

# Scottish Raptor Monitoring Scheme Report 2014



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**Front cover photo.** Juvenile Common Buzzard, Fife (Harry Bell).

**Back cover photo.** Juvenile Peregrine Falcons, Ayrshire (Angus Hogg)

## Foreword

In introducing the 2014 report it is a pleasure to highlight that the number of records submitted to the Scheme has reached new record levels with over 6700 home ranges checked for occupancy and over 3400 occupied ranges monitored. This clearly shows the strength of the Scheme especially as 2014 was also a national Peregrine survey year where more effort was directed to that species.

We are in a 'raptor heavy period' within the national breeding bird survey programme with Golden Eagle this year and Hen Harrier in 2016. The levels of effort that go into the fieldwork for these surveys is huge and the voluntary contribution from Scottish Raptor Study Group (SRS) members and other volunteers is increasingly valued by the survey organisers.

The annual monitoring collated by the SRMS does greatly help us keep a handle on what is happening with these species between the periodic national surveys. This has been highlighted in the publication of the SNH commissioned report: Raptors in Scotland - a methodology for developing trends and indicators ([http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/542.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/542.pdf)). This is the first attempt to produce trends for raptors in Scotland and the report assesses where improvements could be made. It only uses SRMS data up to 2009 and we intend to work on providing updated trends where possible on a regular basis.

Improving the quality of data submitted to the Scheme and understanding better the variations in annual survey effort and geographical coverage will enhance our ability to make trends and other information using Scheme data more robust. The better the data the more uses they can have to support raptor conservation.

With Amy now in post we are moving ahead with other aspects of the SRMS. These include producing an online data submission system (it will be an option for data submission not the only method) and an SRMS website. We are grateful for the SRS for hosting the SRMS page on their website but a stand-alone SRMS website will make the Scheme more visible and we have more scope to develop it. The SRMS website can be accessed at <http://raptormonitoring.org/>. I'm aware that there is some concern about the speed of progress currently. We will try to manage progress in light of the concerns but we do hope that it is recognised that this is being done for the benefit of raptor conservation in Scotland and that the SRMS has been looked on favourably internationally.

Thanks are once again due to the partner representatives on the SRMG and their organisations for continuing support of the SRMS and in particular to Amy as the SRMS Coordinator who has coped very well with a steep learning curve.

Andrew Stevenson  
(Chair of the Scottish Raptor Monitoring Group)

# 1 Introduction

This is the twelfth report of the Scottish Raptor Monitoring Scheme covering the year 2014. It follows the previous annual reports in the series (Etheridge 2005; Etheridge *et al.* 2006, 2007, 2008, 2010, 2011, 2012 a & b, 2013a & b & Challis *et al.* 2014). 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.

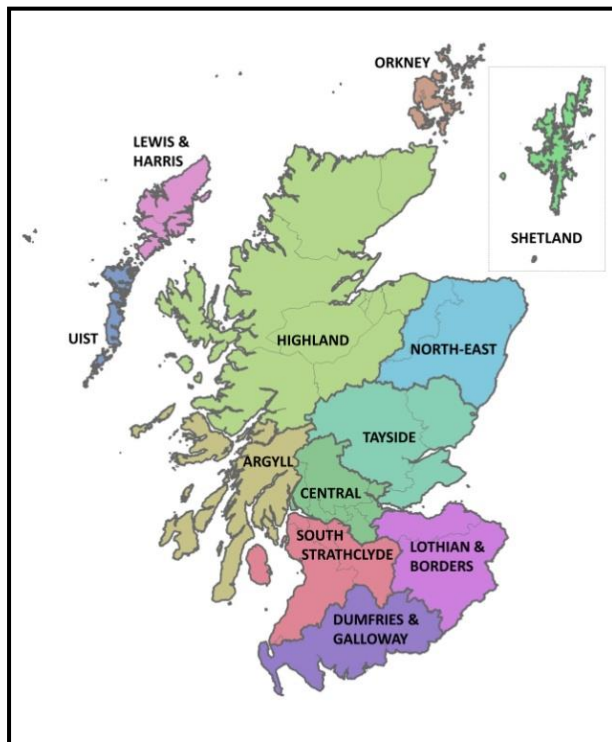
The SRMS currently focuses primarily on the annual monitoring of the abundance, distribution and breeding success of diurnal birds of prey (Accipitriformes and Falconiformes) and owls (Strigiformes) native to Scotland. Because of its ecological similarity to raptors, Northern Raven (henceforth Raven) is given honorary status as a bird of prey and is included in the Scheme. The SRMS is currently exploring the potential for broadening its remit to consider including collation of communal roost information (already being gathered by some of its partners organisations) for species such as White-tailed Eagle, Hen Harrier, Red Kite and Raven as, particularly in the case of the former three species, such data can give useful information of age and sex structure of the population.

## 1.2 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, Amy Challis took up the full-time role of Scottish Raptor Monitoring Coordinator (SRMC) to help take the work of the SRMS forward. Amy is based at BTO Scotland in Stirling University.

A key priority for the SRMS over the next year is to build on the recommendations of a report on raptor trends which was recently published (Roos *et al.*, 2015) to be able to produce more robust trends for all Scotland's raptors in the future through incorporating our knowledge of changes in survey coverage and survey effort of our volunteer network across Scotland. In light of the findings from this report we will also be looking at how we can enhance monitoring of some of the more common raptor species, such as Kestrels, Sparrowhawks and owls which currently do not receive sufficient monitoring to enable us to produce robust trends at a regional or Scotland-wide scale. We will also be progressing work on data usage protocols which would improve mobilisation of Scheme data so that it can be used even more effectively by SRMS partners to benefit raptor conservation. The present funding package for the SRMS terminates at the end of March 2016 so over the next few months the SRMG will be working to secure funding to allow continuation of the Scheme.

### 1.3 Scottish Raptor Study Group (SRSG)



**Figure 1.** Scottish Raptor Study Group branch areas in 2014.

The Scottish Raptor Study Group (SRSG) comprises twelve regional branches (Figure 1). The SRSG is active in all regions of Scotland meaning that the whole of Scotland receives some level of coordinated monitoring effort.

The SRSG has a combined membership of more than 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.

## 2 Data management

### 2.1 Data contributors

The SRSG members have provided the bulk of the data collected in this report on raptor numbers, distribution and productivity. Following the 2014 season, data were received from twelve regional raptor study group branches. With the recent formation of the Zetland Raptor Study Group, we are pleased to be able to report on the breeding success of Scheme species in Shetland for the first time.

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. Rare Breeding Birds Panel data were extracted from the annual returns to the relevant licensing bodies (SNH and BTO) made by the small number of Schedule 1 licence holders who were not members of the SRSG. A number of ecological consultancies also supplied data.

### 2.2 Observer coverage

For some of the scarcer species covered by the Scheme, such as Red Kite, Marsh Harrier, White-tailed Eagle and perhaps Osprey, a high proportion of the breeding population (90-100% for some species) is monitored each year.

Amongst volunteer fieldworkers, the appeal of carrying out fieldwork on open moorland and mountain habitats is strong. Combined with the fact that raptors nesting in open habitats are, by and large, easier to survey compared to those nesting in woodlands, three widely but thinly spread upland species, Hen Harrier, Golden Eagle, and Peregrine Falcon, receive excellent coverage. The Scottish breeding populations for these species are in the range of 400–800 pairs, with up to 50% of the breeding population monitored annually. In years leading up to and including national surveys effort is often increased leading to an even greater proportion of the population being monitored.

Two lowland owl species, Barn Owl and Tawny Owl, readily adapt to nest boxes and their relative ease of study means they are monitored by quite a number of raptor workers. Wider geographic coverage, however, is poor in terms of being able to determine estimates of population size, annual productivity and long-term trends. Common Buzzard (henceforth Buzzard) and Raven attract interest from a growing number of raptor enthusiasts.

A few species in Scotland present challenges as far as monitoring is concerned. European Honey-buzzard (henceforth Honey-buzzard) and Hobby are extremely scarce and Short-eared and Long-eared Owl exhibit cyclic occurrence related to vole abundance (Korpimäki & Norrdahl 1991) and/or secretive behaviour. However, two widespread species attract little attention from the majority of field workers, coverage of Eurasian Sparrowhawk (henceforth Sparrowhawk) and Common Kestrel (henceforth Kestrel) 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 Kestrel (Harris *et al.* 2014), is now causing concern.

## **2.3 Data analysis and reporting**

The majority of data submitted to the SRMS are sent in electronically, using the custom-designed MS Excel recording spreadsheet. This spreadsheet is currently the best means of ensuring that the majority of submitted data are in a consistent format. This greatly reduces the need for manual correction and re-formatting of data, ensuring that the tables and other summary outputs required for the annual report can be generated quickly and efficiently.

Although the spreadsheet helps to standardise SRMS data, records still need to be carefully checked. It is important to make sure that data are entered into the correct fields, and are consistently reported. Making sure that observer, species, site names and codes, and location information are all comparable between different records makes the data in the Scheme a much more powerful and valuable tool for raptor conservation. Even slight variations between records in the way that data are reported, such as the same observer being listed as both “Joe Bloggs” and “J Bloggs”, could lead to confusion when calculating the area covered by long-term studies, which are among the most valuable datasets held by the Scheme. Your help in checking data is greatly appreciated. Although we carry out thorough checks on all data, we cannot always spot errors so the checking before data are submitted is important, and potentially saves us having to correct future reports.

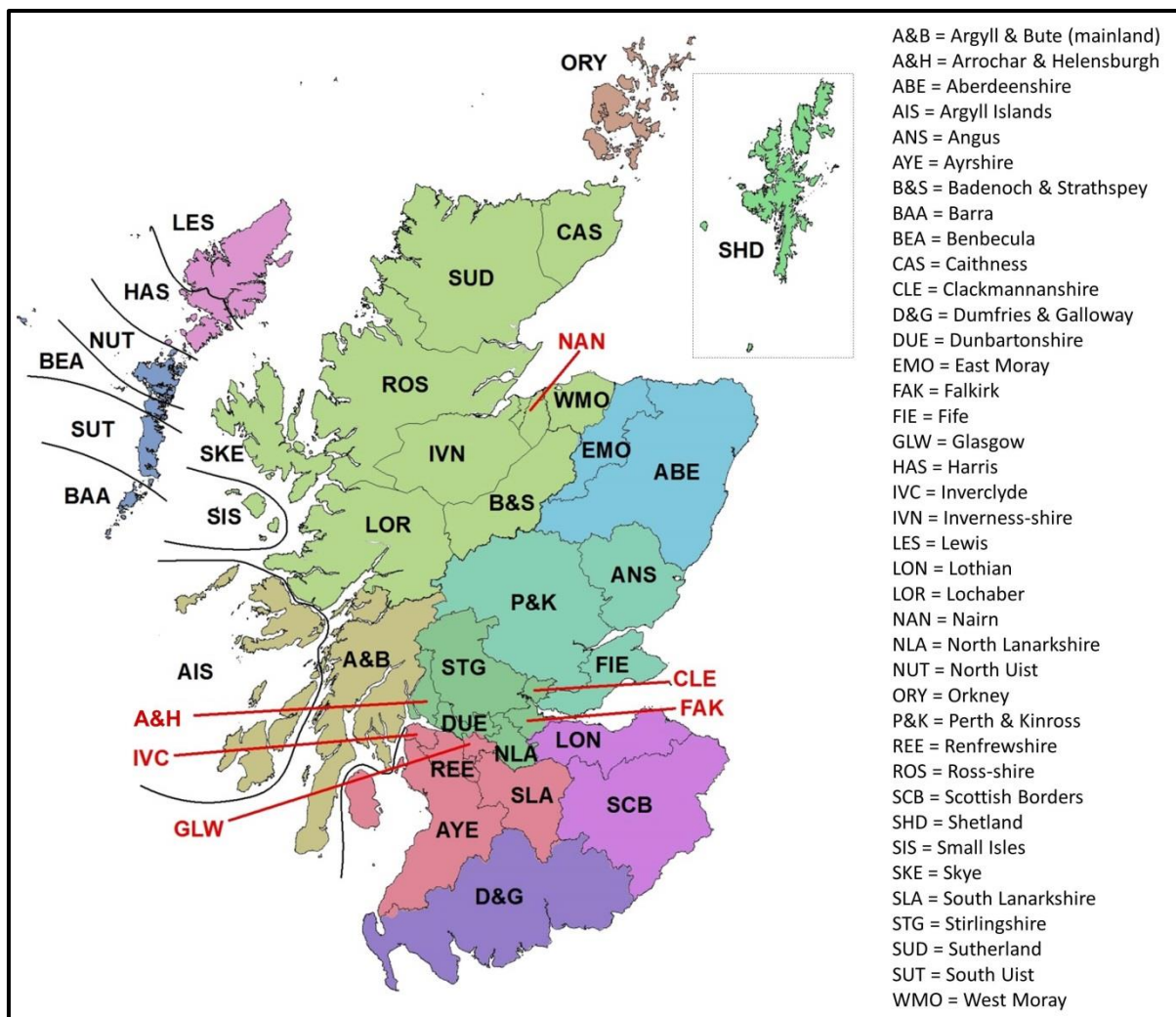
Another important step in preparing SRMS records for summary and analysis is to identify duplicate records submitted to the scheme. These typically arise when data for one nest comes in from multiple sources. In 2014, over 200 duplicate records were identified and removed from the dataset before the summary tables were generated. Reporting of nest locations to a resolution of 100 m (i.e. six-figure grid references) greatly facilitates this process, and also makes it easier to identify and correct typos in grid references. Providing data at greater resolution will not make records less secure. The purposes for which nest location data can be used, and the spatial resolution it is made available at, will be strictly governed by rules agreed by all Scheme partners.

