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SCOTTISH RAPTOR MONITORING SCHEME

REPORT 2012



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Foreword

I'm pleased to say that with this 2012 report, the Scheme has fully caught up with annual reporting. As usual it's been a huge effort by the authors and others to get the report together. Firstly, as those who were at the Scottish Raptor Study Groups Conference in February will be aware, Brian indicated that after 10 years as Raptor Monitoring Officer, he intends stepping down for a well earned rest, or rather to spend more time looking at the birds rather than spreadsheets! Brian has been a fantastic RMO and will be a hard act to follow, so my sincere thanks to him for all the work he has put in getting the Scheme off the ground. The Scheme database now has over 53,000 records in it which shows just how much effort goes into raptor monitoring in Scotland and how far the Scheme has come. On the down side it's a shame that the 2012 breeding season over much of the mainland was a bit of a wash out with very poor wet spring and summer weather. There were a few species and areas that bucked the general picture with parts of the north and west escaping the wet weather, however they had a cold late spring and early summer which probably affected productivity there too. It was anticipated that after good vole numbers in parts of the country over the last couple of years that 2012 would see a 'crash' with resultant knock on impacts on those species that rely on these rodents. Some owl species have really struggled with very low Barn Owl numbers in some areas and worryingly low numbers of Hen Harriers on large areas of the mainland. In the case of the latter there seems to be a shortage of birds returning to some areas and it's not just the poor summer or vole crash that is responsible for the low numbers in 2012.

Whilst everyone is aware of the impacts of persecution on some species we mustn't lose sight of other factors affecting our raptors. Two topics I would raise here are the potential impacts of second generation rodenticides and

lead. The former are now being tested for regularly by SASA and their results up to September 2012 show that these anticoagulants are showing up in a wide range of raptors, often at higher than expected levels. It is something we need to get a better handle on quickly. In a similar vein, lead residues in raptors have been highlighted as an issue in other countries but we are perhaps overlooking a significant threat in this country. The RSPB is keen to start looking at lead in raptors as unfortunately the Predatory Bird Monitoring Scheme currently does not receive enough samples to address this from a Scottish point of view. Samples from eagles, kites and buzzards are needed for this work, and whilst bone is probably the best, sample feathers are being considered. Please contact Staffan (staffan.roos@rspb.org.uk) if you are interested in helping with this work.

I would like to thank the following for all their work on behalf of the Scheme: David Stroud (Joint Nature Conservation Committee), Patrick Stirling-Aird, Wendy Mattingley and Alan Heavisides (Scottish Raptor Study Groups), Chris Wernham, Andy Dobson and Anne Cotton (British Trust for Ornithology, Scotland), Gordon Patterson and Kenny Kortland (Forestry Commission Scotland), Mark Holling (Rare Breeding Birds Panel), Staffan Roos, Duncan Orr-Ewing and Jeremy Wilson (Royal Society for the Protection of Birds, Scotland), Gordon Riddle (Scottish Ornithologists' Club), Nigel Buxton, Simon Foster and Des Thompson (SNH), Brian Etheridge and Helen Riley for supporting the secretariat. In particular, I would like to thank the Raptor Monitoring Officer, Brian Etheridge, for leading the compilation of this report, and for his tireless work for the Scheme.

Andrew Stevenson
Chair of the Scottish Raptor Monitoring Group

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1 Introduction

This is the tenth report of the Scottish Raptor Monitoring Scheme covering the year 2012. It follows the previous annual reports in the series (Etheridge 2005; Etheridge *et al.* 2006, 2007, 2008, 2010, 2011, 2012 a & b, 2013). The aim of the report is to provide clear and factual information on territory occupation and breeding success of birds of prey in Scotland.

1.1 Scottish Raptor Monitoring Scheme (SRMS)

The SRMS was established on 24 June 2002 with the signing of an Agreement by the following parties: Scottish Natural Heritage (SNH), Joint Nature Conservation Committee (JNCC), Scottish Raptor Study Groups (SRSGs), British Trust for Ornithology, Scotland (BTO), Rare Breeding Birds Panel (RBBP), Royal Society for the Protection of Birds, Scotland (RSPB), and Scottish Ornithologists' Club (SOC) (Anon. 2002). In 2012, Forestry Commission Scotland was invited to join the scheme. The SRMS currently focuses primarily on the annual monitoring of the abundance, distribution and breeding success of diurnal birds of prey (Accipitriformes and Falconiformes) and owls (Strigiformes) native to Scotland. Because of its ecological similarity to raptors, the Northern Raven is given honorary status as a bird of prey and is included in the Scheme. The majority of data submitted to the SRMS come in electronically in the customised MS Excel recording spreadsheet. This means that much of the routine data checking and processing can be done automatically, and the standard tables for the annual report can be generated quickly and efficiently. We are now looking ahead to further improve data

submission and handling. We hope that the next couple of years will see the development of on-line data submission to further enhance the SRMS.

1.2 Scottish Raptor Study Groups (SRSGs)

The SRSGs form a consortium of eleven regional raptor study groups (Figure 1) active during 2012 with a combined membership of 300, mostly voluntary, ornithologists. Members have extensive expertise in the field study of breeding birds of prey and conduct these studies largely in their own time. They have provided the bulk of the data collected in this report on raptor numbers, distribution and productivity.



Figure 1. Scottish Raptor Study Group Areas in 2012

1.3 Scottish Raptor Monitoring Group (SRMG)

The SRMG consists of representatives of the eight partner organisations of the SRMS. They meet regularly and oversee the work of the scheme. During the year under review, a part-time Raptor Monitoring Officer (RMO), funded by SNH and employed by BTO Scotland, reported to the group and was primarily responsible for collecting and collating annual breeding records on all raptor and owl species.



The RMO, Brian Etheridge, indicated a desire to retire from the post at the end of March 2013, to spend more time in the field studying the birds that are his passion. He will be sorely missed by the Scheme and the SRMG. At the time of writing, the SRMG is in the final stages of securing the funding for a full-time Scottish Raptor Monitoring Coordinator to take over from Brian, and we hope the new

postholder will take up this role later in 2013. The post will continue to be hosted and supported by BTO Scotland in Stirling, and Brian will also have some paid time to pass on his experiences to the new Coordinator as he or she takes up the reins. The members of the SRMG extend our warmest thanks to Brian for all he has done to develop the SRMS over the last ten years!

2 Breeding report 2012

2.1 Introduction

Members of the eleven regionally based raptor study groups in Scotland (Figure 1), all of which are part of the Scottish Raptor Study Groups, were the main contributors to this breeding report. Important data were also supplied by species officers employed by RSPB Scotland, primarily to monitor the reintroduced populations of Red Kite and White-tailed Eagle. Other organisations supplying data were Haworth Conservation Ltd, Natural Research Ltd and RPS Group. Rare Breeding Birds Panel data were also extracted from the annual returns to SNH and BTO by the small number of Schedule 1 licence holders who are not members of the SRSGs. Annex 1 provides a regional breakdown, based on Scottish Raptor Study Group boundaries (Figure 1), of the raptor home ranges that received at least one visit in the spring of 2012 to check on occupancy. A total of 5,736 home ranges were visited, a 9% increase on the 2011 total of 5,246 (Table 1), and continuing an upward trend since 2003. The number of home ranges visited in 2012 was 65% higher than it was nine years ago. Not all these home ranges held pairs: some had only single birds and others were apparently vacant. If the monitoring effort is carried out rigorously each year, the occupancy rate expressed as a percentage of

home ranges visited may reflect changes in population levels. Equally important are follow up visits to confirm the findings of the first visit and to monitor the nesting success of pairs present. This nesting success, normally expressed as the percentage of monitored breeding pairs producing fledged young, together with the mean brood size, can also provide an indication of the health of the population. Table 1 also shows that 3,042 potential breeding pairs received further visits in 2012, enabling their nesting success to be determined. This constitutes a 1% increase on the previous year total of 2011 and is the highest total since the start of the scheme in 2003 (Table 1). The number of occupied home ranges monitored increased 26% in the ten years 2003 to 2012. A regional summary of these monitored home ranges is provided in Annex 2.

Overall, the summer of 2012 was one of the wettest in Scotland since records began in 1910. The rain did not fall evenly, however; the south and east of Scotland experienced about 150–200% of normal rainfall, whereas the northwest mainland and the Western Isles got only about 65–80% of their usual summer quota. This was apparently due to the ‘jet stream’ lying much further south than normal in early summer 2012. Wet weather in spring and summer is known to reduce the breeding success of some raptor species (e.g. Golden Eagle, Watson 2010; Hen Harrier, Amar *et al.* 2010); the majority of raptor species monitored under the scheme showed low breeding success in 2012 and weather is likely to have been a key contributing factor.

2.2 Observer coverage

For some of the scarcer species, such as Red Kite, Marsh Harrier, White-tailed Eagle and perhaps Osprey, a high proportion of the breeding population, reaching 90-100% for

some species, is monitored each year, mainly by RSPB personnel and specialist groups. Amongst volunteer fieldworkers, the appeal of carrying out fieldwork on open moorland and mountain habitats is strong. Thus four widely but thinly spread upland species, Hen Harrier, Golden Eagle, Merlin and Peregrine Falcon, with Scottish breeding populations in the range of 400–800 pairs, receive excellent coverage, with up to 50% of the breeding population monitored annually. Also receiving good coverage are two lowland owl species, Barn and Tawny Owl, both because they readily adapt to nest boxes, thus allowing easier study. Common Buzzard and Northern Raven attract support from a growing number of raptor enthusiasts, and although there are several substantial regional gaps in coverage for the former, offering monitoring opportunities for new fieldworkers, record numbers of breeding records for both species were received in the year. A few species in Scotland - either because of their extreme scarcity (European Honey-buzzard and Eurasian Hobby), sporadic occurrence, and/or secretive behaviour (Short-eared and Long-eared Owl) - present challenges as far as monitoring is concerned. Two widespread species attract little attention from the majority of field workers. Coverage of breeding Eurasian Sparrowhawks and Common Kestrels needs to increase if we are to achieve effective monitoring to determine estimates of population size, annual productivity and long-term trends. This requirement is becoming ever more urgent as the declining status of these two species, in particular the Common Kestrel (Risely *et al.* 2012), is now causing concern.

2.3 Occupation of home ranges

In many species of raptors and owls, breeding pairs are faithful to a home range. In some resident species such as Red Kite, Common Buzzard, Golden Eagle and Northern Raven,

the pair can remain together throughout the year and for at least part of the day will be on their home range. In migratory species such as European Honey-buzzard, Western Marsh Harrier and Osprey, the pair bond breaks up at the end of the breeding season. If they survive the rigours of migration, the majority of adults will return to the same location the following year and pair up again. In long-lived species, the same pair of birds will typically occupy the same home range, and use the same nesting locations, over many years. For relatively short-lived species such as Hen Harrier, Eurasian Sparrowhawk and Merlin, providing the habitat remains unchanged, such home ranges may be occupied by a succession of breeding pairs.

Not all home ranges will be occupied by a breeding pair and there are a variety of reasons why a pair of raptors may not breed in a given year e.g. one or both birds may be immature (not yet of breeding age) or food may be in short supply. In some years, only a single bird may be present, caused by the death of a mate or even 'divorce', or recruitment to a new territory if the population is undergoing expansion. Some home ranges may be occupied only when the population reaches a certain level and others may have the appearance of being vacant for long periods, sometimes because of human interference. Others may suffer irreversible habitat changes, e.g. through afforestation, or be subjected to increased human disturbance and may never become regularly occupied again. For these reasons, it is important in the long-term monitoring of Scotland's bird of prey populations, that the presence of unoccupied ranges within a study area is recorded accurately, as well as the occurrences of breeding attempts and any production of young.

