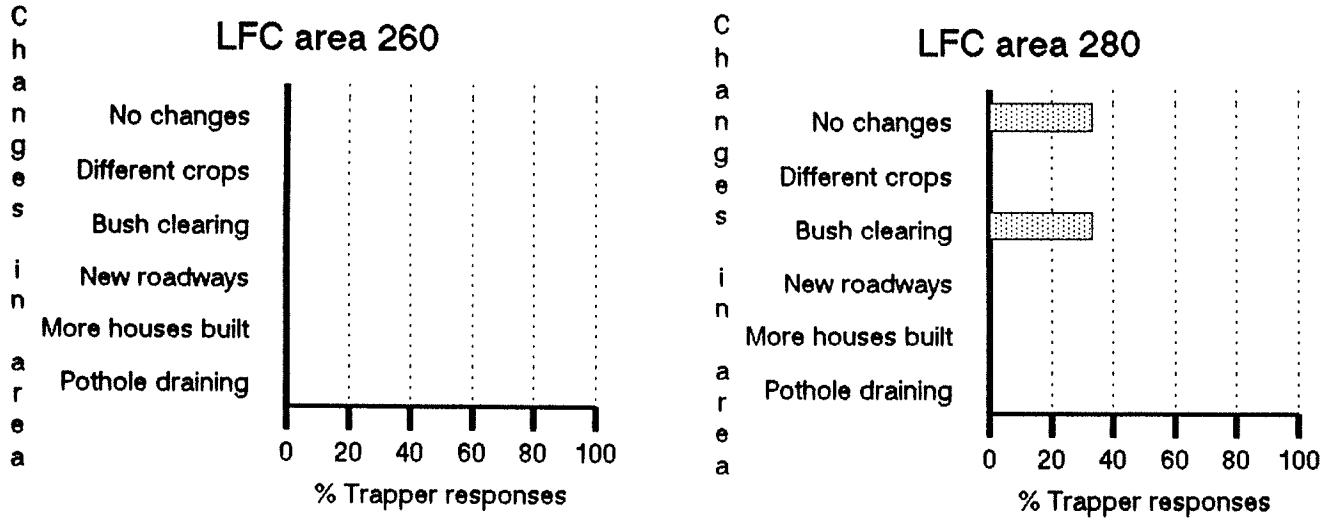


Figure 6.8 (continued)

