



Scottish Raptor Monitoring Scheme Annual Report 2020

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Front cover image: Hobby (Chris Baker).

Back cover image: Raven (Angus Hogg).

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Foreword

Welcome to the 2020 report. The Covid pandemic and subsequent government restrictions arrived just in time to make monitoring during the 2020 breeding season challenging. The early part of the breeding season was quite heavily impacted by the spring 'lockdown' but discussions with the Scottish Government and the police allowed raptor monitoring to be covered by post 'lockdown' guidance to allow outdoor working to resume. This saved complete loss of the breeding season reducing impacts on monitoring, resulting in data submitted to be c75-80% of typical submissions in recent years, which is quite remarkable in the circumstances.

This report includes further articles on both online submission of data and on where we are at with trends production. Hopefully these articles show how the online system marries up to trend production by providing a more efficient way of gathering some key data some of which sometimes doesn't seem that important, e.g. changes in survey effort, sites not checked and negative returns.

Improving data submission to allow maximum value to be gained from the analyses of it has probably never been more important. The Climate and Nature Crises highlight the need for high quality long-term monitoring data to help understand the impacts on raptors, which may be more subtle than for other species, but changing weather patterns affecting key periods in the breeding season, populations of prey and quality of breeding habitats all play an intertwined role. This does lead to declines in both occupancy and productivity but this may not be apparent until a longer time period is looked at. The forthcoming trends which we will produce later this year will show some interesting results. The Scottish Government response to the Werritty Report to introduce grouse moor licensing brings with it a need to be able to describe and report on favourable conservation status in relation to Peregrine, Hen Harrier and Golden Eagle in grouse moor areas. Both the trends and annual monitoring data of the SRMS will have an important role to play in assessing this.

Whilst sign up to the SRMS Data Sharing & Use Policy has been very high there is still a small number of contributors who haven't returned their form yet. This has meant that about 5% of 2020 records cannot currently be used in the annual report and I would urge those who haven't yet returned the form to do so. There is legislation and policy around data management behind having these agreement forms and we do need to know if you are happy to sign up or not.

As ever thanks to all those who have contributed records: to the partner organisations which provide funding, NatureScot, BTO, FLS, SF, RSPB and SOC; and the partner representatives that help oversee the Scheme. Special thanks to Amy and colleagues at BTO Scotland for their hard work collating and analysing the data.

Andrew Stevenson (Chair of the Scottish Raptor Monitoring Scheme)
on behalf of the Scottish Raptor Monitoring Group.

1 ROUND-UP OF RAPTOR MONITORING SEASON IN 2020

Despite the Covid-19 pandemic hampering fieldwork efforts during the 2020 breeding season, the Scottish Raptor Monitoring Scheme still received a remarkable 4,775 records of raptor home ranges checked in 2020, representing around c75-80% of the number of records we might expect to receive in a typical year. A total of 4,502 records were available to be used for SRMS reporting, thanks to data contributors giving explicit permission for their data being used in this way. This represents a tremendous effort from SRMS contributors to whom we are extremely grateful. This section provides an overview of the breeding season, discussing the implications of the pandemic for monitoring and briefly describing the weather conditions and prey situation that Scottish raptors experienced in 2020. Here we also provide a summary of the records received from each region of Scotland in 2020, along with some species highlights. Links to more detailed breakdowns can be found in the appendices at the end of the report and on the SRMS website.

COVID-19

The usual monitoring activities of our SRMS data contributors were disrupted in 2020 due to the global Covid-19 pandemic. SRMS volunteers were advised not to carry out fieldwork during the period 23rd March to 28th May ('lockdown') where it would be in breach of the government advice, which was to remain at home as much as possible. These guidelines were updated on the 7th May to allow people to exercise locally more than once a day. Following lockdown, monitoring was allowed to continue under the Scottish Government guidelines for outdoor working.

The long-term nature of monitoring means that the Scheme will not be severely impacted by this short-term crisis. A parallel can be drawn with the outbreak of Foot and Mouth disease in the UK in 2001, during which restrictions on access to the countryside severely limited or prevented fieldwork. While this event pre-dates the existence of the SRMS, it is reassuring to note that other long-term monitoring schemes operating at this time, such as the Breeding Bird Survey, were not unduly affected.

It is important that anybody reading this report or making use of SRMS data from 2020 in line with our SRMS Data Sharing & Use Policy does so with the full knowledge of the potential limitations that the reduced monitoring brings to its usability.

Data from 2020 should be used with caution due to the impact of the Covid-19 pandemic on monitoring activities.

The breeding data for many long-term studies will not be as complete or comprehensive as in previous years, so comparisons between years are unlikely to be helpful. No records were reported for some combinations of species and regions that have been well represented by records in past years.

The timing of lockdown coincided with the early part of the breeding season for many raptor species. This means that many home ranges did not receive early checks for occupancy, which is therefore likely to be under-recorded. Many home ranges could not be visited until nesting was already underway. Many early breeding failures are also likely to have gone undetected. This means that the recorded outcomes of breeding attempts, for many species, will be skewed towards success.

Raven, the Scheme's honorary raptor species, starts breeding earlier than most of the other species covered by the Scheme. The timing of lockdown meant that while the majority of Raven home ranges for which the Scheme normally receives records were likely to have been checked for occupancy, many breeding attempts at occupied sites will not have been followed through to their conclusion. Some later

breeding Raven pairs may not have been picked up before lockdown, and failures among these pairs are likely to have gone undetected.

WEATHER

The winter preceding the 2020 breeding season was milder than average, and broadly unsettled, with a few interludes of more settled weather.

Scotland had the second wettest February on record, with 213% of average rainfall. While rainfall was near average in parts of the north-east, other areas had well over twice the normal rainfall amount.

Spring was warmer and sunnier than average and was the UK's fifth driest on record. March rainfall totals were slightly above average in western fringes of Scotland, whereas eastern counties were rather dry. April was much drier than average, especially over southern and eastern Scotland. Rainfall was well below average during May, although northwest Scotland had above average rainfall for the month. Overall, this spring weather is likely to have been favourable for many breeding raptors.

Following the sunny and dry spring, the summer months were more unsettled. The summer was wetter than average, with 134% rainfall totals compared to the 1981-2010 average.

VOLE ABUNDANCE

Cyclic changes in the annual and seasonal abundance of voles can have a profound effect on the number of pairs and breeding success of a number of raptor and owl species (e.g. Petty *et al.* 2000; Lambin *et al.* 2000), particularly affecting Kestrel, Barn Owl and Short-eared Owl (Figure 1) (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.

Anecdotal reports suggest vole numbers were high in some regions in 2020 with correspondingly high productivity in species such as owls. More data on small mammal abundance in Scotland would be useful to better understand the drivers of demographic rates in raptors.



Figure 1: Short-eared Owl in Perthshire in 2020. (Photo: Chris Baker, Tayside & Fife RSG).

MONITORING

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 of establishing whether or not ranges are occupied. In 2020, a total of 4,502 raptor home ranges in Scotland received at least one visit to check for occupancy (Table 1). For comparison, over the preceding four years, this figure has ranged between 5,965 and 6,593. Figure 2 shows a summary of raptor monitoring coverage in 2020, depicting 10-km squares that received at least one visit to check for occupancy. Not all of these home ranges held pairs: some had only single birds and others were apparently vacant. The regional breakdown of home ranges checked in 2020 can be seen in Table 1.

Equally important to occupancy checks are follow-up visits to confirm the findings of the first visit and to monitor the breeding status and outcome of birds present. Nesting success, normally expressed as the percentage of monitored breeding pairs rearing at least one offspring to fledging, together with the mean fledged brood size, provides a measure of a population's breeding productivity. In 2020,

2,409 potential breeding pairs received further visits that enabled their nest success to be determined. For comparison, over the preceding four years, this figure has ranged between 2,736 and 3,248.

Species-specific and regional breakdowns showing the results of monitored breeding attempts can be found at the end of this report and on the SRMS website, <https://raptormonitoring.org/>.

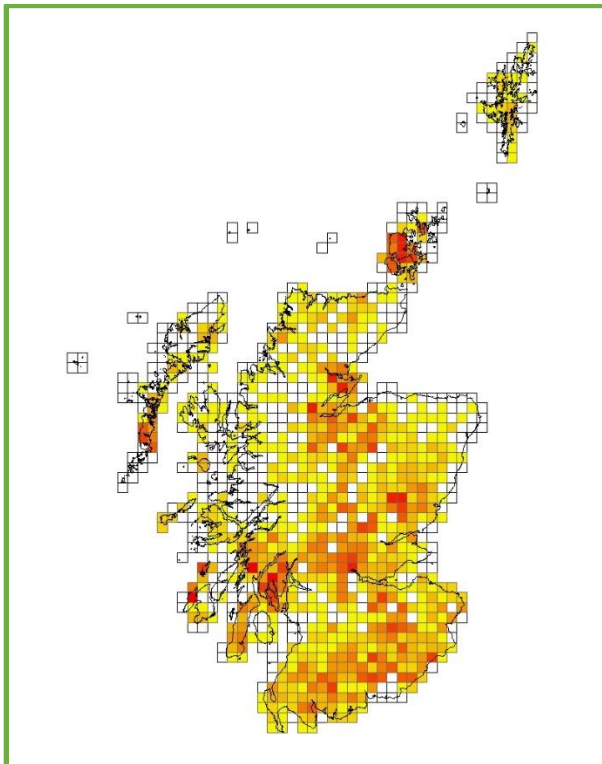


Figure 2: Raptor, owl and Raven monitoring coverage in Scotland in 2020. This map illustrates the number of SRMS species for which occupancy (or absence) was recorded for each 10-km square. The redder the square, the more species were covered. The maximum number of species checked for occupancy in a single square in 2020 was nine, from a total of 20 species. White indicates no monitoring records were received in a square for 2020. Note that this figure masks variation in coverage at finer geographic scales, and work is ongoing to improve our knowledge of coverage.

DATA SUBMISSION

While the vast majority of data submitted to the SRMS in 2020 was via the standard Excel

spreadsheet, a few data contributors (17 individuals) embraced using SRMS Online for the first time. We hope to see an increase in submissions via SRMS Online over the next few years, as more contributors, transition from using the Excel spreadsheet to the SRMS's preferred data entry system, which will ultimately allow us to maximise the value of monitoring data collected for conservation purposes (see Chapter 3).

We are still, unfortunately, not able to make use of all the records submitted to us. Of the records we received in 2020, 5% came from contributors who have not given explicit permission, via completion of our SRMS Registration Form, for their records to be used by SRMS. This means we cannot use these records to inform the following species accounts, or for any other reporting, analysis or sharing with SRMS partners in line with our SRMS Data Sharing & Use Policy.

HAVE YOU CONSENTED TO YOUR DATA BEING USED AND SHARED IN LINE WITH THE SRMS DATA SHARING & USE POLICY?

Any records you submit to the SRMS will only have been used in this annual report if you have returned a completed SRMS Registration Form. If you have not already done so, please complete and return a form to the SRMC as soon as possible.

<https://raptormonitoring.org/getting-involved/registering-for-srms>

Once your SRMS Registration Form has been received your records will be incorporated into periodic updates of the summary tables on the SRMS website. Anyone wanting to get in touch to discuss any aspect of this policy in relation to their data is welcome to contact the SRMC.

Table 1. The number of home ranges of raptors, owls and Raven checked in 2020 that were submitted to the SRMS. For a given region and species combination a “-” indicates that the SRMS does not hold any previous records and “0” indicates that no records were provided for 2020 (but that SRMS does hold records from previous years). The most recent population estimates available for each species are also presented for context, where possible for Scotland, otherwise for a broader geographic region.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL	Estimated population size (pairs)	Region estimate relates to	Year estimate relates to
Osprey	23	0	19	78	-	11	25	-	-	4	38	-	198	230	Scotland	2017 ⁵
Honey-buzzard	-	-	7	28	-	-	-	-	-	-	2	-	37	50	Scotland	2020 ⁶
Golden Eagle	56	11	1	113	8	3	0	-	-	1	22	12	227	508	Scotland	2015 ⁴
Sparrowhawk	4	28	1	7	0	11	0	25	10	7	18	4	115	30,500	UK	2016 ¹¹
Goshawk	-	0	28	11	-	47	0	-	-	7	14	-	107	281	Scotland	2019 ²
Marsh Harrier	0	1	-	0	-	0	1	0	-	-	10	-	12	12	Scotland	2019 ²
Hen Harrier	40	9	22	40	5	14	13	166	-	10	28	20	367	460	Scotland	2016 ¹²
Red Kite	-	54	145	37	-	1	26	-	-	1	82	-	346	≥ 273	Scotland	2015 ¹
White-tailed Eagle	34	-	-	53	23	-	2	2	-	-	3	10	127	123	Scotland	2019 ²
Buzzard	105	17	62	136	0	93	3	14	-	7	257	15	709	63,000–87,500	UK	2016 ¹¹
Barn Owl	96	111	164	44	-	64	0	-	-	24	9	-	512	500–1000	Scotland	post 2004 ⁷
Tawny Owl	38	33	23	44	-	19	0	-	-	0	7	-	164	50,000	UK	2015 ¹¹
Little Owl	-	-	-	-	-	2	-	-	-	-	-	-	2	<10	Scotland	2015 ¹
Long-eared Owl	2	5	0	4	-	11	0	4	-	2	8	1	37	1,800–6,000	UK	2007-2011 ¹¹
Short-eared Owl	12	2	3	1	-	7	0	65	-	3	25	0	118	620–2,200	UK	2007-2011 ¹¹
Kestrel	23	33	18	23	2	54	0	35	-	1	58	6	253	2,750–5,500	Scotland	2013 ⁸
Merlin	0	5	12	55	3	41	67	44	60	4	31	6	328	733	Scotland	2008 ³
Hobby	-	-	-	1	-	0	-	-	-	-	7	-	8	2,050	UK	2016 ¹¹
Peregrine	38	24	81	42	0	137	17	19	2	61	61	5	487	523 (479-592)	Scotland	2014 ⁹
Raven	87	42	38	17	5	31	0	48	17	35	12	16	348	3241 (1035–5447)	Scotland	2007-2011 ¹⁰
TOTAL:	558	375	624	734	46	546	154	422	89	167	692	95	4502			

Sources of estimated population sizes: ¹Challis *et al.* 2016; ²Eaton *et al.* 2021; ³Ewing *et al.* 2011; ⁴Hayhow *et al.* 2017; ⁵Holling *et al.* 2019; ⁶RBBP; ⁷Shaw 2007; ⁸Wilson *et al.* 2015; ⁹Wilson *et al.* 2018; ¹⁰Wilson *et al.* 2019; ¹¹Woodward *et al.* 2020; ¹²Wotton *et al.* 2018.

