



Scottish Raptor Monitoring Scheme Annual Report 2018

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Scottish Raptor Monitoring Scheme

Annual Report 2018

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Front cover image: Juvenile Long-eared Owl in Perthshire (Val Gall).

Back cover image: Golden Eagle chick ringed at a tree eyrie in Easter Ross (Adam Ritchie).

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Foreword

Welcome to the 2018 report. Some key aspects of the breeding season were the effects of the late winter blast in March delaying breeding for some species and causing early failure in others. Subsequent to that vole numbers crashed in spring in many areas in Scotland from their peak the previous year with obvious impacts on vole specialist species, the combination of weather and reduced prey availability proving a 'double-whammy' for species like Barn Owl. Again monitoring effort was high, with over 6,200 records received with some increases noted in coverage of really scarce species like Marsh Harrier and Hobby.

The report contains interesting articles including one by David Stroud of JNCC on how the SRMS data has fed into the assessment of UK EU Special Protection Area sufficiency under the ongoing review. Currently the Scottish government is considering the report but what will be decided will likely be dependent on the final Brexit outcome. Another article describes the revised Data Sharing & Use Policy that the SRMS partners have been working on for some time to make handling of data requests and the use of data more efficient between the partners. Everyone these days expects data to be at their fingertips and the SRMS does need to move in this direction and revised policy is a big step forward. However, we also need to respect the sensitivity of the dataset and the role of the data providers. The partners strongly encourage liaison with data providers especially the SRSG who supply the majority of the data to the Scheme. The final article is by SASA on the development of a forensic DNA database for Hen Harrier which has great potential as a tool to fight wildlife crime, and I'd urge Hen Harrier ringers to get involved.

As ever thanks to all those who have contributed records: to the partner organisations which provide funding, SNH, BTO, FCS, FES, 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, and we wish Amy well on her forthcoming maternity leave.

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

The current Scottish Raptor Monitoring Coordinator, Amy Challis, will be on maternity leave from the middle of March. To cover in her absence, SRMG are pleased to welcome Nina Schönberg. Nina will be hosted at BTO Scotland and can be contacted on srmc@bto.org

1 ROUND-UP OF RAPTOR MONITORING SEASON IN 2018

The Scottish Raptor Monitoring Scheme received 6,284 records of checked raptor home ranges in 2018. This represents a tremendous effort from SRMS contributors to whom we are extremely grateful. This section provides an overview of the breeding season, setting the scene on the weather conditions and prey situation that Scottish raptors experienced in 2018. Here we also provide a summary of the records received from each region of Scotland in 2018, along with some species highlights, and provide links to more detailed breakdowns which can be seen in the appendices at the end of the report and on the SRMS website.

WEATHER

The winter preceding the 2018 breeding season was in general colder and drier than average. The end of February saw the arrival of the “Beast from the East”, when cold easterly winds from Siberia led to widespread heavy snowfalls and sub-zero temperatures. Periods of snowfall continued into March and April. These harsh conditions are likely to have meant that many birds may not have attempted to breed at all, or may have delayed laying. The summer was warmer and drier than average; 1.1°C warmer and with 85% 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. Following vole numbers being high in many areas of Scotland during the 2017 breeding season, vole numbers in many parts of Scotland crashed in 2018 and this was reflected by low occupancy and breeding productivity for a number of raptor and owl species in 2018.



Figure 1: Short-eared Owl breeding success is heavily influenced by vole abundance. (Photo: Rick Taylor, Dumfries & Galloway 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 ranges are occupied or not. In 2018, a total of 6,284 raptor home ranges in Scotland received at least one visit to check for occupancy (Table 1). Figure 2 shows a summary of raptor monitoring coverage in 2018, 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 2018 can be seen in Table 1.

Equally important to checking occupancy are follow-up visits to confirm the findings of the first visit and to monitor the nesting success of birds present. The nesting success, normally expressed as the percentage of monitored

breeding pairs producing fledged young, together with the mean brood size, provides one measure of the health of the population. In 2018, 2,920 potential breeding pairs received further visits, enabling their nest success to be determined.

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, <http://raptormonitoring.org/>.

It is important to recognise that, for the majority of species, not all breeding pairs were monitored, thus the numbers presented do not represent entire populations 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.

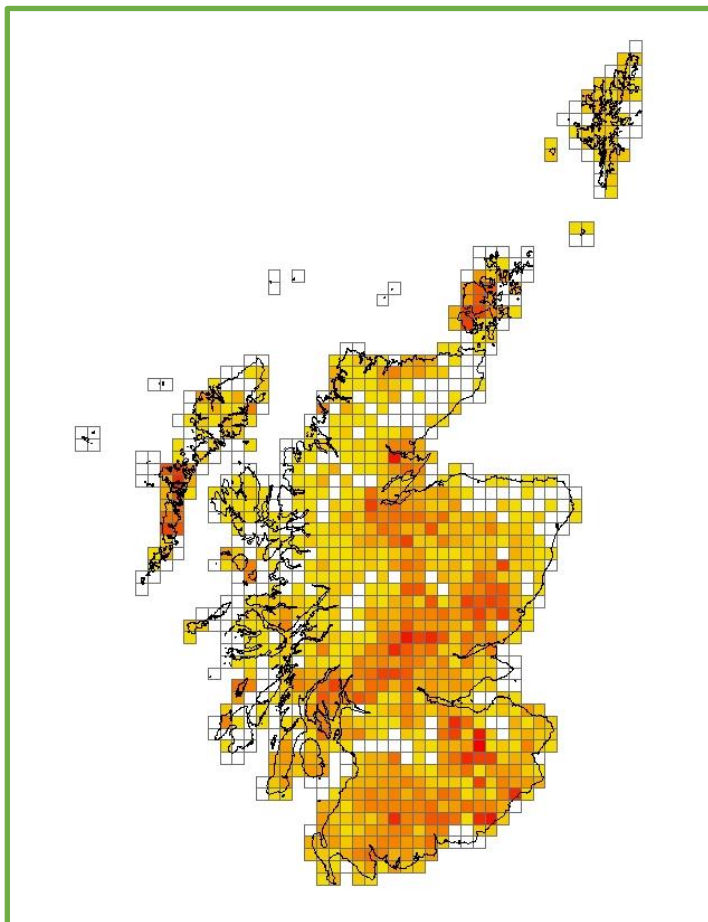


Figure 2: Raptor, owl and Raven monitoring coverage in Scotland in 2018. This map illustrates the number of SRMS species for which occupancy (or absence) was recorded for each 10km square. The redder the square, the more species were covered. The maximum number of species checked for occupancy in a single square in 2018 was 11. White squares indicate no monitoring records for 2018. N.B. This figure masks variation in coverage at finer geographic scales, and work is ongoing to improve our knowledge of coverage.

All SRMS fieldworkers are asked to follow best practice guidance for raptor monitoring set out in Hardey *et al.* (2013). For more information about what raptor monitoring entails please visit:
<http://raptormonitoring.org/raptor-monitoring>

Table 1. The number of home ranges of raptors, owls and Raven checked in 2018 that were submitted to the Scottish Raptor Monitoring Scheme. 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 2018 (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	28	44	18	74	-	15	27	-	-	3	61	-	270	224	Scotland	2016 ³
Honey-buzzard	-	-	0	2	-	-	-	-	-	-	2	-	4	< 10	Scotland	2003-2015 ¹
Golden Eagle	51	7	2	168	33	3	1	-	-	0	33	18	316	508	Scotland	2015 ⁵
Sparrowhawk	23	37	2	11	0	12	0	29	1	10	12	2	139	35,000	UK	2009 ⁴
Goshawk	-	7	38	12	-	44	1	-	-	11	22	-	135	174	Scotland	2016 ³
Marsh Harrier	0	1	-	0	-	0	0	0	-	-	14	-	15	< 10	Scotland	2003-2015 ¹
Hen Harrier	28	6	18	81	5	12	21	230	-	87	68	49	605	460	Scotland	2016 ²
Red Kite	-	48	139	49	-	2	32	-	-	0	91	-	361	≥ 273	Scotland	2015 ¹
White-tailed Eagle	37	-	-	53	22	-	1	1	-	-	3	11	128	104	Scotland	2016 ³
Buzzard	170	31	55	151	3	69	11	18	-	9	301	23	841	57,000–77,000	UK	2009 ⁴
Barn Owl	125	176	247	57	-	81	0	-	-	43	21	-	750	500–1000	Scotland	post 2004 ⁶
Tawny Owl	71	100	62	52	-	56	0	-	-	2	20	-	363	50,000	UK	2015 ⁴
Little Owl	-	-	-	-	-	4	-	-	-	-	-	-	4	<10	Scotland	2015 ¹
Long-eared Owl	6	7	0	19	-	19	1	4	-	0	6	11	73	1,800–6,000	UK	2007-2011 ⁴
Short-eared Owl	5	5	4	4	-	8	2	101	0	4	35	11	179	620–2,180	UK	2007-2011 ⁴
Kestrel	2	41	31	36	0	49	2	46	-	25	75	11	318	2,750–5,500	Scotland	2013 ⁷
Merlin	1	9	11	102	2	37	108	76	89	5	51	8	499	733	Scotland	2008 ⁸
Hobby	-	-	-	1	-	0	-	-	-	-	10	-	11	689	UK	2016 ³
Peregrine	1	28	112	91	2	143	87	29	20	75	98	4	690	523 (479-592)	Scotland	2014 ⁹
Raven	103	53	84	38	9	56	0	1	49	50	108	32	583	7,400	UK & IOM	2009 ⁴
TOTAL:	651	600	823	1001	76	610	294	535	159	324	1031	180	6284			

Sources of estimated population sizes: ¹Challis *et al.* 2016; ²Wotton *et al.* 2018; ³Holling *et al.* 2018; ⁴Musgrove *et al.* 2013; ⁵Hayhow *et al.* 2017; ⁶Shaw 2007; ⁷Wilson *et al.* 2015; ⁸Ewing *et al.* 2011; ⁹Wilson *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 Chapter 2 and <http://raptormonitoring.org/srms-data/data-sharing-use-policy>).

Osprey

In 2018, 183 of 270 home ranges checked were occupied by pairs. A further 14 home ranges were occupied by single birds. Of 172 pairs that were monitored, 156 were confirmed to lay eggs. A total of 125 pairs went on to fledge a minimum of 238 young.