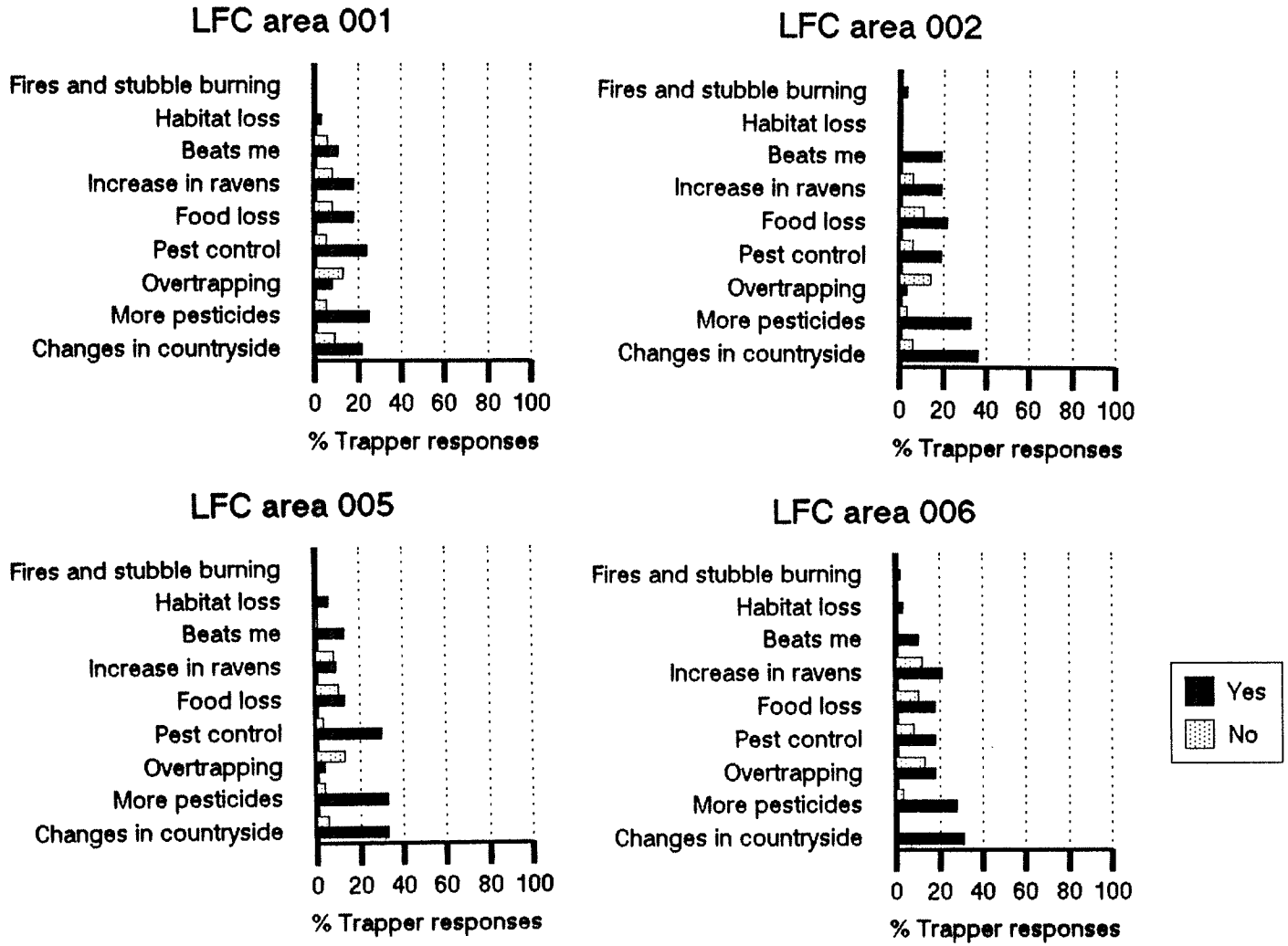


Figure 6.9 Trapper opinions as to possible causes for changes in long-tailed weasel numbers

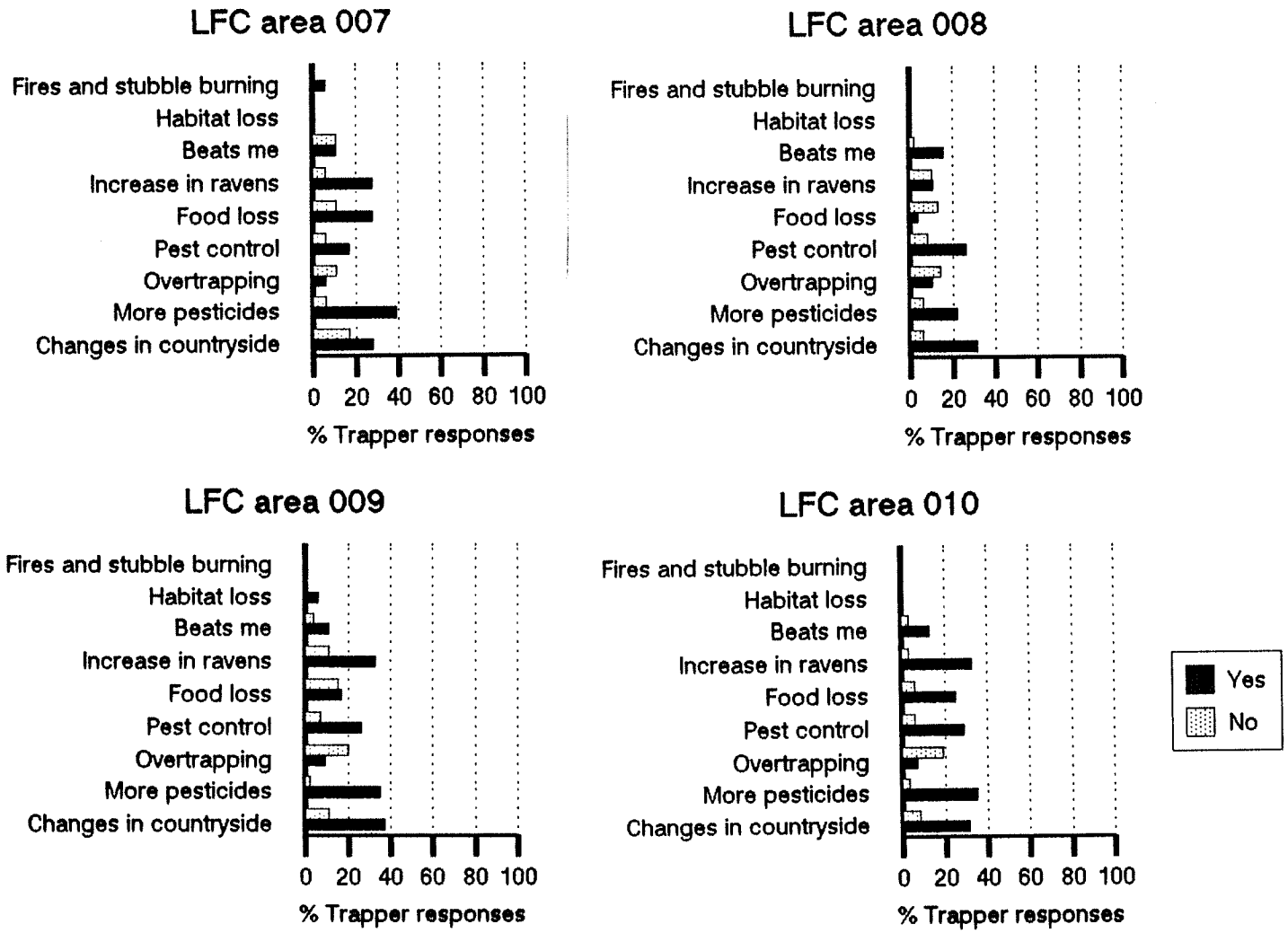


Figure 6.9 (continued)