SPECIES SUMMARIES

Throughout this report the names of birds follow the SOC list of English vernacular names (<http://www.the-soc.org.uk/bird-recording/the-scottish-list/>).

The following species accounts draw principally on the information presented in our SRMS summary tables which can be accessed on the SRMS website and viewed at the end of this report. These tables summarise the records which the SRMS has received in the standard SRMS format and have therefore passed through our quality assurance processes as set out in the SRMS Data Sharing & Use Policy (see <https://raptormonitoring.org/srms-data/data-sharing-use-policy>).

It is important to recognise that, for the majority of species, not all breeding pairs were monitored, thus the numbers presented do not represent absolute population size or provide a complete picture of breeding productivity, at either regional or national scales. Table 1 provides the most recent population estimates available for each species to help contextualise the SRMS data.

Osprey

In 2020, 134 of 198 home ranges checked were occupied by pairs. A further 11 home ranges were occupied by single birds. Of 128 pairs that were monitored, 121 were confirmed as having laid eggs. A total of 106 pairs went on to fledge a minimum of 203 young.



Figure 3: Osprey in Perthshire in 2020 (Photo: Keith Brockie, Tayside & Fife RSG).

Honey-buzzard

In response to a national survey organised by Honey-buzzard experts on the behalf of the RBBP, we saw an increase in home ranges being identified and reported to the SRMS in 2020. A total of 37 home ranges were checked, with 10 occupied by pairs and a further eight occupied by single birds. Of the three pairs that were monitored, two pairs were known to lay and hatch eggs, with one pair going on to successfully fledge a single chick. This survey is being extended into 2021, so we might hope to see even more Honey-buzzard records being identified and reported in the future.

Golden Eagle

A total of 189 of 227 home ranges checked in 2020 were occupied by pairs, with a further 17 home ranges in use (either single birds or fresh signs were reported). Of 155 pairs that were monitored, 110 were confirmed to lay eggs. In total, 79 pairs went on to fledge a minimum of 93 young; 30 out of the 155 (19%) monitored pairs failed early or did not breed.



Figure 4: Golden Eagle eyrie in 2020 (Photo: Keith Brockie, Tayside & Fife RSG).



Figure 5: Male Honey-buzzard carrying frog prey, Inverness-shire, August 2021 (Photo: Adam Ritchie, Highland RSG).

Sparrowhawk

In 2020, 84 of the 115 home ranges checked were occupied by pairs. Of the 78 pairs that were monitored, 73 were confirmed to lay eggs. A total of 60 pairs went on to fledge a minimum of 142 young.



Figure 6: Female Sparrowhawk with pigeon prey in 2020 (Photo: Ian Poxton, Lothian & Borders RSG).

Goshawk

In 2020, 81 of the 107 home ranges checked were occupied by pairs, with a further 12 home ranges in use (either single birds or fresh signs were reported). Of 69 pairs that were

monitored, 68 were confirmed to lay eggs. A total of 61 pairs went on to fledge a minimum of 130 young.

Marsh Harrier

In 2020, eight of 12 home ranges checked were occupied by pairs. Of six pairs monitored across Scotland, five pairs were known to lay eggs and all went on to successfully fledge a minimum of 18 young.

Hen Harrier

In 2020, 153 of 367 home ranges checked were occupied by pairs with a further 18 ranges occupied by single birds. Of 144 pairs that were monitored, 116 were confirmed to lay eggs, and 88 pairs went on to fledge a minimum of 233 young.

Red Kite

In 2020, 253 of 346 home ranges checked were occupied by pairs. Of these 253 pairs, an estimated 24 pairs were new (occupying home ranges from which records had not been

submitted to SRMS in previous years). Of 226 pairs that were monitored across Scotland as a whole, 222 were confirmed to lay eggs. A total of 188 pairs went on to fledge a minimum of 284 young.

White-tailed Eagle

In 2020, 123 of 127 home ranges checked were occupied by pairs. Of these 123 pairs, an estimated 14 pairs were new (occupying home ranges from which records had not been submitted to SRMS in previous years). Of 107 pairs that were monitored, 92 were confirmed to lay eggs and 74 pairs fledged a minimum of 96 young.

Buzzard

In 2020, 512 of 709 home ranges checked were occupied by pairs, with a further 19 ranges occupied by single birds. Of 427 pairs that were monitored, 405 were confirmed to lay eggs. A total of 374 pairs went on to fledge a minimum of 593 young.



Figure 7: Common Buzzard in Ayrshire in 2020 (Photo: Angus Hogg, South Strathclyde RSG).

Barn Owl

In 2020, 319 of 512 home ranges checked were occupied by pairs, with a further 38 sites occupied by single birds. Of 289 pairs that were monitored, 286 were confirmed to lay eggs, and 274 pairs went on to fledge a minimum of 951 young.

Tawny Owl

In 2020, 105 of 164 home ranges checked were occupied by pairs. Of 83 pairs that were monitored, all were confirmed to lay eggs. A total of 75 pairs went on to fledge a minimum of 170 young.



Figure 8: Tawny Owl in a hollow tree in 2020 (Photo: Keith Brockie, Tayside & Fife RSG).

Little Owl

This species continues to be a scarce breeder in Scotland. In 2020, single birds were present at two locations in the Scottish Borders.

Long-eared Owl

In 2020, 27 of 37 home ranges checked were occupied by pairs. Of 25 pairs that were monitored, all laid eggs and went on to fledge a minimum of 54 young.

Short-eared Owl

In 2020, 45 of 118 home ranges checked were occupied by pairs, with a further 14 home ranges occupied by single birds. Of 35 pairs that were monitored, 29 were confirmed to lay eggs. A total of 29 pairs went on to fledge a minimum of 63 young.

Kestrel

In 2020, 140 of 253 home ranges checked were occupied by pairs. Of 123 pairs that were monitored, 116 were confirmed to lay eggs. A total of 115 pairs went on to fledge a minimum of 393 young.

Merlin

In 2020, 122 of 328 home ranges checked were occupied by pairs. Of 111 pairs that were monitored, 107 were confirmed to lay eggs. A total of 98 pairs went on to fledge a minimum of 291 young.



Figure 9: Merlin brood, Perthshire in 2020 (Photo: Chris Baker, Tayside & Fife RSG).

A national survey as part of the Statutory Conservation Agencies/RSPB Annual Breeding Bird Scheme (SCARABBS) programme was due in 2020, but unfortunately did not proceed due to lack of financial resources.

Hobby

This is a scarce breeding raptor in Scotland, with small numbers of records tending to reach the SRMS. In 2020 we received records of eight home ranges checked, seven in Tayside and one in Highland. Of the two pairs that were monitored, both laid eggs and fledged young, 2.0 young per successful pair. As a migrant breeder to the UK it has significantly increased its range and may well become a more regular breeder in Scotland.

Peregrine

In 2020, 232 of 487 home ranges checked were occupied by pairs, with a further 48 home ranges in use (either single birds or where fresh signs were reported). Of 206 pairs monitored, 175 were confirmed to lay eggs and 164 pairs went on to fledge a minimum of 372 young.

Raven

In 2020, 269 of 348 home ranges checked were occupied by pairs. Of 192 monitored pairs, 161 were confirmed to lay eggs. A total of 152 pairs went on to fledge a minimum of 393 young.

Scarcer species

No records of breeding attempts by irregular breeders such as Snowy Owl, Pallid Harrier and Montagu's Harrier were supplied to the SRMS for the 2020 breeding season.

2 TRENDS IN BREEDING NUMBERS & PRODUCTIVITY

A key objective for the Scottish Raptor Monitoring Scheme is to provide robust information on Scottish raptor populations, in order to report on trends in numbers, range and productivity and also to understand the causes of population changes and constraints on raptor populations. Such trends are important in allowing us to monitor the health of our raptor populations, understand the causes of population change, and identify problems that conservation NGOs, statutory agencies and ultimately Scottish Government can act on to protect these raptors. This section of the report aims to provide a concise summary of all trend information available for Scottish raptors as a one-stop shop for stakeholders.

UPDATE ON LOCAL STUDY AREA TREND PRODUCTION

In our last report we described the work that was underway to produce local study area trends for all SRMS species quickly and efficiently using Merlin as an example.

The SRMS produced (unpublished) draft trends from the data submitted to the SRMS since 2003 (and up to 2018) for 98 different 'clusters' (groups of territories in a more or less contiguous geographical area) across Scotland where the coverage was considered high enough to calculate trends for at least 10 years up to 2018. We also identified a number of other areas where it will likely be possible to calculate local trends in the future, provided that recent levels of monitoring are maintained.

In Autumn 2020 we consulted key data contributors within the twelve Scottish Raptor Study Group branches to help to sense check the draft trends we have been able to produce based on their local knowledge.

Among the aspects of the trend we asked data contributors to check were:

- Did any trends we had produced for areas and species with which they were familiar concur with their own understanding of patterns in numbers or productivity of the relevant populations?

- If they had any concerns about the trends produced, were these related to known variations over the years in survey coverage/effort? For which areas?
- Were they aware of any areas of consistently good coverage for which it might be possible to produce trends that we had not included?

We are extremely grateful to all those contributors taking the time to provide feedback. We received some really helpful general feedback and also received specific feedback about 26 of the 98 clusters.

Knowledge about the existence of Study Areas, their boundaries and how coverage and monitoring effort within these has changed through time at the local scale is crucial in informing trends production at larger scales including regional (SRMS Regions & NHZ's) and national (Scotland).

This feedback was taken on board during our work to produce regional and national trends which will be published in our next annual report.

In due course we want to use the feedback we have received to revise the draft study-level trends we have produced, and to publish all of these on the SRMS website. This will require further conversations with those that have

already provided feedback so that we can ensure that we make the right decisions, as well as seeking feedback on the 72 clusters for which we have not yet had feedback. As well as allowing us to revise local study area trends, this feedback will also allow us to ensure that regional and national trends are as robust as possible.

REGIONAL & NATIONAL TRENDS PRODUCTION

Draft regional (SRMS Regions & Natural Heritage Zones) and national trends have been produced for a number of Scottish raptors. These trends will be reviewed by SRMG and key data contributors shortly, and we hope to be able to publish these in our next annual report during 2022 alongside an interactive tool to explore these trends via the SRMS website.

SPECIES NOT AMENABLE TO TRENDS PRODUCTION

There are six species for which the SRMS collects data but for which we have not compiled population trends (Table 2). The reasons why these datasets are not suited to trend production vary between species, but are all related to data being too few, too widely scattered, or too inconsistent in time and/or space to be comparable from year to year. These species are discussed below, starting with the most data deficient and finishing with species for which the prospects of producing trends in the near future are greatest.

Little Owl is the species for which the SRMS holds the fewest records – only 12 in total, with a minority of these relating to occupied territories (Table 2). If these records comprised a complete set of data for this species, they could be used to evaluate trends of this tiny population. However, particularly for a small and unobtrusive species like Little Owl, there is no knowing whether, or how many, unmonitored Little Owl pairs attempted to breed in Scotland during this time. Widely-scattered records of (usually dead) juveniles from different parts of southern Scotland (Forrester *et al.* 2012) suggest that breeding Little Owls are often over-looked. Thus, recent numbers of records are much too low to make it advisable to calculate trends for this species. This species is on the very northern edge of its UK distribution in Southern Scotland so may always be quite scarce or prone to fluctuating numbers.

Although the number of Hobby records received by SRMS each year has been greater than those for Little Owl (Table 2), they are widely scattered, relating to between one and four pairs each year, and are unlikely to be comprehensive. More than half of the records for this species are from Angus but, even here, distances between records are large, and the potential for pairs to be missed is high. This is another species for which robust population trends from SRMS data are an unlikely prospect for the near future. As for Little Owl, Hobby is at its northern edge of its UK range and has always been rare.

