Scottish Birds

published by the
SCOTTISH ORNITHOLOGISTS' CLUB

VOLUME 42(3) SEPTEMBER 2022

Scottish Birds

Established in 1958.

Published quarterly by:
The Scottish Ornithologists' Club,
Waterston House, Aberlady,
East Lothian EH32 0PY.

Email: mail@the-soc.org.uk
Phone: 01875 871330
www.the-soc.org.uk

facebook.com/ScotlandsBirdClub
twitter.com/ScottishBirding
instagram.com/socaberlady

Editoral team:

Co-ordinating editor
Harry Scott

Peer-reviewed papers and notes
Dr Stan da Prato
Assisted by: Dr I. Bainbridge,
Dr M. Marquiss, Dr C.R. McKay,
Dr W.T.S. Miles, R. Swann

Club articles, news and views
Prof Andrew Barker

Birding articles and observations
Harry Scott, Mark Wilkinson

Proof-readers
Ed Austin, Dr John Frank,
Bridget Khursheed

Editorial correspondence:
c/o SOC, Waterston House,
Aberlady, East Lothian EH32 0PY.
Email: mail@the-soc.org.uk

Designed and typeset by:
PicaDesign, 51 Charlton Crescent,
Aboyne, Aberdeenshire AB34 5GN.
Email: picades@ifb.co.uk

Printed by:
Swallowtail Print Limited,
Unit 2 Drayton Industrial Park,
Taverham Road, Drayton
Norwich, Norfolk NR8 6RL.

Front Cover:
Golden Eagle, Glen Tanar,
North-East Scotland, 17 June 2015.
© *Andy S. Hayes*

ISSN 0036-9144

Scottish Birds is the quarterly journal for SOC members, and is published in March, June, September and December annually.

Containing original papers relating to ornithology in Scotland, topical articles, bird observations, reports of rare and scarce bird sightings, alongside branch and Club-related news, our members tell us that *Scottish Birds* is one of the key benefits of belonging to the SOC. Its different sections have been developed to meet the wide needs of the birdwatching community, and the publication is renowned for its first-class photography.

An archive of the journal is available on the SOC website, where links can be found to other Club publications including the *Online Scottish Bird Report*.

More about the SOC...

On the one hand, a birdwatching club. Established in 1936, the Scottish Ornithologists' Club (SOC) is Scotland's bird club with 15 branches around the country and a growing membership of over 3,000. Through a programme of talks, outings, conferences and other events, it brings together like-minded individuals with a passion for birds, nature and conservation.

On the other, a network of volunteers across Scotland, gathering vital, impartial information about our wild birds. The data we collect is made available to conservationists, planners and developers, and is used by organisations such as the RSPB, as one of the first points of reference in informed conservation planning.

Club Headquarters can be found at Waterston House, Aberlady, overlooking the scenic local nature reserve. Housed within, is the George Waterston Library, the largest ornithological library in Scotland, and the Donald Watson Gallery - one of the jewels in the Waterston House crown, exhibiting wildlife art all year-round.

Join us...

As well as receiving *Scottish Birds* every quarter, SOC members have access to a programme of talks and outings across Scotland and affiliation to a local branch of the Club. New members choosing to pay their subscription by direct debit are eligible to a free thank you gift.

Annual membership rates		Print*	Digital only
Adult (aged 18 and over)	£	42.00	36.00
Adult unwaged	£	20.00	14.00
Family	£	56.00	48.00
Junior (aged 17 or under)	£	14.00	5.00**
Student (in F/T further education)	£	18.00	5.00
Pensioner	£	31.00	27.00
Joint Pensioner	£	41.00	35.00
Life	£	820.00	760.00
Life Family	£	1,230.00	1,170.00
Library	£	68.00	n/a

** Print subscription includes access to* Scottish Birds Online. *For non-UK addresses, a £15 postage supplement applies to all print subscriptions. ** One-off joining fee then free until age 18 reached.*

For more information about the Club and its activities, including details of how to join, please visit www.the-soc.org.uk or contact Waterston House on 01875 871 330, or email membership@the-soc.org.uk

Scottish Birds 42:3 (2022)

All at sea

Plate 154. Ruth Briggs, Staffa, Argyll, July 2022. © *Richard Briggs*

This foreword has to begin by observing and recording this summer's tragedy for some of our internationally important breeding seabird populations. Iconic birds like Gannet, Great Skua, auks, terns, gulls and Eider have succumbed to highly pathogenic avian influenza. Hundreds of sick and dead birds have been found around our mainland coastline and our islands, carcasses have been diligently collected by local authorities and conservation bodies, and we have felt powerless to do anything to stop the disease in its tracks and stop the birds' suffering and deaths. The longer-term fear is that population or colony-level recovery, presuming it's achievable, will take many years. Fostering that recovery requires optimum environmental conditions and, therefore, an even greater commitment on our part to careful, sustainable use and management of marine ecosystems.

What can SOC members do? The summer season has now passed so numbers of new bird casualties have hopefully subsided. Noting and submitting records to the national reporting line has been important. While formal nature reserves are closely monitored, members have a particular role to play when visiting other stretches of coast, contributing towards understanding the geography of the outbreaks and the species that have proved most susceptible. What might be the impact on this year's new generation of seabirds, and how does this year's crash for some species 'fit' with population trends (whether up or down) witnessed over the last 30–40 years? We might only know more once the 2023 season begins and numbers and productivity back at the breeding colonies can be assessed. Keep looking, keep recording, keep submitting data, and keep sharing understanding among others of both the value of, and the challenges faced by, these birds to which we owe so much.

During this summer, it has been my pleasure to see more of how the SOC, through its members and its excellent staff team, contributes to knowledge and to enjoyment of Scotland's birds. I could write a very long list of activities, from bird identification walks through to specialised migration and ringing projects, that wouldn't otherwise happen. Our network of branches is unique, varied and tailored to local needs and resources. The breadth of skills and experience (not just ornithological!) among members and staff is amazing. Branch representatives attending their long-awaited weekend meeting in Grantown-on-Spey this year shared enthusiasm, experience and ideas to help and learn from each other. The benefits will cascade to members around the country.

Another recent organisational highlight has been the first Scottish Bird Camp for young people aged 10–16, run in May by SOC in partnership with the BTO. I saw developing skills, varied backgrounds and universal energy and enthusiasm among the next generation of members, recorders and professionals at a weekend that, I feel sure, will inform their future interests and ambitions.

But what have these last two paragraphs got to do with my heading to this page? Not much, as written. They are brilliant examples of some of what the SOC does best. The Club is buzzing with ideas, and opportunities are endless. The crunch comes as running the Club inevitably costs money. We spend only carefully and keep costs to a minimum. But we are somewhat 'at sea' in that for too many recent years our expenditure has significantly outweighed our income. That's unsustainable in the long run and we need to get ourselves in better financial balance. To help that, please can you, for starters, recruit a new member? Thank you!

Ruth Briggs, SOC President

Breeding success of Lapwings, Oystercatchers and Curlews in agricultural habitats in Badenoch and upper Strathspey

N.E. BUXTON, K. DUNCAN, S. FOSTER, E. PHILLIP, A. ELLIOTT & I.R. TAYLOR

Introduction

Farmland wader populations in the UK have been declining for several decades (Spencer 1953, Balmer 2013, O`Brien *et al.* 2002, Shrubb 2007, Newton 2017, Scottish Natural Heritage 2018). Even though agriculture on upland Highland farms is less intensive than in the Lowlands, or through much of England, French *et al.* (2000) have shown that populations in Badenoch in the central Highlands are similarly under pressure. Survey work was initially started as part of a comparison of wader productivity between the early 1970s and the mid-2000s in Speyside, Deeside and Grampian (Buxton & Summers 2006, Buxton & Duncan 2021). Subsequently, surveys of a limited part of the study area, where the majority of the remaining birds were concentrated, were continued until 2019 to investigate some of the factors potentially influencing breeding wader numbers and their productivity. This paper describes the results of the 14 years survey of a sample of upland farms and their breeding waders.

Study Area

The study area (Figure 1) lay in the central Highlands of Scotland centred on the eastern Grampian mountains and one of the largest river catchments in northern Scotland, that of the River Spey. Upland farms, substantially based on livestock and barley, lined the river catchments. To the south-west, along the slower flowing parts of the Spey, the farms were more lowland in type with a greater dependence upon arable land, at least historically.

Methods

The study was based on a transect, covering just less than 50 miles, surveying both the numbers and distributions of chicks of three species of wader, Lapwing *Vanellus vanellus*,

Figure 1. The location of the study area and outline route of the transect in Badenoch and Strathspey; Newtonmore – Well of the Lecht. (1 = Newtonmore, 2 = Kingussie, 3 = Nethybridge, 4 = Tomintoul, 5 = Well of the Lecht).

Oystercatcher *Haematopus ostralegus* and Curlew *Numenius arquata*, whose main habitats were dependent upon farmland. Because numbers of the other species were so low the study largely concentrated upon two species, Lapwing and Oystercatcher. The transect ran along roads from Newtonmore (B9152) in Badenoch, followed the Spey towards Grantown-on-Spey (A95 & B970) and climbed steadily from Nethybridge (A9390) to end at the Well of the Lecht.

Bird survey

Lapwings were counted as 'adult' in the early season, but 'fully grown' later in June when some fledged birds of the year could also be present. Chicks were unfledged birds of the year. A survey of adult birds of the three species, the available habitats and those used was carried out by car during early spring in 2007 and 2008 as the wader populations first settled on their breeding grounds. Counts of birds and the habitats used were repeated during the first few days of June in each subsequent year up to 2019. Fully grown waders and chicks were counted, the habitats used noted and their distribution mapped. Chicks were caught and ringed wherever possible. However, all chicks seen, whether caught or not, were counted; hence these data are a full survey of both fully grown birds and chicks observed. Transect width was inevitably variable; on both sides of the road generally a minimum of a 100 metres up to a maximum of about 500 metres.

Habitat survey

The habitats available to waders in the study area were initially surveyed in detail in April/May in 2007 and 2008. Using the car odometer the vegetation on both sides of the road was sampled at mile intervals and classified into five categories (Table 1). Subsequently during the June transect habitat actually used by any birds present was noted.

Table 1. The percentage frequency of occurrence of habitats along the transect during 2007 and 2008.

Habitat	Number of sample plots	%
Heather moorland	33	17.6
Grazed grassland	53	28.2
Marsh	5	2.7
Cultivation & crops	5	2.7
Conurbation, woodland etc	92	48.9

Climate data

Temperature, rainfall and other climate data for the north of Scotland were obtained from the data summaries on the Met. Office web site.

Results

Habitat distribution and availability in 21st century

Grazed grassland was the most abundant habitat along the transect available to waders during the breeding season (Table 1). This grassland either had stock present or had been grazed in the recent past. Grazed grassland remained the dominant habitat until, at an altitude of between 250 and 300 m, heather moorland took over (Figure 2). Unsuitable habitat, largely housing, together with both deciduous and coniferous woodland, formed almost 50% of the area but decreased at higher altitudes. Distribution of habitat at all five altitude bands was similar between the 2007 and 2008 surveys; cultivation had the greatest potential for change between years but was so limited in frequency that it had little effect between years. Greatest apparent, but limited, variation occurred at middle altitudes where grazed grass and heather tended to form an integrated mix in many areas without a clear boundary, and hence were occasionally difficult to categorise.

Lapwing

Numbers were greatest early in the season when birds first settled to breed (Figure 3) but numbers of fully-grown birds had decreased considerably by the time chicks were present in early June; in total by over 30%. Greatest proportional decrease occurred in parts of the hill ground above 220 m although in this zone, where greatest numbers bred, there was also local increase in mid-summer.

During 13 years of the study (adults were not counted in 2006) although the total numbers of fully-grown birds in June fluctuated between 65 and 92 birds with a mean of 75 individuals (Table 2) there was no consistent trend (r=0.5517, P<0.10) over the period. It was unknown whether there was a similar situation over the period in early spring. It was not always possible to distinguish between early fledging full-grown chicks and adults due to long observation distances so, in some years, numbers of 'adult' birds may have been slightly overestimated due to early fledging of chicks but this was only known from a very limited occurrence (i.e. notably 2011) and was not considered a significant issue in most years.

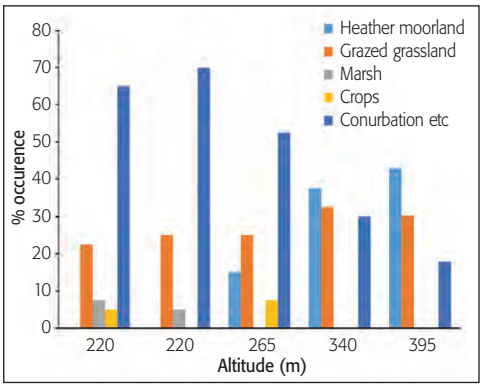


Figure 2. The distribution of habitats in relation to altitude (in ten mile blocks starting at Newtonmore).

Birds were not randomly distributed along the transect (Figure 4) but aggregated in specific areas at particular altitudes (Figure 5). In the lower strath, birds, albeit relatively few, were concentrated in marshes and the wetter areas of otherwise intensively managed, grazed meadows. At higher altitudes, around 250 to 300 metres, birds were concentrated in improved grazed grassland which often included tussocks of rush *Juncus effusus*, most frequently grazed by sheep as the most numerous livestock, but cattle and horses were particularly important in a small number of fields. Horse-grazed fields, even when at high altitude like Tomintoul, supported particularly high densities (e.g. minimum numbers of at least 23 fully-grown birds in 2019 and 28 chicks in 2014 in the same two small adjacent fields; other years were also highly productive).

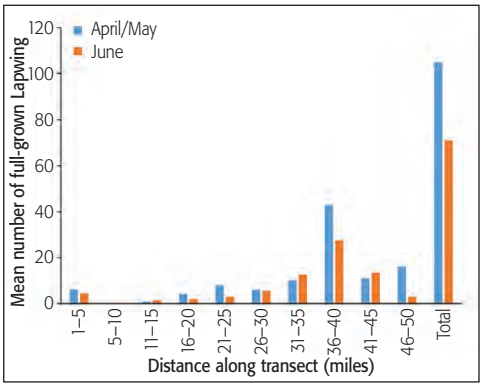


Figure 3. The change in numbers of full-grown Lapwing along the transect in 2007 and 2008 between early and mid-breeding season (altitude is estimated as 220 m at 1–10 miles, 220 m at 11–20 miles, 260 m at 21–30 miles, 365 m 31–40 miles and 395 m at 41–50 miles).

Numbers of chicks produced were low (a mean of 30.8 individuals/year over 50 miles), varying between possible maxima of 18 and 49 birds/year (Table 2) and, whilst the annual number of full-grown birds present did positively influence the number of chicks produced, the relationship was not statistically significant (r=0.4194, P>0.10) suggesting additional factors to the actual number of adults were affecting productivity. Estimated maximum number of chicks/pair over 2006–2019 was 0.82 varying between 0.4 and 1.1. Whilst there was no significant change in chick numbers counted per year over the study period (r=0.3708, P>0.10) numbers of

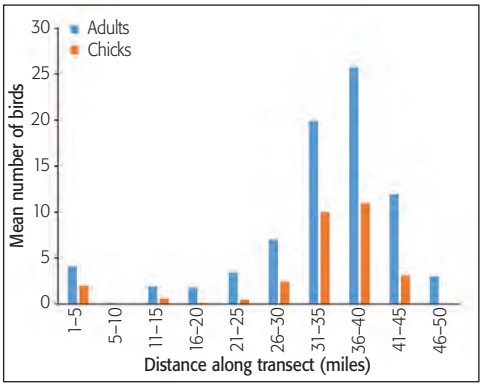


Figure 4. The mean number of full-grown and chick Lapwing along the transect 2007–2016.

Table 2. The annual numbers of full-grown and chick Lapwing, Oystercatcher and Curlew observed on the transect.

Year	Lapwing	Oystercatcher	Curlew	Lapwing	Oystercatcher	Curlew
		Full-grown			Chicks	
2006	-	-	-	24	3	0
2007	74	21	10	22	2	3
2008	66	47	8	18	2	0
2009	69	22	9	40	4	4
2010	65	26	10	23	3	2
2011	78	35	12	34	4	1
2012	65	40	10	35	3	7
2013	69	35	5	26	0	0
2014	86	24	2	48	7	0
2015	86	39	9	20	1	0
2016	92	27	11	49	7	1
2017	81	26	20	18	0	0
2018	65	51	23	34	1	0
2019	92	56	17	41	7	0

Table 3. The relationship between weather parameters and wader chick production in 2006–2019 (n=14).

Weather parameter in northern Scotland	Lapwing		Oystercatcher		Curlew	
	Correlation value	Level of significance	Correlation value	Level of significance	Correlation value	Level of significance
Minimum winter temperature	r=0.2020	P>0.10	r=0.0200	P>0.10	r=0.0265	P>0.10
Minimum spring temperature	r=0.2990	P>0.10	r=0.6028	P<0.05	r=0.1735	P>0.10
Minimum February temperature	r=0.0768	P>0.10	r=0.2502	P>0.10	r=0.2119	P>0.10
Minimum March temperature	r=0.3896	P>0.10	r=0.5506	P<0.05	r=0.5718	P<0.05
Minimum April temperature	r=0.0566	P>0.10	r=0.4990	P< 0.10	r=0.0100	P>0.10
Minimum May temperature	r=0.2263	P>0.10	r=0.1212	P>0.10	r=0.3713	P>0.10
Mean May temperature	r=0.0632	P>0.10	r=0.0332	P>0.10	r=0.1783	P>0.10
Maximum May temperature	r=0.0332	P>0.10	r=0.0686	P>0.10	r=0.1122	P>0.10
Spring rainfall	r=0.2102	P>0.10	r=0.2404	P>0.10	r=0.0600	P>0.10

chicks produced have decreased considerably since the early 1970s (Buxton & Duncan *loc.cit.*); presumably therefore with an associated decrease in breeding adults. Since production of chicks was highly correlated with the altitudinal distribution of adults (Figure 6, r=0.978 P<0.001) fields at around an altitude of 320–360 m were particularly important. Although weather was potentially an important influence on Lapwing chick production no statistically significant correlations were identified over the study period (Table 3) though March minimum temperatures were close to having a positive effect and spring rainfall suggested a negative, but non-significant, effect. However, no data were available on total losses of both eggs and chicks due to heavy snow falls in the early breeding season.

Oystercatcher

Limited data suggested that, as with Lapwing, numbers were greatest in early spring compared to early summer (40% and 9% decreases in 2007 and 2008 respectively). However, estimates of this species were complicated by its flocking behaviour throughout the breeding season. Flocks, presumably comprised of pre-breeding, non-breeding, off-duty or failed breeding birds, were dispersed at a number of locations along the rivers; at times these were observed in fields along the transect and could greatly influence numbers. Good areas for Oystercatchers were also good areas for Lapwings (Figure 7, r=0.8287, p<0.01), so the former species too was found at all altitudes although maximum numbers were around 320–360 m altitude. Annual production of chicks varied considerably between years but, overall, showed no significant trend (r=0.0557, P>0.10) through 2006–2019.

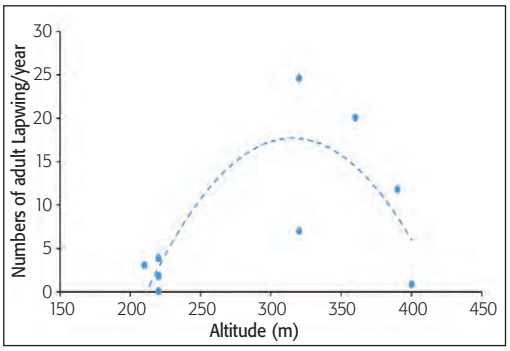


Figure 5. The mean number of full-grown Lapwing per year over 2007–2016 in relation to altitude of their breeding areas.

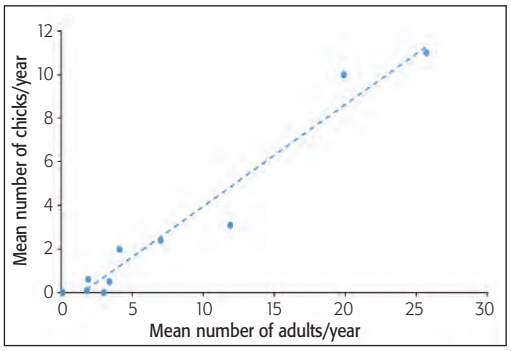


Figure 6. Mean number of Lapwing chicks produced/year in relation to the number of adults at five mile intervals along the transect.

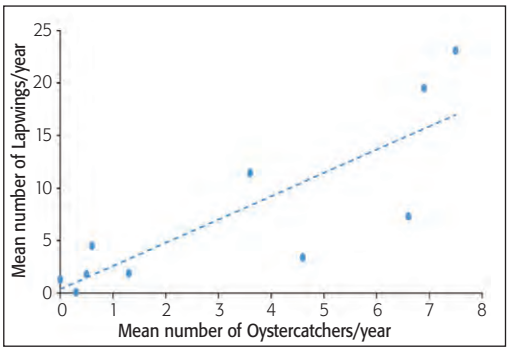


Figure 7. The number of full-grown Lapwing in relation to the number of adult Oystercatchers along the transect.

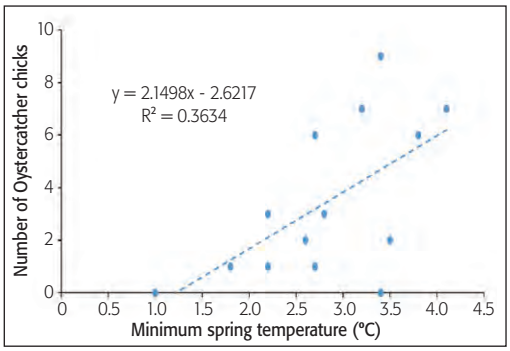


Figure 8. The number of Oystercatcher chicks in relation to the minimum spring temperature (Temperature data from the Met. Office web site).

Chick numbers/year were very low (a mean of 3.2 over the study period) varying between none and seven and were widely distributed along the transect at all altitudes. Minimum spring temperature was a strong influence (Table 3, r=0.6028, p<0.05), as was March (Figure 8, r=0.5506, P<0.05) with April also showing a non-significant but positive trend for increased chick numbers with higher temperatures. As with Lapwing spring rain appeared to be of little consequence.

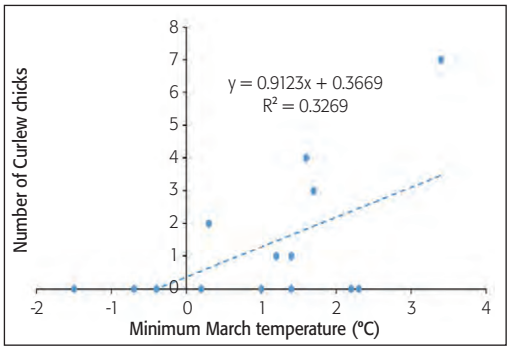


Figure 9. The number of Curlew chicks in relation to minimum March temperature (Temperature data from the Met. Office web site).

Curlew

Small numbers were noted along the transect, but it was the most difficult species to survey because it tended to frequent the moorland areas where vegetation was roughest and birds least visible. Curlews were most numerous at an altitude of 320–390 m; concentrated slightly higher than Lapwings and Oystercatchers. Adult numbers along the transect appeared to increase (Table 2) over the study period (r=0.5571, P<0.05) but if birds in flocks and two birds without chicks were excluded both adults and chicks showed a non-significant trend of decrease over the study years. Along the transect there was no evidence of successful breeding in the lower altitude arable grass fields (220 metres) resulting in a non-

significant trend for greatest productivity at higher altitudes (r= 0.6205, P<0.1). However, the highest altitude, 400 metres, with greatest exposure and the presence of a ski lift supported no curlew. Exclusion of this upper zone gave a significant positive correlation between number of chicks and altitude (r=0.8436, P<0.01). Productivity was also related to minimum temperatures with March being the most important month (Table 3, r=0.5718, P<0.05). Again, spring rain appeared to have little influence.

Discussion

Breeding waders were distributed through the upland farmland of the central Highlands, occurring in specific habitats, defined by agricultural management, from an altitude of about 200 metres to 400 metres with an optimum altitude of around 300 metres. Within this breeding range the numbers of both adult and chicks of Lapwing, Oystercatcher and Curlew counted varied between years. In no species was there a significant trend in numbers over the study years, which was in direct contrast to the large decline in chick numbers demonstrated between the early 1970s and the present (Buxton & Duncan *loc.cit.*). However, the between-year variation in Lapwing chick production ranged from a maximum of 49 in 2016 to 18 in 2008 and 2017. Numbers of Oystercatcher and Curlew also varied between years. In June many Lapwing broods still comprised three or four very small chicks. It is unlikely that all chicks counted in June would survive to fledging. This means the average productivity would be below 0.8 chicks/pair. Shrubb (2007) suggested that to maintain numbers Lapwing required to fledge between 0.8 and 1.0 chicks per breeding pair.

High spring temperature, especially in March, led to an increase in chick productivity for all three species and significantly so for both Oystercatcher and Curlew. Rainfall had no significant effect on chick production despite major variations in spring rainfall totals between years. Hence it would appear that these upland waders are well adapted to their current climatic environment such that contemporary weather variation has only minimal direct effect on productivity and, hence, long-term numbers. However, the large-scale reduction in breeding wader numbers over the latter years of the 20th century, now so well recognised (Shrubb 2007, Newton 2017), occurred initially in the arable lands of England and southern Scotland and latterly in the straths, glens and moorlands of the north of Scotland which, for so many years (Newton 2020), have been a continuing stronghold of these waders. Whilst climate change may be the critical environmental factor now, it is unlikely as the major influence on wader numbers in England and southern Scotland in the years immediately after World War 2 and, possibly, Highland waders in the latter years of the 20th century.

All three of these species are long lived (BTO Ringing Reports); hence, if productivity is reduced, then the effects of diminished recruitment may not be immediately apparent. When it does become apparent, because the numbers of adult breeding birds are falling, the actual timing and nature of the precise causal factor may be difficult to identify. What has changed in this latter period is upland farming, its structure, technology and crops. In the north of Scotland this is relatively easy to identify from Scottish Government statistics (Scottish Government 2018a & b) and technical reports on farming in Scotland (Scottish Agricultural College 2009, 2011, Holland *et al.* 2011, Scottish Natural Heritage 2018). Today there is more, and larger, machinery, fewer workers, fewer stock and changed management, especially grazing, regimes. Additionally overall cropping on many farm holdings has reduced but, where it still occurs, there is an increased emphasis on the planting of winter, rather than spring cereals, resulting in earlier germination and greater sward height and density at wader breeding time.

What is the future? On a broad scale the future looks bleak or, at best, with a question mark! Currently breeding wader conservation focuses on two initiatives. Firstly either national or international protected areas. Many breeding waders are widely dispersed so there are relatively few breeding waders on protected sites and the majority live in the wider countryside. The second initiative is agri-environment schemes of which the Agri-Environment Climate Scheme, jointly funded by the Scottish Government and the EU, is currently the one in use. However, the UK leaving EU must pose questions as to whether positive initiatives in wader conservation will continue and whether the stability of the populations in the early 21st century will change. If there is no living to be made by local people then

areas will be abandoned which, as reduced stocking in recent decades has demonstrated, is also bad for most wader populations. The best hope for upland wader populations in the future is in the design, uptake and implementation of agri-environment schemes promoted by the Scottish Government.

Acknowledgements

Our thanks are due to the Scottish Ornithologists' Club, which gave financial assistance to facilitate the early surveys in this study. Ms M. de la Torres and Ms J. Johnson gave helpful advice on Scottish agricultural statistics. Further thanks should go to Dr R.W. Summers who retained the original 1970s ringing data upon which this later project was built and was instrumental in the early fieldwork. Thanks are also due to Prof J. Wilson (RSPB), Prof. D. Thompson (SNH), Dr K. Park, Ms E. Sheard (Stirling University) for helpful discussions and Fraser Symonds and Karen Sutcliffe who read and made helpful comments on early drafts of this paper. Additional thanks are due to a referee who helpfully suggested a number of improvements to the final draft.

References

Balmer, D., Gillings, S., Caffrey, B., Swann, R., Downey. I. & Fuller, R. 2013. *Bird Atlas 2007–11: The Breeding and Wintering Birds of Britain and Ireland*. British Trust for Ornithology.

Buxton, N.E. & Summers, R.W. 2006 The Lapwing Run. *Scottish Bird News* 82: 17. SOC.

Buxton, N.E. & Duncan, K. 2021. Where have the breeding wader gone? Changing distributions in habitat and fluctuating numbers of breeding waders in the Central Highlands of Scotland. *Scottish Birds* 41 (4): 295–303.

Eaton, M., Aebischer, N. Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R. 2015. Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man, *British Birds* (108): 708–746.

French, P., Insley, H., Siriwardena, G. & Buxton, N. 2000. The breeding success of a population of Lapwings in part of Strathspey 1996–1998. *Scottish Birds* 21: 98–108.

Holland, J.P., Morgan-Davies, C., Waterhouse, T., Thompson, S., Midgley, A. & Barnes, A. 2011. *An Analysis of the Impact on the Natural Heritage of the Decline in Hill Farming in Scotland*. Scottish Natural Heritage Commissioned Report No. 454.

Holloway, S. 1996. *The Historical Atlas of Breeding Birds in Britain and Ireland 1875–1900*. T. & A.D. Poyser.

Met Office. 2019. www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index

Newton, I. 2017. *Farming and Birds*. Collins.

Newton, I. 2020. *Uplands and Birds*. Collins.

O`Brien, M., Tharme, A. & Jackson, D. 2002. Changes in breeding wader numbers on Scottish farmed land during the 1990s. *Scottish Birds* 23 (1): 10–21.

Scottish Agricultural College. 2009. *Farming`s retreat from the hills*. Report for the Scottish Government.

Scottish Agricultural College. 2011. *Response from the hills: Business as usual or a turning point?* Report from the SAC Rural Policy Centre.

Scottish Government. 2018.

a) www2.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/Publications/histagstats

b) www2.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/PubEconomicReport www2.gov.scot/Resource/0044/00441528.pdf

Scottish Natural Heritage. 2018. www.nature.scot/information-library-data-and-research/official-statistics/official-statistics-terrestrial-breeding-birds

Shrubb, M. 2003. *Birds, Scythes and Combines: A History of Birds and Agricultural Change. Cambridge University Press.*

Shrubb, M. 2007. *The Lapwing*. T. & A.D. Poyser.

Spencer, K.G. 1953. *The Lapwing in Britain*. Brown and Sons. London and Hull.

Nigel E. Buxton, Westholme, Station Road, Newtonmore PH20 1DH.
Email: nigelebuxton@hotmail.com

Revised ms accepted 2021

Plate 155. Golden Eagle nestling prior to ringing at a territory in the Central Highlands, also illustrating Mountain Hare and Red Grouse as prey remains, June 2021. © *Stuart Benn*

The diet of breeding Golden Eagles in the Central Highlands of Scotland

D.P. WHITFIELD, S. BENN, J.R. GRANT & E. WESTON

Summary

There is a gap in knowledge of Golden Eagle diet from birds occupying the region immediately east of The Great Glen, largely composed of the Monadhliath hills and mountains: differentiated in a biogeographical classification as Natural Heritage Zone 10, the Central Highlands. Previous studies have described the diet of eagles to the east as being largely Red Grouse and Mountain Hare, whereas to the west eagle diet is more diverse. We analyzed records of over 1,000 individual food remains from post-fledging nest clearances and visual observations during tagging and/or ringing of nestlings, collected over six years between 2015 and 2021 in NHZ 10 at several territories. The majority (95%) of food remains by number involved Red Grouse and Mountain Hare. Our results suggest that eagles breeding in the Central Highlands have a greater dietary affinity with conspecifics to the east and south-east. We also show that Mountain Hare leverets may often be a prey item for Golden Eagles, when prior assumptions seem to have been that only adults may be taken.

Introduction

The diet of Golden Eagles (*Aquila chrysaetos*) in Scotland has been well-studied through analysis of food remains collected at and around the nest, and of regurgitated pellets, begun in comprehensive national quantification by Jeff Watson and colleagues (Watson *et al.* 1987, 1992a, b, 1993, Watson 2010). Contemporary studies in North-East Scotland by Adam Watson and colleagues (Watson *et al.* 1989), south Scotland (Marquiss *et al.* 1985) and subsequent research in western Scotland, including comparisons with the diet of White-tailed Eagles (*Haliaeetus albicilla*) (Madders & Marquiss 2003, Whitfield *et al.* 2009, 2013) have been largely consistent.

A key finding of the research led by Jeff Watson was that in the Highlands and Islands of Scotland there was an east/west split, so that in the eastern Highlands the breeding season diet was dominated by Red Grouse (*Lagopus lagopus scotica*) and Mountain Hare (*Lepidus timidus*) while the diet in the western Highlands and Islands was more diverse, including seabirds at the oceanic extremes, and a wider range of other mammalian and avian species. Such diversity in the western Hebridean Islands was confirmed by Whitfield *et al.* (2009, 2013), with some eagles specializing in locally abundant species.

In attributing where any east/west split in breeding diet may occur, the studies of Watson *et al.* (1987, 1993) did not include a region that is mostly situated east of The Great Glen, characterized on biogeography as Natural Heritage Zone (NHZ) 10: the Central Highlands (SNH 2000, Whitfield *et al.* 2008). Much of this region involves the Monadhliath range of hills and mountains, with the wider area extending into western Strathspey and the uplands of north-west Morayshire in the north-east (SNH 2000). This region (NHZ 10) has been the focus of considerable recent efforts in the study of Golden Eagles (e.g. Benn & Whitfield 2020, 2021), including their breeding season diet.

The primary objective of this paper is to describe the results of dietary studies conducted in NHZ 10 through records of food remains at nests gathered over recent years. This should elucidate more precisely where any Scottish Highlands east/west split in diet may occur.

We also evaluate the age of Mountain Hares taken as prey, based predominantly on biometrics of hind legs and physiology. Previous studies (e.g. Watson 2010) have implicitly assumed that in contribution of prey mass to dietary intake, only adult hares are taken.

Methods

Our study area involved NHZ 10: The Central Highlands (Figure. 1). In 2021 there were an estimated 26 territorial pairs of Golden Eagles: a substantial increase from estimates of 13 and 19 pairs in 2003 and 2015, respectively, when national surveys were conducted (Benn & Whitfield 2021). The vegetation of NHZ 10 is mostly open upland: primarily Heather *Calluna vulgaris* moorland, and wet heath (SNH 2000). There are relatively small areas of woodland, some native but others for commercial exploitation. Land use primarily involves the shooting of Red Grouse and Red Deer (*Cervus elaphus*). Several wind farms have been recently constructed (Fielding *et al.* 2021, 2022).

Nest sites were visited between 2015 and 2021. In some years these were during licensed satellite tagging and/or ringing of nestlings, when nestlings were 50–70 days old, as judged by plumage (Hoechlin 1976, Petersen 1997). To minimize observers' time at the nest during such visits, and to allow any food remnants to be exploited, only visual records of food identities at or under the nest were made. Additional visits to nests, after parents had fledged young, collected remains in a 'clear out' (Grant *et al.* 2011) for subsequent detailed analysis away from the nest site. These collections typically occurred between late July and early September, but some early collections were made November to January in the following calendar year. Such end of season collections can bias diet estimates towards items which are less subject to deterioration (e.g. large bones) and against items which are subject to rapid deterioration (e.g. soft bodied prey) (Marti *et al.* 2007, Whitfield *et al.* 2009, 2013).