Data in this report have been reported both at the level of RSG regions and at county level, with a few regional exceptions (Figure 2). These include the following: (i) some counties have been amalgamated (e.g. North, East and South Ayrshire combined into Ayrshire - note this area includes the Clyde islands of Arran and Cumbrae which are part of North Ayrshire Council Area); (ii) Moray has been split into West Moray and East Moray following the boundary between Highland RSG and North-east Scotland RSG; and (iii) due to its large area Highland has been divided into smaller areas reflecting a combination of old counties (e.g. Inverness-shire) and Highland Council wards (e.g. Badenoch & Strathspey).

## **2.4 Data analysis and reporting in the future**

We are looking to further improve data submission and handling in the near future. The next couple of years will see the development of an on-line option for secure data submission to further enhance the SRMS. As well as decreasing the potential for recording errors and inconsistencies, the development of such a system will allow more flexible reporting. This means that, with appropriate permissions, individuals or groups of individuals (e.g. all raptor workers working on the same species within a particular long-term study area) might be able to explore and view summaries of their data in the context of other local, regional and national data. We are hoping to have a prototype of this on-line system ready for testing in 2017.

The present report follows a format similar to that of the preceding eleven reports. The SRMG is keen to refresh and modernise the annual report for future years. As we consider what format the future reports might take, we will be carefully considering how we might bring more information to you via the new SRMS website - <http://raptormonitoring.org/>.



**Figure 2.** The regions used for data presentation in the summary tables.

## 2.5 Note on revision to 2013 reported figures

The figures for territory occupation and breeding success for birds of prey in Scotland in 2013 have been revised in light of a re-analysis of the breeding data following publication of the Scottish Raptor Monitoring Scheme Report 2013 (Challis *et al.*, 2014). Many of the small changes that readers may notice between figures presented in the present report relative to Challis *et al.* (2014) can be accounted for by us redefining the rules that our analysis programme uses. Clear definitions of the data that goes into producing each of the reported figures in the tables are now presented at the beginning of the Tables section (Section 7).

We have also taken the opportunity to update the 2013 figures to include some records that were omitted from the previous analysis either because they had not reached the Scheme in time for inclusion or because they had been overlooked as they had not been provided on the standard SRMS spreadsheet. Further, we have also taken the opportunity to correct a small number of errors which were brought to our attention by readers of the 2013 report.



## **3 Raptor monitoring**

### **3.1 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, Buzzard, Golden Eagle and Raven, pairs 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 Honey-buzzard, Marsh Harrier and Osprey, pairs break 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 might 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, Sparrowhawk and Merlin, if the habitat remains unchanged, home ranges may be occupied by a succession of breeding pairs, with some individuals breeding with several partners over the course of their lives.

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. For example, 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 or separation from a mate, or recruitment to a vacant territory, particularly if the population is undergoing expansion. Some home ranges may be occupied only when the population reaches a certain level and others stay vacant for long periods, sometimes because of human interference. Others may suffer irreversible habitat changes, or be subjected to increased unintentional human disturbance, e.g. through a change in land use activities, and may never become regularly occupied again.

Cyclic changes in the annual and seasonal abundance of voles can have a profound effect on the number of pairs in an area as well as the breeding success of a number of raptor and owl species (e.g. see Petty *et al.* 2000; Lambin *et al.* 2000), particularly Kestrel, Barn Owl and Short-eared Owl (Village 1990; Korpimäki & Norrdahl 1991, Taylor 1994). If vole populations reach a peak during the spring, 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.

### **3.2 Monitoring of occupancy and breeding outcome**

In general, raptor workers try to visit known home ranges and other suitable habitat several times before and during the breeding season with the aim to establish whether they are occupied or not. Here we describe some of the most important features of the best practice of monitoring raptors. For more detailed species-specific information we refer to Hardey *et al.* (2013).

For many species, a special licence (Schedule 1 licence, issued by SNH) is needed to visit the nest sites. This licence should be granted before any visit to a home range takes place. Those intending to ring young later in the season must be licensed and obtain their ringing permit from the BTO.

For forest-dwelling species such as Buzzard, Goshawk and Sparrowhawk, winter visits to known and suitable habitat might be useful, as the lack of leaves makes it easier to find nests in deciduous trees. For some early-nesting species, such as Golden Eagle and Raven, visits to home ranges can start already in January, whereas for other species, especially migratory species such as Osprey, Marsh Harrier and Hobby, the first visit might occur in spring or even early summer. The most common way of establishing whether a territory is occupied is to watch from a distance whether suitable habitat is used by hunting, displaying and nest-building raptors. This can be done from a vantage point or from a vehicle. However, raptor workers also use indirect evidence to give indications of whether a home range is occupied. This is best collected by walking through the suitable habitat looking for new and old prey remains (pluckings), moulted feathers, pellets (regurgitated fur, feathers and bones from prey animals) and faeces (normally seen as white splashes). Once the occupancy status of the home range is established, the raptor worker normally tries to identify whether the home range is occupied by a single bird or a pair (and for a small number of species, e.g. Hen Harrier, whether a male might have more than one female) and the age of the birds in the home range. The age structure of the breeding birds in a population may give useful insights into survival of the various age groups and might act as an early signal if survival has declined for adult or sub-adult birds.

Data collected during this phase could also include habitat monitoring and should be accompanied by thorough recording of visit dates. For reasons described above, many raptor home ranges are likely to be unoccupied in a given year. It is important that the presence of unoccupied ranges within a study area is recorded accurately, as it will give indications of changes in the number of breeding pairs, survey effort and habitat-specific changes of occupancy.

Once the nest has been located, the raptor worker monitors the breeding attempt. For this phase, it is of utmost importance that the timing of visits to the nest is undertaken according to best practice, i.e. at times when the risk of disturbing the adult birds is minimal. Visits should not be undertaken in adverse weather conditions (i.e. cold, wet or excessively hot). For some species, it is even recommended that no visits should be done during the egg stage of the breeding season (Hardey *et al.* 2013). The raptor worker tries to establish clutch size, brood size and fledging success (see “Terminology” on inside back cover), using the minimum number of visits required to establish these parameters. Often a visit during the chick stage is combined with the ringing of the chicks. For this, the person must be a licensed ringer (ringing permits issued by BTO on behalf of SNH), again following best practice described in Hardey *et al.* (2013) and BTO's "Ringers' Manual" (Redfern and Clarke 2001). Finally, a visit around or just after the chicks are expected to fledge will reveal the number of fledglings from each nest. This visit should involve a nest inspection to check if any chicks might have died at the later stages of the breeding attempt. This is an important part of the monitoring, as it will give the final piece of information of the outcome of the breeding attempt.

Data collected during the nest monitoring phase includes, apart from clutch size, brood size and fledgling numbers, the type of nest (e.g. nest box, tree or cliff), nest site (e.g. species of tree) and if ringing occurs, the age, sex and size (e.g. wing and tarsus length as well as body mass) of the chicks. Thorough recording of visit dates is again essential, as it will indicate stages and even specific dates when a potential nest failure might have happened.

### **3.3 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 fieldworkers, this ideal is typically not achievable. For example, 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. 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 common in raptor populations and 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, placing 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.

### **3.4 Factors limiting raptor populations**

Many factors influence the distribution, numbers, and productivity of birds of prey in Scotland. For example, there is good evidence that raptors are limited in their distribution by the extent of suitable habitat (Anderson *et al.* 2009, Evans *et al.* 2010) and climate conditions (e.g. Taylor 1994).

The number of individuals in a population can be limited not only by the availability of suitable habitat, but also by a number of other factors. For example, both prey abundance and predation by larger raptors and mammals might influence raptor numbers at local and even national scales. For instance, the lack of voles on some Scottish islands (notably Shetland, Lewis and Harris) is associated with the absence of or very low densities of breeding vole eating owls and raptors. This has been used to explain the absence/low density of e.g. Short-eared Owl and Kestrel in these areas. Predation can have both direct (i.e. increased mortality; Newton 1998) and indirect (i.e. avoidance of perceived risky areas; Sergio & Hiraldo 2008) effects on the number of breeding raptors in an area. For example, Petty *et al.* (2003) showed that Kestrel numbers in Kielder Forest in Northern England declined when numbers of Goshawks in the forest increased. The causal link seems to have been predation of Kestrels by Goshawks, as many Kestrel remains were found near active Goshawk nests (Petty *et al.* 2003). Locally, Red Fox predation is likely to limit breeding populations of Hen Harriers

(Baines & Richardson 2013, McMillan 2014). Other natural factors constraining raptor numbers and breeding success include weather events such as cold, wet springs (Amar *et al.* 2011) and harsh winters (Taylor 1994).

Population size and breeding success of raptors are also affected by several anthropogenic factors. For example, forestry and agriculture operations can influence availability of nesting habitat and prey, and can cause failure of breeding attempts.

Non-deliberate disturbance by hillwalkers, climbers and mountain bikers have also been implicated in causing nesting failure, but there is little evidence that recreational disturbance has a measurable effect on national raptor populations (e.g. Whitfield *et al.* 2007). Another way in which human activities can impact raptor populations is secondary poisoning. This has had drastic effects on raptor populations in the recent past. For example, secondary poisoning by agricultural pesticides during the 1950s-1980s brought many raptor species close to extinction in the UK (e.g. Newton 1998). More recently, Second Generation Anticoagulant Rodenticides (SGARs) have been implicated in deaths of several species of owls and raptors (e.g. Hughes *et al.* 2013), but their effects on the national trends is so far unknown.

Deliberate killing has also had measurable impacts on bird of prey populations in Scotland, despite the fact that it is illegal. Several studies have shown that illegal killing is often associated with (though not restricted to) areas managed for Red Grouse (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). As the illegal killing of birds of prey repeatedly has been shown to be an important limiting factor for several raptor species, we summarise these studies here.

In Scotland, a large proportion of the uplands, particularly in the south and east of Scotland, are 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 practice became illegal country-wide in 1954. However, even after nearly 60 years of legal protection, birds of prey are still killed illegally in Scotland (Anon. 2013a, Anon. 2013b). Recent research has shown that these illegal activities, including nest destruction and the killing of sub-adults and adults, are adversely affecting the conservation status of several species. On many driven grouse-moors certain raptor species are scarce or absent and attempts to breed frequently 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 populations at a local or regional level by reducing the number and success of breeding pairs. It can also impact negatively on surrounding populations, by drawing dispersing birds into areas of apparently suitable habitat which are unoccupied because previous inhabitants have been removed. This phenomenon has been referred to as a "black hole", a "sink" or an "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 that 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 elsewhere in the UK (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. There is strong evidence that illegal persecution is causing the majority of breeding attempts on grouse moors to fail (Fielding *et al.* 2011) and is driving the current population decline on mainland Scotland (Hayhow *et al.* 2013). Furthermore, in northern England, the productivity of Peregrine Falcons breeding on grouse moors was found to be 50% lower than in non-grouse moor habitat, despite similar clutch and brood size (suggesting little difference in prey availability) between habitat types (Amar *et al.* 2012). 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 objectively 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 determine the degree to which these issues could be biasing 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, 2013a & 2013b), National PAW persecution maps (PAW 2014) and Scottish Government reports on wildlife crime (e.g. Scottish Government 2014).

## 4 Species accounts

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 2014 to check on occupancy. The organised monitoring in Scotland continues to increase with 6,727 home ranges receiving at least one visit in 2014 (Table 1). Not all of these home ranges held pairs: some had only single birds and others were apparently vacant.

Equally important are follow up visits to confirm the findings of the first visit and to monitor the nesting success of pairs present. The 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 3,487 potential breeding pairs received further visits in 2014, enabling their nesting success to be determined. This constitutes a 20.0% increase on the previous year (Table 1). A regional summary of these monitored home ranges is provided in Annex 2.

### 4.1 European Honey-buzzard *Pernis apivorus*

In 2014 data were only reported from two regions, Dumfries & Galloway and Tayside. Four pairs in Dumfries & Galloway were monitored. Two pairs laid eggs and both went on to fledge a single young each. A record from Tayside suggested that there was possible breeding in 2014 but no nest site was located. No breeding records were received from any other region.

### 4.2 Red Kite *Milvus milvus* (Tables 2 & 3)

The number of pairs laying eggs has risen year on year since 1995. This upward trend continued in 2014 (Table 2). In 2014, 260 pairs were located. Of 239 pairs that were monitored 233 were confirmed to lay eggs (Table 3). A minimum of 349 young fledged. Productivity and fledging success were the same as the previous two breeding seasons, at 1.5 young per laying pair (Table 2).



**Figure 3.** Red Kite in Dumfries & Galloway (Angus Hogg).

Despite the well-publicised poisoning incident on the Black Isle in March 2014, the breeding figures for North Scotland were relatively consistent with the previous year, with a similar number of pairs laying eggs. It remains to be seen what the impact of this incident will be on recruitment to the breeding population in future years.

Up until fairly recently the Red Kite population has received almost complete monitoring coverage. However, due to the success of the reintroduction projects in four regions of Scotland the population

is expected to continue to grow in both number and range. The proportion of the population receiving monitoring effort (and that the SRMS is able to report on) is therefore likely to decline.

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

White-tailed Eagle continues to increase both numerically and geographically as well as maintaining a high breeding success (Tables 4 and 5)<sup>1</sup>. In 2014, at least 96 pairs were confirmed to be occupying territories. Of 96 monitored pairs, 82 pairs laid eggs, 58 pairs hatched chicks and 50 pairs went on to fledge a minimum of 63 young. The number of successful pairs exceeded 50 for the first time since breeding recommenced. A pair was also present on Orkney but no known nest was located.

Following the first breeding attempt in East Scotland in 2013 of birds released as part of the East Scotland Sea Eagles Project, 2014 saw three pairs laying eggs in Tayside. Only the pair in Fife went on to successfully fledge young.

Up until fairly recently the White-tailed Eagle population has received almost complete monitoring coverage. However, due to the success of the three reintroduction phases since 1975 the population is expected to continue to grow in both number and range. It is likely that an increasing proportion of the population will not receive full monitoring coverage in the future.

### **4.4 Marsh Harrier *Circus aeruginosus* (Table 6)**

Marsh Harrier continues to be a scarce breeder and passage migrant in Scotland. In 2014, there were nine pairs located, all in Tayside. Marsh Harrier had their best season since 2006, with seven pairs going on to lay and successfully rear a minimum number of 20 young (Table 6).