Table 2: SRMS species for which trends are not being compiled. Total records is the number of records involving site or territory checks for a species and with location information of 1 km or better, across all years from 2003 to 2018. Annual records and Annual pairs are the average number of records and territorial pairs reported to the SRMS each year from 2014 to 2018.

Species	Total records	Annual records	Annual pairs
Honey-buzzard	39	4.2	1.4
Marsh Harrier	124	10.6	9.0
Little Owl	12	2.4	2.0
Long-eared Owl	626	72.4	48.2
Short-eared Owl	1,754	192.0	80.6
Hobby	47	7.2	2.4

An increase in range in numbers in England may mean we see an increase in Scotland in future.

The SRMS holds very few records for Honey-buzzard. Although monitoring of this species is relatively intensive in some parts of Scotland (Shaw *et al.* 2017), few if any records from these intensive studies come to the SRMS. That said, in 2019 the SRMS received ten records relating to home range checks for this species, five of which were from within about 20 km of Inverness. If monitoring intensity and record submission were consolidated in this area (or elsewhere) it might be possible for SRMS to produce local trends for Honey-buzzard in the future.



Figure 10: Honey-buzzard in Southwest Scotland in 2020 (Photo: Angus Hogg, South Strathclyde RSG).

The area from which the greatest number of Marsh Harrier records has been submitted to the SRMS is the Tay Reed Beds (Firth of Tay and Eden Estuary is currently the only SPA for this species in Scotland). Over the past five years, between four and eight Marsh Harrier records have been submitted to the SRMS each year from a broken strip of reedbed about 12 km long. This is a high enough level of coverage to justify trend calculations. However, the number of records submitted from the same area during the five years prior to this was much lower, at between two and four records per year. Given that Scotland has only recently been colonised by this species, it is likely that numbers in the Tay Reed Beds were increasing during this time. It might be that the low rate

of record submission prior to 2012 is simply a reflection of low numbers of pairs, and that the intensity of monitoring during this period was actually comparable to that in more recent years. If discussions with key observers confirm this, it might be possible to derive trends from existing data. Alternatively, provided that coverage in this area is maintained, it may be possible to calculate trends for Marsh Harrier (at least for occupancy and pair numbers) within the next five years.

Long-eared Owl and Short-eared Owl have many more records submitted for them each year than any of the other four species in Table 2. For Long-eared Owl, there are some (mostly quite small) areas (e.g. in western Angus and in the Pentland Hills) where clusters of records suggest coverage might be close to comprehensive, but within these areas the number of records submitted varies a lot from year to year. Moreover, the secretive nature and relatively quiet calls of Long-eared Owls (relative to Tawny Owls) mean that their breeding attempts can be difficult to pick up until nests have large chicks. This pre-disposes datasets with variable coverage of this species to detection bias in favour of successful pairs, which can make productivity difficult to accurately assess at a population level. Short-eared Owl is also a difficult species to monitor consistently over a large area, due to its unpredictably nomadic nature. This allows its breeding numbers to effectively track small mammal cycles in most breeding areas. However, unless monitoring is sufficiently intensive to locate the majority of pairs breeding each year, inter-annual variation in numbers recorded may owe much to variation in the proportion of pairs detected – particularly in years where pairs fail early, when they may attempt to breed elsewhere. The two regions where monitoring of Short-eared Owls appears to have been most intensive are Orkney and Tayside. In both of these areas, the intensity of monitoring has increased greatly since 2012, such that even a ten-year trend for either of these areas would

be data deficient during the first five years. Production of trends for one or both of these areas may become feasible within the next few years. However, it will be important to liaise closely with data contributors for this species, to make sure that monitoring within the areas contributing data for trends is sufficiently intensive.

NEXT STEPS

We will be completing review of the national and regional trends that we have been able to produce over the next few months ahead of publishing them in our next annual report.



Figure 11: Long-eared Owl is one of six species for which trends analysis is not currently possible (Photo: Harry Bell, Tayside & Fife RSG).

3 USING SRMS ONLINE TO MAXIMISE THE VALUE OF DATA FOR UNDERSTANDING CHANGES IN RAPTOR POPULATIONS

In March 2019 the SRMS launched SRMS Online, our online data entry system which is the SRMS's preferred way of receiving data submissions from our data contributors. There are a number of tools now available via SRMS Online which SRMS contributors can take advantage of to ensure that the SRMS can maximise their data for trends production in the future. A number of improvements have been made since SRMS Online was launched, and others are in the pipeline, all of which are aimed at making SRMS Online easier and more rewarding to use and engage with.

VISIT-BY-VISIT DATA RECORDING

Any SRMS data contributors not yet doing so are strongly encouraged to start using SRMS Online to submit their data to the Scheme. Compared to the SRMS excel spreadsheet recording which resulted in each breeding attempt being summarised into a single row, SRMS Online is designed to capture observations from individual visits in a way that allows much more useful information to be extracted from raptor records. When it comes to producing trends it is extremely valuable to be able to connect individual observations that comprise a record with

specific dates. For example, for producing trends in productivity it is much easier to take into account the effects of survey effort (in particular, the timing of nest-finding) on apparent levels of success. As discussed at the start of this report, the later nesting attempts are found, the greater the tendency for monitoring at these nests to be biased towards successful outcomes. Data entered into SRMS Online provides us with the date and reported breeding status for each nest visit, allowing us to make unbiased assessments of breeding success.

Visit Log 1 of 14

Prev Next

Code/Number	Species	Home Range	Grid Ref
/22	Raven	Home range: RN_CEN_STI_0023	NS8196
Outcome: Success (Young Near Nest)			

Show full nest record data Edit Visit Log

* Visits must have a date and then contents and/or a status code

Date	Time	Eggs Live Dead	Young Live Dead	Status Codes	Observation Type	Time spent by nest(m)	Initials	Nesting attempt	
DD/MM/YYYY									Visit Locations
01/05/2020	20:00			NN	Observation from distance		AH,CS	1	RN01 (Airthrey Castle)
14/04/2020	14:00		4		Nest Visit	10	CS	1	RN01 (Airthrey Castle)
01/04/2020	08:30			AF	Observation from distance		CS,AH	1	RN01 (Airthrey Castle)
10/03/2020	11:30			AB AX	Observation from distance		AH	1	RN01 (Airthrey Castle)
14/02/2020	09:00			PD	Observation from distance		AH	1	RN01 (Airthrey Castle)

Save visit log and 0 visit(s) *

Add row above

Figure 12: On SRMS Online, visit data are recorded in a Visit Log. Visit Logs operate at the level of Home Range. Data from successive breeding attempts and also data from multiple alternate Nest Sites within a Home Range are captured in the same visit log.

However, there needs to be a significant uptake in the use of SRMS Online by SRMS contributors in order for the benefits of visit-by-visit recording to really make a positive difference to SRMS analyses.

If you are registered with SRMS and would like to contribute your monitoring records via SRMS Online going forward, please contact the SRMC at srmc@bto.org.

DEFINING STUDY AREA BOUNDARIES

When it comes to producing trends, particularly in breeding numbers, it is really important to know the extent of the areas that are being monitored routinely. The completeness and quality of the trends we can produce at all geographic scales (local, regional and national) depends on our understanding the representativeness of the areas being monitored, and knowing where there is reliable monitoring in areas from which no territories are reported.

The SRMS defines a Study Area as a discrete geographical area that should receive comprehensive coverage from one year to the next. When we refer to comprehensive coverage we mean that if a pair of a particular species was to establish a territory anywhere within the Study Area it would be detected. In this way, we can be confident that the majority

of breeding pairs of a species are found within the study areas where that species is monitored.

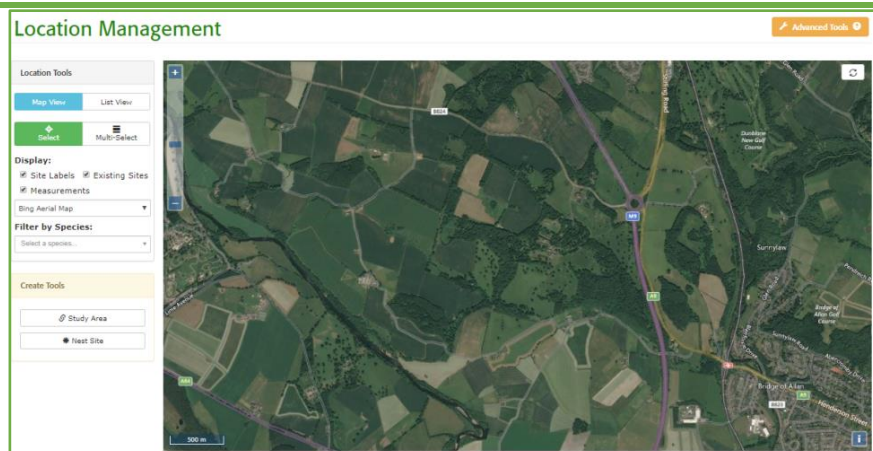
SRMS data contributors will be adding hugely to the value of the records they submit if they use the tools available in SRMS Online to record the extent of their Study Area(s).

To define Study Areas, SRMS contributors should:

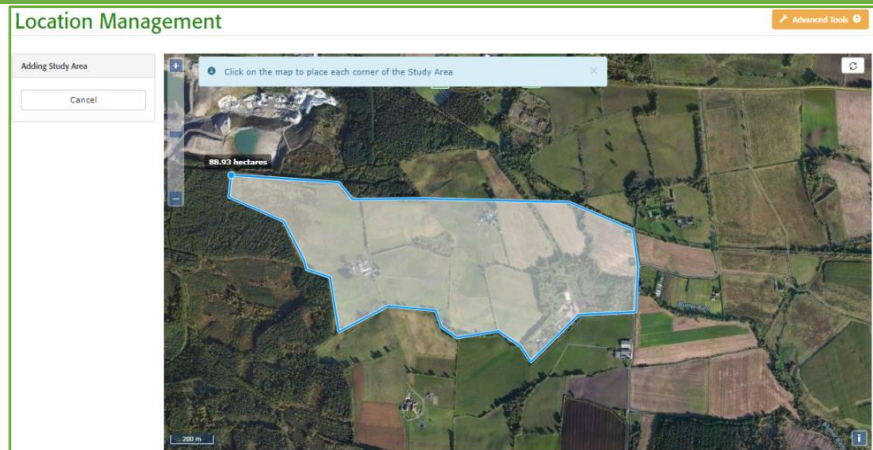
- establish an individual Study Area for each distinct geographic area they monitor within. Large areas which are not checked for occupancy, even if they are considered unsuitable for the relevant study species, should not be included within the Study Area.
- define the species they are monitoring within each Study Area. This will allow robust assessments of coverage and monitoring effort for different species.
- specify 'Start Date' (and 'End Date', if the study ends) defining the period during which Study Areas are active (i.e. monitored for the focal species).

Drawing Study Areas in SRMS Online is straightforward and can be achieved via Map View (See Figure 13).

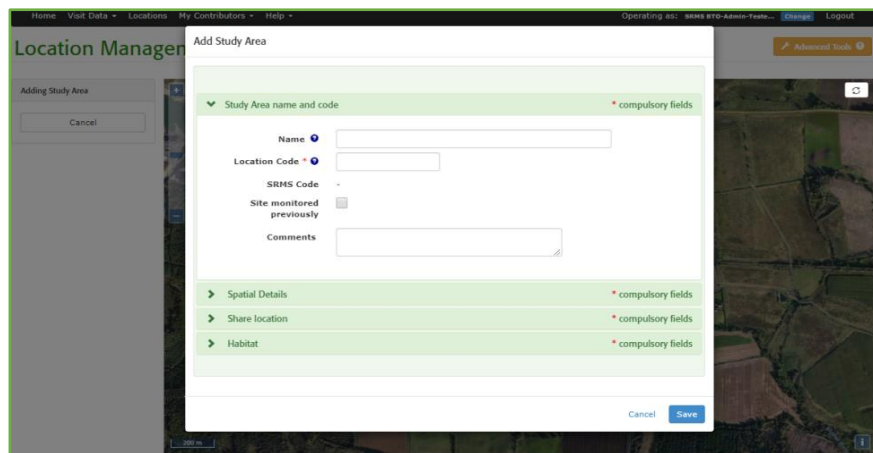
1. Select the 'Study Area' button under 'Create Tools' in the left-hand panel.



