



The changing face of Britain's Tawny Owls

Jeff R. Martin and Heimo Mikkola

Tawny Owls in Kensington Gardens, London, 2014.

Ralph Hancock

Changes in behaviour and plumage among Britain's Tawny Owls prompt one of the world's leading owl experts to wonder whether we may have a new subspecies in this country.

The Tawny Owl *Strix aluco* is a familiar and widely distributed species throughout much of Europe and has eight recognised subspecies, two of which are of interest to us here. The nominate race *Strix aluco aluco* is resident from southern Scandinavia, the Netherlands, Belgium, Germany and eastern France to central European Russia, Ukraine, Crimea, Italy (including Sicily) and through to the Balkans. Elsewhere, the subspecies *S. a. sylvatica* resides in Britain, western and central France, the Iberian peninsula, western and central Turkey, the Levant, and probably parts of Greece.

In recent times, the family of owls has gone from being a comparatively little-known group of birds to a position where it has become the focus of

attention of a great many scientists, ornithologists and taxonomists around the world. As a result of this, the number of recognised species has risen from 130 (Burton 1984) to over 250, although more than 100 of the latter number are awaiting confirmation through DNA analysis (Mikkola 2013), and at least some of these may not survive detailed scrutiny.

On the basis of phylogenetic samples of *sylvatica* from Scotland and *aluco* from Germany, König *et al.* (2008) assigned those two subspecies to the same clade. Apart from that, however, little work appears to have been carried out with regard to investigating the genetic background of this species, and this is especially so in Britain.

An island race

The Tawny Owl has an interesting history in the British Isles. It was around 9500 bp (before present) that Ireland became separated from what is now the British mainland (Cabot 1999), and there is nothing in the archaeological history to



Typical forms of the Tawny Owl (Kensington Gardens, London) socially advertising themselves in daylight. Both birds have white chest patches. Ralph Hancock

suggest that Tawny Owls reached Ireland before that event. Consequently, they are absent from that land mass.

A little later, at around 8000–8500 years bp, Britain also became separated from mainland Europe (Berry 2009), although by that time the owl had become firmly established as a breeding species (Yalden & Albarella 2009). As a result of these events, the Tawny Owls of mainland Britain are now in a unique position, because today they inhabit the largest isolated landmass that sits within the species' range.

A species with this type of background has been described by Mayr (1959) as a 'geographical isolate' which has only a limited or non-existent genetic exchange with other populations of the same species. An isolate such as this usually exists on the periphery of the species' range and is usually accorded the taxonomic rank of subspecies, although sometimes it has yet to achieve the differences required to justify that ranking. In the case of Britain's Tawny Owls, they do not sit on the edge of the species' range but are, in effect, outside the range by being completely isolated from the main population, which makes them unique.

Mayr (1959) pointed out that, if the isolate's population is large enough, there may exist within it more than one subspecies and that every isolate, irrespective of its taxonomic rank, is an emerging species and, as such, is an important unit of evolution.

A nocturnal and sedentary species

Throughout the whole of Europe the Tawny Owl is regarded as a strictly nocturnal species, with a reputation in Britain for being highly sedentary. According to *The Migration Atlas* (Wernham *et al.* 2002), few other species display such a high degree of site fidelity, with no known instances of emigration to or immigration from mainland Europe. As an indication of its sedentary nature, but also an indication of its unwillingness, perhaps, to cross open water, it is an irregular breeding species on the Isle of Wight, which is at its closest point only 5 km (3

miles) from the mainland of southern England and nowhere more than 8 km (5 miles) from it.

In recent years, Tawny Owls have bred on the Isle of Man (Balmer *et al.* 2013), where they were formerly absent (Sharrock 1976; Lack 1986; Wingfield-Gibbons *et al.* 1993), and in 2013 an individual turned up in Co. Down, Northern Ireland, not far from Belfast. It is not known how Tawny Owls reached those islands, and Bunn *et al.* (1982) expressed concern for the long-term future of the Isle of Man's Barn Owls *Tyto alba* owing to the small spectrum of prey species that is available on the island (shrews and rats) and the application of poisons.

In the UK, there is a long history of ringing data for the Tawny Owl which covers the years from 1909 to 2013, the first recovery of a ringed individual dating back to 1912. Altogether, a total of 49,369 Tawny Owls has been ringed under the British Trust for Ornithology's (BTO) ringing scheme (bto.org/ringta/ringing-totals, accessed 10th May 2014), and during the whole of this period there have been only five recoveries at distances exceeding 100km from the site of ringing. The longest of these involved a movement of 687km, from the Highlands of Scotland to Dyfed, in south-west Wales. *The Migration Atlas*, however, was of the view that, because this was a roadside recovery, there was a possibility that this movement had been traffic-assisted.