### **4.5 Hen Harrier *Circus cyaneus* (Tables 7 & 8)**

Visits were made to 589 home ranges in 2014 (Table 7), all of them locations where Hen Harriers have bred regularly in the past 20 years. Pairs were found at 314 (51%) and of these 293 received follow-up visits. The low number of Hen Harrier nests in parts of Scotland (e.g. in Angus and North-east Scotland; Table 8) continues to suggest that persecution is a limiting factor in areas dominated by uplands managed for driven grouse shooting.

The number of confirmed egg-laying pairs was 219, the highest number recorded since 2008, but there is a tendency for a decline in the proportion of pairs known to have laid eggs (Table 7). There were 177 successful nesting pairs and 579 young fledged.

<sup>1</sup> The summarised breeding data presented for White-tailed Eagle are consistent with the terminology recommended by Oehme (2003). This needs to be borne in mind when drawing comparisons with summarised breeding data for other SRMS species which have been analysed according to the definitions set out at the beginning of Section 7.



**Figure 4.** Hen Harrier brood, Perthshire (Keith Brockie).

In 2014 productivity reached the highest recorded by the Scheme so far, with a mean brood size per laying pair of 2.5 and mean brood size per successful nest of 3.2 (Table 7). This was probably a response to the high vole abundance across large parts of Scotland. The failure rate of Hen Harrier breeding on Orkney is striking, with more than half of the pairs monitored failing early (Table 8). This is at least in part due to the high incidence of polygyny in this population which is much higher than elsewhere in Scotland. The updated Hen Harrier Conservation Framework (update of

Fielding *et al.*, 2011) due to be published later in 2015 will guide conservation and management for this species.

#### **4.6 Northern Goshawk *Accipiter gentilis* (Tables 9 & 10)**

In 2014, 192 home ranges were checked, which is the highest number of home ranges checked since 2003 (Table 9). There was evidence of pairs in 137 home ranges (Table 9), with signs suggesting at least one bird in a further 19 ranges (Table 10). In total, 128 nests were monitored, 122 where eggs were laid and 83% of these produced young. The average brood size was 1.8 young per nesting pair, slightly lower than the previous year (Table 9). North-east Scotland continues to hold the highest number of home ranges checked (Table 10). Away from the areas which are more intensively studied, this species may well be under recorded.

#### **4.7 Eurasian Sparrowhawk *Accipiter nisus* (Tables 11 & 12)**

In 2014, 121 home ranges were visited (Table 11) and only 71 were occupied (52%). Fifty-three home ranges received follow up visits, and eggs were laid at each of these sites but young fledged from only 48 of these.

The number of home ranges checked has increased on the previous year (Table 11) although this species still does not receive a huge amount of attention from volunteers and is one for which the SRMG would like to see enhanced monitoring for in the future.



**Figure 5.** Female Sparrowhawk with chicks, North Lanarkshire (Jackie Gilliland).



In Edinburgh, the only ongoing long-term study reported the most productive breeding season since they started monitoring in 2009, recording four clutches of six eggs.

#### **4.8 Common Buzzard *Buteo buteo* (Tables 13 & 14)**

In 2014, 941 home ranges were checked, 693 of which were occupied by pairs. A total of 519 occupied ranges received follow-up visits. Four hundred and seventy-three pairs were confirmed to lay eggs, but only 424 of these went on to fledge young. A mean productivity of 1.4 young per monitored pair was recorded (Table 13).

#### **4.9 Golden Eagle *Aquila chrysaetos* (Tables 15 & 16)**

In 2014, 373 home ranges were checked for occupation (Table 15). Golden Eagle pairs were present in 325 home ranges (87% of those visited) and there were signs of occupation at an additional 22 home ranges. There were follow up visits to 258 pairs, but 43 (17%) of these failed early. The 116 successful pairs reared 137 young to fledging, a mean brood size per monitored pair of 0.5 young (Table 15). It is worth noting that the south of Scotland Golden Eagle population is still very weak, with no young fledged on mainland Scotland south of the Central Belt (Table 16).

At time of going to press the national survey for Golden Eagles is underway. This is being coordinated by RSPB as part of the Statutory Conservation Agencies/RSPB Annual Breeding Bird Scheme (SCARABBS) programme. We will eagerly await the findings of this survey.

#### **4.10 Osprey *Pandion haliaetus* (Tables 17 & 18)**

In 2014, more Osprey territories than ever before, 307, were checked (Table 17). The increased survey coverage resulted in the highest number of confirmed pairs (209) since 2008. Of these, 206 pairs were monitored. A record-breaking minimum of 339 fledglings were produced (Table 17). Clearly, the population expansion is still ongoing, but most records are still submitted from the Osprey strongholds in the Highlands and Tayside regions (Table 18).



**Figure 6.** Osprey brood, Perthshire (Keith Brockie).

#### **4.11 Barn Owl *Tyto alba* (Tables 19 & 20)**

Following the poor breeding season of 2013, 2014 was one of the best years recorded by the Scheme (Table 19). Of the 639 sites checked, 347 (54%) were occupied by pairs. Of the 307 pairs which received follow up visits, 296 (96%) went on to lay eggs and of these 285 (96%) successfully fledged young. The mean brood size per laying pair was 4.0, the highest recorded by the Scheme to date (Table 19). We have received records of 18 pairs that went on to lay a second clutch; 2 pairs in Argyll & Bute (both successfully fledging 11 young), 15 pairs in Dumfries & Galloway (11 successfully fledging 47 young) and 1 pair in Badenoch and Strathspey (successfully fledging 4 young). Barn Owls are likely to have been responding to the very high vole numbers which were reported by observers from many parts of Scotland.

#### **4.12 Little Owl *Athene noctua***

Little Owl is a scarce breeding bird in Scotland. A single breeding record was reported in 2014, for a site in Berwickshire where a pair nested successfully for the third successive year.

#### **4.13 Tawny Owl *Strix aluco* (Tables 21 & 22)**

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). In 2014, a record number of pairs were monitored by the Scheme, 185 (Table 21). In 2014, a total of 290 nest sites were checked (mainly nest boxes) and 187 pairs were located. One-hundred and eighty-five of these received follow up visits, of which 184 pairs laid eggs and 160 hatched young. A minimum number of 152 young fledged with a mean breeding success of 1.9 young per monitored pair, the best recorded by the Scheme since 2003 (Table 21). This was probably a response to the high vole abundance in 2014.

#### **4.14 Long-eared Owl *Asio otus* (Table 23)**

Although Long-eared Owls regularly breed in all regions of Scotland, apart from the Northern Isles, this is a secretive and overlooked species and is therefore under-recorded throughout its range.

In 2014, 63 of the 81 known territories that were checked showed signs of occupation (Table 23). Fifty-six pairs were known to lay eggs and 55 pairs succeeded in fledging a minimum of 128 young. The mean brood size was 2.3 per laying pair (Table 23). 2014 appeared to be a much more productive year for this species compared to 2013.

#### 4.15 Short-eared Owl *Asio flammeus* (Table 24)



**Figure 7.** Short-eared Owl chick, Perthshire (Keith Brockie).

A total of 195 known sites were checked in 2014 of which 108 (55%) were found to hold pairs and 38 held single birds (Table 24). Eighty-one nests were found and monitored and 57 (70%) fledged young. The mean brood size was 2.5. However, any count of fledged young will always be conservative as the fledglings disperse away from the nest long before they are capable of flying. This is a species for which the SRMS is keen to see expansion of monitoring coverage, but which is a challenging bird to survey systematically. The species is likely to be under-recorded in some areas, particularly island populations

such as on the Uists and Orkney with records reaching the SRMS generally limited to incidental records of confirmed breeding.

#### 4.16 Common Kestrel *Falco tinnunculus* (Tables 25 & 26)

In 2014, visits were made to 396 home ranges, which is the highest survey effort recorded since the inception of the Scheme (Table 25). It is very encouraging that more raptor workers have started to monitor Kestrels, as their negative population trend in Scotland (i.e. -65%; Harris *et al.* 2014) is still largely unknown. The establishment of further long-term study areas would be a welcome development for the Scheme.



**Figure 8.** Kestrel, Fife (Robin Manson).

Of the 396 checked home ranges, there were signs of occupation at 231 (Table 26). Of the 165 pairs that were monitored, 151 pairs laid eggs (92%) (Table 26). Of these, 146 pairs went on to successfully fledge a minimum of 443 young.

#### 4.17 Merlin *Falco columbarius* (Tables 27 & 28)

In 2014, visits were made to 419 home ranges and 221 (53%) had signs of occupation, though only 185 (84%) by breeding pairs (Table 27). A total of 150 pairs received follow up visits, of which 142 laid eggs, 130 reached the hatching stage and 124 fledged a minimum of 366 young. This is the highest number of fledglings recorded by the SRMS since 2008 and can be explained by the Scheme

reporting on the fortune of raptors on Shetland for the first time. Mean brood size recorded was 3.0 young per laying pair, the highest ever recorded by the Scheme (Table 28). Again this figure may have been bolstered by the addition of Shetland data, which had the highest number of fledged young per laying pair (3.2). There was quite a lot of regional variation with some regions (North-east Scotland, Uist, Lothian & Borders & South Strathclyde) having apparently higher productivity than in 2013 whereas other regions (Orkney & Tayside) fared less well.

#### **4.18 Eurasian Hobby *Falco subbuteo***

In 2014, six ranges were checked, but only two nesting pairs were located in Tayside. Both pairs were successful, fledging a minimum of two and one young, respectively.

#### **4.19 Peregrine Falcon *Falco peregrinus* (Tables 29 & 30)**



**Figure 9.** Peregrine Falcon in North Lanarkshire (Jackie Gilliland).

Year 2014 was the national survey year for the Peregrine, which provided an excellent opportunity to compare the health of the population in 2014 with the population in the last national survey in 2002. This survey was coordinated by BTO as part of the SCARABBS programme. N.B. It is likely that the figures presented in this report will change slightly to take account of additional information received during the period between analysis of the figures for this report and publication of the final national survey report.

In 2014, a staggering 1,082 home ranges were checked, but only 474 (44%) were occupied. This falls a long way short of the estimated 624 occupied territories from the last national survey (Banks *et al.* 2010) and continues the decline from the peak number of 639 occupied territories in 1991 (Crick & Ratcliffe 1995).

Follow-up monitoring visits were made to 344 pairs. Of these, 34 either failed at an early stage or were not breeding. In total, 245 pairs successfully reared a minimum of 515 young, giving a mean brood size per monitored pair of 1.5 young.

#### **4.20 Northern Raven *Corvus corax* (Tables 31 & 32)**

A record 392 pairs were monitored under the Scheme in 2014 (Table 31). Of these, 354 (90%) were confirmed to lay eggs and 334 pairs (94%) reared young. With a minimum of 910 fledged young recorded, the mean breeding success was 2.6 per pair laying eggs (Table 31).

## 5 Acknowledgements

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Please send breeding records for raptors, owls and Raven for 2015 before  
31st October 2015 to the Scottish Raptor Monitoring Coordinator, Amy  
Challis at:  
**amy.challis@bto.org**

## 6 References

- Amar, A., Court, I.R., Davison, M., Downing, S., Grimshaw, T., Pickford, T. and Raw, D. (2012). Linking nest histories, remotely sensed land use data and wildlife crime records to explore the impact of grouse moor management on peregrine falcon populations. *Biological Conservation* 145: 86-94.
- Amar, A., Davies, J., Meek, E., Williams, J., Knight, A. and Redpath, S. (2011) Long-term impact of changes in sheep *Ovis aries* densities on the breeding output of the hen harrier *Circus cyaneus*. *Journal of Applied Ecology* 48: 220-227
- Anderson, B.J., Arroyo, B.E., Collingham, Y.C., Etheridge, B., Fernandez-De-Simon, J., Gillings, S., Redpath, S.M. (2009) Using distribution models to test alternative hypotheses about a species' environmental limits and recovery prospects. *Biological Conservation* 142: 488-499.
- Anon. (2002). *Scottish Raptor Monitoring Scheme Agreement*. Scottish Natural Heritage, Perth.
- Anon. (2012). *Birdcrime 2011. Offences against wild bird legislation in 2011*. RSPB, Sandy, Beds.
- Anon. (2013a). *The illegal killing of Birds of Prey in Scotland in 2011*. RSPB Scotland, Edinburgh.
- Anon. (2013b). *The illegal killing of Birds of Prey in Scotland in 2012*. RSPB Scotland, Edinburgh.
- Banks, A.N., Crick, H.Q.P., Coombs, R., Benn, S., Ratcliffe, D.A., & Humphreys, E.M. (2010). The breeding status of Peregrine Falcons *Falco peregrinus* in the UK and Isle of Man in 2002. *Bird Study* 57: 421-436.
- Baines, D. & Richardson, M. (2013) Hen harriers on a Scottish grouse moor: multiple factors predict breeding density and productivity. *Journal of Applied Ecology*, 50: 1397–1405.
- Challis, A., Holling, M., Stevenson, A., Roos, S., Stirling-Aird, P. & Wilson, M.W. (2014). *Scottish Raptor Monitoring Scheme Report 2013*. BTO Scotland, Stirling.
- Crick, H.Q.P. & Ratcliffe, D.A. (1995). The peregrine (*Falco peregrinus*) breeding population of the United Kingdom in 1991. *Bird study* 42: 1-19.
- Etheridge, B, Summers, R.W. & Green, R.E. (1997). The effects of illegal killing and destruction of nests by humans on the population dynamics of the hen harrier *Circus cyaneus* in Scotland. *Journal of Applied Ecology* 34: 1081-1105.
- Etheridge, B. (2005). *Scottish Raptor Monitoring Report 2003*. Scottish Ornithologists' Club, Aberlady.
- Etheridge, B., Holling, M., Thompson, D.B.A., & Riley, H.T. (eds.) (2006). *Scottish Raptor Monitoring Scheme Report 2004*. Scottish Ornithologists' Club, Aberlady.
- Etheridge, B., Holling, M., Riley, H.T., Wernham, C.V. & Thompson, D.B.A. (2007). *Scottish Raptor Monitoring Scheme Report 2005*. Scottish Ornithologists' Club, Aberlady.
- Etheridge, B., Holling, M., Riley, H.T., Wernham, C.V. & Thompson, D.B.A. (2008). *Scottish Raptor Monitoring Scheme Report 2006*. Scottish Ornithologists' Club, Aberlady.
- Etheridge, B., Holling, M., Riley, H.T., Wernham, C.V. & Thompson, D.B.A. (2010). *Scottish Raptor Monitoring Scheme Report 2007*. Scottish Raptor Study Groups, Dunblane.
- Etheridge, B., Riley, H.T., Wernham, C.V., Holling, M. & Thompson, D.B.A. (2011). *Scottish Raptor Monitoring Scheme Report 2008*. Scottish Raptor Study Groups, Dunblane.