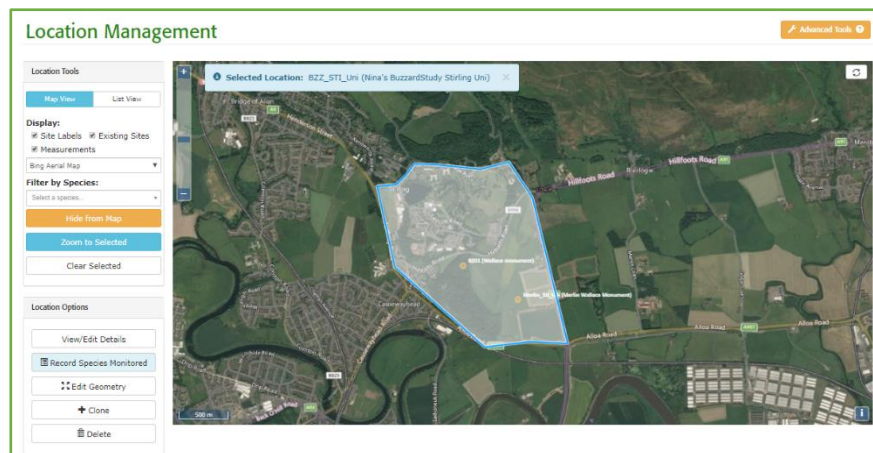
2. Click on the map and start drawing your Study Area. When you complete the shape the screen will change to display the extent of the Study Area in red.



3. You will need to provide some details for your Study Area (e.g. Name and Location Code) and then click 'Save' and exit.



4. You may wish to edit the extent of an existing Study Area or any of its associated attributes. To do this, select the Study Area in Map View.



5. Clicking on 'Record Species Monitored' will bring you to this pop-up window. You can click 'Add Row' for each species, and the period that you have monitored for them. Note that if monitoring is ongoing you can leave the 'End Date' field empty. In case there are gaps in your monitoring, you should record these periods separately. Click 'Update' to save your edits. It's worthwhile keeping this up to date on an annual basis.

Species	Start Date	End Date
BZ BUZZA Buzzard	01/04/2020	

Figure 13: It is easy to capture Study Area boundaries on SRMS Online, and keep track of any contraction or expansion of areas covered through time so these can be taken account of in any analyses.

As well as ensuring that SRMS data are correctly used in trend production, knowing where existing contributors are active and what areas are being effectively monitored for each species is hugely valuable to any efforts to direct new monitoring effort to ensure that it complements existing monitoring and makes the most of any opportunities to fill existing gaps in coverage.

RECORDING MONITORING EFFORT

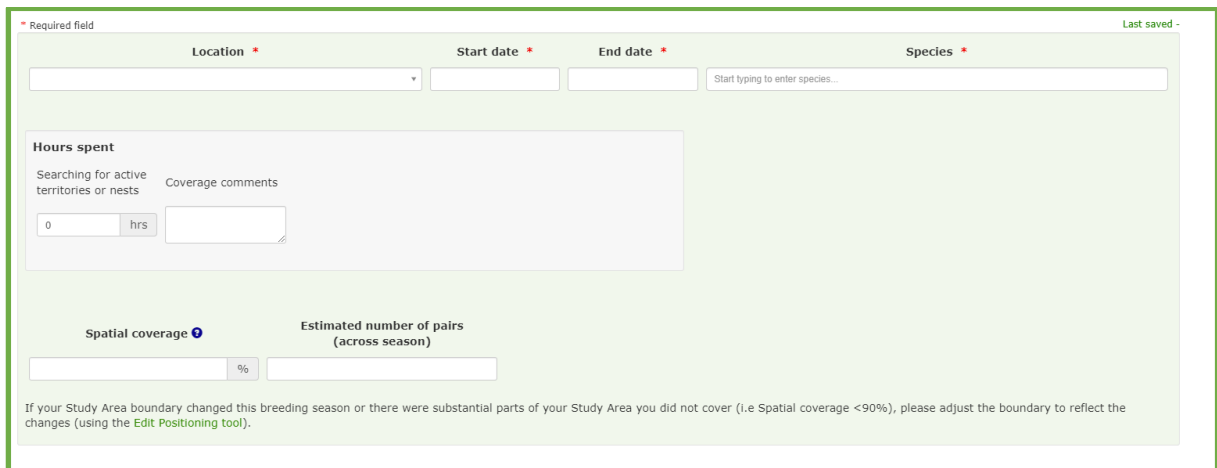
The robustness of trends produced by SRMS relies on our being able to account for changes in survey effort or coverage over time (see Chapter 3). In an ideal situation, coverage of an area will be complete (so we can be confident that most or all breeding pairs were detected) and consistent from year to year. If there is

variation in either the intensity of monitoring or the area covered, this can be accommodated – but only if we know about it!

To this end, SRMS data contributors should ensure that they use the Effort Recording area in SRMS Online to document changes in their survey effort and coverage within their Study Area(s) each year.

From the Study Area Effort Recording page, you can choose whether to complete a 'New annual summary' or a 'New daily summary'.

All our data contributors are required to complete a New Annual Summary at the end of every breeding season to let us know the approximate number of hours they have spent searching for active territories or nests within their Study Area.



Required field

Location * Start date * End date * Species *

Start typing to enter species...

Hours spent

Searching for active territories or nests Coverage comments

0 hrs

Spatial coverage ⓘ Estimated number of pairs (across season)

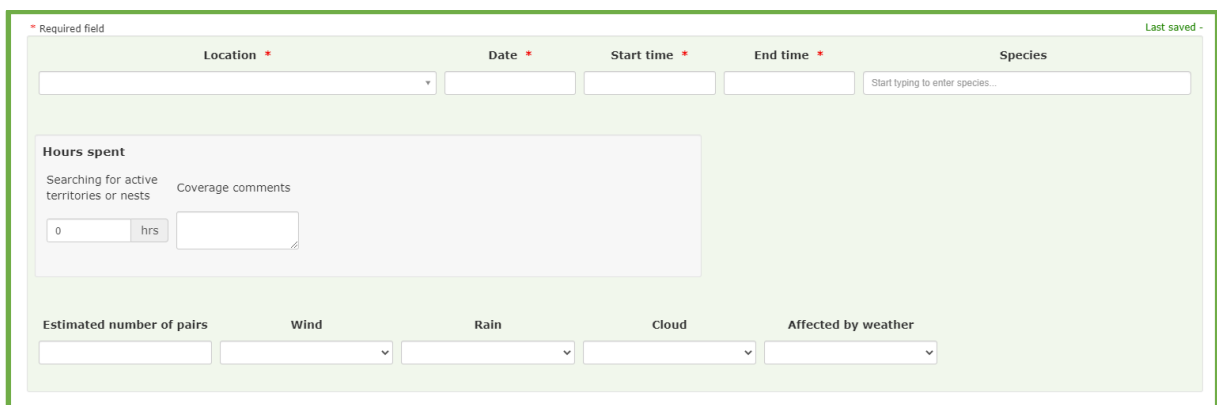
%

If your Study Area boundary changed this breeding season or there were substantial parts of your Study Area you did not cover (i.e. Spatial coverage <90%), please adjust the boundary to reflect the changes (using the [Edit Positioning tool](#)).

Figure 14: Annual Summary input form.

We would strongly encourage all our data contributors to also complete a New Daily Summary every time they visit their Study Area to let us know the approximate number of

hours spent searching for active territories or nests within their Study Area as well as the weather conditions during their visit.



Required field

Location * Date * Start time * End time * Species *

Start typing to enter species...

Hours spent

Searching for active territories or nests Coverage comments

0 hrs

Estimated number of pairs Wind Rain Cloud Affected by weather

Figure 15: Daily Summary input form. Very similar to the Annual Summary form but needs completing after each visit to the Study Area. It can be helpful to let us know whether monitoring efforts were impacted by the weather conditions at the time.

4 OPTIMISING MONITORING APPROACHES TO INFORM TRENDS PRODUCTION

One of the key priorities of the SRMS is to produce population trend information that is rigorous and defensible for a wide range of conservation purposes. This chapter highlights the type of data that are required for robust population trends analysis, and suggests a few ways that some SRMS contributors might consider concentrating their monitoring efforts to ensure that the data they submit to the SRMS are suitable for producing long-term trend information.

BACKGROUND

As we have seen in Chapter 2, the SRMS aims to produce population trend information that is rigorous and defensible for a wide range of conservation and management purposes. However, it does this on the understanding that many of the long-term studies contributing records to the SRMS annually were not set up with the original aim of producing long-term trend information. This is in no way a criticism of these studies, which were set up with other very worthwhile aims. However, it does mean that it is important to carefully consider how these data can be used to produce rigorous trends.

As we have seen in Chapter 2, the SRMS aims to produce population trend information that is rigorous and defensible for a wide range of conservation and management purposes. However, it does this on the understanding that the extent, distribution and nature of monitoring underlying much of the data contributed to the SRMS has been shaped by a range of objectives, among which the aim of producing scientifically robust, long-term trends has not always been the most influential. The collection of data submitted to the SRMS is strongly rooted in the field studies of individual volunteer raptor workers. In contrast, other large-scale, national surveys (like the BTO/JNCC/RSPB Breeding Bird Survey) have been designed from first principles to yield robust trends in bird numbers. This observation is not intended as a criticism of the studies contributing data to SRMS - these are set up and carried out with a variety of other worthwhile aims. However, it does make it important to carefully consider how these data can best be used to produce rigorous trends.

While the SRMS dataset now comprises over 100,000 records, only a proportion of these data are suitable for trends analysis.

WHAT TYPE OF DATA ARE REQUIRED FOR ROBUST POPULATION TRENDS ANALYSIS?

High quality and accurate population trends can be generated from:

- **a comprehensive and consistent survey of an entire area of interest** (i.e. the whole of Scotland, a whole Scottish region or a single study area); or
- **a consistent sample of sub-areas** (either based on grid cells or defined study areas) **that together are representative of the area of interest as a whole.**

Whenever trends are based on a sample rather than the entire area of interest, it is important that the territories and breeding attempts monitored are not a biased sample, and the areas surveyed are representative of the areas for which trends are generated.

Within each study area this means:

1. **All breeding attempts should have the same chance of being found.** This is much less likely to hold true where search effort differs between areas or over time. Data from study areas where search effort is uneven are unlikely to result in a reliable index of change unless variation in search effort is recorded.

Some examples:

- If coverage within a long-term study has expanded to include an area

that was not previously monitored, it would be inappropriate to use records from the new area when producing trends in breeding numbers for the original study area. This is because the newly expanded study area is likely to hold more pairs than the original study area. It may still be possible to include the whole dataset when producing trends in productivity, as long as the area covered is still representative and the additional area does not differ markedly in terms of, for example, breeding habitat.

- If a change in circumstance means that a raptor worker surveys less regularly or is unable to cover the same amount of ground as usual, it would be inappropriate to produce a trend in breeding numbers without taking this change in survey effort into account. At best, failure to take account of the change in survey effort could lead to extra between-year variation in the trend, with the potential to mask more important long-term changes. At worst, a systematic reduction in survey effort could give the false impression of a decrease in breeding numbers that was not real.
- Changes in effort may not be so important when monitoring changes in productivity but only as long as the breeding attempts included in monitoring show no systematic bias over time. For example, if a raptor worker increasingly focused monitoring effort on sites within the study area that were easily accessible, and sites that were easy to access tended to be less successful than other sites, this change in effort

would result in trends that misleadingly suggested a decline in productivity.

2. **A lack of record must correspond to a lack of breeding attempt.** ‘Negative’ records are just as important as records of breeding. If a study only reports occupied territories/nests, it does not allow absences to be distinguished from unchecked sites, where occupancy is unknown. This can lead to misleading assessments of density or population change, or render the data generated by a study unusable for some analyses.

Within each region (or nationally) this means:

1. **Studied and unstudied areas must be subject to the same drivers of change (so that change observed in the study areas can be assumed to have occurred more widely).** If this is not the case, then increases or decreases in breeding numbers or productivity from the sample monitored cannot be assumed to apply elsewhere. In other words, the trend calculated from the monitored sites cannot be considered representative of the regional or national population.

WHAT CRITERIA DOES THE SRMS USE TO DETERMINE WHETHER DATA CAN BE USED FOR TRENDS PRODUCTION?

The SRMS only produces trends in **breeding numbers** from data that meet certain criteria:

Trends in breeding numbers can be produced where data are drawn from a Study Area with a minimum number of occupied home ranges and span a period of at least ten years.

1. ***Data need to be drawn from a ‘Study Area’ – i.e. a defined geographic area***

where there is high intensity monitoring.

Existing long-term studies contributing data to the SRMS tend to be comparatively large. Defined areas could equally be comprised of multiple smaller samples, such as raptor patches. What is crucial is the total area that is effectively covered, and the representativeness of the sample for the area that the trends are applied to.

Table 3. For each of the species for which provisional trend analysis can be carried out from SRMS data, approximate typical spacing between neighbouring nest sites, and maximum nearest neighbour distance for sites used to define clusters for trend analysis. Typical spacing entries marked with asterisks are based primarily on observed spacing in SRMS data, there being a paucity of useful information on spacing (or a lack of consensus on this matter) in the literature. For Barn Owl and Tawny Owl, the maximum distance used to identify clusters was 2 km for numerical trends and 5 km for productivity trends.

