

The status of pine martens *Martes martes* (L.) in Northern Ireland, 1850–2004

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Records of pine martens in Northern Ireland spanning 150 years were collated and 57 forests were surveyed for scats in 2004. Pine martens were historically more widely distributed than at present. Pine marten scats were found at 11 (19%) sites in Fermanagh, Tyrone, Antrim and Down. At a further 9 (15%) sites, morphologically similar fox and stoat scats were found, while the remaining 38 (66%) sites contained no scats attributed to martens. The forests of Fermanagh and Tyrone remain strongholds, but anecdotal evidence suggests the species is still present in other localities where scats were not found.

The pine marten *Martes martes* (L.) is a member of the family Mustelidae that, in Ireland, includes the native stoat *Mustela erminea* L., otter *Lutra lutra* (L.) and badger *Meles meles* (L.) and the feral American mink *Neovison vison* (Schreber) and ferret *Mustela putorius* L.. Cat-like in appearance, the pine marten is an omnivore that feeds on small mammals, birds, invertebrates, fruits and berries (Lockie 1960, Birks 2002). The species is commonly found within woodlands or forests across its range in the Palaeartic, but upland areas and rocky landscapes in Britain and Ireland are also inhabited (Webster 2001, Birks 2002).

Under Annex V of the EU Habitats Directive, the pine marten is classed as "a Species of Community Interest whose taking in the wild and exploitation may be subject to management issues". Consequently, the pine marten appears in Schedules 5, 6 and 7 of the Wildlife (Northern Ireland) Order 1985 in which the species is protected at all times, can not be taken or killed by certain methods and can not be sold dead or alive.

Prior to the 18th and 19th centuries the pine marten was believed to be ubiquitous in Great Britain (Langley and Yalden 1977). However, falling forest cover and increased persecution through the rise of game-keeping led to a dramatic reduction in the creature's range (Langley and Yalden 1977). As a consequence the species is now mostly confined to Scotland with relict populations persisting in parts of England and Wales (Strachan *et al.* 1996).

References to the distribution of pine marten in Ireland are vague but it is agreed that pine martens were more widespread than at present (Ni Lamhna 1979, Corbet and Harris 1991, Hayden and Harrington 2000). The only study to explore the species' distribution in southern Ireland was conducted in the early 1980s (O'Sullivan 1983). Although considered to be widespread in southern Ireland in the 1950s and 1960s, the animal was believed to be confined to the mid-western region of the country by the 1980s (O'Sullivan 1983) and declared the "the rarest of all Irish mammals" by Fairley (1975). The decline in the species here is also believed to have been caused by habitat loss and persecution by man (O'Sullivan 1983).

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The species' distribution in Northern Ireland was not fully investigated until the 1990s when questionnaires returned by Forest Service staff revealed its presence in Cos Fermanagh and Tyrone (Anon. 1993). Prior to the 20th century, further references are made to the species' existence throughout Northern Ireland. However, post-1900 records indicate the species to be restricted to Cos Fermanagh, Tyrone and Down (Fairley 2001). It is evident that in Northern Ireland little is known of the historical or contemporary distribution of pine martens.

In their review of the status of the pine marten in England and Wales, Messenger *et al.* (1997) suggested that single method approaches to surveys for species such as the pine marten were inappropriate. They cited the approach of Strachan *et al.* (1996) of collecting records coupled with scat surveys as the most efficient method for surveying this cryptic species. Therefore, this study followed a similar protocol as that used by these authors. As in the Strachan *et al.* (1996) survey, the aim of this aspect of the study was not to conduct a comprehensive distribution study of pine marten in Northern Ireland but to verify, or otherwise, historical records.

Methods

Historical records of pine marten sightings or activity were collected from a variety of published sources. Further records were sought from government agencies, non-governmental organizations, estate records, naturalists' records, museums and from appeals through the media. Records obtained from the 19th and early 20th centuries frequently referred to two species of marten in Ireland, *Martes sylvatica* (Nilsson) and *Mustela martes* L. These were recognized as the same species, *Martes martes*, for this study. Multiple records of the same captured or shot animal often appeared in several journals and often in different volumes. Therefore older records were cross checked to remove duplicates.

Following the protocol adopted by Strachan *et al.* (1996) and Velander (1983), records were divided into four categories (trapped or shot, sighting, scat and roadkill) and then placed into six time periods similar to those adopted by Strachan *et al.* (1996) for purposes of comparison (1850-1899, 1900-1929, 1930-1959, 1960-1982, 1983-1994, 1995-2004). The time of year of records was also noted.