- Etheridge, B., Riley, H.T., Wernham, C.V., Roos, S., Holling, M., Stevenson, A. & Thompson, D.B.A. (2012a). *Scottish Raptor Monitoring Scheme Report 2009*. Scottish Raptor Study Groups, Dunblane.
- Etheridge, B., Riley, H.T., Wernham, S., Holling, M., Stevenson, A. & Thompson, D.B.A. (2012b). *Scottish Raptor Monitoring Scheme Report 2010*. Scottish Raptor Study Groups, Dunblane.
- Etheridge, B., Riley, H.T., Wernham, S., Holling, M. & Stevenson, A. (2013a). *Scottish Raptor Monitoring Scheme Report 2011*. Scottish Raptor Study Groups, Inverness.
- Etheridge, B., Riley, H.T., Wernham, S., Holling, M. & Stevenson, A., Roos, S. & Stirling-Aird, P. (2013b). *Scottish Raptor Monitoring Scheme Report 2012*. Scottish Raptor Study Groups, Inverness.
- Evans, R.J., Pearce-Higgins, J., Whitfield, D.P., Grant, J.R., MacLennan, A. & Reid, R. (2010). Comparative nest habitat characteristics of sympatric White-tailed *Haliaeetus albicilla* and Golden Eagles *Aquila chrysaetos* in western Scotland. *Bird Study* 57: 473-482.
- Fielding, A., Haworth, P., Whitfield P., McLeod, D. & Riley, H. (2011). *A conservation framework for hen harriers in the United Kingdom*. JNCC Report, 441.
- Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013). *Raptors: a field guide to survey and monitoring* (3rd Edition). The Stationery Office, Edinburgh.
- Hardey, J., Rollie, C.J., & Stirling-Aird, P.K. (2003). Variation in breeding success of inland peregrine falcon (*Falco peregrinus*) in three regions of Scotland 1991-2000. In: *Birds of Prey in a Changing Environment*, Thompson, D.B.A., Redpath, S.M., Fielding, A.H., Marquiss, M. and Galbraith, C.A. (eds). The Stationery Office, Edinburgh.
- Harris, S.J., Risely, K., Massimino, D., Newson, S.E., Eaton, M.A., Musgrove, A.J., Noble, D.G., Procter, D. & Baillie, S.R. (2014) *The Breeding Bird Survey 2013*. BTO Research Report 658. British Trust for Ornithology, Thetford.
- Hayhow, D.B., Eaton, M.A., Bladwell, S., Etheridge, B., Ewing, S. R., Ruddock, M., Saunders, R., Sharpe, C., Sim, I.M.W. and Stevenson, A. (2013). The Status of the Hen Harrier, *Circus cyaneus*, in the UK and Isle of Man in 2010. *Bird Study* 60: 446-58.
- Hughes, J., Sharp, E., Taylor, M.J., Melton, L. and Hartley, G. (2013) Monitoring agricultural rodenticide use and secondary exposure of raptors in Scotland. *Ecotoxicology* 22: 974-984.
- Korpimäki, E., & Norrdahl, K. (1991). Numerical and Functional Responses of Kestrels, Short-Eared Owls, and Long-Eared Owls to Vole Densities. *Ecology* 72: 814-826.
- Lambin, X., Petty, S. J. & Mackinnon, J. L. (2000). Cyclic dynamics in field vole populations and generalist predation. *Journal of Animal Ecology* 69: 106-118.
- McMillan, R.L. (2014) Hen Harriers on Skye, 2000-12: nest failures and predation. *Scottish Birds* 34 (2): 30-39.
- Newton, I. (1998). *Population limitation in birds*. Academic Press, London.
- Oehme, G. (2003) On the methods, terminology and criteria in population studies of the White-tailed Eagle. In Helander, B., Marquiss, M. & Bowerman, W. (eds) *Sea Eagle 2000*: 2526. Stockholm: Swedish Society for Nature Conservation.
- PAW (2014) PAW Scotland Bird of Prey Crime Hotspot Maps 2009-2013.
- Petty, S. J., Anderson, D. I. K., Davison, M., Little, B., Sherratt, T. N., Thomas, C. J. and Lambin, X. (2003) The decline of Common Kestrels *Falco tinnunculus* in a forested area of northern England: the role of predation by Northern Goshawks *Accipiter gentilis*. *Ibis*, 145: 472-483.

- Petty, S. J. (2007) Tawny Owl. In: *The Birds of Scotland*, Forrester, R.W, Andrews, I.J., McNerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C., and Grundy, D.S. (eds). The Scottish Ornithologists' Club, Aberlady. pp 917-920.
- Petty, S. J., Lambin, X., Sheratt, T.N., Thomas, C. J., Mackinnon, J. L., Coles, C. F., Davison, M. & Little, B. (2000). Spatial synchrony in field vole *Microtus agrestis* abundance in a coniferous forest in northern England: the role of vole-eating raptors. *Journal of Applied Ecology* 37 (Suppl.1): 136-147.
- Redpath, S., Amar, A., Smith, A., Thompson, D. B. A. & Thirgood, S. (2010). People and nature in conflict: can we reconcile hen harrier conservation and game management. In: *Species Management: Challenges and Solutions for the 21st Century*, Baxter, J. M. & Galbraith, C. A. (eds). TSO, Edinburgh.
- Redfern, C.P.F. & Clark, J.A. 2001. Ringers' Manual. BTO, Thetford.
- Roos, S., Dobson, A., Noble, D., Haworth, P., Fielding, A., Carrington-Cotton, A., Etheridge, B. & Wernham, C. 2015. Raptors in Scotland – a methodology for developing trends and indicators. Scottish Natural Heritage Commissioned Report No. 542.
- Scottish Government (2014) Wildlife Crime in Scotland 2013 Annual Report. Scottish Government, Edinburgh.
- Sergio, F. & Hiraldo, F. (2008) Intraguild predation in raptor assemblages: a review. *Ibis* 150: 132-145.
- Smart, J., Amar, A., Sim, I.M.W., Etheridge, B., Cameron, D., Christie, G. & Wilson, J.D. (2010). Illegal killing slows population recovery of a reintroduced raptor of high conservation concern - The red kite *Milvus milvus*. *Biological Conservation* 143: 1278-1286.
- Taylor, I. R. (1994). *Barn Owls: Predator-Prey Relationships and Conservation*. Cambridge University Press, Cambridge.
- Village, A. (1990). *The Kestrel*. T. & A.D. Poyser, London.
- Whitfield, D.P., Fielding, A.H., Mcleod, D.R.A. & Haworth, P.F. (2004a). The effects of persecution on age of breeding and territory occupation in Golden Eagles in Scotland. *Biological Conservation* 118: 249-259.
- Whitfield, D.P., Fielding, A.H., Mcleod, D.R.A. & Haworth, P.F. (2004b). Modelling the effects of persecution on the population dynamics of golden eagles in Scotland. *Biological Conservation* 119: 319-333.
- Whitfield *et al.* (2007). Factors constraining the distribution of Golden Eagles *Aquila chrysaetos* in Scotland. *Bird Study* 54: 199-211.
- Whitfield, D.P., Fielding, A.H., Mcleod, D.R.A. & Haworth, P.F. (2008). *A conservation framework for the golden eagle: implications for the conservation and management of golden eagles in Scotland*. Scottish Natural Heritage Commissioned Report No. 193, Perth.



## 7 Tables

N.B. Data in the following tables present the data submitted to the SRMS in 2014. It is important to recognise that, for the majority of species, not all breeding pairs were monitored. Thus, the numbers in these tables do not represent entire populations or provide a complete picture of breeding productivity, at either regional or national scales. For more detail on completeness of coverage for these species by the SRMS, please see section 2.2.

In order to aid understanding of the data in the following tables descriptions of some of the main headings reported against are provided below:

**Home ranges checked** = this is the total number of sites that received a visit to check for occupancy. This figure excludes records where no young were produced but no indication was given as to whether the site was occupied or not. The number of home ranges checked is therefore likely to be a minimum figure.

**Home ranges occupied by pairs** = this is the total number of home ranges that were found to be occupied by a pair.

**Home ranges occupied by single birds** = this is the total number of home ranges that were found to be occupied by a single bird.

**Further home ranges in use** = this is typically the total number of additional home ranges to those occupied by pairs. This figure always includes single birds and for some species also fresh signs.

**Pairs monitored** = this is the total number of home ranges occupied by pairs monitored. This figure includes all nests that were reported to have reached the large chick stage.

**Pairs failing early or non-breeding** = this is the total number of territories occupied by pairs which produced no fledglings and where no eggs are known to have been laid. This figure excludes records where it was not reported whether eggs were laid (i.e. eggs laid was reported as outcome unknown). The number of pairs failing early or non-breeding is therefore likely to be a minimum.

**Pairs known to lay eggs** = this is the total number of monitored pairs laying eggs.

**Pairs known to hatch eggs** = this is the total number of monitored pairs hatching eggs. This figure is only from monitored home ranges and therefore excludes data for sites that were not reported to have reached the large chick stage.

**Pairs known to fledge young** = this is the total number of pairs producing at least one fledgling. This figure includes pairs with young last seen at large chick stage.

**Minimum number of young fledged** = this is the total number of young fledged regionally or nationally. This figure includes pairs with young last seen at large chick stage.

**Table 1.** Scottish Raptor Monitoring Scheme: The number and inter-annual percentage change of home ranges checked and monitored between 2003 and 2014.

<b>Year</b>	<b>Home ranges checked</b>	<b>Annual change</b>	<b>Occupied home ranges monitored</b>	<b>Annual change</b>
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
2013	5872	2.4	2907	-4.4
2014	6727	14.6	3487	20.0

**Table 2.** Number of pairs laying eggs and breeding success of Red Kites in Scotland, 1992-2014.

Year	Pairs known to lay eggs	Pairs known to fledge young	Minimum number of young fledged	% of pairs that fledged young	Productivity (young per laying pair)
1992	1	1	1	100.0	1.0
1993	5	3	7	60.0	1.4
1994	8	7	13	87.5	1.6
1995	15	11	26	73.3	1.7
1996	17	16	39	94.1	2.3
1997	23	19	39	82.6	1.7
1998	25	22	49	88.0	2.0
1999	34	27	59	79.4	1.7
2000	39	35	86	89.7	2.2
2001	43	38	95	88.4	2.2
2002	50	43	112	86.0	2.2
2003	54	48	106	88.9	2.0
2004	60	49	115	81.7	1.9
2005	76	61	131	80.3	1.7
2006	84	69	151	82.1	1.8
2007	93	73	162	78.5	1.7
2008	121	97	210	80.0	1.7
2009	152	113	235	74.3	1.6
2010	162	134	293	82.7	1.8
2011	185	155	313	83.8	1.7
2012	212	170	312	80.2	1.5
2013	224	177	330	79.0	1.5
2014	233	190	349	80.3	1.5
<b>TOTAL:</b>	<b>1916</b>	<b>1555</b>	<b>3233</b>	<b>81.2</b>	<b>1.8</b>

N.B. 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 have not been taken into consideration.

**Table 3.** Breeding success of Red Kites in Scotland in 2014.

Reintroduced populations	Home ranges checked	Home ranges occupied by pairs	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
<b>North Scotland</b>	<b>97</b>	<b>60</b>	<b>56</b>	<b>0</b>	<b>55</b>	<b>47</b>	<b>46</b>	<b>87</b>
- Inverness-shire	11	6	6	0	6	4	4	7
- Nairn	1	1	1	0	1	1	1	2
- Ross-shire	82	50	47	0	46	40	37	72
- Sutherland	3	3	2	0	2	2	2	6
<b>Aberdeenshire</b>	<b>33</b>	<b>28</b>	<b>26</b>	<b>1</b>	<b>25</b>	<b>24</b>	<b>21</b>	<b>57</b>
- Aberdeenshire	31	26	24	1	23	22	19	51
- Angus	2	2	2	0	2	2	2	6
<b>Central Scotland</b>	<b>135</b>	<b>86</b>	<b>73</b>	<b>2</b>	<b>71</b>	<b>61</b>	<b>56</b>	<b>108</b>
- Perth & Kinross	81	55	46	2	44	41	38	73
- Stirling	54	31	27	0	27	20	18	35
<b>Dumfries &amp; Galloway</b>	<b>91</b>	<b>86</b>	<b>84</b>	<b>1</b>	<b>82</b>	<b>71</b>	<b>67</b>	<b>97</b>
<b>TOTAL:</b>	<b>356</b>	<b>260</b>	<b>239</b>	<b>4</b>	<b>233</b>	<b>203</b>	<b>190</b>	<b>349</b>

**Table 4.** The number of White-tailed Eagle pairs monitored, their breeding success and productivity in Scotland, 1996-2014.

N.B. The summarised breeding data presented for White-tailed Eagle are consistent with the terminology recommended by Oehme (2003). This needs to be borne in mind when drawing comparisons with summarised breeding data for other SRMS species which have been analysed according to the definitions set out at the beginning of Section 7. Data presented in this table therefore include data relating to pairs whose fate was not followed post egg laying.