Species	Typical spacing (km)	Maximum distance (km)
Osprey	1.0 – 4.0*	5.0
Golden Eagle	3.0 – 15.0	10.0
Sparrowhawk	0.5 – 2.0	2.0
Goshawk	1.0 – 4.0	5.0
Hen Harrier	1.0 – 5.0	5.0
Red Kite	1.0 – 4.0	5.0
White-tailed Eagle	3.0 – 15.0	10.0
Buzzard	0.5 – 1.7	2.0
Barn Owl	0.5 – 2.0*	2.0 (5.0)
Tawny Owl	0.5 – 4.0	2.0 (5.0)
Kestrel	1.0 – 3.0*	2.0
Merlin	0.5 – 4.5	5.0
Peregrine	2.0 – 9.0	7.5
Raven	2.0 – 8.0	7.5

Unfortunately, until recently (with the launch of SRMS Online – see Chapter 3) data contributors have not been in a position to systematically record their study area boundaries for long-term studies contributing data to the SRMS. As a consequence, for our latest trends analysis,

discussed in Chapter 2, potential Study Areas were identified as areas within which monitoring appeared to be reasonably comprehensive. To do this, we first calculated nearest neighbour distances between all SRMS records with 4-figure (1 km resolution) or better grid references. These were used to identify subsets of records pertaining to nest sites that were all within a maximum distance of the nearest neighbouring site. Maximum neighbour distances of sites for each species were based broadly on the range of inter-nest site distances observed from records of each species (Table 3). These are based on the distribution of records in the SRMS dataset, drawing also on information from published reference works such as Hardey *et al.* (2013), Cramp (1982) and Perrins & Brooks (1994).

Help the SRMS maximise the value of your data for trends production by capturing your Study Area boundary on SRMS Online and recording your monitoring effort within this boundary – See Chapter 3.

2. Data collection needs to have spanned a period of at least ten years to be considered for trends analysis.

In our latest trend analysis discussed in Chapter 2, areas were first assessed to see if they qualified for trends analysis on all 16 years of data (2003 to 2018). Areas that did not qualify for trend analysis over the full period were then assessed to see if they qualified for the ten year period from 2009 to 2018.

Home ranges only contributed to regional and national productivity trends if records had been submitted for them in at least five years.

3. There should be a minimum number of occupied home ranges within the Study Area.

This particular criterion has been necessary to maximise the value of the data we hold in the absence of good knowledge of existing long-term Study Area boundaries. This does pose

difficulties for getting to grips with understanding populations in areas where pairs are sparsely distributed, or where (as is the case for several areas that now hold Red Kites or White-tailed Eagles) they have been colonised over the course of a study.

In our latest trend analysis discussed in Chapter 2, in order to be able to produce local study area trends, Study Areas needed to comprise at least five Home Ranges, each represented by three or more records in the first and the last half of the period covered by the trends analysis. To ensure that they were drawn from areas where monitoring effort was relatively high, regional and national trends in number were based solely on data drawn from the clusters identified for the production of local trends. In addition, records of checked home ranges had to be available from five or more years, and at least one of these years had to be represented by at least five checked home ranges.

Looking to the future, we are hoping that more monitoring will follow the *Raptor Patch* approach outlined below, or at least be accompanied by more thorough recording of Study Area boundaries and effort recording within these (Chapter 3).

Trends in breeding productivity can be produced where data are drawn from a wider geographic area than for trends in breeding numbers.

Trends in breeding productivity were drawn from data collected over a wider geographic area (i.e. not restricted to study area clusters). However, to ensure that monitoring effort at the contributing home ranges was reasonably high, these data were restricted to home ranges that each contributed data in at least five years, and to years in which the trend was informed by data from seven or more of these home ranges.

THE RAPTOR PATCH APPROACH

Compared to traditional long-term monitoring the raptor patch approach has been developed with trends in mind.

Monitoring many small patches rather than one or two large study areas within a region can be advantageous as within smaller areas monitoring intensity is likely to be high enough to have greater confidence in finding all pairs of a given species. This approach is particularly valuable for common species and is suitable for a broader range of observers and volunteers.

Small patch sizes and a wider participation by volunteers should mean that a relatively large number of patches can be covered. This, in turn, lends this approach to sampling in different regions and habitats to make sure that the overall data drawn from patches are representative of the whole population.

Rather than targeting areas suspected of holding high densities of pairs of a given species, patches aim to be broadly representative of the habitats and land uses in the landscapes they are situated in.

With a sufficient number of patches covered in this way, it should be possible to derive population trends that are robust and representative of the wider population, at least for common species.

Raptor Patch is an initiative taking forward these principles to collect more information on four of Scotland's most widespread but currently under-recorded raptor species (Buzzard, Kestrel, Sparrowhawk and Raven).

***Raptor Patch* is designed with trend production in mind from the outset.** *Raptor Patch* is an area-based approach where individuals take on the monitoring of a **defined geographic area** (approximately 2 km x 2 km is considered ideal) where they attempt to **obtain complete coverage** of one or more raptor species which they declare from the outset.

One of the tasks for 2021/2022 work plan is to undertake a power analysis to determine how many Raptor Patches may be needed across Scotland to generate data that could meaningfully be used to inform trends production. As highlighted in our 2019 report, we will be looking to grow our *Raptor Patch*

initiative over the next three years in line with our over-arching Enhancement Strategy & Plan, such that in the future we should be able to report on specific trends drawn from Raptor Patch studies.

HOW COULD I CONSIDER ADAPTING MY MONITORING EFFORTS TO SUPPORT POPULATION TRENDS PRODUCTION IN THE FUTURE?

The answer to this question will very much depend the type of raptor monitoring you are involved in, and how much you might wish to consider adapting what you currently do to better meet the needs of the SRMS.

Already got a long-term study up and running?

If you are already engaged in a long-term study and you are achieving comprehensive coverage each year within a well-defined study area, that's great! Such long-term studies are really valuable to the SRMS in terms of us being able to produce trends, particularly in numbers of breeding pairs.

We would strongly encourage you to consider succession planning for your study into the future so that, if and when you find yourself struggling or unable to maintain your current intensity of monitoring, this valuable work can be continued by others. Getting others involved in your study, particularly younger people and those who seem likely to be based in the area for a long time, could greatly increase the likelihood that someone will be available to pick up the reins and carry on.

Already got a study up and running but it is still relatively new?

If you have recently started a study and are managing to achieve comprehensive coverage

within a well-defined area, then please carry on! If it is not already doing so, your study area will be able to contribute to population trends in the future, provided you keep up the good work!

Gathering data from a limited suite of species over a narrow area?

This is still useful, particularly where your efforts might be contributing to completing the picture as part of a larger study.

Gathering data from a wide variety of species over a wide area?

You might have a slightly more opportunistic approach to your monitoring, perhaps gathering data from a wide variety of species over a wide area.

Please consider whether you could identify one or more areas as Study Areas within the wider area that you monitor where you could focus on the intensive monitoring that is required for robust trends in breeding numbers, perhaps concentrating on just one or two species within these specific areas.

Just starting out with raptor monitoring?

Why not consider getting involved with *Raptor Patch*? This is an area-based approach to monitoring designed to collect data in a way that is most amenable to the SRMS being able to produce robust trends in both numbers and productivity.

Find out more about *Raptor Patch* on a dedicated page on the SRMS website:
<http://raptormonitoring.org/getting-involved/raptor-patch>

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<https://www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index>

Breeding success of raptors in Scotland in 2020

N.B. Data in the following tables present the data submitted to the SRMS in 2020. 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. To explore trends through time we would recommend that you consult the national, regional or local trends available on the SRMS website.

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 home ranges 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 home range 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.

Productivity = this is based exclusively on observed numbers of fledged young. Breeding attempts that were assumed to be successful (because they reached large chick stage and were not recorded to fail) but where number of fledged young was not recorded, do not contribute to estimates of productivity. In a few instances, this means that no data were available to derive estimates of productivity, despite there being one or more (assumed) successful breeding attempts. Productivity values for these situations are expressed as "?" (rather than as "-") or, for young fledged per successful pair, "? (n=0)".

Raptor, owl and Raven nest site and home range data submitted under the Scottish Raptor Monitoring Scheme in 2020

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
Osprey	23	0	19	78	-	11	25	-	-	4	38	-	198
Honey-buzzard	-	-	7	28	-	-	-	-	-	-	2	-	37
Golden Eagle	56	11	1	113	8	3	0	-	-	1	22	12	227
Sparrowhawk	4	28	1	7	0	11	0	25	10	7	18	4	115
Goshawk	-	0	28	11	-	47	0	-	-	7	14	-	107
Marsh Harrier	0	1	-	0	-	0	1	0	-	-	10	-	12
Hen Harrier	40	9	22	40	5	14	13	166	-	10	28	20	367
Red Kite	-	54	145	37	-	1	26	-	-	1	82	-	346
White-tailed Eagle	34	-	-	53	23	-	2	2	-	-	3	10	127
Buzzard	105	17	62	136	0	93	3	14	-	7	257	15	709
Barn Owl	96	111	164	44	-	64	0	-	-	24	9	-	512
Tawny Owl	38	33	23	44	-	19	0	-	-	0	7	-	164
Little Owl	-	-	-	-	-	2	-	-	-	-	-	-	2
Long-eared Owl	2	5	0	4	-	11	0	4	-	2	8	1	37
Short-eared Owl	12	2	3	1	-	7	0	65	-	3	25	0	118
Kestrel	23	33	18	23	2	54	0	35	-	1	58	6	253
Merlin	0	5	12	55	3	41	67	44	60	4	31	6	328
Hobby	-	-	-	1	-	0	-	-	-	-	7	-	8
Peregrine	38	24	81	42	0	137	17	19	2	61	61	5	487
Raven	87	42	38	17	5	31	0	48	17	35	12	16	348
TOTAL:	558	375	624	734	46	546	154	422	89	167	692	95	4502

Raptor, Owl and Raven breeding attempts monitored under the Scottish Raptor Monitoring Scheme in 2020

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
Osprey	15	0	13	49	-	10	19	-	-	3	19	-	128
Honey-buzzard	-	-	2	1	-	-	-	-	-	-	0	-	3
Golden Eagle	46	7	1	72	5	1	0	-	-	1	14	8	155
Sparrowhawk	2	21	1	5	0	8	0	14	9	5	11	2	78
Goshawk	-	0	19	9	-	35	0	-	-	2	4	-	69
Marsh Harrier	0	1	-	0	-	0	1	0	-	-	4	-	6
Hen Harrier	27	2	9	13	3	8	8	49	-	5	8	12	144
Red Kite	-	24	119	24	-	1	17	-	-	1	40	-	226
White-tailed Eagle	34	-	-	40	19	-	2	2	-	-	2	8	107
Buzzard	37	12	27	99	0	60	0	10	-	6	165	11	427
Barn Owl	54	64	79	36	-	34	0	-	-	18	4	-	289
Tawny Owl	17	9	7	32	-	13	0	-	-	0	5	-	83
Little Owl	-	-	-	-	-	0	-	-	-	-	-	-	0
Long-eared Owl	2	4	0	4	-	8	0	0	-	2	5	0	25
Short-eared Owl	4	0	1	0	-	4	0	12	-	3	11	0	35
Kestrel	11	23	6	16	0	28	0	4	-	0	30	5	123
Merlin	0	1	4	20	2	15	22	4	21	1	15	6	111
Hobby	-	-	-	0	-	0	-	-	-	-	2	-	2
Peregrine	13	13	41	11	0	43	10	9	0	30	33	3	206
Raven	37	20	19	13	4	20	0	41	9	15	5	9	192
TOTAL:	299	201	348	444	33	288	79	145	39	92	377	64	2409

Breeding success of Osprey in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	23	17	0	15	0	15	15	13	23	1.7 (n=12)	1.5	1.5
- Argyll Mainland	21	15	0	13	0	13	13	11	19	1.6 (n=10)	1.4	1.4
- Bute	2	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
Dumfries & Galloway	19	14	1	13	2	11	10	10	22	2.2 (n=10)	2.0	1.7
Highland	78	50	7	49	2	47	44	42	82	2.0 (n=42)	1.7	1.7
- Badenoch & Strathspey	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Caithness	2	2	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Inverness-shire	14	10	0	10	0	10	10	9	12	1.3 (n=9)	1.2	1.2
- Lochaber	4	4	0	4	1	3	3	3	8	2.7 (n=3)	2.7	2.0
- Nairn	1	0	1	0	0	0	0	0	0	-	-	-
- Ross-shire	33	20	4	20	0	20	18	17	34	2.0 (n=17)	1.7	1.7
- Sutherland	22	12	2	12	1	11	10	10	21	2.1 (n=10)	1.9	1.8
- West Moray	1	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
Lothian & Borders	11	10	0	10	1	9	7	7	17	2.4 (n=7)	1.9	1.7
- Lothian	1	1	0	1	0	1	0	0	0	-	-	-
- Scottish Borders	10	9	0	9	1	8	7	7	17	2.4 (n=7)	2.1	1.9
North-east Scotland	25	19	1	19	0	17	13	13	26	2.0 (n=13)	1.5	1.4
- Aberdeenshire	24	19	1	19	0	17	13	13	26	2.0 (n=13)	1.5	1.4
- East Moray	1	0	0	0	0	0	0	0	0	-	-	-
South Strathclyde	4	3	1	3	0	3	3	3	5	1.7 (n=3)	1.7	1.7
- Ayrshire	2	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Inverclyde	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- South Lanarkshire	1	0	1	0	0	0	0	0	0	-	-	-
Tayside	38	21	1	19	0	19	18	18	28	1.5 (n=17)	1.4	1.4
- Angus	15	10	0	8	0	8	7	7	14	2.0 (n=7)	1.8	1.8
- Fife	1	0	1	0	0	0	0	0	0	-	-	-
- Perth & Kinross	22	11	0	11	0	11	11	11	14	1.2 (n=10)	1.2	1.2
TOTAL:	198	134	11	128	5	121	110	106	203	1.9 (n=104)	1.7	1.6