Scat surveys have been utilized in Scotland, England, Wales and the Republic of Ireland to determine the contemporary distribution of the species (O'Sullivan 1983, Velander 1983, McDonald *et al.* 1994, Balharry *et al.* 1996, Strachan *et al.* 1996). We used a protocol adapted from otter surveys that has been used extensively by researchers conducting pine marten surveys (O'Sullivan 1983, Velander 1983, Balharry 1996, McDonald *et al.* 1994, Strachan *et al.* 1996). Forests with clusters of historic records or those near record aggregations were selected for surveys. Chosen sites contained tracks/roads that could be walked and surveyed for scats as these have been shown to be locations where pine martens mark territories (Lockie 1964, O'Sullivan 1983, Velander 1983, Balharry 1996, McDonald *et al.* 1994, Strachan *et al.* 1996). At each location transects of between 1 and 3km in length were walked. Suspected pine marten scats were distinguished in the field from other carnivores using descriptions of scat morphology and scat location as reported elsewhere (Lockie 1960, O'Sullivan 1983, Velander 1983, Balharry 1996, Strachan *et al.* 1996).

Results

A total of 169 records of pine martens representing a 150 year period from 1850 to 2004 was obtained from published and unpublished sources (Table 1). The number of pine martens that were shot or trapped declined between 1960 and 1994. However, the average number of animals reported killed between 1995 and 2004 is on a par with records from the period 1850-1899 (Table 1). The number of sightings has increased steadily since the beginning of the 20th century as have the number of animals killed on roads (Table 1). Of the 169 records collected, 121 contained details on time of year the record was obtained (Table

Table 1. Type and number of pine marten *Martes martes* (L.) records in Northern Ireland, 1850–2004

Time Period	Scat		Sighting		Shot & Trapped		Roadkill		Total	
	No.	Ave./Yr	No.	Ave./Yr	No.	Ave./Yr	No.	Ave./Yr	No.	Ave./Yr
1850-1899	2	0.04	4	0.08	25	0.50	0	0	31	0.60
1900-1929	0	0	0	0	7	0.24	0	0	7	0.24
1930-1959	0	0	7	0.24	11	0.40	0	0	18	0.62
1960-1982	0	0	16	0.72	2	0.10	1	0.05	19	0.90
1983-1994	0	0	19	1.70	1	0.10	4	0.40	24	2.20
1995-2004	3	0.30	47	5.20	5	0.40	15	2	70	8
Total No.	5		93		51	28	20		169	

Table 2. The number of sites surveyed and at which pine marten scats were found in each county of Northern Ireland.

County	No. of sites visited	No. of sites at which pine marten scats were found	Percentage occurrence (%)
Antrim	13	1	7
Armagh	2	0	0
Down	14	1	7
Fermanagh	12	6	50
Londonderry	7	0	0
Tyrone	9	3	33

1). Sightings of pine martens occurred throughout the year but most observations occurred in late spring and early summer (Fig. 1).

A total of 57 sites was surveyed across Northern Ireland (Fig. 3) between 28 September and 18 November 2004. At 20 (35%) of these sites, 25 scats were found (Table 2). Twelve (48%) were attributed to pine marten, 12 (48%) to red fox *Vulpes vulpes* (L.) and 1 (2%) to stoat. The highest incidence of pine marten scats was in Fermanagh and Tyrone.

Discussion

Records collected during this study indicate that pine martens were more widely distributed in Northern Ireland during the 19th century than at present. A similar decline in carnivorous birds and mammals took place in Britain during the 19th century. This was subsequently attributed to the evolution of the sporting estate and the game-keeping profession during the 19th century and not a decline in forest cover (Langley and Yalden 1977). The majority of pine marten records from the 1800s originate from sporting estates in Northern Ireland. Records are of trapped, shot and snared pine martens and it is therefore not implausible to suggest that historically, game-keeping negatively impacted the pine marten population in Northern Ireland. Low numbers and a decline of the sporting estate may have resulted in the observed decline of pine marten records from the late 19th and early-20th centuries.