Year	Pairs monitored	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Young fledged per laying pair	Young fledged per territorial pair
1996	12	12	8	7	9	0.8	0.8
1997	14	11	6	5	9	0.8	0.6
1998	19	16	9	9	13	0.8	0.7
1999	20	16	9	6	11	0.7	0.6
2000	22	19	12	8	12	0.6	0.6
2001	23	17	10	7	11	0.7	0.5
2002	25	22	14	8	12	0.6	0.5
2003	31	25	20	16	26	1.0	0.8
2004	32	28	19	15	19	0.7	0.6
2005	33	28	21	17	24	0.9	0.7
2006	36	31	25	21	29	0.9	0.8
2007	42	35	31	24	34	1.0	0.8
2008	44	35	21	20	28	0.8	0.6
2009	46	39	31	24	36	0.9	0.8
2010	52	47	34	33	46	1.0	0.9
2011	57	49	38	33	43	0.9	0.8
2012	67	59	46	41	60	1.0	0.9
2013	84	75	56	49	62	0.8	0.7
2014	96	82	58	50	63	0.8	0.7
<b>TOTAL:</b>	<b>755</b>	<b>646</b>	<b>468</b>	<b>393</b>	<b>547</b>	<b>0.8</b>	<b>0.7</b>

**Table 5.** Breeding success of White-tailed Eagles in Scotland in 2014.

N.B. The summarised breeding data presented for White-tailed Eagle are consistent with the terminology recommended by Oehme (2003). This needs to be borne in mind when drawing comparisons with summarised breeding data for other SRMS species which have been analysed according to the definitions set out at the beginning of Section 7. Data presented in this table therefore include data relating to pairs whose fate was not followed post egg laying.

Study area	Home ranges occupied by pairs <sup>1</sup>	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Additional establishing pairs
<b>Argyll</b>	<b>30</b>	<b>29</b>	<b>19</b>	<b>18</b>	<b>21</b>	<b>0</b>
- Argyll & Bute (mainland)	5	5	4	3	4	
- Argyll Islands	25	24	15	15	17	
<b>Highland</b>	<b>39</b>	<b>30</b>	<b>23</b>	<b>16</b>	<b>20</b>	<b>0</b>
- Inverness-shire	1	0	0	0	0	
- Isle of Skye	20 <sup>2</sup>	16 <sup>3</sup>	12 <sup>4</sup>	8	11 <sup>5</sup>	
- Lochaber	6	6	5	3	3	
- Ross-shire	8	6	5	4	5	
- Small Isles	3	2	1	1	1	
- Sutherland	1	0	0	0	0	
<b>Lewis &amp; Harris</b>	<b>15</b>	<b>14</b>	<b>11</b>	<b>11</b>	<b>17</b>	<b>0</b>
- Lewis	14	13	11	11	17	
- Harris	1	1 <sup>3</sup>	0	0	0	
<b>Orkney</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Tayside</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	
- Angus	1	1	0	0	0	
- Fife	1	1	1	1	1	
- Perth & Kinross	1	1	0	0	0	
<b>Uist</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>0</b>
- Barra	1	1	1	1	1	
- Benbecula	1	1	1	1	1	
- North Uist	4	2	1	1	1	
- South Uist	3	2	1	1	1	
<b>TOTAL:</b>	<b>96<sup>2</sup></b>	<b>82<sup>3</sup></b>	<b>58<sup>4</sup></b>	<b>50</b>	<b>63<sup>5</sup></b>	<b>1</b>

<sup>1</sup> Data for home ranges occupied by pairs exclude records of establishing pairs (that do not have nests) that have been submitted to the Scheme. Additional establishing pairs are captured in an additional column of the table.

<sup>2</sup> One pair on the Isle of Skye that does not meet the SRMS definition of a monitored pair (See Section 7) has been included in the total of home ranges occupied by pairs.

<sup>3</sup> Two pairs on the Isle of Skye and one pair on Harris that do not meet the SRMS definition of a monitored pair (See Section 7) have been included in the total of pairs known to lay eggs.

<sup>4</sup> One pair on the Isle of Skye that does not meet the SRMS definition of a monitored pair (See Section 7), has been included in the total of pairs known to hatch eggs.

<sup>5</sup> One fledged young on the Isle of Skye that met the SRMS criteria for being considered minimum number of young fledged (See Section 7) has been discarded from the minimum number of young fledged.

**Table 6.** The number of pairs of Marsh Harriers located and their breeding success in Scotland, 2003-2014.

Year	Pairs located	Pairs known to lay eggs	Pairs known to fledge 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
2013	9	5	5	16
2014	9	7	7	20

\* One male in 2010 was polygamous.

**Table 7.** Home range occupancy and breeding success of Hen Harriers in Scotland, 2003-2014.

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Year	Home ranges checked	Home ranges occupied by pairs	%	Pairs monitored	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
2013	622	278	45	247	190	77	109	44	294	2.7	1.5	1.2
2014	589	314	51	293	219	74	177	58	579	3.2	2.5	1.9

**Table 8.** The number of home ranges checked and the breeding success of Hen Harriers in Scotland in 2014.

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
<b>Argyll</b>	<b>86</b>	<b>45</b>	<b>2</b>	<b>38</b>	<b>0</b>	<b>35</b>	<b>33</b>	<b>32</b>	<b>100</b>
- Argyll & Bute (mainland)	32	20	2	14	0	13	11	11	31
- Argyll Islands	54	25	0	24	0	22	22	21	69
<b>Central</b>	<b>16</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>15</b>
- Arrochar & Helensburgh	10	3	0	3	0	3	3	3	15
- Stirling	6	0	1	0	0	0	0	0	0
<b>Dumfries &amp; Galloway</b>	<b>21</b>	<b>20</b>	<b>1</b>	<b>16</b>	<b>0</b>	<b>16</b>	<b>12</b>	<b>11</b>	<b>51</b>
<b>Highland</b>	<b>73</b>	<b>31</b>	<b>5</b>	<b>24</b>	<b>2</b>	<b>22</b>	<b>21</b>	<b>18</b>	<b>62</b>
- Badenoch & Strathspey	3	1	1	1	0	1	1	1	1
- Caithness	2	2	0	1	0	1	1	1	3
- Inverness-shire	7	2	1	1	0	1	1	1	5
- Isle of Skye	20	6	2	5	0	5	5	3	10
- Nairn	2	0	0	0	0	0	0	0	0
- Ross-shire	4	4	0	3	0	3	2	2	6
- Small Isles	4	3	0	3	0	3	3	3	9
- Sutherland	12	6	1	4	0	4	4	3	9
- West Moray	19	7	0	6	2	4	4	4	19
<b>Lothian &amp; Borders</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>14</b>
- Scottish Borders	5	4	1	4	0	4	3	3	14
<b>Northeast Scotland</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
- Aberdeenshire	1	0	1	0	0	0	0	0	0
- East Moray	4	1	0	1	0	1	1	1	2
<b>Orkney</b>	<b>216</b>	<b>105</b>	<b>20</b>	<b>105</b>	<b>55</b>	<b>50</b>	<b>41</b>	<b>35</b>	<b>92</b>
<b>South Strathclyde</b>	<b>53</b>	<b>40</b>	<b>0</b>	<b>39</b>	<b>4</b>	<b>34</b>	<b>32</b>	<b>28</b>	<b>101</b>
- Ayrshire	42	31	0	31	4	27	27	25	87
- South Lanarkshire	11	9	0	8	0	7	5	3	14
<b>Tayside</b>	<b>75</b>	<b>28</b>	<b>8</b>	<b>28</b>	<b>2</b>	<b>21</b>	<b>17</b>	<b>13</b>	<b>42</b>
- Angus	26	0	2	0	0	0	0	0	0
- Perth & Kinross	49	28	6	28	2	21	17	13	42
<b>Uist</b>	<b>39</b>	<b>37</b>	<b>1</b>	<b>35</b>	<b>2</b>	<b>33</b>	<b>33</b>	<b>33</b>	<b>100</b>
- Benbecula	4	4	0	4	0	4	4	4	13
- North Uist	18	17	1	16	0	16	16	16	50
- South Uist	17	16	0	15	2	13	13	13	37
<b>TOTAL:</b>	<b>589</b>	<b>314</b>	<b>40</b>	<b>293</b>	<b>65</b>	<b>219</b>	<b>196</b>	<b>177</b>	<b>579</b>

**Table 9.** The number of Northern Goshawk home ranges checked, their occupancy and breeding success in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied by pairs	%	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	2.0
2004	132	86	65	67	60	90	126	1.9
2006	116	78	67	60	48	80	108	1.8
2007	136	87	64	70	60	86	127	1.8
2008	139	89	64	70	61	87	163	2.3
2009	128	85	66	77	68	88	167	2.2
2010	143	97	68	92	75	82	182	2.0
2011	158	116	73	102	89	87	212	2.1
2012	171	128	75	117	98	84	202	1.7
2013	174	124	71	114	100	88	218	1.9
2014	192	137	67	122	100	83	226	1.8

**Table 10.** The number of checked home ranges and the breeding success of Northern Goshawks in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	Further home ranges in use (single birds or fresh signs)	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
<b>Central</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
- Stirling	4	2	0	2	0	2	2	2	3
<b>Dumfries &amp; Galloway</b>	<b>35</b>	<b>30</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>30</b>	<b>26</b>	<b>26</b>	<b>60</b>
<b>Highland</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>
- Badenoch & Strathspey	2	2	0	2	0	2	2	0	0
- Inverness-shire	1	0	0	0	0	0	0	0	0
- Lochaber	1	1	0	1	0	1	1	1	3
- Nairn	1	0	1	0	0	0	0	0	0
<b>Lothian &amp; Borders</b>	<b>49</b>	<b>24</b>	<b>13</b>	<b>18</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>17</b>	<b>36</b>
- Lothian	1	0	1	0	0	0	0	0	0
- Scottish Borders	48	24	12	18	0	18	18	17	36
<b>North-east</b>	<b>83</b>	<b>64</b>	<b>4</b>	<b>[62]</b>	<b>[10]</b>	<b>56</b>	<b>45</b>	<b>45</b>	<b>109</b>
<b>South Strathclyde</b>	<b>7</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>7</b>
- Ayrshire	5	4	0	3	0	3	2	2	3
- South Lanarkshire	2	2	0	2	0	2	2	2	4
<b>Tayside</b>	<b>9</b>	<b>8</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>5</b>	<b>5</b>	<b>8</b>
- Angus	6	6	0	6	0	6	3	3	6
- Perth & Kinross	3	2	1	2	0	2	2	2	2
<b>TOTAL:</b>	<b>192</b>	<b>137</b>	<b>19</b>	<b>128</b>	<b>10</b>	<b>122</b>	<b>103</b>	<b>100</b>	<b>226</b>

Figures in square brackets were not supplied, therefore a minimum figure has been used.



**Table 11.** Home range occupancy and breeding success of Eurasian Sparrowhawks in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pairs monitored	Pairs known to lay eggs	%	Pairs known to fledge young	%	Minimum number of young fledged	Mean brood size per laying pair	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
2013	113	59	52	50	49	98	41	82	125	2.6	2.5
2014	121	71	52	53	53	100	48	84	137	2.6	2.6

**Table 12.** Breeding success of Eurasian Sparrowhawks in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	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
<b>Argyll</b>	<b>9</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>7</b>
- Argyll & Bute (mainland)	4	3	2	0	2	2	2	7
- Argyll Islands	5	4	1	0	1	1	0	0
<b>Central</b>	<b>31</b>	<b>15</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>25</b>
- North Lanarkshire	11	8	5	0	5	4	4	9
- Stirling	20	7	4	0	4	4	4	16
<b>Dumfries &amp; Galloway</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>6</b>
<b>Highland</b>	<b>11</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>7</b>	<b>12</b>
- Caithness	1	1	1	0	1	1	1	1
- Inverness-shire	1	0	0	0	0	0	0	0
- Isle of Skye	1	1	1	0	1	1	1	1
- Ross-shire	5	4	4	0	4	4	3	6
- Small Isles	3	2	2	0	2	2	2	4
<b>Lothian &amp; Borders</b>	<b>34</b>	<b>17</b>	<b>13</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>56</b>
- Lothian	33	16	12	0	12	12	12	51
- Scottish Borders	1	1	1	0	1	1	1	5
<b>North-east</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>
- Aberdeenshire	2	2	2	0	2	2	2	4

Table 12. Continued.