Breeding success of Honey-buzzard in Scotland in 2020

Region	Home ranges checked	Home ranges occupied by pairs	Additional home ranges with single birds	Pairs occupied home ranges monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Dumfries & Galloway	7	2	2	2	0	1	1	0	0	-	-	-
Highland	28	8	6	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Badenoch & Strathspey	4	0	2	0	0	0	0	0	0	-	-	-
- Inverness-shire	11	6	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Lochaber	1	0	0	0	0	0	0	0	0	-	-	-
- Nairn	1	1	0	0	0	0	0	0	0	-	-	-
- Ross-shire	7	0	2	0	0	0	0	0	0	-	-	-
- West Moray	4	1	1	0	0	0	0	0	0	-	-	-
Tayside	2	0	0	0	0	0	0	0	0	-	-	-
- Angus	2	0	0	0	0	0	0	0	0	-	-	-
- Perth & Kinross	0	0	0	0	0	0	0	0	0	-	-	-
TOTAL:	37	10	8	3	0	2	2	1	1	1.0 (n=1)	0.5	0.3

Breeding success of Golden Eagle in Scotland in 2020

Region	Home ranges checked	Home ranges occupied by pairs	Of which immature pairs ¹	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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	56	51	0	1	46	5	38	25	20	21	0.9 (n=18)	0.5	0.4
- Argyll Islands	20	20	0	0	19	2	14	7	7	7	1.0 (n=7)	0.5	0.4
- Argyll Mainland	35	31	0	1	27	3	24	18	13	14	0.9 (n=11)	0.5	0.4
- Bute	1	0	0	0	0	0	0	0	0	0	-	-	-
Central Scotland	11	9	1	0	7	1	5	5	5	6	1.2 (n=5)	1.2	0.9
- Stirling	11	9	1	0	7	1	5	5	5	6	1.2 (n=5)	1.2	0.9
Highland	113	91	6	11	72	20	45	38	36	44	1.2 (n=36)	1.0	0.6
- Badenoch & Strathspey	21	18	2	1	17	3	13	11	11	16	1.5 (n=11)	1.2	0.9
- Inverness-shire	19	15	1	2	10	3	6	5	5	5	1.0 (n=5)	0.8	0.5
- Isle of Skye	3	2	0	1	2	1	1	1	1	1	1.0 (n=1)	1.0	0.5
- Lochaber	15	14	2	0	10	2	5	5	4	5	1.2 (n=4)	1.0	0.5
- Ross-shire	26	16	0	5	9	0	7	6	6	7	1.2 (n=6)	1.0	0.8
- Small Isles	3	3	0	0	3	0	3	1	1	1	1.0 (n=1)	0.3	0.3
- Sutherland	26	23	1	2	21	11	10	9	8	9	1.1 (n=8)	0.9	0.4
Lewis & Harris	8	8	0	0	5	0	5	5	3	3	1.0 (n=3)	0.6	0.6
- Harris	4	4	0	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Lewis	4	4	0	0	4	0	4	4	2	2	1.0 (n=2)	0.5	0.5
Lothian & Borders	3	1	0	0	1	0	1	1	0	0	-	-	-
- Scottish Borders	3	1	0	0	1	0	1	1	0	0	-	-	-
South-west Scotland	2	2	0	0	2	0	2	2	1	1	1.0 (n=1)	0.5	0.5
Tayside	22	15	1	5	14	3	10	10	10	14	1.4 (n=10)	1.4	1.0
- Angus	1	1	0	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Perth & Kinross	21	14	1	5	13	3	9	9	9	12	1.3 (n=9)	1.3	0.9
Uist	12	12	0	0	8	1	4	4	4	4	1.0 (n=4)	1.0	0.5
- Benbecula	2	2	0	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- South Uist	10	10	0	0	7	1	3	3	3	3	1.0 (n=3)	1.0	0.4
TOTAL:	227	189	8	17	155	30	110	90	79	93	1.2 (n=77)	0.8	0.6

¹These immature pairs are included in the column 'Home ranges occupied by pairs'. Pairs consisting of either one or two birds with immature plumage are treated as immature pairs.

Breeding success of Sparrowhawk in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	4	2	2	0	2	2	2	8	4.0 (n=2)	4.0	4.0
- Argyll Islands	3	1	1	0	1	1	1	5	5.0 (n=1)	5.0	5.0
- Argyll Mainland	1	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
Central Scotland	28	24	21	0	21	18	18	44	2.4 (n=18)	2.1	2.1
- Dunbartonshire	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Glasgow	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- North Lanarkshire	14	12	12	0	12	10	10	30	3.0 (n=10)	2.5	2.5
- Stirling	12	10	7	0	7	6	6	11	1.8 (n=6)	1.6	1.6
Dumfries & Galloway	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Highland	7	5	5	0	5	4	4	11	2.5 (n=3)	2.0	2.0
- Caithness	1	1	1	0	1	1	1	4	4.0 (n=1)	4.0	4.0
- Inverness-shire	2	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Nairn	1	1	1	0	1	1	1	1	? (n=0)	?	?
- Ross-shire	1	0	0	0	0	0	0	0	-	-	-
- West Moray	2	1	1	0	1	0	0	0	-	-	-
Lothian & Borders	11	9	8	0	7	7	7	18	2.6 (n=7)	2.6	2.2
- Lothian	6	5	5	0	4	4	4	8	2.0 (n=4)	2.0	1.6
- Scottish Borders	5	4	3	0	3	3	3	10	3.3 (n=3)	3.3	3.3
Orkney	25	14	14	4	10	10	3	6	2.0 (n=3)	0.6	0.4
Shetland	10	9	9	0	9	8	7	16	2.3 (n=7)	1.8	1.8
South Strathclyde	7	6	5	0	5	5	5	5	0.8 (n=4)	0.8	0.8
- Arran & Cumbrae	7	6	5	0	5	5	5	5	0.8 (n=4)	0.8	0.8
Tayside	18	11	11	0	11	11	11	29	2.6 (n=11)	2.6	2.6
- Fife	8	6	6	0	6	6	6	20	3.3 (n=6)	3.3	3.3
- Perth & Kinross	10	5	5	0	5	5	5	9	1.8 (n=5)	1.8	1.8
Uist	4	3	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- South Uist	4	3	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
TOTAL:	115	84	78	4	73	68	60	142	2.4 (n=58)	2.0	1.9

Breeding success of Goshawk in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Dumfries & Galloway	28	20	3	19	0	19	19	17	33	1.9 (n=17)	1.7	1.7
Highland	11	10	1	9	0	9	9	9	19	2.1 (n=9)	2.1	2.1
- Badenoch & Strathspey	7	7	0	6	0	6	6	6	16	2.7 (n=6)	2.7	2.7
- Inverness-shire	2	2	0	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- Lochaber	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- West Moray	1	0	1	0	0	0	0	0	0	-	-	-
Lothian & Borders	47	39	1	35	0	35	33	31	73	2.4 (n=31)	2.1	2.1
- Lothian	1	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Scottish Borders	46	38	1	34	0	34	32	30	70	2.3 (n=30)	2.1	2.1
South Strathclyde	7	5	2	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- Ayrshire	7	5	2	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
Tayside	14	7	5	4	0	3	2	2	3	1.5 (n=2)	1.0	0.8
- Angus	4	3	1	3	0	2	1	1	1	1.0 (n=1)	0.5	0.3
- Fife	1	0	0	0	0	0	0	0	0	-	-	-
- Perth & Kinross	9	4	4	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
TOTAL:	107	81	12	69	0	68	65	61	130	2.1 (n=61)	1.9	1.9

Breeding success of Marsh Harrier in Scotland in 2020

Region	Home ranges checked	Home ranges occupied by pairs	Additional home ranges with single birds	Pair occupied home ranges monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Central Scotland	1	1	0	1	0	1	1	1	4	4.0 (n=1)	4.0	4.0
- Clackmannanshire	1	1	0	1	0	1	1	1	4	4.0 (n=1)	4.0	4.0
North-east Scotland	1	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Aberdeenshire	1	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
Tayside	10	6	1	4	0	3	3	3	11	3.7 (n=3)	3.7	2.8
- Fife	2	0	0	0	0	0	0	0	0	-	-	-
- Perth & Kinross	8	6	1	4	0	3	3	3	11	3.7 (n=3)	3.7	2.8
TOTAL:	12	8	1	6	0	5	5	5	18	3.6 (n=5)	3.6	3.0

Breeding success of Hen Harrier in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	40	29	3	27	0	27	26	22	70	3.2 (n=22)	2.6	2.6
- Argyll Islands	8	8	0	7	0	7	7	7	26	3.7 (n=7)	3.7	3.7
- Argyll Mainland	32	21	3	20	0	20	19	15	44	2.9 (n=15)	2.2	2.2
Central Scotland	9	3	2	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Arrochar & Helensburgh	9	3	2	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
Dumfries & Galloway	22	9	0	9	0	9	9	7	22	3.1 (n=7)	2.4	2.4
Highland	40	15	2	13	0	12	10	7	17	2.4 (n=7)	1.4	1.3
- Badenoch & Strathspey	8	5	1	5	0	5	4	3	9	3.0 (n=3)	1.8	1.8
- Caithness	2	0	0	0	0	0	0	0	0	-	-	-
- Inverness-shire	9	0	0	0	0	0	0	0	0	-	-	-
- Nairn	3	0	0	0	0	0	0	0	0	-	-	-
- Ross-shire	1	1	0	1	0	1	1	0	0	-	-	-
- Small Isles	1	1	0	0	0	0	0	0	0	-	-	-
- Sutherland	8	5	1	4	0	3	2	2	2	1.0 (n=2)	0.7	0.5
- West Moray	8	3	0	3	0	3	3	2	6	3.0 (n=2)	2.0	2.0
Lewis & Harris	5	5	0	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
- Lewis	5	5	0	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
Lothian & Borders	14	8	2	8	1	7	6	6	12	2.0 (n=6)	1.7	1.5
- Scottish Borders	14	8	2	8	1	7	6	6	12	2.0 (n=6)	1.7	1.5
North-east Scotland	13	8	1	8	0	8	8	7	18	2.6 (n=7)	2.2	2.2
- Aberdeenshire	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- East Moray	12	7	1	7	0	7	7	6	16	2.7 (n=6)	2.3	2.3
Orkney	166	49	5	49	24	25	23	13	26	2.0 (n=13)	1.0	0.5
South Strathclyde	10	5	0	5	1	4	4	3	11	3.7 (n=3)	2.8	2.2
- Ayrshire	2	0	0	0	0	0	0	0	0	-	-	-
- South Lanarkshire	8	5	0	5	1	4	4	3	11	3.7 (n=3)	2.8	2.2

Breeding success of Hen Harrier in Scotland in 2020 (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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Tayside	28	8	3	8	0	8	7	7	19	2.7 (n=7)	2.4	2.4
- Angus	5	1	0	1	0	1	0	0	0	-	-	-
- Perth & Kinross	23	7	3	7	0	7	7	7	19	2.7 (n=7)	2.7	2.7
Uist	20	14	0	12	0	11	11	11	26	2.4 (n=11)	2.4	2.2
- Benbecula	2	2	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- North Uist	1	0	0	0	0	0	0	0	0	-	-	-
- South Uist	17	12	0	11	0	10	10	10	23	2.3 (n=10)	2.3	2.1
TOTAL:	367	153	18	144	26	116	109	88	233	2.6 (n=88)	2.0	1.6

Breeding success of Red Kite in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Central Scotland	54	33	24	3	21	16	12	20	1.7 (n=12)	1.0	0.8
- Stirling	54	33	24	3	21	16	12	20	1.7 (n=12)	1.0	0.8
Dumfries & Galloway	145	122	119	0	119	113	107	135	0.8 (n=61)	0.7	0.7
Highland	37	29	24	1	23	21	20	41	2.0 (n=20)	1.8	1.7
- Badenoch & Strathspey	1	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Inverness-shire	8	5	3	0	3	3	3	4	1.3 (n=3)	1.3	1.3
- Ross-shire	24	19	17	1	16	14	13	27	2.1 (n=13)	1.7	1.6
- Sutherland	3	3	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
- West Moray	1	1	0	0	0	0	0	0	-	-	-
Lothian & Borders	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Unknown	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
North-east Scotland	26	19	17	0	17	17	16	29	1.8 (n=15)	1.6	1.6
- Aberdeenshire	26	19	17	0	17	17	16	29	1.8 (n=15)	1.6	1.6
South Strathclyde	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- South Lanarkshire	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Tayside	82	48	40	0	40	33	31	56	1.8 (n=30)	1.4	1.4
- Angus	21	12	9	0	9	9	9	14	1.6 (n=9)	1.6	1.6
- Perth & Kinross	61	36	31	0	31	24	22	42	1.9 (n=21)	1.3	1.3
TOTAL:	346	253	226	4	222	202	188	284	1.7 (n=140)	1.4	1.4