Cyclic changes in the annual and seasonal abundance of the Field Vole can have a profound effect on the breeding success on a number of raptor and owl species (e.g. see

Petty *et al.* 2000; Lambin *et al.* 2000), particularly Common Kestrel, Barn Owl and Short-eared Owl (Village 1990; Taylor 1994; Korpimäki & Norrdahl 1991). If vole populations reach a peak during the spring and summer months, these predators can respond with an increase in the number of pairs settling to breed and a corresponding increase in brood size, nesting success and productivity; conversely, when vole numbers are low, the reverse can occur.

2.4 Terminology

The terminologies used in this report have the following definitions and are based on Hardey *et al.* (2009):

Breeding range - the geographical area within which the species occurs and breeds.

Home range - the immediate area around the nest site and the area over which a raptor or a pair of raptors forage. Some raptor species, such as Golden Eagle and Tawny Owl, defend more-or-less the entire home range, whereas others, including Goshawks and Kestrels, defend only a core area of the home range around the nest site and have extensive home ranges for hunting which overlap with those of neighbouring pairs.

Nesting range - the locality within a home range that includes all the alternative nests used in successive years by a pair of birds.

Nesting territory - an area around an active nest that is defended by the resident pair of birds against intrusions by other raptors of the same species, or against potential predators.

Occupancy - a nesting range is occupied if a single bird or pair of birds is recorded during the breeding season, usually on more than one occasion, or if there is strong evidence that birds are present (moulted feathers, pellets, plucks, faecal splash).

Territorial bird or pair - a pair or single bird that defends a territory against intrusions by other raptors of the same species or against potential predators. For some species, notably Common Buzzard, this territorial behaviour can occur throughout the year and not just during the breeding season.

Breeding pair - a pair that (a) defends a nesting territory in the spring; (b) repairs or builds a nest, or prepares a nest scrape; and (c) lays at least one egg.

Nest site - the nest and its immediate surrounds (e.g. the tree or ledge on which the nest is placed).

Nesting or breeding success - the proportion or percentage of breeding pairs that successfully rear at least one chick to fledging.

Breeding failure - once occupancy by a breeding pair is established, failure occurs if no young fledge successfully. A broader definition will also include those territorial pairs which appear capable of breeding but fail to lay eggs (this can be difficult to prove without careful and very regular observations).

Productivity - the number of young produced annually, can be expressed in one of three ways: (i) as the mean or average number of young fledged per occupied home range; (ii) the mean number of young fledged per breeding pair, territorial pair or female laying eggs; or (iii) the mean number of young fledged per successful pair or female.

Monitored home range - a home range occupied by a pair that receives sufficient repeat visits to establish the outcome of a breeding attempt.

2.5 Estimating breeding success: a note of warning

Ideally, all breeding attempts should be monitored from the start of pair formation to

either breeding failure or the successful fledging of young. In a national scheme of this size, using data from a wide range of field workers, this ideal is not always achievable. The timing of survey visits may bias estimates of raptor breeding success. Individual fieldworkers often cover large geographical areas so first visits to different parts of the study area must necessarily be staggered, and usually areas that held breeding pairs of a target species in the previous year are prioritised. First visits to an area that occur later in the season may miss breeding attempts that failed early and overestimate nesting success. Non-breeding territorial pairs are a common component in raptor populations and these can be easily overlooked, exacerbating the problem. Therefore, there is a bias in favour of detection of nesting attempts that have a longer period of survival. In particular, nests are most likely to be found and examined at the chick stage; this places a strong positive slant on estimations of breeding success, as failure is more likely to occur at the pre-lay stage or during incubation. In the early years of the SRMS, it was not always possible to determine from data submitted at what stage in the breeding cycle individual nests received their first visit, nor in many cases of nest failure, what caused this to happen. The nest recording spreadsheet, introduced at the start of 2005 (updated in 2009), and now widely adopted by raptor workers, is helping to address these issues, and raptor observers are encouraged to submit information on the dates that they carry out every monitoring visit.

2.6 Persecution

Many factors influence the numbers, distribution and productivity of birds of prey in Scotland. A large proportion of the uplands, particularly in the south and east of Scotland, is managed for driven grouse shooting, with a full-time gamekeeper and often one or more

under-keepers. The keepers' primary aim is to manage the heather through regular burning and cutting to maximise the number of Red Grouse available for shooting and to legally control common and widespread predators such as crows, stoats, weasels and foxes. Historically gamekeepers also controlled birds of prey, but this practise became illegal in 1954. However, even after nearly 60 years of legal protection, birds of prey are still killed illegally in Scotland (Anon. 2013). Recent research has shown that these illegal activities, including nest destruction and the killing of sub-adults and adults, are adversely affecting the conservation and status of several species. On many driven grouse-moors certain raptor species are scarce or absent and many attempts to breed fail due to human interference (Etheridge *et al.* 1997; Hardey *et al.* 2003; Whitfield *et al.* 2004a & b, 2008; Redpath *et al.* 2010; Fielding *et al.* 2011; Amar *et al.* 2012). This can have a severe effect on species at a local or regional level by reducing the number of breeding pairs present and their breeding success. It will also impact on surrounding populations, if birds are drawn into areas of apparently suitable habitat which are unoccupied because previous inhabitants have been removed – the so-called “black hole” or “ecological trap” effect (Whitfield *et al.* 2004a & b). Population modelling has indicated that persecution, mainly in the form of poisoning, is responsible for an estimated 3–5% of annual deaths of adult Golden Eagles, and in the absence of this mortality the Scottish population would increase (Whitfield *et al.* 2004b, 2008). Illegal poisoning is a cause of poor population growth of re-introduced Red Kites in north Scotland, compared with similar populations in England (Smart *et al.* 2010). A negative correlation has been found between recorded incidents of Hen Harrier persecution in different areas of Scotland and the proportion of successful nests, and there is strong evidence that illegal persecution is causing the majority of breeding attempts to fail on grouse moors (Fielding *et al.* 2011) and is driving the current population

decline on mainland Scotland (Hayhow *et al.* in press). Furthermore, in northern England, the productivity of Peregrine Falcons breeding on grouse moors was found to be 50% lower than non-grouse moor habitat, despite similar clutch and brood size between habitat types suggesting little difference in prey availability. Population modelling indicated that the grouse moor population of this raptor species was unsustainable and reliant on immigration (Amar *et al.* 2012).

Such illegal interference can also diminish the enthusiasm of volunteer raptor fieldworkers for monitoring raptors in what they perceive to be a hostile environment. The consequential impact of this shift of effort away from some grouse-moors, particularly where this form of land management is dominant at the regional scale, is that:

- (i) data collected on some raptor breeding populations may not be an accurate reflection of the species status and breeding success in the region. Some upland breeding species such as Hen Harrier, Golden Eagle or Peregrine may appear to have considerably higher occupancy of home ranges, breeding success and productivity than is actually the case nationally across all habitats. This is because, in areas not being surveyed, occupancy may be low and mortality high compared with other habitats; and
- (ii) persecution of birds of prey may be under-recorded.

Ongoing SRMS work to more thoroughly assess annual changes in monitoring coverage, to identify the causes of breeding failure and in particular cases of suspected persecution, and to collect related habitat data to characterise nesting attempts, will help to address whether these issues do indeed lead to any biases in the data collected.

The Scheme also aims to provide intelligence and evidence for illegal persecution wherever possible, in the form of objective information

that can be passed to the National Wildlife Crime Unit. This will enable scheme data to add to and complement other sources of information on the persecution of birds of prey, such as annual reviews published by the RSPB (e.g. Anon. 2012, 2013).

3 Species accounts

3.1 European Honey-buzzard *Pernis apivorus*

Three pairs were located in Dumfries & Galloway. One pair was confirmed to lay eggs but failed soon after hatching and a second built-up the nest but either failed to lay or failed during incubation. Alarm calls were heard from a third pair suggesting there were young in the nest, but it was not located. In Highland, for the first time, no breeding records were received.

3.2 Red Kite *Milvus milvus* (Tables 2 & 3)

Since the re-introduction of this species began in 1988, the increasing population has been closely monitored by RSPB and annual coverage has been close to 100% (Table 2). In 2012, for the first time since the re-introduction began 24 years ago, the Scottish breeding population exceeded the 200 pair mark, both in the pairs located (232) and in the number of pairs confirmed to lay eggs (212) (Table 3). Despite this landmark occasion, productivity and fledging success was one of the worst on record. One in five pairs that laid eggs failed at some stage and the productivity at 1.47 young per laying pair is the lowest

since 1993 when there were just five pairs. All this can be attributed to the poor summer weather, in particular high rainfall, which commenced around the time of hatching and continued throughout the period when vulnerable young were in the nest.

Most Red Kites pair and breed for the first time when they reach two or three years of age (some occasionally start when only one, though this is a rare event, Evans *et al.* 1998). During the 3-year period 2010-2012 over 900 young fledged from successful nests, representing 36% of the total number of young produced since breeding started in 1992. Could Scotland be on the brink of a major Red Kite population increase? The populations in south west and central Scotland are increasing in numbers and range, and the newly established Aberdeenshire population is also growing, but it appears that the population in the Highlands is still limited by persecution (Smart *et al.* 2010).

3.3 White-tailed Eagle *Haliaeetus albicilla* (Tables 4 & 5)

In 2012, further increases in the west Highlands and islands breeding population were recorded, with an increase of 18% to 67 breeding pairs (Table 4). A total of 60 young fledged, the first time more than 50 young have fledged in any one year since the species was reintroduced. The overall proportion of successful pairs was 61% (41 pairs) and productivity per laying pair was 1.02 young, both representing increases from the previous year. There was evidence of some 'infilling' with pairs in the main island areas with continued signs of, albeit slow, range expansion in the Inner Hebrides and also on the mainland. The increase in sightings on parts of the mainland suggests further range expansion should be expected in the next few years. Additionally 2012 saw the release of a

final six young birds collected from Norway as part of the East Scotland Sea Eagles project. The eldest released birds from this project are now reaching maturity and we are hopeful of nesting attempts away from the west coast in the near future.

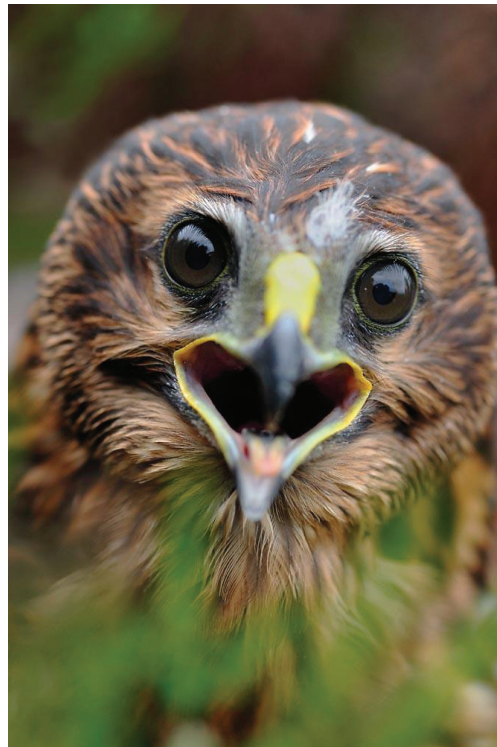
3.4 Marsh Harrier *Circus aeruginosus* (Table 6)

For this scarce species, 2012 proved to be one of the best years yet. The fine weather that occurred in late March may have contributed to the higher number of pairs arriving in Scotland to breed. Seven pairs were at the important River Tay reed beds, the most extensive of its kind in UK, whilst elsewhere in Tayside two further pairs were found. All nine pairs laid eggs and reached the hatching stage, but four failed with young, all at the Tay reed beds. Two of the failures were attributed to poor weather and this may have had a major effect on the other two failures through changing water levels. The five successful broods were of 4, 3, 2, 2 and 1 young.