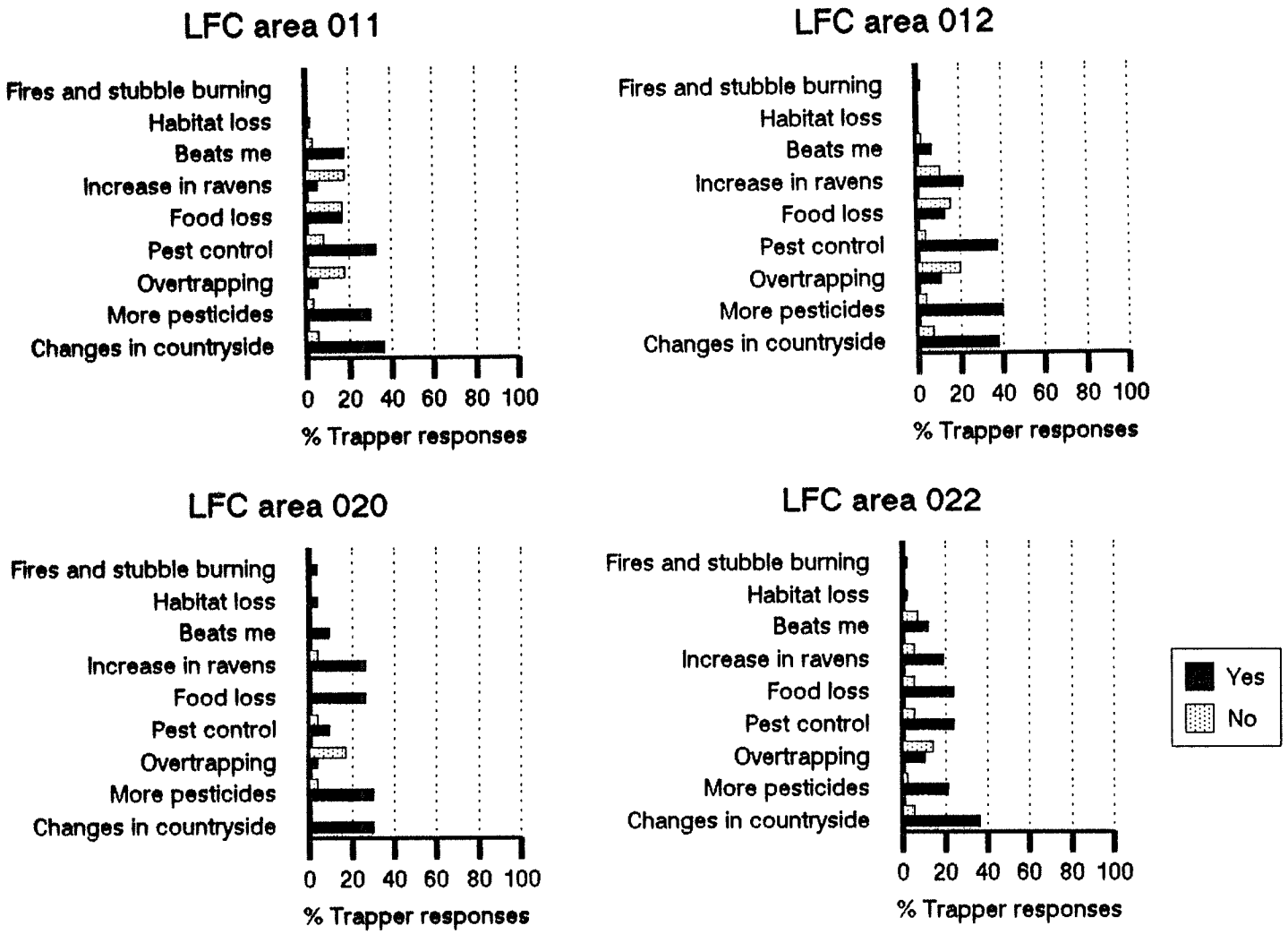


Figure 6.9 (continued)