Breeding success of White-tailed Eagle in Scotland in 2020

Region	Home ranges checked	Home ranges 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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	34	34	34	30	30	26	30	1.2 (n=26)	1.0	0.9
- Argyll Islands	30	30	30	26	26	22	26	1.2 (n=22)	1.0	0.9
- Argyll Mainland	4	4	4	4	4	4	4	1.0 (n=4)	1.0	1.0
Highland	53	50	40	33	28	24	35	1.5 (n=24)	1.1	0.9
- Badenoch & Strathspey	2	2	2	2	2	2	3	1.5 (n=2)	1.5	1.5
- Inverness-shire	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Isle of Skye	22	22	14	11	10	9	15	1.7 (n=9)	1.4	1.1
- Lochaber	6	6	5	3	3	3	3	1.0 (n=3)	1.0	0.6
- Ross-shire	10	8	7	7	6	3	4	1.3 (n=3)	0.6	0.6
- Small Isles	3	3	3	2	0	0	0	-	-	-
- Sutherland	9	8	8	7	6	6	9	1.5 (n=6)	1.3	1.1
Lewis & Harris	23	23	19	17	15	13	17	1.2 (n=12)	0.9	0.8
- Harris	4	4	3	2	2	1	1	? (n=0)	?	?
- Lewis	19	19	16	15	13	12	16	1.3 (n=12)	1.1	1.0
North-east Scotland	2	2	2	1	1	1	2	2.0 (n=1)	2.0	1.0
- Aberdeenshire	2	2	2	1	1	1	2	2.0 (n=1)	2.0	1.0
Orkney	2	2	2	2	2	2	4	2.0 (n=2)	2.0	2.0
Tayside	3	2	2	2	2	1	1	1.0 (n=1)	0.5	0.5
- Angus	1	1	1	1	1	0	0	-	-	-
- Fife	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Perth & Kinross	1	0	0	0	0	0	0	-	-	-
Uist	10	10	8	7	7	7	7	1.0 (n=7)	1.0	0.9
- Benbecula	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- North Uist	3	3	3	3	3	3	3	1.0 (n=3)	1.0	1.0
- South Uist	6	6	4	3	3	3	3	1.0 (n=3)	1.0	0.8
TOTAL:	127	123	107	92	85	74	96	1.3 (n=73)	1.0	0.9

Breeding success of Buzzard in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	105	69	9	37	0	37	37	36	63	1.8 (n=36)	1.7	1.7
- Argyll Islands	47	35	1	11	0	11	11	11	16	1.5 (n=11)	1.5	1.5
- Argyll Mainland	24	21	1	18	0	18	18	17	34	2.0 (n=17)	1.9	1.9
- Bute	34	13	7	8	0	8	8	8	13	1.6 (n=8)	1.6	1.6
Central Scotland	17	12	1	12	2	10	9	9	20	2.2 (n=9)	2.0	1.7
- Stirling	17	12	1	12	2	10	9	9	20	2.2 (n=9)	2.0	1.7
Dumfries & Galloway	62	43	1	27	1	25	24	23	35	1.4 (n=21)	1.3	1.2
Highland	136	103	0	99	0	98	78	75	139	1.9 (n=75)	1.4	1.4
- Badenoch & Strathspey	21	21	0	21	0	21	18	18	40	2.2 (n=18)	1.9	1.9
- Caithness	2	2	0	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Inverness-shire	8	8	0	8	0	7	7	6	13	2.2 (n=6)	1.9	1.6
- Ross-shire	98	65	0	62	0	62	46	44	71	1.6 (n=44)	1.1	1.1
- Sutherland	7	7	0	6	0	6	5	5	9	1.8 (n=5)	1.5	1.5
Lothian & Borders	93	71	0	60	0	55	54	53	87	1.3 (n=37)	1.3	1.2
- Lothian	22	22	0	22	0	22	22	21	46	2.2 (n=21)	2.1	2.1
- Scottish Borders	71	49	0	38	0	33	32	32	41	0.8 (n=16)	0.8	0.7
North-east Scotland	3	2	0	0	0	0	0	0	0	-	-	-
- Aberdeenshire	3	2	0	0	0	0	0	0	0	-	-	-
Orkney	14	10	1	10	3	7	7	6	10	1.7 (n=6)	1.4	1.0
South Strathclyde	7	6	1	6	0	6	6	6	8	0.8 (n=3)	0.8	0.8
- Arran & Cumbrae	3	2	1	2	0	2	2	2	2	? (n=0)	?	?
- Ayrshire	4	4	0	4	0	4	4	4	6	1.2 (n=3)	1.2	1.2
Tayside	257	183	6	165	0	157	157	157	216	1.3 (n=146)	1.3	1.2
- Angus	115	107	1	98	0	95	95	95	118	1.2 (n=95)	1.2	1.2
- Fife	34	24	1	23	0	18	18	18	28	1.5 (n=17)	1.5	1.2
- Perth & Kinross	108	52	4	44	0	44	44	44	70	1.4 (n=34)	1.4	1.4
Uist	15	13	0	11	0	10	9	9	15	1.7 (n=9)	1.5	1.4
- Benbecula	2	2	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- North Uist	4	3	0	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- South Uist	9	8	0	8	0	7	6	6	10	1.7 (n=6)	1.4	1.2
TOTAL:	709	512	19	427	6	405	381	374	593	1.6 (n=342)	1.5	1.4

Breeding success of Barn Owl in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	96	58	7	54	1	53	50	48	226	4.7 (n=48)	4.3	4.2
- Argyll Islands	5	2	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Argyll Mainland	89	54	7	51	1	50	47	45	221	4.9 (n=45)	4.4	4.3
- Bute	2	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
Central Scotland	111	77	2	64	0	64	64	64	202	3.2 (n=64)	3.2	3.2
- Arrochar & Helensburgh	2	2	0	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- Clackmannanshire	8	7	1	5	0	5	5	5	12	2.4 (n=5)	2.4	2.4
- North Lanarkshire	18	13	0	13	0	13	13	13	32	2.5 (n=13)	2.5	2.5
- Stirling	83	55	1	44	0	44	44	44	156	3.5 (n=44)	3.5	3.5
Dumfries & Galloway	164	82	16	79	1	78	74	73	270	3.7 (n=73)	3.5	3.4
Highland	44	36	2	36	0	35	35	34	100	2.9 (n=33)	2.8	2.8
- Badenoch & Strathspey	4	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Caithness	7	6	1	6	0	6	6	6	16	2.7 (n=6)	2.7	2.7
- Inverness-shire	5	4	0	4	0	4	4	4	13	3.2 (n=4)	3.2	3.2
- Lochaber	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Ross-shire	15	12	1	12	0	11	11	10	26	2.6 (n=10)	2.4	2.2
- Sutherland	12	11	0	11	0	11	11	11	39	3.5 (n=10)	3.5	3.5
Lothian & Borders	64	40	5	34	0	34	34	33	84	2.5 (n=33)	2.5	2.5
- Lothian	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Scottish Borders	63	39	5	33	0	33	33	32	83	2.6 (n=32)	2.5	2.5
South Strathclyde	24	22	1	18	0	18	18	18	61	3.4 (n=18)	3.4	3.4
- Ayrshire	5	4	0	3	0	3	3	3	17	5.7 (n=3)	5.7	5.7
- Inverclyde	1	0	1	0	0	0	0	0	0	-	-	-
- Renfrewshire	18	18	0	15	0	15	15	15	44	2.9 (n=15)	2.9	2.9
Tayside	9	4	5	4	0	4	4	4	8	2.0 (n=4)	2.0	2.0
- Fife	3	2	1	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Perth & Kinross	6	2	4	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
TOTAL:	512	319	38	289	2	286	279	274	951	3.5 (n=273)	3.3	3.3

Breeding success of Tawny Owl in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	38	19	17	17	15	15	30	2.0 (n=15)	1.8	1.8
- Argyll Islands	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Argyll Mainland	37	18	16	16	14	14	29	2.1 (n=14)	1.8	1.8
Central Scotland	33	19	9	9	8	8	28	3.5 (n=8)	3.1	3.1
- Stirling	33	19	9	9	8	8	28	3.5 (n=8)	3.1	3.1
Dumfries & Galloway	23	10	7	7	6	6	15	2.5 (n=6)	2.1	2.1
Highland	44	33	32	32	29	28	55	2.0 (n=28)	1.7	1.7
- Badenoch & Strathspey	6	3	3	3	3	3	5	1.7 (n=3)	1.7	1.7
- Inverness-shire	7	7	6	6	6	6	17	2.8 (n=6)	2.8	2.8
- Ross-shire	31	23	23	23	20	19	33	1.7 (n=19)	1.4	1.4
Lothian & Borders	19	18	13	13	13	13	31	2.4 (n=13)	2.4	2.4
- Scottish Borders	19	18	13	13	13	13	31	2.4 (n=13)	2.4	2.4
Tayside	7	6	5	5	5	5	11	2.2 (n=5)	2.2	2.2
- Fife	2	2	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Perth & Kinross	5	4	4	4	4	4	10	2.5 (n=4)	2.5	2.5
TOTAL:	164	105	83	83	76	75	170	2.3 (n=75)	2.0	2.0

Breeding success of Little Owl in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Lothian & Borders	2	0	2	0	0	0	0	0	0	-	-	-
- Scottish Borders	2	0	2	0	0	0	0	0	0	-	-	-
TOTAL:	2	0	2	0	0	0	0	0	0	-	-	-

Breeding success of Long-Eared Owl in Scotland in 2020

Region	Known territories checked for occupation	Pairs found	Pairs monitored	Pairs known to lay eggs	Pairs known to fledge young	Minimum number of fledged young	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	2	2	2	2	2	6	3.0 (n=2)	3.0	3.0
- Argyll Mainland	2	2	2	2	2	6	3.0 (n=2)	3.0	3.0
Central Scotland	5	5	4	4	4	9	2.2 (n=4)	2.2	2.2
- Arrochar & Helensburgh	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
- Clackmannanshire	2	2	2	2	2	5	2.5 (n=2)	2.5	2.5
- Stirling	2	2	1	1	1	2	2.0 (n=1)	2.0	2.0
Highland	4	4	4	4	4	10	2.5 (n=4)	2.5	2.5
- Badenoch & Strathspey	2	2	2	2	2	6	3.0 (n=2)	3.0	3.0
- Ross-shire	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Small Isles	1	1	1	1	1	3	3.0 (n=1)	3.0	3.0
Lothian & Borders	11	8	8	8	8	15	1.6 (n=6)	1.6	1.6
- Lothian	3	2	2	2	2	5	2.5 (n=2)	2.5	2.5
- Scottish Borders	8	6	6	6	6	10	1.3 (n=4)	1.3	1.3
Orkney	4	0	0	0	0	0	-	-	-
South Strathclyde	2	2	2	2	2	2	1.0 (n=2)	1.0	1.0
- Ayrshire	2	2	2	2	2	2	1.0 (n=2)	1.0	1.0
Tayside	8	6	5	5	5	12	2.4 (n=5)	2.4	2.4
- Angus	6	4	4	4	4	9	2.2 (n=4)	2.2	2.2
- Perth & Kinross	2	2	1	1	1	3	3.0 (n=1)	3.0	3.0
Uist	1	0	0	0	0	0	-	-	-
- North Uist	1	0	0	0	0	0	-	-	-
TOTAL:	37	27	25	25	25	54	2.3 (n=23)	2.3	2.3

Breeding success of Short-eared Owl in Scotland in 2020

Region	Sites checked	Pairs found	Additional single birds recorded	Pairs monitored	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	12	7	2	4	3	3	3	5	1.7 (n=3)	1.7	1.2
- Argyll Islands	4	2	0	1	0	0	0	0	-	-	-
- Argyll Mainland	8	5	2	3	3	3	3	5	1.7 (n=3)	1.7	1.7
Central Scotland	2	2	0	0	0	0	0	0	-	-	-
- Stirling	2	2	0	0	0	0	0	0	-	-	-
Dumfries & Galloway	3	3	0	1	1	1	1	5	5.0 (n=1)	5.0	5.0
Highland	1	0	0	0	0	0	0	0	-	-	-
- Badenoch & Strathspey	1	0	0	0	0	0	0	0	-	-	-
Lothian & Borders	7	6	0	4	4	4	4	7	1.2 (n=2)	1.2	1.2
- Lothian	2	2	0	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- Scottish Borders	5	4	0	3	3	3	3	6	1.3 (n=1)	1.3	1.3
Orkney	65	12	8	12	7	7	7	10	1.4 (n=7)	1.4	0.8
South Strathclyde	3	3	0	3	3	3	3	8	2.7 (n=3)	2.7	2.7
- South Lanarkshire	3	3	0	3	3	3	3	8	2.7 (n=3)	2.7	2.7
Tayside	25	12	4	11	11	11	11	28	2.5 (n=10)	2.5	2.5
- Angus	10	3	1	3	3	3	3	9	3.0 (n=3)	3.0	3.0
- Perth & Kinross	15	9	3	8	8	8	8	19	2.2 (n=7)	2.2	2.2
TOTAL:	118	45	14	35	29	29	29	63	2.3 (n=26)	2.3	1.9