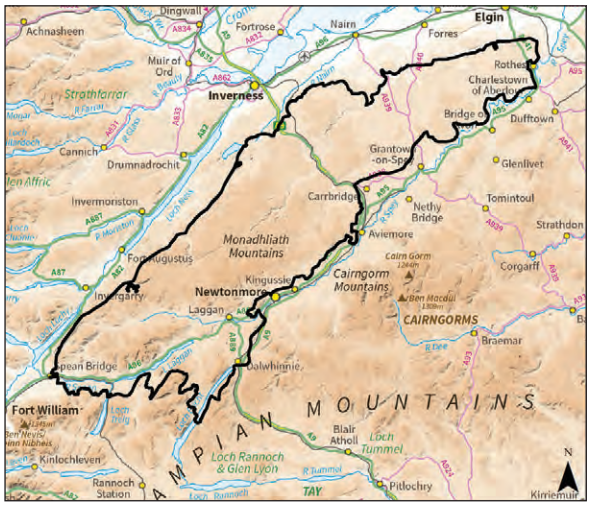


Figure. 1. Central Highlands NHZ 10. Contains Ordnance Survey data *© Crown copyright and database right 2010.*

Moreover, such collections can also bias towards food of eagles brought to the nest late in the breeding season. Golden Eagles also regularly seem to remove uneaten remains or inedible remnants from their nests, so the number of remains in end of season collections is less than for some other raptors such as White-tailed Eagle (Madders & Marquiss 2003, Whitfield *et al.* 2013). Conversely, some remains can fall through the nest structure (Grant *et al.* 2011), so that collections may refer to more than one breeding season if the contents had not been cleared in a previous year. Eagles' nest-cleansing behaviour also infers that food taken earlier in the breeding season is much less likely to be represented by clear outs at the end of the season (Marti *et al.* 2007).

There are consequently several biases associated with different methods used to estimate diet (Marti *et al.* 2007, García-Salgado *et al.* 2015). Nonetheless, dietary estimates from post-breeding nest clearances allow a broadly comparable basis for evaluation of food items taken, if under the same method and at the same period in the breeding cycle.

Food items were identified to the lowest taxonomic level, ideally species. Identification was undertaken using keys such as Brom (1986), Teerink (1991), www.featherbase.info, and personal reference collections. Estimates on the minimum number of food items ensured that collected parts of an item did not result in the same individual being counted twice through, for example, comparing measurements and/or left/right counterparts of the same body parts (Marti *et al.* 2007).

We focused on Mountain Hares as food items. Remains of juveniles (young of the year: leverets) and older adults can be differentiated by the degree of leg bone fusion (calcification) at their epiphyseal joints (J. Grant *unpubl. data*) since leverets are still growing in summer. In consequence leverets are also smaller, and so can also be discriminated based on tibia, femur and jaw lengths. Additionally, after depredating hares (and Rabbits *Oryctolagus cuniculus*) eagles often appear to leave intact the distal part of the hind limb complete with skin and fur, likely because of its limited musculature. With scrutiny of remains, Rabbits can be distinguished from hares based on a combination of leg/foot lengths cross referenced to leg-joint calcification (J. Grant *unpubl. data*) and medullary hair characteristics (Teerink 1991). Hence, differentiation between juvenile and adult hares was also based on the length of the 'foot' measurement of remains recovered at nest sites as prey, assuming bimodality in this measure by age due to stage of growth. This measure involves the combined phalanges (and 'toenails'), metatarsal and tarsal bones i.e. from proximal end of the calcaneus (heel bone) to the longest toenail.

To account for the possibility that hare leg remains could involve the same individual, each foot was documented as either left or right and force-measured at a right-angled tarsal-tibiofibular joint with a stopped ruler, to the tip of the longest phalangeal toenail. Through drying of skin and contraction of tendons over time the remains of hare feet can reduce in length, and so a ≤ 2 mm limit was used to assign a left and right foot to the same individual. Hence, if there was a left foot and a right foot recorded in the same nest remains, which were joined skeletally via a pelvis or were separate but measured at ≤ 2 mm difference, the two feet were assumed to be from the same

Table 1. Summary of food remains collected or observed at nests in 15 Golden Eagle territories in NHZ 10 2015–2021. To preserve confidentiality the locations of territories are not given. MH = Mountain Hare, RG = Red Grouse, ad = adult, juv = juvenile (young of the year). Comments: NC = nest clearance post-fledging, VO = visual observation when nestlings were tagged and/or ringed.

Territory	MH total	MH ad	MH juv	RG total	RG ad	RG juv	Other records*	N remains	N years	Years	Comments
1	45	41	4	27	1	1	1 Teal, 1 Red Deer fawn & 1 Roe Deer fawn	75	2	2018, 2021	NC
2	4			2				6	1	2018	VO
3	6	2	0	66			1 Snipe, 1 Red Fox cub, 1 Pheasant poult, 1 Golden Plover & 1 unidentified wader	77	4	2015, 2016, 2018, 2019	NC
4	2	2	0	2	1	1	1 adult Ptarmigan	5	1	2018	NC
5	143	20	21	293			4 Black Grouse, 9 Hooded Crow, 1 Woodpigeon, 2 Roe Deer fawn, 2 Red Squirrel, 1 Jackdaw, 1 Pheasant & 1 Buzzard	457	2	2016, 2019	NC
6	7	6	1	11			Unidentified young bird	19	1	2019	NC
7	23	5	11	12	6	3	Red Deer fawn leg	36	3	2019, 2020, 2021	NC. VO only in 2021
8	6	2	4	3	1	2	Badger cub & Roe Deer fawn	11	1	2020	NC. VO on Badger and Roe Deer under nest
9	14	1	4	128	16	1	2 Rabbit (juvenile) & 1 Water Vole	145	3	2015, 2020, 2021	NC
10	10			9				19	2	2015, 2020	NC. VO in 2020
11							1 Water Vole	1	1	2021	VO
12	34	4	30	137			1 Stoat, 1 Mistle Thrush, & 1 Short-eared Owl	174	1	2015	NC
13	14	2	12	20				34	1	2015	NC
14	4			16			1 large bird	21	1	2016	NC
15	1			6			Sheep remains & 1 Pheasant	9	1	2016	NC

* Teal *Anas crecca*, Roe Deer *Capreolus capreolus*, Snipe *Gallinago gallinago*, Red Fox *Vulpes vulpes*, Pheasant *Phasianus colchicus*, Golden Plover *Pluvialis apricaria*, Ptarmigan *Lagopus mutus*, Black Grouse *Lyrurus tetrix*, Hooded Crow *Corvus cornix*, Woodpigeon *Columba palumbus*, Red Squirrel *Sciurus vulgaris*, Jackdaw *Corvus monedula*, Buzzard *Buteo buteo*, Badger *Meles meles*, Water Vole *Arvicola amphibius*, Stoat *Mustela erminea*, Mistle Thrush *Turdus viscivorus*, Short-eared Owl *Asio flammeus*, Sheep *Ovis aries*.

individual hare. (From one nest clearance in the present study these criteria led to 33 hare feet being classed as from 21 individuals.)

Some earlier dietary studies of Golden Eagle and other raptors pooled all data collected from different nests or territories and years to present a study area dietary composite (e.g. Watson *et al.* 1993, Wildman *et al.* 1998). Such pooling can create biases and not represent the study area properly, when samples from nests/territories with many remains or pellets may be over-represented from those with fewer records but with potentially a different diet. Most recent studies have consequently used the territory as the basic sampling unit (e.g. Katzner *et al.* 2006, Whitfield *et al.* 2009). We followed this practice.

Table 2. Proportional contributions of Mountain Hare (MH) and Red Grouse (RG) towards estimated regional diet late in the breeding season for Golden Eagles in NHZ 10, 2015–2021. Territory numbers refer to Table 1, based on ≥ 10 samples per territory for inclusion.

Territory	MH + RG	MH	RG
1	0.96	0.6	0.36
3	0.94	0.08	0.86
5	0.95	0.31	0.64
6	0.95	0.37	0.58
7	0.97	0.64	0.33
8	0.82	0.55	0.27
9	0.98	0.10	0.88
10	1.00	0.53	0.47
12	0.98	0.20	0.79
13	1.00	0.41	0.59
14	0.95	0.19	0.76
Mean	0.95	0.36	0.59
SD	0.05	0.20	0.21

Under this practice, in assigning a representative sample of prey items to an individual territory a minimum of ten food items was also used as a threshold in describing the regional data (e.g. Korpimäki 1987, Whitfield *et al.* 2009, 2013). In the present paper we have presented all data, but descriptive analyses summarizing the regional dietary records have been restricted to those territories with at least 10 records.

Results

Dietary data 2015–2021 were gathered at 15 territories in NHZ 10, mostly in the south where the majority of occupied territories were located (Table 1). Eleven territories passed the threshold of ≥ 10 samples per territory, with varying sample sizes across years and per year (Table 1) revealing that Red Grouse and Mountain Hare were the predominant food items recorded, composing on

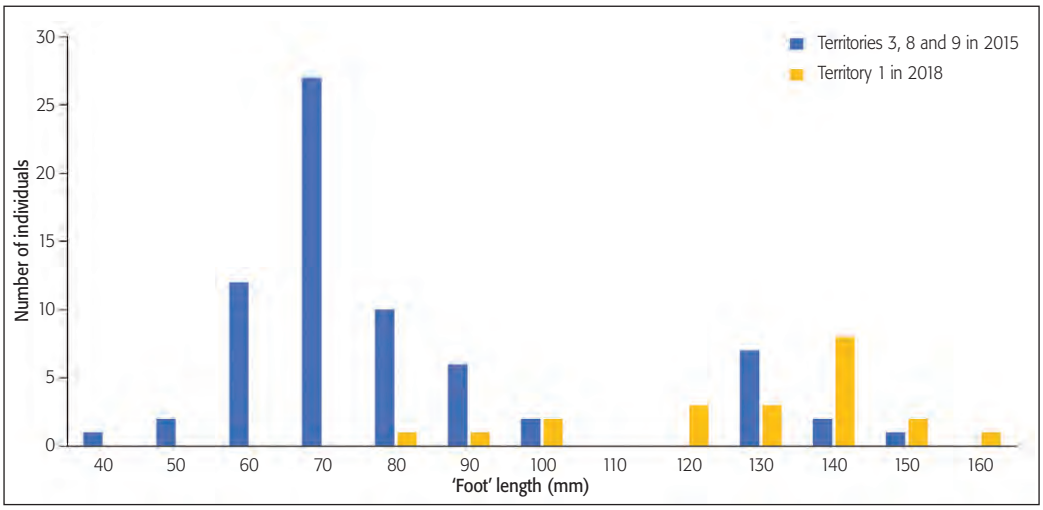


Figure. 2. Examples showing the frequencies of foot length measures of individual Mountain Hare remains recovered from Golden Eagle nests: within territory 1 in 2018 (yellow bars) and within territories 3, 8 and 9 in 2015 (blue bars) (see also Table 1 and Methods). Bimodal distributions illustrate the juncture between juvenile and adult Mountain Hare foot length. Degree of leg bone fusion (calcification) at epiphyseal joints (Methods) confirmed classification of age via foot length measures.

average 95% by number of total items (Table 2). The inter-territory variation on the contribution of these two food items was minimal (Table 2). On average 59% of food items involved Red Grouse and 36% involved Mountain Hare (Table 2). Mountain Hare leverets were often taken as prey (Table 1, Figure. 2).

Discussion

The estimated diet of breeding eagles in NHZ 10 was dominated by Red Grouse and Mountain Hares and was consequently more akin to prey taken to the east and south-east, rather than to the west and south-west (Watson *et al.* 1989, Watson *et al.* 1993, Watson 2010, Whitfield *et al.* 2009, 2013). The Golden Eagle can be characterized as a generalist predator, which may explain its extensive Northern Hemisphere distribution (Watson 2010). Globally there may be regional/national exceptions, such as breeding season specialization on tortoises (*Testudo* spp.) in parts of the northern Mediterranean basin (notably Greece: Handrinos & Akriotis 1997). Nevertheless, across its wider global distribution Watson (2010) showed that lagomorphs (rabbits and hares) and Galliformes (Tetraonidae: grouse and pheasants) were often predominant prey, suggesting a preference for them: notably lagomorphs.

Under this assumption of preference, the coarse differences in diet across Scotland is probably related to the comparable abundances of Red Grouse and hares, rather than any fundamental geographical divisions, per se. The distribution of these prey species, and their abundance, is probably at least partly governed by a crude east/west split in climate related to the persistent influence of oceanic (west and wet) and continental (east and dry) weather patterns (Whitfield *et al.* 2008).

However, the goal of some land managers to create conditions favourable to Red Grouse for their shooting, especially for driven shoots with especially intensive management, has likely emphasized this inherent eastern distribution and the abundance of Red Grouse there (Whitfield *et al.* 2008). Mountain Hares may intrinsically benefit from, or exploit, such management including legal and illegal predator control. Nevertheless, any potential benefit could probably be severely degraded by hare culls on some ground where maximizing grouse numbers is deemed paramount, when some grouse moor managers mistakenly view hares as threats to grouse numbers via disease vectors. Hare numbers on intensively managed ground for driven grouse shooting have disproportionately declined (Watson & Wilson 2018).

Further clues to the prey preferences emphasized by Watson (2010) are revealed in Scotland by exceptions to the east/west dietary split in the west where, for example, birds in the mountains of north Harris frequently took members of a remnant Mountain Hare population and Red Grouse often featured in the diet of Harris and Lewis eagles (Whitfield *et al.* 2009, 2013, R. Reid pers. comm.). The introduced Irish Hare (*L. t. hibernicus*) often predominated as prey on the Isle of Mull, and Rabbits were locally important on the islands of Skye and North Uist (Whitfield *et al.* 2009, 2013, R. Reid pers. comm.), despite ravages on Rabbit populations elsewhere through myxomatosis and viral hemorrhagic disease.

Mountain Hare leverets were often taken as prey, but this varied by year and by territory and more adults were recorded in some cases (Table 1, Figure. 2). We had insufficient sampling to examine further this variation, which is also apparent further east (E. Weston pers. obs.). Eagles taking leverets as prey may depend on local abundances and this may, in turn, also depend on the stage of the cyclical nature of hare populations and/or any suppression via mass culls (although such culls did not occur in our study's territories: S. Benn pers. obs.). However, that leverets can be frequent prey items has implications for attempts to characterize eagle diet via consumed mass through assumed weights of food items.

Acknowledgements

Many of the earlier nest collections were the result of research and monitoring studies funded by SSE under the Regional Eagle Conservation Management Plan (RECMP) centered on NHZ 10 through planning conditions attached to the Dunmaglass Wind Farm. Other later collections were undertaken through SSE funding for the Stronelairg Wind Farm Habitat Management Plan. Both Plans on research and survey/monitoring are independently administered by Natural Research, with gratitude to Pat Whitfield. Mick Marquiss identified several unusual items in early collections. We are indebted to Emma Ahart, Thomas Plant, Nicki Small and several other staff of SSE for their considerable assistance in developing and maintaining SSE's continued support of independent research on Golden Eagles. The roles of Emma Ahart, Paul Haworth and Alan Fielding in creating the RECMP were indispensable. The Highland Raptor Study Group (HRSG) deserves many thanks for their continued substantial assistance and expertise towards realizing the RECMP, notably Dave Pierce, Keith Duncan, Jon Clarke, Andrew Davies and Lewis Pate. The co-operation and enthusiastic support from several landowners and their estate staff has also been crucial and gratefully received.

References

Benn, S. & Whitfield, D.P. 2020. *Golden eagle monitoring in the Central Highlands of Scotland (NHZ 10) in 2020*. Natural Research, Banchory.

Benn, S. & Whitfield, D.P. 2021. *Golden eagle monitoring in the Central Highlands of Scotland (NHZ 10) in 2021*. Natural Research, Banchory.

Brom, T.G. 1986. Microscopic identification of feathers and feather fragments of Palearctic birds. *Bijdragen Dierkunde* 56: 181–204.

Fielding, A.H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. & Whitfield, D.P. 2021. Non-territorial GPS-tagged golden eagles *Aquila chrysaetos* at two Scottish wind farms: avoidance influenced by preferred habitat distribution, wind speed and blade motion status. *PLoS ONE* 16: e0254159. https://doi.org/10.1371/journal.pone.0254159

Fielding, A.H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. & Whitfield, D.P. 2022. Responses of dispersing GPS-tagged Golden Eagles *Aquila chrysaetos* to multiple wind farms across Scotland. *Ibis* 164: 102–117.

García-Salgado, G., Rebollo, S., Pérez-Camacho, L., Martínez-Hesterkamp, S., Navarro, A. & Fernández-Pereira. J.-M. 2015. Evaluation of trail-cameras for analyzing the diet of nesting raptors using the Northern Goshawk as a model. *PLoS ONE* 10: e0127585. https://doi:10.1371/journal.pone.0127585

Grant, J.R., Reid, R. & Whitfield, D.P. 2011. Clearing nests of prey remains does not influence subsequent nest choice in White-tailed Eagles. *Scottish Birds* 31: 308–310.

Handrinos, G. & Akriotis, T. 1997. *The Birds of Greece*. Christopher Helm, London.

Hoechlin, D.R. 1976. Development of golden eaglets in southern California. *Western Birds* 7: 137–152.

Katzner, T.E., Bragin, E.A., Knick, S.T. & Smith, A.T. 2006. Spatial structure in the diet of Imperial Eagles *Aquila heliaca* in Kazakhstan. *Journal of Avian Biology* 37: 594–600.

Korpimäki, E. 1987. Dietary shifts, niche relationships and reproductive output of coexisting Kestrels and Long-eared Owls. *Oecologia* 74: 277–285.

Madders, M. & Marquiss, M. 2003. A comparison of the diet of White-tailed Eagles and Golden Eagles breeding in adjacent ranges in west Scotland. In Helander, B., Marquiss, M. & Bowerman, W. (eds) *Sea Eagle 2000. Proceedings from an International Conference at Björkö, Sweden, 13–17 September 2000*: 289–295. Swedish Society for Nature Conservation, Stockholm.

Marquiss, M., Ratcliffe, D.A. & Roxburgh, R. 1985. The numbers, breeding success and diet of Golden Eagles in southern Scotland in relation to changes in land use. *Biological Conservation* 33: 1–17.

Marti, C.D., Bechard, M. & Jacksic, F.M. 2007. Food habits. In D.M. Bird, K.L. Bildstein, D.R. Barber, & A. Zimmerman, (eds). *Raptor research and management techniques*: 129–153. Hancock House Publishers Ltd, British Columbia, Canada.

Peterson, D. 1997. *Möt Kungsörnen*. ICA Bokförlag, Västerås.
SNH (Scottish Natural Heritage). 2000. *Natural Heritage Zones*. SNH, Battleby.
Teerink, B.J. 1991. *Hair of West-European Mammals*. Cambridge University Press, Cambridge.
Watson, A. & Wilson, J.D. 2018. Seven decades of mountain hare counts show severe declines where high-yield recreational game bird hunting is practised. *Journal of Applied Ecology* 55: 2263–2272.
Watson, A., Payne, S. & Rae, R. 1989. Golden eagles *Aquila chrysaetos*: land use and food in North-East Scotland. *Ibis* 131: 336–348.
Watson, J. 2010. *The Golden Eagle*. 2nd edition. Academic Press, London.
Watson, J., Langslow, D.R. & Rae, S.R. 1987. *The impact of land-use changes on golden eagles in the Scottish Highlands*. CSD Report No. 720. Nature Conservancy Council, Peterborough.
Watson, J., Rae, S.R. & Stillman, R. 1992a. Nesting density and breeding success of Golden Eagles *Aquila chrysaetos* in relation to food supply in Scotland. *Journal of Animal Ecology* 61: 543–550.
Watson, J., Leitch, A.F. & Broad, R.A. 1992b. The diet of the sea eagle *Haliaeetus albicilla* and golden eagle *Aquila chrysaetos* in western Scotland. *Ibis* 134: 27–31.
Watson, J., Leitch, A.F. & Rae, S.R. 1993. The diet of golden eagles *Aquila chrysaetos* in Scotland. *Ibis* 135: 387–393.
Whitfield, D.P., Fielding, A.H., McLeod, D.R.A & Haworth, P.F. 2008. *A conservation framework for golden eagles: implications for their conservation and management in Scotland.* Scottish Natural Heritage Commissioned Report No.193 (ROAME No. F05AC306). SNH, Battleby.
Whitfield, D.P., Reid, R., Haworth, P.F., Madders, M., Marquiss, M., Tingay, R. & Fielding, A.H. 2009. Diet specificity is not associated with increased reproductive performance of Golden Eagles *Aquila chrysaetos* in western Scotland. *Ibis* 151: 255–264.
Whitfield, D.P., Marquiss, M., Reid, R., Grant, J., Tingay, R. & Evans, R.J. 2013. Breeding season diets of sympatric White-tailed Eagles and Golden Eagles in Scotland: no evidence for competitive effects. *Bird Study* 60: 67–76.
Wildman, L., O'Toole, L. & Summers, R.W. 1998. The diet and foraging behaviour of the Red Kite in northern Scotland. *Scottish Birds* 19: 134–140.

D. Philip Whitfield, Natural Research, Banchory Business Centre, Aberdeenshire AB31 4BY.
Email: phil.whitfield@natural-research.org

Revised ms accepted February 2022

Plate 156. Male Hen Harrier in flight, Mar Lodge Estate 2021. © *Richard Birchett*

Hen Harrier colonisation of Mar Lodge Estate, Cairngorms National Park - a site under ecological restoration

S. RAO & A. PAINTING

Introduction

In 2016, Hen Harriers *Circus cyaneus* bred on Mar Lodge Estate (MLE) in Upper Deeside, Cairngorms National Park for the first time in living memory (Rao 2020). There are no confirmed historic breeding records of Hen Harrier from MLE and only two possible/probable breeding records from Upper Deeside prior to 1999 (Tucker 1945, Buckland *et al.* 1990). In 1999, a pair fledged two young, the only confirmed breeding in Upper Deeside between 1981–2015 (NERSG 2021).

MLE is owned by the National Trust for Scotland (NTS) and managed for the multiple objectives of conservation, public access and highland sport. Prior to NTS ownership the estate was run as a traditional Highland sporting estate. Since acquiring the estate in 1995, NTS has been undertaking large scale ecological restoration. In its eastern bounds, MLE supports a large remnant (1006 ha) of the ancient Caledonian pine woodland, a UK priority habitat (JNCC 2022). In these remnant woodland and surrounding areas (12,487 ha), the deer population has been reduced significantly to encourage natural regeneration and thus allow large-scale restoration and expansion of the native woodland. The habitat response to this management intervention is now evident and in 2021, 1,900 ha of new natural regeneration was recorded from the forest edge up to 700 m altitude (NTS 2021). The reduced grazing has also induced a marked response in the ground vegetation with much of the area now having a luxuriant field layer with long, mature

heather interspersed with variable sized patches of long grass. This dynamic habitat change can affect the overall biodiversity including improving the prey base, which is potentially beneficial to Hen Harriers (Milne *et al.* 1998; Evans *et al.* 2006; Bush *et al.* 2012, den Herder *et al.* 2016).

Hen Harriers re-colonised North-East Scotland in the 1940s with peak breeding numbers recorded in the 1990s (28 pairs). However, despite areas of suitable habitat and prey, Hen Harriers declined to 3–5 pairs in 2009–2013 with only one confirmed breeding in 2014 (Rebecca *et al.* 2016). Since then, there has been a partial recovery, with a current estimate, including the MLE population, of around 20 breeding pairs (NERSG 2021).

In Britain and Ireland, breeding Hen Harriers are associated with open heather-grass habitats for both hunting and nesting and are universally considered a 'moorland' species (Watson 1977). However, where available, they also utilise scrub areas, young conifer plantations and young re-stock areas (Petty & Anderson 1986, Barton *et al.* 2006, Arroyo *et al.* 2008, Haworth & Fielding 2009, Carvaggi *et al.* 2020). Throughout Britain and Ireland, historic land management practices have resulted in an upland landscape which is extensively burned and/or heavily grazed at a large scale resulting in an unnatural short either burned or closely cropped field layer. Almost half (7%) of Scotland's upland heather moorland areas (15% of Scotland's land area) is managed for Red Grouse *Lagopus lagopus* shooting (Scottish Government 2019a). Woodland, where present, is often dominated by commercial conifer plantations. In recent years, driven by public policy and incentives (Scottish Government 2019b, 2020a 202b), such land is being encouraged to be managed to deliver wider ecosystem services and biodiversity benefits. Across a number of sites in Scotland, grazing pressure is being reduced, burning ceased and natural processes restored often to deliver native woodland expansion e.g. Abernethy Reserve (RSPB), Creag Meagaidh (NatureScot) and Glen Feshie (Wildland Ltd). Hen Harrier colonisation of MLE allows us the chance to study the ecology of the species in an example of this 'new' upland management paradigm. Here we review the ecological characteristics of Hen Harrier colonisation of MLE, suggest reasons for this in the context of the ecological restoration work undertaken and detail the fate of Hen Harriers that were satellite-tagged on the estate.

Plate 157. Caledonian pinewood habitat, Mar Lodge Estate 2020. © *Shaila Rao*

Study area and methods

MLE is situated in the Cairngorm mountains at the top of the River Dee catchment in Deeside (Figure 1). The estate forms 7% of the Cairngorms National Park. At 29,340 ha, MLE is the largest National Nature Reserve in Britain, with over 80% covered by international conservation designations (Ramsar, Special Protection Area & Special Area of Conservation). The estate is mountainous and ranges in altitude from 320 m to 1,309 m. It supports 1,745 ha of woodland (semi-natural Caledonian pinewood (1006.7 ha), 1970s commercial plantations (607.9 ha) and new native woodland schemes (130.4 ha), and 1,900 ha of developing natural regeneration. Regenerating areas represent early successional woodland with 82.2% of regenerating trees occurring along a sample of 11 km of transects being less than 1 m in height (NTS 2021). Overall, MLE is dominated by open habitats with over 25,000 ha of heathland, blanket bog, upland grassland and montane heath habitats. Red Deer density across the whole estate in 2020 was 5.7 per km², but in the remnant Caledonian pinewood area has been reduced to less than 1 per km² since 2010.

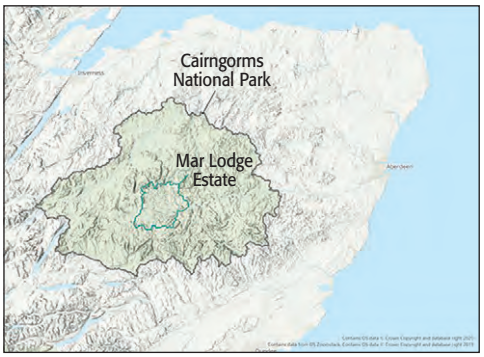


Figure 1. Map showing the location of Mar Lodge Estate within Scotland and North-East of Scotland.

Walked up Red Grouse shooting and deer stalking with clients still occurs across the western part of the estate. Muirburn ceased in the eastern part of the estate in 1995 and in the western part of the estate in 2017. Limited predator control of foxes and crows only is still undertaken.

Hen Harrier occupancy and breeding success was monitored during 2016–2021 following the methods in Hardey *et al.* (2006). This involved vantage point observations to identify potential breeding pairs and subsequent classification using specified criteria into Confirmed, Probable or Possible breeding. As this was a new breeding population there was interest in detailing the breeding behaviour, ringing, and satellite tagging a sample of the chicks. Once breeding was confirmed from observations, a visit was made to confirm clutch size, then one or two visits were made to determine hatching success and to calculate a suitable ringing/satellite-tagging date. For this paper, chicks were considered fledged if observed away from the nest. The whole estate was monitored but there is the possibility that a small number of breeding pairs could have been missed if they failed early.

The following variables were recorded for each nest (Table 1).

Table 1. List of variables recorded for each Hen Harrier nest monitored on MLE 2016–2021.

Measure	Categories/units
OS Grid reference	12 figure
altitude	metres above sea level
aspect	north, north-east, east, south-east, south, south-west, west, north-west
heather height at nest	single measure in cm (only recorded 2019 onwards)
habitat	NVC community
proximity to mature woodland (>50 years)	metres
proximity to young regeneration	metres
eggs/chicks in nest	count of eggs and/or chicks
distance to nearest neighbour nest	kilometres

Over the last 22 years, data on heather heights has been recorded every 20 m along individual 1 km transects while undertaking 11 one-kilometre regeneration transects across the eastern part of the estate.

Table 2. Breeding attempts and success, fledged chicks and productivity for Hen Harriers at MLE 2016–2021.

	Breeding**				Failed		Chicks	Productivity
Year	Con	Prob	Poss	Successful	Deserted	Predated?	fledged	(fly/con+prob)
2016	1			1			4	4
2017	1			1			2	2
2018	7			7			24	3.4
2019	6		1	3		3	8	1.2
2020*	5			4		1	13	2.6
2021	6			5	1		16	3.2
Total	**26**		**1**	**21**	**1**	**4**	**67**	**Mean 2.6**

*Monitoring in 2020 was affected by COVID-19 and so coverage was less comprehensive than in other years.
** Con - confirmed, Prob - probable, Poss - possible as per Hardey *et al.* (2006)

A high proportion of Hen Harrier chicks were ringed and a sample satellite tagged as part of the RSPB Hen Harrier Life Project (RSPB 2020), under licence from the British Trust for Ornithology. All staff involved in monitoring held appropriate Schedule 1 licences.

Results

Numbers and productivity

Over the first six years of Hen Harrier breeding at MLE there have been 27 breeding attempts recorded (26 confirmed, 1 possible, Table 2) with 80.8% of confirmed nests having successfully fledged chicks. Of the five nest failures, one nest was deserted on eggs, three nests were predated on eggs and both chicks and adults were predated at one nest.

Mean clutch size was 4.9 (±0.2 SE) eggs and the range in clutch size 3 to 7 eggs. There was a mean of 23.2% (±5.0% SE) unhatched eggs per clutch. Sixty-seven chicks were fledged over the six years and these derived from a total of 104 eggs laid. This equates to 2.6 chicks per nesting attempt and 3.2 chicks per successful nest (excl. deserted and predated nests). Of these chicks, 23 were male, 20 female and 24 were not sexed and thus unknown. Only four chicks were recorded as failing post-hatching. Fourteen eggs were predated and four deserted.

Two nests were observed to be fathered by young ring-tailed males and both of these nests were successful. Polygyny was recorded on one occasion with a male serving two females. One of these nests was predated at the egg stage.

Nest characteristics and habitat

The mean altitude of 26 nests was 507 m (±8.2 m SE), the range 450–606 m with 88.5% of nests having a southerly inclined aspect (south-west, south or south-east, Figure 2). Only two nests (the same satellite tagged female in succeeding years) had a northerly aspect. She deserted one of these nests on eggs in late cold and snowy weather in 2021 and this is the only nest recorded as having been deserted on eggs.

Plate 158. Typical Hen Harrier nest, Mar Lodge Estate 2020. © *Shaila Rao*

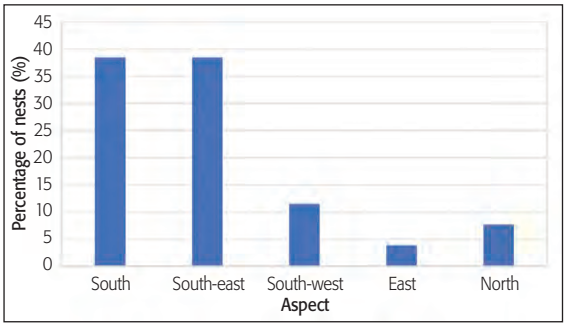


Figure 2. Percentage of Hen Harrier nests recorded for each aspect at MLE 2016–2021.

Plate 159. Hen Harrier nest with very young chicks, a few days old, Mar Lodge Estate 2021. © *Shaila Rao*

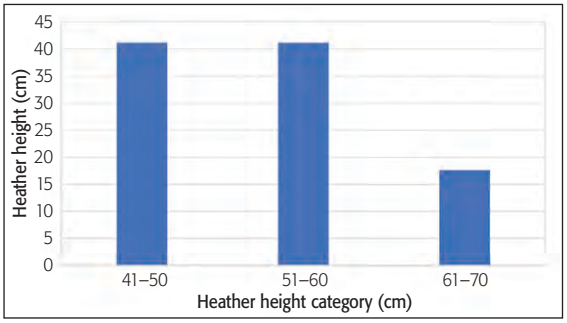


Figure 3. Percentage of Hen Harrier nests within each heather height category at MLE 2016–2021.

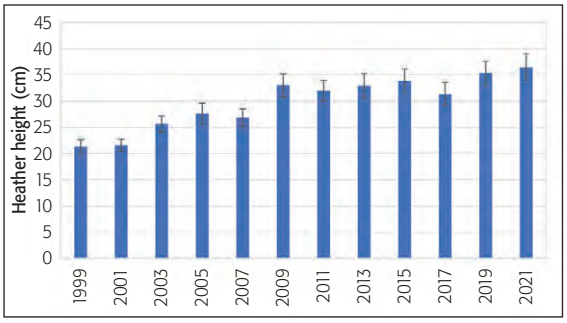


Figure 4. Mean heather height recorded every 20 m along 11 kilometres of regeneration monitoring transects throughout the eastern part of MLE 1999–2021.

All nests were in long mature heather over 40 cm tall and in NVC communities H10 (*Calluna vulgaris - Erica cinerea* heath) or H12 (*Calluna vulgaris - Vaccinium myrtillus* heath) (Rodwell 1992). Mean heather height at the nest was 55.9 cm (±3.4 cm SE) in 2019, 50.4 cm (±2.0 cm SE) in 2020 and 52.2 cm (±2.9 cm SE) in 2021. Across all three years mean heather height at the nests (17 nests) was 53.0 cm (±1.7 cm SE). Figure 3 Illustrates the distribution of nests across heather heights.

Heather height across the eastern part of MLE has increased over the years as the grazing pressure has been reduced with mean heather height increasing from 21.3 cm in 1999 to 36.5 cm in 2021 (Figure 4).

32% of nests occurred on moorland within scattered regeneration that was dominated by Scots Pine at an average stem density of 200–500 stems per ha. In total 60% of nests occurred within or less than 100 m from natural regeneration of pine. Mean height of regeneration across an 11 km sample of transects through regenerating areas was 67.4cm (±1.8 STE) (NTS 2021).

No nests occurred within any mature woodland type and 92% of nests occurred further than 100 m from any mature woodland type. Hen Harriers nested in closest proximity to 1970s plantations followed by native Caledonian pinewood and then New native woodland schemes.

With respect to the land management, 73.1% of harrier nests occurred within the areas where deer density has been reduced to and maintained at fewer/less than 1 deer per km² since 2010 to encourage natural regeneration of the woodland. 26.9% of nests occurred in the area where deer are managed less intensively (average density over last ten years 10.3 deer per km²) and muirburn was carried out until 2017.

Nest distribution in relation to other nests

Across the years 2018 to 2021, when more than one Hen Harrier nest was present, the mean nearest neighbour distance between Hen Harrier nests within a single year was 1.89 km (±0.23 km SE). The smallest mean nearest neighbour distance was recorded in 2019 (1.35 km (±0.66 km SE)) and the longest in 2021 (2.23 km (±0.37 km SE)) but there was no significant difference between any years. The closest together nests occurred in 2019 and were 240 m apart. These were the nests from the one recorded instance of polygyny.

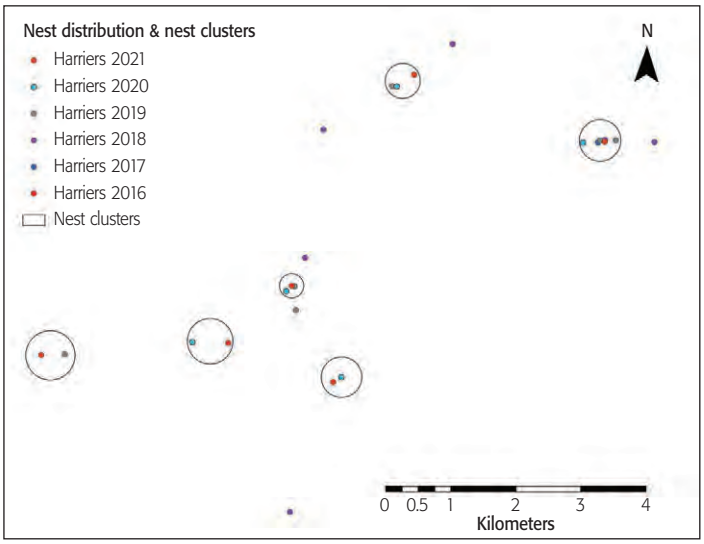


Figure 5. Illustration showing distribution of Hen Harrier nests each year from 2016–2021 at MLE with nest clusters indicated which are likely to be returning adult(s) Hen Harriers to the same nesting area.