The number of records received in 2018 for the Highland region was significantly lower compared to 2017. This was because data did not reach the SRMS from a large, long-term Osprey study that has contributed data to previous reports.

Honey-buzzard

Only four records for checked home ranges were reported to the SRMS in 2018 – two in Inverness-shire and two in Angus.

Golden Eagle

A total of 281 of 316 home ranges checked in 2018 were occupied by pairs, with a further 18 home ranges in use (either single birds or fresh signs were reported). Of 213 pairs that were monitored, 162 were confirmed to lay eggs. A total of 121 pairs went on to fledge a minimum of 138 young.



Figure 3: Twin Golden Eagle chicks in Easter Ross. (Photo: Jon Brain, Highland RSG).

A total of 33 out of the 213 (15%) monitored pairs failed early or did not breed. In Tayside, early failures were at high crag nest sites where the “Beast from the East” is likely to have had greatest impact (Dan Spinks, pers. comm.).

Sparrowhawk

In 2018, 77 of the 139 home ranges checked were occupied by pairs. Of 67 pairs that were monitored, 64 were confirmed to lay eggs. A total of 57 pairs went on to fledge a minimum of 156 young.

The SRMS is pleased to report its first ever record of breeding Sparrowhawk on Shetland, where a single chick successfully fledged from the first known nesting attempt to have taken place on the isles.



Figure 4: Brood of Sparrowhawk chicks in a nest in the Highlands. (Photo: Jon Clarke, Highland RSG).



Figure 5: Two Goshawk chicks, one male and one female, at a nest in the Tweed Valley. (Photo: Eve Schulte, Lothian & Borders RSG).

Goshawk

In 2018, 92 of 135 home ranges checked were occupied by pairs, with a further 16 home ranges in use (either single birds or fresh signs were reported). Of 79 pairs that were monitored, 78 were confirmed to lay eggs. A total of 71 pairs went on to fledge a minimum of 151 young.

Marsh Harrier

The Tay reed beds continue to be the stronghold for this species in Scotland with nine home ranges occupied by pairs in 2018. Of six pairs that were monitored, five went on to successfully fledge a minimum of 14 young. Away from the Tay reed beds there were a further three pairs located in Angus, two of which were monitored and successfully fledged a minimum of five chicks. The pair that had successfully bred in Clackmannanshire, Central Scotland for the first time in 2017, was absent.

Hen Harrier

In 2018, 277 of 605 home ranges checked were occupied by pairs with a further 70 ranges occupied by single birds. Of 230 pairs that were monitored, 158 were confirmed to lay eggs. A total of 110 pairs went on to fledge a minimum of 296 young. Of all the species the SRMS monitors Hen Harrier tend to have a high proportion of monitored pairs either failing early or non-breeding, in 2018 27% of monitored pairs failing early. On Orkney 58% of monitored pairs failed early or did not breed. A pair of Hen Harrier was recorded for the first time ever attempting to breed on Barra.

Relative to previous years, we received significantly fewer records from Argyll Islands, only 11 home ranges checked as compared with at least 48 home ranges checked in each of the previous five years (64, 54, 48, 101, 54 in 2013-2017 respectively). This follows the sad passing

of a long-standing SRMS data contributor, Paul Haworth, and emphasises the massive contribution that individual raptor workers make across Scotland in terms of providing data about particular raptor populations to the Scheme.

Red Kite

In 2018, 266 of 361 home ranges checked were occupied by pairs. It was good to see a larger sample of Red Kites from the reintroduced Black Isle population receiving full monitoring coverage, with 30 pairs monitored compared to only seven pairs monitored in 2017. Of 205 pairs that were monitored across Scotland as a whole, 199 were confirmed to lay eggs. A total of 165 pairs went on to fledge a minimum of 273 young.



Figure 6: Juvenile Red Kite in Dumfries & Galloway. (Photo: Angus Hogg, Dumfries & Galloway RSG).

White-tailed-Eagle

In 2018, 120 of 128 home ranges checked were occupied by pairs. A total of 70 pairs fledged a minimum of 95 young. After several nesting attempts over recent years, White-tailed Eagles bred successfully on Orkney for the first time since 1873. A single chick fledged from a nest on Hoy.



Figure 7: Two 5-6 week old White-tailed Eagle chicks at a nest on the Isle of Skye. (Photo: Lewis Pate, Highland RSG).

Buzzard

Buzzard is the species for which the SRMS consistently receives the most records of checked home ranges annually. In 2018, 555 of 841 home ranges checked were occupied by pairs, with a further 29 ranges occupied by single birds. Of 409 pairs that were monitored, 386 were confirmed to lay eggs. A total of 378 pairs went on to fledge a minimum of 616 young.

Barn Owl

In 2018, 380 of 750 home ranges checked were occupied by pairs, with a further 65 sites occupied by single birds. Of 310 pairs that were monitored, 286 were confirmed to lay eggs. A total of 248 pairs went on to fledge a minimum of 559 young. Following the very productive season in 2017, productivity in 2018 was poor with only 2.0 young per laying pair compared with 3.4 young in 2017. A long-term study in Ayrshire, which has been running since 2002, reported its worse breeding season ever attributing this to the very cold winter with snow lying for a few days on more than one occasion and a crash in vole numbers early in the season particularly impacting pairs attempting to breed at lowland sites (Gray & Thomson, *pers. comm.*)

Tawny Owl

In 2018, there was a low occupancy rate, only 36% of sites checked were occupied by pairs compared 56% the previous breeding season. Across Scotland, 85% of nesting pairs bred successfully and fledged 170 young, giving an average productivity of 1.8 young per successful pair.



Figure 8: Sleeping Tawny Owl at Langholm. (Photo: Rick Taylor, Dumfries & Galloway RSG).

Little Owl

In 2018, four nest sites were occupied, all in the Borders, two by pairs and two by single birds. The pair that was monitored failed on eggs.

Long-eared Owl

In 2018, 42 breeding pairs were monitored and 41 pairs reared at least 78 young. This is a very under-recorded species in Scotland.

Short-eared Owl

In 2018, 45 of 179 home ranges checked were occupied by pairs with a further 43 home ranges occupied by single birds. Across Scotland average productivity was 2.6 young fledged per successful pair. This nomadic owl species responds to changing prey abundance, moving away from areas where voles are scarce and quickly colonising those where voles are more abundant. A satellite-tag study in Perthshire is revealing just how nomadic this species can be – a female Short-eared Owl left the Perthshire area flying roughly past Aviemore, on to the Elgin area, over the Cromarty Firth to Lairg. She

then moved to the north Coast around the Melvich area then moved south west towards Kinlochewe. Finally she flew over Loch Ness and returned to exactly the same spot she had left nine days earlier in Perthshire where she got down to the important business of breeding (Neil Morrison, pers. comm.).

Kestrel

In 2018, 201 of 318 home ranges checked were occupied by pairs. Of 151 pairs that were monitored, 143 were confirmed to lay eggs. A total of 137 pairs went on to fledge a minimum of 454 young.



Figure 9: Adult female Kestrel in Fife. (Photo: Harry Bell, Tayside RSG).

Merlin

In 2018, 194 of 499 home ranges checked were occupied by pairs. Of 160 pairs that were monitored, 144 were confirmed to lay eggs. A total of 117 pairs went on to fledge a minimum of 327 young.



Figure 10: Merlin chick at a nest in Perthshire. (Photo: Chris Baker, Tayside RSG).

If funding is available, Merlin will be surveyed across the UK as part of the Statutory Conservation Agency and RSPB Annual Breeding Bird Scheme (SCARABBS) in 2020, having been last surveyed in 2008.

Hobby

This is a scarce breeding raptor in Scotland, with small numbers of records tending to reach the SRMS from just two regions. We are pleased to report an increasing number of reports of Hobby in Angus being submitted to the SRMS. In 2018, of 11 home ranges (known to have been used in recent years) checked, four were occupied by pairs and four were occupied by single birds. Any adult in suitable habitat during the June-August period is a possible breeding bird and further searches should be carried out concentrating on old crow nests in the vicinity, particularly during July and early August when young may be present in nests and adults more demonstrative.

Peregrine

In 2018, 315 of 690 home ranges checked were occupied by pairs, with a further 44 home ranges in use (either single birds or where fresh signs were reported). Of 282 pairs that were monitored, 225 were confirmed to lay eggs. A total of 190 pairs went on to fledge a minimum of 398 young. Unfortunately data from Argyll did not reach the SRMS in time for inclusion in this report.



Figure 11: Peregrine chicks at a scrape in Perthshire. (Photo: Chris Baker, Tayside RSG).

The SRMS is pleased to see a greater sample of Peregrine home ranges in the Highlands being checked for occupancy, with 91 sites checked in 2018. The number of pairs monitored in 2018 (29 pairs) is more than the number of pairs monitored in recent years, including during the national Peregrine survey in 2014 when only 22 pairs were monitored.

Raven

In 2018, 433 of 583 home ranges checked were occupied by pairs. Of 336 monitored pairs, 307 were confirmed to lay eggs. A total of 282 pairs went on to fledge a minimum of 766 young.

Scarcer species

When the SRMS receives data on breeding attempts by irregular breeders such as Snowy Owl, Pallid Harrier and Montagu's Harrier we will include them in the annual report. No such records were supplied to the SRMS for the 2018 breeding season.

2 SRMS DATA SHARING & USE POLICY

Over the last four years, the Scottish Raptor Monitoring Group (SRMG) has been implementing developments to make the SRMS more modern and efficient. The Group aims to shift the focus of its work from purely cleaning and curating submitted data to making information products from the Scheme more available for the benefit of raptor conservation and wider society. Some of these recent developments and the challenges the SRMS has faced in achieving them are described in Challis *et al.* (2019). Below we introduce the SRMS's new Data Sharing & Use Policy which governs how SRMS data may (and may not) be shared, accessed and used by different audiences to benefit raptors.

WHY IS A DATA SHARING & USE POLICY NECESSARY?

One of the key developments SRMG has been working towards is facilitating access to SRMS data by conservation professionals, so that it can be mobilised to support raptor conservation much more efficiently than it has been in the past.

While the SRMS endeavours to process requests for data within 20 working days, unfortunately requests can often take considerably longer than this to service. When data requests are received by the SRMS they are considered by SRMG. This also includes a period of consultation with the individual data owners whose data may be pertinent to the request for their consent or otherwise for the SRMS to supply data on their behalf. All nine SRMS partners (together with the individual data providers) need to come to a consensus decision before data can be supplied. The requests that data contributors tend to support are those where it is clear that the scientific use of the data will inform the conservation of raptors.