3.5 Hen Harrier *Circus cyaneus* (Tables 7 & 8)

Visits were made to a record high of 558 home ranges in 2012, all of them locations where Hen Harriers have bred regularly in the past 20 years. Pairs were found at 259 (46%) and of these 217 received follow-up visits. The number of confirmed egg-laying pairs was 160, the lowest number recorded during the ten-year period, 2003–2012 (Table 7). There were 107 successful nesting pairs and 275 young fledged. The mean brood size per monitored pair occupied home range was just 1.3 young. These figures constitute some of the lowest so far recorded by the Scheme. The

production of young is now less than half of what it was ten years ago. Moreover, breeding success of nesting pairs has fallen 10% in recent years from an average of 57% for the period 2003–2007, to 47% in 2008–2012 (Figure 2).



The Orkney breeding population of Hen Harriers has been monitored continuously for over 60 years, the longest running study of its kind in the world. Elsewhere, breeding pairs have been studied comprehensively by RSG members in ten locations for periods of 20–30 years. All seven mainland study areas have reported large declines in the local Hen Harrier breeding population, declines that are particularly marked in all areas where driven-grouse shooting dominate upland land use. These declines are not matched by Hen Harriers breeding on the west coast islands or in Orkney. Direct persecution by gamekeepers is implicated as a key cause (Fielding *et al.* 2011). The percentage change in occupancy rate of home range nest sites checked annually since 2003 is shown in Figure 3.

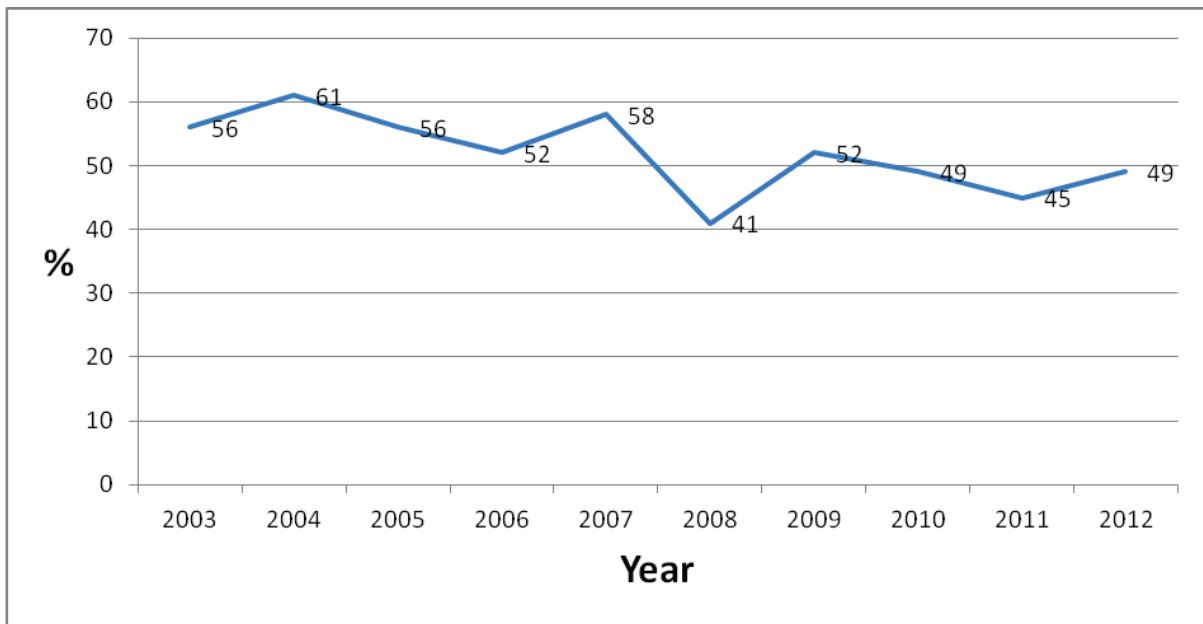


Figure 2. Annual percentage of Hen Harriers pairs in Scotland breeding successfully. Data extracted from Table 7.

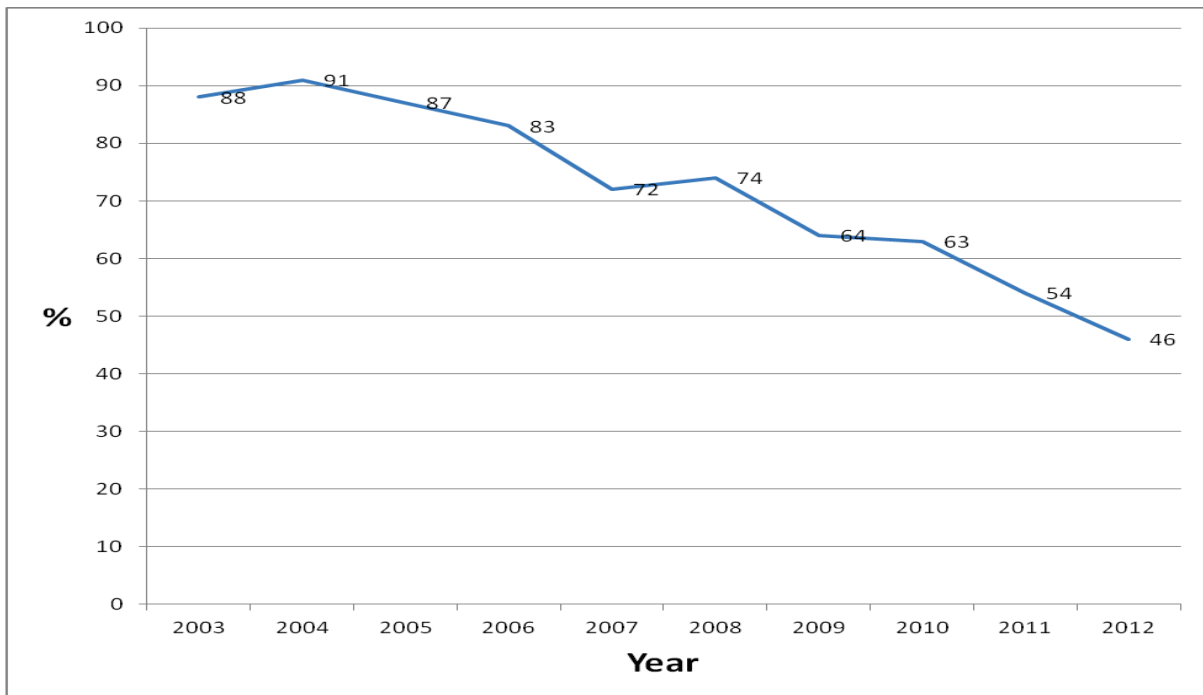


Figure 3. Hen Harrier home ranges in Scotland – annual percentage occupied by pairs. Data extracted from Table 7.

All Scottish records are included and no selection for area or land use has been made. It shows an almost straight line decline since 2004, year on year. If the island records were to be excluded, the rate of decline would be much greater. The pattern is of great concern, and suggests that breeding Hen Harriers in Scotland, at least populations on mainland grouse-moor sites, are at risk of severe depletion or perhaps even extinction within the next ten years, thus mirroring what is on the cusp of happening through persecution in England.

3.6 Northern Goshawk *Accipiter gentilis* (Tables 9 & 10)

As in previous years, the numbers of Goshawk breeding pairs located and monitored continues to increase. In 2012 there was evidence of pairs in 128 home ranges (Table 9), with signs suggesting at least one bird in a further 11 ranges (Table 10). Most of the population was still in Northeast Scotland, Lothian & Borders and Dumfries & Galloway, with only 12% of pairs elsewhere. The overall trend is for a slow spread in distribution and an increase averaging 5% *per annum* (Table 9). Some of this increase is because more fieldworkers are interested enough to search diligently for existing pairs, but there is also good evidence for genuine population increase as additional pairs are located within well searched long term study areas. Although increase in the Scottish Goshawk population is welcome, it is remarkably slow by comparison with recovering populations elsewhere and persecution is still the main constraint on population restoration here. In Northeast Scotland the long term 5% *per annum* increase in breeding pairs initially filled the major forests, then spread the breeding distribution eastwards into less wooded low ground (Francis & Cook 2011), but there have been few pairs established in woodlands close to

intensive Pheasant releases or adjacent to grouse moor. Breeding pairs use some such woods each year but rarely persist. In 2012, one new nest in a wood beside a grouse moor failed as a crow cage trap was set within 200m. Another new nest in the same area hatched young but was then completely shot out of the tree. Breeding performance was poor in Scotland in 2012. There were 120 nests monitored, 117 where eggs were laid and 84% of these produced young, close to the long term average (Table 10). In stark contrast broods were small so that only 1.73 young were produced per nesting pair, the lowest productivity rate recorded since national monitoring began 2003. In Northeast Scotland, losses were clearly associated with wet weather. Many nests were apparently doing well until late June and early July when persistent rain led to the deaths of large well-feathered nestlings in 11 of the 42 broods. One pair failed completely as three well grown chicks were saturated and died in a particularly exposed nest. At least in 2012, breeding productivity seemed most affected by weather, rather than other factors (**Mick Marquiss**).



3.7 Eurasian Sparrowhawk *Accipiter nisus* (Tables 11 & 12)

Despite visits to 140 home ranges in 2012, a 9% increase over the previous year (Table 11),

only 79 (56%) were occupied. Sixty-nine home ranges received follow-up visits, eggs were laid at only 59, and 50 produced fledged young. The combined failures led to the poorest breeding success and productivity per occupied home range so far recorded. This could be attributed to the poor summer weather impacting not only directly on the Sparrowhawks' nests but also on their small song-bird prey. It is a surprising fact that considerably more nests of the much scarcer Goshawk are now being monitored by SRMS. Sparrowhawks are far more widespread than their larger cousin and knowledge of their abundance and breeding success is important in assessing the health of the wider environment. The Sparrowhawk is a priority species and we urge all raptor study groups to consider setting up long-term study areas to monitor them.

3.8 Common Buzzard *Buteo buteo* (Tables 13 & 14)

Probably the most abundant raptor in Scotland, the Common Buzzard is widespread across the country, breeding in all areas except Shetland. Abundance data based on the BTO/JNCC/RSPB Breeding Bird Survey (BBS) shows that the greatest densities of Buzzards in Scotland in 2007-09 (over four birds per km²) occurred in lowland areas (below about 300 m) south of the Highland boundary fault, in Aberdeenshire and Caithness, and in coastal areas around the Moray Firth (<http://www.bto.org/volunteer-surveys/bbs/latest-results/maps-population-density-and-trends>). In the ten years that the SRMS has collected data on the species, between 342 and 989 home ranges have been checked annually, and the number has increased in most years (Table 13). Slightly fewer were checked in 2012 (931) than in 2011 (989). There are ten dedicated studies concentrating on Buzzards which have been

operating throughout the last ten years, in Badenoch, Easter Ross and Eigg (Highland), Fife and Strathallan (Tayside), Falkirk and Stirling (Central), Bute and Colonsay (Argyll) and Lothian. These key studies have formed the backbone of the SRMS monitoring of this species. In addition, each year the results from these studies are enhanced by nest reports collected by raptor workers focussing on other species in their study area, and it may be that the limitations of the wet summer of 2012 meant less time available for this incidental recording. In the ten years of monitoring under SRMS, the mean brood size per pair laying pair has declined year on year from 1.8 in 2003 to 1.4 in 2012. One reason behind this decline may be density-dependent factors operating on the increasing population, but there has been little or no research on this to date. In 2012, monitoring visits were made to 536 pairs and 464 of these were confirmed to lay eggs. Nesting success at 74% was identical to 2011, although less than the ten year mean (76.7), with 394 pairs rearing 640 fledged young. However, productivity was lower with a mean of 1.2 young per monitored pair.