Mapping the distribution of nests year on year illustrates the probable site faithfulness of at least one adult from the previous year returning to the same area. Figure 5 shows this nest distribution by year and the clusters.

Satellite tagging

Seventeen Hen Harrier chicks, eight female and nine male, were satellite tagged between 2016 and 2021. Only one is currently still alive (5.9%) and transmitting location data. Twelve chicks perished in the tagging year (70.6%), two chicks survived till the subsequent year (11.8%) and two chicks survived into the second year after tagging (11.8%). Table 3 outlines the fate of the tagged chicks.

Plate 160. Fully feathered, close to fledging Hen Harrier chicks, Mar Lodge Estate 2020. © *Shaila Rao.*

Plate 161. Hen Harrier chick just fitted with a satellite-tag, Mar Lodge Estate 2020. © *Shaila Rao.*

Table 3. The fate of the 17 satellite tagged Hen Harrier chicks from MLE indicating whether the body was recovered, how far from the nest it was recovered and the cause of death if known.

Fate of tagged birds	Number of tagged birds	Body recovered	Within 1 km of nest site	Cause of death
Death suspected from natural causes	5	4	3	starvation
Unknown	6	2	2*	too decomposed to ascertain cause of death
Sudden satellite transmission stop - suspicious	5	0	0	
Alive	1			

*Although both of these were classified as unknown, it is highly likely to be natural causes.

Table 4. The details of satellite tagged Hen Harriers which have made a breeding attempt at MLE, the success of these attempts and the fate of the Hen Harriers.

Name	Tagging location	Tagging year	Bred at Mar Lodge	Nest success	Current status
DeeCee	Perthshire, Central Scotland	2016	2018	3 fledged young	Dead (sudden stop, suspicious 2019)
Harriet	Mar Lodge Estate	2016	2018	4 fledged young	Dead (unknown cause, body recovered 2018)
Sorrel	Langholm	2016	2018 2020 2021	2 broods of 3 fledged young. One desertion of nest on eggs	Alive

On six occasions (three unknowns and three natural causes) the stop location of the tag was at MLE and in five cases close to the nest site and within one month of fledging. On ten occasions (five sudden stops, three unknown and two natural causes) the stop locations were elsewhere with seven of these in North-East Scotland.

Three satellite tagged birds have bred at MLE between 2016 and 2021 including one fledged as a chick from MLE (Table 4).

Discussion

The successful establishment of Hen Harriers at MLE is a welcome positive story against a gloomy backdrop of continued persecution of harriers across Britain and Ireland (Fielding *et al.* 2011; Murgatroyd *et al.* 2019, RSPB 2020) There has been no known raptor persecution on MLE since its acquisition by NTS in 1995, so the colonisation of Hen Harriers in 2016 cannot be explained by a cessation of any persecution. Nor can it be explained by a reduction in persecution nationally, as there is little evidence from breeding studies or satellite tagged birds to suggest this situation has improved significantly (Fielding *et al.* 2011; Murgatroyd *et al.* 2019, RSPB 2020).

The reasons for the lack of breeding Hen Harriers on MLE previously has speculatively been attributed to a number of factors over the years including altitude, climate, prey abundance and low Hen Harrier productivity in surrounding areas. The successful colonisation and productivity observed in the last five years has demonstrated that these reasons are unlikely to explain the previous lack of Hen Harrier occupation. Furthermore, satellite and wing tagging data has demonstrated how far Hen Harriers can travel to establish a breeding territory suggesting a site is not reliant on productivity from neighbouring areas (Etheridge & Summers 2006, Natural England 2014, Rao 2020, RSPB 2020).

The most likely hypothesis for the establishment of Hen Harriers on MLE is that an increased availability and suitability of nesting habitat (NTS 2021) combined with an improved prey-base (Milne *et al.* 1998; Evans *et al.* 2006, Bush *et al.* 2012, den Herder *et al.* 2016) has improved conditions to the point where the species has been capable of colonising the site. Both factors have resulted from the reduced grazing pressure and the consequent development of a tall and luxuriant heather dominated field layer. The mean heather height has increased significantly since 2002 across the eastern part of the estate (NTS 2021). Hen Harriers are known to select tall heather for nesting with a mean height of 46.0 cm from a wider Scottish sample (Redpath *et al.* 1998). The mean height of the heather at the nests in MLE over the last three years was higher than this at 53.0 cm. The Hen Harriers breeding at MLE are clearly selecting to nest in tall heather and it is highly likely that this habitat type in appropriate locations was not available in the early years of NTS ownership. Indeed, the majority of nests occur in the eastern part of the estate where Red Deer density has been reduced furthest and heather growth has increased the most. Hen Harriers have also previously been shown to prefer *Calluna* dominated vegetation (Redpath *et al.* 1998) and all nests occurring at MLE have been situated in *Calluna* dominated heath communities.

No data have been collected on prey abundance at MLE but anecdotally it has been observed that vole abundance in both grassland and heath areas has increased as the field layer has developed (pers. obs. Rao, S. & Painting, A.). It is also likely that the advancing scattered tree regeneration onto the moorland and low-density native woodland brings with it an increased bird abundance and assemblage offering a greater potential prey diversity (Savory *et al.* 2016) whilst also remaining open enough for hunting. The data demonstrated that 60% of nests occurred within or less than 100 m from areas of regenerating pine. Previous studies have demonstrated that small mammal abundance increases as grazing pressure by large herbivores decreases and the field layer develops (Milne *et al.* 1998; Evans *et al.* 2006; Bush *et al.* 2012, den Herder *et al.* 2016). Hence it is highly likely that the reduced grazing pressure which has

Table 5. Mean clutch size, fledglings per successful nest and fledglings per breeding attempt at MLE 2016–2021 and across other studies.

Study	Mean clutch size	Mean fledglings per successful nest	Mean fledglings per breeding attempt
Irwin *et al.* 2008	4.1 (±0.1 se)	2.6 (±0.1 se)	1.6 (±0.3 se)
Green & Etheridge 1999	4.43–6.0 (range in mean clutch size across regions)	2.6–3.91 (range in mean brood size across regions)	
Etheridge *et al.* 1997			0.4 grouse moor 2.4 other moorland 1.4 young conifer forest
Whitfield *et al.* 2008	4.69± 0.97SD (1980–2004), 4.93± 0.89SD (1986–1996) 4.36 ± 1.00SD (1997–2004)	3.30 ± 0.46SD (1986–1996) 3.08 ± 0.35SD (1997–2004) 3.21 ± 0.43SD (1986–2004)	1.10 ± 0.47SD (1986–1996) 1.42 ± 0.56SD (1986–2004) 1.85 ± 0.33SD (1997–2004)
Amar *et al.* 2003	4.58 ±0.24SE Orkney 5.00 ±0.09SE Langholm		
Mar Lodge Estate 2016–2021	4.9 (±0.2 SE)	3.7	2.6

resulted in natural tree regeneration has also resulted in a more substantial prey base for Hen Harriers (voles, larks and pipits etc.) than a short heavily grazed field layer.

Productivity data suggest that the Hen Harriers breeding at MLE are attaining levels similar or better than other areas that are not intensively managed for grouse and thus not compromised significantly by any factors such as food availability, climate, predation etc. The range in clutch size, 3–7 eggs (Cramp & Simmons 1980) and the mean clutch size of 4.9 eggs was comparable to previous findings (Green & Etheridge 1999; Amar *et al.* 2003, Irwin *et al.* 2008, Whitfield *et al.* 2008). Chicks fledged per nest and overall breeding success was also equal to or greater than previous findings (Etheridge *et al.* 1997, Green & Etheridge 1999; Irwin *et al.* 2008, Whitfield *et al.* 2008) (Table 5). Successful breeding attempts of ring-tailed males and an incidence of polygyny also suggest that the harriers breeding at MLE currently have a healthy and productive habitat in which to breed.

The mean altitude of nests sites at MLE, 507 m (±8.2 m SE) was at the upper end of the expected range (190–520 m) with the highest nest recorded at 606 m. This is perhaps not unexpected due to the general high altitude of MLE. However, all except one nest had a southerly inclined aspect, which is different to that found previously by Redpath *et al.* (1998) where a north-west aspect was favoured. The selection of mostly south-facing nest sites is possibly a compensatory mechanism for the higher altitude locations and more extreme climate experienced at MLE relative to sites at lower altitude. A south facing aspect would be warmer and, perhaps more importantly, shifts any late frost or snow in late spring more quickly. The one nest which was deserted on eggs was north facing and it was deserted during a period of late snow in mid-May 2021. Interestingly, a similar desertion in mid-May 2021 from a female nesting on a north-west facing slope occurred on a nearby estate (NERSG 2021).

Only a few individuals could be identified in the field (satellite-tagged females). However, the distribution and clustering of nests suggests a degree of site faithfulness. Unfortunately, the fate of the satellite-tagged chicks from MLE is not so positive with only one chick surviving from 17 tagged since 2016. Natural chick mortality in the two years after fledging is high but more concerning is the loss of tagged birds in suspicious circumstances which accounted for 31% of the tagged birds.

The return of Hen Harrier to MLE has allowed us to study the fortunes of a species of conservation concern within a 'new' habitat within the UK upland paradigm. Early successional open moorland/woodland habitats can be used effectively by Hen Harriers, and indeed have been shown to be more favoured for breeding at MLE than was the previous habitat of moorland under more traditional management of high herbivore densities and rotational burning. The early successional, relatively open mixture of native woodland and heather moor found at MLE currently remains rare in the UK, particularly at a landscape scale. However, this habitat type may well become more abundant in Scotland in the decades to come, and the experience at MLE suggests that this habitat could become an important part of the matrix of upland land uses that comprise the Hen Harrier's range in Scotland.

MLE is not managed specifically for any single species, and habitat currently used by Hen Harrier may become less (or more) suitable as the current cohort of woodland regeneration establishes. It is expected that as habitat succeeds to closed-canopy woodland in some areas it will ultimately become of less use to Hen Harriers. Nevertheless, given the vast acreage of open habitats at MLE and the dynamic, natural processes-led management ethos of the estate, it is expected that large areas (thousands of hectares) of the estate will remain suitable for Hen Harriers for decades to come.

The colonisation of MLE by Hen Harriers is a success story at present but it is still in its infancy. As ecologically restored habitats continue to change in composition and structure, we can expect further changes in the fortunes of Hen Harrier at MLE.

Acknowledgements

Thanks to G. Rebecca, B. Etheridge, J. & E. Weston, W. Hayward & RSPB Investigations team for help and advice on monitoring, ringing and satellite tagging birds and providing follow up information on tagged birds. Thanks to G. Rebecca, J. Weston, M. Daniels & W. Hayward for comments on the manuscript and R. Birchett for the male Hen Harrier photo.

Plate 162. Moorland with naturally regenerating Scots Pine trees, Mar Lodge Estate 2019. © *Shaila Rao*

References

Amar, A., Redpath, S. & Thirgood, S. 2003. Evidence for food limitation in the declining Hen Harrier population on the Orkney Islands, Scotland. *Biological Conservation* 111, 377–384.

Arroyo, B., Amar, A., Leckie, F., Buchanan, G.M., Wilson, J.D. & Redpath, S. 2008. Hunting habitat selection by Hen Harriers on moorland: implications for conservation management. *Biological Conservation*. 142: 586–596.

Barton, C., Pollock, C., Norris, D.W., Nagle, T.A., Oliver G.A. & Newton, S. 2006. The second national survey of breeding Hen Harriers *Circus cyaneus* in Ireland 2005. *Irish Birds* 8: 1–20.

Beck, A. 2016. *Baseline survey of scrub and montane regeneration*. Unpublished Report, NTS. Mar Lodge Estate.

Buckland, S.T., Bell, M.V. & Picozzi, N. (editors) 1990. *The Birds of North-East Scotland*. North-East Scotland Bird Club, Aberdeen.

Bush, E.R., Buesching, C.D., Slade, E.M. & Macdonald, D.W. 2012. Woodland recovery after suppression of deer : cascade effects for small mammals, wood mice *Apodemus sylvaticus* and bank voles *Myopes glareolus*. *PLoS ONE* 7(2): e31404.

Caravaggi, A., Irwin, S., Lusby, J., McCarthy, A., Mee, A., Nagle, T. & O'Halloran, J. 2020. Forest management and Hen Harrier *Circus cyaneus* conservation in Ireland. *Irish Birds* 42:1–12.

Den Herder, M., Helle, S., Niemelä, P., Henttonen, H & Helle, T. 2016. Large Herbivore Grazing Limits Small-Mammal Densities in Finnish Lapland Article. *Annales Zoologici Fennici* 1–18.

Ecology Team. 2021. *Regeneration transects report 2021*. Unpublished Report. NTS. Mar Lodge Estate.

Etheridge, B. & Summers, R.W. 2006. Movements of British hen harriers *circus cyaneus* outside the breeding season, *Ringing & Migration*, 23:1, 6–14, DOI: 10.1080/03078698.2006.967433

Etheridge, B., Summers, R.W. & Green, R.E. 1997. The Effects of Illegal Killing and Destruction of Nests by Humans on the Population Dynamics of the Hen Harrier *Circus cyaneus* in Scotland. *Journal of Applied Ecology*. 34 (4): 1081–1105.

Evans, D.M., Redpath, S.M., Elston, D.A., Evans, S., Mitchell, R.J. & Dennis, P. 2006. To Graze or Not to Graze? Sheep, Voles, Forestry and Nature Conservation in the British Uplands. *Journal of Applied Ecology*. 43 (3): 499–505.

Fielding, A.H., Whitfield, P., Mcleod, D. & Riley, H. 2011. *A Conservation Framework for Hen Harriers in the United Kingdom*. JNCC Report 441. Peterborough.

Green, R.E. & Etheridge, B. 1999. Breeding success of the Hen Harrier *Circus cyaneus* in relation to the distribution of grouse moors and the red fox Vulpes vulpes. *Journal of Applied Ecology* 36: 472–483.

Hardey, J., Irwin, S., Wilson, M., Kelly, T.C., O'Donoghue, B., O'Mahony, B., Oliver, G., Cullen, C., O'Donoghue, T. & O'Halloran, J. 2008. Aspects of the breeding biology of Hen Harriers *Circus cyaneus* in Ireland. *Irish Birds* 8: 331–334.

Haworth, P.F. & Fielding, A.H. 2009. *An Assessment of Woodland Habitat Utilisation by Breeding Hen Harriers*. Report to SNH, SNH Project No. 24069.

JNCC. 2022. UK BAP Priority Habitats. UK BAP Priority Habitats | JNCC - Adviser to Government on Nature Conservation. Accessed 3 March 2022

Milne, J.A., Birch, C.P.D., Hester, A.J., Armstrong, H.M. & Robertson, A. 1998. *The impact of vertebrate herbivores on the natural heritage of the Scottish Uplands - a review.* Scottish Natural Heritage Review No 95.

Murgatroyd, M., Redpath, S.M., Murphy, S.G, Douglas, D.J.T, Saunders, R. & Amar, A. 2018. Patterns of satellite tagged Hen Harrier disappearances suggest widespread illegal killing on British grouse moors. *Nature Communications* 10:1094.

Maier, R. 2021. *Mar Lodge Regeneration map*. Unpublished report. National Trust for Scotland. Mar Lodge Estate.

Natural England 2014. Tracking sky dancers: the incredible journeys of our native hen harriers [ARCHIVED CONTENT] Natural England - Tracking sky dancers: the incredible journeys of our native hen harriers (nationalarchives.gov.uk). Accessed on 9 March 2022.

NESRSG 2021. *Raptors breeding in North-East Scotland, 2021. North-East Scotland Raptor Study Group Annual Report*. Unpublished Report. 1: 8. Aberdeenshire.

Painting, A. & Rao, S. 2021. *Mar Lodge Regeneration transect report*. Unpublished report. National Trust for Scotland. Mar Lodge Estate.

Petty, S.J. & Anderson. D. 1986. Breeding by Hen Harriers *Circus cyaneus* on restocked sites in upland forests. *Bird Study* 33:177–178.

Rao, S.J. 2020. Welcoming back the ghost of the moor. Welcoming back the ghost of the moor | National Trust for Scotland (nts.org.uk). Accessed on 3 March 2022.

Rebecca, G., Cosnette, B., Craib, J., Duncan, A., Etheridge, B., Francis, I., Hardey, J., Pout, A. & Steele, L. 2016. The past, current and potential status of breeding Hen Harriers in North-East Scotland. *British Birds* 109:77–95

Redpath, S., Madders, M., Donnelly, E., Anderson, B., Thirgood, S.J., Martin, A. & Mcleod, D. 1998. Nest site selection by Hen Harriers in Scotland. *Bird Study* 45: 51–61.

Rodwell, J.S. 1992. *British Plant Communities: Volume 2, Mires and Heaths***.** Cambridge University Press, Cambridge.

RSPB. 2020. *Hen Harrier Life Project*. Final report. LIFE13 NAT/UK/000258. 1:74. RSPB. Sandy.

RSPB. 2020. *Hen Harrier Life Project 2014–2019*. Laypersons report. LIFE13 NAT/UK/000258. Page 10. RSPB. Sandy.

Savory, J. 2016. Colonisation by woodland birds at Carrifran Wildwood: the story so far. *Scottish Birds* 36: 135–149.

Scottish Government. 2019a. *Grouse Moor Management Review Group*. Report to the Scottish Government. Edinburgh.

Scottish Government. 2019b. *Scottish Forestry strategy* 2019–2029. Edinburgh.

Scottish Government. 2020a. *The Environment Strategy for Scotland*. Edinburgh.

Scottish Government 2020b. *The Scottish Biodiversity Strategy post 2020: statement of intent*. Edinburgh.

Sim, I.M.W., Dillon, I.A., Eaton, M.A., Etheridge, B., Lindley, P., Riley, H., Saunders, R., Sharpe, C. & Tickner, M. 2007. Status of the Hen Harrier *Circus cyaneus* in the UK and Isle of Man in 2004, and a comparison with the 1988/89 and 1998 surveys. *Bird Study* 54:256–267.

Stoate, C. 1995. The changing face of lowland farming and wildlife, part 1:1845–1945. *British Wildlife* 6:341–350.

Tucker, B.W. 1945. Hen Harrier in Aberdeenshire in summer. *British Birds* 38: 275.

Watson, D. 1977. *The Hen Harrier*. T. & A.D. Poyser.

Whitfield, D.P., Fielding, A.H. & Whitehead, S. 2008. Long-term increase in the fecundity of Hen Harriers in Wales is explained by reduced human interference and warmer weather. *Animal Conservation* 11:144–152.

Shaila Rao & Andrew Painting - National Trust for Scotland, Mar Lodge Estate, Braemar, AB35 5YJ

Email: shailarao@nts.org.uk

Revised MS accepted March 2022

A rough winter for Puffins in the North Sea

M.P. HARRIS, N. ELKINS, W.T.S. MILES & S. WANLESS

The winter of 2021–22 will long be remembered for its storms that caused severe damage to power supplies and woodlands throughout north-east Britain. Conditions at sea were also extreme resulting in many dead seabirds washed up on beaches potentially affecting their populations. Such seabird wrecks, or mass die-offs, are not uncommon and normally occur after periods of stormy weather. In the Northern Hemisphere, the Guillemot *Uria aalge* is the commonest species involved in wrecks, followed by Razorbill *Alca torda* but wrecks of Puffins *Fratercula arctica* are much less common.

Starting in late summer 2021, and continuing through the autumn, there were reports of unusually high concentrations of Guillemots and Razorbills very close inshore and large numbers of dead and dying birds were found on beaches in eastern Scotland and northern England (Duncan 2022, Fullick *et al.* 2022). A few dead Puffins were also reported and exceptionally high numbers were recorded during regular sea watches at Fife Ness, Fife, with a maximum count of 31 (along with 708 Little Auks *Alle alle*) in two hours on 20 November (Jared Wilson pers. comm.). However, most deaths of Puffins did not occur until after a series of storms in late November and the first half of December. A request for information about dead Puffins, if possible accompanied by digital photographs, was made on social networks and in the national and local news at the end of November and start of December and this generated a huge response. With the exception of Shetland (Miles and Mellor 2021), and a few beaches in North-East Scotland (Sue O'Brien pers. comm.), searches of beaches were largely opportunistic and were not standardised or systematic. Photographs of corpses from specific locations were compared to reduce the chances of double-counting. On well-visited beaches, notably Scapa, Orkney, during the peak of the mortality the maximum count of corpses was used.

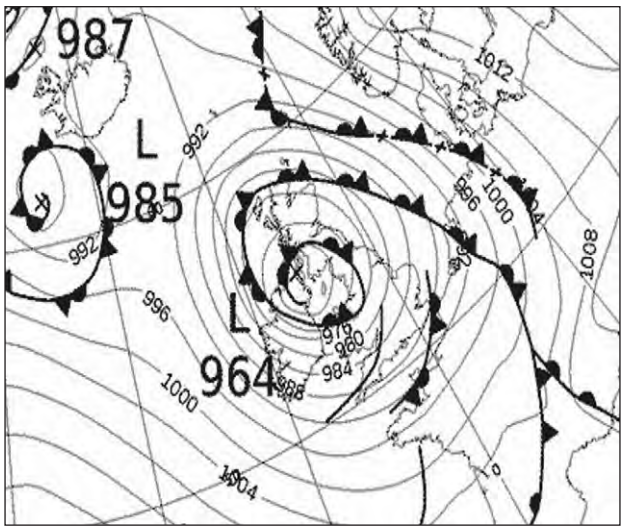


Figure 1. Synoptic chart showing storm 'Barra', 00:01 hrs, 8 December 2021. © *Met Office*

The weather in winter 2021–22

The weather during the autumn of 2021 was generally mild with no major storms. The first storm of the winter, named 'Arwen', moved south along the east coast of Britain on 26 November. Deepening rapidly, it introduced severe N-NNE gales to eastern Scotland and the northern North Sea. During the afternoon mean wind speeds of 40–45 kt (74–83 kph) occurred along the east coast, spreading south from Shetland to Northeast England, with gusts to hurricane force (60–68 kt; 110–126 kph). Over the northern North Sea, mean wind speeds reached 55 kt (102 kph) creating very high sea states with wave heights at least 8 m over the open sea. Duration of the most severe winds was approximately seven hours.

No significant winds or weather then occurred until storm 'Barra' moved north-east across southern Scotland on 7–8 December (Figure 1) bringing severe SE gales to eastern Scotland but weakening as it moved into the North Sea. Mean onshore winds of up to 47 kt (87 kph) and gusts up to 59 kt (109 kph) were recorded along the North Sea coast, mainly late on 7 December. The duration of the most severe winds was approximately 12 hours, although the strongest core moved steadily north and lay between 57ºN and 59ºN by early the next day, during which maximum wave heights reached 6–7 m over the open sea.

Plate 163. A survivor - the first Puffin known to be ashore in Scotland in 2022. The bird retains some dark winter face feathers and has yet to develop fully the orange eye-ring and eye ornaments. Fowlsheugh, North-East Scotland. 15 March 2022. © *Ian Hastie*

A third, unnamed, storm moved rapidly northeast to pass the Northern Isles on 13 December, with SW winds off Cape Wrath reaching 70 kt (130 kph) at 02:00 hrs and clearing north of Shetland by 06:00 hours. During all three storms, sea temperatures remained between 9ºC and 11ºC and air temperatures over the sea were between 4ºC and 7ºC. Windy conditions continued in January 2022 with storms Malik and Corrie in the last three days of the month while storms Dudley, Eunice and Franklin swept through between 16–21 February. These 2022 storms produced W–NW gales, but these were fast moving and resulted in few Puffins being washed up dead (see below).

Numbers of dead Puffins

A total of 609 Puffins was reported between 23 August 2021 and 19 February 2022 (Figure 2). Nine (1.5%) were alive but subsequently died, 64 (10.5%) were recently dead having intact eyes or were freshly predated and 97 (15.9%) were reported as long dead. No details of finding condition were given for the remaining 72.0% of birds. However, it was clear that many corpses were disintegrating and had obviously been in the water for many days. The majority (532, 87.4%) were reported between 26 November and 31 December, the period during and relatively soon after the three storms in late November and December (Figure 2).

Looking at locations (grouped by SOC Local Recorders' Network areas) and dates of dead Puffins in more detail indicated that prior to storm Arwen, there were scattered records during the last week of August (two birds alive in North-East Scotland), September (seven in Shetland, two in North-East Scotland, one each in Caithness, Moray & Nairn and Angus & Dundee) and October (two in Shetland, one each in North-East Scotland and Orkney). Puffins were recorded inland in Essex (two) and Yorkshire (one) on 9–11 November, and beached birds were reported in North-East Scotland (eight), Yorkshire (one) and Shetland (one) on 12–24 November.

Following storm Arwen, 11 freshly dead Puffins were reported in Northeast England on 28–30 November. All the Puffins reported from Shetland (three) and Fair Isle (two) during the monthly beached bird survey 28–30 November were long-dead so had not died as a result of the storm. Before the arrival of Storm Barra on 8 December, more birds were reported in Northeast England (two), North-East Scotland (seven), Moray & Nairn (three) and Orkney (one).

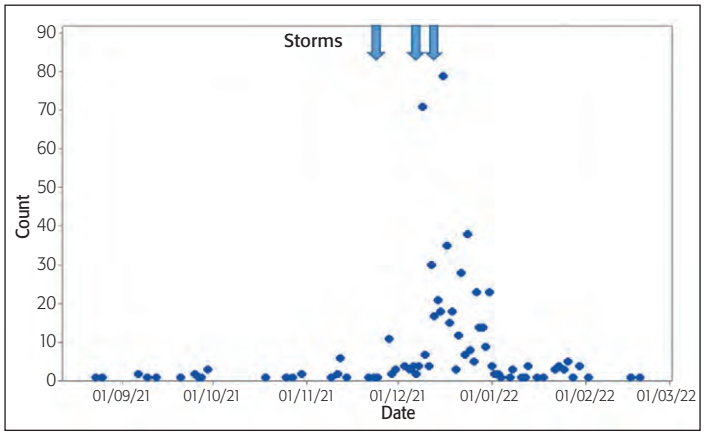


Figure 2. Daily totals of dead and dying Puffins reported between 23 August 2021 and 28 February 2022. The arrows indicate the dates of the three storms in November and December.

The first records of Puffins following storm Barra were two freshly dead in North-East Scotland, a living bird in Orkney and a bird in Fife on 8 December. Numbers then increased dramatically with 71 recorded on beaches in North-East Scotland on 9 December. These included recent casualties but also some birds that had been dead for longer so were presumably a mixture of Puffins affected by both Arwen and Barra. The first recently dead birds reported in Orkney were in Scapa Flow on 10 December. On 16 December there were at least 59 corpses on 1.6 km of Scapa beaches (Colin Corse pers. comm.) and at least a further 14 there in the subsequent three days. The first Puffins reported from Shetland were ten freshly dead on 15 December on a beach where there had been none two days previously. Large numbers of beached birds were reported throughout the rest of December and into January. Subsequently, there was a suggestion of a minor mortality around 16–26 January when seven of 17 corpses in Orkney/Caithness/Highland were described as recently or very recently dead.

Although after the storms dead Puffins were reported over a very wide area from Shetland to Yorkshire, there were three major concentrations (Figure 3). The largest was in Orkney with 286 (53.8% of the 532 casualties between 28 November and 31 December), followed by North-East Scotland (135; 25.4%) and Shetland including Fair Isle (74; 13.9%). At face value, mortality in Moray & Nairn and Caithness (17, 3.2%) seemed to be lower but it is possible that search effort here was lower. Almost 30% of all reports during this time came from around Scapa Flow in southern Orkney and there was a similar southern bias in the Shetland records. Both these areas are where Puffins dying in the Northwestern North Sea would have been drifted ashore by the currents (Tait 1937) and prevailing southerly winds.

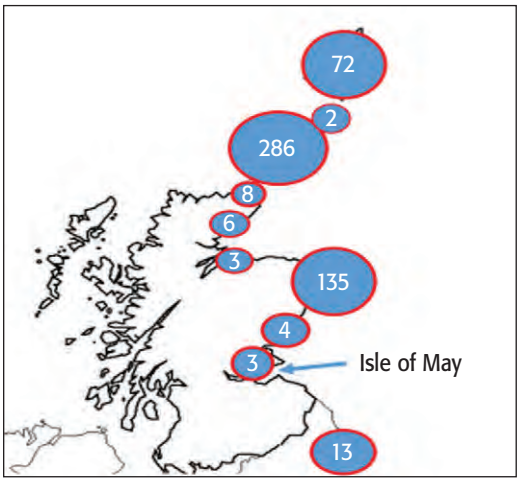


Figure 3. Numbers of dead Puffins reported during the main period of mortality 28 November–31 December in SOC recording areas. There were also 13 birds recorded from Northumberland and Yorkshire.

Age, moult condition and origin of dead Puffins

Many of the digital images were of high enough quality to allow the Puffins to be aged (from the bill features that develop over the first years of a bird's life; Harris 2014) and/or assessed as to whether they could fly (from the condition of the flight feathers). Of 403 birds that were aged, 279 (69.2%) were adult, 69 (17.1%) were first-winter and 55 (13.6%) were in their second- or third-winters indicating that all age classes were involved in the mortality.

Between breeding seasons, Puffins undergo a complete moult during which they lose all their main wing feathers and become flightless for 3–4 weeks (Harris *et al.* 2014). Ignoring the minute and hidden outermost primary, the longest visible outer primary is normally the last to complete growth giving the wing a rounded rather than a pointed tip (Plate 164). Thus, images where the wing tip was clearly visible and the outer primary was noticeably shorter than the next innermost primary, could be used to identify Puffins that had just completed their moult and could probably fly again. Birds still growing other primaries or with large gaps in the wing were assumed to have been flightless. All 35 first-year birds still had the primaries they had grown as chicks. Of 257 older birds, 225 (84.6%) had fully grown primaries, 26 (9.8%) were just completing the growth of the outer primaries and only six (2.3%) had the wing area so reduced as to render them flightless.

Compared with other species that undergo a flightless moult, timing of moult in Puffins appears to be exceptionlly variable occuring throughout the non-breeding period with slight peaks in autumn (October) and spring (March) (Harris *et al.* 2014). Moulting Puffins are thought to be more vulnerable to storms and during previous wrecks that occurred in February and March, many of the birds found dead were replacing their primaries and were flightless (Harris *et al.* 2014). However, in November and December 2021, only six (2.3%) of 266 adult or immature Puffins found dead were classed as flightless and only nine (3.4%) had worn or bleached primaries indicating they had not moulted since the summer (Harris *et al.* 2014). The high incidence of Puffins with recently grown primaries in the 2021 wreck was therefore surprising and suggests that the majority of birds had either moulted earlier than normal or that the birds that had still to replace their wing feathers were not affected by the severe conditions or were elsewhere during the storms.

During the winter, Puffins typically accumulate large fat reserves and are 20–30% heavier than they are during the breeding season (Anker-Nilssen *et al.* 2018). Thus, healthy Puffins in the North Sea in November

Plate 164. Adult Puffin completing the growth of the outer primary. This individual would probably have just been able to fly. Sanday, Orkney, 25 December 2021. © *Russell Neave*

Plate 165. A ringed adult Puffin from the Isle of May that had been shot in the Faroes on 16 October 2021, and whose body feathers had been plucked ready for the pot. It had massive fat deposits and was just starting to regrow its primaries and was obviously flightless. © *Jens-Kjeld Jensen*

Plate 166. Distressed freshly moulted adult Puffin. Orkney, 8 December 2021. © *Solan Dodman*

and December should weigh *c.* 450–500 g and have high fat scores. Collection of morphometric and post-mortem data for the 2021 wreck was severely limited because of concerns about Avian Influenza and the fact that many corpses had been scavenged. However, four freshly dead adults had an average weight of 285 g (SE 18; range 250–325), and an adult found freshly dead on 28 November immediately following storm Arwen that was skinned for taxidermy, was very emaciated with a protruding breastbone and no subcutaneous fat (Adrian Johnstone pers. comm.). Post-mortems carried out on seven Puffins found dead in North-East Scotland between 31 October and 27 December, found that six had subcutaneous fat and breast muscle scores of 0 (the maximum score being 3), and the seventh had a score of 1 for both tissues (Sue O'Brien pers. comm.). Thus, the available weights and assessments of body condition all indicated that Puffins had died of starvation. In striking contrast, an adult Puffin ringed on the Isle of May and shot in the Faroes in October 2021, after it had dropped its primaries during moult weighed 480 g, (excluding its body feathers but including a tracking device and ring weighing *c.* 3 g) (Plate 165, Jens-Kjeld Jensen pers. comm.). This indicated that at least in the early part of the winter, Puffins around the Faroes were in good condition.

Decades of ringing recoveries and more recent geolocator tracking studies show that the majority of Puffins in the North Sea during the winter come from colonies along the east coast of Britain (Harris 2002, Fayet *et al.* 2017, SEATRACK https://seapop.no/en/seatrack/) and this was also the case during the 2021 wreck. Between 21 November 2021 and 11 January 2022 ringed birds were reported dead in Orkney (seven), Shetland (one), Caithness (one), Aberdeenshire (one), Angus (one), Fife (one), Northumberland (one) and Redcar & Cleveland (one). Thirteen had been ringed on the Isle of May and one on Coquet Island, Northumberland. Later in February, Puffins ringed on the Isle of May were also found dead in Denmark (two) and Norway (one). Thirty-five unringed adults/immatures that were not growing their primaries had a mean wing length of 156.4 ± SE 0.72 mm (range 147–163), again indicating that individuals came from colonies in the south of the range since birds from more northern colonies have much longer wings (Harris & Wanless 2011).

Conclusions

Getting an accurate assessment of the total number of birds dying in a seabird wreck is notoriously difficult. Firstly, many birds die offshore and sink before they are washed up on beaches. Experiments with dead Guillemots found that, on average, carcasses remained afloat for 8 days (95% C.I. 6–10 days; Wiese 2003). However, Puffins are less than half the weight of Guillemots and so their bodies probably disintegrate and sink even faster. Puffins also normally winter further offshore than Guillemots further decreasing the chances of dead birds being washed ashore (Harris and Wanless 2011). Secondly, the largely opportunistic collection of data makes scaling up from body counts to total numbers dying problematic. Both these issues apply to the current wreck so the number of Puffins actually dying is likely to be considerably higher than the number found. However, despite intense public interest resulting in many people looking for and reporting dead Puffins, the total of 532 recorded during the main period of mortality after the storms in November and December 2021, was small compared to some other wrecks in the North Sea e.g. totals of 1642 in February 1983 and 3055 in March–April 2013 (Underwood and Stowe 1984, Harris and Elkins 2013).