Many JNCC/SNH/FCS workers are desk-based and need information that can be accessed online and at their fingertips. If data cannot be accessed there is a risk of poor decisions being made, as it may be assumed there are no suitable data available. Irrespective of whether or not SRMS data are made available, decisions on issues affecting raptors need to be, and will be, made. It is therefore better to have

evidence readily available to draw upon so that decisions can be made on the best available evidence.

The SRMS Data Sharing & Use Policy avoids the need to consult data contributors on a case-by-case basis as contributors will have already opted in to their data being shared with particular audiences for agreed uses set out in the Policy. For any audiences and uses not covered in the Policy the SRMS's existing data request procedure still needs to be followed. This includes all commercial uses and any scientific uses which might lead to publication.

The most up to date data available from the SRMS will always be that from the previous breeding season. If data are sought for the current breeding season we encourage data users to liaise directly with the relevant SRSG branch or other bodies that may hold additional information for the current season.

To view the SRMS Data Sharing & Use Policy in full please visit:
<http://raptormonitoring.org/srms-data/data-sharing-use-policy>

DO YOU CURRENTLY CONTRIBUTE DATA TO THE SRMS?

The SRMS would not be able to achieve its core aims of monitoring and reporting on the health of Scottish raptor populations if raptor data were not provided to the SRMS by a vast network of raptor workers across Scotland.

We hope that if you contribute data to the SRMS you will give your consent for the SRMS to use and share your data in the ways specified in our Data Sharing & Use Policy. All SRMS data contributors can give us a clear indication for their support (or otherwise) for their data being shared in the ways specified in the Policy by completing and returning a SRMS Registration Form to the Scottish Raptor Monitoring Coordinator. We really hope that raptor workers across Scotland will feel able to support this Policy, but to help you decide, please read on for a better understanding of who will have access to your data through the Policy and what they may be used for.

DATA PROVIDER?

Please complete and return a SRMS Registration Form to confirm your consent (or otherwise) to the data sharing set out in the Data Sharing & Use Policy. Registration forms can be downloaded here :

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

Either complete electronically and email to srmc@bto.org or print off and post to Scottish Raptor Monitoring Coordinator, BTO Scotland, Beta Centre (Unit 15), Stirling University Innovation Park, Stirling, FK9 4NF

WHO WILL HAVE ACCESS TO MY DATA?

There are many way in which SRMS data may be used to benefit raptors, at a local, regional, national and even international level. Below are the audiences that can gain routine access to your data though the Policy.

The public

The public will be able to access your data at 10 x 10 km resolution (or less for more sensitive species) via the Atlas for Living Scotland (<https://scotland.nbnatlas.org/>). These are distribution data only, i.e. presence in each grid square and not numbers or productivity data.

These viewing resolutions are compatible with those at which raptor data is typically presented in published Bird Atlases. Members of the public wishing to access more detailed data would have to proceed through our standard data request process.

The SRMS and SRMG

Section 8.1 of the Policy

(<http://raptormonitoring.org/srms-data/data-sharing-use-policy/8-1-use-of-srms-data-by-the-srms-and-srmg>) describes how your data will be used by the SRMS for core scheme work agreed in the SRMS work plan

(<http://raptormonitoring.org/about-the-srms/work-programme>). Routine uses include reporting on trends in breeding numbers and productivity at a range of geographic scales and analysing and reporting on patterns of breeding success and causes of breeding failure.

Conservation professionals within SRMS partner organisations

Section 8.2 of the Policy

(<http://raptormonitoring.org/srms-data/data-sharing-use-policy/8-how-srms-data-are-used/8-2-use-of-srms-data-by-srms-partners>) describes how your detailed data may be used by SRMS partners for a specified list of agreed purposes and how these data will be accessed and managed (see Table 2). It is really important for a whole range of conservation uses to be able to work at capture scale resolution, i.e. to have records with detailed grid references (100 m resolution or better). In an ideal world, any such individual piece of work might be done working closely with the individual raptor worker(s) who collected the data but given the need to carry out work at very short notice and in a cost-effective way this is not always possible. Our Policy promotes local liaison where this is possible to encourage data users to liaise with data providers to be able to benefit from local knowledge and to advise on interpretation of local and regional raptor data. Conservation professionals wishing to use SRMS data for uses not specified in the Policy would have to proceed through our standard data request process.

The National Wildlife Crime Unit

The SRMS and its partner organisations are committed to supporting activities directed at combatting wildlife crime, which in the context of raptors may involve illegal killing, destruction of eggs or nests, and other forms of illegal disturbance. Section 8.3 of the Policy ([http://raptormonitoring.org/srms-data/data-](http://raptormonitoring.org/srms-data/data-sharing-use-policy/8-how-srms-data-are-used/8-3-use-of-srms-data-by-the-national-wildlife-crime-unit)

[sharing-use-policy/8-how-srms-data-are-used/8-3-use-of-srms-data-by-the-national-wildlife-crime-unit](http://raptormonitoring.org/srms-data/data-sharing-use-policy/8-how-srms-data-are-used/8-3-use-of-srms-data-by-the-national-wildlife-crime-unit)) describes how your data may be used by the National Wildlife Crime Unit to inform their operations and target efforts to tackle wildlife crime appropriately. **Table 2.** demonstrates the purposes for which SRMS data can be used by SRMS partner organisations.

Table 2. The routine purposes for which SRMS data can be used by SRMS partner organisations.

SRMS partner	Agreed purposes for which SRMS data can be used by each partner
BTO	<ul style="list-style-type: none"> To contribute to the Nest Record Scheme to enhance the production of UK-wide trends in the breeding performance of raptors which are published in the <i>BirdTrends</i> report. To plan national surveys for raptors (e.g. as part of the SCARABBS programme).
FCS	<ul style="list-style-type: none"> To protect raptors from disturbance by forest management activities such as tree felling and track construction, and from other activities such as formal and informal recreation. To screen the potential impact of planting proposals before they are submitted to FCS for approval for grant support. To determine the requirement for an EIA assessment associated with a forest operation. To monitor trends in raptor success associated with forest operations approved and grant aided under SRDP.
FES	<ul style="list-style-type: none"> To protect raptors from disturbance by forest management activities such as tree felling and track construction, and from other activities such as formal and informal recreation.
JNCC	<ul style="list-style-type: none"> UK-scale national reporting. Assessment of species status within statutorily designated sites of international importance (on behalf of SNH).
RBBP	<ul style="list-style-type: none"> To maintain the UK's definitive archive of rare breeding bird data. In the context of breeding raptors, data will be provided for those raptor species which feature on RBBPs species list, currently Honey-buzzard, White-tailed Eagle, Marsh Harrier, Hen Harrier, Goshawk, Golden Eagle, Osprey, Merlin, Hobby, Peregrine.
RSPB	<ul style="list-style-type: none"> To inform responses to development control casework. To plan regional and national surveys for raptors (e.g. as part of the SCARABBS programme). To update sensitivity maps for developments (e.g. onshore windfarms). To inform Investigations Team work to help prevent wildlife crime. Data will at times be required to form part of intelligence packages provided to the police or National Wildlife Crime Unit.
SNH	<ul style="list-style-type: none"> SRMS data may be used by SNH (or those working directly on their behalf) for the purposes of fulfilling its statutory nature conservation functions with respect to raptors including: <ul style="list-style-type: none"> To establish protected areas. To contribute to SNH Site Condition Monitoring. To identify areas where targeted conservation action should be directed by SNH for species conservation (e.g. informing management decisions and management planning on designated sites). To inform responses to development control casework. To update sensitivity maps for developments (e.g. onshore windfarms). To plan national surveys for raptors (e.g. as part of the SCARABBS programme). To understand the causes of population change and limitation in raptors. To support the development and implementation of policy and action for raptors. For national reporting on Annex 1 species (e.g. as required under Article 12 of the EU Birds Directive and the Convention on Migratory Species' Memorandum of Understanding on the conservation of migratory raptors). For reporting on monitoring activity (that may disturb birds listed on Schedule 1 of the Wildlife & Countryside Act) undertaken under license.
SOC	<ul style="list-style-type: none"> To plan surveys of raptors locally or nationally (in liaison with other partners). For the purposes of compiling a national Scottish Bird Report. For the purposes of supplying summaries for inclusion in local bird reports.
SRSG	<ul style="list-style-type: none"> To further its knowledge of status, distribution and breeding success of raptors in Scotland. To organise monitoring coverage. <p>SRSG is also encouraged to use its own data that has been processed by the SRMS (see section 6) to satisfy any commercial requests for data. However, SRSG may not sell any SRMS data originating from a non-SRSG source to a third party or use it within work for which there is a commercial gain or for research publications without approval of the data owner.</p>

3 THE VALUE OF SRMS DATA

The Scottish Raptor Monitoring Scheme aims to get the raptor data that we hold to those conservation bodies that can best use it to benefit raptor conservation, whether they are a statutory agency or non-governmental organisation. In 2018, with SRMS data contributors' permission, SRMS data were supplied to SRMS partners and other organisations for a number of purposes. Below we revisit a conservation purpose for which SRMS data were supplied to JNCC back in 2015 - read on to find out the important role that SRMS data has played in highlighting insufficiencies in the UK network of Special Protection Areas.

Developing the UK network of Special Protection Areas

David Stroud (JNCC)

The 2015 SRMS annual report summarised the major use of raptor data in reviewing the UK SPA Network. This third SPA Review (Stroud *et al.* 2016) was submitted to Ministers in October 2016 and is published on JNCC's website (<http://jncc.defra.gov.uk/page-7309>).

As well as auditing numbers within each SPA (as outlined in the 2015 summary for SRMS) another key purpose of the Review was to assess, for each relevant species, the 'sufficiency' of the suite of SPAs selected in order to fulfil the objectives of the EU Birds Directive. Such sufficiency assessments were undertaken using an objective, evidence-based framework as documented in the Review.

The assessment outcomes identify three forms of potential insufficiency in SPA provision. These are:

- **population numbers** – where it is considered that there is too small a proportion of the species' population within the SPA suite;
- **range coverage** – irrespective of population coverage within SPAs, where significant parts of the distributional range of the species are not covered by the SPA suite – thus limiting the scope of the suite to

conserve species "*in their area of distribution*"; and

- **ecological provision** – irrespective of population and range coverage, ecological provision is judged as insufficient where it is known that the boundaries of existing SPAs currently exclude areas important for key ecological needs (for example farmland areas used for feeding adjacent to the breeding areas of upland waders).