3.9 Golden Eagle *Aquila chrysaetos* (Tables 15 & 16)

In the run-up to the next national survey in 2015, it is important that SRS coverage of known home ranges continues to increase. This happened in 2012, with 356 checked for occupation, the highest since 2004 (Table 15). In the last national survey carried out in 2003, information was collected from 698 territories (Eaton *et al.* 2007). In 2012, Golden Eagle pairs were present in 306 home ranges (86% of those visited) and there were signs of occupation at an additional 14 (4%) (Table 16). There were repeat visits on 280 pairs but 113 (40%) either failed to lay or laid eggs but failed soon after. Of the remaining 166 pairs, a

further 71 (25%) failed either during incubation (52 pairs) or at some stage in chick rearing (19 pairs). The 95 successful pairs (34%) reared 109 young to fledging, a mean brood size per monitored occupied home range of 0.39 young. The latter figure is the joint lowest to date (Table 15) and, like other raptor species, can be partly attributed to the poor weather experienced during the breeding season. Highland region has a large number of active and historic home ranges. At least 348 are currently known, by far the greatest number of any of the areas covered by the regional raptor study group network. The breeding success of this population thus has a large influence on the overall Scottish figure presented in this report. In 2012, 176 (51%) of these Highland home ranges were checked for occupation (Table 16), an immense undertaking by a single group. Of the 136 pairs monitored, just 39 (29%) succeeded in rearing any young and the productivity was 0.33 young per monitored occupied home range. All these figures are below the combined Scottish average.



3.10 Osprey *Pandion haliaetus* (Tables 17 & 18)

After the disastrous breeding season in 2011 (Table 17) when many nests were destroyed by high winds at a critical stage, in 2012 the breeding success and productivity returned to more usual levels. However, the return rate of Ospreys in the spring was one of the lowest recorded, with only 71% of known nests occupied by pairs despite a record 276 breeding sites checked. Single birds were present at an additional 19 sites (Table 18). Of the 194 monitored pairs, 180 (93%) were confirmed to lay eggs and 142 (73%) succeeded in rearing young. The fall in the number of pairs returning, compared with 2011, occurred mainly in the regions with some of the highest populations (Highland, Tayside, Northeast Scotland); only in three regions (Central Scotland, Argyll, Lothian & Borders) did the number of pairs present apparently increase (Table 18 compared with Table 17 in Etheridge *et al.* 2013).

3.11 Common Kestrel *Falco tinnunculus* (Tables 19 & 20)

An increase in the monitoring effort in Orkney, Central Scotland and Lothian & Borders led to a 41% increase in the number of Common Kestrel home ranges visited in 2012, compared with 2011 (Table 19). Conversely, occupancy (58%) was the second lowest since the start of the SRMS in 2003. This may partly reflect the establishment of new nest boxes, which kestrels may take several years to occupy. Nevertheless, the 134 pairs that were monitored was the highest total under the Scheme. The poor summer weather apparently impacted on Kestrels by reducing breeding success to the lowest yet recorded (Table 20). With a Scottish Breeding Bird Survey (BBS)

decline of 64% recorded between 1994 and 2011 (Risely *et al.* 2012), the status of Kestrels is now of considerable concern. The increase in monitoring in 2012 is welcome but must build further in future years in order to help understand the cause. The SRMS would welcome the establishment of more long-term study areas for this species, and coverage of more BBS squares across Scotland (see www.bto.org/volunteer-surveys/bbs) would also make a valuable contribution to monitoring the fortunes of this and other widespread raptors in Scotland.

3.12 Merlin *Falco columbarius* (Tables 21 & 22)

The Scottish breeding population of Merlins in 2008 was estimated at 733 pairs (Ewing *et al.* 2011), showing little change from the 800 pairs estimated in the 1993-94 survey. Table 21 indicates that whilst coverage of breeding pairs is strong in some areas (Orkney, Northeast Scotland and parts of Tayside and Lothian & Borders), in others, important populations get poor or limited coverage (Lewis and much of Highland). Monitoring of breeding Merlins has remained almost unchanged over the last ten years, the national survey year excepted (Table 22) and is a reflection of the endearing popularity of this small falcon.

In 2012, visits were made to 369 home ranges and 211 (57%) had signs of occupation, though only 170 (46%) by breeding pairs (Table 21). The total of 145 pairs subsequently monitored is 20% of the estimated Scottish population. At least 135 pairs laid eggs, 113 reached the hatching stage and 100 successfully produced fledged young. Mean brood size recorded was the lowest recorded since 2004 (Table 22). Many of the losses recorded were attributed by field workers to cold and wet weather.

3.13 Eurasian Hobby *Falco subbuteo*

In the best year so far since the establishment of the SRMS, at least three nesting pairs were found and two other possible nesting pairs. The home range in Badenoch & Strathspey was again occupied in 2012. A stick nest, built and used by crows in 2011, was occupied. Of the three eggs laid, one failed to hatch and two young fledged successfully during early August. Elsewhere, in Tayside, two nesting pairs were found. One pair reared a single chick and a second pair was seen feeding an unknown number of fledged young in mid-August. At a third Tayside site, an adult was seen hunting on three separate dates in August, whilst in Lothian & Borders an adult was seen in suitable nesting habitat in July, mobbing a hunting Barn Owl.

3.14 Peregrine Falcon *Falco peregrinus* (Tables 23 & 24)

After recovery from the detrimental effects of organochlorine pesticides on productivity and survival in the 1950s & 1960s, Scottish Peregrine numbers from the periodic national surveys peaked at 639 occupied territories in 1991 (Crick & Radcliffe 1995) but have subsequently shown signs of decline in some parts of Scotland. The last national survey in



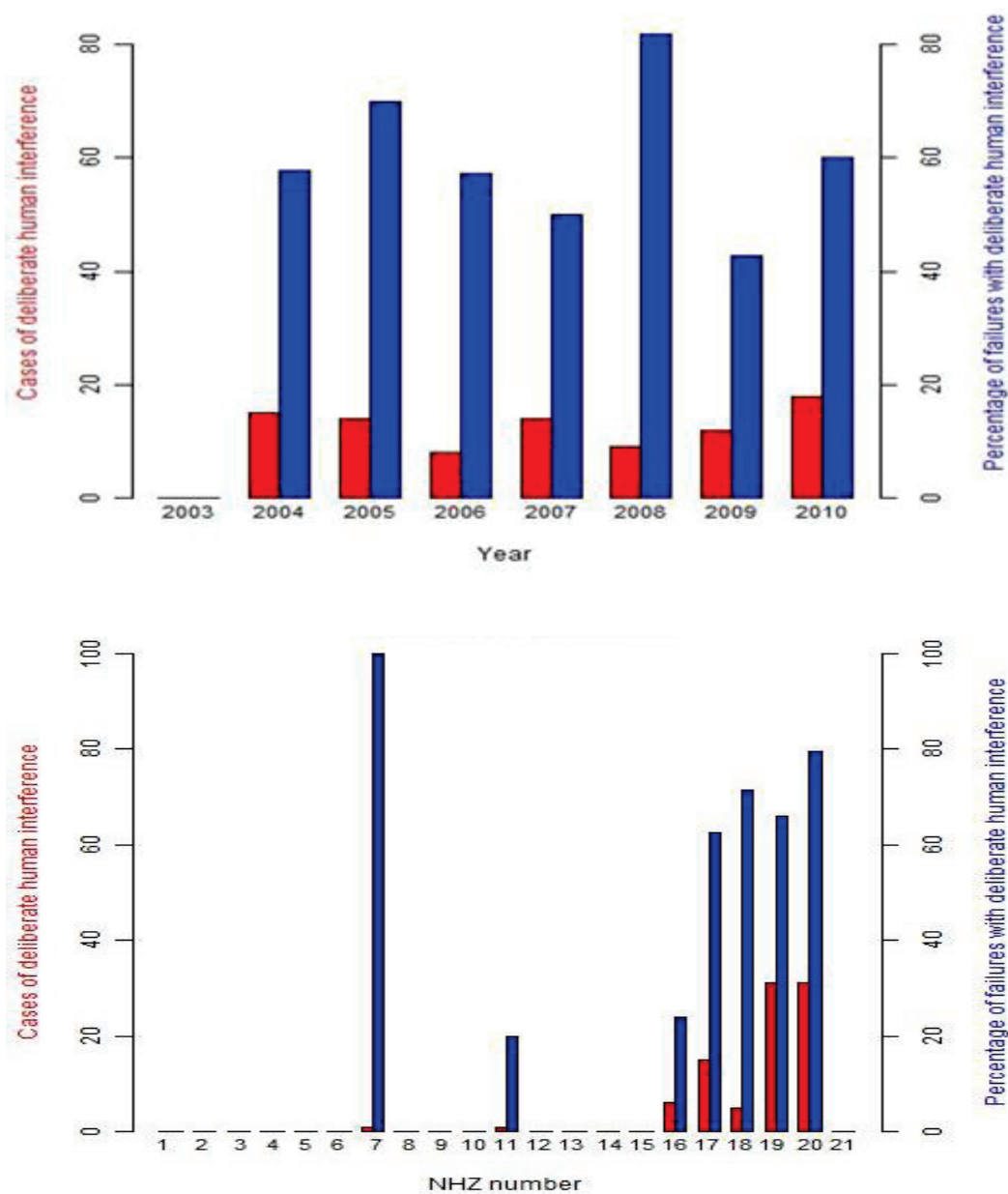


Figure 4: Incidences of known or suspected deliberate illegal human disturbance to breeding Peregrine Falcons submitted via the SRMS between 2003 and 2010 (a) by year and (b) by Natural Heritage Zone (biogeographical zone) of Scotland. Red bars indicate the actual numbers of cases, and blue bars the number of cases expressed as a percentage of the overall number of breeding failures recorded in that year or NHZ. Key to NHZs: 1 = Shetland, 2 = North Caithness and Orkney, 3 = Western Isles, 4 = North West Seaboard, 5 = The Peatlands of Caithness and Sutherland, 6 = Western Seaboard, 7 = Northern Highlands, 8 = Western Highlands, 9 = North East Coastal Plain, 10 = Central Highlands, 11 = Cairngorms Massif, 12 = North East Glens, 13 = Lochaber, 14 = Argyll West and Islands, 15 = Breadalbane and East Argyll, 16 = Eastern Lowlands, 17 = West Central Belt, 18 = Wigtown Machairs and Outer Solway, 19 = Western Southern Uplands and Inner Solway, 20 = Border Hills, 21 = Moray Firth.

2002 estimated 592 occupied territories (Banks *et al.* 2010) and the results of the next survey in 2014 are eagerly awaited. In 2012, 618 home ranges were checked (Table 23). There were signs of occupation at 361 (58%); 315 (51%) by pairs and 46 (7%) by single birds. Follow up monitoring visits were carried out on 279 pairs. Of these 45 (16%) either failed at an early stage or were non-breeding, 48 pairs (17%) failed during incubation and a further 14 pairs (5%) failed with young. One hundred and seventy-two pairs (62%) successfully reared a minimum of 372 young giving a mean brood size per monitored pair of 1.3 young. Table 24 shows territory occupation over the last ten years, 2003–2012, and suggests some decline through time, although turnover of the sites monitored in the sample through time has not been formally taken into account in this simple presentation of the data to date. In the 2011 report (Etheridge *et al.* 2013), a simple analysis suggested that home ranges in the uplands have lower occupancy and breeding success than those on lower ground, and home ranges on land subject to game management for shooting have lower occupancy and poorer breeding success than similar ground where shooting does not occur. Further detailed analyses of SRMS data would be valuable to investigate differences in the success of Peregrines in different habitats in Scotland and environmental and human drivers of this variation. Recent work to look more closely at information on deliberate illegal human interference submitted annually to the SRMS suggests that the direct killing of adult birds and the destruction of nests is still prevalent, particularly so in parts of eastern and southern Scotland (in some regions and years suggested as accounting for more than 60% of recorded nesting failures; Figure 4). The threat from illegal falconers and egg collectors is thought to be still present but declining. Pollutants such as PCBs and mercury have been suggested as affecting coastal breeding populations in the north and west Highlands through the seabird food chain, whilst habitat

degradation in some upland areas is likely to have reduced the prey base.