The best evidence with which to assess the magnitude of the 2021 wreck comes from long-term standardised monthly beached bird surveys with consistent and systematic coverage that are carried out in Shetland. Such surveys are now very rare in the UK but allow unbiased comparisons of the number of bird corpses found per kilometre of beach surveyed to be made between different months and years. The Shetland beached bird survey is unique in that it is a systematic county-wide survey done at the end of each month and has run since 1979 (Heubeck 1995). The December 2021 survey recorded a total of 50 Puffin corpses during the standardised

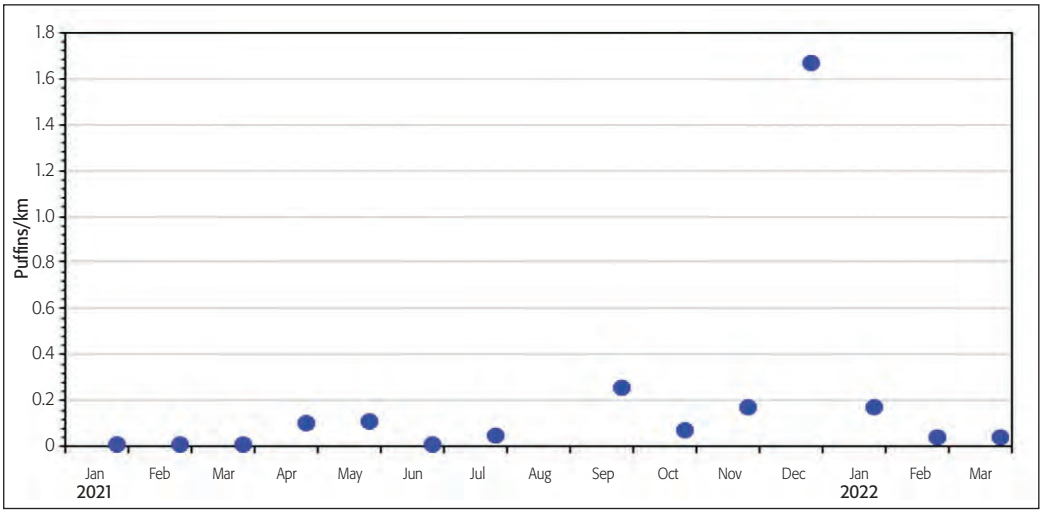


Figure 4. Monthly totals of Puffin corpses found per km of beaches surveyed during the Shetland beached bird survey, January 2021 to March 2022 (no survey in August due to bird flu restrictions). The exceptionally high number of corpses found per km during the December survey (1.66) was more than six times higher than the second highest data point in the series (0.25 during the September survey).

monitoring period, which equated to 1.66 Puffin corpses per km of beaches surveyed (Miles and Mellor 2021). This density of corpses was more than six times higher than in any other month from January 2021 to March 2022 (Figure 4), indeed the total number of Puffins found during the December 2021 survey was higher than in any other month (or entire year!) during the previous twelve years. Thus, in the wider context of the 2021 wreck, the Shetland results indicate that the high numbers of Puffin corpses found were not simply an artefact of the media appeal for information about dead Puffins and increased searching effort immediately thereafter but did reflect an unusually high mortality.

Although the main mortality occurred in the Northern Isles and North-East Scotland in November and December 2021, unusually large numbers of dead Puffins were also reported from the southern and eastern North Sea. Thus, 90 Puffins washed ashore in the Netherlands between 20 November 2021 and 16 March 2022. Mortality occurred in four distinct waves: early and mid-December 2021, mid-January, and mid-February 2022 (Kees Camphuysen pers. comm.), making this the second largest wreck of Puffins recorded in the Netherlands, only the one in 2003 was bigger (Camphuysen 2003). Adult Puffins made up most of the casualties in December, but first-winter and immature birds predominated in early 2022. Fifty-one Puffins were also found on beaches in Denmark between 29 January and 1 March 2022, again many more than in most winters (https://dofbasen.dk/, Ib Krag Petersen pers.comm.).

While the November/December storms were undoubtedly responsible for the accumulation of dead birds ashore and may have directly contributed to their deaths, it is also possible that Puffins were already stressed and in poor condition prior to this. Puffins are birds of the open sea and are rarely seen from land when not breeding so the high numbers of birds seen during sea watches in the autumn before the weather deteriorated, suggests that for some reason birds were forced inshore. Storms Arwen, Barra and the unnamed storm occurred within the space of 18 days and were severe by North Sea standards. However, on each occasion the strongest winds lasted for only 7–12 hours and unlike the previous North Sea Puffin wreck in March 2013 that was associated with arctic temperatures (Harris & Elkins 2013), air and sea temperatures were relatively mild. Such conditions might have prevented birds feeding temporarily but seem unlikely to have lasted long enough to

result in starvation (Clairbaux *et al.* 2021). Outside the breeding season Puffins typically experience severe weather on a regular basis. An analysis of the impacts of extreme extra-tropical cyclones (storms more powerful than those occurring in the North Sea in late 2021), on the survival of Puffins found no evidence of a significant effect in four populations including the Isle of May (Reiertsen *et al.* 2021). Only Puffins on Runde, SW Norway seemed to be adversely affected by extreme weather.

Compared to Guillemots and Razorbills, few Puffins were reported dead prior to storm Arwen but even these totals were higher than usual and Puffins continued to be found dead a month or more after the storms. Thus, all the evidence points to conditions throughout the North Sea during the winter of 2021–22 being unfavourable for Puffins with the storms exacerbating the situation and bringing the plight of birds to the public's attention. The return of colour-ringed birds, and hence their survival, is monitored annually on the Isle of May. Fewer than normal marked Puffins were seen during the 2022 season suggesting that mortality was higher. However, another year's observations are needed before it will be clear whether the missing birds are indeed dead or whether they were taking a year off breeding because they were in poor condition at the end of the winter. Thus, in time, it should be possible to assess the demographic impact of the wreck on this population and establish whether mortality was indeed higher than normal or whether birds were closer inshore meaning corpses were more likely to be found. In addition, data from any returning birds fitted with geolocators will provide information on the distribution and behaviour of Puffins that survived the wreck. Hopefully, the ongoing detailed investigation into the deaths of large numbers of other auks earlier in the winter (F. Daunt, S. O'Brien and others in prep.) will identify the underlying cause (or causes) of the problem. However, undeniably the arrival of Avian Influenza among North Sea seabirds in the 2022 summer is going to make understanding last winter's wreck even more challenging.

Acknowledgements

We thank the 97 people who responded to our requests for information and photographs and apologise for not naming them individually. We are very grateful to Francis Daunt and Sue O'Brien for alerting us to messages on social media, Kees Camphuysen and Ib Krag Petersen for information from the Netherlands and Denmark, respectively, Jared Wilson for information from Fife Ness and Roger Riddington, Russell Neave, Fllett Carmichael Vets and Sue O'Brien for post-mortem information and/or checking and measuring wings.

References

Anker-Nilssen, T., Jensen, J.-K. & Harris, M.P. 2018. Fit is fat: winter body mass of Atlantic Puffins *Fratercula arctica*. *Bird Study* 65: 451–457.

Camphuysen, C.J. 2003. Characteristics of Atlantic Puffins *Fratercula arctica* wrecked in The Netherlands, January–February 2003. *Atlantic Seabirds* 5: 21–30.

Clairbaux, M., Mathewson P., Porter, W., Fort, J., Strøm, H., Moe, B., Fauchald, P., Descamps, S., Helgason, H.H., Bråthen, V.S., Merkel, B., Anker-Nilssen, T., Bringsvor, I.S., Chastel, O., Christensen-Dalsgaard, S., Danielsen, J., Daunt, F., Dehnhard, N., Erikstad, K.E., Ezhov, A., Gavrilo, M., Krasnov, Y., Langset, M., Lorentsen, S.-H., Newell, M., Olsen, B., Reiertsen, T. K., Systad, G. H., Thórarinsson, T.L., Baran, M., Diamond, T., Fayet, A.L., Fitzsimmons, M.G., Frederiksen, M., Gilchrist, H.G., Guilford, T., Huffeldt, N.P., Jessopp, M., Johansen, K.L., Kouwenberg, A.-L., Linnebjerg, J.F., Major, H.L., Tranquilla, L.M., Mallory, M., Merkel, F.R., Montevecchi, W., Mosbech, A., Petersen, A. & Grémillet, D. 2021. North Atlantic winter cyclones starve seabirds. *Current Biology* 31: 3964–3971.e3.

Duncan, R. 2022. Ringers' roundup. *Scottish Birds* 42: 62–70.

Fayet, A.L., Freeman, R., Anker-Nilssen, T., Diamond, A., Erikstad, K.E., Fifield, D., Fitzsimmons, M., Hansen, E.S., Harris, M.P., Jessopp, M., Kouwenberg, A.-L., Kress, S., Mowat, S., Perrins, C.M., Petersen, A., Petersen, I.K., Þórarinsson, Þ.L., Reiertsen, T.K., Robertson, G., Sigurðsson, I.A., Shoji, A., Wanless, S. & Guilford, T. 2017. Ocean-wide drivers of migration strategies and their influence on population breeding performance in a declining seabird. *Current Biology* 27: 1–8.

Fullick, E., Bidewell, C., Duff, J.P., Holmes, J.P., Howie, F., Robinson, C., Goodman, G., Beckmann, K.M., Philbey, A.W. & Daunt, F. 2022. Mass mortality of seabirds in GB. *Veterinary Record* 190: 129–130 doi/10.1002/vetr.1462.

Harris M.P. 2002. Atlantic Puffin (Puffin) *Fratercula arctica*. *In:* Wernham, C.V., Toms, M., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds.) *The Migration Atlas; movements of the birds of Britain and Ireland*. London: T. & A.D. Poyser.

Harris, M.P. 2014. Aging of Atlantic Puffins *Fratercula arctica* in summer and winter. *Seabird* 27: 22–40.

Harris, M.P. & Elkins, N. 2013. An unprecedented wreck of Puffins in eastern Scotland in March and April 2013. *Scottish Birds* 32: 157–159.

Harris, M.P. & Wanless, S. 2011. *The Puffin*. T. & A.D. Poyser.

Harris, M.P., Wanless, S. & Jensen, J.-K. 2014. When are Atlantic Puffins *Fratercula arctica* in the North Sea and around the Faroe Islands flightless? *Bird Study* 61: 182–192.

Heubeck, M. 1995. Shetland beached bird surveys: national and European context. *Proceedings of the Royal Society of Edinburgh* 103B: 165–179.

Miles, W. & Mellor, M. 2021. SOTEAG Ornithological Monitoring Programme in Shetland, Annual Report 2021. Shetland Oil Terminal Environmental Advisory Group, University of St Andrews. www.soteag.org.uk

Reiertsen, T.K., Layton-Matthews, K., Erikstad, K.E., Hodges, K., Ballesteros, M., Anker-Nilssen, T., Barrett, R.T., Benjaminsen, S., Bogdanova, M., Christensen-Dalsgaard, S., Daunt, F., Dehnhard, N., Harris, M.P., Langset, M., Lorentsen, S.-H., Newell, M., Bråthen, V.S., Støyle-Bringsvor, I., Systad8, G.-H. and Wanless, S. 2021. Inter-population synchrony in adult survival and effects of climate and extreme weather in non-breeding areas of Atlantic puffins. *Marine Ecology Progress Series 676*: 219–231.

Tait, J.P. 1937. The surface water drift in the northern and middle areas of the North Sea and in the Faroe-Shetland Channel. *Scientific Investigations of the Fishery Board of Scotland* 1: 1–66.

Underwood, L.A. & Stowe, T.J. 1984. Massive wreck of seabirds in eastern Britain, 1983. *Bird Study* 31: 79–88.

Wiese, F.K. 2003. Sinking rates of dead birds: improving estimates of seabird mortality due to oiling. *Marine Ornithology* 31: 65–70.

Mike P. Harris and Sarah Wanless, UK Centre for Ecology & Hydrology, Bush Estate, Penicuik, Midlothian EH26 0QB.
Email: mph@ceh.ac.uk

Will T.S. Miles, SOTEAG, Scottish Oceans Institute, University St Andrews, Fife, KY16 8LB.

Norman Elkins, 18 Scotstarvit View, Cupar, Fife KY15 5DX.

MS accepted April 2022

Cliff-nesting hirundines in Scotland

On 21 July 2021, Westray resident David Bailey found an active House Martin *Delichon urbicum* nest on a cliff at Castle o'Burrian, Westray, Orkney. House Martins are relatively recent colonists to Westray, with only a small number of pairs nesting on houses around the village of Pierowall since the 1980s (Dean 2008, Martin Grey pers. comm.). On recognising the significance of a pair using a cliff (the natural nesting habitat) in Orkney, news was posted of the sighting to Orkney Facebook groups and other social media, and SPD used these as the basis for a request for information on any other cliff-nesting hirundines in Orkney. WJS saw this request on Twitter and reported that he and MTJ had encountered a pair of cliff face-nesting Swallows *Hirundo rustica* at The Gloup, Deerness, Mainland, Orkney on 19 May 2021. The outcomes of both of these breeding attempts were successful, with fledged young seen at the The Gloup in early August (Holly Peek pers. comm. via Twitter) and, following an adult House Martin observed leaving the Castle o'Burrian nest with a faecal sac by Westray residents Sandra and Don Otter, the original finder, David Bailey, saw three fledged young at the site on 3 August. These records are therefore the most northerly successful cliff-nesting Swallows and House Martins in Britain. The only other known natural site nesting in the Northen Isles was an unsuccessful attempt by House Martins on Fair Isle in 2013 (Table 1).

A request for information on cliff-nesting hirundines in Orkney unearthed a historical record in an article by Jourdain & Witherby (1939), which stated "ORKNEYS. G. Low (*Tour Orkney*, etc. 1774) states that he [George Low] found "Swallows, Martins and Sand-Martins breeding at Stowe [Stews] Head in South Ronaldsay"" (Low 1879). No other reference to cliff-nesting hirundines could be found for the county.

We also contacted the BTO to see if they had any relevant information but their 2016–17 House Martin survey has not yet been written up and data submitted to the BTO's BirdTrack does not record nest location at a site, only breeding evidence.

Summers & Kalejta-Summers (2021) published an account of extensive cliff-nesting by House Martins along cliffs north of Arbroath, Angus, based on a repeat survey of House Martin colonies in eastern Scotland (Table 1). This survey showed that cliff-nesting was still common in some areas. These results encouraged us to contact all UK county/regional bird recorders, seeking both contemporary (within the last 10 years) and historical records to put the Orkney observations into context. It became apparent that cliff-nesting hirundines are still known today at a local scale, mainly in Scotland (Table 1). However, there seems to have been little attention paid to the recording of the use of natural nest sites by these birds, so this information has not been published in bird reports. As a result, responses to our enquiry have relied on the knowledge of regional recorders and individual observers.

In England, there are still cliff-nesting House Martins in several areas, with contemporary records from Yorkshire, principally Flamborough Head and inland at Malham Cove (Geoff Dobbs, former recorder, pers. comm.), and from Derbyshire (Frost & Shaw 2013) and Kent (Paul Holt pers. comm.). Also, they are known from north-west Norfolk in 1990s (Neil Lawton (Recorder) pers. comm.). In Wales, a few pairs remain in East Glamorgan and Breconshire with historical records known from Anglesey, Ceredigion, Gwynedd, Pembrokeshire and Radnorshire (Pritchard *et al*. 2021). There is also a record from Jersey, Channel Islands, from 1914 (Dobson 1952).

Cliff-nesting Swallows are much scarcer, with the only other Scottish record coming from Islay, Argyll & Bute and Rosemarkie, Highland (Table 1). In England, several pairs were seen at St Bees Head, Cumbria, in July 2021 (Guy Kirwan pers. obs. via Twitter) and historically they are known from Derbyshire (Davies 1987) and the Isles of Scilly (John Headon, recorder, pers. comm.). In

Table 1. Locations of Scottish cliff-nesting hirundines.

County/Region	Site Nests/Pairs	Observer (obs)/Recorder Within last 10 years	Older than 10 years
House Martin			
Aberdeenshire	Stonehaven–Fowlsheugh Not uncommon	Steve Willis 2021	
Aberdeenshire	Aberdour Bay 6 active nests (3 with chicks)	Allen Perkins (obs) 2021	
Aberdeenshire	Muchalls *c.* 10 occupied nests	Ian Broadbent (obs) 2021	
Aberdeenshire	Pennan < 10 nests	John Poyner (obs) 2021	
Angus	Arbroath cliffs 171 nests	Summers & Kalejta-Summers 2021 2020	
Angus	Craig Damff, Corrie Fee *c.* 20 birds	Jon Cook	> 10 yrs ago
Borders	Pease Bay, Cockburnspath At least 2 nests	Dave Roberts (obs) 2018	
Borders	St Abbs Head 21 nests	Ciaran Hatsell (obs) 2021	
Caithness	Caithness n/a	Sinclair Manson	up to 1960s
Dumfries & Galloway	Mull of Galloway *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
Dumfries & Galloway	Burrow Head *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
Dumfries & Galloway	Monreith Cliffs *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
Dumfries & Galloway	Cruggleton cliffs *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
Dumfries & Galloway	Balcary Point *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
Dumfries & Galloway	Meikle Pinnacle *c.* 2–5 prs	Paul N Collin < 10 yrs ago	
East Lothian	Tantallon 1 nest	Stephen Welch 2017	
East Lothian–Borders	North Berwick–Eyemouth n/a	Murray *et al.* 1998	> 10 yrs ago
Fife	Kinghorn Several nests	Hugh Brazier < 10 yrs ago	
Highland	Cromarty Souters–Tarbet Ness Up to 100 pairs (est)	John Poyner < 10 yrs ago	
Orkney	Castle o'Burrian, Westray 1 successful nest	David Bailey (obs) 2021	
Shetland	Fair Isle 1 unsuccessful nest	Fair Isle BO report 2013 2013	
Swallow			
Argyll & Bute	Oa RSPB reserve, Islay 2 successful pairs	David Wood (obs) 2021	
Highland	Rosemarkie 1 pair	John Poyner (obs.)	> 10 yrs ago
Orkney	The Gloup, Deerness 1 successful nest	WJS, MTJ (obs.) 2021	

Wales, a pair is known to have bred in Breconshire in 2016 (Andrew King, county recorder, pers. obs.). There is also a record from Sark, Channel Islands, from 1923 (Dobson 1952).

It's not surprising that relatively little is known about numbers of cliff-nesting hirundines because surveying steep coastal cliffs can be problematic and even dangerous at some sites. Ideally, surveys should be carried out from below the cliffs if access is possible (Summers & Kalejta-Summers 2021). However, a national survey of known or likely cliff sites would be an interesting exercise to bring together data to better understand the extent to which the Scottish House Martin population use natural sites, especially if matched with data from urban-nesting martins.

Acknowledgements

We'd like to thank those regional and county bird recorders, and observers on social media, who responded to requests for information; also Sandra & Don Otter, Roy Frost, Logan Johnson, Mark Holling, Julian Hughes and Tony Paintin who assisted with published references. We thank an anonymous reviewer for their comments on the first draft.

References

Davies, C. 1987. Cave- and cliff-nesting Swallows in Derbyshire and the Peak. *Derbyshire Bird Report 1986*: 66–67. Derbyshire Ornithological Society.

Dean, T. 2008. *The Orkney Book of Birds*. Orcadian Ltd.

Dobson, R. 1952. *Birds of the Channel Islands*. Staples Press.

Frost, R. & Shaw, S. 2013. *The Birds of Derbyshire*. Liverpool University Press.

Jourdain, F.C.R & Witherby, H.F. 1939. Cliff-breeding in the House Martin. *British Birds* XXXIII: 16–24.

Low, G. 1879. *A tour through the islands of Orkney and Shetland: containing hints relative to their ancient, modern, and natural history, collected in 1774*. William Peace & Son, Kirkwall.

Murray, R.D, Holling, M., Dott, H.E.M. & Vandome, P. 1998. *The Breeding Birds of south-east Scotland: A Tetrad Atlas 1988–1994*. Scottish Ornithologists' Club.

Pritchard, R., Hughes, J., Spence, I.M., Haycock, B. & Brenchley, A. (eds). 2021. *The Birds of Wales*. Liverpool University Press.

Summers, R.W & Kalejta-Summers, B. 2021. Repeat surveys of House Martin colonies in eastern Scotland, 50 and 75 years later. *Scottish Birds* 41: 26–31.

Steve P. Dudley, Monivey, Westray, Orkney KW17 2DW.
Email: stevedudley787@gmail.com

Will J. Smith and Michal T. Jezierski, Edward Grey Institute of Field Ornithology, Department of Zoology, University of Oxford OX1 3SZ.
Email: william.smith@queens.ox.ac.uk
Email: michal.jezierski@zoo.ox.ac.uk

Revised ms accepted March 2022

Evidence of wintering by Scandinavian Rock Pipits in Fife

The Scandinavian Rock Pipit *Anthus petrosus littoralis* is currently recognised as distinguishable from the nominate British Rock Pipit *Anthus petrosus petrosus* only following pre-breeding moult, from February/March through to post breeding moult from July. Demongin (2016) describes *littoralis* as in 'autumn, very similar to *petrosus* and indiscernible with certainty', whilst breeding plumage is 'variable but typically tinged vinaceous-pink on breast, streaks on underparts limited to sides of breast and flanks; malar stripe dark; clear pale supercilium; head and upperparts greyish; sometimes breeding plumage more similar to *petrosus*' (see Plate 167). The late Kevin Woodbridge (in Forrester *et al.* 2007) concluded that the winter status of *littoralis* in Scotland was 'not established', with only one confirmed record, a Norwegian nestling from July 1957 found dead in Anstruther, Fife, in January

Plate 167. Typical *petrosus* Rock Pipit, Kilrenny Mill, Fife, 4 April 2022. © *Mike Martin*

1961. A review of *Scottish Bird Reports*, 2007–2020, indicates approaching annual records for *littoralis* in a number of east and northern coastal areas (Borders, Caithness, Fair Isle, Highland, Lothians, North-East Scotland and Shetland), in many cases as single date observations from end December through to May, and with the majority in the period when birds are recognised as potentially separable from the nominate race. Records from April and May, particularly when multiple birds involved, e.g. the exceptional record of 35 at St Combs, North-East Scotland on 1 April 2013, one of which carried a Norwegian colour-ring (*SBR* 2013), arguably reflect *littoralis* passage rather than wintering. Birds of the *littoralis* race are now regularly reported in winter in Lothian. Sites include Musselburgh, Aberlady, Tyninghame and Dunbar–Thorntonloch. Recent evidence supporting the presence of Scandinavian birds in winter comes from the colour-ring sightings of birds ringed at Makkevika, Norway (per Kjell Mork Soot) at Skateraw 1 January, another on 2 and 19 January (also 25 Nov 2018)) with a third at Fluke Dub on 8 October (*Lothian Bird Report* 2019). There are a handful of records from Fair Isle (e.g. *SBR* 2015) suggesting that breeding by *littoralis* may have taken place. A putative *littoralis* which nested in Lothian in 2016 (Andrews, 2016) was also noted in 2017 and 2018.

A three-year colour-ring study of rock pipits roosting in Anstruther Harbour commenced in December 2021 (Martin 2022), supported by the Tay Ringing Group, and has gathered data on 40 birds to April 2022. Included amongst these have been three birds carrying Norwegian colour-rings, two of which have resulted in multiple captures/sightings. In addition, Jared Wilson (pers. comm.) has alerted the author to three Norwegian colour-ringed birds sighted at Kilrenny Mill, Cellardyke, Fife, over the last three years. All birds have been caught or sighted in Anstruther Harbour and/or in the littoral zone of the shores between 2.5 km east (Kilrenny Mill) and 1 km west (Billow Ness) of the harbour. A female ringed in Anstruther on 3 January 2022 (Plate 169) as part of the study, with a wing measuring within the range for *littoralis* and outside that for *petrosus*, was

Table 1. Ringing and control/retrap/sightings detail of birds seen in the Anstruther area that are considered to be of the *littoralis* sub species of Rock Pipit in chronological order of ringing date.

ED08905 Full grown 15/09/17 Makkevioa, Giske, More & Romsdal, Norway.
Sight record 22/02/20 Kilrenny Mill, Cellardyke, Fife (sight record 01/03/20).

EL00920 Juvenile 04/03/19 Maletangen, Fraena, More & Romsdal, Norway.
Sight record 21/02/20 Kilrenny Mill, Cellardyke, Fife.

EL04745 Juvenile 10/09/19 Makkesika, Giske, More & Romsdal, Norway.
Sight record 27/12/20 Kilrenny Mill, Cellardyke, Fife.
Sight record 15/02/22 Kilrenny Mill.

EP07821 Juvenile 05/09/21 Vigra, Giske, More & Romsdal, Norway.
Controlled 03/01/22 Anstruther Harbour, Anstruther, Fife (Retrapped AH 21/01/22)
Sight record 04/01/22 Billow Ness, Anstruther, Fife.

EP02633 Juvenile 07/10/21 Maletangen, Fraena, More & Romsdal, Norway.
Sight record 31/12/21 Kilrenny Mill, Cellardyke, Fife (Sight record: KM 03/01, 07/01, 19/01, 01/02,15/02, 13/03, 14/03, 18/03).
Controlled 21/01/22 Anstruther Harbour, Anstruther, Fife (Retrapped: 25/01; Sight record: 07/03, 08/03).

BV55269 Full grown 03/01/22 Anstruther Harbour, Anstruther, Fife
Sight record 16/01/22 Kilrenny Mill, Cellardyke, Fife (also 19/01. 02/02, 19/03, 27/03)

2727003 Full grown 03/02/22 Anstruther Harbour, Anstruther, Fife (Sight record: KM 05/03, 17/03, 21/03)

2727005 Full grown 16/03/22 Anstruther Harbour, Anstruther, Fife (Sight record: KM 18/03)

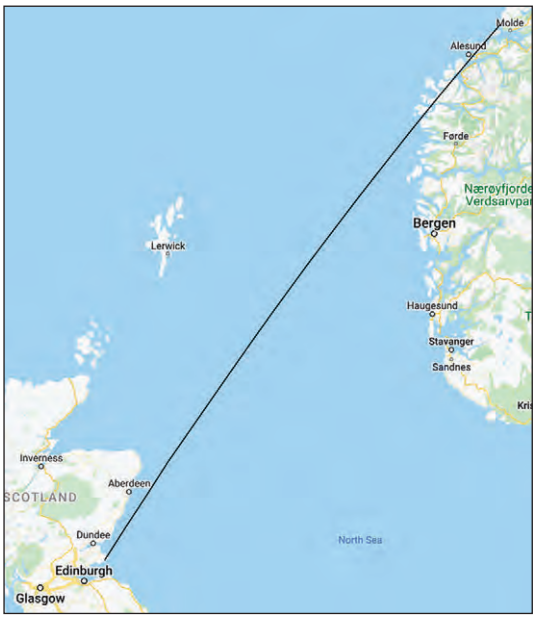


Figure 1. Line connecting ringing area of Norwegian colour-ringed birds from More & Romsdal and control/sighting area in Anstruther, Fife. Distances vary between 853 and 927 km, and between 219º and 220º SE.

seen subsequently on several occasions, and when photographed on 27 March was considered to be exhibiting pre-breeding *littoralis* moult; two other females ringed between January and March 2022 had wing length compatible with *littoralis*, but outside *petrosus* limits (Table 1).

All of the Norwegian controls/sightings are from sites in More & Romsdal, an area in Western Norway (Figure 1), where they have been trapped in an extensive study by Kjell Mork Soot (pers. comm.) and colleagues, in a collaboration between several ringing stations. In the past ten years they have ringed over 11,000 birds on passage through Western Norway, generating controls in Scotland, England and Wales and, on the continent, as far south as the North of Spain.

Ring number ED08905 is of note as a Norwegian bird represented by sightings in Fife in its third calendar-year after year of ringing, within the winter period (22 February and 1 March), and EL00920 of a juvenile bird ringed in March of its first winter in Norway and sighted in its second winter (21 February) in Fife. EP07821 was ringed in its first autumn in Norway, controlled on 3 January in Anstruther Harbour, retrapped there 18 days later, having been seen 1 km west the day after initial control. EP02633, having been ringed as a juvenile in Norway in the first week of October, was first sighted at Kilrenny Mill at the end of December, seen again there on nine further dates to 18 March, retrapped twice in January at the Anstruther Harbour roost, and sighted there again twice in March (Plate 168). Ring number EL04745 provides evidence of a returning Norwegian autumn ringed juvenile,

Plate 168. Known *littoralis* Rock Pipit, carrying Norwegian ring EP02633 left, and yellow colour KJX right, Kilrenny Mill, Cellardyke, Fife; 18 March 2022. © *Mike Martin*

sighted in late December two years later at Kilrenny Mill and then again in mid-February two years after that. BV55269 was colour-ringed yellow AH at Anstruther Harbour on 3 January, and the colour-ring read on six occasions to 3 April, on which occasion observation suggested the bird was of *littoralis* origin (Plate 167), although this had not been noted on the previous sighting occasions or when ringed on 3 January 2022.

It is suggested that EP02633 provides evidence of a *littoralis* bird wintering in Fife, having been present from at least 31 December 2021 to 18 March 2022; with further evidence from EP07821, present for a period of at least 18 days in January 2022, and EP08905, present for a period of at least nine days in February and March 2020. Bird BV55269 is indicative of a wintering bird with dates spanning from 3 January to 3 April, during which period it developed pre-breeding *littoralis* type plumage; this bird had a wing length of 83 mm which is outwith the range given by Demongin (2016) for female *petrosus* (85.5–92.5 mm) and within that for *littoralis* (80–89 mm, Figure 2). Ring

Plate 169. Considered *littoralis* Rock Pipit ringed (blue over metal BV55269 right, yellow colour AH left) at Anstruther Harbour, Fife, on 3 January 2022. Resighted there and at Kilrenny Mill 2.5 km East, on seven occasions up to 3 April 2022, having developed *littoralis* plumage by 27 March 2022. © *Mike Martin*

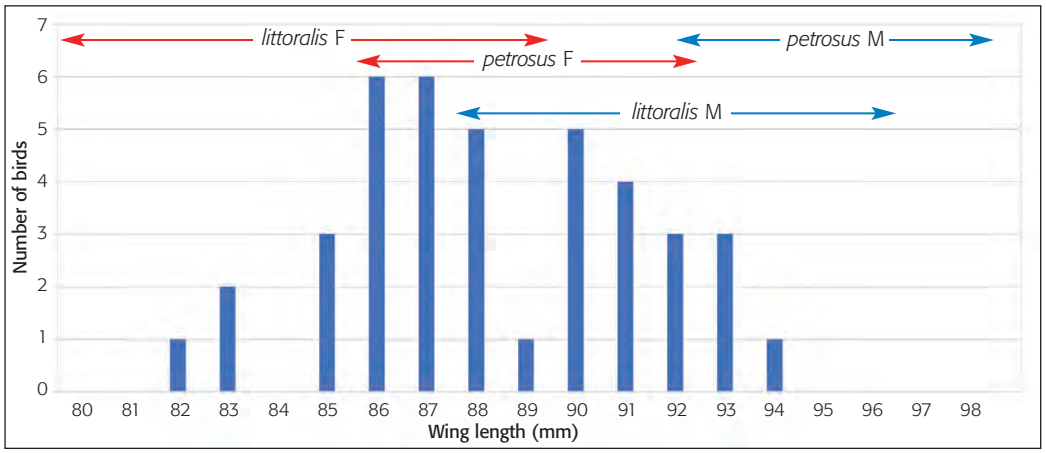


Figure 2. Wing lengths of *littoralis* and *petrosus* Rock Pipits recorded at Anstruther and Kilrenny Mill, Fife in winter 2021/22, indicating presence of females of the former in falling outwith the range of the latter (Male data also shown). Bar chart below range indicators of *littoralis* and *petrosus* male and female wing lengths. From Demongin (2016).

number EL04745 is noteworthy in reflecting a bird at Kilrenny Mill on two winter dates spanning three winter periods, and suggesting return to wintering area. Ring numbers 2727003 and 2727005 had wing lengths of 82 and 83 mm respectively, indicating female *littoralis*, with the former present between 2 February and 21 March, suggestive of wintering. In addition, of the 40 birds ringed or controlled between 13 December 2021 and 16 March 2022 three had wing lengths of 85 mm, too close to Demongin's (2016) end range point of 85.5 mm for female *littoralis* to be certain to which sub-species they belong (Figure 2).

It is remarkable that a 3.5 km section of the Fife coast should have five Norwegian controls over a period of 24 months, whilst the same number has been generated locally from birds ringed on the Isle of May (8.5 km SE), where, incidentally, two Anstruther colour-ringed birds have subsequently been sighted (in late March and April 2022, Mark Newall and David Steele pers. comm.). While the colour-ring study is in its infancy and has a primary purpose of exploring aspects of local feeding and roosting areas, a spinoff is that information on Norwegian and other controls has emerged, and this will become an additional focus for future study.

Acknowledgements

I am grateful for permission from John Kinninmonth of Fife Council Harbours HQ for permission to ring birds in Anstruther Harbour and acknowledge support in various ways from members or staff of the Centre for Ecology & Hydrology, Fife Bird Club, Tay Ringing Group and NatureScot.

References

Addlesse, H. 2015. *North-East Scotland Bird Report,* 201:108. North-East Scotland Bird Club.

Andrews I.J. 2016. Possible Scandinavian Rock Pipit nesting in Lothian. *Scottish Birds* 36: 213.

Andrews, I.J. and Gillon, K. (eds) 2019. *Lothian Bird Report* 2016:97. Lothian SOC.

Andrews, I.J. and Gillon, K. (eds) 2021. *Lothian Bird Report* 2019:125. Lothian SOC.

Demongin, L. 2016. *Identification Guide to Birds in the Hand.* Pp.231–232. Laurent Demongin

Forrrester, R.W., Andrews, I.J., McInerny, C.J., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C., & Grundy, D.S. (eds) 2007. *The Birds of Scotland.* Vol 2: 1021–1022 The Scottish Ornithologists' Club (SOC), Aberlady.

Martin, M. 2022. Ringers' Roundup. *Scottish Birds* 42:66.

Parnaby, D. (ed) 2016. *Fair Isle Bird Observatory Report* No 67. (2015):103. Fair Isle Bird Observatory Trust.

Scottish Bird Reports. 2007 to 2020.

Mike Martin, 1 Melville Terrace, Crail Road, Anstruther, Fife KY10 3EW.

Revised ms accepted April 2022

SOC Borders - Local Survey Initiatives

The SOC Borders Branch is made up of over 140 members with a wide range of experience and expertise. During the summer of 2021, the branch developed a set of Local Survey Initiatives (LSI) with the objective of improving coverage of rare and scarce inland breeders in the Borders.

The background to these initiatives can be found in two main areas. Firstly, in partnership with Lothian, SOC Borders has now participated in two tetrad Atlases for south-east Scotland (1988–1994, 2007–2014). Within these surveys, there are numerous recommendations for further investigation and attention to be paid to several species in our region. Secondly, in our annually-produced Bird Report, many species are described as either under-reported or requiring better attention by observers.

Plate 170. Pied Flycatcher, St Abb's Head, Borders, May 2021. © *Richard Jackson*

The branch decided to make this a more specific survey list, so certain species were excluded for the following reasons:

- It was assumed that rare or scarce seabirds would be covered in winter through the annual Rocky Shore Counts and in summer by the St Abbs Head NNR Seabird Survey.
- Raptors and Owls were assumed already suitably covered also through the Lothian & Borders Raptor Study Group.
- Geese were considered accounted also from the organised Icelandic Goose Counts.

The exclusion of these species resulted in a manageable list for a moderately-sized branch. BTO data could then be interrogated in order to inform best approaches.

Survey Types

Once the final list of species had been agreed, it was ratified by the branch's Discussion Group: this is an open-forum format group, where members are invited to participate and discuss the items on the month's agenda and relay recent sightings of interest. During this meeting (online due to the COVID-19 pandemic), Long-eared Owl was re-instated due to personal interest from members. This shows the flexibility of our approach.

Thought was then put to the best method of survey for each species. Due to the rare and scarce nature of the target species, it was decided that the objective of each visit would be the completion of a Complete List to be submitted via BirdTrack. In this way, if the presence of the target species was not detected, valuable data could still be gathered at each location through the SOC's preferred means of submission.

A variety of different survey formats were required to suit the species:

- As a number of species consisted of relatively rare and scarce dabbling and diving duck species, it was decided that coordinated counts of priority local waterbodies would be a suitable method.
- As more than one target species occurred at significant but under-watched locations in the Borders, certain sites of particular interest were identified at which to record Complete Lists.
- Two species were nocturnal, and therefore warranted a further nuanced approach using night-time detection techniques.

- A group was identified which consisted of singing late migrants. It was proposed that a more accurate impression of visiting populations might be obtained through promotion of the species through the group's social media channels, to include identification kits, links to Xeno-canto song recordings, and the publicising of previous or potential locations at which local members could attempt to see these birds.

However, again, the intention for all surveys was for a complete species list to be completed for each of these surveys via BirdTrack.

It is worth mentioning that in the early stages of discussing methodology of nocturnal surveys, the opportunity to purchase audio equipment arose through an application to the SOC Endowment Fund research grants scheme. The application was successful and has allowed an enhanced methodology for the targeting of Nightjar in the area. The branch would like to take this opportunity to thank the SOC for the opportunity of this funding.