These data further reveal that the average distance moved by young birds which are recovered in the year immediately following fledging is 4km, and that only 7% of those birds have travelled farther than 20km from the area in which they hatched. At the time of *The Migration Atlas*, the available data indicated that the average distance travelled by adult Tawny Owls was less than 1km, and according to the information on the BTO website (bto.org/ring/countyrec/result-sall/, accessed 10th May 2014) there seems to be no indication that this situation has changed.

Ringing data have also revealed that those Tawny Owls which live in the north of Britain are likely to disperse more widely, and for slightly longer distances, than those which live in the south. For example, individuals that live in the north-west tend to travel an average of 5km before recovery, while those in the north-east travel 4km, which compares with an average dispersal distance of 2km in the south.

Daylight calling

There is now a growing awareness that, in Britain, some Tawny Owls behave differently from others by calling on a regular basis in daylight. It was not known how common or widespread this was, however, until 2013, when we launched a survey. From this we received just a little over 500 records, most of which came from the south and south-east of England.

After adjusting all of the records to fit within Greenwich Mean Time, we found that calling commenced early in the morning but that from 09.00 hours there was a sharp rise to a midday peak, before calling gradually tailed off in the afternoon (Fig. 1).

We made extensive enquiries across the European mainland but, apart from some very isolated pockets of daylight calling in the Netherlands, Belgium and Hungary, we found no evidence that this behaviour is widespread or that it occurs as frequently as it does in Britain.

From the results of our enquiry we explored a variety

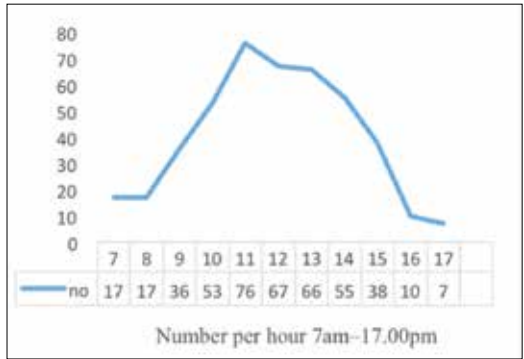


Figure 1. The distribution of daylight calling by Tawny Owls in Britain

of threads. These included climate change, the possible absence or presence of predators, human disturbance, and mimicry by Eurasian Jays *Garrulus glandarius*. After careful examination, we were able to discount all of those factors.

Our survey revealed that not only did birds call more frequently in the midday period, they also called more frequently when the sun shone. Of those records with which the weather conditions were described, 58% (131) reported that the calling occurred in bright sunshine, a further 17% (38) involved calls being made in conditions of broken cloud with sunny intervals, while the remaining 25% (58) related to calling taking place in dull or cloudy weather. We also received a few records of owls calling in foggy or misty conditions.

Typical form of the Tawny Owl (Edinburgh) socially advertising itself in daylight. This bird has white chest patches. Laura Coventry



The changing face of Britain's Tawny Owls



Ipswich Museum study skins of Tawny Owls, with the earliest (1915) on the left and the most recent (1985) on the far right

A search of the literature revealed a ten-year study of wintering Snowy Owls *Nyctea scandiaca* in southern Saskatchewan, Canada (Bortolotti *et al.* 2011), during which time unusual and unique behaviour was observed among those owls. In that study, it was found that the owls were socially advertising themselves to conspecifics and that they usually, though not always, did so from the tops of telegraph poles. Those owls with the whitest and least spotted plumage tended to display for longer and from ground perches, such as hillocks or fence posts, whereas those with a less white plumage tended to display from the tops of the poles. The researchers, however, were astonished to find that not only did these owls deliberately sun themselves but they actually followed the sun as it traversed the sky.

It was this study that sparked our interest and caused us to wonder whether there might be some

connection between the Snowy Owls' behaviour and the habit of some 'nocturnal' Tawny Owls of 'sunning' themselves in the middle of the day. The Snowy Owl is a bird of the open countryside and as such it would have no trouble in projecting its image, but what of the Tawny Owl, a bird that is usually associated with woodland? The similarity in the behaviour of the two drew us to conclude that some Tawny Owls might be using sunlight to the same effect as Snowy Owls and that, because they were confined to woodlands, they needed to call to draw attention to themselves. Hence the brief hooting, when the sun was highest in the sky.