3.15 Barn Owl *Tyto alba* (Tables 25 & 26)

The severe winters of 2009/10 and 2010/11, with freezing conditions and snow cover across Scotland, were probably responsible for the low occupancy rates in the following springs. Of the 702 nest sites checked in 2012, 295 (only 42%) were occupied by pairs, showing no indication of population recovery (Table 26). Barn Owl surveyors across the country reported a poor breeding season in 2012, due to the combination of wet weather and low vole numbers in many places, and this was reflected in the 2012 breeding results. Of the 279 pairs that were monitored further for breeding success, 86% went on to lay eggs (the lowest proportion since 2006; Table 25). Only 188 pairs (78%) fledged young (again the lowest proportion since 2006) and the mean brood size of only 1.68 per laying pair was the lowest recorded by the SRMS since 2003 (and the first time this has fallen below 2.0 young per laying pair).

3.16 Tawny Owl *Strix aluco* (Tables 27 & 28)

Tawny Owls are the most abundant owl species in Scotland. They are widespread on the Scottish mainland, except in more mountainous areas, and also occupy some islands, notably those close to the mainland (Petty 2007). The number of pairs monitored annually has nearly doubled since the Scheme began in 2003 (Table 27). In 2012, nesting data for this species were submitted from Highland, Tayside, Argyll, Central Scotland, Lothian & Borders and Dumfries & Galloway

(Table 28). A total of 239 nest sites were checked (mainly nest boxes) and 131 pairs were located. Of the 124 pairs monitored, 117 (94 %) laid eggs and 107 pairs (86 %) hatched young. The mean breeding success was 1.4 young per monitored pair.

3.17 Long-eared Owl *Asio otus* **(Table 29)**

Although Long-eared Owls regularly breed in most regions of Scotland, apart from the Northern Isles, this is a secretive and overlooked species and so is under-recorded throughout its range. To further our knowledge about its numbers, the Rare Breeding Birds Panel began reporting this species with effect from the 2010 season (Holling *et al.* 2012), when only 304 pairs were identified across the whole of the UK (62 in Scotland). There are no detailed local studies in Scotland and the poor weather in summer 2012, with many wet and windy nights, will have reduced opportunities for locating both adults and squeaking young calling for food. Perhaps therefore it is not surprising that the number of monitored home ranges dropped in 2012, to 31 from 46 in 2011. Of these 31 known territories checked, 23 (74%) had signs of occupation, a similar proportion to 2011. Thirteen pairs were known to lay eggs and 12 (92%) succeeded in fledging young and the mean brood size was 1.8 per laying pair – the latter two figures being the same as in 2011. However, sample sizes were small, with only 22 young counted, less than half the total in 2011.

3.18 Short-eared Owl *Asio flammeus* **(Table 30)**

There was a welcome, almost three-fold, increase in the number of known sites (207)

checked for this species in 2012. A total of 105 sites (51%) were found to hold pairs and 87 single birds were also located. Thirty-three nests were found and monitored, and 28 (85%) fledged young. The (minimum) mean brood size from these 28 monitored nests was only 1.8, lower than the figures of 2.2 in 2011 and 2.7 in 2010, and presumably reflecting the wet summer conditions and their impact on hunting success and brood rearing. However, any count of fledged young will always be minimal as they disperse away from the nest long before they are capable of flying. This is a species for which the SRMS is very keen to see expansion of monitoring coverage but it is a challenging bird to survey systematically.

3.19 Northern Raven *Corvus corax* **(Tables 31 & 32)**

Northern Raven numbers appear to be increasing in Scotland. One consequence of this is the formation of flocks of non-breeding birds that are not holding territory – including juveniles and older paired birds. These flocks – which provide spectacular bird watching opportunities - may be seen at any time of year but most frequently in late autumn and winter. Once on territory, breeding adults are strongly site-faithful (Mearns 2007). The number of Northern Raven pairs monitored under the Scheme has increased from less than 200 in 2003 to more than 300 annually since 2008 (Table 31). In 2012, 450 home ranges were checked, 371 were found occupied and 324 pairs were monitored (Table 32). Of these, 297 (92 %) were confirmed to lay eggs and 265 pairs (82 %) reared young. With a minimum of 725 fledged young recorded, the mean breeding success was 2.2 fledged young per monitored pair and 2.4 per pair laying eggs.

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The current Scottish Raptor Monitoring Officer, Brian Etheridge, is due to retire during 2013. Please continue to send breeding records for raptors, owls and Northern Raven for 2013 to him until the new Scottish Raptor Monitoring Coordinator has been appointed. If you have any queries you can contact the Scheme by e-mailing srms@bto.org (a secure e-mail address, only viewable by Chris Wernham, which will be transferred to the new SRMS Coordinator once he/she is appointed).

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6 Tables

Table 1. Scottish Raptor Monitoring Scheme: home ranges checked and monitored, 2003–2011.

Year	Home ranges checked	Annual change	Occupied home ranges monitored	Annual change
2003	3483		2406	
2004	3488	+0.1	2277	-5.4
2005	3618	+3.7	2289	+0.5
2006	4006	+10.7	2525	+10.3
2007	4284	+6.9	2614	+3.5
2008	4606	+7.5	2800	+7.1
2009	4472	-2.9	2592	-7.4
2010	4811	+7.6	2824	+9.0
2011	5246	+9.0	3011	+6.6
2012	5736	+9.0	3042	+1.0

Table 2. Population growth and breeding success of Red Kites in Scotland, 1992–2012.

Year ¹	Pairs laying eggs	Pairs fledging young	Total young fledged	% of pairs that fledged young	Productivity: young per laying pair
1992	1	1	1	100.00	1.00
1993	5	3	7	60.00	1.40
1994	8	7	13	87.50	1.63
1995	15	11	26	73.33	1.73
1996	17	16	39	94.12	2.29
1997	23	19	39	82.61	1.70
1998	25	22	49	88.00	1.96
1999	34	27	59	79.41	1.74
2000	39	35	86	89.74	2.21
2001	43	38	95	88.37	2.21
2002	50	43	112	86.00	2.24
2003	54	48	106	88.89	1.96
2004	60	49	115	81.67	1.92
2005	76	61	131	80.26	1.72
2006	84	69	151	82.14	1.80
2007	93	73	162	78.49	1.74
2008	121	97	210	80.00	1.74
2009	152	113	235	74.34	1.55
2010	162	134	293	82.72	1.81
2011	185	155	313	83.78	1.69
2012	212	170	312	80.18	1.47
TOTAL	1459	1191	2554	81.63	1.75

¹ Breeding in North Scotland started in 1992, in Central Scotland in 1998, in Dumfries & Galloway in 2003 and in Aberdeen in 2008. The mean values given for the final columns are the unweighted means, i.e. the sample sizes for each year has not been taken into consideration.

Table 3. Breeding success of Red Kites on Scotland in 2012.

Region	Home ranges checked	Pairs located	Pairs monitored	Pairs failing early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Highland								
Black Isle	42	31	28	0	28	24	24	47
Easter Ross	39	26	21	0	21	18	18	35
Inverness-shire	6	5	4	0	4	4	4	6
sub-total	87	62	53	0	53	46	46	88
Aberdeenshire	24	19	19	0	19	16	15	31
Perthshire	72	54	51	4	47	41	37	70
Stirlingshire	52	27	26	0	26	22	21	31
Dumfries & Galloway	73	70	69	2	67	54	51	92
Grand total	308	232	218	6	212	179	170	312

Table 4. White-tailed Eagle breeding success and productivity in Scotland, 1996–2012.

Year	Territorial pairs monitored	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Total young fledged	Young fledged per laying pair	Young fledged per territorial pair
1996	12	12	8	7	9	0.75	0.75
1997	14	11	6	5	9	0.82	0.64
1998	19	16	9	9	13	0.81	0.68
1999	20	16	9	6	11	0.69	0.55
2000	22	19	12	8	12	0.63	0.55
2001	23	17	10	7	11	0.65	0.48
2002	25	22	14	8	12	0.55	0.48
2003	31	25	20	16	26	1.04	0.84
2004	32	28	19	15	19	0.68	0.59
2005	33	28	21	17	24	0.86	0.73
2006	36	31	25	21	29	0.94	0.81
2007	42	35	31	24	34	0.97	0.81
2008	44	35	21	20	28	0.80	0.64
2009	46	39	31	24	36	0.92	0.78
2010	52	47	34	33	46	0.98	0.88
2011	57	49	38	33	43	0.88	0.75
2012	67	59	46	41	60	1.02	0.90
Total	575	489	354	294	422	0.86	0.73

Table 5. Breeding success of White-tailed Eagles in Scotland in 2012.

Study area	Confirmed occupied by pairs	Nest built up	Incubation confirmed	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Western Isles	19	18	18	13	12	20
NW Highlands	5	5	4	3	3	3
Skye, Lochalsh & Small Isles	17	15	13	10	7	9
Lochaber and mainland Argyll	8	7	7	5	4	6
Argyll islands	18	18	17	15	15	22
Grand total	67	63	59	46	41	60

Table 6. Breeding success of Marsh Harriers in Scotland, 2003–2012.

Year	Pairs located	pairs laying eggs	Pairs fledging young	Minimum number of young fledged
2003	6	6	5	17
2004	8	5	5	15
2005	9	6	5	17
2006	9	7	7	20
2007	8	5	2	3
2008	4	4	2	3
2009	6	3	3	10
2010	4*	4*	4*	11
2011	5	5	4	10
2012	9	9?	5	12

*one male in 2010 was polygamous

Table 7. Home range occupancy and breeding success of Hen Harriers in Scotland, 2003–2012

Year	Home ranges checked	Home ranges occupied by pairs	%	Monitored pair occupied home ranges	Pairs known to lay eggs	%*	Pairs known to fledge young	%*	Minimum number of young fledged	Mean brood size per successful nest	Mean brood size per pair laying	Mean brood size per monitored occupied home range
2003	379	335	88	303	271	89	171	56	529	3.1	2.0	1.7
2004	457	417	91	359	236	91	219	61	630	2.9	1.9	1.8
2005	395	342	87	310	268	86	175	56	466	2.7	1.7	1.5
2006	428	355	83	278	223	80	144	52	381	2.6	1.5	1.4
2007	415	298	72	253	213	84	147	58	432	2.9	2.0	1.7
2008	422	311	74	311	232	75	128	41	370	2.9	1.6	1.2
2009	365	232	64	208	162	78	108	52	326	3.0	2.0	1.6
2010	383	240	63	222	182	82	108	49	303	2.8	1.7	1.4
2011	490	267	54	246	186	76	111	45	291	2.6	1.6	1.2
2012	558	259	46	217	160	74	107	49	275	2.6	1.7	1.3

* expressed as a percentage of monitored pair occupied home ranges

Table 8. Breeding success of Hen Harriers in Scotland in 2012.