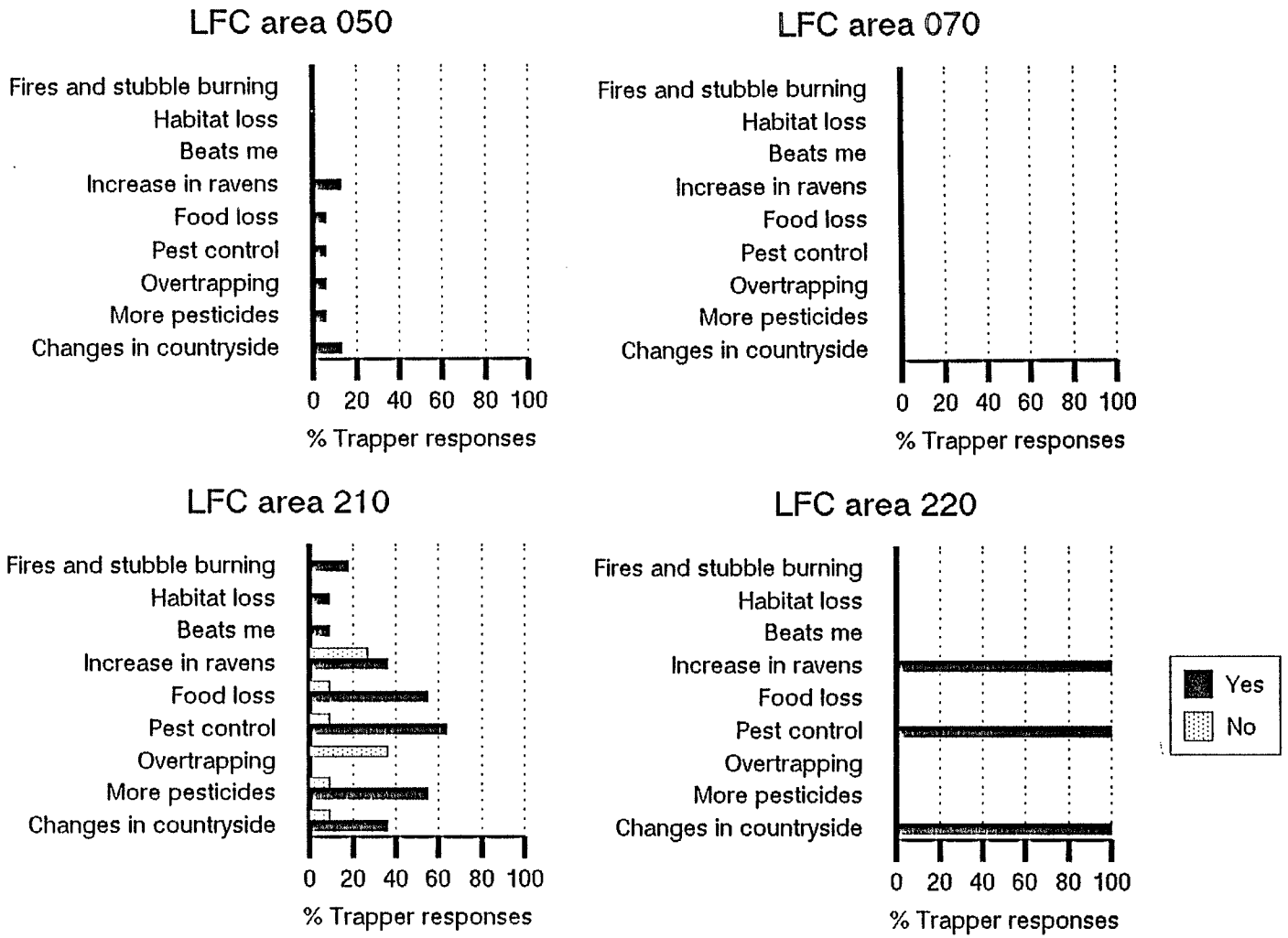


Figure 6.9 (continued)

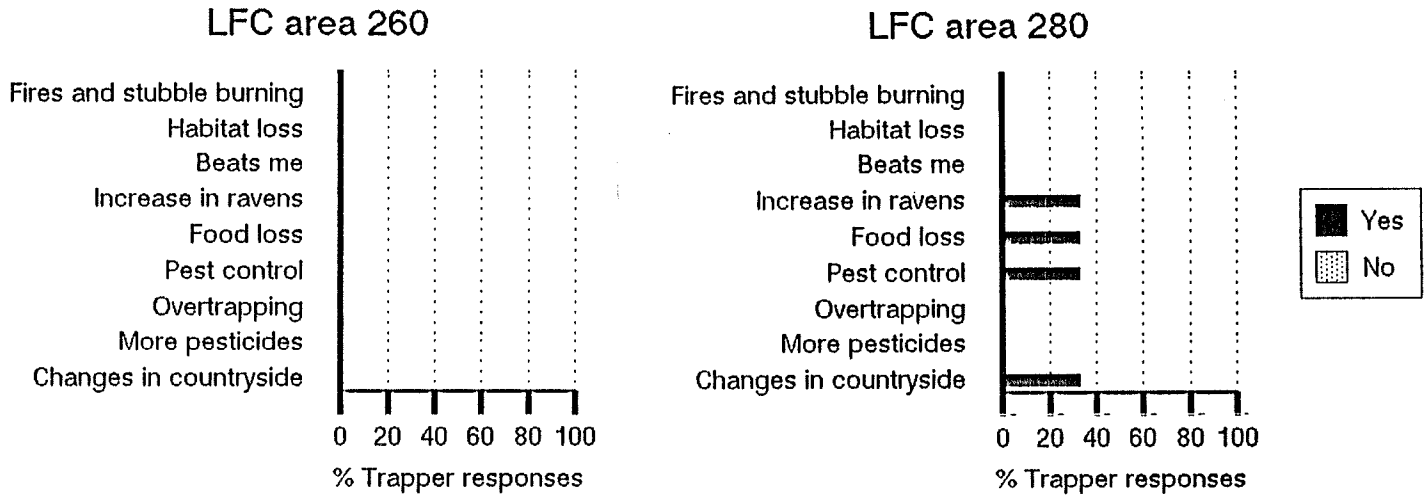


Figure 6.9 (continued)

APPENDIX 7

ADDITIONAL INFORMATION ON BADGERS

CONTENTS

APPENDIX 7

ADDITIONAL INFORMATION ON BADGERS

Opinions on the badger populations were fairly evenly split, with a small spread between the number of trappers who consider they have increased, and those who say they have decreased. (Appendix 7, Table 7.1 and Fig. 7.1). In both cases the change was considered to have occurred mostly in the last five years (Appendix 7, Table 7.2).

Reasons cited for a decrease in numbers were:-

(i) Overtrapping when pelt prices were high;

(ii) Loss of food through pesticides and poisoning; and

(iii) Increase in land clearing, with subsequent loss of cover.

Reasons cited for an increase in numbers were:-

(1) Increase in gophers because fewer farmers are poisoning them; and

(ii) No trapping now that pelt prices have dropped.