Consequently, JM visited five provincial museums, the first of which was at Ipswich, in Suffolk, where he inspected the museum's collection of 13 Tawny Owl study skins. It was found that, since 1915, there had been a gradual progression in the plumage from brown to a very light colour. He

Colchester Museum study skins of Tawny Owls, with the earliest (1959) on left and the most recent (1979) on the far right





Left: Ipswich / Middle: Colchester / Right: Norwich

followed this with a visit to the nearby Colchester Museum, in Essex, where a similar story was evident among its 10 skins. The museum at Saffron Walden, in north-west Essex, has only two specimens of Tawny Owl but it was found that, although both displayed the more typical tawny-brown colour, their chests were quite light. At the Norwich Castle Museum, in Norfolk, a wide array of colour variations was found, many of which were also light. With the exception of Saffron Walden, those museum collections presented little evidence of the typical rufous colouring that might be expected with this species. A visit was made also to the Natural History Museum at Oxford, where nine Tawny Owl study skins exist with quantifiable collecting data. Those are from the era pre-daylight calling (before 1966), but most displayed patches of white on the chest area, and especially in the throat region.

In general, we found a wide array of colours among the museum skins, while in other individual Tawny Owl specimens the colouring was more stable. An inspection of all colour phases, and in all museums, revealed that a good number of Tawny Owls had developed white chests spots or areas of white.

Here we return to the work of the late Dr Bortolotti. Having made further enquiries, we found that, during the course of that study, Snowy Owls did not call (Dr Karen Wiebe in litt.). It was pointed out by Bortolotti et al. (2011) that, if the white plumage of Snowy Owls is used in communication, the theory of signalling predicts that colour properties of plumage should vary across the body, with the brightest parts those involved in visual display performance. Those authors also stated that specific displays which call attention to or enhance detection or conspicuousness to conspecifics should be evident, and we point to the distinctive daylight calling as evidence of the means by which Tawny Owls draw attention to themselves.

Building upon the work of Bortolotti and colleagues, Potapov & Sale (2012) have pointed out that the face and throat of Snowy Owls are white at all times, even with heavily barred individuals, and even young chicks in the nest have a white face mask, despite the rest of their bodies being dark.

The third point stated by Bortolotti et al. (2011) was that the location of the signallers should be at a place where signal efficacy is optimised. In other

The changing face of Britain's Tawny Owls



Many of the museum specimens had developed either a white chest patch or more extensive areas of white

words, the birds should be in a location where they can be seen by their conspecifics, and we further suggest that the elevated height at which the owls usually call enables them to be seen by others at a similar height. We would also suggest that it is important that Tawny Owls display against a strong background in order to project their images. This would explain why so many of the birds (63.6%) were recorded in either coniferous or mixed woodland sometimes containing Holly trees *Ilex aquifolium*. It was noticeable that, in autumn and winter, the number of records which were made in broad-leaf woodland progressively fell.

After examining the evidence which was available at the time, Voous (1988) came to the conclusion that the Tawny Owl was in a flexible state of subspecies formation. He thought that this was probably due to the colour tone of the daylight habitat, the temperature and the size of available prey. These subjects, however, require further investigation before valid conclusions can be drawn.

In Finland, an intensive long-term study ranging over 28 years, but which incorporated national data ranging back 48 years (Karell et al. 2011), found that in response to a warming climate, the grey-phase plumage of Tawny Owls of the nominate race *aluco* was steadily being replaced by the rufous colouring that is typical of the subspecies *sylvatica*. From our present work, this appears not to be the case in Britain.

In Italy, Galeotti & Cesaris (1996) stated that there were two colour phases of the Tawny Owl, with the rufous race *sylvatica* present in southern Italy, although Mikkola (1983, 2013) and König et al. (2008) did not include this subspecies. In line with other commentators, Galeotti & Cesaris stated that rufous birds of the race *sylvatica* tended to dominate western Europe, but it is clear that this is not the case in parts of Britain. While the rufous morph does indeed prevail in some areas, in others it is the lighter morphs which tend to dominate. It is equally clear that there are contrasting pockets of different colour morphs dotted around Britain. In one area of Northumberland, for example, only rufous individuals are known (P. Rose in litt.), but farther north, in western Scotland at Kilmartin (in Argyllshire), very grey birds can be found alongside rufous ones (D. Jardine in litt.). It is not known whether there is any interbreeding between those two colour morphs.

An island race or just behaviour?

We now have the information which shows that some populations of Tawny Owls in Britain are not of the typical rufous colouring that would be associated with the race *sylvatica*, and that many rufous individuals exhibit significant amounts of white not only on their facial disc, but also on the chest and throat.