Comparing the locations of 19th century pine marten records to sites surveyed for scats in the 21st century it is also apparent that a contraction in range has taken place. Pine marten scats were found at 1 (5%) of 20 locations at which pine martens were recorded

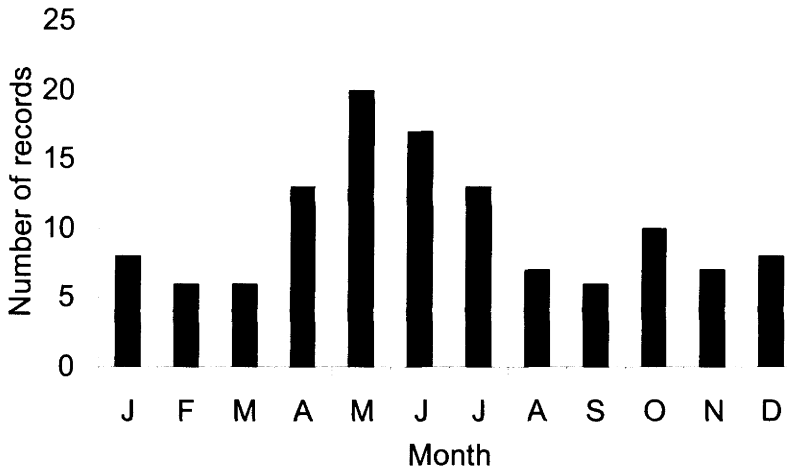


Figure 1. The occurrence of pine marten *Martes martes* (L.) records from Northern Ireland throughout the year (records from 1850-2004).

during the 19th century. Overall only 12 (21%) of the 57 sites surveyed contained scats that were morphologically similar to those of pine marten. However, studies in Poland have shown that the pine marten is less active during the winter and is active for shorter periods in comparison to the summer (Zalewski 2000). Therefore pine martens may mark their territories less during the winter if they are less active. This may have affected our success in finding scats during this autumn study.

Overall, records of pine martens are greater during the summer than the winter (Fig. 1). This may be explained by reduced periods of activity and nocturnal behaviour during the winter (Zielinski *et al.* 1983, Zalewski 2000). However, human activity could also explain why sightings are higher in the summer as people are more active during the summer.

Threats to the survival of the species within Northern Ireland have changed with time. In the 19th century the majority of recorded deaths were from trapping by gamekeepers but this has declined during the 20th century. In Northern Ireland one of the greatest threats to the species currently appears to be the rise in the number of road kill incidents. It is estimated that since the early 1960s the number of cars licenced in Great Britain has risen steadily since the 1950s; there are now more than ten times as many cars as there were in 1950 (National Statistics Agency). Since the 1960s the number of pine marten killed on the roads has increased from 5 per cent of total records to 22 per cent of total records in the late 20th century (Table 1). This may impact the long term survival of the species as dispersing pine martens would be at a greater risk of being killed on the roads. This may further accentuate the effects of habitat fragmentation on this and other mammal species.

Scat survey results for Ireland (22%), north-west Scotland (59%) and England and Wales (8.7%) suggest that, overall, the incidence of pine martens in Northern Ireland may be comparable to the rest of Ireland but is low by comparison to Scotland (Balharry 1996, O'Sullivan 1983, Strachan *et al.* 1996). However, results for individual counties indicate that some counties (Fermanagh 50% and Tyrone 33%) have a higher incidence of pine marten than others (Antrim 7% and Down 7%). This suggests the pine marten population of Co Fermanagh may be comparable in levels of activity to that of Scotland. A more worrying result of this study is the suggestion that pine martens may not have persisted in significant numbers in Cos Londonderry and Armagh (Table 2). However, direct comparisons with scat