Breeding success of Kestrel in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	23	13	11	0	9	9	9	26	2.9 (n=9)	2.9	2.4
- Argyll Islands	4	2	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Argyll Mainland	15	9	8	0	6	6	6	20	3.3 (n=6)	3.3	2.5
- Bute	4	2	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Central Scotland	33	26	23	0	23	22	22	92	4.2 (n=22)	4.0	4.0
- Dunbartonshire	1	0	0	0	0	0	0	0	-	-	-
- North Lanarkshire	20	15	14	0	14	13	13	52	4.0 (n=13)	3.7	3.7
- Stirling	12	11	9	0	9	9	9	40	4.4 (n=9)	4.4	4.4
Dumfries & Galloway	18	9	6	0	6	6	6	16	2.7 (n=6)	2.7	2.7
Highland	23	18	16	1	15	15	15	51	3.4 (n=15)	3.4	3.2
- Badenoch & Strathspey	4	3	3	0	3	3	3	10	3.3 (n=3)	3.3	3.3
- Inverness-shire	12	10	9	1	8	8	8	32	4.0 (n=8)	4.0	3.6
- Nairn	2	2	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Ross-shire	4	2	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- West Moray	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Lewis & Harris	2	1	0	0	0	0	0	0	-	-	-
- Lewis	2	1	0	0	0	0	0	0	-	-	-
Lothian & Borders	54	31	28	0	28	26	26	110	4.2 (n=24)	3.9	3.9
- Lothian	25	14	13	0	13	13	13	66	5.1 (n=13)	5.1	5.1
- Scottish Borders	29	17	15	0	15	13	13	44	3.2 (n=11)	2.8	2.8
Orkney	35	4	4	0	4	4	3	8	2.7 (n=3)	2.0	2.0
South Strathclyde	1	1	0	0	0	0	0	0	-	-	-
- Ayrshire	1	1	0	0	0	0	0	0	-	-	-
Tayside	58	32	30	0	30	29	29	77	2.4 (n=23)	2.4	2.4
- Angus	24	8	8	0	8	8	8	18	2.2 (n=8)	2.2	2.2
- Fife	9	7	6	0	6	5	5	18	3.6 (n=5)	3.0	3.0
- Perth & Kinross	25	17	16	0	16	16	16	41	2.2 (n=10)	2.2	2.2
Uist	6	5	5	0	5	5	5	13	2.6 (n=5)	2.6	2.6
- North Uist	1	0	0	0	0	0	0	0	-	-	-
- South Uist	5	5	5	0	5	5	5	13	2.6 (n=5)	2.6	2.6
TOTAL:	253	140	123	1	120	116	115	393	3.6 (n=107)	3.4	3.4

Breeding success of Merlin in Scotland in 2020

Region	Home ranges checked	Home ranges occupied by pairs	Home ranges occupied (pairs, singles or fresh signs)	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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Central Scotland	5	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Stirling	5	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Dumfries & Galloway	12	5	0	4	0	4	4	4	12	3.0 (n=4)	3.0	3.0
Highland	55	25	4	20	0	20	18	18	48	2.7 (n=18)	2.4	2.4
- Badenoch & Strathspey	12	5	0	5	0	5	5	5	15	3.0 (n=5)	3.0	3.0
- Inverness-shire	7	3	0	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Nairn	8	3	0	3	0	3	3	3	8	2.7 (n=3)	2.7	2.7
- Ross-shire	2	1	0	0	0	0	0	0	0	-	-	-
- Small Isles	1	1	0	1	0	1	1	1	5	5.0 (n=1)	5.0	5.0
- Sutherland	15	9	4	6	0	6	4	4	7	1.8 (n=4)	1.2	1.2
- West Moray	10	3	0	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
Lewis & Harris	3	3	0	2	0	2	2	2	9	4.5 (n=2)	4.5	4.5
- Harris	1	1	0	0	0	0	0	0	0	-	-	-
- Lewis	2	2	0	2	0	2	2	2	9	4.5 (n=2)	4.5	4.5
Lothian & Borders	41	15	6	15	1	14	13	12	37	3.1 (n=12)	2.6	2.5
- Lothian	13	5	3	5	1	4	3	3	8	2.7 (n=3)	2.0	1.6
- Scottish Borders	28	10	3	10	0	10	10	9	29	3.2 (n=9)	2.9	2.9
North-east Scotland	67	25	5	22	0	22	20	20	54	2.6 (n=19)	2.4	2.4
- Aberdeenshire	52	19	3	16	0	16	15	15	44	2.9 (n=14)	2.7	2.7
- East Moray	15	6	2	6	0	6	5	5	10	2.0 (n=5)	1.7	1.7
Orkney	44	4	2	4	1	3	2	2	6	3.0 (n=2)	2.0	1.5
Shetland	60	21	3	21	2	19	17	17	59	3.5 (n=17)	3.1	2.8
South Strathclyde	4	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- South Lanarkshire	4	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
Tayside	31	16	4	15	0	15	15	15	43	2.8 (n=14)	2.8	2.8
- Angus	10	7	0	6	0	6	6	6	17	2.7 (n=5)	2.7	2.7
- Perth & Kinross	21	9	4	9	0	9	9	9	26	2.9 (n=9)	2.9	2.9
Uist	6	6	0	6	0	6	6	6	18	3.0 (n=6)	3.0	3.0
- South Uist	6	6	0	6	0	6	6	6	18	3.0 (n=6)	3.0	3.0
TOTAL:	328	122	25	111	4	107	99	98	291	3.0 (n=96)	2.8	2.7

Breeding success of Hobby in Scotland in 2020

Region	Home ranges checked	Home ranges occupied by pairs	Additional home ranges with single birds	Pair occupied home ranges monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Highland	1	0	0	0	0	0	0	0	0	-	-	-
- Badenoch & Strathspey	1	0	0	0	0	0	0	0	0	-	-	-
Tayside	7	2	3	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Angus	6	2	2	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Perth & Kinross	1	0	1	0	0	0	0	0	0	-	-	-
TOTAL:	8	2	3	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0

Breeding success of Peregrine in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	38	15	3	13	0	13	11	11	20	1.7 (n=10)	1.5	1.5
- Argyll Islands	9	7	0	6	0	6	6	6	12	1.8 (n=5)	1.8	1.8
- Argyll Mainland	18	6	3	5	0	5	3	3	4	1.3 (n=3)	0.8	0.8
- Bute	11	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
Central Scotland	24	15	1	13	0	12	12	11	23	2.1 (n=11)	1.9	1.8
- Clackmannanshire	1	1	0	1	0	1	1	0	0	-	-	-
- Falkirk	3	3	0	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
- North Lanarkshire	8	5	0	4	0	4	4	4	7	1.8 (n=4)	1.8	1.8
- Stirling	12	6	1	5	0	4	4	4	9	2.2 (n=4)	2.2	1.8
Dumfries & Galloway	81	45	5	41	0	40	40	39	80	2.1 (n=39)	2.0	2.0
Highland	42	20	5	11	2	9	9	8	17	2.1 (n=8)	1.9	1.5
- Badenoch & Strathspey	4	2	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Inverness-shire	12	6	2	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Nairn	3	1	1	1	1	0	0	0	0	-	-	-
- Ross-shire	6	6	0	4	0	4	4	3	7	2.3 (n=3)	1.8	1.8
- Small Isles	1	0	0	0	0	0	0	0	0	-	-	-
- Sutherland	13	4	1	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- West Moray	3	1	0	1	1	0	0	0	0	-	-	-
Lothian & Borders	137	47	12	43	11	29	27	27	82	3.0 (n=27)	2.8	1.9
- Lothian	36	13	6	12	1	9	9	9	27	3.0 (n=9)	3.0	2.2
- Scottish Borders	101	34	6	31	10	20	18	18	55	3.1 (n=18)	2.8	1.8

Breeding success of Peregrine in Scotland in 2020 (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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
North-east Scotland	17	10	3	10	1	9	9	9	20	2.2 (n=9)	2.2	2.0
- Aberdeenshire	12	10	1	10	1	9	9	9	20	2.2 (n=9)	2.2	2.0
- East Moray	5	0	2	0	0	0	0	0	0	-	-	-
Orkney	19	9	3	9	5	4	3	3	3	1.0 (n=3)	0.8	0.3
Shetland	2	0	0	0	0	0	0	0	0	-	-	-
South Strathclyde	61	31	7	30	0	25	24	23	55	2.3 (n=22)	2.2	1.8
- Arran & Cumbrae	7	7	0	6	0	4	4	4	6	1.5 (n=4)	1.5	1.0
- Ayrshire	33	13	6	13	0	10	10	9	24	2.7 (n=9)	2.4	1.8
- Inverclyde	1	0	0	0	0	0	0	0	0	-	-	-
- Renfrewshire	5	4	0	4	0	4	4	4	9	2.2 (n=4)	2.2	2.2
- South Lanarkshire	15	7	1	7	0	7	6	6	16	2.5 (n=5)	2.1	2.1
Tayside	61	35	9	33	0	31	30	30	66	2.2 (n=30)	2.1	2.0
- Angus	24	9	4	8	0	8	7	7	12	1.7 (n=7)	1.5	1.5
- Fife	14	12	0	11	0	9	9	9	22	2.4 (n=9)	2.4	2.0
- Perth & Kinross	23	14	5	14	0	14	14	14	32	2.3 (n=14)	2.3	2.3
Uist	5	5	0	3	0	3	3	3	6	2.0 (n=3)	2.0	2.0
- North Uist	2	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- South Uist	3	3	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
TOTAL:	487	232	48	206	19	175	168	164	372	2.3 (n=162)	2.1	1.8

Breeding success of Raven in Scotland in 2020

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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Argyll	87	61	37	0	34	34	32	95	3.0 (n=32)	2.8	2.6
- Argyll Islands	27	22	8	0	8	8	8	24	3.0 (n=8)	3.0	3.0
- Argyll Mainland	33	22	14	0	12	12	11	30	2.7 (n=11)	2.5	2.1
- Bute	27	17	15	0	14	14	13	41	3.2 (n=13)	2.9	2.7
Central Scotland	42	30	20	2	15	15	15	31	2.1 (n=15)	2.1	1.6
- North Lanarkshire	8	7	6	0	6	6	6	15	2.5 (n=6)	2.5	2.5
- Stirling	34	23	14	2	9	9	9	16	1.8 (n=9)	1.8	1.1
Dumfries & Galloway	38	33	19	2	17	15	15	32	2.1 (n=15)	1.9	1.7
Highland	17	16	13	0	13	13	13	30	2.3 (n=13)	2.3	2.3
- Inverness-shire	2	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Isle of Skye	1	1	0	0	0	0	0	0	-	-	-
- Lochaber	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Nairn	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Ross-shire	7	7	6	0	6	6	6	13	2.2 (n=6)	2.2	2.2
- Small Isles	1	0	0	0	0	0	0	0	-	-	-
- Sutherland	3	3	2	0	2	2	2	7	3.5 (n=2)	3.5	3.5
- West Moray	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Lewis & Harris	5	5	4	0	4	4	4	6	1.5 (n=4)	1.5	1.5
- Lewis	5	5	4	0	4	4	4	6	1.5 (n=4)	1.5	1.5
Lothian & Borders	31	26	20	2	18	18	18	55	3.0 (n=17)	3.0	2.7
- Lothian	14	11	11	0	11	11	11	36	3.3 (n=11)	3.3	3.3
- Scottish Borders	17	15	9	2	7	7	7	19	2.6 (n=6)	2.6	2.0

Breeding success of Raven in Scotland in 2020 (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	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Orkney	48	41	41	13	28	28	26	70	2.7 (n=26)	2.5	1.7
Shetland	17	13	9	2	6	5	5	14	2.6 (n=4)	2.2	1.4
South Strathclyde	35	22	15	0	15	15	15	40	2.7 (n=15)	2.7	2.7
- Ayrshire	35	22	15	0	15	15	15	40	2.7 (n=15)	2.7	2.7
Tayside	12	9	5	0	4	2	2	2	1.0 (n=2)	0.5	0.4
- Angus	9	7	5	0	4	2	2	2	1.0 (n=2)	0.5	0.4
- Fife	2	2	0	0	0	0	0	0	-	-	-
- Perth & Kinross	1	0	0	0	0	0	0	0	-	-	-
Uist	16	13	9	0	7	7	7	18	2.4 (n=6)	2.4	1.9
- Benbecula	3	2	2	0	2	2	2	3	1.5 (n=2)	1.5	1.5
- North Uist	3	1	0	0	0	0	0	0	-	-	-
- South Uist	10	10	7	0	5	5	5	15	2.8 (n=4)	2.8	2.0
TOTAL:	348	269	192	21	161	156	152	393	2.6 (n=149)	2.5	2.1



 <p>NatureScot Scotland's Nature Agency Buidheann Nàdair na h-Alba</p>	 <p>SOC</p>	 <p>BTO Looking out for birds</p>
<p>RBBP</p> 	 <p>SRSG</p>	 <p>Scottish Forestry Coilltearachd na h-Alba</p>
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