For raptors, the third SPA Review found that existing SPA provision was insufficient for nine species/seasons in Scotland: Red Kite (breeding and non-breeding); White-tailed Eagle; Hen Harrier (breeding and non-breeding); Osprey; Merlin (breeding and non-breeding) and Peregrine. For White-tailed Eagle there are no SPAs classified, and for other species, the nature of the insufficiencies is documented in the review and summarised below (Table 3).

In Phase 2 of the Review, the situation for each of these species has been assessed and options presented to governments within the UK in November 2017 as to how the relevant insufficiencies could be addressed. In Scotland, these outcomes are currently being considered by the Scottish Government and Scottish Natural Heritage.

Table 3. The sufficiency of the existing suite of SPAs to support raptors in Scotland to fulfil the objectives of the EU Birds Directive as determined by the third SPA Review.

Species	Season	Numerical sufficiency	Range sufficiency	Ecological sufficiency
Red Kite	Breeding	Insufficient	Insufficient	Sufficient
Red Kite	Non-breeding	Insufficient	Insufficient	Insufficient
White-tailed Eagle		Insufficient	Insufficient	Insufficient
Hen Harrier	Breeding	Insufficient	Insufficient	Insufficient
Hen Harrier	Non-breeding	Insufficient	Insufficient	Sufficient
Golden Eagle		Sufficient	Sufficient	Sufficient
Osprey		Insufficient	Insufficient	Insufficient
Merlin	Breeding	Insufficient	Insufficient	Insufficient
Merlin	Non-breeding	Insufficient	Insufficient	Insufficient
Peregrine	Breeding	Insufficient	Insufficient	Sufficient

4 GUEST ARTICLE

This section features a guest article from Sherryn Ciavaglia from SASA providing an update on work being undertaken to develop a forensic database for Hen Harriers. If you are a Hen Harrier ringer then this is an opportunity for you to assist in collecting DNA samples.

Hen Harrier Forensic Database Update – Volunteers Required

Sherryn Ciavaglia (Wildlife DNA Forensics Unit, SASA)

The July 2018 issue of the Scottish Raptor Monitoring Scheme Newsletter, *Scottish Raptor*, introduced an SNH funded project to set up a forensic DNA database for Hen Harriers. This ongoing project is aimed principally at strengthening the evidence available for future wildlife crime investigations.



Figure 12: Hen Harrier. (Photo: Steve Campbell, SASA).

The purpose of this article is to provide an update on the status of the project and invite volunteers to collect DNA samples from Hen Harrier chicks.

A forensic DNA test used to identify individual Hen Harriers (equivalent to a human forensic DNA test) has been published in the prominent forensic science journal *Forensic Science International: Genetics* [1]. Sarah Underwood, a laboratory technician funded by the University of Edinburgh, is currently validating this technique. This will lay the groundwork for staff at SASA's Wildlife DNA Forensic (WDF) unit to apply the DNA test in criminal casework. It can then be used to start building up a database with the DNA profiles of known Hen Harrier

individuals. This will be compiled from samples taken from as many Hen Harriers as possible, from across the Scottish range of this species. Such a database will be invaluable in wildlife crime casework, as it can be used to calculate the strength of probabilities when DNA profiles match. As the buccal swabs will be collected with complete traceability, it may be possible to link a missing Hen Harrier to items seized from a suspect for criminal prosecution using the reference profile of that bird on the DNA database, even if no carcass is located. It is also hoped that publicity surrounding the database will have a deterrent effect on would-be wildlife criminals.



Figure 13: The collection of DNA evidence from an item seized in a wildlife crime investigation. (Photo: SASA).

As part of this project the WDF unit previously appealed to readers of the *Scottish Raptor* newsletter to collect shed feather samples from around nests. This year we are making preparations to submit an application to the BTO for permission to carry out DNA collection by buccal swab. This involves sampling DNA from the bird's gape, allowing samples to be

attributed with confidence to individual birds. We are hoping that Hen Harrier ringers (either with prior experience in buccal swabbing birds, or willing to learn how to take buccal DNA samples), will help collect these samples. However, because employing this technique requires an extension to a ringer's licence, we need to apply to the BTO for permission to use this method. Details of ALL ringers who are permitted to take buccal DNA samples for our project must be specified in the application form. We need to gather the details of volunteers as soon as possible, in order to process this application in time for sample collection during the 2019 field season.

The BTO also provides guidance on how to sample bird DNA using buccal swabs, which they have forwarded to us. Please contact us if you would like to find out more. The WDF unit will supply all sampling materials and instructions for maintaining sample traceability. To read about the buccal swab type ('Mini Swab') being used for this project, please visit: <https://isohelix.com/products/isohelix-dna-buccal-swabs/>.

If you are willing to help by collecting buccal samples from Hen Harriers, or would like to learn more about this project, please contact Sherryn Ciavaglia on 0131 244 8941 or at wildlifeforensics@sasa.gov.scot.

[1] Van Hoppe, M.J.C., Dy, M.A.V., Van Den Einden, M., Iyengar, A (2016) SkydancerPlex: A novel STR multiplex validated for forensic use in the hen harrier (*Circus cyaneus*), Forensic Science International: Genetics, 22:100-109.

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Breeding success of raptors in Scotland in 2018

N.B. Data in the following tables present the data submitted to the SRMS in 2018. 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 (mostly in regions where there were few monitored broods), 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 "0" (rather than as "-") or, for young fledged per successful pair, "0 (n=0)".

Raptor, owl and Raven nest site and home range data submitted under the Scottish Raptor Monitoring Scheme in 2018.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
Osprey	28	44	18	74	-	15	27	-	-	3	61	-	270
Honey-buzzard	-	-	0	2	-	-	-	-	-	-	2	-	4
Golden Eagle	51	7	2	168	33	3	1	-	-	0	33	18	316
Sparrowhawk	23	37	2	11	0	12	0	29	1	10	12	2	139
Goshawk	-	7	38	12	-	44	1	-	-	11	22	-	135
Marsh Harrier	0	1	-	0	-	0	0	0	-	-	14	-	15
Hen Harrier	28	6	18	81	5	12	21	230	-	87	68	49	605
Red Kite	-	48	139	49	-	2	32	-	-	0	91	-	361
White-tailed Eagle	37	-	-	53	22	-	1	1	-	-	3	11	128
Buzzard	170	31	55	151	3	69	11	18	-	9	301	23	841
Barn Owl	125	176	247	57	-	81	0	-	-	43	21	-	750
Tawny Owl	71	100	62	52	-	56	0	-	-	2	20	-	363
Little Owl	-	-	-	-	-	4	-	-	-	-	-	-	4
Long-eared Owl	6	7	0	19	-	19	1	4	-	0	6	11	73
Short-eared Owl	5	5	4	4	-	8	2	101	0	4	35	11	179
Kestrel	2	41	31	36	0	49	2	46	-	25	75	11	318
Merlin	1	9	11	102	2	37	108	76	89	5	51	8	499
Hobby	-	-	-	1	-	0	-	-	-	-	10	-	11
Peregrine	1	28	112	91	2	143	87	29	20	75	98	4	690
Raven	103	53	84	38	9	56	0	1	49	50	108	32	583
TOTAL:	651	600	823	1001	76	610	294	535	159	324	1031	180	6284

Raptor, Owl and Raven breeding attempts monitored under the Scottish Raptor Monitoring Scheme in 2018.

Species	Argyll	Central Scotland	Dumfries & Galloway	Highland	Lewis & Harris	Lothian & Borders	North-east Scotland	Orkney	Shetland	South Strathclyde	Tayside	Uist	TOTAL
Osprey	15	31	14	54	-	6	18	-	-	2	32	-	172
Honey-buzzard	-	-	0	1	-	-	-	-	-	-	0	-	1
Golden Eagle	46	4	2	95	27	0	1	-	-	0	25	13	213
Sparrowhawk	7	16	1	11	0	9	0	12	1	4	4	2	67
Goshawk	-	3	20	11	-	28	0	-	-	3	14	-	79
Marsh Harrier	0	0	-	0	-	0	0	0	-	-	8	-	8
Hen Harrier	6	1	11	30	5	6	7	89	-	35	24	16	230
Red Kite	-	22	92	30	-	1	15	-	-	0	45	-	205
White-tailed Eagle	32	-	-	47	20	-	0	1	-	-	1	8	109
Buzzard	46	10	26	85	2	56	5	12	-	4	150	13	409
Barn Owl	23	69	109	44	-	41	0	-	-	15	9	-	310
Tawny Owl	9	31	18	28	-	17	0	-	-	0	6	-	109
Little Owl	-	-	-	-	-	1	-	-	-	-	-	-	1
Long-eared Owl	0	4	0	16	-	15	1	0	-	0	3	3	42
Short-eared Owl	0	0	4	2	-	4	1	7	0	0	11	4	33
Kestrel	2	21	8	23	0	33	2	8	-	10	38	6	151
Merlin	1	2	6	32	0	7	43	11	36	1	18	3	160
Hobby	-	-	-	0	-	0	-	-	-	-	3	-	3
Peregrine	1	17	58	29	1	53	35	12	0	38	37	1	282
Raven	52	39	40	30	6	37	0	1	19	36	59	17	336
TOTAL:	239	270	409	568	61	314	129	153	56	148	487	86	2920

Breeding success of Osprey in Scotland in 2018 (continued)

Region	Breeding sites checked	Breeding sites occupied by pairs	Breeding sites occupied by single birds	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Tayside	61	33	5	32	0	29	28	26	43	1.6 (n=24)	1.4	1.3
- Angus	13	10	1	9	0	8	7	7	12	1.6 (n=6)	1.4	1.2
- Fife	1	0	0	0	0	0	0	0	0	-	-	-
- Perth & Kinross	47	23	4	23	0	21	21	19	31	1.6 (n=18)	1.4	1.3
TOTAL:	270	183	14	172	7	156	131	125	238	1.9 (n=121)	1.5	1.4

Breeding success of Honey-buzzard in Scotland in 2018

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
Highland	2	1	1	1	0	1	1	1	1
- Inverness-shire	2	1	1	1	0	1	1	1	1
Tayside	2	0	0	0	0	0	0	0	0
- Angus	2	0	0	0	0	0	0	0	0
TOTAL:	4	1	1	1	0	1	1	1	1