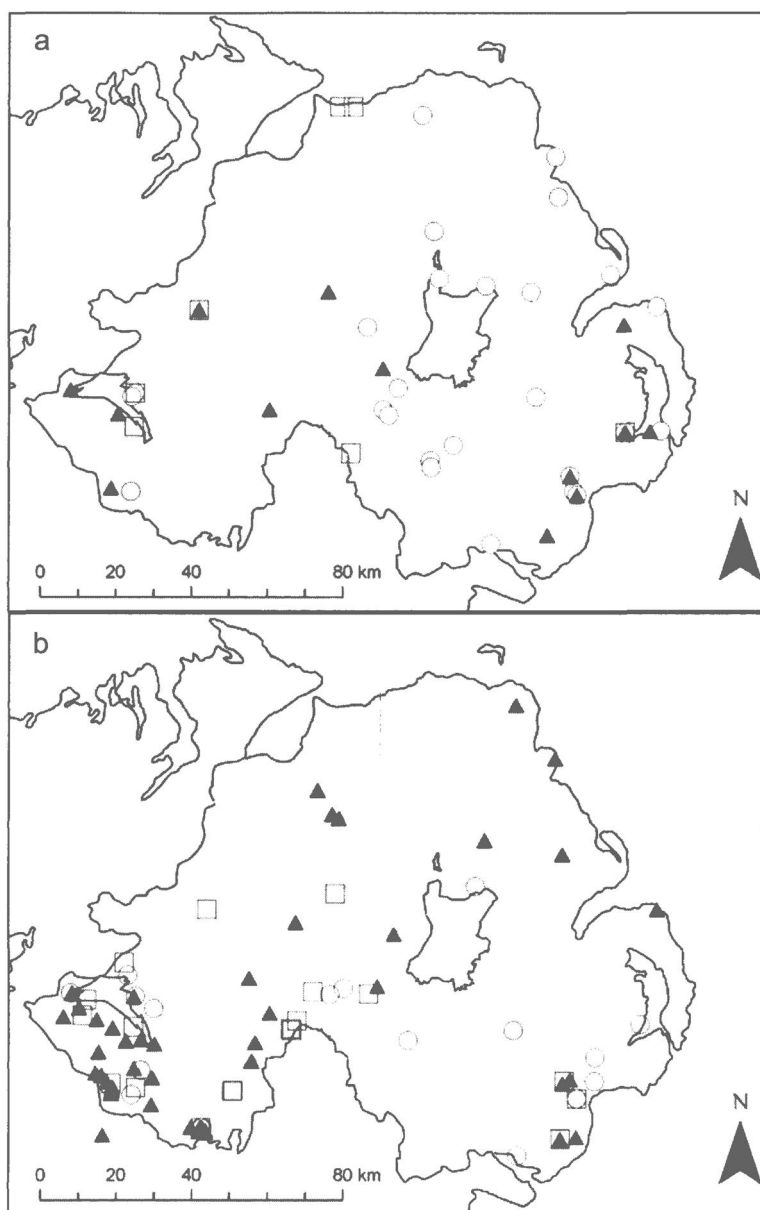


Figure 2. Pine marten *Martes martes* (L.) records in Northern Ireland based on records. a) 1850–1959; ○ 1850-1899; □ 1900-1920; ▲ 1930-1959., b) 1960–2004; ○ 1960-1982; □ 1983-1994; ▲ 1995-2004.

survey returns from other, purely random, studies may be misleading as the woodlands surveyed here were specifically targeted due to their historical records.

The limitations of scat surveys in estimating pine marten occurrence are highlighted by Davison *et al.* (2002), in which pine marten density was found to affect the success of

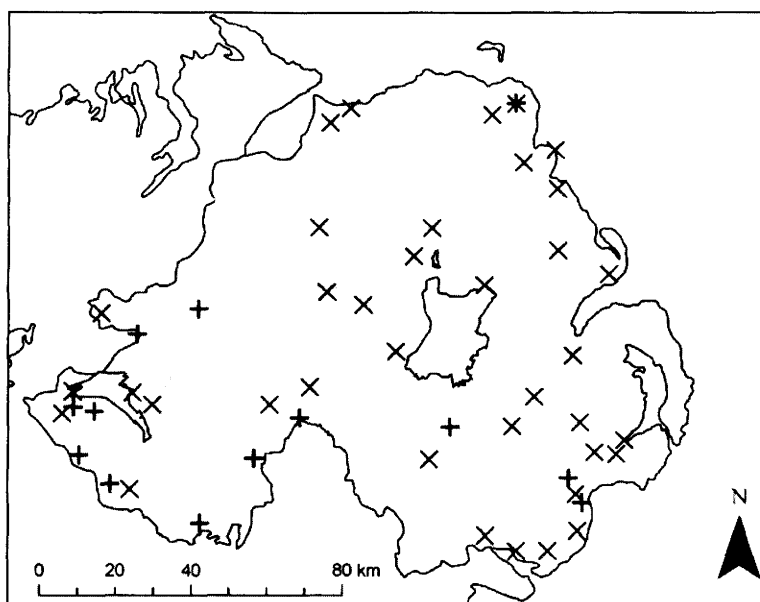


Figure 3. Locations and results of pine marten *Martes martes* (L.) surveys in Northern Ireland in 2004. + pine marten scats found; X No pine marten scats.

a surveyor to identify a pine marten scat. In Scotland, at sites where population density was lower than the national average, a higher proportion of scats identified by experienced surveyors as pine marten were actually fox. In England and Wales, where martens are particularly scarce, 97 per cent of the scats thought to be pine marten were not (Davison *et al.* 2002). These findings emphasize the need for caution when interpreting results from scat surveys alone as genetic verification has highlighted the incidence of surveyor error where pine marten density is low. Further ecological investigations could incorporate genetic identification of scats or the use of fur snagging devices, and this would be particularly valuable where anecdotal evidence of the species exists but where few or no scats were found.

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