Region	Home ranges checked	Home ranges occupied by pairs	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
<b>Orkney</b>	11	4	4	0	4	4	2	6
<b>South Strathclyde</b>	8	7	6	0	6	6	6	9
- Ayrshire	8	7	6	0	6	6	6	9
<b>Tayside</b>	2	2	2	0	2	2	2	5
- Angus	0	0	0	0	0	0	0	0
- Fife	2	2	2	0	2	2	2	5
<b>Uist</b>	7	6	4	0	4	4	4	7
- North Uist	5	4	2	0	2	2	2	3
- South Uist	2	2	2	0	2	2	2	4
<b>TOTAL:</b>	<b>121</b>	<b>62</b>	<b>45</b>	<b>0</b>	<b>45</b>	<b>44</b>	<b>40</b>	<b>123</b>

Table 13. Home range occupancy and breeding success of Common Buzzards in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pairs monitored	Pairs known to lay eggs	%	Pairs known to fledge 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
2013	1027	703	68	553	484	88	437	79	724	1.5	1.3
2014	941	693	74	519	473	91	424	82	750	1.6	1.4

**Table 14.** The number of Common Buzzard home ranges checked and their breeding success in Scotland in 2014.

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
<b>Argyll</b>	<b>156</b>	<b>76</b>	<b>9</b>	<b>40</b>	<b>2</b>	<b>33</b>	<b>33</b>	<b>33</b>	<b>57</b>
- Argyll & Bute (mainland)	75	39	5	21	0	20	20	20	37
- Argyll Islands	81	37	4	19	2	13	13	13	20
<b>Central</b>	<b>286</b>	<b>241</b>	<b>7</b>	<b>165</b>	<b>24</b>	<b>138</b>	<b>120</b>	<b>114</b>	<b>174</b>
- Arrochar & Helensburgh	5	5	0	2	0	2	2	2	2
- Dunbartonshire	4	4	0	3	1	2	2	2	2
- Falkirk	7	7	0	7	0	7	7	7	23
- Glasgow	3	2	0	1	0	1	1	1	1
- North Lanarkshire	42	38	3	27	1	26	24	24	37
- Stirling	225	185	4	125	22	100	84	78	109
<b>Dumfries &amp; Galloway</b>	<b>58</b>	<b>44</b>	<b>2</b>	<b>40</b>	<b>0</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>81</b>
<b>Highland</b>	<b>134</b>	<b>101</b>	<b>3</b>	<b>90</b>	<b>6</b>	<b>83</b>	<b>71</b>	<b>69</b>	<b>136</b>
- Badenoch & Strathspey	12	12	0	11	0	11	11	11	29
- Caithness	1	1	0	1	0	1	1	1	1
- Inverness-shire	9	6	2	0	0	0	0	0	0
- Isle of Skye	1	1	0	1	0	1	1	1	1
- Ross-shire	87	58	1	58	6	51	40	38	69
- Small Isles	7	7	0	7	0	7	7	7	11
- Sutherland	14	13	0	12	0	12	11	11	25
- West Moray	3	3	0	0	0	0	0	0	0
<b>Lewis &amp; Harris</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>5</b>
- Harris	3	3	0	3	0	3	2	2	2
- Lewis	3	3	0	3	0	3	2	2	3
<b>Lothian &amp; Borders</b>	<b>74</b>	<b>60</b>	<b>12</b>	<b>50</b>	<b>2</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>111</b>
- Lothian	32	32	0	32	2	30	30	30	77
- Scottish Borders	42	28	12	18	0	18	18	18	34
<b>North-east</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>4</b>
- Aberdeenshire	3	3	0	3	0	3	3	3	4
- East Moray	1	1	0	1	0	1	0	0	0
<b>Orkney</b>	<b>12</b>	<b>8</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>14</b>
<b>South Strathclyde</b>	<b>19</b>	<b>19</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>20</b>
- Ayrshire	18	18	0	12	0	12	12	12	20
- South Lanarkshire	1	1	0	0	0	0	0	0	0

Table 14. Continued.

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
<b>Tayside</b>	<b>164</b>	<b>109</b>	<b>7</b>	<b>87</b>	<b>0</b>	<b>87</b>	<b>85</b>	<b>81</b>	<b>125</b>
- Angus	15	15	0	14	0	14	12	11	20
- Fife	15	14	0	14	0	14	14	14	17
- Perth & Kinross	134	80	7	59	0	59	59	56	88
<b>Uist</b>	<b>28</b>	<b>25</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>23</b>
- Benbecula	6	6	0	4	0	4	4	3	6
- North Uist	12	10	0	4	0	4	4	4	7
- South Uist	10	9	0	9	0	9	8	8	10
<b>TOTAL:</b>	<b>941</b>	<b>693</b>	<b>42</b>	<b>519</b>	<b>37</b>	<b>473</b>	<b>437</b>	<b>424</b>	<b>750</b>

Table 15. Home range occupancy and breeding success of Golden Eagles in Scotland, 2004-2014.

Year	Home ranges checked	Home ranges occupied by pairs	%	Further home ranges in use (single birds or fresh signs)	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	1.2	0.6
2005	264	220	83	19	207	72	35	88	1.2	0.4
2006	290	233	80	27	218	78	36	84	1.1	0.4
2007	291	227	78	26	216	92	43	104	1.1	0.5
2008	310	242	78	28	224	111	50	123	1.1	0.6
2009	307	242	79	28	232	95	41	111	1.2	0.5
2010	344	264	77	36	247	111	45	134	1.2	0.5
2011	345	280	81	26	247	91	37	108	1.2	0.4
2012	356	306	86	14	280	95	34	109	1.2	0.4
2013	357	298	83	30	257	112	44	125	1.1	0.5
2014	373	325	87	22	258	116	45	137	1.2	0.5

**Table 16.** Breeding success of Golden Eagles in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	Of which immature pairs <sup>1</sup>	Further home ranges in use (single birds or fresh signs)	Pairs monitored	Failed early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>76</b>	<b>73</b>	<b>0</b>	<b>1</b>	<b>63</b>	<b>9</b>	<b>39</b>	<b>24</b>	<b>20</b>	<b>20</b>
- Argyll & Bute (mainland)	34	32	0	1	29	3	21	13	11	11
- Argyll Islands	42	41	0	0	34	6	18	11	9	9
<b>Central</b>	<b>10</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>9</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>6</b>
- Arrochar & Helensburgh	2	2	0	0	2	1	1	1	1	1
- Stirling	8	7	1	1	7	1	5	5	4	5
<b>Dumfries &amp; Galloway</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Highland</b>	<b>188</b>	<b>154</b>	<b>5</b>	<b>14</b>	<b>112</b>	<b>20</b>	<b>90</b>	<b>68</b>	<b>58</b>	<b>67</b>
- Badenoch & Strathspey	16	15	2	0	13	3	10	9	9	12
- Inverness-shire	22	11	1	6	6	1	5	5	5	6
- Isle of Skye	39	34	0	1	18	0	18	13	11	12
- Lochaber	33	30	0	2	26	4	20	14	7	8
- Ross-shire	45	32	1	5	23	3	20	16	15	17
- Small Isles	6	6	0	0	5	1	4	2	2	2
- Sutherland	27	26	1	0	21	8	13	9	9	10
<b>Lewis &amp; Harris</b>	<b>21</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>2</b>	<b>14</b>	<b>7</b>	<b>6</b>	<b>6</b>
- Harris	11	11	0	0	9	1	7	2	2	2
- Lewis	10	9	0	0	8	1	7	5	4	4
<b>Lothian &amp; Borders</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
- Scottish Borders	3	1	0	0	1	0	0	0	0	0
<b>North-east</b>	<b>16</b>	<b>16</b>	<b>0</b>	<b>3</b>	<b>14</b>	<b>5</b>	<b>8</b>	<b>0</b>	<b>5</b>	<b>8</b>
<b>Tayside</b>	<b>35</b>	<b>30</b>	<b>5</b>	<b>1</b>	<b>27</b>	<b>4</b>	<b>22</b>	<b>16</b>	<b>14</b>	<b>21</b>
- Angus	9	5	0	1	5	0	5	4	4	7
- Perth & Kinross	26	25	5	0	22	4	17	12	10	14
<b>Uist</b>	<b>22</b>	<b>20</b>	<b>0</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>12</b>	<b>12</b>	<b>8</b>	<b>9</b>
- Barra	2	2	0	0	0	0	0	0	0	0
- Benbecula	2	2	0	0	2	1	1	1	0	0
- North Uist	9	7	0	2	4	0	4	4	3	4
- South Uist	9	9	0	0	7	0	7	7	5	5
<b>TOTAL:</b>	<b>373</b>	<b>325</b>	<b>11</b>	<b>22</b>	<b>258</b>	<b>43</b>	<b>193</b>	<b>133</b>	<b>116</b>	<b>137</b>

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

**Table 17.** Breeding site occupancy and breeding success of Ospreys in Scotland, 2003-2014.

Year	Breeding sites checked	Breeding sites occupied by pairs	%	Pairs monitored	Pairs failing early or non-breeding	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 monitored pair
2003	232	162	70	[162]	[22]	140	109	67	229	2.1	1.4
2004	230	182	79	[182]	[27]	155	114	63	233	2.0	1.3
2005	239	180	75	[180]	[22]	158	124	69	242	2.0	1.3
2006	206	155	75	[155]	[12]	143	111	72	225	2.0	1.5
2007	198	140	71	138	19	119	92	67	182	2.0	1.3
2008	>211	208–211	–	204	31	173	148–149	73	303	2.0	1.5
2009	209	168	80	166	10	156	130	78	259	2.0	1.6
2010	229	193	84	190	24	166	144	76	306	2.1	1.6
2011	260	202	78	201	28	173	104	52	210	2.0	1.0
2012	276	195	71	194	14	180	142	73	278	2.0	1.4
2013	289	196	67	185	14	163	138	77	280	2.0	1.5
2014	307	209	64	206	17	182	156	69	339	1.9	1.6

Figures in square brackets were not supplied, therefore the maximum possible figure was used.

35 **Table 18.** Breeding success of Ospreys in Scotland in 2014.

Region	Breeding sites checked	Breeding sites occupied by pairs	Breeding sites 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
<b>Argyll</b>	<b>32</b>	<b>19</b>	<b>0</b>	<b>19</b>	<b>1</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>34</b>
- Argyll & Bute (mainland)	32	19	0	19	1	17	17	17	34
<b>Central</b>	<b>38</b>	<b>28</b>	<b>2</b>	<b>26</b>	<b>3</b>	<b>22</b>	<b>18</b>	<b>18</b>	<b>37</b>
- Arrochar & Helensburgh	1	1	0	1	0	1	1	1	2
- Dunbartonshire	2	2	0	1	0	1	1	1	1
- Stirling	35	25	2	24	3	20	16	16	34
<b>Dumfries &amp; Galloway</b>	<b>15</b>	<b>10</b>	<b>1</b>	<b>10</b>	<b>4</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>12</b>
<b>Highland</b>	<b>97</b>	<b>73</b>	<b>3</b>	<b>72</b>	<b>2</b>	<b>68</b>	<b>64</b>	<b>63</b>	<b>142</b>
- Badenoch & Strathspey	12	10	0	10	0	10	8	8	22
- Caithness	1	1	0	1	0	1	1	1	3
- Inverness-shire	14	12	0	12	0	12	12	11	23
- Lochaber	2	2	0	2	0	2	2	2	4
- Ross-shire	32	21	1	21	0	20	19	19	39
- Sutherland	23	16	2	15	0	14	13	13	28
- West Moray	5	5	0	5	0	5	5	5	13
- West Moray & Nairn	8	6	0	6	2	4	4	4	10

Table 18. Continued.

Region	Breeding sites checked	Breeding sites occupied by pairs	Breeding sites 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
<b>Lothian &amp; Borders</b>	<b>15</b>	<b>10</b>	<b>1</b>	<b>10</b>	<b>1</b>	<b>9</b>	<b>8</b>	<b>6</b>	<b>13</b>
- Lothian	1	1	0	1	0	1	1	1	1
- Scottish Borders	14	9	1	9	1	8	7	5	12
<b>North-east</b>	<b>34</b>	<b>21</b>	<b>0</b>	<b>21</b>	<b>1</b>	<b>18</b>	<b>18</b>	<b>16</b>	<b>36</b>
- Aberdeenshire	34	21	0	21	1	18	18	16	36
<b>South Strathclyde</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>
- Ayrshire	3	3	0	3	1	2	2	2	4
- South Lanarkshire	3	2	0	2	2	0	0	0	0
<b>Tayside</b>	<b>70</b>	<b>43</b>	<b>5</b>	<b>43</b>	<b>2</b>	<b>40</b>	<b>30</b>	<b>29</b>	<b>61</b>
- Angus	9	9	0	9	0	9	8	7	15
- Perth & Kinross	61	34	5	34	2	31	22	22	46
<b>TOTAL:</b>	<b>307</b>	<b>209</b>	<b>12</b>	<b>206</b>	<b>17</b>	<b>182</b>	<b>162</b>	<b>156</b>	<b>339</b>

36 Table 19. Nest site occupancy and breeding success of Barn Owls in Scotland, 2003-2014.

Year	Nest sites checked	Nest sites occupied by pairs	% of those checked	Pairs monitored	Pairs known to lay eggs	% of those monitored	Pairs known to fledge young	Breeding success: % of those laying	Minimum number of young fledged	Mean brood size per laying pair
2003	260	238	92	–	226	–	209		656	2.9
2004	279	252	90	–	226	–	197		535	2.4
2005	316	253	80	–	204	–	160		433	2.1
2006	368	278	76	267	249	93	215	86	591	2.4
2007	474	391	82	374	352	94	320	91	1032	2.9
2008	524	409	78	369	340	92	276	81	688	2.0
2009	579	337	58	308	290	94	262	90	795	2.7
2010	545	347	64	330	312	95	285	91	919	2.9
2011	551	301	55	288	283	98	269	95	809	2.9
2012	702	295	42	279	240	86	188	78	402	1.7
2013	617	217	35	183	172	94	158	92	487	2.8
2014	639	347	54	307	296	96	285	96	1177	4.0