Breeding success of Golden Eagle in Scotland in 2018

[illegible]

Breeding success of Golden Eagle in Scotland in 2018 (continued)

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)
North-east	1	1	0	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- East Moray	1	1	0	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
South West Scotland	2	2	0	0	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
Tayside	33	25	3	2	25	6	14	13	10	14	1.3 (n=9)	0.9	0.5
- Angus	9	6	0	0	6	0	3	3	3	5	1.7 (n=3)	1.7	0.8
- Perth & Kinross	24	19	3	2	19	6	11	10	7	9	1.1 (n=6)	0.7	0.4
Uist	18	18	0	0	13	2	9	8	7	8	1.1 (n=7)	0.9	0.6
- Barra	1	1	0	0	0	0	0	0	0	0	-	-	-
- Benbecula	2	2	0	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- North Uist	6	6	0	0	4	0	4	4	4	4	1.0 (n=4)	1.0	1.0
- South Uist	9	9	0	0	8	2	4	3	2	2	1.0 (n=2)	0.5	0.2
TOTAL:	316	281	18	15	213	33	162	134	121	138	1.1 (n=116)	0.9	0.7

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 2018

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	11	7	0	7	7	7	20	2.7 (n=6)	2.7	2.7
- Argyll Islands	5	3	1	0	1	1	1	1	0.0 (n=0)	0.0	0.0
- Argyll Mainland	14	7	5	0	5	5	5	18	3.6 (n=5)	3.6	3.6
- Bute	4	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Central	37	17	16	0	16	16	16	53	3.3 (n=16)	3.3	3.3
- Dunbartonshire	1	0	0	0	0	0	0	0	-	-	-
- North Lanarkshire	19	11	11	0	11	11	11	38	3.5 (n=11)	3.5	3.5
- Stirling	17	6	5	0	5	5	5	15	3.0 (n=5)	3.0	3.0
Dumfries & Galloway	2	2	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Highland	11	11	11	0	11	11	11	31	2.8 (n=11)	2.8	2.8
- Inverness-shire	3	3	3	0	3	3	3	10	3.3 (n=3)	3.3	3.3
- Ross-shire	4	4	4	0	4	4	4	11	2.8 (n=4)	2.8	2.8
- Small Isles	1	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- West Moray	3	3	3	0	3	3	3	7	2.3 (n=3)	2.3	2.3
Lothian & Borders	12	9	9	0	9	9	9	29	3.2 (n=9)	3.2	3.2
- Lothian	8	7	7	0	7	7	7	23	3.3 (n=7)	3.3	3.3
- Scottish Borders	4	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
Orkney	29	12	12	3	9	8	4	8	2.0 (n=4)	0.9	0.7
Shetland	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
South Strathclyde	10	5	4	0	4	4	4	6	1.2 (n=3)	1.2	1.2
- Arran & Cumbrae	9	4	4	0	4	4	4	6	1.2 (n=3)	1.2	1.2
- Ayrshire	1	1	0	0	0	0	0	0	-	-	-
Tayside	12	7	4	0	4	4	3	4	1.0 (n=2)	0.8	0.8
- Angus	9	5	2	0	2	2	1	2	2.0 (n=1)	1.0	1.0
- Fife	2	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Perth & Kinross	1	1	1	0	1	1	1	1	0.0 (n=0)	0.0	0.0
Uist	2	2	2	0	2	1	1	2	2.0 (n=1)	1.0	1.0
- Barra	1	1	1	0	1	0	0	0	-	-	-
- South Uist	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0

Breeding success of Sparrowhawk in Scotland in 2018 (continued)

Region	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
TOTAL:	139	77	67	3	64	62	57	156	2.8 (n=54)	2.5	2.4

Breeding success of Goshawk in Scotland in 2018

[illegible]

Breeding success of Goshawk in Scotland in 2018 (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)
Tayside	22	14	6	14	0	14	14	14	30	2.1 (n=13)	2.1	2.1
- Angus	2	2	0	2	0	2	2	2	3	1.0 (n=1)	1.0	1.0
- Fife	2	0	1	0	0	0	0	0	0	-	-	-
- Perth & Kinross	18	12	5	12	0	12	12	12	27	2.2 (n=12)	2.2	2.2
TOTAL:	135	92	16	79	1	78	73	71	151	2.1 (n=70)	2.0	1.9

Breeding success of Marsh Harrier in Scotland in 2018

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	0	0	0	0	0	0	0	0	-	-	-
- Clackmannanshire	1	0	0	0	0	0	0	0	0	-	-	-
Tayside	14	12	0	8	0	8	8	7	19	2.7 (n=7)	2.4	2.4
- Angus	3	3	0	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Fife	2	0	0	0	0	0	0	0	0	-	-	-
- Perth & Kinross	9	9	0	6	0	6	6	5	14	2.8 (n=5)	2.3	2.3
TOTAL:	15	12	0	8	0	8	8	7	19	2.7 (n=7)	2.4	2.4

Breeding success of Hen Harrier in Scotland in 2018

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	28	13	5	6	0	6	5	5	7	1.4 (n=5)	1.2	1.2
- Argyll Islands	11	6	0	2	0	2	2	2	2	1.0 (n=2)	1.0	1.0
- Argyll Mainland	16	7	5	4	0	4	3	3	5	1.7 (n=3)	1.2	1.2
- Bute	1	0	0	0	0	0	0	0	0	-	-	-
Central	6	4	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Arrochar & Helensburgh	5	4	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Clackmannanshire	1	0	0	0	0	0	0	0	0	-	-	-
Dumfries & Galloway	18	12	2	11	2	7	6	4	14	3.5 (n=4)	2.0	1.3
Highland	81	42	6	30	0	30	28	22	69	3.1 (n=22)	2.3	2.3
- Badenoch & Strathspey	16	9	1	3	0	3	3	2	8	4.0 (n=2)	2.7	2.7
- Inverness-shire	15	5	0	4	0	4	3	3	9	3.0 (n=3)	2.2	2.2
- Isle of Skye	11	9	2	9	0	9	9	7	17	2.4 (n=7)	1.9	1.9
- Lochaber	5	3	1	0	0	0	0	0	0	-	-	-
- Nairn	4	3	0	3	0	3	3	2	5	2.5 (n=2)	1.7	1.7
- Ross-shire	4	3	0	3	0	3	3	1	4	4.0 (n=1)	1.3	1.3
- Small Isles	3	2	0	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Sutherland	10	6	2	4	0	4	4	4	16	4.0 (n=4)	4.0	4.0
- West Moray	13	2	0	2	0	2	1	1	4	4.0 (n=1)	2.0	2.0
Lewis & Harris	5	5	0	5	0	5	3	3	9	3.0 (n=3)	1.8	1.8
- Lewis	5	5	0	5	0	5	3	3	9	3.0 (n=3)	1.8	1.8
Lothian & Borders	12	6	1	6	3	3	3	3	11	3.7 (n=3)	3.7	1.8
- Scottish Borders	12	6	1	6	3	3	3	3	11	3.7 (n=3)	3.7	1.8
Northeast Scotland	21	10	1	7	0	7	7	7	23	3.3 (n=7)	3.3	3.3
- Aberdeenshire	6	1	0	0	0	0	0	0	0	-	-	-
- East Moray	15	9	1	7	0	7	7	7	23	3.3 (n=7)	3.3	3.3

Breeding success of Hen Harrier in Scotland in 2018 (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)
Orkney	230	89	27	89	52	37	29	18	32	1.8 (n=18)	0.9	0.4
South Strathclyde	87	38	10	35	2	25	23	23	63	2.7 (n=23)	2.5	1.8
- Arran & Cumbrae	35	27	4	27	0	19	19	19	52	2.7 (n=19)	2.7	1.9
- Ayrshire	18	2	2	2	0	2	1	1	3	3.0 (n=1)	1.5	1.5
- Inverclyde	12	0	0	0	0	0	0	0	0	-	-	-
- Renfrewshire	8	0	2	0	0	0	0	0	0	-	-	-
- South Lanarkshire	14	9	2	6	2	4	3	3	8	2.7 (n=3)	2.0	1.3
Tayside	68	29	9	24	2	21	15	9	31	3.4 (n=9)	1.5	1.3
- Angus	9	3	2	0	0	0	0	0	0	-	-	-
- Perth & Kinross	59	26	7	24	2	21	15	9	31	3.4 (n=9)	1.5	1.3
Uist	49	29	9	16	0	16	15	15	34	2.4 (n=14)	2.2	2.2
- Barra	1	1	0	0	0	0	0	0	0	-	-	-
- Benbecula	6	2	3	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- North Uist	15	9	5	5	0	5	5	5	13	2.6 (n=5)	2.6	2.6
- South Uist	27	17	1	10	0	10	9	9	20	2.1 (n=8)	1.9	1.9
TOTAL:	605	277	70	230	61	158	135	110	296	2.7 (n=109)	1.9	1.3

Breeding success of Red Kite in Scotland in 2018

Reintroduced populations	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
Central Scotland	48	30	22	1	21	16	13	20	1.4 (n=11)	0.9	0.8
- Stirling	48	30	22	1	21	16	13	20	1.4 (n=11)	0.9	0.8
Dumfries & Galloway	139	123	92	1	91	81	75	101	1.3 (n=75)	1.1	1.1
Highland	49	37	30	0	29	25	24	47	2.0 (n=24)	1.6	1.6
- Inverness-shire	11	8	4	0	4	4	4	7	1.8 (n=4)	1.8	1.8
- Ross-shire	34	25	22	0	21	17	16	33	2.1 (n=16)	1.6	1.5
- Sutherland	4	4	4	0	4	4	4	7	1.8 (n=4)	1.8	1.8
Lothian & Borders	2	2	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Scottish Borders	2	2	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
North-east Scotland	32	24	15	1	14	12	11	26	2.4 (n=11)	1.9	1.7
- Aberdeenshire	32	24	15	1	14	12	11	26	2.4 (n=11)	1.9	1.7
Tayside	91	50	45	1	43	42	41	76	1.8 (n=39)	1.7	1.6
- Angus	15	12	12	1	10	9	9	18	2.0 (n=9)	1.8	1.5
- Perth & Kinross	76	38	33	0	33	33	32	58	1.8 (n=30)	1.7	1.7
TOTAL:	361	266	205	4	199	177	165	273	1.7 (n=161)	1.4	1.3