The resulting list of surveys was as follows:

- Gadwall - Coordinated counts of waterbodies with recent previous records.
- Two visits of specific sites where rare and scarce species had occurred previously, including Hawfinch and Willow Tit.
- Great Crested Grebe - Coordinated count of waterbodies with recent previous records.
- Long-eared Owl - Nocturnal survey of suitable habitat with historical records.
- Nightjar - Nocturnal survey of suitable habitat with historical records.
- Pied Flycatcher and Wood Warbler - Aim of increased coverage of scarce breeding migrants each with singing periods until late June. Group message to local birding social media platforms to raise interest/awareness with suggested locations for members to target and contribute to building a more accurate picture.
- Further project evolutions have led to a full Marsh Tit survey, to assess the population status of the birds in their only known Scottish location.

Plate 171. Gadwall, River Tweed, Borders, November 2021. © *Alistair Cutter*

Plate 172. Wood Warbler, Plora Wood, Borders, April 2021. © *Richard Jackson*

Results

It is too early in the cycle of these initiatives to publish results from all of the surveys mentioned above. This is not the intention of this piece, and at the time of writing the data have simply not yet been collected in order to do this. Instead, we aim to describe the processes involved in defining these surveys, and are able to offer some preliminary observations on the benefits to the branch.

Preliminary data

Some preliminary data have been gathered, and a more accurate winter population estimate has been derived for Gadwall in the Borders. The count supports estimates given in the most recent regional Bird Atlas, and also suggests possible factors affecting the movement of the species between waterbodies and the swell of numbers in different locations.

Links to other SOC branches

We would like to express our gratitude to our Lothian Branch counterparts who suggested an augmentation to this initial Gadwall count. There has since been a coordinated count with Lothian SOC in order to more accurately assess breeding season populations of Gadwall in the entire south-east Scotland region.

We are also indebted to the North-East Scotland SOC Branch, with which improved links have been developed through consultation on Nightjar survey methodology in pursuing relevant expertise to inform these surveys.

Links to other external agencies

Improved links have now been established with the Borders Scottish Wildlife Trust. The sharing of information and coordination of 'extra eyes' looking for priority species in the Borders has been positive, so again, we pass on our thanks.

Membership outreach

The narrative of the surveys has provided several reasons and opportunities to reach out to new members in order to engage them with the work. This has been successful, and led to an increase in attendance at branch Discussion Groups. The branch has since decided to ensure that an 'Engagement Officer' now forms part of the elected branch committee with responsibility for promoting local surveys and reaching out to members.

Additional and historical records

Through research made necessary by our dedicated Marsh Tit survey, previously unknown records of this rare species have been identified from historical notebooks. These have built better understanding of its previous distribution in the region, and hence, subsequent decline.

Alasdair Reid
Email: alasdairreid@hotmail.co.uk

NEWS AND NOTICES

New members

Ayrshire: Mr A. Nicol, **Central Scotland:** Mr J. Brown, Mr S. Holland, **Clyde:** Dr E. Conway, Mrs L. Dobie, Mr R. Graham, Dr P. Mason, Mr I. McCrae, Mr F. McGurn, Ms E. Page, Miss S. Pickles & Mr T. Roper, Mr A. Pinch, Mr H. Revell, Dr A. Whiteley, **Dumfries:** Dr G. Clewley, **England, Wales & NI:** Mr & Ms S. Bradley, Dr J. Cracknell, Mr C. Hagan, Mr E. Jones, Mr M. King, Mr & Mrs H. Lucas, Mr & Mrs C. Roberts, Mr C. Shreeve, **Fife:** Mrs A. Mansell, Mr J. O'Reilly, Mr S. Russell, Mr R. Turk, **Highland:** Mr J. Brough, Mr G. Roberts, **Lothian:** Ms A. Black, Ms E. Breitenbach, Mr C. Foubister, Mr J. Goodacre, Ms R. Greaves, Miss E. Halligan, Mrs S. Hamilton, Ms A. Hawitt, Miss N. Hodgson, Miss D. Horsley, Ms G. Knight, Mr & Mrs S. MacGregor, Ms S. McIntosh, Ms J.E. McMeekin, Miss A.A. Michael, Ms A. Milton, Dr D. Molyneux, Ms C. Patience, Mr A. Pringle, Mr G.R. Ramon, Dr S. Rivers, Mr & Ms H. Shimizu, Mr D. Sutherland, Mrs H.M. Wager, **Moray:** Ms C. MacLeod, **North-East Scotland:** Miss S. Laidlaw, Mrs E. Niven, **Orkney:** Mr J. Gilman, Mr R. Neave, **Scotland - no branch:** Ms J. Peddie, Mr D. Pretswell, Mr P. Sclater, **Stewartry:** Miss C. Whatmough.

Plate 173. Atholl Palace Hotel, Pitlochry.
© Atholl Palace Hotel

SOC Annual Report and Accounts 2021/22

This year's report will be available in early November in digital format only, with members notified by email. If you do not have internet access or would like to receive a printed copy of the report, please email mail@the-soc.org.uk or contact the office on 01875 871330.

SOC Annual Conference, 25–27 November 2022, Atholl Palace Hotel, Pitlochry

We look forward to proceeding with an in-person event in Pitlochry. The theme of this year's event is raptors, to mark the 20th anniversary of the Scottish Raptor Monitoring Scheme. Full details of the programme and how to book will be emailed to members who are signed up to receive our Club news and events notices (www.the-soc.org.uk/gdpr-consent) and details will be available on the SOC website. If you do not have internet access and would like to receive the programme and booking form by post, please contact the office on 01875 871330.

85th SOC Annual General Meeting

26 November 2022, 5.00pm

Atholl Suite, Atholl Palace Hotel, Pitlochry. The AGM agenda (enclosed with this issue of *Scottish Birds)* includes details of a proposed amendment to the the Club's Constitution to make provision for virtual members' meetings in future. www.the-soc.org.uk/support-us/events/events/soc-85th-annual-general-meeting

Scottish Birdwatchers' Conference, 18 March 2023 (TBC), Stirling (venue to be announced)

Next year's spring conference will be hosted by BTO Scotland and SOC Central Scotland branch. Programme and booking information will be circulated to members with the December issue of *Scottish Birds.* As soon as the date and venue are confirmed, details will be posted on the SOC website: www.the-soc.org.uk/get-involved/scottish-birdwatchers-conference

Waterston House update

Opening hours Wednesday–Sunday 10:00–17:00 hrs (10:00–16:00 hrs from 28 September). Please check the SOC website for any updates to opening hours and facilities available when planning your visit: www.the-soc.org.uk/about-us/getting-here-opening-hours Admin staff can be reached Monday to Friday 09:00–17:00 hrs and weekend staff 10:00–17:00 hrs (16:00 hrs from 1 October) on 01875 871330.

Art Exhibitions

Northern Flights - a view from Shetland Howard Towll and Paul Bloomer, 28 September–13 November 2022. This joint exhibition presents the work of two artists who chose to make Shetland their home and whose work is deeply informed by their environment. Both also share a talent for printmaking, woodcuts in particular, and these form the core of their exhibition. Howard Towll, originally from Edinburgh, has lived and worked on Shetland for 30 years. A self-taught artist, he studied ecology and also works as a ranger for Shetland Amenity Trust. His art practice is based on observational drawing and painting, as well as studio-based printmaking. As Howard explains: "Shetland is a great place for wildlife and I don't have to go far to find a subject matter! From the shoreline below the house, I regularly see Otter, Red-breasted Merganser, Arctic Tern and Eider. In the hills beyond, I encounter Mountain Hare, Raven or Red-throated Diver. Slightly further afield, I can reach several large seabird colonies and observe scarcer breeding birds such as Arctic Skua and Red-necked Phalarope."

Plate 174. Rain Geese. © *Howard Towll*

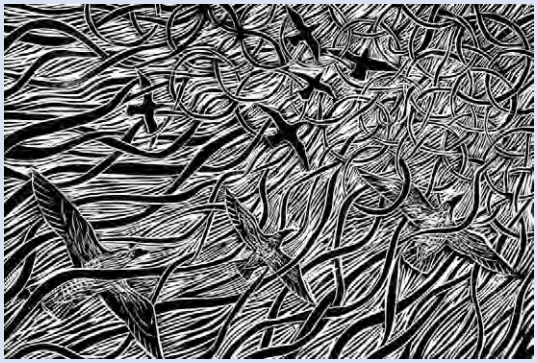


Plate 175. Wind. © *Paul Bloomer*

Paul Bloomer was born and brought up in the heavily industrialised Black Country of the West Midlands and his work as an artist was initially informed by this industrial landscape imbued with a strong autobiographical narrative. Moving to Shetland 20 years ago changed his work dramatically, with the ever-changing light and wild landscape calling for a new approach. He explains: "Working directly from nature is a constant battle in looking and feeling my way through a myriad of unnameable colours and changing shapes. I am something of a hybrid artist - part urban, part rural. I am interested in the harmonies and tensions between the world of nature and the world of man, and no subject is out of bounds."

Woodcuts rely on a strong sense of composition, and in the hands of these two artists, the interpretations of the natural world are striking, ranging from the decorative to the spiritual.

Branch Updates

New contacts Dumfries, change of Secretary: Heather Stevenson, Tel: 01387 248535, Email: dumfriessecretary@the-soc.org.uk Council thanks outgoing Secretary, Alex Banwell, for holding the fort over the past year and a half, during challenging times.

Borders branch appoints Engagement Officer... At the branch AGM in April, an exciting new position was created on the Committee, with Peebles-based member, Alasdair Reid, taking up the challenge. The role will see Alasdair work

Plate 176. Alasdair Reid and Dougal, 2018, Abernethy. © *Charlotte Reid*

with fellow Committee members to find look at ways of growing branch membership, engaging with existing members, and working with the wider birding community to encourage involvement in local surveys and other branch activities. As reported in the June issue, the Borders branch put in a successful application for funding from the SOC Endowment Fund for a Nightjar monitoring project.

...and launches Facebook and Twitter pages

In June, the branch entered the social media arena with the launch of a Twitter profile @BirdingBorders and Facebook page: www.facebook.com/groups/socborders. Both platforms are designed to relay news on branch activities and bird sightings. This Facebook page is a public one, so all posts are available for anyone to see. However, to post, you must be a member of the group and answer a couple of very quick questions to get access. For those posting content, common sense on internet etiquette applies and importantly the non-reporting of rare/sensitive breeding birds or other information best kept out of the public domain.

Scotland's Birding Calendar

If you are ever short of inspiration for your days out birding or simply want to know what birds might be worth looking out for at a particular time of year, there is a new resource on the SOC website that may help. The 'Something for the Weekend' feature produced by SOC Birding and Science Officer Mark Lewis ran on SOC's Facebook page during the 12 months to July 2022. We have pulled these posts together to form a 20,000 word summary that offers insights such as when to see migrating wader, seabirds and other regular visitors, as well as some of the scarcer birds. Hopefully it will prove to be an interesting and useful resource: www.the-soc.org.uk/get-involved/scotland-s-birding-calendar

Scottish Birds Online

You should have already received an email from us with details of how to access your digital copy of the current issue as well as your accumulated recent back issues. If you haven't received the email, or are experiencing any issues with setting up or accessing your *Scottish Birds* Online account, please contact Kathryn Cox (admin@the-soc.org.uk).

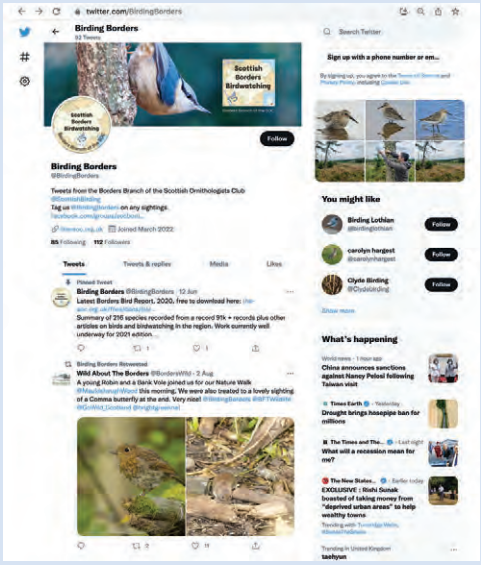


Plate 177. Join the conversation - find SOC Borders branch on Twitter

Prefer a digital-only membership?

We now have a digital-only membership rate available across all our categories - see inside front cover for details. If you would prefer not to receive the printed mailings (including the print version of *Scottish Birds*) and have not already notified us, you can do so by completing our short switch form at www.the-soc.org.uk/switch-to-digital or by dropping Kathryn a line: admin@the-soc.org.uk If you have already renewed your print membership, we regret that we are unable to offer a part refund and the digital-only rate will be effective from your next again renewal. However, we can still set your membership to withhold the printed mailings in the meantime.

SOC mobile app gets a plug on TV

The 2022 series of BBC Scotland Landward included three clips highlighting that you don't need to venture very far from home to find some great birdwatching sites. Landward presenter Arlene Stuart joined Shenaz Khimji (SOC Visitor Experience Officer) out birdwatching at local sites in Edinburgh and East Lothian, finishing up at Dunbar Harbour with its well-known, and very accessible, Kittiwake colony. Their chat in the last episode ended with Shenaz mentioning that the free SOC app 'Where to Watch Birds in Scotland' is a brilliant resource for finding good birding sites anywhere in Scotland.

That Landward episode, #12, was aired in Scotland on Thursday 23 June and UK-wide on Sunday 26 June, with the link to the SOC app posted on the BBC Scotland Facebook page: Normally the app gets about 10 downloads per day but in the period between Landward going out on Scottish networks to a few days after the UK-wide airing, there had been around 600 downloads! This represented the largest spike in usage since the launch of the app on both IOS and Android. The power of TV advertising!

SOC archives listed on national Archives Hub

The Club has reached a real milestone with its archive records - the catalogue went 'live' in June on the Archives Hub and you will find a direct link to the platform on the SOC website: www.the-soc.org.uk/about-us/library

'The Hub' is the main online national repository for archive catalogues, so researchers anywhere can search across all the main UK research archives in one operation. Run by the Joint Information Systems Committee (JISC), the UK's expert body for digital technology and digital resources in higher education, further education and research, the Archives Hub lets you find unique sources for your research.

So what is in the SOC Archive? Why not have a look through our catalogue and find out - our

Plate 178. Shenaz with Arlene Stuart, Arthur's Seat, Edinburgh, June 2022. © *BBC Scotland - Landward*

Plate 179. Early 20th century bird observation schedules. SOC archives. © *Rosie Filipiak*

listing in the Hub has a very easy-to-use Table of Contents and within a few clicks you can find that we have, for example, 19 items under the category of 'Rook Surveys', 20+ items under 'Midlothian Ornithological Society', and copies of Branches' meeting programmes going back to 1947! The Bird Observation Schedules (Plate 179) consist of printed forms, completed by the observer, and sent to William Eagle Clarke and then to Miss Rintoul and Miss Baxter. They formed a significant part of their work on migration.

The material in our Archive, which is housed at the Club's HQ in Aberlady, is available for consultation. To arrange a visit, please contact SOC Librarian, Rosie Filipiak. Tel: 01875 871330 or Email: library@the-soc.org.uk

Council is grateful to Rosie for her work on this project and the support provided by SOC Library Committee members Alan Knox (Chair), Ian Elfick (Archivist), and Ben Crabstick (JISC Hub).

We were greatly saddened to hear of the sudden death of Ian Elfick on 11 July while working in his garden. An appreciation of Ian's work as the SOC Library archivist will follow.

Do you remember Donald Watson?

The Watson Birds project (www.watsonbirds.org), with the agreement of the Watson family, is preparing a series of essays about Donald. Project Director Roger Crofts envisages publishing these as a book, hopefully later next year. John Threlfall is leading on Donald as an artist, Chris Rollie on Donald's life and work in Galloway, Des Thompson and Colin Galbraith on his work as a bird scientist, Kate Watson from the family perspective, and myself on his conservation role. Do you have any stories or anecdotes about Donald from meeting with him and/or spending time with him in the field etc.? If so, Roger would love to hear from you. You can email your material to: roger.dodin@btinternet.com or write to Roger at: 6 Eskside West, Musselburgh EH21 6HZ.

Chris Mylne website - www.chrismylne.com

Members may be interested to learn that there is now a website dedicated to the work of the late Chris Mylne (1927–2018) - wildlife film-maker and photographer, and active member of the SOC for many years. The platform includes links to many of Chris' films about Scottish islands, birds and other subjects (hosted on YouTube), a selection of his still photographs, and some of his writing (including accounts of his early career in film-making).

Latest Local Bird Reports

Isle of May Bird Report 2020

The latest report, published in May, is available to purchase in person from Waterston House (£8.00) or by post from Dr Stuart Rivers (£9.00 including p&p). Please make cheques payable to: Isle of May Bird Observatory Trust and send to direct to Stuart: Flat 8 (2F2), 10 Waverley Park, Edinburgh EH8 8EU.

Orkney Bird Report 2020

Orkney must be one of Scotland's most exciting places to go birding: Breeding raptors, seabirds, waders and wildfowl, rare migrants, rare seabirds, winter waterfowl, the odd Corncrake, breeding Twite, Red-throated Divers and Short-eared Owls, flurries of Snow Buntings in autumn and winter, the list goes on!

Published in June by the Orkney Birds Records Committee, the 2020 report is available to purchase, priced at £10 (plus £2 UK p&p). For more information and to order a copy, email: orkneybirdreport@hestily.co.uk

For the complete list of local bird reports available and details of how to purchase or access the latest as well as back issues, visit the Bird Reports page of the SOC Website (Bird Recording/Bird Reports and atlases)

Avian Flu impacts field work

It would have been very hard not to notice the surge in cases of Avian Influenza (HPAI) through the summer months, either online or in person, with casualties washing up on many beaches all around Scotland. After large numbers of geese were affected earlier in the year, seabird colonies bore the brunt in May and June. This led to the closure of two NatureScot seabird colony reserves: Noss, in Shetland, and the Isle of May, in Fife.

Two seabird research projects supported by SOC's Endowment Fund have also been impacted by the outbreak: The Storm Petrel survey on Shillay in the Monach Isles, which would have included ringing birds under licence, has been postponed until better times. The researchers considered that the risk of spreading the disease through handling the birds was too high to undertake the work this year. On Rousay (Orkney), a long-term skua monitoring project had to introduce strict hygiene controls when handling Arctic Skuas (a species so far apparently unaffected by Avian Flu, at the time of writing) while monitoring of Great Skuas had to be undertaken from a road rather than from within the colony itself, to reduce disturbance.

While the outbreak continues, please pay heed to the following advice:

- DO NOT TOUCH the birds
- Please report any dead or dying birds to DEFRA - Tel: 03459 33 55 77 (be prepared to give some location details - a grid reference or what3words can be helpful)

Bob McGowan retires from National Museums Scotland

On 31 July 2022, Bob McGowan retired as Senior Curator of Birds at National Museums Scotland, where he had worked since 13 November 1978.

During a distinguished career at NMS, Bob published widely on a variety of ornithological topics (as well as co-editing the monumental *The Birds of Scotland*) and served on several ornithological (including SOC) committees, some of which he chaired.

Apart from his regular attendance at the annual conferences of the SOC and Scottish ringers, many Club members will have met Bob in Edinburgh to hand over bird corpses or egg collections, either at the rather gothic Chambers Street site or, latterly, at the state-of-the-art

Granton Collections Centre. Some members may even have been fortunate to enjoy a tour of the museum's facilities and collections, while being entertained by Bob's many anecdotes.

Bob has never been lost for a word or two, usually in English, although in recent years he has been learning Gaelic, partly in response to exposure to place-names when cataloguing various egg collections, particularly those of Golden Eagle. He has, over the years, acquired an encyclopaedic knowledge of egg collections and collectors, although there has on occasion been an associated down-side of having to 'blow' putrid addled eggs! As well as his skill with the blow-pipe, Bob was, briefly, an official Government gun-slinger, having shot a specimen or two (under licence!) when the need arose.

Plate 180. Bob McGowan, January 2008, *The Birds of Scotland* launch, Edinburgh. © *Chris McInerny*

As Bob's time for the deserved slippers and *uisge beatha* has arrived, we know he would be delighted if more ornithologists and artists, especially Scotland-based, would make use of the NMS collections - a priceless resource available to all.

Let us raise a glass or two, then, to Bob in thanks from the ornithological community for his unstinting support to birders, artists and the general public over many productive years.

Slàinte Mhath!

Tom Dougall

Graham Sparshott - a new member of SBRC

The Scottish Birds Records Committee welcomes Graham Sparshott as a new member, replacing Dave Pullan from November 2022.

Graham hails from the Isle of White, where he discovered an interest in birds during his childhood, eventually becoming the Isle of White bird recorder. Moving to Fife in 2010, he has become a professional bird surveyor and visited many parts of Scotland. Since then, he has become the Local Recorder for Fife, and studies visible migration at Ferry Hills, near his home in Dunfermline. Graham has travelled extensively in Europe, and further afield.

SBRC would like to acknowledge its gratitude to Dave Pullan for his work over the period of his tenure on the Committee, and we wish him well for the future.

Chris McInerny, on behalf of SBRC

2023 Research and Survey grants - plan ahead!

The closing date for applications for next year's research grants from the SOC Endowment Fund is 31 January. Decisions are usually made by mid-February so that applicants can get their funding in place for the fieldwork season (whether breeding or non-breeding). Payments are made on or around 1 April. Given that there is a finite amount of money in the pot each year, and in the interests of fairness to those submitting application forms timeously, please note that we are unable to accept late applications. As such, if you think you might require some funding for a research project, please plan ahead to avoid disappointment. For more information on the scheme and how to apply, visit the SOC website (About Us/Grants).

Plate 181. Mentees Christopher Kilmartin and Madli Kopa studying the ID features of Red-legged Partridge. Stottencleugh, East Lothian, 25 February 2022. © *Rosie Filipiak*

Engaging younger generations in ornithology through an East Lothian Winter Atlas Mentoring Scheme

There has been a significant increase in environmental awareness and concern during the last three decades, with mounting evidence of climate change and biodiversity loss. This is reflected in the rapid rise in the membership of environmental charities like the RSPB, which has more than doubled since the early 1990s to 1.2 million members today (RSPB). This has brought into close focus our need to take collective action at an individual, organisational, national and global scale to address our environmental crisis.

This rapid emergence in environmental awareness has been particularly evident in younger generations, who will ultimately inherit the environmental crisis we face. The number of student members in the SOC has risen from 19 in March 2012, to 75 a decade later - an almost four-fold increase. It is now even more important that we equip these younger generations with the required knowledge and skills to better understand environmental change to help identify effective management and policy solutions to address the environmental crisis.

We believe that fieldwork should play an important part in this process, as all the evidence underpinning our understanding of the biodiversity and climate crisis comes from dedicated fieldwork over many years. Fieldwork can also satisfy a natural curiosity, generating new questions leading to new discoveries, all of which contributes to our understanding of the natural world (Burt & Thompson 2020). Finally, participation in fieldwork, and contact with nature, can have positive effects on our mental health and wellbeing, and this has become even more evident during the recent lockdowns (NatureScot).

Fieldwork underpins many citizen science projects, such as the Breeding Bird Survey, Wetland Bird Survey and bird atlases which have generated invaluable long-term, extensive datasets, allowing us to better understand how bird populations are changing in response to climate change and other environmental pressures. These projects rely on the commitment and experience of a huge army of voluntary ornithologists, collecting vast amounts of bird data over many years. However, the future of these projects will depend on the recruitment of younger generations, with the necessary skills and experience to undertake accurate fieldwork.

The SOC has established several excellent initiatives in recent years aimed at engaging, supporting, and developing young birdwatchers, providing them with support from the Club's skilled membership of ornithologists, scientists and educators. This includes the pioneering Young Birders' Training Course in collaboration with the Isle of May Bird Observatory, an online programme of youth events throughout the COVID-19 pandemic, and more recently, the Scottish Bird Camp in collaboration with BTO Scotland.

The importance of opportunities like these to learn in the field with mentors has recently been highlighted by several lifelong ornithologists, conservationists and members of the SOC, who have cited their experience with mentors as having played a pivotal role in the development of their careers in ornithology and conservation. At the last spring SOC and BTO Conference, speaker Roy Dennis referred to the late George Waterston, one of the founding members of the SOC, as being an important influence in his career in conservation and ornithology. In addition, at a recent Lothian Branch talk, Rick Goater, Chair of the Central Scotland Branch, referred to the kindness of influential mentors, and the importance of them in shaping his lifelong interest in birds and conservation. One of the authors (MT) was mentored by the late Ray Murray, a former president of the SOC, who provided him with inspiration, support and guidance at the start of his career in ornithology.

During the last two winters, the SOC Lothian Discussion Group undertook an East Lothian Winter Atlas survey, aimed at mapping the abundance and distribution of birds at a tetrad scale (2 km x 2 km square). In recognition of the need to engage and mentor younger generations in field ornithology, it was decided by the Group that the Winter Atlas project should establish a pilot mentoring scheme to help facilitate the transfer of knowledge and skills to encourage the participation in ornithology by younger generations. More specifically, the principal aims of the scheme were to teach the field identification of birds, recruit new members to participate in citizen science, and promote the work of the SOC.

The mentoring scheme was promoted to life science students at Edinburgh and Edinburgh Napier Universities through their courses, as well as through the Edinburgh University Bird Society. The level of engagement in this pilot scheme was encouraging, with a total of thirty students (mentees) and nine members from the Discussion Group (mentors) registering on the scheme. A total of 19 field sessions were completed throughout the second winter of the Atlas, involving 26 mentees aged 18+ years old, with a varied level of experience and knowledge in ornithology. Each field session usually consisted of a walk through the tetrad covering the full range of habitats, with the mentor teaching bird identification and survey methods, to a maximum of three mentees, over a four-hour period. The mentees were then informally tested on what they had learnt in the field at the end of each session, and all bird records were submitted to the East Lothian Winter Atlas. At the end of the field season, each mentee was sent an SOC pack full of information about how to get more involved in ornithology, with additional resources to support bird identification and survey work.

Although we did not systematically evaluate the outcomes of this scheme, we received some positive feedback from mentees, all of whom valued the opportunity to meet experienced ornithologists and network within an informal field setting. Below are some of the comments received from mentees:

"I sadly didn't get the opportunity to attend as many sessions as I would have liked, but would love to join again in the future! I really enjoyed those few mornings spent in the Scottish countryside, encountered some species for the first

Plate 182. Dipper, Stottencleuch, East Lothian, 17 February 2022. © *Rosie Filipiak*

time (e.g. Dipper, Long-tailed Tit) and learned how to identify a couple of them by call (Chaffinch, Blackbird, Great Tit, Song Thrush). The mentors were incredible, very helpful, and made me realise how much I don't know (yet)." ***Madli Kopa***

"It was a beautiful experience. Our mentor was Mike Thornton. Those hours poured out more knowledge. I improved my bird identification skills through this scheme and met more people and shared their thoughts and experiences." ***Amie Ann Michael***

"As soon as I started this scheme, I began to tick off many species I had never seen before, including some common species. For me, some notable sightings during the surveys included a population of over 1,800 Pink-footed Geese, a pair of Long-tailed Duck, and a Kingfisher...

I took a great deal of benefit from the scheme. I encountered new species, saw new places and made new friends. Upon the conclusion of the mentorship, I became a member of the SOC so that I can continue to enjoy those benefits and to give back when I can. I want to express my gratitude to the people who organised this scheme, gave their time, and shared their knowledge." ***Christopher Kilmartin***

Given the success of this pilot mentoring scheme, we believe that the SOC should explore further opportunities to develop mentoring initiatives, perhaps by establishing links between SOC branches and universities, colleges and schools. Such a mentoring approach could offer an entry level introduction to ornithology for younger generations. This could be achieved by identifying SOC branch reps responsible for liaising with their local education institutes. Based on feedback from several mentors, it was suggested that mentoring guidance should be developed to support the teaching of bird identification. This idea was also suggested at the recent meeting of SOC Branch Representatives in Grantown-on-Spey in May, where the development of a Club-wide mentoring scheme received a lot of support. Although this pilot scheme was designed to offer an informal approach to field teaching, a more structured approach could also be developed in the future to increase involvement in citizen science schemes.

The development of field skills is a fundamental tool required by all environmentalists, allowing us to understand environmental change and identify solutions to tackle the climate and biodiversity crisis we face. The participation in fieldwork can also provide a greater sense of wonder and wellbeing in our increasingly complex world. A range of organisations, including universities, colleges, schools and conservation charities have an important role to play towards inspiring a connection with nature in younger generations, and support the development of field skills. We hope you, and the SOC can help play an important role in this process.

If you wish to receive further details about how the pilot mentoring scheme was set-up and managed, or if you have any feedback regarding this article, please contact: mike_thornton_99@yahoo.com

We would like to thank the following mentors for participating in the pilot scheme: Ian Andrews, James Boyle, Phil Bysh, Rosie Filipiak, Mark Holling, Stephen Metcalfe and Jeremy Wilson. We would also like to thank all those mentees who participated in the scheme.

References

www.rspb.org.uk

Burt, T. & Thompson, D. 2020. Curious About Nature - A Passion for Fieldwork. Cambridge.

www.nature.scot/nature-and-health-perfect-partnership

Mike Thornton, Andrew Matthews & Jane Allison

Plate 183. HMP Perth, February 2022. © *Steve Urquhart*

'Doing bird': Scotland's sounds at HMP Perth

Inmates at HMP Perth have been engaging with archive birdsong and oral history recordings from the SOC – some more than sixty years old – in a unique, creative audio art collaboration. Peesweeps meet hip hop beats, grouse unlock coded prison language, and an unhatched Kestrel chick provokes philosophy...

"To be a bird, even just for a day, would be... freeing. Just free. Where would you go? I don't know - I'm just gonna fly!"

In prison, people are literally separated from the outside world, and from the natural world. It can be disturbingly easy to disconnect from life beyond prison walls. And yet, a sound that's often cited by prisoners as one of their few direct live links with the outside world, is birdsong.

A couple of years ago, the National Library of Scotland and the British Library secured funding to digitise important community audio collections. The SOC's collection was one of the first to be done (*Scottish Birds*, Vol 40 (3), 247–249) and as part of this project, artists were invited to engage community partners with the archive recordings.

My name is Steve Urquhart, I'm a radio producer and sound artist. Much of my audio work over the past two decades has been with people affected by the criminal justice system. And so, I proposed working with people being held in one of Scotland's prisons.

"With birds, there's a pecking order - same as there is in the jail!"

In prison, avian language and symbolism are widespread. 'Doing Bird' is a slang term for being in prison, as is 'jailbird'. Many prisons are divided into 'wings'. Bird tattoos often have specific meanings.

Among the principal stated objectives of prison are constructive engagement, recovery and reintegration. Through the powerful sensation of sound, I wanted to bring the outside world directly into prison, to encourage inmates to actively consider – and to engage creatively with – life, experiences and sounds far removed from their cells, as they prepare for release.

Those taking part are all producer-presenters at HMP Perth's 'Insider Radio' (the station launched in 2021). Together they've produced the 'Doing Bird' mixtape – Side A and Side B – two ambitious, personal and celebratory new compositions for radio and digital listening, blending archive material with their own stunningly imaginative responses through music, spoken word, and sound art.

"Some mornings, between 3 and 4am, I'll hear a smaller bird, like a robin. That sound takes me back to being at home."

The two pieces (each 19 minutes in duration) have been created with eight inmates working at HMP Perth's *Insider Radio*. Engaging with Scotland's archive birdsong recordings encourages the men to recall positive memories, to spark creativity, to reflect on the purpose of prison, and to re-evaluate their connection to the world beyond prison walls. They also think deeply about the accessibility and value of oral history recordings, and about who gets to be involved.

'Doing Bird' is supported by the National Lottery through Creative Scotland. It's also supported by the National Librarian's Innovation Fund, and by the Scottish Prison Service.

'Doing Bird' was first broadcast on *Insider Radio*, HMP Perth, in March 2022, before reaching the airwaves of National Prison Radio and Resonance FM in spring 2022.

We are thrilled that 'Doing Bird' has been received so warmly, particularly by SOC staff and volunteers. The Club's Librarian and Communications Officer, Rosie Filipiak, shared this project with the family of the late William Brotherston, one of the Club's staunchest supporters whose sound recordings feature prominently. His nephew, also named William Brotherston, writes: *"I enjoyed listening to the tapes very much because of their variety and humour and also the chance to listen again to my Uncle Willie... but also, for example on Side B, listening to the discussion following the recording of the Kestrel chick inside the egg and its significance to someone locked up in jail..."*

To listen to 'Doing Bird' at any time, follow this link: www.listentosteve.com/doingbird

Steve Urquhart

The status of Golden Eagle in Fife

A recent sighting of a Golden Eagle in the Lomond Hills in March 2022 has revived interest in the exact status of the species in the Kingdom of Fife. Anne-Marie Smout (1986) described the Golden Eagle as a very rare visitor to Fife. She mentions three records from the 1950s, and one from March 1939. Going further back and quoting G. Bruce's *Land Birds in and around St Andrews* (1895), she mentions two further, much older records.

Reviewing old records is never easy; modern standards and identification features cannot be applied to records from 150 years ago. The Fife Local Records Committee (FLRC) looked at all Fife Golden Eagle records but took a very different approach; if the record was 'given credence' at the time, it stood.

This 'review' resulted in just two old records no longer being listed. The first involved a bird seen by the coastguards at Fife Ness on 21 May 1956. Chris Mylne said at the time that this was probably a Golden Eagle, but the possibility of an immature White Tailed Eagle could not be ruled out. Smout stated that this record was 'less certain' than the other Golden Eagle records in Fife. FLRC went back to the original write up of this record in the *Edinburgh Bird Bulletin* and agreed with Mylne and Smout. In fact, they went a bit further, stating it is unlikely this was a Golden Eagle. The second record is of a 'Golden Eagle' being mobbed by a Buzzard over Brucefield – ten miles west of Dunfermline – on 25 May 1958. This bird was watched right on the Fife/Clackmannan border. An interesting aspect of this record is that in the title of the short article – again in *Edinburgh Bird Bulletin* – the bird is referred to as a 'probable' Golden Eagle. Furthermore, the observer was perfectly open about the fact that he concentrated on the Buzzard, which was unusual in this area at the time, rather than the 'larger bird'. FLRC unanimously reached the conclusion that there were just too many doubts around this record.

There are now eight Fife records of Golden Eagle from 'about 1840' to March 2022. Of these eight records, one of the most interesting, in several ways, was an overwintering bird in 1952–53, not only because it was a 'long stayer', but because there had only been one sighting in Fife in the previous 90 years, and no records over the next 50 years.

The overwintering bird in the winter of 1952–53 at Earlshall Muir and Tentsmuir forest was first noted in early November 1952 on Earlshall Muir. In *Edinburgh Bird Bulletin* (3:26, 27), J. Grierson and I. Munroe reported: 'the outstanding event has been the presence on the Earlshall Moor of a Golden Eagle. First noted at the beginning of November, it has been seen on several occasions and was still present at the end of January. Of an overall dark brown colour, the absence of white in the tail shows it to be an adult bird'. The same authors reported later that it remained in the area until the end of February (*Edinburgh Bird Bulletin* 3:26, 40). There are three records before the 1952–53 record, and four since.

The first record of Golden Eagle in Fife was at Stravithie Wood and Prior Wood about 1840 (Bruce, 1895). The second was two birds at Mount Melville and Drumcarrow Craig around 1860. Seen by several observers, there were unsuccessful attempts to shoot them. This record may seem old and rather vague, and perhaps two birds is slightly odd, but 'credence' is given to this account as Mr W. Berwick told J. A. Harvie-Brown that one was observed at Stravithie, and two were near Mount Melville 'a good many years ago' (Bruce 1895). The last record before 1952 was one north of Crail, 19 March 1939 (Boase 1964).