Region*	Home ranges checked	Home ranges occupied by pairs	Additional home ranges with single birds	Pair occupied home ranges monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
Orkney									
West Mainland	110	70	8	68	25	43	34	25	64
East Mainland	10	10	0	10	1	9	6	5	12
Rousay	12	8	4	5	2	3	1	1	3
Hoy	26	22	2	18	7	11	8	6	14
Sub-total	158	110	14	101	35	66	49	37	93
Hebrides									
Uists	19	19	0	18	0	18	18	17	46
Skye, Rum & Eigg	25	8	4	8	1	7	6	4	16
Sub-total	44	27	4	26	1	25	24	21	62
North Highlands									
Sutherland	16	7	2	7	0	7	7	5	11
Inverness	13	3	5	3	2	1	1	1	4
Sub-total	29	10	7	10	2	8	8	6	15
East Highlands									
Moray	31	9	0	9	5	4	3	1	3
Aberdeen	14	0	-	-	-	-	-	-	-
Angus	30	0	-	-	-	-	-	-	-
Perthshire	60	35	9	30	7	23	18	15	31
Sub-total	135	44	9	39	12	27	21	16	34
West Highlands & Islands									
Central Scotland	15	2	2	2	0	2	1	1	1
Kintyre & mid-Argyll	9	4	1	4	0	4	3	3	8
Cowal & Bute	14	2	2	2	0	2	1	0	0
Islay, Jura & Colonsay	18	11	0	9	0	9	9	9	24
Mull & Coll	50	35	0	10	0	10	10	10	26
Sub-total	106	54	5	27	0	27	24	23	59
Southwest & Southern Uplands									
East Ayrshire	27	2	2	2	0	2	2	1	3
South Ayrshire	5	1	0	1	0	1	1	0	-
Renfrew Heights	19	0	1	-	-	-	-	-	-
South Lanarkshire	23	2	0	2	2	-	-	-	-
Lothian & Borders	4	4	0	4	2	2	2	1	3
Dumfries & Galloway	8	5	1	5	3	2	2	2	6
Sub-total	86	14	4	14	7	7	7	4	12
Grand total	558	259	43	217	57	160	133	107	275

* For this species, the regions reported are those used to summarise the findings of national surveys in 1988/89, 1994, 2004 and 2010 (Figure 5).

Table 9. Home range occupancy and breeding success of Northern Goshawks in Scotland, 2003–12.

Year	Home ranges checked	Home ranges occupied	%	Pairs known to lay eggs	Pairs known to fledge young	%	Minimum number of young fledged	Young per breeding pair
2003	117	84	72	62	52	84	121	1.95
2004	132	86	65	67	60	90	126	1.88
2005	116	81	70	58	47	81	117	2.02
2006	116	78	67	60	48	80	108	1.80
2007	136	87	64	70	60	86	127	1.81
2008	139	89	64	70	61	87	163	2.33
2009	128	85	66	77	68	88	167	2.17
2010	143	97	68	92	75	82	182	1.98
2011	158	116	73	102	89	87	212	2.08
2012	171	128	75	117	98	84	202	1.73

Table 10. Breeding success of Northern Goshawks in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by pairs	Further home ranges in use ¹	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
Highland	3	3	0	3	0	3	2	2	7
Northeast Scotland	67	53	4	53	3	50	[42]	42	82
Tayside	12	8	3	6	0	6	5	5	12
Central Scotland	4	3	0	2	0	2	2	2	7
South Strathclyde	2	2	0	1	0	1	1	1	2
Lothian & Borders	48	33	4	29	0	29	25	23	45
Dumfries & Galloway	35	26	0	26	0	26	24	23	47
Grand total	171	128	11	120	3	117	59	98	202

¹ Fresh signs or single birds recorded

Figures in square brackets were not provided. Therefore a minimum figure used.

Table 11. Home range occupancy and breeding success of Eurasian Sparrowhawks in Scotland, 2003–12.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pair occupied home ranges monitored	Pairs known to lay eggs	%	Pairs fledging young	%	Minimum number of young fledged	Mean brood size per pair laying	Mean brood size per monitored occupied home range
2003	63	45	71	43	39	91	33	77	114	2.9	2.7
2004	72	58	81	44	44	100	35	80	97	2.2	2.2
2005	98	69	70	59	55	93	47	80	150	2.7	2.5
2006	84	51	61	39	36	92	31	79	112	3.1	2.9
2007	104	67	64	55	52	95	42	76	135	2.6	2.5
2008	98	64	65	54	52	96	45	83	123	2.4	2.3
2009	176	97	55	89	87	98	78	88	182	2.1	2.0
2010	128	71	55	61	58	95	53	87	157	2.7	2.6
2011	128	97	76	89	76	85	72	81	177	2.3	2.0
2012	140	79	56	69	59	86	50	72	134	2.3	1.9

Table 12. Breeding success of Eurasian Sparrowhawks in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by pairs	Home ranges monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
Orkney	20	10	9	3	6	5	4	12
Uist	2	2	2	1	1	1	1	2
Highland								
Isles of Eigg & Rum	4	3	3	0	3	3	3	6
Mainland	8	7	7	0	7	7	4	7
Central Scotland	29	15	14	3	11	11	11	30
Argyll								
Colonsay	4	4	0	-	-	-	-	-
Mainland	7	6	5	0	5	5	5	8
South Strathclyde								
Ayrshire study	28	17	14	0	14	11	10	26
Lothian & Borders								
Edinburgh city study	37	14	14	3	11	11	11	40
Dumfries & Galloway	1	1	1	0	1	1	1	3
Grand total	140	79	69	10	59	55	50	134

Table 13. Home range occupancy and breeding success of Common Buzzards in Scotland, 2003–2012.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pair occupied home ranges monitored	Pairs known to lay eggs	%*	Pairs fledging young	%*	Minimum number of young fledged	Mean brood size per pair laying	Mean brood size per monitored occupied home range
2003	342	298	87	270	246	91	209	77	435	1.8	1.6
2004	388	338	87	285	279	98	240	84	505	1.8	1.8
2005	418	349	83	273	261	96	218	80	377	1.4	1.4
2006	499	416	83	337	300	89	251	74	475	1.6	1.4
2007	652	528	81	410	360	88	307	75	590	1.6	1.4
2008	742	627	85	409	346	85	311	76	546	1.6	1.3
2009	660	491	74	382	325	85	275	72	476	1.5	1.2
2010	913	672	74	495	443	89	400	81	674	1.5	1.4
2011	989	747	76	539	490	91	398	74	699	1.4	1.3
2012	931	669	72	536	464	87	394	74	640	1.4	1.2

* expressed as a percentage of monitored pair occupied home range.

Table 14. Breeding success of Common Buzzards in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by pairs	Home ranges occupied by single birds	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
Orkney	13	9	2	9	1	8	5	5	9
Lewis & Harris	5	5	0	5	0	5	5	5	6
Uist	7	7	0	7	0	7	7	7	11
Highlands									
Eigg	8	8	0	8	1	7	7	7	11
Caithness & Sutherland	9	9	0	8	0	8	8	8	15
Ross-shire	82	60	0	60	9	51	44	42	79
Moray, Badenoch & Strathspey	11	11	0	10	0	10	10	9	15
Sub-total	110	88	0	86	10	76	69	66	120
North-east Scotland	153	74	1	63	1	62	[55]	55	76
Tayside & Fife									
Angus	31	29	0	20	1	19	19	18	25
Strathallan, Perth study	100	66	2	38	8	30	30	30	45
Fife	16	14	0	13	2	11	11	9	9
Sub-total	147	109	2	71	11	60	60	57	79
Central Scotland									
N Lanarkshire	37	35	0	29	2	27	24	22	36
Falkirk	31	20	7	6	1	5	5	5	8
Stirling	206	177	3	148	41	107	87	80	105
Sub-total	274	232	10	183	44	139	116	107	149
Argyll									
Tiree	12	12	0	2	0	2	2	2	3
Colonsay	58	12	6	12	0	12	8	8	12
Islay	9	8	0	7	2	5	5	5	7
Bute	42	21	2	14	1	13	12	12	26
Kintyre	6	6	0	5	0	5	5	5	11
Sub-total	127	59	8	40	3	37	32	32	59
Lothian & Borders									
Lothian	34	32	1	29	0	29	26	22	50
Borders	33	30	0	22	0	22	22	22	47
Sub-total	67	62	1	51	0	51	48	44	97
Dumfries & Galloway	28	24	3	21	2	19	16	16	34
Grand total	931	669	27	536	72	464	413	394	640

Figures in square brackets were not provided. Therefore a minimum figure used.

Table 15. Home range occupancy and breeding success of Golden Eagles in Scotland, 2004–2012.

Year	Home ranges checked	Home ranges occupied by pairs	%	Further home ranges in use ¹	Pairs monitored	Pairs known to fledge young	%	Minimum number of young fledged	Mean brood size per successful pair	Mean brood size per monitored pair
2004	232	175	75	19	151	81	54	97	1.20	0.64
2005	264	220	83	19	207	72	35	88	1.22	0.43
2006	290	233	80	27	218	78	36	84	1.08	0.39
2007	291	227	78	26	216	92	43	104	1.13	0.48
2008	310	242	78	28	224	111	50	123	1.11	0.55
2009	307	242	79	28	232	95	41	111	1.17	0.48
2010 ²	344	264	77	36	247	111	45	134	1.21	0.54
2011	345	280	81	26	247	91	37	108	1.19	0.44
2012	356	306	86	14	280	95	34	109	1.15	0.39

¹ Additional home ranges occupied by single birds or showing signs of occupation but no pair seen.

² Amended totals from 2010 SRMS report.

Table 16. Breeding success of Golden Eagles in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by pairs	Of which immature pairs ¹	Further home ranges in use ²	Pairs monitored	Failed early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Min. number of young fledged
Lewis & Harris										
Lewis	13	13	0	0	11	1	10	6	5	7
Harris	11	11	0	0	9	2	7	4	4	4
Sub-total	24	24	0	0	20	3	17	10	9	11
Uists										
North Uist	9	8	1	1	8	4	4	4	3	4
Benbecula	2	2	0	0	2	1	1	1	0	0
South Uist	9	9	0	0	7	2	5	3	2	2
Barra	2	2	0	0	0	-	-	-	-	-
Sub-total	22	21	1	1	17	7	10	8	5	6
Highland										
Sutherland	37	32	2	1	26	12	14	9	8	8
Wester Ross	19	17	0	0	17	12	5	3	3	3
Easter Ross	11	8	1	1	8	3	5	3	2	2
Skye	34	30	0	0	30	11	19	9	7	8
Rum, Canna & Eigg	6	6	0	0	6	0	6	4	4	6
Ardnamurchan, Morvern & Sunart	24	23	4	0	22	12	10	8	5	5
West Inverness	17	13	1	0	9	3	6	4	3	3
East Inverness	14	6	1	5	6	4	2	1	1	1
Badenoch	14	14	3	0	12	3	9	7	6	9
Sub-total	176	149	12	7	136	60	76	48	39	45
Northeast Scotland	23	14	2	4	14	5	9	7	7	10
Tayside										
Perthshire west of A9 road	16	13	2	1	13	5	8	7	6	6
Perthshire east of A9 road	5	5	0	0	5	2	3	2	2	2
Angus glens	8	5	0	0	5	1	4	4	4	5
Sub-total	29	23	2	1	23	8	15	13	12	13
Central Scotland	11	10	0	0	8	5	3	2	2	2
Argyll										
South Argyll	27	24	2	0	24	10	14	11	8	8
Mull	32	31	0	0	28	13	15	10	9	9
Islay & Colonsay	7	7	0	0	7	1	6	4	4	5
Sub-total	66	62	2	0	59	24	35	25	21	22
Lothian & Borders	3	1	1	1	1	0	0	0	0	0
Dumfries & Galloway	2	2	1	0	2	1	1	1	0	0
Grand total	356	306	21	14	280	113	166	114	95	109

¹ These immature pairs are included in the column 'Home ranges occupied by pairs'. For the purpose of this report, we regard pairs consisting of either one or two birds with immature plumage as immature pairs.

² Additional home ranges occupied by single birds or showing signs of occupation but no pair seen.

Table 17. Home range occupancy and breeding success of Ospreys in Scotland, 2003-2012.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pairs monitored	Pairs failing early or non-breeding	Pairs laying eggs	Pairs known to fledge young	%	Minimum number of young fledged	Mean brood size per successful nest	Mean brood size per monitored pair
2003	232	162	70%	[162]	[22]	140	109	67%	229	2.1	1.41
2004	230	182	79%	[182]	[27]	155	114	63%	233	2.04	1.28
2005	239	180	75%	[180]	[22]	158	124	69%	242	1.95	1.34
2006	206	155	75%	[155]	[12]	143	111	72%	225	2.03	1.45
2007	198	140	71%	138	19	119	92	67%	182	1.98	1.32
2008	>211	208–211	-	204	31	173	148–149	73%	303	2.04	1.49
2009	209	168	80%	166	10	156	130	78%	259	1.99	1.56
2010	229	193	84%	190	24	166	144	76%	306	2.13	1.61
2011	260	202	78%	201	28	173	104	52%	210	2.02	1.04
2012	276	195	71%	194	14	180	142	73%	278	1.96	1.43

Table 18. Breeding success of Ospreys in Scotland in 2012.