Breeding success of White-tailed Eagle in Scotland in 2018

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	37	34	32	21	18	17	19	1.1 (n=17)	0.9	0.6
- Argyll Islands	28	28	28	19	17	16	18	1.1 (n=16)	0.9	0.6
- Argyll Mainland	9	6	4	2	1	1	1	1.0 (n=1)	0.5	0.2
Highland	53	52	47	40	35	32	47	1.4 (n=31)	1.1	1.0
- Badenoch & Strathspey	1	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
- Inverness-shire	1	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
- Isle of Skye	24	24	20	16	13	12	17	1.4 (n=12)	1.1	0.8
- Lochaber	10	10	10	9	7	5	5	0.8 (n=4)	0.4	0.4
- Ross-shire	9	9	9	8	8	8	14	1.8 (n=8)	1.8	1.6
- Small Isles	5	4	3	2	2	2	2	1.0 (n=2)	1.0	0.7
- Sutherland	3	3	3	3	3	3	5	1.7 (n=3)	1.7	1.7
Lewis & Harris	22	21	20	17	14	12	15	1.2 (n=12)	0.9	0.8
- Harris	4	4	4	4	3	2	2	1.0 (n=2)	0.5	0.5
- Lewis	18	17	16	13	11	10	13	1.3 (n=10)	1.0	0.8
North-east Scotland	1	0	0	0	0	0	0	-	-	-
- Aberdeenshire	1	0	0	0	0	0	0	-	-	-
Orkney	1	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
Tayside	3	1	1	1	0	0	0	-	-	-
- Angus	1	1	1	1	0	0	0	-	-	-
- Fife	1	0	0	0	0	0	0	-	-	-
- Perth & Kinross	1	0	0	0	0	0	0	-	-	-
Uist	11	11	8	8	8	8	12	1.5 (n=8)	1.5	1.5
- Benbecula	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
- North Uist	7	7	4	4	4	4	6	1.5 (n=4)	1.5	1.5
- South Uist	3	3	3	3	3	3	5	1.7 (n=3)	1.7	1.7

Breeding success of White-tailed Eagle in Scotland in 2018 (continued)

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)
TOTAL:	128	120	109	88	76	70	95	1.4 (n=69)	1.1	0.9

Breeding success of Buzzard in Scotland in 2018

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	170	65	12	46	0	44	43	42	66	1.6 (n=42)	1.5	1.4
- Argyll Islands	90	30	5	12	0	10	9	9	16	1.8 (n=9)	1.6	1.3
- Argyll Mainland	17	13	0	13	0	13	13	13	16	1.2 (n=13)	1.2	1.2
- Bute	63	22	7	21	0	21	21	20	34	1.7 (n=20)	1.6	1.6
Central	31	18	2	10	2	7	7	7	10	1.3 (n=6)	1.3	0.9
- Clackmannanshire	3	3	0	3	2	0	0	0	0	-	-	-
- Dunbartonshire	3	2	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Glasgow	1	0	1	0	0	0	0	0	0	-	-	-
- Stirling	24	13	0	6	0	6	6	6	9	1.3 (n=5)	1.3	1.3
Dumfries & Galloway	55	35	4	26	0	26	26	25	33	1.3 (n=24)	1.2	1.2
Highland	151	115	3	85	0	85	85	83	149	1.8 (n=83)	1.8	1.8
- Badenoch & Strathspey	17	13	2	13	0	13	13	13	26	2.0 (n=13)	2.0	2.0
- Caithness	0	0	0	0	0	0	0	0	0	-	-	-
- Inverness-shire	24	22	1	13	0	13	13	13	24	1.8 (n=13)	1.8	1.8
- Isle of Skye	2	2	0	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- Lochaber	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Ross-shire	92	63	0	44	0	44	44	42	70	1.7 (n=42)	1.6	1.6
- Small Isles	5	5	0	5	0	5	5	5	10	2.0 (n=5)	2.0	2.0
- Sutherland	9	8	0	7	0	7	7	7	14	2.0 (n=7)	2.0	2.0

Breeding success of Buzzard in Scotland in 2018 (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)
- West Morry	1	1	0	0	0	0	0	0	0	-	-	-
Lewis & Harris	3	2	1	2	0	2	2	2	3	1.5 (n=2)	1.5	1.5
- Harris	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Lewis	2	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Lothian & Borders	69	61	0	56	2	54	53	52	111	2.1 (n=51)	2.0	2.0
- Lothian	37	35	0	34	0	34	34	33	76	2.3 (n=33)	2.2	2.2
- Scottish Borders	32	26	0	22	2	20	19	19	35	1.8 (n=18)	1.7	1.5
North-east	11	7	1	5	0	5	5	5	9	1.8 (n=5)	1.8	1.8
- Aberdeenshire	11	7	1	5	0	5	5	5	9	1.8 (n=5)	1.8	1.8
Orkney	18	12	0	12	8	4	4	4	8	2.0 (n=4)	2.0	0.7
South Strathclyde	9	4	0	4	0	4	4	4	5	1.2 (n=4)	1.2	1.2
- Arran & Cumbrae	6	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Ayrshire	3	3	0	3	0	3	3	3	4	1.3 (n=3)	1.3	1.3
Tayside	301	218	5	150	0	143	143	142	201	1.4 (n=142)	1.4	1.3
- Angus	164	144	2	96	0	94	94	94	132	1.4 (n=94)	1.4	1.4
- Fife	33	22	2	17	0	17	17	16	24	1.5 (n=16)	1.4	1.4
- Perth & Kinross	104	52	1	37	0	32	32	32	45	1.4 (n=32)	1.4	1.2
Uist	23	18	1	13	1	12	12	12	21	1.8 (n=12)	1.8	1.6
- Barra	3	3	0	3	0	3	3	3	4	1.3 (n=3)	1.3	1.3
- Benbecula	2	2	0	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- North Uist	11	7	1	3	0	3	3	3	8	2.7 (n=3)	2.7	2.7
- South Uist	7	6	0	5	1	4	4	4	4	1.0 (n=4)	1.0	0.8
TOTAL:	841	555	29	409	13	386	384	378	616	1.6 (n=375)	1.6	1.5

Breeding success of Barn Owl in Scotland in 2018

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	125	40	19	23	0	21	21	18	33	1.8 (n=18)	1.6	1.4
- Argyll Islands	15	9	0	5	0	4	4	2	2	1.0 (n=2)	0.5	0.4
- Argyll Mainland	106	30	19	17	0	16	16	15	28	1.9 (n=15)	1.8	1.6
- Bute	4	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
Central	176	89	2	69	1	66	63	58	122	2.1 (n=57)	1.8	1.8
- Arrochar & Helensburgh	6	4	0	4	0	4	3	3	5	1.7 (n=3)	1.2	1.2
- Clackmannanshire	9	9	0	9	0	9	9	9	20	2.2 (n=9)	2.2	2.2
- Dunbartonshire	10	6	1	3	0	3	3	3	6	2.0 (n=3)	2.0	2.0
- Falkirk	16	13	1	7	0	7	7	7	7	0.9 (n=6)	0.9	0.9
- North Lanarkshire	14	10	0	10	1	9	9	9	25	2.8 (n=9)	2.8	2.5
- Stirling	121	47	0	36	0	34	32	27	59	2.2 (n=27)	1.7	1.6
Dumfries & Galloway	247	116	20	109	17	92	84	75	178	2.4 (n=74)	1.9	1.6
Highland	57	47	4	44	1	43	41	39	104	2.6 (n=37)	2.4	2.3
- Badenoch & Strathspey	3	3	0	3	0	3	3	3	8	2.3 (n=2)	2.3	2.3
- Caithness	6	6	0	5	0	5	5	5	12	2.4 (n=5)	2.4	2.4
- Inverness-shire	10	7	1	7	1	6	6	6	13	2.0 (n=5)	2.0	1.7
- Lochaber	9	9	0	9	0	9	8	7	11	1.6 (n=7)	1.2	1.2
- Nairn	3	2	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Ross-shire	8	5	2	5	0	5	4	4	11	2.8 (n=4)	2.2	2.2
- Sutherland	16	14	0	13	0	13	13	13	46	3.5 (n=13)	3.5	3.5
- West Moray	2	1	0	1	0	1	1	0	0	-	-	-
Lothian & Borders	81	54	5	41	1	40	35	35	71	2.0 (n=35)	1.8	1.7
- Lothian	7	2	1	2	0	2	1	1	3	3.0 (n=1)	1.5	1.5
- Scottish Borders	74	52	4	39	1	38	34	34	68	2.0 (n=34)	1.8	1.7

Breeding success of Barn Owl in Scotland in 2018 (continued)

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)
South Strathclyde	43	21	8	15	0	15	14	14	29	2.1 (n=14)	1.9	1.9
- Ayrshire	42	21	8	15	0	15	14	14	29	2.1 (n=14)	1.9	1.9
- South Lanarkshire	1	0	0	0	0	0	0	0	0	-	-	-
Tayside	21	13	7	9	0	9	9	9	22	2.4 (n=9)	2.4	2.4
- Angus	8	5	3	3	0	3	3	3	10	3.3 (n=3)	3.3	3.3
- Fife	1	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Perth & Kinross	12	7	4	5	0	5	5	5	11	2.2 (n=5)	2.2	2.2
TOTAL:	750	380	65	310	20	286	267	248	559	2.3 (n=244)	2.0	1.8

Breeding success of Tawny Owl in Scotland in 2018

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	71	16	9	9	7	7	9	1.3 (n=7)	1.0	1.0
- Argyll Islands	1	0	0	0	0	0	0	-	-	-
- Argyll Mainland	69	15	8	8	6	6	8	1.3 (n=6)	1.0	1.0
- Bute	1	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
Central	100	36	31	30	29	29	56	1.9 (n=29)	1.9	1.8
- Arrochar & Helensburgh	1	1	1	0	0	0	0	-	-	-
- Stirling	99	35	30	30	29	29	56	1.9 (n=29)	1.9	1.9
Dumfries & Galloway	62	21	18	18	15	15	24	1.6 (n=15)	1.3	1.3
Highland	52	29	28	27	23	21	43	2.0 (n=21)	1.6	1.5
- Inverness-shire	8	3	3	2	1	1	2	2.0 (n=1)	1.0	0.7
- Ross-shire	40	22	22	22	19	17	33	1.9 (n=17)	1.5	1.5
- Sutherland	4	4	3	3	3	3	8	2.7 (n=3)	2.7	2.7
Lothian & Borders	56	18	17	17	16	15	30	2.0 (n=15)	1.8	1.8
- Lothian	11	4	3	3	3	3	4	1.3 (n=3)	1.3	1.3
- Scottish Borders	45	14	14	14	13	12	26	2.2 (n=12)	1.9	1.9
South Strathclyde	2	0	0	0	0	0	0	-	-	-
- Ayrshire	1	0	0	0	0	0	0	-	-	-
- South Lanarkshire	1	0	0	0	0	0	0	-	-	-
Tayside	20	11	6	6	6	6	8	1.3 (n=6)	1.3	1.3
- Angus	6	5	3	3	3	3	4	1.3 (n=3)	1.3	1.3
- Fife	2	1	0	0	0	0	0	-	-	-
- Perth & Kinross	12	5	3	3	3	3	4	1.3 (n=3)	1.3	1.3
TOTAL:	363	131	109	107	96	93	170	1.8 (n=93)	1.6	1.6