One trapper commented that he had noticed that badgers often seemed to start coughing and wheezing, then numbers would drop for a few years and then slowly start building up again. It is possible that they may be susceptible to Tuberculosis, as is the case with European badgers. Table 7.3 shows the number of badger pelt takes, and pelt values, for the ten years from 1975 to 1985.

TABLE 7.1

OVERALL CHANGES IN BADGER POPULATIONS FROM PREVIOUS YEARS

LFC Area	More	Less	No change	Don't know	No badgers
001	13	22	04	37	11
002	22	19	03	33	17
005	31	28	09	15	03
006	25	25	20	16	08
007	22	28	11	28	06
008	33	19	06	26	24
009	30	24	06	33	02
010	20	27	07	22	14
011	29	33	06	24	02
012	40	29	07	13	02
020	17	22	-	30	09
022	21	26	10	24	14
050	-	-	-	28	06
070	-	-	-	-	-
210	09	46	-	09	27
220	100	-	-	-	-
260	-	-	100	-	-
280	-	-	-	-	100

TABLE 7.2

TRAPPER OPINIONS AS TO WHEN CHANGES IN BADGER NUMBERS TOOK PLACE

	LFC Code	001	002	005	006	007	008	009	010	011	012	020	022	050	070	210	220	260	280
5 yrs. ago	More	11	17	24	20	11	24	20	10	24	31	09	12	–	–	–	100	–	–
	Less	13	03	14	13	22	10	13	13	23	07	13	10	–	–	18	–	–	–
	No change	01	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	100	–
	Don't know	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	No badgers	–	–	–	–	–	01	–	–	–	–	–	–	–	–	–	–	–	100
5-10 yrs ago	More	01	08	04	02	06	08	09	08	08	07	–	05	–	–	09	–	–	–
	Less	06	03	10	10	06	07	11	11	08	18	–	12	–	–	09	–	–	–
	No change	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Don't know	–	–	–	–	–	–	–	01	–	–	–	–	–	–	–	–	–	–
	No badgers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
10-20 yrs ago	More	01	–	–	02	06	–	02	–	–	02	09	–	–	–	–	–	–	–
	Less	06	06	05	03	06	03	02	02	02	04	–	05	–	–	18	–	–	–
	No change	–	–	–	02	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Don't know	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	No badgers	–	–	–	02	–	–	02	–	–	–	–	–	–	–	–	–	–	–
20-30 yrs ago	More	01	–	–	–	–	–	–	–	–	–	04	02	–	–	–	–	–	–
	Less	01	03	–	02	–	–	–	–	03	02	–	–	–	–	–	–	–	–
	No change	–	–	–	–	–	–	–	–	02	–	–	–	–	–	–	–	–	–
	Don't know	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	No badgers	–	–	–	–	–	01	–	01	–	–	–	–	–	–	–	–	–	–
Before 30 yrs ago	More	–	–	–	–	–	–	–	01	–	–	04	02	–	–	–	–	–	–
	Less	–	03	–	02	–	–	–	–	02	–	–	–	–	–	–	–	–	–
	No change	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Don't know	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	No badgers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 7.3

NUMBER OF BADGER PELTS TAKEN AND AVERAGE VALUES FROM 1975 TO 1985

Trapping Season	Pelts Taken	Average Value ($)
1974-75	608	18.03
1975-76	858	34.50
1976-77	1,463	48.62
1977-78	1,022	56.05
1978-79	1,405	65.00
1979-80	1,132	37.00
1980-81	462	50.00
1981-82	519	48.00
1982-83	458	34.00
1983-84	489	28.00
1984-85	499	25.00

Examination of the above table shows that pelt takes dropped considerably after a period of high avarage prices, suggesting that the trapper opinions of overtrapping when pelt price is high as a cause of low badger numbers may be justified.