Between February 1953 and September 2006 – more than half a century – there was no Fife record of Golden Eagle. On 22 October 2006, a sub-adult male Golden Eagle was watched for around 12–15 minutes in the Lomond Hills (Shaw 2007). We did not have to wait too long for the next record. The following is from the 2012 Fife Bird Report: 'The fascinating use of technology has allowed one of this, the most sought after species in Fife, to be recorded this year. An immature female – 'Angus 33' – with a

satellite transmitter fitted was found to have travelled at least 115 km on 19 September, originating in Angus, she then flew south east over the Tay and across the south end of Tentsmuir and then headed WSW along north Fife, passing east of Newburgh and roosting near to Crieff. She then moved to Speyside within the next couple of days. An incredible journey and an insight for us into how far these magnificent birds actually roam around. This is the sixth record for Fife but only the second since the 1950s, with Ken Shaw's bird in 2006 being the first in modern times. Thanks are due to RaptorTrack for all the information regarding this historic event'.

After taking advice from Scottish Birds Records Committee (SBRC), FLRC accepted this record as the second modern record of Golden Eagle for Fife. Only three years later on 14 August 2015, Andy Cage watched a sub-adult bird at Kilmany. Most recently, on 25 March 2022 three observers got very close views of an adult male Golden Eagle at the summit of West Lomond being mobbed by an adult male Peregrine, two Buzzards and two Ravens. After circling the summit of the hill several times it flew off powerfully to the NNW. All four modern records were fully documented, and all were accepted by FLRC.

It is interesting to compare Fife with Lothian, which is probably better situated and suited for wintering and wandering birds. Lothian had 16 records between 1951 and 2012, with four in the 1990s and three in the 1980s. Very different to Fife.

In an article entitled 'Discover Sea Eagles in the East', Jim Crumley stated that 'a Golden Eagle would not be seen dead in Fife - not even North Fife' (*Scots Magazine*). For most of the last 150 years he was about right, and he is certainly right that you are more likely to see Sea Eagle than Golden Eagle anywhere in Fife today. But what about the future? Fife birdwatchers would probably say that their chances of seeing Golden Eagle in Fife are increasing. The most recent national survey in 2015 put the Scottish population at 509 pairs (Hayhow *et al.* 2017). There have been increases in several parts of the country since then, and the figure is now probably in excess of 550 pairs, the highest number in recorded history (S. Benn, pers. comm.). This, along with the southern Scotland reintroduction project, means there are more birds to the north, south and west of Fife than ever. We know from satellite tracking that non-territorial Golden Eagles travel around much more than previously thought, and there are dozens, if not hundreds of birds – both sub-adults and adults – on the move (S. Benn, pers. comm.). As far as we know, Fife has been visited by Golden Eagles four times in the last 16 years, and that number is only likely to grow (S. Benn, pers. comm.).

Acknowledgements

We thank Stuart Benn, Andy Cage, David Clugston, Roy Dennis, Caroline Gordon, Anne-Marie & Chris Smout and Malcolm Ware.

References

Boase, H. 1964. *Birds of North Fife*. Unpublished typescript. Scottish Ornithologists' Club. Aberlady.

Bruce, G. 1895. *Land Birds in and around St Andrews*. Dundee.

Crumley, J. 'Discover Sea Eagles in the East'. *The Scots Magazine.* www.scotsmagazine.com› articles › sea-eagles-fife

Grierson, J. & Munroe, I. 1953. Tentsmuir and the Eden Estuary 20 October 1952 to 1 February 1953. *Edinburgh Bird Bulletin* 3: 28.

Grierson, J. & Munroe, I. 1953. Tentsmuir and the Eden Estuary 1 February 1953 to 31 March 1953. *Edinburgh Bird Bulletin* 3: 40.

Harvie-Brown, J.A. 1906. *A Fauna of the Tay Basin and Strathmore*. Edinburgh.

Hayhow, D.B., Benn, S., Stevenson, A., Stirling-Aird, P.K., & Eaton, M.A. 2017. Status of Golden Eagle *Aquila chrysaetos* in Britain in 2015. *Bird Study* 64: 281–294.

Mylne, C.K. 1956. Eagle at Fife Ness. *Edinburgh Bird Bulletin* 6:5. August 1956: 60.

Shaw, K.D. 2007. Golden Eagle in the Lomond Hills - first county record since the 1950s. *Fife Bird Report* 2006.

Smout, A-M. 1986. *The Birds of Fife. An Outline of their Status and Distribution*. Edinburgh.

Weir, R.S. 1958. Buzzard and Probable Golden Eagle on the Fife/Clackmannan Border. *Edinburgh Bird Bulletin* 8: 83.

Ken D. Shaw, Anstruther, Fife.
Email: kenshaw495@gmail.com

G. Sparshott & FLRC, Dunfermline, Fife.
Email: grahamspa@aol.com

BOOK REVIEWS

The book reviews published in *Scottish Birds* reflect the views of the named reviewers and not those of the SOC.

ERRATUM

***Scottish Birds* 42, (2), page 161**

In the review of Christine Jackson's biography of William Yarrell, it was implied that Thomas Bewick first classified and named Bewick's Swan. It was not Bewick himself, but Yarrell who did so in memory of his late friend.

Wild Mull: A Natural History of the Island and its People

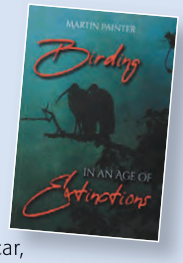
Stephen Littlewood (Author) & Martin Jones (Photographer), 2021. Pelagic Publishing, ISBN: 978-1-78427-276-0, paperback, 297 pages, £25.00.

Given the size of Mull, and the number of people visiting especially to watch the wildlife, you would probably have thought 'why not a book on its wildlife'? Well, here is the first to come out, and what a great book for everyone to have while visiting the island. It is packed with stunning images throughout, both of wildlife and landscape. The latter help you understand its often volcanic nature, shaped by many former volcanoes, to its extensive shore line and magical off-shore islands. Some are only five minutes away, others a boat ride out into the Atlantic. Mull is by far the best island in the UK to show predator-prey relationships, with its amazing number of eagles, Hen Harriers, Buzzards, small raptors and owls, also Otters, Pine Martens, Polecats, Mink and Stoats. Well-spaced chapters cover geology, man's history, even lost birds of Mull like Chough and Black Grouse. Eagles have been lumped with other raptors in one chapter, other birds are covered in two further chapters under land birds, or sea birds. Lynn Farrell has added her great knowledge of the plants, Stewart Gibson his all-round natural history knowledge of the island. Stephen has delved deep into the history, which makes the book a great reference work. Mull deserves this coverage, and the beautiful pictures taken by Martin Jones greatly enhance the book. I will certainly return, having first worked on the island in 1975, and now having a son running his tour company there.

John Miles

Birding in an Age of Extinctions

Martin Palmer, 2021. Whittles Publishing, ISBN: 978-1-84995-487-7, paperback, 171 pages, 90+ colour photos, £18.99.



This book effectively combines a travelogue with the author's thought-provoking commentary about attitudes and motivations behind world birding. He takes you on a roller-coaster ride, sharing entertaining anecdotes on birding in such exotic, far-flung locations as Madagascar, Cambodia, the Australian outback and the southern Oceans. We meet many interesting, dedicated and eccentric birders along the way, including obsessive listers, bird guides, and local conservationists working to save habitats and species.

The author questions the importance of aims such as accumulating a personal life-list, searching for rarities and trophy birds, and why the idea of a 'species' is so hard to define yet so important. I particularly enjoyed his digression into the development of ornithology, from collecting for display in Victorian museums to our modern more science-led field ornithology using high-tech methodology, optics and cameras.

These reflections lead us to consider in our current age the loss of biodiversity and climate change which often lead to species' extinctions and raise some important issues about world-birding and opportunities for our planet. On the one hand, world-birding results in a high individual carbon footprint yet, conversely, can be a force for positive change through supporting ecotourism to highlight and protect endangered habitats and species. These are important issues, and this book appeals for birders to engage in more self-reflection to address them. I found it an entertaining and worthwhile read, taking me to exotic places without adding to my carbon footprint!

Mike Thornton

The George Waterston Library is open for browsing and borrowing during Waterston House opening hours (check SOC website). Books can either be borrowed directly or can be posted out (UK only, conditions and p&p charges apply) by emailing the Librarian (Library@the-soc.org.uk).

WildWings

0117 9658 333
www.wildwings.co.uk
tours@wildwings.co.uk

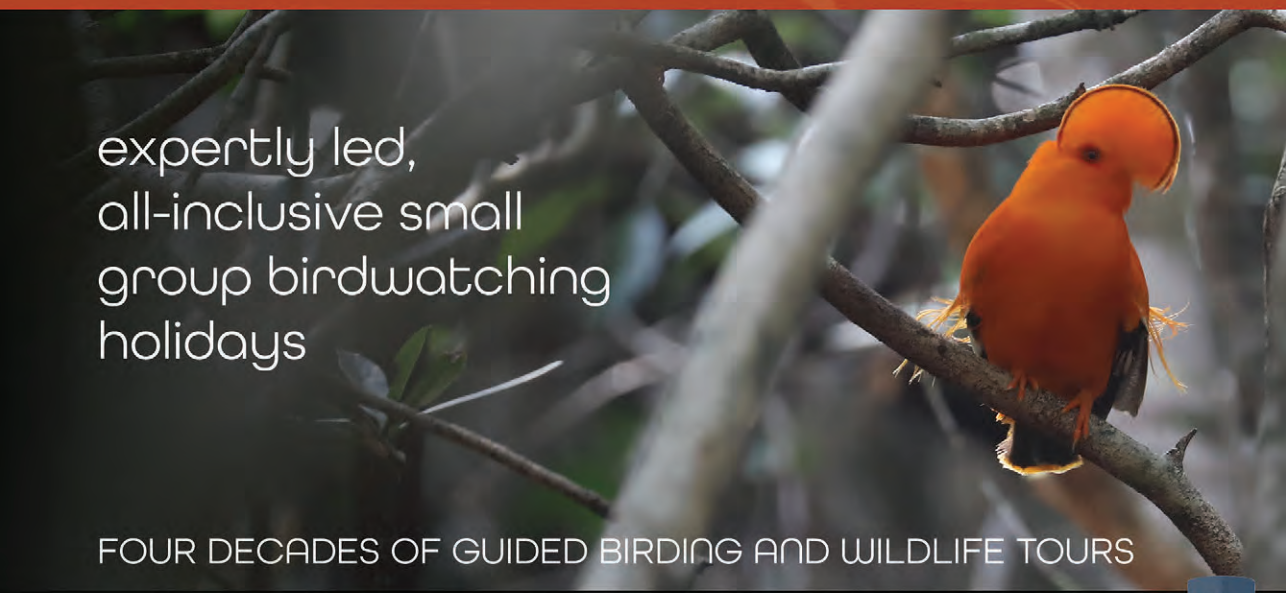
birdwatching
bird & wildlife cruises
mammal watching

Travel the whole wild world

EUROPE / ASIA /AFRICA / AMERICAS/ AUSTRALASIA/ ANTARCTICA

Limosa

01692 580 623
www.limosaholidays.co.uk
tours@limosaholidays.co.uk



expertly led,
all-inclusive small
group birdwatching
holidays

FOUR DECADES OF GUIDED BIRDING AND WILDLIFE TOURS

Birds and Wildlife Limited. 9 Pound Close, Long Ditton, Surbiton, Surrey KT6 5JW

RINGERS' ROUNDUP

This edition is a summary of the activities, results and recoveries from the 'southern' Scotland ringing groups, including Argyll, Borders, Clyde, Lothian and North Solway.

It has been two years since our last Ringers' Round-up and what a two years it has been. The human population has suffered the effects of the COVID-19 virus and as we write, our seabird populations are suffering the impact of the virulent Avian Influenza virus.

The COVID-19 pandemic saw all ringing activities locked down in the spring and early summer of 2020 and then spring again in 2021. This did have a negative effect on all our springtime ringing projects but once the restrictions ended, I must say, we did try to make up for it and started our long-term projects with rejuvenated enthusiasm!

While some people disagree with the idea of bird ringing, and I respect that opinion, many do see the benefits. The AI outbreak is an excellent example of why having a small proportion of our bird populations identifiable through individually numbered rings, is vital for their conservation and study. As seabirds wash ashore, the ringed birds reported to the BTO will give us precise information about these birds' lives, origins and age ranges. We will be able to see which colonies have been most badly affected and in the future which birds hopefully replace those adults lost this year. I would encourage all readers to report all ringed birds that you find (at all times) and ideally any colour-ringed birds as well. By working together, we generate information to help all our wild birds.

While gathering information for this article from the other Groups and ringers then reviewing Clyde's totals and recoveries it really brings home how privileged we are being able to ring Scotland's wild birds and see at first hand the valuable information ringing generates. The sections below are merely summaries of huge amounts of volunteer time e.g. the NSRG Osprey project which must have taken thousands of person hours to generate these data, and the cost of the rings and equipment mainly paid for by these volunteers personally e.g. the cost of A sized rings is currently £26.70/100 (see Borders RG Siskin total for 2022!). Please keep this in mind as you read on or digest migration related articles in other birding journals.

We hope you enjoy the following sections and results.

Argyll ringers

Finding out more about Hooded Crows

Love them or hate them, Hooded Crows are highly intelligent and successful birds. However, compared with some other members of the corvid family (e.g. Chough and Raven) we know relatively little about the basics of their population biology.

In an effort to rectify this, a long-term study of them has been underway on Colonsay. It has been relatively easy to find out about their breeding success (Jardine, in prep.), but learning more about their survival has been harder. In the early years of the study (using only metal BTO rings) 134 nestlings were ringed, but only produced nine recoveries. These provided some information on dispersal, with two birds

Plate 184. Hooded Crow (AR), Kiloran Bay, Coll, Argyll, 30 October 2020. © *David Jardine*

recovered on Islay, and a new longevity record for Hooded Crow, with a bird found ten years and three days after it was ringed.

Since 2017, 120 nestlings have been colour-ringed, and these are now providing a steady stream of re-sightings (123 to date). These have shown that some four-year old birds remain in the non-breeding flock, and it is hoped that before long juvenile and adult survival rates can be calculated. All these sightings have been on Colonsay and Oronsay, but it would be great to get some from elsewhere to further understand dispersal patterns.

Kittiwake colour-ringing

Given concerns regarding the decline in Kittiwake populations in Scotland, an increased effort is being made to understand the reasons behind this, with colour-ringing playing an important role in helping track adult survival and also potentially juvenile dispersal. To help with the latter, 55 adults were colour-ringed in 2021 on Colonsay (the largest colony in Argyll). The population here has not declined to the same extent as some of the northern populations. This decision proved fortuitous as NatureScot suspended seabird ringing as a precautionary measure during the Avian Influenza (AI) outbreak in seabirds this summer, but observational studies could be continued. The 2022 season proved to be a good breeding season for Kittiwakes on Colonsay, with large, early broods and no signs of AI were found. Although data collection for survival estimates takes a few years to gather, a good start was made in 2022, with 60% of the colour-ringed birds being re-sighted. While the number of Kittiwakes which are colour-ringed is relatively small, all re-sightings are very helpful, so it is always worth scanning through any breeding colonies and loafing flocks for rings... every sighting is helpful. Thank you.

Plate 185. Kittiwake, Coll, Argyll, 24 June 2022. *© David Jardine*

A stunning recent ringing recovery of a Tree Pipit ringed on passage 26 August 2021 at Nanjizal, Land's End, Cornwall and re-trapped breeding as an adult male 12 June 2022 at Glen Euchar, Argyll 699 km 290 days. Recoveries for Tree Pipits are extremely rare but recent interest in autumn passage ringing is starting to provide answers.

Borders Ringing Group

The accompanying Table 1 details the more interesting recoveries and controls, including all foreign ones, for the first six months of 2022.

Colour-ringing of Common Sandpipers continues, but in smaller numbers due to reduced effort. However, interesting results still arise - in the form of a nine-year-old bird, and another spotted on spring migration, returning to its 2021 breeding site. Borders-hatched and colour-ringed Black-headed Gulls are still being reported from Northern Ireland in winter.

Few Reed Warblers are ringed in the Borders, so it was good to get a control - was AZL1854 stopping to breed at Mersehead, or was it continuing its return journey to St Abbs Head? Also, on its way north, probably, was Chiffchaff NKL012.

The nomadic lifestyle of finches can be seen in Table 1. The Brambling* influx (in Borders and Lothians at least) of winter 2021/22 - when around 500 individual birds were handled - was dwarfed by the spring and early summer passage of Siskins, with just over 4,900* ringed by the end of June in a small Peebles garden. In addition, 30 birds (ten from the 2022 influx) were controlled in Peebles and 27 birds (eight from the 2022 influx) from Peebles were controlled elsewhere by the end of June (see summary Table 2); and there were 17 recoveries of dead birds, mainly within the Borders.

* *Both Brambling and Siskin take A sized rings!*

Table 1. Borders R.G. recoveries and controls reported January–June 2022.

Ring no.	Age/sex	Date & location	Distance (kms) & direction
Common Sandpiper			
NW35717	Chk	08/06/2013 Ladyside, near Heriot	
colour-rings read	Ad	27/05/2015 Glentress, Leithen Water	6 SSW
colour-rings read	Ad	03/06/2018 Glentress, Leithen Water	
colour-rings read	Ad	15/06/2019 Glentress, Leithen Water	
colour-rings read	Ad	14/06/2022 Glentress, Leithen Water	
NW35954	Ad F	03/05/2021 Williamslee, Leithen Water	
colour-rings read	Ad	19/04/2022 Telford, Shropshire	337 S
colour-rings read	Ad	07/06/2022 Williamslee, Leithen Water	
Black-headed Gull			
EY21689	Chk	29/06/2013 Moorfoot Hills	
colour-rings read	Ad	20/01/2022 Dundrum, Co. Down	247 SW
EY21806	Chk	14/06/2015 Moorfoot Hills	
colour-rings read	Ad	08/03/2022 Lurgan, Armagh	254 SW
EY21995	Chk	03/06/2018 Moorfoot Hills	
colour-rings read	Ad	12/02/2022 Groomsport, Co. Down	234 SW
Reed Warbler			
AZL1854	Ad M	05/06/2021 St Abbs Head	
Controlled	Ad M	14/05/2022 Mersehead, Dumfries & Galloway	75 SW
Chiffchaff			
NKL012	Juv	24/07/2021 St Abbs Head	
Controlled	Ad	29/03/2022 Wirral, Merseyside	288 SSW
Chaffinch			
ALP8327	Ad M	10/11/2021 Pilling, Lancashire	
Controlled	Ad M	25/02/2022 Garvald, Moorfoot Hills	203 N
Brambling			
S992107	Imm M	19/10/2017 Filey Brigg, North Yorkshire	
Controlled	Ad M	23/01/2022 Garvald, Moorfoot Hills	246 NW
AHH5218	Imm M	11/04/2019 Nethybridge, Highland	
Controlled	Ad M	21/03/2022 Garvald, Moorfoot Hills	168 SSE
EP45918	Imm M	08/10/2020 Surnadal, More og Romsdal, NORWAY	
Controlled	Ad M	21/03/2022 Garvald, Moorfoot Hills	1038 SW
Goldfinch			
ALV0082	Imm	24/10/2021 Panshanger Lagoon, Hampshire	
Controlled	Imm M	26/04/2022 Peebles	470 NNW
AFT8334	Imm F	16/01/2022 Penrith, Cumbria	
Controlled	Imm F	15/03/2022 Garvald, Moorfoot Hills	124 N
Siskin			
AEJ1863	Imm M	30/09/2020 Peebles	
Freshly dead	Ad M	20/02/2022 Bitburg, Trier, GERMANY	903 SE
B718164	Ad M	11/10/2020 Vaud, SWITZERLAND	
Controlled	Ad M	16/03/2022 Peebles	1244 NNW
16795889	Imm M	20/02/2021 Liege, BELGIUM	
Controlled	Ad M	12/03/2022 Peebles	846 NW
BD74964	Imm M	08/10/2021 Friesland, NETHERLANDS	
	Imm M	16/03/2022 Peebles	643 WNW

Lesser Redpoll			
AJN8120	Ad F	05/11/2020 Wakefield, West Yorkshire	
Controlled	Ad F	30/03/2022 Peebles	251 NNW
ANK3043	Juv	22/08/2021 Peebles	
Controlled	Imm	15/04/2022 Wirral, Merseyside	250 S
AXK0250	Ad M	26/01/2022 Bestwood, Nottinghamshire	
Controlled	Ad M	08/04/2022 Peebles	318 NNW

Table 2. Summary of Siskin controls in a Peebles garden, January–June 2022.

No. of birds from Peebles to		Location	No. of birds to Peebles from	
Ringed prior to 2022	Ringed in 2022	(administrative area)	Ringed prior to 2022	Ringed in 2022
5	4	Highland	2	0
1	1	North-East Scotland	1	0
1	1	Argyll & Bute	1	0
1	0	Lanarkshire	4	1
1	0	North Ayrshire	0	0
2	1	Dumfries & Galloway	1	0
3	1	Northumberland	5	1
0	0	Cumbria	1	0
0	0	North Yorkshire	0	2
0	0	Merseyside	1	1
1	0	Nottinghamshire	0	1
2	0	Powys	0	0
0	0	Gwynedd	2	2
0	0	Suffolk	0	1
0	0	Hampshire	0	1
1	0	Germany	0	0
0	0	Netherlands	1	0
0	0	Belgium	1	0
0	0	Switzerland	1	0
18	**8**		**21**	**10**

Clyde Ringing Group

The ringing total for 2020 was 12,758 birds of 118 species, with a new species of Lapland Bunting on Arran. For 2021, the total was 14,772 birds of 125 species, with new species of Bar-tailed Godwit (2) and Little Tern on Tiree, a Cetti's Warbler at Kinneil, two Siberian Chiffchaffs (one each Arran and Kinneil) and our first ever Nightjar also ringed on Arran.

The lockdown in 2020 coincided with a bumper year for voles on Arran, which in turn led to a bumper and very early breeding season for both Short-eared Owls and Hen Harriers. However, as very few of these nests were in the ringers' gardens, we were only able to ring a small sample once the restrictions were lifted, but this was still a record year for us. The Barn Owls, nesting later, also benefited and over 80 chicks were ringed by the Group. This stimulated us to target full grown owls in the autumn when another 68 owls were caught!

We missed out on the Eider duck RAS project on RSPB Horse Isle, Ardrossan in May 2020 but did manage in 2021 and 2022, now the only and longest running project of its type in the UK.

It was also a bit 'boom and bust' for our Jack Snipe project with the main site at Cathkin Marsh looking perfect in autumn 2020 having been grazed that summer. We made a record Scottish mainland count of 61 birds on 18 October 2020, catching 28 individuals but in winter 21/22 with the site un-grazed a peak count of only five was the best the site produced. Despite over 1,000 Jack Snipe having been ringed since 1994 we still have no recoveries!

Plate 186 a–d. Ringing highlights on Arran, Argyll. **a.** Lapland Bunting, 11 October 2020. **b.** Short-eared Owl, 22 October 2021. **c.** Long-eared Owl, 22 October 2021 **d.** Nightjar, 30 June 2021. © *Chris Southall*

Our long-term seabird projects included over 1,000 gulls and terns ringed in 2021, almost all of them colour-ringed as well, including our first Little Tern, a chick on Tiree. It wasn't such a good year for finches, for Lesser Redpoll after their bumper season in 2020 things returned to normal, but targeted effort for the little understood Linnet saw 264 ringed, mainly on Arran. The ringers on Arran also managed their second Rose-coloured Starling in three years, once again in the same garden!

Plate 187. Rose-coloured Starling, Arran, Clyde, 17 June 2021. © *Chris Southall*

2022 started well with good numbers of passage finches, although we didn't get the Bramblings unlike Borders/Lothian RGs. The discovery of a new site at Shieldhill Farm, East Renfrewshire has become an excellent wader dazzling site for Woodcock, Common and Jack Snipes and then over five mornings in April and May had a good passage of Greenland Wheatears with 19 spring-trapped. Body weights for these birds ranged from 32.1–42.7 g (males) and 27.5–46.8 g (females). A brief recce trip to Tiree in early May was very productive with our first adult Little (six) and Arctic Terns (28) ringed and colour-ringed, as well as our first Corncrake!

Recent recoveries

The year started with the most disturbing recovery I think we have ever had, a juvenile male Pink-footed Goose shot and left to die in Fife was successfully rehabilitated by the team at SSPCA Fishcross. Once fit he was ringed and released close to where he was found, only to be shot again, this time fatally, at Rothwell, Dumfries 127 km and 29 days later, the hunter having driven from Yorkshire during the lockdown! If this bird managed to get shot twice it does make us wonder what proportion of our geese get shot every winter?

Other gems included:

Oystercatchers ringed at Kinneil Lagoons: 3A6 18 January 2020 and seen 9 June 2021 breeding at Bjornoya, Rowsal, Norway 919 km, and then back at Kinneil in August! 2A6, a juvenile, September 2018 seen repeatedly this April and May at Kinloch, Rum. 10A, ringed at Sliddery, Arran 22 March 2016, breeding at Thorshavn, Faroe Islands. This bird breeds at an old folks' home and comes to tap the windows for scraps!

Plate 188. Oystercatcher (3A6), Norway, 9 June 2021. *© Magne O. Grytten*

Common Terns, both adults colour-ringed at Blackness Castle, Inner Forth in August 2018, one seen at Hafrsfjord, Rogaland, Norway, 636 km 693 days, and one caught by Portuguese ringers in Ponta de Bruce, Guinea Bissau 5,092 km 472 days, as a wader ringing bycatch!

Our first foreign Teal report, EZ82173 ringed as an adult male at Sliddery 4 February 2019 and found dead 20 August 2020 Karkkaala, Vassa, Finland 1,961 km 563 days.

The pick of the passerine recoveries was our first ever Linnet recovery from Arran, a young male APL1472 23 September 2020 at Cleats Shore and caught wintering by ringers at Manor Farm, Buckinghamshire 17 December 2021, 509 km 450 days later and a young Garden Warbler AFE1300 6 September 2020 at Kinneil, caught by Antony Wetherhill 17 May 2022 at Loch Katrine, Stirling, 56 km 618 days. This recovery along with the Sedge Warbler from North-East Scotland in 2021 shows wide area the passage birds at Kinneil originate from.

Lothian Ringing Group

The use of PIT tags on Peregrines over the last 15 years or so has dramatically increased the numbers of recoveries for this species. Tag readers placed close to nest site reads the tag without the need for the bird to be re-caught. Three recent reports include nestling Peregrines moving from Enniskerry, Co. Wicklow, Ireland to Scottish Borders at four years of age, from Daviot, Highland to Moffat at 15 years and from Newton, Powys, Wales to Penicuik, Lothian at two years.

Kittiwake nestling from Inchkeith Firth of Forth ringed July 19 and found dead in December 21 Grande Plage, Vendee, France 1,066 km movement.

The French connection continued with a Paris scheme Sand Martin ringed as a juvenile 7 August 2019 Terres d'Oiseaux, Gironde and caught as a breeding male at Musselburgh Lagoons on 8 August 2020 1,197 km.

Part of the Brambling influx to Lothian and Borders in 2021 included two Norwegian ringed birds caught at Middleton Moor, Midlothian, one ringed 7 October 2018 at Trondheim re-caught 9 March 2021, 1,117 km and one from Bomyra, Rogaland 28 December 2018 re-caught on 14 December 2021 624 km.

More unusual recoveries included a young Chiffchaff ringed at White Castle, East Lothian 6 September 2021 and re-caught on return passage 30 March 2022 at Long Bay, Alderney, Channel Islands 688 km and a Great Tit, not known for long distance movements usually, a second-year male ringed 31 January 2021 at Dirleton, East Lothian and re-caught at Lugar, East Ayrshire on 11 March 2022 112 km!

North Solway Ringing Group

Osprey ringing 2004–22

Members of North Solway Ringing Group have been ringing Osprey chicks in Dumfries & Galloway, and in neighbouring regions, since 2004 when two were successfully reared at a nest near Wigtown. Figure 1 shows the number of nests visited each year and the total number of chicks ringed is 166 - includes 12 expected in 2022. The average brood size is 2.4.

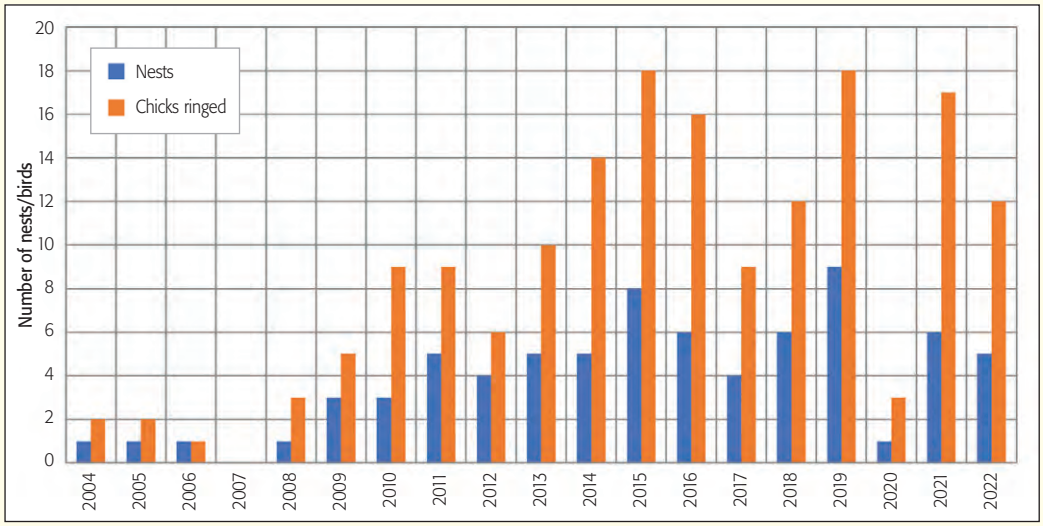


Figure 1. Number of Osprey nests and chicks ringed, 2004–2022.

Table 3. North Solway Ringing Group Osprey recoveries and sightings, 2004–22.

Birds have been found, probably on passage, at the following sites:

Darvic	Finding Location, Date	Ringing Date, Location
BK	Noyalo, Brittany 19/09/2010	13/07/2010 Threave
CV6	Tamar Lake, Cornwall 20/09/2014	29/06/2014 Near New Galloway
CX7	Spain 05/10/2014	20/07/2014 Loch Doon
PK9	Carcans, Bordeaux 19/09/2016	07/07/2016 Near Carsphairn
PL2	Ibiza 06/10/2016	24/07/2016 Kells, Kirkcudbrightshire
PL9	St, Ouen, Jersey 26/08/2017	01/07/2017 Near New Galloway
PK3	Deux Sevres, Nantes 22/05/2018	06/07/2016 Near Wigtown
FH8	Dos Minutos, east of Lisbon 06/09/2018	07/07/2015 Threave
PL0	Bodmin Moor, Cornwall 29/08/2020	07/07/2016 Near New Galloway
NK4	Kingfisher Bridge, Cambridge September 2019	12/07/2019 Threave

Two birds have been found at wintering sites in Africa

Darvic	Finding Location, Date	Ringing Date, Location
PK5	Sangyang, Gambia 10/01/2018	06/07/2016 Near Wigtown
566	Pointe Sarene, Senegal 11/12/2021	29/06/2021 Near Dumfries

Birds have been found at the following sites during the breeding season:

Darvic	Finding Location, Year	Ringing Date, Location
JK	Hertfordshire 2013	27/07/2011 Near New Galloway
CU2	North Wales 2014	08/07/2012 Near Carsphairn
CU8	Trosachs 2016–2021	17/07/2013 Threave
CV3	Perthshire 2016	19/07/2013 Near Carsphairn
CV9	Kielder Forest 2018	29/06/2014 North of Newton Stewart
JR4	Kielder Forest 2021	28/06/2018 Threave
JT7	Kielder Forest 2021	29/06/2019 South-east of Dumfries
CX3	Yarrow Valley 2017	06/07/2014 Near Moffat
CX5	South Cumbria 2019–2021	06/07/2014 East of Dumfries
FH0	Near Manchester 2017	04/07/2015 Near Moffat
FH8	Fochabers 2018	07/07/2015 Threave
JT9	Pembrokeshire 2021	01/07/2019 Near Wigtown

Discussion

In most years, the late Ciril Ostroznik was responsible for erecting and maintaining many of the nests and for ringing the chicks. The numbers displayed in the chart would have been higher had not some of his nests been taken over by other ringers. Sadly, Ciril died in 2020. This, and COVID-19 restrictions, were responsible for only one nest being visited in that year.

Fortunately, with practical help from Clyde Ringing Group and advice from Highland Ringing Group, together with the recruitment of two new members who are keen climbers and trainee ringers, NSRG has been able to keep its Osprey programme on track. With new nests being built in suitable areas, the future for Ospreys and Osprey ringing is looking good in the NSRG area.

Acknowledgements

On behalf of North Solway Ringing Group, I should like to thank all the ringers, recorders and photographers who have contributed to this project. The co-operation of landowners and their staff who have permitted access to their sites is much appreciated.

NSRG is grateful to the following organisations that have contributed to the programme: Forestry & Land Scotland, British Trust for Ornithology, Scottish Raptor Study Group (Dumfries & Galloway Branch), Scottish Raptor Monitoring Group, Nature Scot, Royal Society for the Protection of Birds, The Roy Dennis Foundation, National Trust for Scotland and Scottish Wildlife Trust.

Duncan Irving, North Solway Ringing Group

A selection of recent recoveries from Dumfries & Galloway

A couple of old birds to start, a Lesser Black-backed Gull ringed as a chick at Craigmore, Gatehouse in July 1994 and seen alive at Doca de Pesca, Portugal on 24 November 2014 1,847 km 23+ years. A Peregrine ringed as an adult at Applegarthtown in May 2008 and recorded breeding at Lochmaben in April 2021. Two Oystercatchers, both ringed as adults at Annan

Plate 189. Osprey 566 at Pointe Sarente, Senegal, 11 December 2021. © Jean-*Marie Dupart*

on 24 August 2014 and found in Shetland, one killed after hitting power lines at Kergord 604 km and one seen at Voe 608 km. A really nice batch of passerine recoveries as well; a Goldcrest 18 October 2021 at Kirmabreck and found dead 8 January 2021 at Broadlayngs, Hampshire 452 km. Was this a continental bird? Goldfinch adult male 7 May 2018 at Leswalt and re-caught by ringers wintering in France, 12 January 2020 Grand-Lucesarthe 873 km. Siskin adult Lockerbie 15 July 2020 also caught by ringers, 21 March 2021 at Hockai, Liege, Belgium 812 km. Sedge Warblers, both juveniles ringed Dundrennan 20 August 2021 and caught 4 September 2021 Nanjizal, Land's End, Cornwall, 538 km 15 days, and Glencaple 26 July 2021 re-caught Roseliere Point, Pas de Calais, France 585 km 24 days. Blackcap juvenile male 23 September 2017 Haxton Down, Wiltshire and re-caught 27 March 2021 Thornhill 462 km 128 days. Chiffchaff adult 26 September 2018 Wilmington, East Sussex caught 22 May 2021 Mersehead 525 km, and a Reed Warbler juvenile from Tichfield Haven, Hampshire 4 August 2018 also re-caught at Mersehead 12 June 2021 480 km 1,043 days.

I hope you have enjoyed this round-up. I would like to thank David Jardine, Rob and Audrey Lightfoot, Tom Dougal, William Edmond, Ed Tooth and Duncan Irving for supplying the data from the other Groups.

Iain Livingstone Clyde R.G.
Email: iainlivcrg@googlemail.com

Phil Harris's Big Year – Part 1

P. HARRIS

When we arrived back in Shetland, at the beginning of January 2021, from Christmas and New Year south with family, I had no thoughts on attempting a Big Year. I had a half-hearted effort in 2019 which saw me fall eight short of Paul Harvey's 2013 record of 254.

My work is totally seasonal, running Shetland Seabird Tours with my partner Rebecca Nason, and some ecological surveying work, all running from April till early September.

So, in the first few months of the year, I have time to catch up with most birds that are overwintering or residents.

In order to beat the previous record, you really need for there to be a few goodies overwintering i.e., Blue and Great Tits and, fortunately, 2021 started with a few left-overs from a record autumn for some species. After scoring some decent birds at the start of the year, it became apparent that a record attempt was on the cards. Below I've broken down the year month by month and will try to recollect a few of the highlights.