Breeding success of Little Owl in Scotland in 2018

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	4	2	2	1	0	1	0	0	0	-	-	-
- Scottish Borders	4	2	2	1	0	1	0	0	0	-	-	-
TOTAL:	4	2	2	1	0	1	0	0	0	-	-	-

Breeding success of Long-Eared Owl in Scotland in 2018

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	6	1	0	0	0	0	-	-	-
- Argyll Islands	6	1	0	0	0	0	-	-	-
Central Scotland	7	4	4	4	4	5	1.2 (n=4)	1.2	1.2
- Arrochar & Helensburgh	7	4	4	4	4	5	1.2 (n=4)	1.2	1.2
Highland	19	17	16	16	16	37	2.2 (n=15)	2.2	2.2
- Badenoch & Strathspey	2	2	2	2	2	5	2.5 (n=2)	2.5	2.5
- Inverness-shire	5	5	5	5	5	13	2.6 (n=5)	2.6	2.6
- Ross-shire	2	2	2	2	2	5	2.5 (n=2)	2.5	2.5
- Small Isles	2	2	2	2	2	6	3.0 (n=2)	3.0	3.0
- Sutherland	6	4	3	3	3	6	2.0 (n=3)	2.0	2.0
- West Moray	2	2	2	2	2	2	0.5 (n=1)	0.5	0.5
Lothian & Borders	19	16	15	15	15	24	1.5 (n=14)	1.5	1.5
- Lothian	9	7	7	7	7	10	1.3 (n=6)	1.3	1.3
- Scottish Borders	10	9	8	8	8	14	1.8 (n=8)	1.8	1.8
North-east	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
- Aberdeenshire	1	1	1	1	1	2	2.0 (n=1)	2.0	2.0
Orkney	4	0	0	0	0	0	-	-	-
Tayside	6	3	3	3	2	4	2.0 (n=2)	1.3	1.3
- Angus	4	1	1	1	0	0	-	-	-
- Perth & Kinross	2	2	2	2	2	4	2.0 (n=2)	2.0	2.0
Uist	11	6	3	3	3	6	2.0 (n=3)	2.0	2.0
- North Uist	10	5	2	2	2	5	2.5 (n=2)	2.5	2.5
- South Uist	1	1	1	1	1	1	1.0 (n=1)	1.0	1.0
TOTAL:	73	48	42	42	41	78	1.9 (n=39)	1.9	1.9

Breeding success of Short-eared Owl in Scotland in 2018

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	5	1	0	0	0	0	0	0	-	-	-
- Argyll Islands	2	1	0	0	0	0	0	0	-	-	-
- Argyll Mainland	3	0	0	0	0	0	0	0	-	-	-
Central	5	1	0	0	0	0	0	0	-	-	-
- Arrochar & Helensburgh	4	0	0	0	0	0	0	0	-	-	-
- Stirling	1	1	0	0	0	0	0	0	-	-	-
Dumfries & Galloway	4	4	0	4	0	0	0	0	-	-	-
Highland	4	2	2	2	2	2	2	11	5.5 (n=2)	5.5	5.5
- Badenoch & Strathspey	2	2	0	2	2	2	2	11	5.5 (n=2)	5.5	5.5
- Caithness	0	0	0	0	0	0	0	0	-	-	-
- Nairn	1	0	1	0	0	0	0	0	-	-	-
- Sutherland	1	0	1	0	0	0	0	0	-	-	-
Lothian & Borders	8	5	1	4	4	4	4	7	1.8 (n=4)	1.8	1.8
- Lothian	1	0	0	0	0	0	0	0	-	-	-
- Scottish Borders	7	5	1	4	4	4	4	7	1.8 (n=4)	1.8	1.8
North-east	2	2	0	1	1	1	1	1	0.0 (n=0)	0.0	0.0
- Aberdeenshire	2	2	0	1	1	1	1	1	0.0 (n=0)	0.0	0.0
Orkney	101	7	26	7	2	2	1	2	2.0 (n=1)	1.0	0.3
South Strathclyde	4	0	0	0	0	0	0	0	-	-	-
- Ayrshire	4	0	0	0	0	0	0	0	-	-	-
Tayside	35	17	9	11	11	11	11	25	2.1 (n=9)	2.1	2.1
- Angus	10	1	2	0	0	0	0	0	-	-	-
- Perth & Kinross	25	16	7	11	11	11	11	25	2.1 (n=9)	2.1	2.1
Uist	11	6	5	4	4	4	4	9	2.2 (n=4)	2.2	2.2
- Benbecula	2	1	1	0	0	0	0	0	-	-	-

Breeding success of Short-eared Owl in Scotland in 2018 (continued)

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)
- North Uist	6	2	4	1	1	1	1	3	3.0 (n=1)	3.0	3.0
- South Uist	3	3	0	3	3	3	3	6	2.0 (n=3)	2.0	2.0
TOTAL:	179	45	43	33	24	24	23	55	2.6 (n=20)	2.5	1.8

Breeding success of Kestrel in Scotland in 2018

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	2	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Argyll Mainland	2	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
Central	41	28	21	0	21	20	20	70	3.5 (n=20)	3.3	3.3
- Arrochar & Helensburgh	4	4	4	0	4	4	4	12	3.0 (n=4)	3.0	3.0
- Clackmannanshire	1	1	0	0	0	0	0	0	-	-	-
- Dunbartonshire	3	3	3	0	3	3	3	13	4.3 (n=3)	4.3	4.3
- Falkirk	2	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- North Lanarkshire	25	16	11	0	11	10	10	33	3.3 (n=10)	3.0	3.0
- Stirling	6	3	2	0	2	2	2	9	4.5 (n=2)	4.5	4.5
Dumfries & Galloway	31	11	8	0	8	8	8	24	3.0 (n=8)	3.0	3.0
Highland	36	32	23	0	22	22	22	84	3.8 (n=22)	3.8	3.7
- Badenoch & Strathspey	4	4	4	0	4	4	4	11	2.8 (n=4)	2.8	2.8
- Inverness-shire	21	17	13	0	12	12	12	52	4.3 (n=12)	4.3	4.0
- Lochaber	1	1	0	0	0	0	0	0	-	-	-
- Nairn	3	3	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Ross-shire	4	4	3	0	3	3	3	15	5.0 (n=3)	5.0	5.0
- Small Isles	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Sutherland	1	1	0	0	0	0	0	0	-	-	-
- West Moray	1	1	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Lothian & Borders	49	37	33	0	33	31	31	136	4.4 (n=30)	4.1	4.1
- Lothian	25	22	21	0	21	19	19	86	4.5 (n=18)	4.0	4.0
- Scottish Borders	24	15	12	0	12	12	12	50	4.2 (n=12)	4.2	4.2
North-east	2	2	2	1	1	1	1	2	2.0 (n=1)	2.0	1.0
- Aberdeenshire	2	2	2	1	1	1	1	2	2.0 (n=1)	2.0	1.0
Orkney	46	8	8	4	4	4	2	5	2.5 (n=2)	1.2	0.6

Breeding success of Kestrel in Scotland in 2018 (continued)

Region	Home ranges checked	Home ranges occupied by pairs	Pairs monitored	Pairs failing early or non-breeding	Pairs known to lay eggs	Pairs known to hatch eggs	Pairs known to fledge young	Minimum number of young fledged	Productivity (Young fledged per successful pair)	Productivity (Young fledged per pair laying eggs)	Productivity (Young fledged per pair occupied home range monitored)
South Strathclyde	25	16	10	0	10	10	10	27	2.7 (n=10)	2.7	2.7
- Ayrshire	21	12	8	0	8	8	8	23	2.9 (n=8)	2.9	2.9
- Renfrewshire	4	4	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
Tayside	75	56	38	1	36	35	35	83	2.3 (n=31)	2.2	2.1
- Angus	35	23	17	0	17	17	17	42	2.5 (n=17)	2.5	2.5
- Fife	3	2	1	0	1	0	0	0	-	-	-
- Perth & Kinross	37	31	20	1	18	18	18	41	2.1 (n=14)	2.1	1.8
Uist	11	9	6	0	6	6	6	17	2.8 (n=6)	2.8	2.8
- North Uist	3	2	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- South Uist	8	7	5	0	5	5	5	14	2.8 (n=5)	2.8	2.8
TOTAL:	318	201	151	6	143	139	137	454	3.4 (n=132)	3.3	3.1