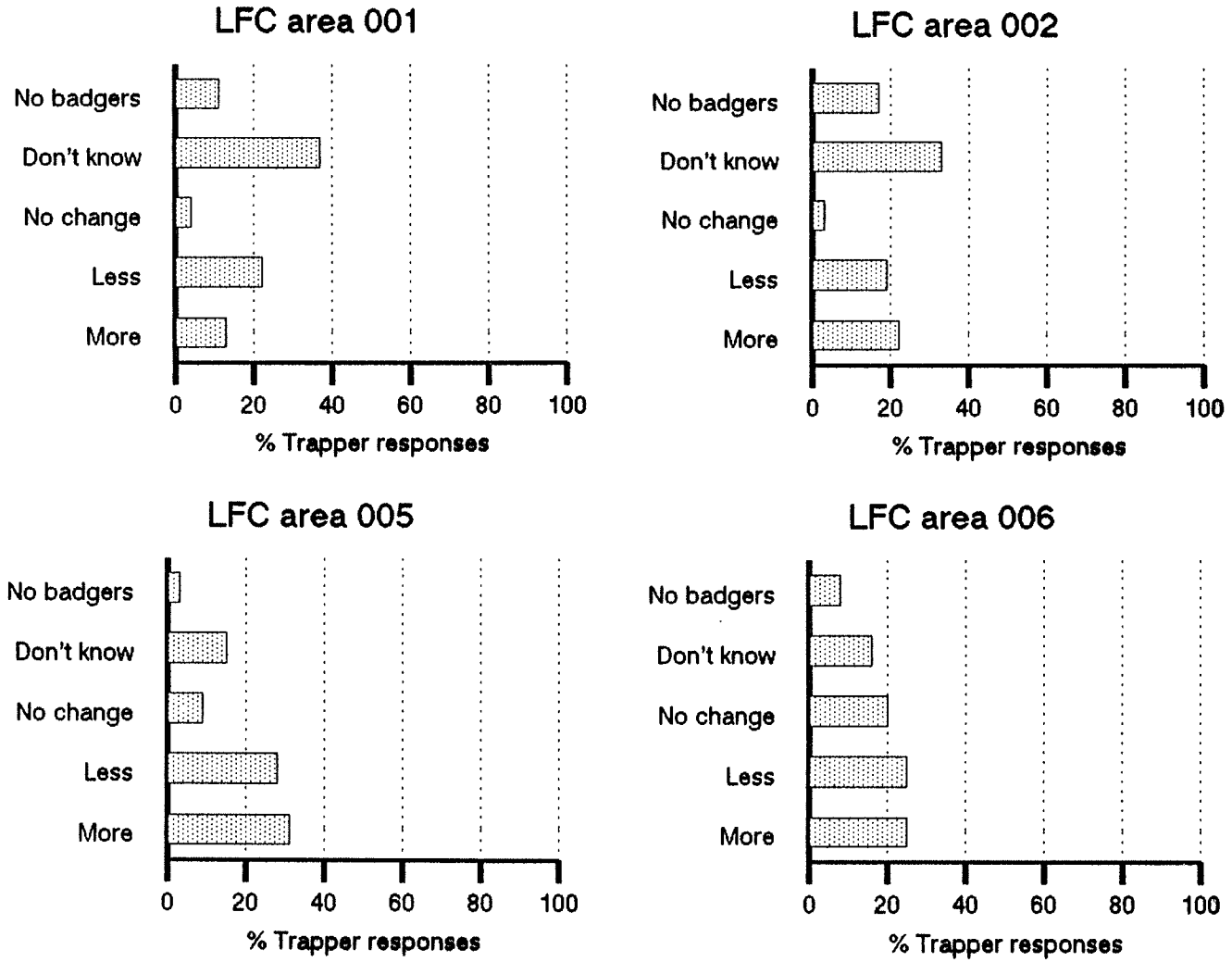


Figure 7.1 Trapper opinions of changes in badger populations from previous years

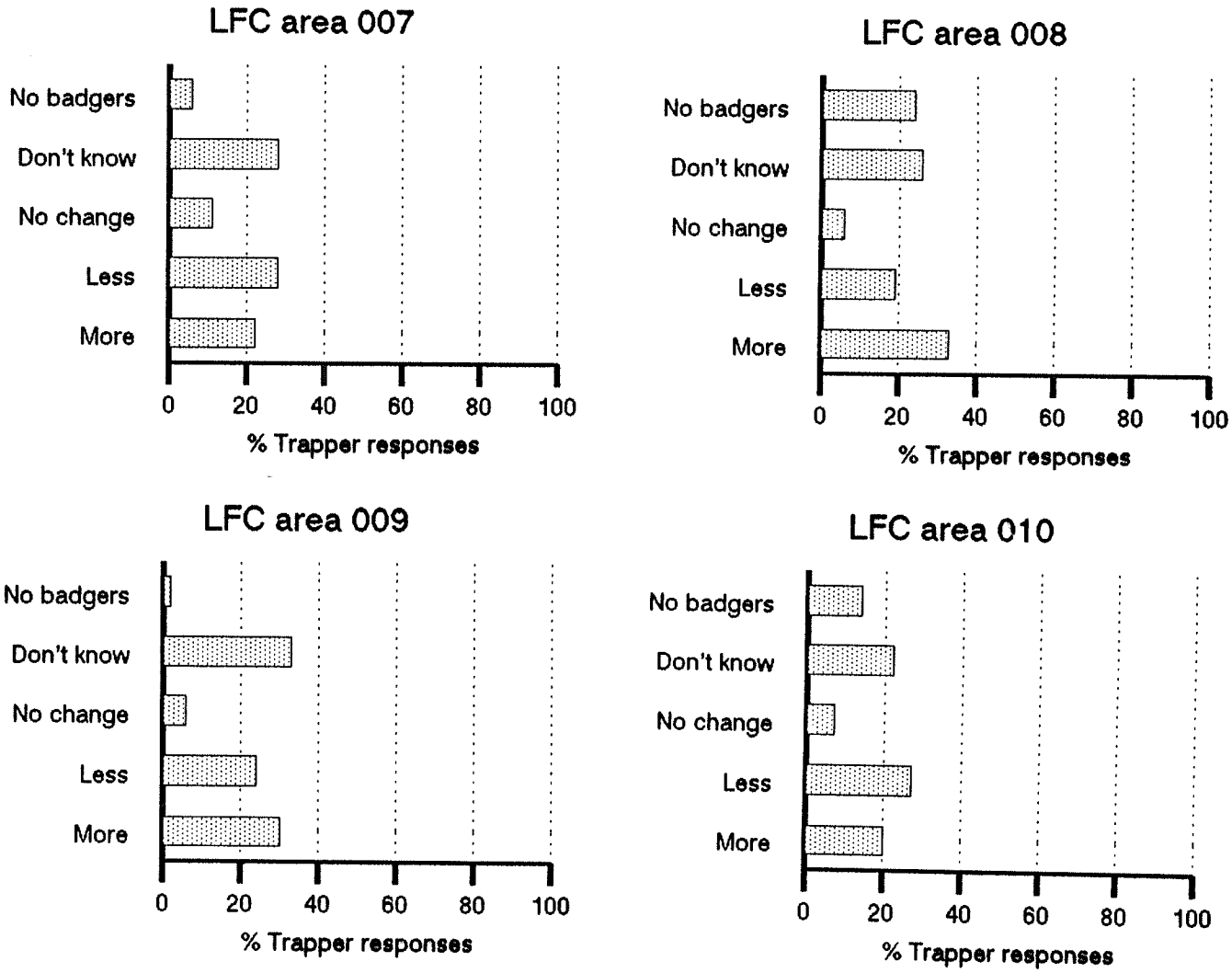


Figure 7.1 (continued)