**Table 20.** Breeding success of Barn Owls in Scotland in 2014.

Region	Nest sites checked	Nest sites occupied by pairs	Nest sites occupied by single birds	Pairs monitored	Failed early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>75</b>	<b>52</b>	<b>1</b>	<b>50</b>	<b>1</b>	<b>49</b>	<b>49</b>	<b>46</b>	<b>191</b>
- Argyll & Bute (mainland)	69	50	1	49	1	48	48	45	189
- Argyll Islands	6	2	0	1	0	1	1	1	2
<b>Central</b>	<b>85</b>	<b>49</b>	<b>1</b>	<b>46</b>	<b>0</b>	<b>46</b>	<b>45</b>	<b>44</b>	<b>146</b>
- Arrochar & Helensburgh	6	5	0	5	0	5	5	5	17
- Clackmannanshire	11	6	0	6	0	6	6	6	22
- Dunbartonshire	10	7	0	7	0	7	6	5	16
- Falkirk	9	9	0	7	0	7	7	7	17
- Stirling	49	22	1	21	0	21	21	21	74
<b>Dumfries &amp; Galloway</b>	<b>295</b>	<b>140</b>	<b>20</b>	<b>139</b>	<b>7</b>	<b>131</b>	<b>130</b>	<b>125</b>	<b>585</b>
<b>Highland</b>	<b>22</b>	<b>19</b>	<b>2</b>	<b>13</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>50</b>
- Badenoch & Strathspey	1	1	0	1	0	1	1	1	9
- Caithness	1	1	0	1	0	1	1	1	2
- Inverness-shire	7	7	0	2	0	2	2	2	5
- Lochaber	1	0	1	0	0	0	0	0	0
- Nairn	1	1	0	0	0	0	0	0	0
- Ross-shire	7	7	0	7	0	7	7	7	25
- Small Isles	1	0	1	0	0	0	0	0	0
- Sutherland	3	2	0	2	0	2	2	2	9
<b>Lothian &amp; Borders</b>	<b>54</b>	<b>22</b>	<b>7</b>	<b>18</b>	<b>1</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>63</b>
- Lothian	5	1	0	1	0	1	1	1	5
- Scottish Borders	49	21	7	17	1	16	16	16	58
<b>North-east</b>	<b>25</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>1</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>41</b>
- Aberdeenshire	25	12	0	12	1	11	11	11	41
<b>South Strathclyde</b>	<b>70</b>	<b>43</b>	<b>4</b>	<b>20</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>70</b>
- Ayrshire	65	41	3	18	0	18	18	18	64
- Renfrewshire	3	2	1	2	0	2	2	2	6
- South Lanarkshire	2	0	0	0	0	0	0	0	0
<b>Tayside</b>	<b>13</b>	<b>10</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>31</b>
- Perth & Kinross	13	10	0	9	0	9	9	9	31
<b>TOTAL:</b>	<b>639</b>	<b>347</b>	<b>35</b>	<b>307</b>	<b>10</b>	<b>296</b>	<b>294</b>	<b>285</b>	<b>1177</b>



**Table 21.** Annual breeding success and productivity of Tawny Owls in Scotland, 2003-2014.

Year	Pairs monitored	Pairs known to fledge 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
2013	86	70	81	123	1.4
2014	185	152	82	351	1.9

**Table 22.** Breeding success of Tawny Owls in Scotland in 2014.

Region	Nest sites checked	Nest sites occupied by pairs	Pairs monitored	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>12</b>
- Argyll & Bute (mainland)	8	8	7	7	5	5	12
- Argyll Islands	1	0	0	0	0	0	0
<b>Central</b>	<b>110</b>	<b>68</b>	<b>68</b>	<b>67</b>	<b>51</b>	<b>48</b>	<b>120</b>
- North Lanarkshire	7	7	7	7	5	5	10
- Stirling	103	61	61	60	46	43	110
<b>Dumfries &amp; Galloway</b>	<b>59</b>	<b>29</b>	<b>29</b>	<b>29</b>	<b>29</b>	<b>28</b>	<b>58</b>
<b>Highland</b>	<b>40</b>	<b>31</b>	<b>31</b>	<b>31</b>	<b>27</b>	<b>25</b>	<b>56</b>
- Badenoch & Strathspey	1	1	1	1	1	1	3
- Lochaber	1	1	1	1	1	1	2
- Nairn	1	1	1	1	1	1	1
- Ross-shire	27	22	22	22	19	17	38
- Sutherland	10	6	6	6	5	5	12
<b>Lothian &amp; Borders</b>	<b>50</b>	<b>31</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>29</b>	<b>60</b>
- Lothian	2	2	2	2	2	2	5
- Scottish Borders	48	29	28	28	28	27	55
<b>South Strathclyde</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
- Ayrshire	1	0	0	0	0	0	0
<b>Tayside</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>18</b>	<b>17</b>	<b>45</b>
- Perth & Kinross	21	20	20	20	18	17	45
<b>TOTAL:</b>	<b>290</b>	<b>187</b>	<b>185</b>	<b>184</b>	<b>160</b>	<b>152</b>	<b>351</b>

**Table 23.** Breeding success of Long-eared Owls in Scotland in 2014.

Region	Known territories checked for occupation	Pairs found	Pairs known to lay eggs	Pairs known to fledge young	Minimum number of fledged young
<b>Argyll</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>7</b>
- Argyll Islands	5	2	2	2	7
<b>Central Scotland</b>	<b>8</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>14</b>
- Arrochar & Helensburgh	3	2	1	1	4
- Dunbartonshire	1	1	1	1	2
- Falkirk	1	1	1	1	2
- Stirling	3	3	2	2	6
<b>Dumfries &amp; Galloway</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>Highland</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>18</b>
- Badenoch & Strathspey	4	3	3	3	7
- Inverness-shire	2	1	1	1	4
- Small Isles	4	4	4	4	7
<b>Lothian &amp; Borders</b>	<b>25</b>	<b>24</b>	<b>21</b>	<b>21</b>	<b>50</b>
- Lothian	11	11	11	11	25
- Scottish Borders	14	13	10	10	25
<b>North-east</b>	<b>12</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>21</b>
- Aberdeenshire	12	10	10	10	21
<b>Orkney</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>South Strathclyde</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4</b>
- South Lanarkshire	2	2	2	2	4
<b>Tayside</b>	<b>10</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>11</b>
- Angus	6	5	5	5	8
- Fife	2	1	1	1	3
- Perth & Kinross	2	0	0	0	0
<b>Uist</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
- North Uist	5	1	0	0	0
- South Uist	1	0	0	0	0
<b>TOTAL:</b>	<b>81</b>	<b>63</b>	<b>56</b>	<b>55</b>	<b>128</b>

**Table 24.** The number of sites checked and the breeding success of Short-eared Owls in Scotland in 2014.

Region	Sites checked	Pairs found	Additional single birds recorded	Pairs monitored	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>9</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>4</b>	<b>6</b>
- Argyll & Bute (mainland)	6	4	0	4	4	6
- Argyll Islands	3	1	0	1	0	0
<b>Central</b>	<b>14</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
- Arrochar & Helensburgh	2	2	0	0	0	0
- Stirling	12	4	1	1	1	3
<b>Dumfries &amp; Galloway</b>	<b>14</b>	<b>13</b>	<b>1</b>	<b>7</b>	<b>7</b>	<b>25</b>
<b>Highland</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>3</b>
- Badenoch & Strathspey	2	2	0	2	1	1
- Inverness-shire	2	1	1	1	0	0
- Small Isles	1	1	0	1	1	2
- Sutherland	1	1	0	0	0	0
<b>Lothian &amp; Borders</b>	<b>17</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>14</b>
- Scottish Borders	17	5	6	5	5	14
<b>Orkney</b>	<b>81</b>	<b>28</b>	<b>22</b>	<b>28</b>	<b>9</b>	<b>15</b>
<b>South Strathclyde</b>	<b>8</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
- Ayrshire	4	3	1	0	0	0
- South Lanarkshire	4	4	0	1	1	1
<b>Tayside</b>	<b>28</b>	<b>22</b>	<b>5</b>	<b>18</b>	<b>16</b>	<b>24</b>
- Angus	1	1	0	1	1	1
- Perth & Kinross	27	21	5	17	15	23
<b>Uist</b>	<b>18</b>	<b>17</b>	<b>1</b>	<b>12</b>	<b>12</b>	<b>30</b>
- Benbecula	4	4	0	3	3	5
- North Uist	6	5	1	3	3	10
- South Uist	8	8	0	6	6	15
<b>TOTAL:</b>	<b>195</b>	<b>108</b>	<b>38</b>	<b>81</b>	<b>57</b>	<b>121</b>

**Table 25.** Home range occupancy and breeding success of Common Kestrels in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied by pairs	%	Pairs monitored	Pairs known to lay eggs	%	Pairs fledging young	%	Minimum number of young fledged	Mean brood size per pair laying	Mean brood size per pair occupied 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
2013	237	116	49	89	76	85	72	81	219	2.9	2.5
2014	396	231	58	165	151	92	146	88	443	2.9	2.7

**Table 26.** Breeding success of Common Kestrels in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	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
<b>Argyll</b>	<b>23</b>	<b>17</b>	<b>11</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>26</b>
- Argyll & Bute (mainland)	12	12	9	0	8	8	8	22
- Argyll Islands	11	5	2	0	2	2	2	4
<b>Central</b>	<b>66</b>	<b>31</b>	<b>22</b>	<b>0</b>	<b>22</b>	<b>21</b>	<b>21</b>	<b>74</b>
- Arrochar & Helensburgh	6	2	1	0	1	1	1	2
- Clackmannanshire	2	2	2	0	2	2	2	10
- Dunbartonshire	2	1	1	0	1	1	1	4
- Falkirk	7	5	4	0	4	4	4	14
- North Lanarkshire	13	10	8	0	8	7	7	25
- Stirling	36	11	6	0	6	6	6	19
<b>Dumfries &amp; Galloway</b>	<b>36</b>	<b>11</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>29</b>
<b>Highland</b>	<b>36</b>	<b>29</b>	<b>19</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>18</b>	<b>57</b>
- Badenoch & Strathspey	4	3	2	0	2	2	2	10
- Caithness	1	1	1	0	1	1	1	2
- Inverness-shire	10	8	5	0	5	5	5	21
- Isle of Skye	2	1	1	0	1	1	1	3
- Lochaber	2	2	0	0	0	0	0	0
- Ross-shire	5	4	3	0	3	3	2	8
- Small Isles	8	7	5	0	5	5	5	8
- Sutherland	4	3	2	0	2	2	2	5
<b>Lewis &amp; Harris</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>

Table 26. Continued.

Region	Home ranges checked	Home ranges occupied by pairs	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
- Lewis	2	2	1	0	1	1	1	3
<b>Lothian &amp; Borders</b>	<b>43</b>	<b>14</b>	<b>14</b>	<b>2</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>47</b>
- Lothian	22	8	8	2	6	6	7	29
- Scottish Borders	21	6	6	0	6	6	6	18
<b>North-east</b>	<b>16</b>	<b>10</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>12</b>
- Aberdeenshire	16	10	4	0	4	4	4	12
<b>Orkney</b>	<b>35</b>	<b>21</b>	<b>21</b>	<b>10</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>21</b>
<b>South Strathclyde</b>	<b>35</b>	<b>16</b>	<b>13</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>49</b>
- Ayrshire	29	11	9	0	9	9	9	36
- Renfrewshire	4	3	2	0	2	2	2	9
- South Lanarkshire	2	2	2	0	2	2	2	4
<b>Tayside</b>	<b>85</b>	<b>64</b>	<b>37</b>	<b>0</b>	<b>36</b>	<b>35</b>	<b>35</b>	<b>85</b>
- Angus	20	12	8	0	8	7	7	11
- Fife	2	2	2	0	2	2	2	8
- Perth & Kinross	63	50	27	0	26	26	26	66
<b>Uist</b>	<b>19</b>	<b>16</b>	<b>13</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>40</b>
- Benbecula	1	1	1	0	1	1	1	3
- North Uist	5	4	4	0	4	4	4	12
- South Uist	13	11	8	0	8	8	8	25
<b>TOTAL:</b>	<b>396</b>	<b>231</b>	<b>165</b>	<b>12</b>	<b>151</b>	<b>147</b>	<b>146</b>	<b>443</b>

**Table 27.** Breeding range occupancy and breeding success of Merlin in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied (pairs, singles or fresh signs)	%	Pairs monitored	Pairs known to lay eggs	% of pair occupied monitored home range	Pairs known to fledge 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 <sup>1</sup>	63	[190]	190	–	141	–	476	2.5	–
2004	403	254 <sup>1</sup>	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	513	314	61	209	187	89	142	68	433	2.3	2.1
2009	318	204	64	145 <sup>3</sup>	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
2013	376	205	55	133	125	94	108	81	302	2.4	2.3
2014	419	221	53	150	142	95	124	83	366	3.0	2.4

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

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

<sup>3</sup> Corrected figure from 2009 report.

**Table 28.** The number of home ranges checked and the breeding success of Merlin in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied (pairs, singles or fresh signs)	Home ranges occupied by pairs	Pairs monitored	Failed early on non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
- Argyll & Bute (mainland)	1	1	1	0	0	0	0	0	0
- Argyll Islands	1	0	0	0	0	0	0	0	0
<b>Central</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
- Arrochar & Helensburgh	1	1	0	0	0	0	0	0	0
- Stirling	6	0	0	0	0	0	0	0	0
<b>Dumfries &amp; Galloway</b>	<b>12</b>	<b>12</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>21</b>
<b>Highland</b>	<b>45</b>	<b>38</b>	<b>33</b>	<b>23</b>	<b>1</b>	<b>22</b>	<b>18</b>	<b>18</b>	<b>44</b>
- Badenoch & Strathspey	10	8	7	3	0	3	2	2	5
- Inverness-shire	7	7	5	3	1	2	2	2	6
- Lochaber	1	1	0	0	0	0	0	0	0
- Ross-shire	4	3	3	3	0	3	2	2	5
- Small Isles	5	2	2	2	0	2	1	1	2
- Sutherland	18	17	16	12	0	12	11	11	26
<b>Lewis &amp; Harris</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
- Harris	1	1	1	1	0	1	1	1	3
<b>Lothian &amp; Borders</b>	<b>55</b>	<b>21</b>	<b>16</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>37</b>
- Lothian	18	5	4	3	0	3	3	3	12

Table 28. Continued.