Breeding success of Merlin in Scotland in 2018

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)
Argyll	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Argyll Mainland	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Central Scotland	9	3	0	2	0	2	2	2	3	1.5 (n=2)	1.5	1.5
- Clackmannanshire	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Stirling	8	2	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Dumfries & Galloway	11	8	2	6	1	5	1	1	1	1.0 (n=1)	0.2	0.2
Highland	102	44	13	32	0	31	31	31	90	2.9 (n=31)	2.9	2.8
- Badenoch & Strathspey	20	9	2	9	0	9	9	9	26	2.9 (n=9)	2.9	2.9
- Inverness-shire	12	3	1	3	0	3	3	2	7	3.5 (n=2)	2.3	2.3
- Lochaber	7	1	0	0	0	0	0	0	0	-	-	-
- Nairn	10	5	0	5	0	5	5	5	15	3.0 (n=5)	3.0	3.0
- Ross-shire	2	1	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Small Isles	4	3	1	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Sutherland	28	18	8	9	0	8	8	9	23	2.6 (n=9)	2.9	2.6
- West Moray	19	4	0	3	0	3	3	3	12	4.0 (n=3)	4.0	4.0
Lewis & Harris	2	1	0	0	0	0	0	0	0	-	-	-
- Lewis	2	1	0	0	0	0	0	0	0	-	-	-
Lothian & Borders	37	13	7	7	0	7	6	4	14	3.5 (n=4)	2.0	2.0
- Lothian	9	3	1	0	0	0	0	0	0	-	-	-
- Scottish Borders	28	10	6	7	0	7	6	4	14	3.5 (n=4)	2.0	2.0
North-east	108	46	4	43	1	38	33	31	79	2.5 (n=31)	2.1	1.8
- Aberdeenshire	86	39	2	36	0	33	29	27	71	2.6 (n=27)	2.2	2.0
- East Moray	22	7	2	7	1	5	4	4	8	2.0 (n=4)	1.6	1.1
Orkney	76	11	2	11	4	7	6	3	9	3.0 (n=3)	1.3	0.8
Shetland	89	36	1	36	1	35	28	26	86	3.3 (n=26)	2.5	2.4
South Strathclyde	5	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- South Lanarkshire	5	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Tayside	51	25	10	18	2	14	14	14	33	2.3 (n=13)	2.3	1.8

Breeding success of Merlin in Scotland in 2018 (continued)

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)
Argyll	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Perth & Kinross	34	17	7	10	2	7	7	7	15	2.0 (n=6)	2.0	1.4
Uist	8	5	3	3	0	3	3	3	9	3.0 (n=3)	3.0	3.0
- Barra	1	1	0	0	0	0	0	0	0	-	-	-
- North Uist	3	1	2	0	0	0	0	0	0	-	-	-
- South Uist	4	3	1	3	0	3	3	3	9	3.0 (n=3)	3.0	3.0
TOTAL:	499	194	42	160	9	144	126	117	327	2.8 (n=116)	2.3	2.1

Breeding success of Hobby in Scotland in 2018

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	10	4	4	3	0	3	3	3	3	1.0 (n=3)	1.0	1.0
- Angus	10	4	4	3	0	3	3	3	3	1.0 (n=3)	1.0	1.0
TOTAL:	11	4	4	3	0	3	3	3	3	1.0 (n=3)	1.0	1.0

Breeding success of Peregrine in Scotland in 2018

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	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Argyll Mainland	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
Central	28	19	0	17	0	12	12	12	30	2.5 (n=12)	2.5	1.8
- Arrochar & Helensburgh	1	1	0	0	0	0	0	0	0	-	-	-
- Clackmannanshire	2	2	0	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Dunbartonshire	1	1	0	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Falkirk	3	3	0	3	0	3	3	3	9	3.0 (n=3)	3.0	3.0
- North Lanarkshire	9	7	0	7	0	2	2	2	4	2.0 (n=2)	2.0	0.6
- Stirling	12	5	0	4	0	4	4	4	10	2.5 (n=4)	2.5	2.5
Dumfries & Galloway	112	62	5	58	2	51	45	43	85	2.0 (n=43)	1.7	1.5
Highland	91	41	8	29	0	28	25	25	52	2.1 (n=25)	1.9	1.8
- Badenoch & Strathspey	11	9	0	5	0	5	4	4	9	2.2 (n=4)	1.8	1.8
- Caithness	8	5	0	3	0	3	3	3	5	1.7 (n=3)	1.7	1.7
- Inverness-shire	34	11	4	9	0	9	8	8	21	2.6 (n=8)	2.3	2.3
- Lochaber	9	2	2	0	0	0	0	0	0	-	-	-
- Nairn	3	0	0	0	0	0	0	0	0	-	-	-
- Ross-shire	14	8	1	7	0	6	5	5	7	1.4 (n=5)	1.2	1.0
- Small Isles	3	2	0	2	0	2	2	2	5	2.5 (n=2)	2.5	2.5
- Sutherland	6	3	1	2	0	2	2	2	4	2.0 (n=2)	2.0	2.0
- West Moray	3	1	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
Lewis & Harris	2	2	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0
- Lewis	2	2	0	1	0	1	1	1	1	1.0 (n=1)	1.0	1.0

Breeding success of Peregrine in Scotland in 2018 (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)
Lothian & Borders	143	53	6	53	14	37	31	29	77	2.7 (n=29)	2.1	1.5
- Lothian	38	15	0	15	3	12	10	9	23	2.6 (n=9)	1.9	1.5
- Scottish Borders	105	38	6	38	11	25	21	20	54	2.7 (n=20)	2.2	1.4
North-east	87	37	4	35	0	33	29	28	50	1.8 (n=28)	1.5	1.4
- Aberdeenshire	73	32	3	31	0	30	27	26	47	1.8 (n=26)	1.6	1.5
- East Moray	14	5	1	4	0	3	2	2	3	1.5 (n=2)	1.0	0.8
Orkney	29	12	3	12	7	5	4	4	8	2.0 (n=4)	1.6	0.7
Shetland	20	0	1	0	0	0	0	0	0	-	-	-
South Strathclyde	75	38	6	38	5	29	24	24	48	1.9 (n=22)	1.6	1.2
- Arran & Cumbrae	8	5	0	5	0	4	4	4	8	2.0 (n=4)	2.0	1.6
- Ayrshire	46	23	6	23	2	19	16	16	32	1.9 (n=14)	1.6	1.3
- Inverclyde	1	0	0	0	0	0	0	0	0	-	-	-
- Renfrewshire	6	4	0	4	1	2	1	1	2	2.0 (n=1)	1.0	0.5
- South Lanarkshire	14	6	0	6	2	4	3	3	6	2.0 (n=3)	1.5	1.0
Tayside	98	47	10	37	2	27	26	22	42	1.9 (n=21)	1.5	1.1
- Angus	41	15	3	13	0	6	6	5	9	1.8 (n=5)	1.5	0.7
- Fife	20	15	1	11	0	11	11	9	15	1.7 (n=9)	1.4	1.4
- Perth & Kinross	37	17	6	13	2	10	9	8	18	2.1 (n=7)	1.7	1.3

Breeding success of Peregrine in Scotland in 2018 (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)
Uist	4	3	1	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- Benbecula	1	1	0	1	0	1	1	1	3	3.0 (n=1)	3.0	3.0
- North Uist	1	0	1	0	0	0	0	0	0	-	-	-
- South Uist	2	2	0	0	0	0	0	0	0	-	-	-
TOTAL:	690	315	44	282	30	225	199	190	398	2.1 (n=187)	1.8	1.4

Breeding success of Raven in Scotland in 2018

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	103	72	52	0	52	51	51	144	2.8 (n=51)	2.8	2.8
- Argyll Islands	41	26	15	0	15	15	15	52	3.5 (n=15)	3.5	3.5
- Argyll Mainland	38	29	23	0	23	22	22	54	2.5 (n=22)	2.3	2.3
- Bute	24	17	14	0	14	14	14	38	2.7 (n=14)	2.7	2.7
Central	53	41	39	6	33	29	28	75	2.7 (n=28)	2.3	1.9
- Arrochar & Helensburgh	4	4	4	2	2	1	1	2	2.0 (n=1)	1.0	0.5
- Clackmannanshire	2	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- Dunbartonshire	1	1	1	0	1	1	1	4	4.0 (n=1)	4.0	4.0
- Falkirk	3	2	2	0	2	2	2	6	3.0 (n=2)	3.0	3.0
- North Lanarkshire	10	8	8	0	8	8	8	21	2.6 (n=8)	2.6	2.6
- Stirling	33	24	22	4	18	15	14	36	2.6 (n=14)	2.0	1.6
Dumfries & Galloway	84	68	40	2	35	32	31	63	2.0 (n=29)	1.7	1.5
Highland	38	34	30	0	30	30	29	90	3.1 (n=29)	3.0	3.0
- Badenoch & Strathspey	7	7	6	0	6	6	6	16	2.7 (n=6)	2.7	2.7
- Inverness-shire	8	7	7	0	7	7	7	27	3.9 (n=7)	3.9	3.9
- Lochaber	2	2	0	0	0	0	0	0	-	-	-
- Nairn	2	1	1	0	1	1	1	2	2.0 (n=1)	2.0	2.0
- Ross-shire	6	6	5	0	5	5	4	12	3.0 (n=4)	2.4	2.4
- Small Isles	3	3	3	0	3	3	3	10	3.3 (n=3)	3.3	3.3
- Sutherland	10	8	8	0	8	8	8	23	2.9 (n=8)	2.9	2.9
Lewis & Harris	9	7	6	0	6	6	6	12	2.0 (n=6)	2.0	2.0
- Lewis	9	7	6	0	6	6	6	12	2.0 (n=6)	2.0	2.0
Lothian & Borders	56	43	37	5	31	30	29	76	2.5 (n=26)	2.4	2.0
- Lothian	16	13	13	2	10	10	10	36	3.6 (n=10)	3.6	2.8

Breeding success of Raven in Scotland in 2018 (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)
- Scottish Borders	40	30	24	3	21	20	19	40	1.9 (n=16)	1.8	1.5
Orkney	1	1	1	1	0	0	0	0	-	-	-
Shetland	49	31	19	0	18	14	14	47	3.4 (n=14)	2.6	2.5
South Strathclyde	50	37	36	2	33	33	33	94	2.8 (n=32)	2.8	2.6
- Ayrshire	48	35	34	2	31	31	31	87	2.8 (n=30)	2.8	2.5
- South Lanarkshire	2	2	2	0	2	2	2	7	3.5 (n=2)	3.5	3.5
Tayside	108	74	59	3	52	47	46	119	2.6 (n=45)	2.3	2.0
- Angus	32	15	11	0	9	7	7	19	2.7 (n=7)	2.1	1.7
- Fife	15	13	9	0	8	8	8	24	3.0 (n=8)	3.0	2.7
- Perth & Kinross	61	46	39	3	35	32	31	76	2.4 (n=30)	2.1	1.9
Uist	32	25	17	0	17	15	15	46	3.0 (n=14)	2.6	2.6
- Benbecula	3	3	3	0	3	3	3	8	2.7 (n=3)	2.7	2.7
- North Uist	16	10	3	0	3	1	1	3	3.0 (n=1)	1.0	1.0
- South Uist	13	12	11	0	11	11	11	35	3.1 (n=10)	3.1	3.1
TOTAL:	583	433	336	19	307	287	282	766	2.8 (n=274)	2.5	2.3



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