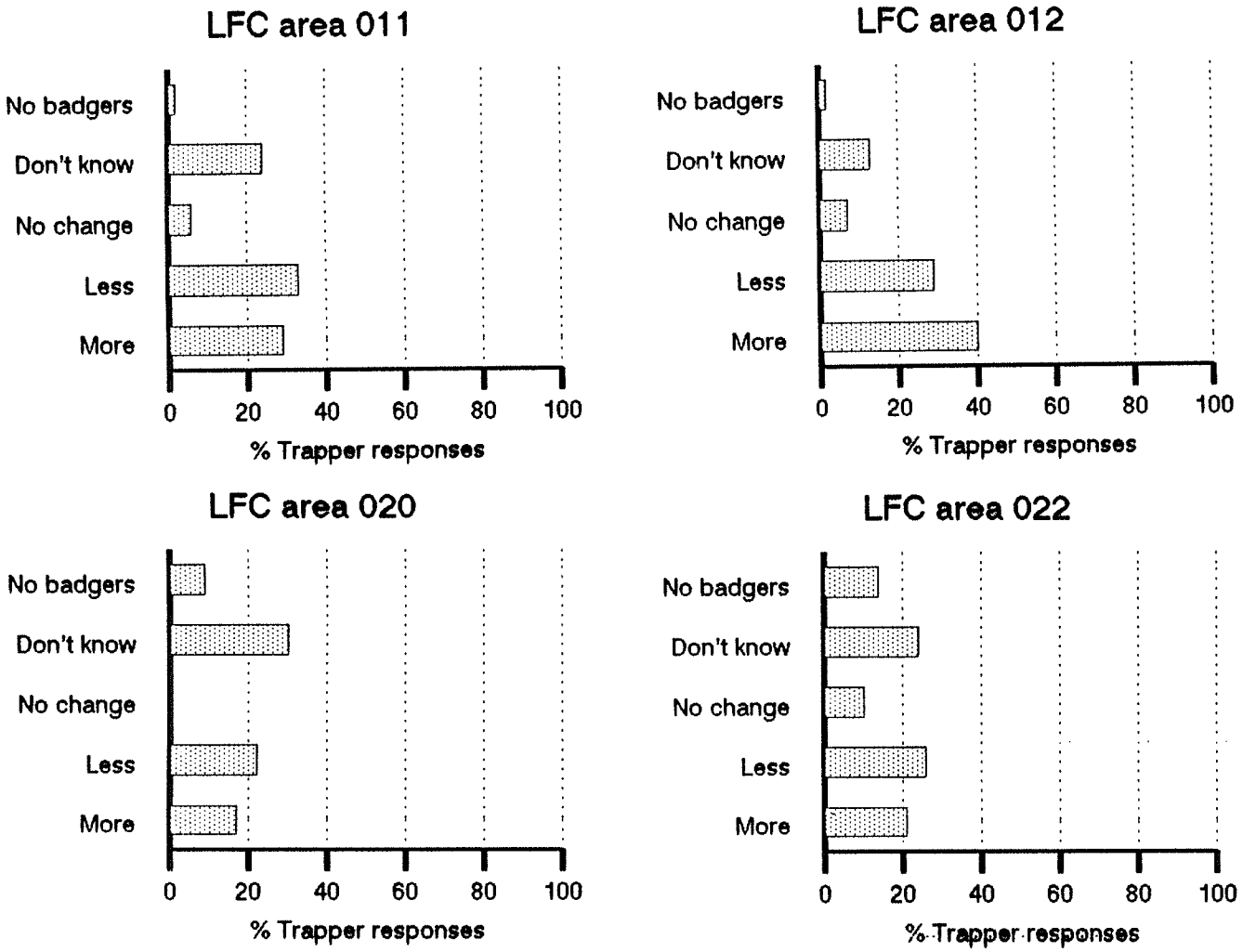


Figure 7.1 (continued)