January (95)

Red-throated Diver, Black-throated Diver, Great Northern Diver, White-billed Diver, Fulmar, Slavonian Grebe, Grey Heron, Gannet, Shag, Red Grouse, Long tailed Duck, Goldeneye, Goosander, Red-breasted Merganser, Eider, Velvet Scoter, Common Scoter, Shoveler, Wigeon, Mallard, Pintail, Teal, Tufted Duck, Smew, Sparrowhawk, Greylag Goose, Barnacle Goose, Mute Swan, Whooper Swan, Pink-footed Goose, Shelduck, Ringed Plover, Curlew, Bar-tailed Godwit, Black-tailed Godwit, Turnstone, Knot, Sanderling, Dunlin, Purple Sandpiper, Merlin, Peregrine Falcon, Water Rail, Moorhen, Oystercatcher, Lapwing, Golden Plover, Woodcock, Jack Snipe, Common Snipe, Redshank, Kittiwake, Black-headed Gull, Common Gull, Great Black backed Gull, Glaucous Gull, Iceland Gull, Herring Gull, Guillemot, Razorbill, Black Guillemot, Cormorant, Rock Dove, Collared Dove, Long-eared Owl, Goldcrest, Wren, Starling, Blackbird, Fieldfare, Redwing, Song Thrush, Robin, Chiffchaff, Jackdaw, Rook, Carrion Crow, Hooded Crow, Raven, Blue Tit, Great Tit, Skylark, Black Redstart, Stonechat, Dipper, House Sparrow, Tree Sparrow, Meadow Pipit, Rock Pipit, Chaffinch, Brambling, Twite, Common Redpoll, Lesser Redpoll and Goldfinch.

By the end of January, I knew that a record attempt was on! All four divers were an amazing start, with White-billed now overwintering annually and pretty much guaranteed. It was Black-throated that was the real prize with Paul Harvey missing that species out in his year.

As I mentioned at the beginning, unusual overwintering species are much needed and the 2020 record influxes of Blue and Great Tit resulted in numerous birds staying for the winter, a real boost. Other noteworthy January birds, were two Black-bellied Dippers at Voe, Shetland's best site for this species, Chiffchaff, Black Redstart, and Tree Sparrow. Although you know you will catch up with some of these later in the year, it felt good to have them now and not need to spend precious time on them again. As it happened, there would be no more records of the tits and dippers for the rest of the year.

February (11)

Firecrest, Mistle Thrush, Greenfinch, Lesser Black-backed Gull, Wood Pigeon, Snowy Owl, Great Spotted Woodpecker, Coot, Grey Plover, White-fronted Goose and King Eider.

February was always going to be quieter, after clearing up all the residents, but there was some quality added.

Adrian Kettle found a lovely male Firecrest on Yell, only my third in Shetland. A pair of

Greenfinches landed in Kristopher Wilson's garden as I was stood there chatting to him, a genuinely rare bird in Shetland now and the only ones seen in 2021.

The Great Spotted Woodpecker was a challenge, a male had been visiting garden feeders at several houses in Wormadale, so every time I was driving past I would take a look. It was probably on the 20th such occasion that I finally scored it but, again, a species that did not turn up again throughout the year.

I wanted my 100th for the year to be something special so, on a lovely, clear, calm day myself and several other Shetland birders climbed Ronas Hill, Shetland's highest point, in search of the adult male Snowy Owl which has been present for the last two years. This magnificent bird did not let us down, giving distant but great views in such an amazing landscape.

March (9)

Dunnock, Pied Wagtail, Snow Bunting, Puffin, Little Grebe, Brent Goose, American Wigeon, Green-winged Teal and Scaup.

March for me is the dullest month in the Shetland birding calendar, still very much winter-like whilst it seems like the spring is well under way in the rest of the UK. The obvious highlights were the two Nearctic ducks, the American Wigeon on Loch of Spiggie and the Green-winged Teal up on Unst, an island I would be visiting many times during the year.

April (25)

Blackcap, Ring Ouzel, Sand Martin, Swallow, Wheatear, Yellow Wagtail, Grey Wagtail, Hawfinch, Linnet, Arctic Redpoll, Common Crossbill, Siskin, Lapland Bunting, Green Sandpiper, Great Skua, Arctic Skua, Stock Dove, Kestrel, Little Ringed Plover, Whimbrel, Spoonbill, Marsh Harrier, Mandarin, Gadwall and Pochard.

At last, the first few spring migrants and the arrival of some of our breeders. Two Shetland ticks were a bonus, Roger Riddington's Little Ringed Plover at Scatness, and Paul Harvey's Spoonbill at Spiggie.

The bird of the month for me, however, was the drake Mandarin, Will Miles found it at a loch at Watsness on the West side of Shetland. I was immediately in the car and onsite 45 mins later. The lochs out there are very sparse with no cover at all and, despite searching all of the nearby suitable places, there was no sign of it. However, a few days later I was searching for Jack Snipe on Brow Marsh when I kicked a duck up out of the burn between Brow Loch and Spiggie. As it flashed in front of me and away, I just noticed a white supercilium and thought brilliant I've found a drake Garganey, a year tick but, as my bins focused in, it was presumably the same drake Mandarin from the Westside. During the year, there are real moments of elation and fist pumping and that was one, it's hard to explain but when you think you've missed a bird and are unlikely to get it back, it's an adrenalin rush when you find one for yourself.

May (46)

Hooded Merganser, Quail, Common Crane, Curlew Sandpiper, Osprey, Hen Harrier, Garganey, Red-crested Pochard, Ring-necked Duck, Long-tailed Skua, Cuckoo, Bee-eater, Wryneck, Red-backed Shrike, White-tailed Eagle, Rough-legged Buzzard, Icterine Warbler, Grasshopper Warbler, Garden Warbler, Lesser Whitethroat, Common Whitethroat, Western Subalpine Warbler, Sardinian Warbler, Spotted Flycatcher, Bluethroat, Pied Flycatcher, Willow Warbler, Sedge Warbler, Marsh Warbler, Golden Oriole, Shorelark, House Martin, Wood Warbler, Yellowhammer, Little Bunting, Reed Bunting, White-throated Sparrow, Redstart, Whinchat, Tree Pipit, Red-necked Phalarope, Common Sandpiper, Wood Sandpiper, Greenshank, Arctic Tern and Common Tern.

May and June were going to be the deal breakers, to stand any chance of breaking the record I needed a good spring. Thankfully, it delivered. One of the reasons it delivered must be down to COVID-19, believe it or not, as I had never seen so many visiting birders before in spring in Shetland (and autumn as it turned out). The lack of travel opportunities to foreign climes meant more visiting birders, which resulted in more quality birds being found.

Plate 190. Sardinian Warbler, Sumburgh Farm, Shetland, 29 May 2021. © *Rebecca Nason*

A pair of Red-crested Pochard, found by Paul Harvey, were new to Shetland and, along with the drake Hooded Merganser added to my plastic duck list! Trips up to Unst produced Bluethroat, Bee-eater, Shorelark and, a very confiding, White-throated sparrow on Robbie Brooke's lawn. A beautiful adult Long-tailed Skua, on territory throughout the summer, was a real treat especially as there was zero spring passage of skuas this year.

Plate 191. Red-rumped Swallow, Vidlin, Shetland, 9 June 2021. © *Rebecca Nason*

Scarce raptors are very difficult to catch up with as they are quite often just single observer records as these birds power on through the islands on their migration, so I was chuffed to get White-tailed Eagle, whilst on a vantage point survey, and coming across the Rough-legged Buzzard by chance. Honey-buzzard and Hobby both evaded me for the year which was frustrating, having seen both species in the previous few years.

June (19)

Thrush Nightingale, Red-breasted Flycatcher, Great Reed Warbler, Paddyfield Warbler, Blyth's Reed Warbler, Short-toed Lark, Red-rumped Swallow, Rustic Bunting, Lesser Yellowlegs, Bonaparte's Gull, Sandwich Tern, Little Tern, Short-eared Owl, Swift, Woodchat Shrike, Corncrake, Ruff, Temminck's Stint and Canada Goose.

Quality, quality, quality is how I would describe June. Typical Shetland that I had seen Great Reed, Blyth's Reed and Paddyfield Warblers before I saw Eurasian Reed Warbler which turned into quite a struggle, in the end eventually scoring one in September. Bonaparte's Gull and Little Tern were Shetland ticks. Getting views of both Corncrake and Quail (in May) was nice as I didn't like the idea of having heard-only records on my list.

July (6)

Rosy Starling, White-rumped Sandpiper, Storm Petrel, Leaches' Petrel, Sooty Shearwater and Manx Shearwater.

A quieter month in Shetland but a large influx of Rosy Starlings was welcome, Roger Riddington did it again with the White-rumped Sandpiper on Pool of Virkie. Some petrel ringing had the required effect and a trip out to Eshaness for some sea-watching, when the conditions were right, produced the two expected Shearwaters.

August (9)

Barred Warbler, Nightingale, Common Rosefinch, Black-winged Pratincole, Sabine's Gull, Black Tern, Pomarine Skua, American Golden Plover and Wilson's Petrel.

Two pelagic trips on our boat to the north-west of Fethaland got me three ticks, Pomarine Skua, our third Wilson's Petrel since we started doing the trips, and one of the standout moments of my year, the adult Sabine's Gull as we came back into Yell Sound in the evening.

It was just so unexpected having spent 8 hours out at sea where you would hope for one. We were all tired and weary so to see the bird just lift off the water and drift in front of you was a real adrenalin pumping moment. I screamed it out and brought the boat to a halt where the bird put on a magical performance coming for left-over sandwiches.

A family walk on Spiggie beach was disrupted when the juvenile Black Tern flew over us, views were brief and we only had one pair of bins with us so were swapping back and forth as the bird drifted off from view. Retrospectively, I called it a White-winged Black but, fortunately, it came back later and the correct identification was nailed.

I can't not mention the juvenile Black-winged Pratincole, when I took our own boat on a charter with other Shetland birders. I've never seen a juvenile Pratincole before, what a stunner and another Shetland tick.

Plate 192. Sabine's Gull, Yell Sound, Shetland, 10 August 2021. © *Phil Harris*

September (18)

Red-flanked Bluetail, Yellow-browed Warbler, Greenish Warbler, Arctic Warbler, Reed Warbler, Booted Warbler, Melodious Warbler, Rose-breasted Grosbeak, Eastern Yellow Wagtail, Citrine Wagtail, Pectoral Sandpiper, Little Gull, Mediterranean Gull, Turtle Dove, Hoopoe, Dotterel, Little Stint and Great White Egret.

Now on 221, I needed 34 more to beat the record, September and October really needed to deliver.

September gave me 18 real quality birds, but it didn't feel enough, the weather was not delivering, and migrants were very thin on the ground. The Bluetail, the first of three I saw, including a self-found bird, was a bit of a saga. The bird was found by John Lowrie Irvine on Whalsay, a quick check of ferry times showed that I could get in but there would be very little daylight left. However, I needed to get our boat to Whalsay, where it spends the winter, so I could kill two birds with one stone. Only problem was the near gale force southerly winds! I decided, as the wind and swell would be behind me and I would be inshore, that I would go with that plan. Jeepers! Let's just say I wish I had taken the ferry option. However, I arrived, not sure if I or the boat were in one piece, but a kind lift from Jon Dunn had me on the bird.

A good warbler month with six species added. As I write, I don't think the Eastern Yellow Wagtail DNA was usable (poo sample), but there is good sound recording and photos.

Star bird came courtesy of a star birder and a legend to anyone carrying out a Big Year in Shetland, Dave Cooper of Unst! He found a Rose-breasted Grosbeak which showed brilliantly just after I arrived. Dave had already found numerous great year ticks for me and he was going to play a major part getting me over the line.

October (18)

White's Thrush, Western Bonelli's Warbler, Hume's Warbler, Pallas's Warbler, Radde's Warbler, Dusky Warbler, Olive-backed Pipit, Semipalmated Sandpiper, Daurian Shrike, Red-eyed Vireo, Spotted Crake, Upland Sandpiper, Cattle Egret, Little Egret, Tundra Bean Goose, Baikal Teal, Little Auk and Surf Scoter.

Just looking at its part in my year, it was impossible to get in to Fair Isle in the spring, full flights, bad weather and work all played a part. I had five trips into the isle in September/October for Melodious and Reed Warbler, White's Thrush, Spotted Crake, Baikal Teal, Little Auk, Surf Scoter and Daurian Shrike. I was actually on Fair Isle when news of the Vireos broke, it was a big relief when I caught up with one the next day, as well as the Radde's Warbler. We had a week's family holiday booked on Fair Isle for the third week of October, and things were really quiet on the bird front. It seemed like I was a long way off even drawing level with the record. The evening before heading to Fair Isle, Paul Harvey found a Pallas's Warbler, in very poor weather, at Sumburgh Head lighthouse. Despite knowing I would never make it in daylight, I went anyway out of desperation and, of course, dipped. Me and friend, Martin Culshaw, decided to go back at first light before our morning flight to Fair Isle. Unfortunately, no sign but, just as we were heading back down the road to catch our flight, Paul and Dan Pointon found a Hume's Warbler in Paul's garden. My luck was in and we got great views of another Shetland tick before racing for the flight.

The week on Fair Isle only produced Spotted Crake and Little Auk but they were most welcome. Back at home from Fair Isle, I was sat on 252...

We headed to a local café to have a celebration lunch as Rebecca had won a photo competition, and, as the waiter left with our order, we commented that it would be typical if a year tick was found just now. Yep sure enough just as the food hit the table the rare bird message came in, Dave Cooper had done it again, an Upland Sandpiper on Unst.

The food was hastily shoved down only to look at the ferry times and discover we had plenty of time.

Deryk Shaw joined us and we all headed up to Unst with a couple of hours of daylight left. We were met by Adrian Kettle who told us the bird had gone missing, my heart sank, but, with a few more birders arriving, we spread out. It turned out we needed every minute of that daylight as I refound the bird with just 20 mins of decent light left. What a relief and a moment of delight as I had now drawn level with the record, would I get over the line?

I didn't have to wait long! Just the very next morning in fact and, yes it was thanks to the legend Dave Cooper, who had found a Pallas's Warbler at Norwick on Unst. Another nervous drive and ferry journeys and, yet again, Adrian Kettle meeting me on site to tell me it had been lost! It was a very frustrating half hour before Julie Redpath and Mary Leask refound it nearby. Boom, Boom, Boom! I had done it. I really didn't know how to react, it was more relief than jubilation. Three Cattle Egret in Lerwick were a bonus and I thought that would be the end.

November (4)

Grey Phalarope, Siberian Stonechat, White-crowned Sparrow and Black-throated Thrush.

Another trip into Fair Isle for two Grey Phalaropes turned into an overnight stay, due to the weather, and became even more frustrating as news of a Siberian Stonechat on Yell broke. Fortunately, it remained for a few days.

Then, back to Unst, for another Shetland tick, White-crowned Sparrow. If I thought the White-throated in the spring was tame, this was ridiculous! Giving amazing views down to a few feet.

Finally, a Black-throated Thrush showed well on Whalsay - amazing how Paul Harvey's final bird of his Big Year was also Black-throated Thrush!

December (0)

We headed south in late November for Rebecca to have an operation, staying down south till the New Year. Birds I missed were Red-necked Grebe, Bittern and Glossy Ibis.

289 species were recorded in Shetland in 2021 (pending acceptance by relevant committees) so I had seen 91% of birds recorded in the year. Redpolls will be lumped eventually so the list will drop by two species, unfortunately, but anyone trying to break it will be under the same rules. Pheasant may yet be added to the Shetland list and I did see birds from the population that are thought to have come from a release 20 years ago and are self-sustaining, so maybe I'll claw one back?

Doing a Big Year on Shetland is both exciting and exhausting (and expensive) but, looking back at the list of species, it brings back some great memories. Can it be beaten? With 29 species missed, yes of course it can, and good luck to anyone trying in the future.

Massive thanks must go to my family, Rebecca and Ayda, for putting up with my stress and me disappearing at the drop of a hat, sometimes overnight. A Big Year would not be possible without the support of those closest to you. Big thanks to Hollie and Deryk Shaw from Fair Isle, and Dave and Brenda Cooper from Unst, for putting me up overnight on numerous occasions. Many thanks to all the Shetland and visiting birders for finding so many great birds and getting the news out, but I have to single out Dave Cooper who found me 12 year-ticks, a phenomenal birder.

So, job done, or was it?

Becca put the news out on social media, and we immediately began to get messages about the Scottish record. Paul Baxter was in touch to say that he thought his total of 272 achieved in 1998 had not been bettered and that surely it would be easily achievable with a visit to the mainland. Only 13 to beat. It had to be done. Will Miles and Glen Tyler were keen to join me on a whirlwind tour of Scotland to break the record, so we made a plan.

Phil Harris, Lerwick, Shetland.
Email: philharris001@hotmail.co.uk

Plate 193. Phil Harris (front) with (l-r) Dave Cooper, Deryk Shaw, Glen Tyler and Will Miles after equalling record with Upland Sandpiper, Haroldswick, Unst, Shetland, 30 October 2021. © *Rebecca Nason*

Plate 194. Video-grab composite of Fea's-type petrel with Great Skua following, North Ronaldsay, Orkney, 3 September 2021. © *George Gay*

Fea's-type petrels and other scarce shearwaters past North Ronaldsay, Orkney

G. GAY

Having lived on North Ronaldsay for seven years, a relative blip in the grand scheme of things, I've seen plenty of good birds as most folk reading this journal can probably imagine. When North Ronaldsay is talked about, we often only speak about the rare landbirds the island drags in, but what we don't mention is the huge seawatching potential - I'd even say we're beyond calling it potential! Last year (2021), produced some of the most ridiculous seawatching I can think of anywhere in the UK. While the annual totals aren't always mind-boggling, it's the consistency of good records we seem to manage to produce, that is a bit mind-blowing.

Since I arrived on North Ronaldsay in 2015 there have been over ten sightings of Fea's-type Petrels past the island. I think of those I've seen around five, which in a British context is frankly exceptional! It appears that the best time of the year for these long-range, seabird migrants is between early September and late October, which almost seems late compared to some species, but they tend to be one of those seabirds that'll catch you off-guard.

In terms of weather, we always look for a strong northerly or north-westerly wind to push birds into the North Sea, followed by slack weather, this appears to produce a kind of mass exodus of seabirds as they pile out of the North Sea and head back for the Atlantic. These conditions are what we look for and they rarely fail to produce something, be it a Fea's-type Petrel, large shearwater, skuas or something even better like the 2020 Barolo Shearwater. It's also a regular feature that this weather gives good totals of Sooty Shearwater as well. Most rare/scarce seabirds are seen from the Seawatching Hide and Dennis Head at the north-east-most point of the island.

As an overall site for seawatching, North Ronaldsay's record can't really be argued with on

paper, as 2021 proved, with no fewer than six sightings of Fea's-type Petrels. One bird seemingly lingered offshore doing regular loops while in the company of a flock of Sooty Shearwaters that spent the morning fishing off the north end of the island. We think it was possible, that at most, there were just two birds; one that spent nearly a week offshore between 2 and 7 September and another that passed through on 17 October. On both occasions the birds were either videoed or photographed, but didn't produce sufficient evidence for nailed-on identification, other than ruling out Soft-plumaged Petrel. The year also produced two sightings of Balearic Shearwater and two Cory's Shearwaters, one albeit dead, not to mention good passages of Pomarine and Long-tailed Skuas and a Brünnich's Guillemot in the early spring.

The seawatching is obviously time consuming and can often overlap with good days on the island itself, so perhaps doesn't get the coverage it deserves at all times of the year. I think, if it was constantly watched, the island would produce some truly outrageous records, since it seems to be the geographical point at which most things leave the North Sea to enter the Atlantic, with the exception of those birds which head around the north-east side of Caithness and bypass Orkney by proceeding through the Pentland Firth. I think there are potentially new species due off Orkney/North Ronaldsay in the next few years, but I'll keep my cards close to my chest on that front!

Table 1. Rare/Scarce 'shearwater' species past North Ronaldsay in the last ten years

2021: (some records still to be assessed)
Cory's Shearwater: one on 4 Sept and one dead 18 Oct.
Sooty Shearwater: excellent year - peaks of 100 on 4 Sep, 520 6 Sep and 321 12 Oct.
Fea's-type Petrel: singles on 2, 3, 4, 6, 7 Sept, and 17 Oct.
Balearic Shearwater: singles on 28 Aug and 6 Sept

2020: Sooty Shearwater: peaks of 68 on 30 Aug, 363 10 Sep and 163 27 Sep.
Fea's-type Petrel: one on 3 Sep.
Great Shearwater: one on 10 Sep.
Balearic Shearwater: one on 10 Sep.
Barolo Shearwater: one on 27 Oct.

2019: Sooty Shearwater: 89 birds in Aug, 625 in Sep, 68 in Oct; peaks of 105 on 2 Sep and 205 on 18 Sep.
Great Shearwater: one on 18 Sep.

2018: Sooty Shearwater: peaks of 153 on 26 Aug and 55 25 Sep.
Balearic Shearwater: singles on 27 and 28 Aug.

2017: Sooty Shearwater: peaks of 69 on 29 Aug, 82 1 Sep, 337 2 Sep, 98 10 Sep and 101 16 Sep.
Fea's-type Petrel: singles on 2 Sep, 18 Oct and 1+ 30 Oct.
Great Shearwater: singles on 31 Aug, 1 Sep and 10 Sep.
Balearic Shearwater: singles on 16 Sep, 17 Sep and 17 Oct.

2016: Cory's Shearwater: one on 25 Aug.
Sooty Shearwater: 2,255 bird days - well above average, with 867 on 7 Sep [record day count].
Fea's-type Petrel: singles on 8 Aug and 30 Oct.
Great Shearwater: singles on 22 July, 30 Aug, 31 Aug, 7 Sep and 27 Sep.
Balearic Shearwater: one on 31 Aug.

2015: Sooty Shearwater: 690 birds 25 July–21 Nov, peaks of 75 on 7 Sep, 93 8 Sep, 175 3 Oct.
Great Shearwater: one on 4 Sep.

2014: Sooty Shearwater: 454 birds total, peaks of 74 on 22 Sep and 62 4 Oct.
Great Shearwater: singles on 21 Aug and 22 Sep.
Balearic Shearwater: one on 19 July.

2013: Cory's Shearwater: one on 13 Aug.
Sooty Shearwater: 472 in total, peaks of 48 on 29 Aug and 80 7 Sep.
Great Shearwater: one on 12 Sep.
Balearic Shearwater: singles on 24 Aug and 12 Oct.

2012: Sooty Shearwater: poor year - peaks of 18 on 27 Aug, 29 9 Sep and 33 9 Oct.

Further records between 1985–2011

33 Cory's Shearwaters, over 400 accounts of Great Shearwater (mostly from a frankly insane period in 2007 involving 284 sightings in September!), a further seven Fea's-type Petrels and even a claim of a Great-winged Petrel passing with Sooty Shearwaters in late September 1996!

George Gay, North Ronaldsay Bird Observatory, Orkney.
Email: 2006gayg@googlemail.com

Plate 195 a. Sub-adult Yellow-legged Gull, Riverside Nature Park (A&D) 15 March 2021. Upperpart colour spot-on for YLG, a fairly neutral shade of medium grey, lacking strong blue tones. Neck and head shape distinctive, muscular neck and full nape, rather large 'domed' head. Bill quite short and heavy, with large red spot reaching upper mandible. Eye ring red (difficult to see) and a rather dark-toned iris (giving a very Caspian Gull-like feel to this bird), which is typical for a sub-adult YLG. © *Mark Wilkinson* **b.** Sub-adult Yellow-legged Gull, Riverside Nature Park (A&D) 15 March 2021. Classic YLG pattern of extensive black in the outer hand, with a broad and evenly black band on p5 (pattern symmetrical on both wings). Signs of immaturity are the black streaks on the primary coverts, and the black spot on p4. © *Mark Wilkinson*

First Yellow-legged Gull for A&D/P&K and second for Fife – are we still overlooking them on the Scottish east coast?

M. WILKINSON

Due to COVID-19 travel restrictions, like many others I found myself working from home in the first half of 2021. More unusually, my normal place of work is The Netherlands, where Yellow-legged Gull (*Larus michahellis*) is a common visitor. Due to my enforced stay in Scotland, I thought this would be an ideal opportunity to test my hypothesis that Yellow-legged Gulls turn up on the Scottish east coast, but are being overlooked due to birder's unfamiliarity with 'what to look for' with this species.

From January 2021 onwards, I began checking all gatherings of large gulls, whenever out birding. This was mostly around Dundee (Invergowrie Bay) and NE Fife (mostly Tayport, but with occasional visits to Leven). All three sites have freshwater burns or rivers entering the sea, which attracts gulls to bathe and drink, and where they can be studied at relatively close range, a prerequisite for finding Yellow-legged Gulls.

Sub-adult Invergowrie Bay, Perth & Kinross, 12–15 March 2021 *(accepted by SBRC)*

After a few false starts, several presumed hybrid Herring × Lesser Black-backed Gulls, and numerous dark-backed *argentatus* Herring Gulls, patience eventually resulted in a sub-adult Yellow-legged Gull at Invergowrie Bay on 12 March. Found late on the evening of 12 March in poor light, the identification was not confirmed until 15 March, when the bird was seen at much closer range in better light. Since Invergowrie Bay is bisected by the county boundary between Perth & Kinross and Angus & Dundee, and the bird spent time on both sides of the bay during its stay, it became the first accepted record for both recording areas.

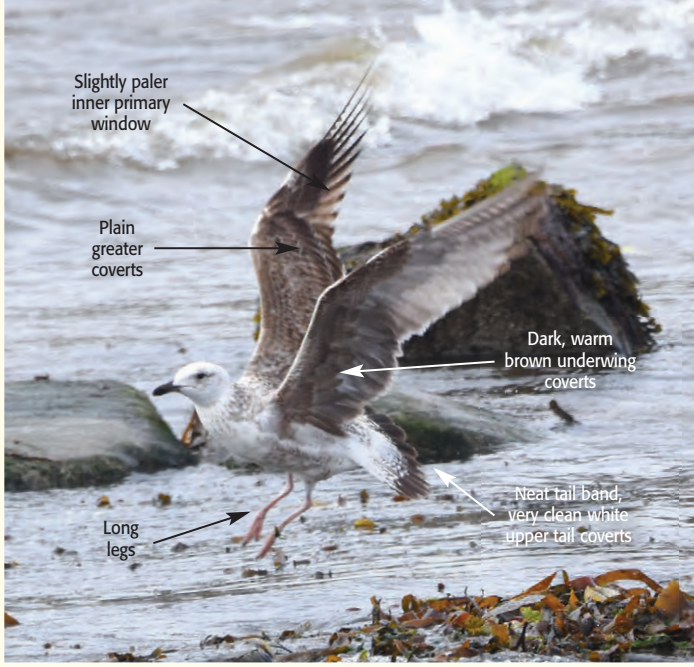
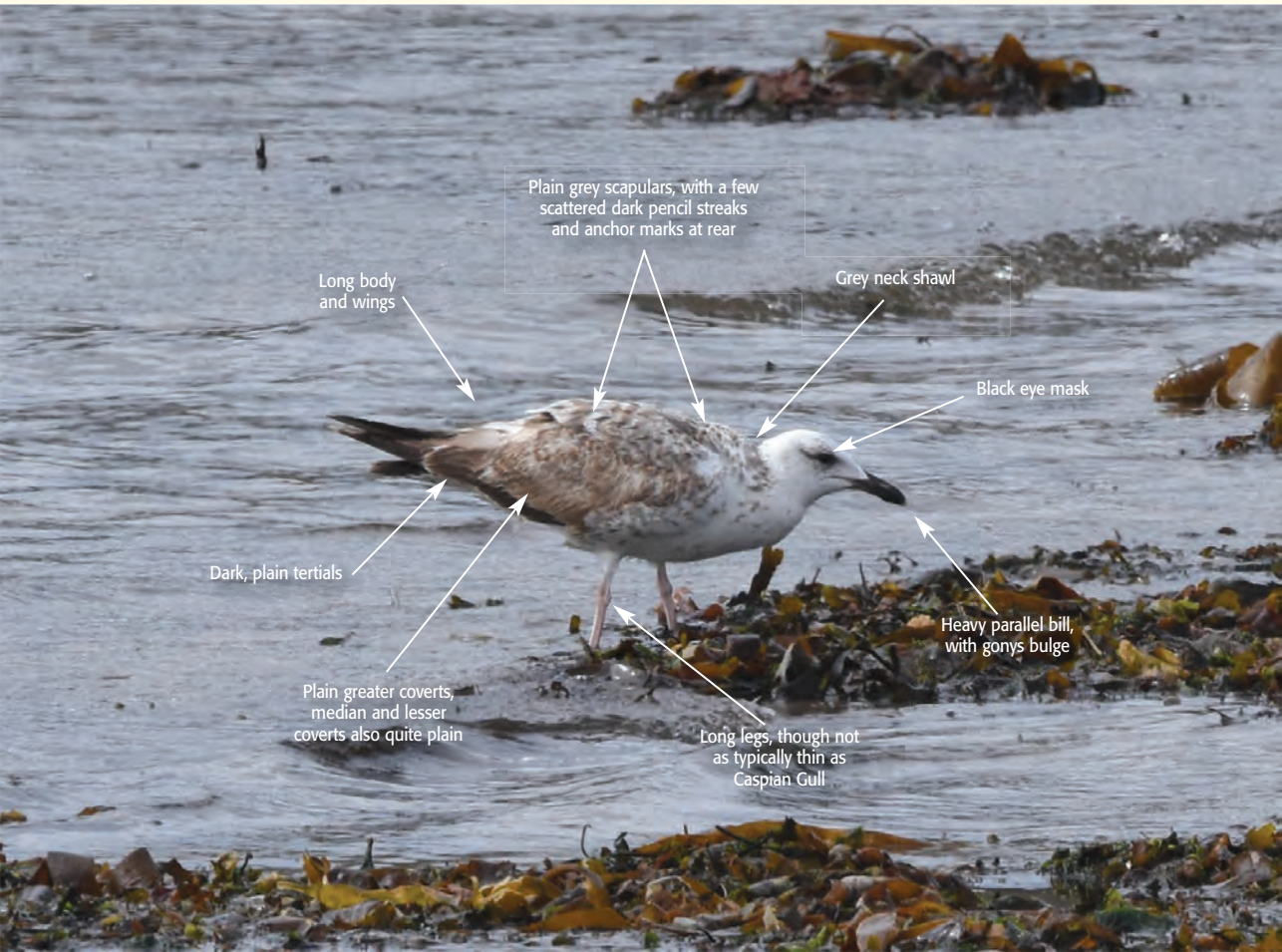


Plate 196. 2cy Yellow-legged Gull, Leven, Fife 10 May 2021. To separate 2cy Yellow-legged and Caspian Gulls, the underwing is critical, with an almost white base colour (only lightly flecked with brown) in Caspian Gull, but typically uniformly warm brown in Yellow-legged Gull. © *Mark Wilkinson*

Plate 197. 2cy Yellow-legged Gull, Leven, Fife 10 May 2021. Quite a clean looking bird for an immature gull, lacking the 'barred' appearance typical of a young Herring Gull, but sharing many features with Caspian Gull, particularly the three-toned appearance of white, grey and brown. © *Mark Wilkinson*



2cy Leven Beach, Fife, 10 May 2021 *(accepted by SBRC)*

The remainder of March and April passed off without incident, and by early May I was beginning to think that the Invergowrie bird had been a lucky one-off. However, on a quick visit to Leven, Fife on 10 May, an immature gull immediately rang alarm bells. Due to the quickly rising tide, it was relatively close, and I concentrated on getting as many photos as possible. My first impression was actually of a second-calendar-year (2cy) Caspian Gull (*Larus cachinnans*), as the bird appeared very white headed, with rather plain grey upperparts and unbarred brown wing coverts, all good features for *cachinnans*. I was probably also subconsciously swayed by finding Fife's first Caspian Gull at the same site almost exactly three years previously, on 11–13 May 2018 (Wilkinson, 2019), and this bird seemed like history repeating itself.

However, when the bird flew a short distance, the uniformly warm brown underwing coverts ruled out Caspian Gull (which normally have diagnostic white underwings at this age) and indicated that it was most probably a Yellow-legged Gull, an identification also supported by the darker eye mask (normally lacking in Caspian Gull, or at best ill-defined). This bird was only the second record for Fife, the only previous record being almost 20 years beforehand, a 3cy bird at Tayport on 21 July 2002.

Discussion

Yellow-legged Gull has a complicated history here, not helped by Scotland being on the very north-western edge of their range, and knowledge concerning their identification has only evolved slowly since the 1990s. The first Scottish Birds Records Committee (SBRC) article in 1995 detailed the (then) known identification features and listed the first three records (Forrester, 1995). However, a SBRC review in 2011 resulted in approximately 50% (16 records of 17 birds) of all records being rejected, including the first six published records (www.the-soc.org.uk/content/bird-recording/sbrc/sbrc-review-of-yellow-legged-gull-larus-michahellis-records-may-2011). Following this review, the first acceptable record became a bird at the Ugie Estuary, North-East Scotland on 15 August 1998. Since then, there have been a total of 42 records of Yellow-legged Gull in Scotland up to the end of 2019, an average of just 1.9 records/year (SBRC data).

Due to these identification difficulties, SBRC has adopted a conservative approach when accepting Yellow-legged Gulls in Scotland, and has published guidance on their identification (McInerny, 2009). However, recent examples of presumed hybrid birds on Shetland (Harrop & Riddington, 2021) illustrate some of the difficulties involved, and reinforce that view that only birds showing all classic features, and no anomalous characteristics, should be considered acceptable.

The two records discussed here, found within a few weeks of each other, suggest that they are much more regular than the few records on the Scottish east coast suggest. For example, there are still no accepted records for either Borders or Upper Forth, and just a single record for Lothian (as long ago as 2007). Hopefully, with more experienced gull-watchers around, more records will be forthcoming.

References

Forrester, R. W. 1995. Yellow-legged Gulls in Scotland. *Scottish Birds* 18: 95–100.

McInerny, C. 2009. Scottish Birds Records Committee criteria for identification of Yellow-legged Gull *Larus michahellis*. *Scottish Birds* 29: 220–222.

Harrop, A.H.J & Riddington, R. 2021. Three problem 'yellow-legged gulls' from Shetland. *Scottish Birds* 41: 168–175.

Wilkinson, M.A. 2019. Caspian Gull, Leven Beach, 11–13 May 2018 - the first record for Fife. *Scottish Birds* 39: 75–78.

Mark Wilkinson, 108/10 Comiston Road, Edinburgh EH10 5QL.
Email: mark.a.wilkinson@blueyonder.co.uk

Plate 198. Adult male Lesser Scaup, Woodend Loch, Coatbridge, Clyde, 3 March 2022. © *John Nadin*

Three Lesser Scaup in Clyde, February to April 2022

C.J. MCINERNY & K. HOEY

On Wednesday 2 February 2022 CJM was completing his regular round of the 'Seven Lochs' of east Glasgow, Clyde looking through and counting waterfowl and gulls. On getting to Woodend Loch, Coatbridge, North Lanarkshire he observed the usual flocks of Tufted Ducks, Coots and a few Goldeneyes, but then noticed a small brown immature *Aythya* duck because it had white face shield markings around the bill which immediately looked interesting. The duck was feeding on the north side of the loch, about 300 m from the viewpoint on the south side.

It was small, Tufted Duck in size, showed a steep forehead and peaked crown, a small nape 'step', a grey mottled mantle and, on careful inspection, difficult at the long range, displayed a neat small dark nail on its bill. CJM knew that the bill structure/colour is crucial for the identification of *Aythya* ducks and hybrids: that this bird had a neat small dark nail indicated that the bird was either a Greater Scaup or Lesser Scaup. Furthermore, that the duck was small, had a steep forehead, peaked crown and a small nape 'step' suggested that very likely it was a Lesser Scaup. But he was also aware that the upperwing pattern is crucial to separate Greater Scaup and Lesser Scaup and so waited for the bird to show this feature. He obtained a few record digiscope shots, which confirmed some of the described features, but unfortunately the bird didn't reveal its upperwing in the two hours he was there, and so he decided to return the following morning.