Region	Breeding sites checked	Pairs present	Single birds	Pairs monitored	Pairs failing early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Highland									
Sutherland/Caithness	19	17	1	16	0	16	16	16	34
Ross-shire	26	19	4	19	3	16	13	13	25
Inverness-shire	18	10	3	10	0	10	8	8	17
Moray & Nairn	14	11	1	11	0	11	9	9	18
Badenoch & Strathspey	11	9	1	9	0	9	6	6	10
sub-total	88	66	10	65	3	62	52	52	104
North-east Scotland	28	21	0	21	1	20	15	15	25
Tayside									
Angus	12	9	0	9	0	9	8	8	14
Perthshire	56	34	3	34	2	32	26	25	44
sub-total	68	43	3	43	2	41	34	33	58
Central Scotland	34	26	0	26	4	22	19	16	29
Argyll	28	19	1	19	2	17	14	14	39
South Strathclyde	4	4	0	4	2	2	2	1	1
Lothian & Borders	13	10	1	10	0	10	7	7	16
Dumfries & Galloway	13	6	4	6	0	6	5	4	6
Grand total	276	195	19	194	14	180	148	142	278

Table 19. Home range occupancy and breeding success of Common Kestrels in Scotland, 2003–12.

Year	Home ranges checked	Home ranges with signs of occupation	%	Pair occupied monitored home ranges	Pairs known to lay eggs	% of pair occupied monitored home range	Pairs fledging young	% of pair occupied monitored home range	Minimum number of young fledged	Mean brood size per pair laying	Mean brood size per pair occupied monitored home range
2003	74	64	86	57	54	95	50	88	184	3.4	3.2
2004	-	127	-	110	106	96	87	79	338	3.2	3.1
2005	151	112	74	92	83	90	64	70	231	2.8	2.5
2006	113	94	83	74	66	89	63	85	211	3.2	2.9
2007	90	52	58	39	36	92	35	90	139	3.9	3.6
2008	115	90	78	68	63	93	59	87	206	3.3	3.0
2009	105	58	55	52	48	92	45	87	140	2.9	2.7
2010	123	98	80	77	74	96	71	92	222	3.0	2.9
2011	212	140	66	95	89	94	86	91	274	3.1	2.9
2012	298	172	58	134	128	96	111	83	320	2.5	2.4

Table 20. Breeding success of Common Kestrels in Scotland in 2012.

Region	Nest sites checked	Pairs present	Pairs monitored	Pairs failing early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Orkney	28	20	16	2	14	12	9	23
Usits	13	13	10	0	10	10	10	29
Highland	8	4	4	0	4	4	4	12
Isle of Eigg	6	6	4	0	4	4	4	6
Northeast Scotland	9	7	7	0	7	7	7	27
Tayside	47	46	25	0	25	24	22	57
Central Scotland	48	18	15	0	15	15	14	35
Argyll	14	7	5	1	4	4	4	11
South Strathclyde	46	26	26	3	23	21	21	63
Lothian & Borders	61	21	18	0	18	15	13	44
Dumfries & Galloway	18	4	4	0	4	3	3	13
Grand total	298	172	134	6	128	119	111	320

Table 21. Breeding success of Merlins in Scotland in 2012.

Region	Home ranges checked	Home ranges with signs of occupation ¹	Home ranges occupied by pairs	Pairs monitored	Failed early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Orkney									
West Mainland	23	8	6	5	2	3	2	2	4
East Mainland	1	1	1	1	1	-	-	-	-
Rousay & Stronsay	3	2	2	1	0	1	0	-	-
Hoy	19	6	5	4	0	4	4	3	9
Sub-total	46	17	14	11	3	8	6	5	13
Lewis & Harris	3	3	2	1	0	1	1	1	2
Uists	9	9	9	6	0	6	6	5	14
Highland									
Isles of Rum & Skye	6	6	6	6	0	6	5	4	11
Ross-shire/Sutherland	22	14	14	11	1	10	6	4	12
Inverness/Badenoch	13	11	11	10	0	10	9	7	17
West Moray/Nairn	1	1	1	1	0	1	1	1	2
Sub-total	42	32	32	28	1	27	21	16	42
Northeast Scotland									
East Moray	24	12	10	10	0	10	8	8	18
Lower Deeside	22	7	7	7	0	7	6	6	20
Mid/upper Deeside	40	23	20	19	2	17	15	15	54
Donside	19	12	9	9	0	9	7	6	19
Sub-total	105	54	46	45	2	43	36	35	111
Tayside									
Perthshire	47	32	18	13	2	11	8	8	16
Angus	29	19	12	11	0	11	10	8	23
Sub-total	76	51	30	24	2	22	18	16	39
Central Scotland	8	1	0	-	-	-	-	-	-
Argyll	2	2	2	2	0	2	2	2	6
South Strathclyde	12	11	10	9	2	7	6	6	15
Lothian & Borders									
Moorfoot Hills	8	1	0	-	-	-	-	-	-
Lammermuir Hills	29	11	8	8	0	8	7	5	19
Pentland Hills	11	3	2	1	0	1	1	1	4
South of River Tweed	10	9	9	6	0	6	5	5	12
Sub-total	58	24	19	15	0	15	13	11	35
Dumfries & Galloway	8	7	6	4	0	4	4	3	10
Grand total	369	211	170	145	10	135	113	100	287

¹The number of home ranges that was occupied by pairs and single birds plus the number of home ranges where fresh signs of Merlins observed.

Table 22. Home range occupancy and breeding success of Merlin in Scotland, 2003–2012.

Year	Home ranges checked	Home ranges with signs of occupation	%	Pair occupied monitored home ranges	Pairs known to lay eggs	% of pair occupied monitored home range	Pairs fledging young	% of pair occupied monitored home range	Minimum number of young fledged	Mean brood size per pair laying	Mean brood size per pair occupied monitored home range
2003	387	242 ¹	63%	[190]	190	-	141	-	476	2.5	-
2004	403	254 ¹	63%	[175]	175	-	115	-	319	1.8	-
2005	409	290	71%	[189]	189	-	156	-	500	2.6	-
2006	462	285	62%	189	171	90%	133	70%	402	2.4	2.1
2007	397	262	66%	168	157	93%	128	76%	403	2.6	2.4
2008 ²	513	314	61%	209	187	89%	142	68%	433	2.3	2.1
2009	318	204	64%	145 ³	126	87%	112	77%	353	2.8	2.4
2010	400	201	50%	133	127	95%	113	85%	335	2.6	2.5
2011	362	202	56%	137	121	88%	108	79%	324	2.7	2.4
2012	369	211	57%	145	135	93%	100	69%	287	2.1	2.0

¹ Figures refer to home ranges occupied by pairs, a slightly lower figure than those showing signs of occupation.

² 2008 was the year of a National Merlin Survey, resulting in improved coverage.

³ Corrected figure from 2009 report.

Table 23. Breeding success of Peregrine Falcons in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by single birds	Home ranges occupied by pairs	Pairs monitored	Pairs failing early or non-breeding	Pairs laying eggs	Pairs hatching young	Pairs fledging young	Minimum number of young fledged
Orkney									
Mainland	12	2	8	7	2	5	5	5	10
Hoy	12	0	5	5	0	5	5	5	7
Other islands	6	0	3	3	0	3	3	3	5
Sub-total	30	2	16	15	2	13	13	13	22
Uist	5	0	5	5	0	5	5	5	9
Highland									
Sutherland	3	0	3	3	0	3	3	3	6
Easter Ross	6	0	5	2	0	2	2	2	3
Inverness & Nairn	9	0	6	6	1	5	3	3	7
Badenoch & Strathspey	5	1	4	1	0	1	1	1	2
Isle of Eigg	1	0	1	1	0	1	1	1	1
Sub-total	24	1	19	13	1	12	10	10	19
Northeast Scotland									
grouse-moor/deer forest	40	2	15	14	2	12	11	11	19
lowland farmland	23	5	10	6	1	5	3	3	6
sea-cliff/coast	16	2	11	7	0	7	7	7	13
Sub-total	79	9	36	27	3	24	21	21	38
Tayside & Fife									
Perthshire uplands	55	10	26	22	3	19	18	18	38
Perth & Fife lowlands	23	2	12	12	1	11	8	4	9
Angus upland	31	3	13	12	3	9	4	4	8
Angus coastal plain	10	1	7	7	1	6	2	2	7
Sub-total	119	16	58	53	8	45	32	28	62
Central Scotland	28	1	19	16	3	13	11	9	20
Argyll									
mainland	16	1	10	6	1	5	4	4	10
islands	16	2	12	12	3	9	6	6	10
Sub-total	32	3	22	18	4	14	10	10	20
South Strathclyde									
upland/ moorland	29	2	10	10	5	5	3	2	4
urban/industrial	15	1	10	10	0	10	8	7	16
sea-cliff/coast	12	1	6	6	2	4	4	4	6
Sub-total	56	4	26	26	7	19	15	13	26
Lothian & Borders									
heather moorland	24	3	7	6	2	4	3	3	7
upland sheep walk	24	1	7	7	1	6	2	2	6
lowland farmland	26	1	19	19	1	18	15	13	32
urban/industrial	12	1	10	10	4	6	6	6	17
sea-cliff/coast	51	2	14	13	1	12	10	10	28
Sub-total	137	8	57	55	9	46	36	34	90
Dumfries & Galloway									
West Wigtown coast	19	0	15	10	2	8	7	7	14
Stewartry coast	9	0	8	7	1	6	5	4	9
Moffat & Eskdale inland	20	1	12	12	0	12	10	10	29
Nithsdale upland	26	1	8	8	1	7	3	2	4
Galloway inland	34	0	14	14	4	10	8	6	10
Sub-total	108	2	57	51	8	43	33	29	66
TOTAL	618	46	315	279	45	234	186	172	372

Table 24. Occupancy of Peregrine Falcon home ranges in Scotland, 2003–2012.

Year	Home ranges checked	Number occupied	%	Pairs recorded	%	Single birds recorded	%
2003	595	402	67.6	-	-	-	-
2004	579	406	70.1	375	64.8	31	5.4
2005	572	384	67.1	353	61.7	31	5.4
2006	595	391	65.7	352	59.2	39	6.6
2007	633	385	60.8	338	53.4	47	7.4
2008	597	344	57.6	317	53.1	27	4.5
2009	529	303	57.3	272	51.4	31	5.9
2010	554	313	56.5	280	50.5	33	6.0
2011*	524	318	60.7	291	55.5	27	5.2
2012	618	361	58.4	315	51.0	46	7.4

* Northeast Scotland totals for 2011 are not included as the 'home ranges checked' figure was not supplied.

Table 25. Nest site occupancy and breeding success of Barn Owls in Scotland, 2003–2012.

Year	Nesting sites checked	Occupied by pairs	% of those checked	Pairs monitored	Pairs laying eggs	% of those monitored	Pairs fledging young	Breeding success: % of those laying	Minimum number of young fledged	Mean brood size per laying pair
2003	260	238	92	-	226	-	209		656	2.90
2004	279	252	90	-	226	-	197		535	2.37
2005	316	253	80	-	204	-	160		433	2.12
2006	368	278	76	267	249	93	215	86	591	2.37
2007	474	391	82	374	352	94	320	91	1032	2.93
2008	524	409	78	369	340	92	276	81	688	2.02
2009	579	337	58	308	290	94	262	90	795	2.74
2010	545	347	64	330	312	95	285	91	919	2.94
2011	551	301	55	288	283	98	269	95	809	2.86
2012	702	295	42	279	240	86	188	78	402	1.68

Table 26. Breeding success of Barn Owls in Scotland in 2012.