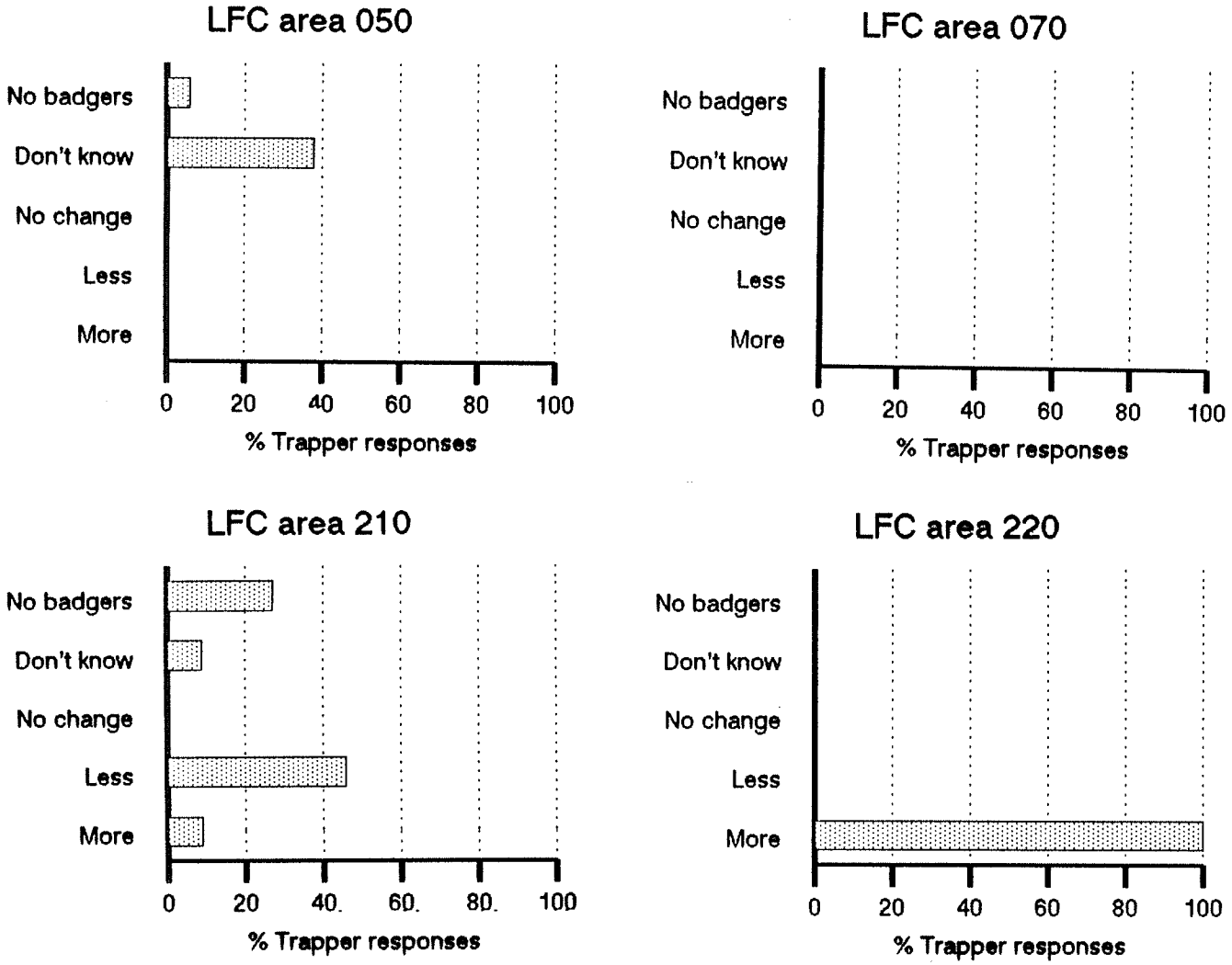


Figure 7.1 (continued)

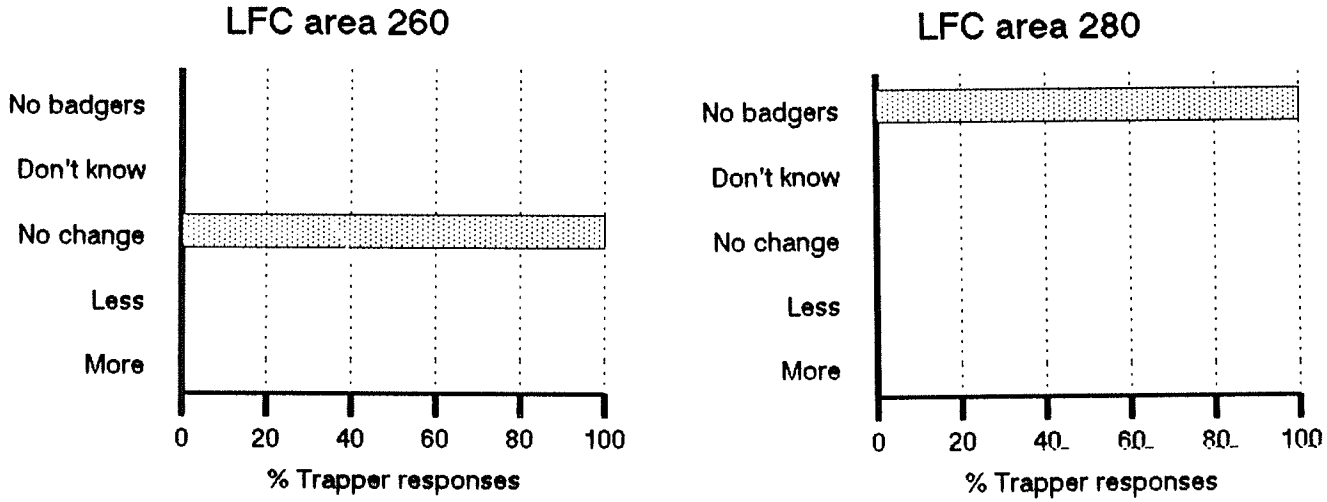


Figure 7.1 (continued)