The following morning the weather was very poor with wind and rain, and in the two hours CJM could stay, the bird was again on the same north side of the loch and did not reveal its upperwing - most frustrating! But he was still convinced the bird was likely a Lesser Scaup and so phoned KH, who lives nearby, to see if he could manage to see the bird later that day. KH could not, nor on the Friday, so CJM and KH agreed to meet on the Saturday morning. More frustration on the Saturday as the weather was again very poor and the bird distant in the same place. But, on this day, the putative Lesser Scaup was joined a second very similar looking bird with a slightly less prominent white face shield. This second bird added to the frustration, but we both had to leave after a couple of hours, and agreed to return the next morning.

Finally, on the Sunday 6 February, after some heavy snow and sleet, the weather improved and KH managed to obtain some photographic images of the open upperwing of each bird, when they lifted on the water and flapped their wings (Plate 200 a–b). Both showed a white wing bar restricted to the secondaries and a grey bar in the primaries, with no bleed-through between the two: diagnostic for Lesser Scaup and which eliminated Greater Scaup. Hurrah, our patience and perseverance had paid off. We aged both birds as second-calendar-year (2cy), and likely females because of the white face shields. After this, CJM released the news to the local Clyde SOC Grapevine.

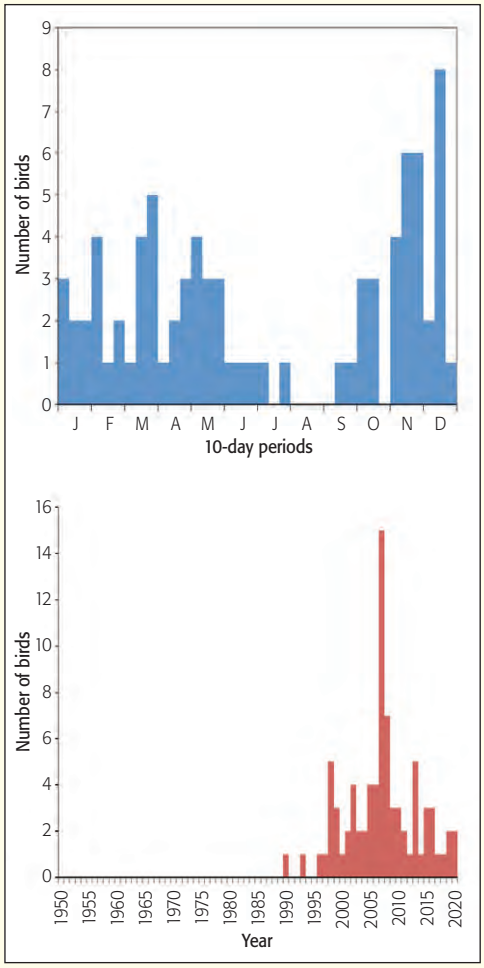


Figure 1. Seasonal and annual occurrence of Lesser Scaup by 10-day periods in Scotland, 1950–2020 (McInerny & McGowan 2021).

Plate 199 a–b. Adult male and female Lesser Scaups, Woodend Loch, Coatbridge, Clyde, 3 March 2022. *© John Nadin*

But the plot thickened. Other birders came to see these ducks, and on the 8 February Donald Wilson noticed another adult male Scaup of which he published images on the internet, and which was identified as another Lesser Scaup (Plates 198 and 199a). So, we had the extraordinary situation at Woodend Loch where one Lesser Scaup was joined by a second independently two days later, with a third bird a further two days later. That these three birds arrived separately at the same site, for such a rare bird in Scotland, is an amazing coincidence.

The three birds settled at Woodend Loch till at least the end of the month with it increasingly apparent, as they developed, that the two 2cy birds were both females (Plate 199b); with two, the male and one female, last seen on 20 March 2022. The male and female were subsequently found at Skinflats (Upper Forth) on 22 March, before returning to Woodend Loch from 29 March to at least 7 April, when they were observed displaying and mating before they disappeared again.

CJM has been lucky to find other Nearctic ducks at the Seven Lochs of east Glasgow: two Lesser Scaup together at Hogganfield Loch in October 2008 (*British Birds* 102: 533; McInerny 2015); a male Blue-winged Teal at Frankfield Loch from September to October 2013 (*British Birds* 107: 585); and a male Ring-necked Duck at Woodend Loch in April 2017.

Plate 200 a–b. Lesser Scaup, Woodend Loch, Coatbridge, Clyde, 6 February 2022. Showing the diagnostic wing pattern of the two females, with a white wing bar restricted to the secondaries and a grey bar in the primaries. © *Keith Hoey*

References

McInerny, C.J. 2015. Lesser Scaup *Aythya affinis* Hogganfield Loch, October–December 2008 - the first multiple occurrence for Clyde. *Clyde Bird Report* 2008: 94–96.

McInerny, C.J. & McGowan, R.Y. 2021. Scottish Birds Records Committee report on rare birds in Scotland, 2019. *Scottish Birds* 41: 99–120.

Christopher J. McInerny,
10 Athole Gardens, Glasgow G12 9AZ.
Email: Chris.McInerny@glasgow.ac.uk

Keith Hoey, 23 Dempsey Road,
Bellshill, North Lanarkshire ML4 2UF.
Email: keithhoopoehoey@yahoo.co.uk

The records of these three Lesser Scaup are subject to acceptance by the British Birds Rarities Committee (BBRC)

Lesser Scaup status in Scotland

Lesser Scaup is a rare vagrant to Scotland with the first recorded as recently as 1990, but with increasing numbers seen since, currently 1–5 each year, and an exceptional 15 in 2007 (Figure 1; McInerny & McGowan 2021).

*Multiple bird have been observed before in Scotland with a group of three 1cy, one male and two females, found on Loch Spiggie, Mainland Shetland from 1 November to 2 December 1998 (*British Birds *92: 567;* Shetland BR *1998: 89–90); and three 1cy males at Auchenreoch Loch (Dumfries & Galloway) on 20–24 December 2002 (*British Birds *96: 558).*

Indeed this 2022 group of three Lesser Scaup were part of an influx to western Europe in the autumn of 2021 of around 25 birds, including a British record flock of five present at Loch Skerrols, Islay (Argyll) from November 2021 into 2022: www.birdguides.com/news/influx-of-lesser-scaup-to-europe-may-be-biggest-ever

The changing status of White-billed Diver in Fife

K.D. SHAW & G. SPARSHOTT

Smout (1986) described the White-billed Diver (*Gavia adamsii*) as a very rare winter visitor to Fife. She quoted three records: 'one in the Tay Estuary "present for some weeks" during February and March 1954', 'one, found dead Earlsferry on the 1 January 1965', and 'one in the Tay Estuary, "probably Fife" on 9 or 10 March 1968'.

By 2014 little had changed. There were four Fife records. Only one bird, a first-winter at Ruddon's Point on 16–17 October 1994 found by Alan Lauder (Fife Bird Report 1994) was seen by several observers. By the autumn of 2014 Fife birdwatchers fell into two groups; a very small group who had seen one White-billed Diver in Fife and a much larger group who had seen none!

Meanwhile, the known UK status of White-billed Diver was changing (Scott and Shaw 2008; McInerny and Shaw 2019). This bird, once an extreme rarity, was now considered a scarce passage migrant!

The day the situation started to change in Fife was 13 October 2014. That was the day Barry Farquharson photographed a large diver flying past Fife Ness. After much debate, involving Killian Mullarney, the bird was identified and finally accepted as a White-billed Diver (Plate 201).

The die had been cast; White-billed Diver was 'on the radar' of the dedicated Fife Ness seawatchers. 'Search image' is important in rare bird finding, but it is critical when seawatching. The Fife seawatchers prepared themselves for the inevitable ...and through that process, it came about!

Between 2015 and 2021 there were another four accepted records of 'flyby' White-billed Divers at Fife Ness (Plates 202 and 203). Seawatchers like to understand the 'window' when any particular species is more likely. For White-billed Diver this window, thus far, is

Plate 201. White-billed Diver, Fife Ness, 13 October 2014. © *Barry Farquharson*

Plate 202. White-billed Diver, Fife Ness, 27 October 2018. © *Barry Farquharson*

Plate 203. White-billed Diver, Fife Ness, 23 October 2021 © *Barry Farquharson*

October and November. Seawatching at Fife Ness has become popular again in recent years (Shaw 2021) and with it has come the commitment to the later autumn months, October and November. However, it is worth noting that at some of the seawatching points in NE England e.g. Whitburn, a very well-organised watch point in County Durham, the 'window' is wider in the autumn.

Seawatchers like the details, so here are some: of the five White-billed Divers, three were going north and two south. All were close, or fairly close, 800 m or considerably less. In fact one was over the hide and another 'just off the rocks'. All were associated with winds from the NW, N or NE directions, most were seen the day after the 'blow'. All were seen on days Great Northern Divers were noted. The 'record day count' for Great Northern Diver (17) was established at Fife Ness, 28 November 2021.

In some ways this change in status is not a surprise given the Scotland-wide situation: an average of 67 White-billed Divers were recorded in the central North Sea between November and April 2010/2011(Burton *et al.* 2013) and up to 32 have been recorded off Portsoy, North-East Scotland in April (Baxter *et al.* 2013, Paul Baxter pers. comm.)

An unexpected twist to the tale of increasing White-billed Diver occurrences in Fife came on 23 October 2021. Ferry Hills is a vis-mig watch point near the 'bridges' over the Firth of Forth. Observations from here have changed the status of several species in Fife, for example Taiga Bean Goose and Hawfinch. On the same day as a White-billed Diver flew over the Fife Ness hide (Plate 203) there was a remarkable sighting from Ferry Hills. GS takes up the story:

"*As usual for a weekend in the autumn migration season, I was at Ferry Hills for dawn on 23 October. It was a calm day with a gentle south-west breeze, but the previous two days had seen a northerly airflow and there were signs that things were happening out in the North Sea with the start of an unprecedented influx of Grey Phalaropes off Fife Ness. At around 08:30 hrs I picked up a group of four large divers heading purposefully up the Forth. Small numbers of Great Northern Divers are not unusual on overland migration here in autumn, often accompanying larger flocks of Red-throated Divers. I automatically identified the four as Great Northern, the task made easier by the fact that a single Red-throated Diver initially accompanied them and was dwarfed by them in size.*

After this, things became more complicated as the birds split up on approaching the bridges, two obvious Great Northern Divers went inland separately and that left two that were more hesitant, and they began veering towards my watch point. As I watched them come closer through my bins the alarm bells started to ring, there was a subtle but distinct difference in shape between the two birds, one of them had a hunch-backed look with a sagging mid-neck and an up-tilted head/bill profile recalling a giant Red-throated Diver. I started to panic, the birds were now looking set on going inland over the Queensferry Crossing and I wouldn't have long to get my 'scope lined up. Fortunately, I was straight on to the birds flying parallel to one another and I was shocked to see that one bird had an upturned, creamy bill and an isolated dark eye standing out in a pale face in stark contrast to the Great Northern alongside - it was a first-winter White-billed Diver! As the birds turned away inland, they remained parallel to one another and even with a rear view there were differences in shape that could be noted. The White-billed Diver was longer winged than the Great Northern, had a bulkier hanging 'beer belly' and larger/longer feet. I also noted that the White Billed Diver would raise its head above the horizontal (not unlike the behaviour of Red-throated Diver), I didn't see the Great Northern Diver do this. I've had some enjoyable migration spectacles on my patch at Ferry Hills but nothing to compare to this!"

It is an extraordinary thought that a species, which for a long time was thought to be a vagrant, might be flying overland over our country! The question that remains being "is overland migration a regular strategy or was the Ferry Hills bird simply an inexperienced first-winter that followed some Great Northern Divers up the Forth, a reflection on the unusual numbers of White-billed Divers displaced further south into the North Sea in autumn 2021?" One thing for certain is that observers at Ferry Hills will be keeping a closer eye on all large divers here in the future.

Rare-bird finders, dedicated seawatchers and vis-mig specialists have completely changed the status of this species in Scotland in half a lifetime. Care still needs to be taken identifying this species in flight, especially young birds (see McInerny and Shaw, 2019).

Acknowledgements

Barry Farquharson deserves credit for photographing three White-billed Divers passing Fife Ness, which are reproduced here. We thank our co-observers at Fife Ness and Ferry Hills especially Will Cresswell, Simon Pinder, Jared Wilson, Clive McKay and Angus Jennings. KDS thanks Steve Addinall, Alan Lauder, Chris McInerny, Killian Mullarney, Martin Scott, David Steel and Malcolm Ware.

References

Baxter, P.A.A., Gibbins C., & Maggs, H. 2013. The White-billed Divers off North-East Scotland - discovering a new birding spectacle. *Scottish Birds* 33: 261–263.

Burton, N.H.K., *et al.* 2013. Ornithology Technical Report for the Proposed Dogger Bank Creyke Beck Offshore Wind Farm Projects. BTO Research Report No. 630 for Forewind.
www.bto.org/our-science/publications/research-reports/ornithological-technical-report proposed-dogger-bank

Lauder A.W. 1995. White-billed Diver In Largo Bay. *The Fife Bird Report 1994*. Fife Bird Club.

Lauder A.W., Shaw K.D., & Steel D. 2020. The 'island effect' - a century on. *Scottish Birds* 40: 157–168

McInerny, C.J. & Shaw, K.D. 2020. The White-billed Diver in Britain. *British Birds* 113: 198–210.

Scott, M.S., & Shaw, K. D. 2008. The status of White-billed Diver in north-west Scotland. *British Birds* 101: 241–248.

Shaw K.D. 2021. Record numbers of Grey Phalaropes in Fife. *Scottish Birds* 42: 88–90.

Smout, A-M. 1986. *The Birds of Fife. An Outline of their Status and Distribution.* John Donald, Edinburgh.

Ken D. Shaw, 13 Chalmers Brae, Anstruther, Fife KY10 3BY.
Email: kenshaw495@gmail.com

Graham Sparshott, 19 Inverewe Place, Dunfermline, Fife KY11 8FH.
Email: grahamspa@aol.com

Plate 204. 1cy female Cetti's Warbler, Kinneil Lagoons, Upper Forth, 13 November 2021. © *Kevin Sinclair*

An unprecedented influx of Cetti's Warblers during autumn 2021

M. WILKINSON

Despite its proximity as a breeding species in northern England, Cetti's Warbler (*Cettia cetti*) remains an extremely rare vagrant to Scotland, with just three previous records:

1993: a freshly dead adult male found at Leith, Edinburgh (Lothian) on 4 October, that had been ringed in August the same year in northern France, near Calais (Forrester *et al.* 2007). The specimen is held at National Museums of Scotland (NMSZ 1993.181).

2014: a bird at Nasg, Barra, Outer Hebrides on 12 October was the first live observation in Scotland (McGowan *et al.* 2016).

2016: a bird trapped at an undisclosed site 8 October during routine ringing operations, but not seen subsequently (McGowan *et al.* 2018).

With this background in mind, the appearance of three widely scattered birds in less than four weeks in late autumn 2021 is remarkable, a series of events that doubled the Scottish total. Not surprisingly, all three records constituted the first records for their respective recording areas.

Kinneil Lagoons, Upper Forth, 13 November 2021 (*accepted by SBRC*)

Reminiscent of the previously trapped bird from 2016, this bird was a surprise mist net discovery during routine ringing operations at Kinneil Lagoons, Upper Forth (Plate 204). It was not seen subsequently.

Stevenston, Ayrshire, 2 December 2021–7 February 2022 (*subject to acceptance by SBRC*)

This bird was a great find by Iain Hamlin at Ardeer Recreation Pond, Stevenston on 2 December. Unlike previous records, this bird remained for an extended period of time, and was therefore the first twitchable bird in Scotland, and it attracted a steady stream of observers during its stay, including a record-breaking Scottish year lister! Although difficult to observe, it could be seen (or more easily heard) with patience. However, on occasion it allowed reasonable views and was photographed by several observers (Plates 205 and 206).

Plate 205. Cetti's Warbler, Stevenston, Ayrshire, 16 December 2021. © *Andrew Russell*

Plate 206. Cetti's Warbler, Stevenston, Ayrshire, 17 December 2021. © *Hayden Fripp*

Kilconquhar Loch, Fife, 10–11 December 2021 *(accepted by SBRC)*

This bird was discovered by Mark Wilkinson during the afternoon of 10 December from the Fife Bird Club Hide, on the west side of Kilconquhar Loch. The bird first attracted attention to itself by its contact call, a sharp, explosive and slightly metallic '*sttiiikk*' but only afforded the very briefest of glimpses as it moved through the waterlogged reeds and willows, almost at ground level. Unsure of the identity, a sound recording was made via iPhone. Returning early the next morning, the bird was heard calling at much closer range, and a better sound recording was obtained, although the bird quickly fell silent and again refused to show. The sound recordings proved crucial to the identification, and acceptance of this record by Scottish Birds Records Committee (SBRC) (Figure 1). Unlike the Ayrshire record, the bird was not seen again, despite the extensive suitable habitat, and searching by several observers over subsequent days.

Discussion

Cetti's Warbler is normally considered resident, but from the 1920s, and particularly during the 1960s and 1970s, it has been subject to a well-known range expansion, detailed and

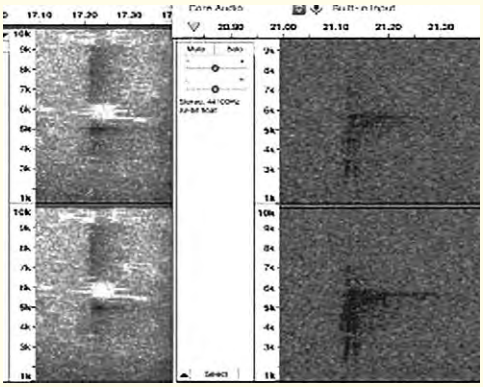


Figure 1. Sonogram of the contact call of Cetti's Warbler, Kilconquhar Loch, Fife, 11 December 2021 (left) compared with a recording from Spain (right). Each recording has the same duration of call note, of approximately 0.04 seconds. Both are very broad frequency, stretching from 2.5kHz at the low end, to 10 kHz at the high end i.e. the ruler like, vertical narrow bands on the sonograms. There is also the same mid-range 4 to 5.5kHz emphatic extensions, which are longer in length than the rest of the call, and being in the main range of human hearing, really stand out and grab attention (S. Taylor pers. comm.).

summarized by Bonham *et al.* (1975). The species first reached Britain in 1961, with breeding first recorded in Kent in 1972. The British breeding population was estimated as 3,450+ males in 2016, with the first breeding records north of the Humber made in 2006 (Woodward *et al.* 2020).

The six Scottish to date have all occurred between early October and December, and suggests that post juvenile dispersal plays a key part in these out-of-range records. Studies in England have shown that juveniles typically disperse significantly further than adults, and females disperse further than males (Robinson *et al.* 2007), so the 1cy female trapped at Kinneil Lagoons fits perfectly to the expected pattern. The fact that the 1993 Lothian bird was an adult male, however, is much more surprising, as statistically this is the least likely age and sex to disperse any distance from the natal area.

What next?

With birds regularly occurring as close to Scotland as Cumbria in the west, and Northumberland in the east, we can surely expect more records in the near future. Climate change, and its positive effect on survival rates due to milder winters, probably plays a large part in this recent range expansion. Colonisation of Scotland is probably imminent, with two singing birds reported in spring 2022 from Dumfries & Galloway (both records still subject to acceptance by SBRC). In suitable habitat, population growth can be rapid, with high breeding success and approximately half of all females laying second clutches during a study in NE Italy (Tasinazzo 1993).

Where to look and what to listen for?

With many Scottish counties still awaiting their first records, observers should be aware of where to look and what to listen for. Habitat preference is densely vegetated and overgrown standing water, containing waterlogged reeds, sedges, brambles and willows. Although the explosive territorial song is highly distinctive and virtually unmistakeable, the contact call is probably far less familiar to Scottish birders, and potential observers should familiarise themselves with it (easily done nowadays from online resources).

It is revealing to note that of the six records considered here, one was found dead, two were trapped, one was sound recorded only, and just two birds were actually observed in the field. The extreme skulking nature of this species does militate against discovery, but more Scottish records are sure to follow.

Acknowledgements

Many thanks to the photographers Hayden Fripp, Andrew Russell and Kevin Sinclair for the use of their excellent photographs. Also thanks to Kris Gibb, Mark Lewis, Sam Taylor and Jared Wilson for helpful comments on the identification of the Fife bird. Sam Taylor also kindly produced the sonograms from the mobile phone recordings, and provided useful interpretation of these.

References

Bonham P.F., Robertson J.C.M. 1975. The spread of Cetti's Warbler in north-west Europe. *British Birds*, 68: 393–408.

Forrester, R.W., Andrews, I.J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. & Grundy, D.S. (eds) 2007. *The Birds of Scotland*. The Scottish Ornithologists' Club, Aberlady.

McGowan, R.Y. & McInerny, C.J. 2016. Scottish Birds Records Committee report on rare birds in Scotland, 2013. *Scottish Birds* 36: 99–120.

McGowan, R.Y. & McInerny, C.J. 2018. Scottish Birds Records Committee report on rare birds in Scotland, 2014. *Scottish Birds* 38: 99–121.

Robert A. Robinson, Stephen N. Freeman, Dawn E. Balmer & Mark J. Grantham 2007. Cetti's Warbler *Cettia cetti*: analysis of an expanding population, *Bird Study*, 54: 2, 230–235.

Tasinazzo, S. 1993. Breeding ecology of Cetti's Warbler *Cettia cetti* in northeastern Italy, *Italian Journal of Zoology* 60(2):185–192.

Woodward, I.D., Massimino, D., Hammond, M.J., Barber, L., Barimore, C., Harris, S.J., Leech, D.I., Noble, D.G., Walker, R.H., Baillie, S.R. & Robinson, R.A. 2020. BirdTrends 2020: trends in numbers, breeding success and survival for UK breeding birds. *BTO Research Report* 732. BTO, Thetford.

Mark Wilkinson, 108/10 Comiston Road, Edinburgh EH10 5QL.
Email: mark.a.wilkinson@blueyonder.co.uk

An interesting Yellowhammer in North-East Scotland

P.A.A. BAXTER

On 8 October 2021, whilst birding in the vicinity of my garden at Craig David Croft, Inverbervie, I came across a female bunting sat in the single elderberry bush on the gorse covered hillside that adjoins the garden. The bird was facing me so the views were mostly front on, and as I moved position for a side view, the bird moved deeper into the bush. It was clearly an *emberiza* bunting but what was very interesting, however, was that it appeared a rather cold and grey bird with no traces of yellow in the plumage during my 30 or so seconds of observation. It looked a good contender for a female Pine Bunting, but I knew I needed more than the brief views that I just had. Sadly, there was no sign of the bird again, despite an extensive search for it, on both that day and over consecutive days. I baited the area with mixed seed in the hope that it attracted the bird - this succeeded in attracting other birds, including Yellowhammers, but there was no such luck with the target bird - it looked like it had slipped away.

Fast forward to February 2022, and following a cold snap of weather, Yellowhammer numbers rose considerably and up to 50 birds or so were now visiting the garden, affording some lovely views from the kitchen window and providing some excellent photography opportunities in the occasional winter sunshine. Of course, when I come across a flock of winter buntings, my thoughts (and hopes) invariable wander to the prizes that may be contained within. I kept tight eyes on the garden flock whenever I had the opportunity but a combination of working in the office and short daylight hours meant those opportunities were limited. Nevertheless, on 18 February, I glimpsed a grey female bunting on the ground, amongst the feeding Yellowhammers. Crikey, this looked very interesting, however the flock was soon spooked, and the birds dispersed. My sighting through binoculars had lasted a mere ten seconds or so, but that was enough for me to know that I needed to see this bird again. Of

Plates 207 & 208. Yellowhammer, Inverbervie, Aberdeenshire, 21 February 2022. The first images taken of the bird, which show a rather monochrome-plumaged cold, grey bird with white underparts lacking any yellow. Other pro-Pine Bunting features include the rather broad supercilium and isolated pale ear covert spot. Would these images have made a convincing case for the identification as a Pine Bunting had it not been seen again? © *Paul Baxter*

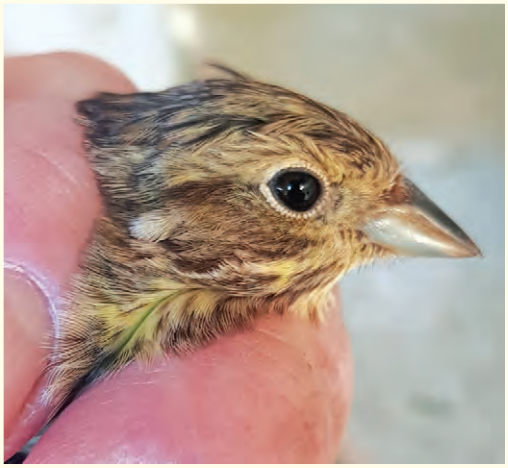
Plate 209. Yellowhammers and Pheasant, Inverbervie, Aberdeenshire, 24 February 2022. The centre bird is the subject bird which is particularly obvious amongst the feeding flock of Yellowhammer. In this image, the pro Pine Bunting features of isolated pale ear spot, broad whitish supercilium and lightly streaked crown are apparent. © *Paul Baxter*

course, I mused whether this could be the same individual from the autumn, that had remained and wintered with the local Yellowhammer flock.

Over the following weekend, the bird made very occasional and brief visits to the garden, but the birds were very flighty, thanks in part to a local Sparrowhawk, and it was not until 21 February that I was able to obtain a series of photographs of the bunting (Plates 207 & 208). What became apparent from both my field observations and, latterly, photographs were that although the bird bore a close resemblance to a female Pine Bunting, there were several features that were not quite right, and I began to consider whether this may actually be a hybrid Pine Bunting × Yellowhammer. What was startling was the apparent clear absence of yellow within the plumage, in stark contrast to even the dullest Yellowhammers visiting the garden that all showed at the very least a yellow wash to their undersides.

Rob Minshull visited during an afternoon which coincided with the bird being present, albeit briefly, and I asked him to confirm that there was no visible yellow in the plumage of the bird, which he did whilst observing the bird at *c.* ten metres through binoculars. What Rob did confirm however, was a slight warmth around the face and the yellow fringes to the outer primaries, both features that I had noted during my own observations. The latter is a well-known tell-tale feature of hybrid Yellowhammer × Pine Bunting.

The bird continued to visit the garden over the following week, and it was trapped during a routine ringing session in the garden on 27 February. I had seen the bird in the field, immediately prior to catching it, so was most surprised when I arrived at the net and there it was, with seven Yellowhammers but looking remarkably different at close quarters, in comparison with my field observations, to such an extent that I could hardly believe it was the same bird. Gone was the cold, monochrome bunting that had grabbed my attention just a few days ago, to be replaced by a rather different looking bird with light lemon-yellow streaking to the underparts (Plates 210 to 212). Was this even the same bird? In comparison with the Yellowhammers



Plates 210–212 above. First-winter female Yellowhammer, Inverbervie, Aberdeenshire, 27 February 2022. In the hand, the bird's appearance was a genuine surprise. The underparts coloration had transformed to a beautiful lemon-yellow wash along the flanks and belly. The upperparts were rather warm rufous brown in tone, although this is perhaps exaggerated in these images, as they were taken on a rare sunny day in February. The streaking to the underparts and breast sides were rather blackish (as opposed to more rufous in Pine), but did change in intensity, depending on how each feather lay - on some days, the flank streaking appeared relatively heavy and intense whereas on several days it appeared lighter and a much better 'fit' for Pine. There was a yellow wash to both the breast sides and within the supercilium, producing the warmer appearance noted in the field. The bird was aged as a first-winter using the primary covert shape, tertials and tail condition. © *Paul Baxter.* **Plates 213–215 opposite.** Yellowhammer, Inverbervie, Aberdeenshire, 10 May 2022. The moult strategy of Yellowhammer includes a partial pre-breeding moult and is limited to parts of head and body. Compare the contrast in appearance from February (Plates 210–212) and May (Plates 213–215) as a result of this partial moult. Note the different generation of feathers, particularly obvious within the undertail coverts with several flank feathers also renewed. © *Paul Baxter*

caught at the same time (which included a dull first-winter female) it was still clearly different, but thoughts of any Pine Bunting influences were now largely dismissed, and I was relatively happy that this was a dull first-winter female Yellowhammer. I decided to ring the bird on the left leg, so that I could readily identify it in the field should it remain.

Over the course of the next few months, the bird was regularly seen around the garden, within the Yellowhammer flock, still numbering *c.* 50 birds, and was trapped several times during garden ringing sessions. What became quite apparent in both field observations and in the hand examination, was the appearance of the bird was gradually changing because of the partial spring moult. It was noticeable that many of the pale, rather off-white feathers within the underparts, particularly the undertail coverts, were now being replaced by adult type yellow feathers,

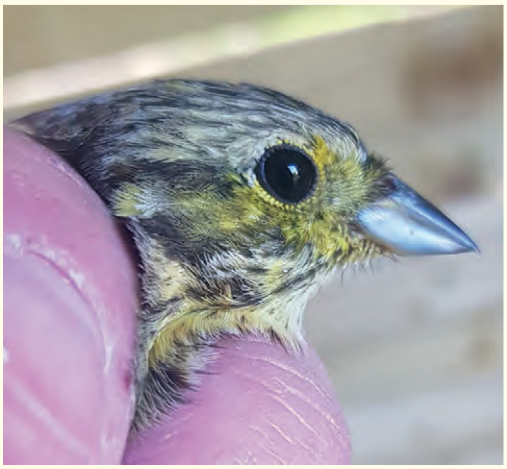


Plate 216. Yellowhammer, Inverbervie, Aberdeenshire, 4 March 2022. © *Paul Baxter*. In this image, the flank streaking looks rather heavy and dark.

and these were also obvious, as one would, expect in the field - its new appearance would barely cause a second glance as anything other than a female Yellowhammer. Also obvious were the advancing yellow feathers in the head, becoming ever more intensive in colour over time, particularly around the bill base and loral areas (see Plates 213 to 215).

To quote Shirihai & Svensson (2018) within the species account of Pine Bunting, "*there is really only one major pitfall to consider, pale or aberrant first-winter female Yellowhammer lacking yellow pigmentation, or hybrids between that species and Pine Bunting*". Although I believe such extreme birds are infrequent and generally uncommon, occasional individuals are out there and are a real pitfall. Thankfully, this individual allowed prolonged observation over several months, both in the field and in the hand, allowing its identity to be confirmed beyond doubt.

Acknowledgements

Thanks to Rob Minshull for the initial discussions on this bird. Richard Bonser kindly provided photographs of a hybrid from Shetland in 2016. Matt Prior kindly provided additional information on ageing and sexing Yellowhammers.

References

Occhiato, D. 2003. Identification of Pine Bunting. *Dutch Birding* 25: 1–16.

Shirihai, H. & Svensson, L. 1018. *Handbook of Western Palearctic Birds Volume II Passerines: Flycatchers to Buntings.* Helm.

Paul Baxter, Inverbervie, Aberdeenshire DD10 0SR.
Email: paulbaxter@hotmail.co.uk

SOC Branch contacts

Ayrshire: Anne Dick
T: 01292 541981
E: a_m_dick@btinternet.com

Borders: Neil Stratton
T: 01573 450695.
E: neildstratton@btinternet.com

Caithness: Nina O'Hanlon
T: 07810 300392
E: caithnesssecretary@the-soc.org.uk

Central: Neil Bielby
T: 01786 823830
E: neil.bielby@gmail.com

Clyde: Ian Fulton
T: 0141 773 4329
E: clydesecretary@the-soc.org.uk

Dumfries: Heather Stevenson
T: 01387 248535
E: dumfriessecretary@the-soc.org.uk

Fife: Caroline Gordon
T: 01592 750230
E: fifesecretary@the-soc.org.uk

Highland: Mary Galloway
T: 07598 320978
E: highlandsecretary@the-soc.org.uk

Lothian: David Parmee
T: 07769 704821
E: lothiansecretary@the-soc.org.uk

Moray: Alison Ritchie
T: 01309 674379
E: moraysecretary@the-soc.org.uk

North-East Scotland: John Wills
T: 01467 651 296
E: grampian.secretary@the-soc.org.uk

Orkney: Helen Aiton
T: 01856 751482
E: helendavidaiton@hotmail.co.uk

Stewartry: Joan Howie
T: 01644 420 280
E: joanospreys1@btinternet.com

Tayside: Rachael Wilbourn
T: 07708 547175
E: rachael.v.wilbourn@gmail.com

West Galloway: Geoff Sheppard
T: 01776 870 685
E: geoff.roddens@btinternet.com

Local Bird Recorders

Angus & Dundee: Jon Cook
T: 01382 738495
E: 1301midget@tiscali.co.uk

Argyll: Jim Dickson
T: 01546 603967
E: Argyllbirder@outlook.com
Assistant recorder: Malcolm Chattwood
E: abcrecorder@outlook.com

Ayrshire: Fraser Simpson
E: recorder@ayrshire-birding.org.uk
Assistant recorder: Angus Hogg
E: dcgos@globalnet.co.uk

Borders: David Parkinson & Martin Moncrieff
T: (DP) 07979 365134
T: (MM) 01835 822398
E: bordersrecorder@gmail.com

Caithness: Sinclair Manson
T: 01847 892379
E: sinclairmanson@btinternet.com

Clyde: Iain Gibson
T: 01505 705874
E: iaingibson.soc@btinternet.com
Assistant recorder: Val Wilson
E: val.wilson38@btinternet.com

Clyde Islands: Bernard Zonfrillo
T: 0141 557 0791
E: Bernard.Zonfrillo@glasgow.ac.uk

Dumfries & Galloway: Paul N. Collin
T: 01671 402861
E: pncollin@live.co.uk

Fair Isle: Rob Fray
T: 07775 647463
E: recorder@shetlandbirdclub.co.uk

Fife: Graham Sparshott
T: 07770 225440
E: grahamspa@aol.com

Forth (Upper): Chris Pendlebury
T: 07798 711134
E: chris@upperforthbirds.co.uk
Assistant recorder: Neil Bielby
E: neil.bielby@gmail.com

Highland: John Poyner
T: 07875 094666
E: highlandrecorder@yahoo.com

Isle of May: Iain English
T: 01698 891788
E: i.english@talk21.com

Lothian: Stephen Welch
T: 01875 852802
E: lothianrecorder@the-soc.org.uk

Moray & Nairn: Martin Cook
T: 01542 850296
E: martin.cook99@btinternet.com

N-E Scotland: Ian Broadbent
T: 07790 562892
E: nescotlandrecorder@the-soc.org.uk

Orkney: Jim Williams
T: 01856 761317
E: jim.geniefea@btinternet.com

Outer Hebrides: Yvonne Benting
T: 07501 332803
E: recorder@outerhebridesbirds.org.uk

Perth & Kinross: VACANT

Shetland: Rob Fray
T: 07775 647463
E: recorder@shetlandbirdclub.co.uk

PhotoSPOT

Plate 217. At certain times of the year the full Moon, when viewed from the west side of Belhaven Bay, rises behind the clubhouse at Winterfield Golf Course. If this coincides with a receding tide the combination of a low orange-tinged Moon and wet sand produces some pleasing reflections. On this particular day, small groups of Wigeon and Teal were feeding and roosting in the bay, close to the sea wall. I figured a shot of a group of ducks silhouetted against the reflected moonlight might make a more 'arty' photo than my usual output. After much toing and froing, to find the best combination of birds and reflection, I settled on a group of three Wigeon and took this shot within a series of images about an hour after sunset.

Equipment used
Fuji X-T20 camera, XF 100–400mm f4.5–5.6 lens, Aperture Priority, 1/250 second, ISO 1,250, f6.4.

Malcolm Quirie, West Barns, Lothian.
Email: issymalcs.mq@gmail.com

Featuring the best images posted on the SOC website each quarter, PhotoSpot will present stunning portraits as well as record shots of something interesting, accompanied by the story behind the photograph and the equipment used. Upload your photos now - it's open to all.