Region	Nesting sites checked	Occupied by pairs	Occupied by single birds	Pairs monitored	Failed early or non-breeding	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Highland									
Sutherland & Caithness	6	5	0	5	0	5	5	4	14
Ross-shire	7	2	1	2	0	2	2	2	3
Inverness & Badenoch	1	1	0	1	0	1	1	1	3
Isle of Eigg	1	1	0	1	1	0	0	0	0
Sub-total	15	9	1	9	1	8	8	7	20
Northeast Scotland	25	11	2	9	0	9	8	8	24
Tayside	5	5	0	5	0	5	5	5	10
Central Scotland									
Clackmannan & Falkirk	16	8	1	8	0	8	7	7	11
Stirling FCS study	57	4	3	4	0	4	4	4	7
Stirling farmland	53	15	1	14	0	14	11	10*	29*
Sub-total	126	27	5	26	0	26	22	21	47
Argyll									
Islay & Mull	9	7	0	7	0	7	7	7	8+
Cowal & Bute	14	3	1	3	1	2	2	2	6
Knapdale & Kintyre	52	28	7	24	3	21	16	13	33
Sub-total	75	38	8	34	4	30	25	22	47+
South Strathclyde									
East Ayrshire	36	20	5	18	3	15	12	12	22
South Ayrshire	13	7	3	6	2	4	3	3	6
Sub-total	49	27	8	24	5	19	15	15	28
Lothian & Borders	147	34	7	30	1	29	26	24	54
Dumfries & Galloway									
Galloway Forest uplands	34	20	3	20	2	18	17	17	37
Stranraer, The Rhins & W Wigton	143	77	31	76	19	57	46	37	67
Galloway & Kirkcudbright lowlands	42	20	7	20	3	17	14	13	25
Nith, Annan & Eskdales	41	27	2	26	4	22	20	19	43
Sub-total	260	144	43	142	28	114	97	86	172
Grand total	702	295	74	279	39	240	206	188	402

* one pair double brooded reared 3 and 6 young in two broods

Table 27. Annual breeding success and productivity of Tawny Owls in Scotland, 2003–2012.

Year	Pairs monitored	Pairs fledging young (%)	Minimum number of young fledged	Mean brood size per pair monitored
2003	70	60 (86%)	131	1.9
2004	67	57 (85%)	108	1.6
2005	92	63 (68%)	103	1.1
2006	123	88 (72%)	173	1.4
2007	101	78 (77%)	142	1.4
2008	77	62 (81%)	111	1.4
2009	91	64 (70%)	93	1.0
2010	86	66 (77%)	122	1.4
2011	130	104 (80%)	193	1.5
2012	124	98 (79%)	179	1.4

Table 28. Breeding success of Tawny Owls in Scotland in 2012.

Region	Nest sites checked	Pairs present	Pairs monitored	Pairs laying eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Highland							
Easter Ross nest box study	37	25	25	25	21	20	34
other locations	7	7	4	4	3	3	5
Tayside							
	16	16	14	14	13	12	22
Argyll							
	3	2	2	0	2	2	3
Central Scotland							
FCS nest box study	53	18	17	17	13	10	13
Argaty nest box study	13	3	3	3	2	2	2
Lothian & Borders							
FCS nest box study	42	29	29	26	26	24	48
Borders nest box study	24	13	12	12	11	11	25
other locations	7	5	5	5	5	5	10
Dumfries & Galloway							
Dumfries nest box study	32	12	12	10	10	8	15
other locations	5	1	1	1	1	1	2
Grand total	239	131	124	117	107	98	179

Table 29. Breeding success of Long-eared Owls in Scotland in 2012.

Region	Known territories checked for occupation	Territories with signs of occupation	Pairs laying eggs	Pairs fledging young	Minimum number of fledged young
Highland	1	1	0	0	0
Isle of Eigg	1	1	0	0	0
Northeast Scotland	3	1	1	1	3
Argyll	1	1	-	-	-
Isle of Colonsay	3	0	0	0	0
Tayside	9	9	7	7	14
Lothian & Borders	13	10	5	4	5
Grand total	31	23	13	12	22

Table 30. Breeding success of Short-eared Owls in Scotland in 2012.

Region	Sites checked	Pairs found	Additional single birds recorded	Nests monitored	Pairs fledging young	Minimum number of young fledged
Orkney	109	48	61	8	5	6+
Uist	2	2	0	1	1	5
Highland	9	6	3	5	5	7+
Northeast Scotland	8	8	0	4	4	11+
Tayside	27	11	15	4	3	7
Central Scotland	17	7	3	0	-	-
Argyll	10	5	0	4	4	4+
Lothian & Borders	20	13	5	6	5	7+
Dumfries & Galloway	5	5	0	1	1	2
TOTAL	207	105	87	33	28	52+

Table 31. Home range occupancy and breeding success of Northern Ravens in Scotland, 2003–2012.

Year	Nesting sites checked	Occupied by pairs	% of those checked	Pairs monitored	Pairs laying eggs	% of those monitored	Pairs fledging young	Breeding success: % of those laying	Minimum number of young fledged	Mean brood size per laying pair
2003	-	-	-	168	148	88	127	86	363	2.5
2004	221	208	94	-	164	-	154	94	417	2.5
2005	289	257	89	-	177	-	139	79	371	2.1
2006	360	324	90	289	249	86	217	87	603	2.4
2007	408	352	86	299	261	87	237	91	636	2.4
2008	404	353	87	317	296	93	219	74	632	2.1
2009	463	394	85	330	316	96	271	86	707	2.2
2010	503	436	87	343	299	87	279	93	731	2.4
2011	465	393	85	321	288	90	264	92	725	2.5
2012	450	371	82	324	297	92	265	89	725	2.4

Table 32. Breeding success of Northern Ravens in Scotland in 2012.

Region	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Failed early or non-breeding	Pairs confirmed with eggs	Pairs hatching eggs	Pairs fledging young	Minimum number of young fledged
Orkney	[42]	[42]	42	[0]	42	[32]	32	85
Lewis & Harris	8	8	3	0	3	3	3	9
Uist	16	16	16	1	15	14	14	35
Highland								
Sutherland	14	14	13	0	13	12	12	39
Inverness, Ross & Badenoch	6	5	4	0	4	4	4	16
Eigg & Rum	9	9	7	0	7	7	7	18
Sub-total	29	28	24	0	24	23	23	73
Northeast Scotland	[9]	[9]	9	0	9	9	9	27
Tayside								
Highland Perthshire	33	25	25	3	22	20	18	50
Perthshire east	11	8	5	1	4	3	3	7
Perth south	17	12	10	3	7	7	7	13
Angus	20	14	14	0	14	12	10	27
Fife	9	7	7	0	7	6	6	21
Sub-total	90	66	61	7	54	48	44	118
Central Scotland								
Dunbartonshire	18	14	13	3	10	10	10	24
N Lanarkshire	6	6	3	0	3	3	3	13
Stirlingshire	23	19	16	5	11	10	9	22
Sub-total	47	39	32	8	24	23	22	59
Argyll								
Tiree, Islay & Mull	15	15	7	0	7	6	6	21
Colonsay	20	12	12	4	8	8	8	23
Bute	26	16	15	1	14	14	14	40
Mainland	5	4	3	0	3	3	3	8
Sub-total	66	47	37	5	32	31	31	92
South Strathclyde								
Lowland	22	18	15	2	13	13	12	24
Upland	22	16	11	0	11	10	10	19
Coastal	15	10	10	1	9	8	8	23
Sub-total	59	44	36	3	33	31	30	66
Lothian & Borders								
Lothian	10	7	7	0	7	7	7	19
Berwickshire coast	13	13	13	0	13	13	13	49
Borders, upland	11	7	7	0	7	6	5	18
Sub-total	34	27	27	0	27	26	25	86
Dumfries & Galloway	50	45	37	3	34	33	32	75
Grand total	450	371	324	27	297	273	265	725

Figures in square brackets were not supplied, the ones given are a minimum figure.

Annex 1: Raptor, owl and Northern Raven nest site and home ranges data submitted under the Scottish Raptor Monitoring Scheme in 2012

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	Northeast Scotland	Orkney	South Strathclyde	Tayside & Fife	Uist	TOTAL
European Honey-buzzard			3									3
Red Kite		52	73	87			24			72		308
White-tailed Eagle ¹	26			22	19							67
Marsh Harrier										9		9
Hen Harrier	91	15	8	54		4	45	158	74	90	19	558
Northern Goshawk		4	35	3		48	67		2	12		171
Eurasian Sparrowhawk	11	29	1	12		37		20	28		2	140
Common Buzzard ²	127	274	28	110	5	67	153	13		147	7	931
Golden Eagle	66	11	2	176	24	3	23			29	22	356
Osprey	28	34	13	88		13	28		4	68		276
Common Kestrel	14	48	18	14		61	9	28	46	47	13	298
Merlin	2	8	8	42	3	58	105	46	12	76	9	369
Eurasian Hobby				1						2		3
Peregrine Falcon	32	28	108	24		137	79	30	56	119	5	618
Barn Owl	75	126	260	15		147	25		49	5		702
Tawny Owl	3	66	37	44		73				16		239
Long-eared Owl	4			2		13	3			9		31
Short-eared Owl	10	17	5	9		20	8	109		27	2	207
Northern Raven	66	47	50	29	8	34	9	42	59	90	16	450
TOTAL	555	759	649	732	59	715	578	446	330	818	95	5736

Annex 1 shows the total number of all breeding sites and home ranges (by area) checked in 2012 and reported under the SRMS. This includes traditional nesting sites and home ranges which were found occupied but received no follow-up during the visit, and also sites and home visits, so their breeding success is unknown.

¹ White-tailed Eagle totals for Lewis & Harris and Uist RSG study areas are included under Lewis & Harris.

² Common Buzzard totals for a study area covering parts of both Central and Tayside regions are included under Central Scotland.

Annex 2: Raptor, owl and Northern Raven breeding attempts monitored under the Scottish Raptor Monitoring Scheme in 2012.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	Northeast Scotland	Orkney	South Strathclyde	Tayside & Fife	Uist	TOTAL
European Honey-buzzard		2										2
Red Kite		26	69	53			19			51		218
White-tailed Eagle ¹	25			20	18							63
Western Marsh Harrier										9		9
Hen Harrier	25	2	5	18		4	9	101	5	30	18	217
Northern Goshawk		2	26	3		29	53		1	6		120
Eurasian Sparrowhawk	5	14	1	10		14		9	14		2	69
Common Buzzard ²	40	183	21	86	5	51	63	9		71	7	536
Golden Eagle	59	8	2	136	20	1	14			23	17	280
Osprey	19	26	6	65		10	21		4	43		194
Common Kestrel	5	15	4	8		18	7	16	26	25	10	135
Merlin	2		4	28	1	15	45	11	9	24	6	145
Eurasian Hobby				1						2		3
Peregrine Falcon	18	16	51	13		55	27	15	26	53	5	279
Barn Owl	34	26	142	9		30	9		24	5		279
Tawny Owl	2	20	13	29		46				14		124
Long-eared Owl						5	1			7		13
Short-eared Owl	4		1	5		6	4	8		4	1	33
Northern Raven	37	32	37	24	3	27	9	42	36	61	16	324
TOTAL	275	372	382	508	47	311	281	211	145	428	82	3042

Annex 2 shows the total number of all breeding sites and home ranges (by area) that were found to be occupied and which received follow-up visits in 2012 i.e. they were effectively monitored to enable a level of breeding success and productivity to be estimated.

¹ White-tailed Eagle totals for a study area covering Lewis & Harris and Uist regions, are included under Lewis & Harris.

² Common Buzzard totals for a study area covering parts of both Central and Tayside regions, are included under Central Scotland.