Region	Home ranges checked	Home ranges occupied (pairs, singles or fresh signs)	Home ranges occupied by pairs	Pairs monitored	Failed early on non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
- Scottish Borders	37	16	12	9	0	9	9	9	25
<b>North-east</b>	<b>101</b>	<b>40</b>	<b>40</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>35</b>	<b>33</b>	<b>115</b>
- Aberdeenshire	80	33	33	31	0	31	28	26	91
- East Moray	21	7	7	7	0	7	7	7	24
<b>Orkney</b>	<b>64</b>	<b>16</b>	<b>11</b>	<b>11</b>	<b>3</b>	<b>8</b>	<b>8</b>	<b>5</b>	<b>13</b>
<b>Shetland</b>	<b>48</b>	<b>23</b>	<b>20</b>	<b>18</b>	<b>1</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>54</b>
<b>South Strathclyde</b>	<b>13</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>26</b>
- Ayrshire	0	0	0	0	0	0	0	0	0
- South Lanarkshire	13	10	10	9	0	9	8	8	26
<b>Tayside</b>	<b>55</b>	<b>56</b>	<b>28</b>	<b>19</b>	<b>3</b>	<b>16</b>	<b>14</b>	<b>14</b>	<b>28</b>
- Angus	25	19	12	9	0	9	8	8	17
- Perth & Kinross	30	37	16	10	3	7	6	6	11
<b>Uist</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>25</b>
- Benbecula	2	2	2	1	0	1	1	1	2
- North Uist	4	4	4	1	0	1	1	1	3
- South Uist	10	10	9	7	0	7	7	7	20
<b>TOTAL:</b>	<b>419</b>	<b>235</b>	<b>185</b>	<b>150</b>	<b>8</b>	<b>142</b>	<b>130</b>	<b>124</b>	<b>366</b>

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Table 29. Occupancy of Peregrine Falcon home ranges in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied (pairs, singles or fresh signs)	%	Home ranges occupied by pairs	%	Home ranges occupied by single birds	%
2003	595	402	68	–	–	–	–
2004	579	406	70	375	65	31	5
2005	572	384	67	353	62	31	5
2006	595	391	66	352	59	39	7
2007	633	385	61	338	53	47	7
2008	597	344	58	317	53	27	5
2009	529	303	57	272	51	31	6
2010	554	313	57	280	51	33	6
2011	524*	318	61	291	56	27	5
2012	618	361	58	315	51	46	7
2013	648	354	55	314	48	40	6
2014	1082	474	44	394	36	72	7

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

**Table 30.** Breeding success of Peregrine Falcons in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	Further home ranges in use (single birds or fresh signs)	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
<b>Argyll</b>	<b>69</b>	<b>34</b>	<b>5</b>	<b>30</b>	<b>1</b>	<b>26</b>	<b>23</b>	<b>23</b>	<b>38</b>
- Argyll & Bute (mainland)	49	23	3	20	1	16	14	14	24
- Argyll Islands	20	11	2	10	0	10	9	9	14
<b>Central</b>	<b>59</b>	<b>28</b>	<b>3</b>	<b>19</b>	<b>3</b>	<b>16</b>	<b>14</b>	<b>12</b>	<b>26</b>
- Arrochar & Helensburgh	5	2	0	2	0	2	2	2	4
- Clackmannanshire	2	2	0	0	0	0	0	0	0
- Dunbartonshire	5	2	0	2	0	2	2	2	4
- Falkirk	3	2	0	1	0	1	1	1	4
- Glasgow	1	1	0	0	0	0	0	0	0
- North Lanarkshire	8	4	1	4	0	4	4	4	9
- Stirling	35	15	2	10	3	7	5	3	5
<b>Dumfries &amp; Galloway</b>	<b>120</b>	<b>61</b>	<b>5</b>	<b>60</b>	<b>1</b>	<b>56</b>	<b>47</b>	<b>45</b>	<b>91</b>
<b>Highland</b>	<b>133</b>	<b>37</b>	<b>11</b>	<b>22</b>	<b>1</b>	<b>21</b>	<b>17</b>	<b>17</b>	<b>36</b>
- Badenoch & Strathspey	8	4	1	4	0	4	3	3	6
- Caithness	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
- Inverness-shire	11	9	0	6	0	6	6	6	13
- Isle of Skye	25	0	0	0	0	0	0	0	0
- Lochaber	7	2	1	0	0	0	0	0	0
- Nairn	1	1	0	1	0	1	1	1	4
- Ross-shire	21	5	1	3	0	3	2	2	2
- Small Isles	3	3	0	3	0	3	2	2	4
- Sutherland	51	10	8	5	1	4	3	3	7
- West Moray	1	0	0	0	0	0	0	0	0
<b>Lewis &amp; Harris</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>5</b>
- Lewis	4	4	0	4	0	4	4	4	5
<b>Lothian &amp; Borders</b>	<b>142</b>	<b>52</b>	<b>6</b>	<b>49</b>	<b>9</b>	<b>39</b>	<b>35</b>	<b>35</b>	<b>85</b>
- Lothian	46	23	3	22	4	18	15	15	34
- Scottish Borders	96	29	3	27	5	21	20	20	51
<b>North-east</b>	<b>167</b>	<b>47</b>	<b>18</b>	<b>41</b>	<b>9</b>	<b>28</b>	<b>24</b>	<b>23</b>	<b>48</b>
- Aberdeenshire	134	40	14	36	7	25	23	22	46
- East Moray	33	7	4	5	2	3	1	1	2
<b>Orkney</b>	<b>38</b>	<b>15</b>	<b>8</b>	<b>15</b>	<b>6</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>19</b>
<b>Shetland</b>	<b>76</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>South Strathclyde</b>	<b>86</b>	<b>47</b>	<b>8</b>	<b>44</b>	<b>2</b>	<b>39</b>	<b>31</b>	<b>29</b>	<b>63</b>
- Ayrshire	65	33	7	30	2	26	20	19	39
- Renfrewshire	7	7	0	7	0	7	6	6	12
- South Lanarkshire	14	7	1	7	0	6	5	4	12
<b>Tayside</b>	<b>182</b>	<b>62</b>	<b>13</b>	<b>54</b>	<b>2</b>	<b>45</b>	<b>43</b>	<b>42</b>	<b>96</b>



Table 30. Continued.

Region	Home ranges checked	Home ranges occupied by pairs	Further home ranges in use (single birds or fresh signs)	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
- Angus	54	23	3	21	1	16	14	14	34
- Fife	22	12	1	10	0	9	9	8	16
- Perth & Kinross	106	27	9	23	1	20	20	20	46
<b>Uist</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>6</b>
- Benbecula	1	0	0	0	0	0	0	0	0
- North Uist	2	2	0	2	0	2	2	2	2
- South Uist	3	3	0	3	0	3	3	3	4
<b>TOTAL:</b>	<b>1082</b>	<b>394</b>	<b>80</b>	<b>344</b>	<b>34</b>	<b>289</b>	<b>253</b>	<b>245</b>	<b>515</b>

Table 31. Home range occupancy and breeding success of Northern Ravens in Scotland, 2003-2014.

Year	Home ranges checked	Home ranges occupied by pairs	% of those checked	Pairs monitored	Pairs known to lay eggs	% of those monitored	Pairs known to fledge 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
2013	552	458	83	357	311	87	283	91	769	2.5
2014	623	510	82	392	354	90	334	94	910	2.6

Table 32. The number of checked Northern Raven home ranges and their breeding success in Scotland in 2014.

Region	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Failed early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
<b>Argyll</b>	<b>81</b>	<b>65</b>	<b>50</b>	<b>1</b>	<b>45</b>	<b>45</b>	<b>44</b>	<b>135</b>
- Argyll & Bute (mainland)	42	35	28	0	25	25	25	68
- Argyll Islands	39	30	22	1	20	20	19	67
<b>Central</b>	<b>74</b>	<b>62</b>	<b>46</b>	<b>5</b>	<b>40</b>	<b>37</b>	<b>36</b>	<b>91</b>
- Arrochar & Helensburgh	12	8	5	0	5	5	5	16
- Clackmannanshire	2	1	1	0	1	1	1	2
- Falkirk	2	2	0	0	0	0	0	0

Table 32. Continued.

Region	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Failed early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged
- North Lanarkshire	7	7	6	0	6	5	4	11
- Stirling	51	44	34	5	28	26	26	62
<b>Dumfries &amp; Galloway</b>	<b>107</b>	<b>93</b>	<b>59</b>	<b>4</b>	<b>53</b>	<b>52</b>	<b>49</b>	<b>114</b>
<b>Highland</b>	<b>40</b>	<b>36</b>	<b>30</b>	<b>3</b>	<b>27</b>	<b>26</b>	<b>26</b>	<b>77</b>
- Badenoch & Strathspey	3	3	2	0	2	2	2	4
- Caithness	1	1	0	0	0	0	0	0
- Inverness-shire	4	3	3	0	3	3	3	9
- Isle of Skye	1	1	1	0	1	1	1	2
- Lochaber	4	4	2	0	2	2	2	2
- Ross-shire	6	6	5	0	5	4	4	13
- Small Isles	9	8	7	3	4	4	4	9
- Sutherland	12	10	10	0	10	10	10	38
<b>Lewis &amp; Harris</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>23</b>
- Harris	3	3	3	0	3	3	3	8
- Lewis	7	7	6	0	6	6	6	15
<b>Lothian &amp; Borders</b>	<b>40</b>	<b>30</b>	<b>27</b>	<b>1</b>	<b>26</b>	<b>26</b>	<b>26</b>	<b>82</b>
- Lothian	14	10	10	0	10	10	10	33
- Scottish Borders	26	20	17	1	16	16	16	49
<b>North-east</b>	<b>29</b>	<b>20</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>28</b>
- Aberdeenshire	27	19	9	0	9	9	9	23
- East Moray	2	1	1	0	1	1	1	5
<b>Orkney</b>	<b>[43]</b>	<b>34</b>	<b>34</b>	<b>[3]</b>	<b>[31]</b>	<b>[29]</b>	<b>29</b>	<b>78</b>
<b>South Strathclyde</b>	<b>58</b>	<b>45</b>	<b>33</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>69</b>
- Ayrshire	56	43	32	0	27	27	27	67
- South Lanarkshire	2	2	1	0	1	1	1	2
<b>Tayside</b>	<b>103</b>	<b>84</b>	<b>71</b>	<b>2</b>	<b>63</b>	<b>58</b>	<b>56</b>	<b>142</b>
- Angus	27	17	14	0	13	12	10	30
- Fife	9	6	6	0	6	6	6	16
- Perth & Kinross	67	61	51	2	44	40	40	96
<b>Uist</b>	<b>38</b>	<b>31</b>	<b>23</b>	<b>0</b>	<b>22</b>	<b>21</b>	<b>21</b>	<b>71</b>
- Benbecula	4	4	4	0	4	3	3	10
- North Uist	20	13	8	0	7	7	7	22
- South Uist	14	14	11	0	11	11	11	39
<b>TOTAL:</b>	<b>623</b>	<b>510</b>	<b>392</b>	<b>19</b>	<b>354</b>	<b>341</b>	<b>334</b>	<b>910</b>

Figures in square brackets were not supplied and therefore inferred from other values in the table.

# Annex 1

Raptor, owl and Northern Raven nest site and home range data submitted under the Scottish Raptor Monitoring Scheme in 2014.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
European Honey-buzzard			10								1		11
Red Kite		54	91	97			31				83		356
White-tailed Eagle	30			39	15						3	9	96
Marsh Harrier											9		9
Hen Harrier	86	16	21	73		5	5	216		53	75	39	589
Northern Goshawk		4	35	5		49	83			7	9		192
Eurasian Sparrowhawk	9	31	6	11		34	2	11		8	2	7	121
Common Buzzard	156	286	58	134	6	74	4	12		19	164	28	941
Golden Eagle	76	10	2	188	21	3	16				35	22	373
Osprey	32	38	15	97		15	34			6	70		307
Barn Owl	75	85	295	22		54	25			70	13		639
Little Owl						1							1
Tawny Owl	9	110	59	40		50				1	21		290
Long-eared Owl	5	8	1	10		25	12	2		2	10	6	81
Short-eared Owl	9	14	14	6		17		81		8	28	18	195
Common Kestrel	23	66	36	36	2	43	16	35		35	85	19	396
Merlin	2	7	12	45	1	55	101	64	48	13	55	16	419
Eurasian Hobby				1							5		6
Peregrine Falcon	69	59	120	133	4	142	167	38	76	86	182	6	1082
Northern Raven	81	74	107	40	10	40	29	43		58	103	38	623
<b>TOTAL:</b>	<b>662</b>	<b>862</b>	<b>882</b>	<b>977</b>	<b>59</b>	<b>607</b>	<b>525</b>	<b>502</b>	<b>124</b>	<b>366</b>	<b>953</b>	<b>208</b>	<b>6727</b>

## Annex 2

Raptor, owl and Northern Raven breeding attempts monitored under the Scottish Raptor Monitoring Scheme in 2014.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
European Honey-buzzard			4										4
Red Kite		27	84	56			24				48		239
White-tailed Eagle	30			39	15			0			3	9	96
Marsh Harrier											7		7
Hen Harrier	38	3	16	24		4	1	105		39	28	35	293
Northern Goshawk		2	30	3		18	62			5	8		128
Eurasian Sparrowhawk	3	9	2	8		13	2	4		6	2	4	53
Common Buzzard	40	165	40	90	6	50	4	8		12	87	17	519
Golden Eagle	63	9	2	112	17	1	14				27	13	258
Osprey	19	26	10	72		10	21			5	43		206
Barn Owl	50	46	139	13		18	12			20	9		307
Little Owl						1							1
Tawny Owl	7	68	29	31		30					20		185
Long-eared Owl	2	5	1	8		21	10	2		2	6		57
Short-eared Owl	5	1	7	4		5		28		1	18	12	81
Common Kestrel	11	22	10	19	1	14	4	21		13	37	13	165
Merlin			10	23	1	12	38	11	18	9	19	9	150
Eurasian Hobby											2		2
Peregrine Falcon	30	19	60	22	4	49	41	15	1	44	54	5	344
Northern Raven	50	46	59	30	9	27	10	34		33	71	23	392
<b>TOTAL:</b>	<b>348</b>	<b>448</b>	<b>503</b>	<b>554</b>	<b>53</b>	<b>273</b>	<b>243</b>	<b>228</b>	<b>19</b>	<b>189</b>	<b>489</b>	<b>140</b>	<b>3487</b>

# Terminology

The terminologies used in this report have the following definitions and are based on Hardey *et al.* (2013):

**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 can 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 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; or (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 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 might also include territorial pairs that appear capable of breeding but fail to lay eggs, but such criteria are often 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.



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