At Norwich Museum a wide and interesting range of plumage was found

There is much colour variation in Tawny Owls across central Europe (Cramp 1985). We have come to the conclusion that this applies also to Britain's populations of this species, and in doing so we cannot help but agree with the view of Voous (1988). It was Mayr (1959) who described the formation of a race as 'geographically defined aggregates of local populations which differ taxonomically from other such sub-divisions of a species'. It is because of this state of affairs, as well as behavioural and morphological differences, that we are of the view that some, perhaps all, of the UK's Tawny Owls are now in the process of establishing such subspecies.

We also have to consider that the various colour phases, and the lightening of even rufous-coloured birds, strongly suggest that this owl is going through some form of colour-change process that is uncommon in most of its range, and that this is likely to be a result of its isolation from mainland Europe.

Undoubtedly, there are various colour forms of Tawny Owls across many parts of Europe, such as Italy, where it seems that rufous and grey forms do exist but, apart from four or five springtime records noted over a number of years (P. Galeotti *in litt.*), they do not call in daylight. It is this feature of daylight calling that most clearly sets some of Britain's Tawny Owls apart from all others, both on the European mainland and also within Britain itself.

Judging from the number of people who contacted us and who commented that they had never heard daylight calling before, we tentatively

suggest that this behaviour is on the increase, although it is far from widespread, with isolated pockets turning up here and there.

Conclusions

Britain has been separated from the European mainland for around 8,000–8,500 years. On the basis of present-day knowledge, it seems extremely unlikely that there has been any genetic exchange between Tawny Owls in Britain and those of the European mainland. In addition, it seems likely that, owing to the highly sedentary nature of this species, there has been little interchange between northern and southern populations, although, where the two groups meet, there must be some genetic interchange, unless they have evolved into two distinct species. This requires further study.

Argyll, Scotland, 2014. Chris Griffin



The changing face of Britain's Tawny Owls



Left: Colchester Museum. Right: Tawny Owl, Kensington Gardens, 2013. Ralph Hancock

In addressing this subject Mayr (1959) stated 'Even where, owing to the unsuitability of the habitat, there is an occasional minor break, such a break is bridged by steady dispersal, resulting in gene-exchange among populations. For the taxonomist such a population continuum is characterised by clinal variation. Extreme populations in a continuum may be very different phenotypically and may justify subspecific recognition'.

One wonders whether the clearance of the 'Wildwood' during the Mesolithic (Rackham 1986) has had some influence in preventing gene dispersal between southern and northern Tawny Owls in Britain. There is, however, much more work to be carried out on this subject before any assumptions can be made.

Acknowledgements

We thank the following for their kind help and assistance. For the photographs we are especially grateful to Ralph Hancock, but also to Laura Coventry, Doug Holden and Chris Griffin, and in Finland we are appreciative of the work of Ari Rantamaki. All other photographs are by Jeff Martin.

We thank Dr Karen Wiebe, at the University of Saskatchewan, for contacting Marten Stoffel, one of the late Gary Bortolotti's fieldworkers, who was able to confirm that Snowy Owls do not call when displaying in sunlight.

In concluding our report, we should like to draw attention to the museum staff who have made us welcome wherever we have gone. We thank the staff at the Colchester & Ipswich Museums Service,

A wide range of head markings and colours exists in Britain. Colchester Museum, 2014





A Tawny Owl hoots in daylight, Kensington Gardens, London, April 2014. At such times the white throat patch is very visible. Ralph Hancock



Wintering Tawny Owls choose evergreen trees, rather than leafless deciduous ones, from which to call. This daylight-calling owl was photographed in a Holly tree *Ilex aquifolium* on a bright sunny day on 6th March 2014. Doug Holden

in particular Ann Ainsworth (lately of Ipswich Museum) and Sophie Stevens (Colchester Museum). Sarah Kenyon made us welcome at the Saffron Walden museum. We are also very grateful to Tony Irwin and his staff at the Norwich Castle Museum for kindly providing the facilities for us to work through the museum's collection. We were pleased to meet Malgosia Nowak-Kemp, of the Oxford Natural History Museum, who provided the facilities to inspect its study skins, as well as providing a brief, but enthusiastic, tour of the museum.

References

- Balmer, D. E., Gillings, S., Caffrey, B. J., Swann, R. L., Downey, I. S., & Fuller, R. J. 2013. *Bird Atlas 2007-2011: the breeding and wintering birds of Britain and Ireland*. BTO Books, Thetford.
- Berry, R. J. 2009. *Islands*. Collins, London.
- Bortolotti, G. R., Stoffel, M. J., & Galvan, I. 2011. Wintering Snowy Owls *Bubo scandiacus* integrate colour, behaviour and their environment to maximize efficacy of visual displays. *Ibis* 153: 134–142.
- Bunn, D. S., Warburton, A. B., & Wilson, R. D. S. 1982. *The Barn Owl*. T. & A. D. Poyser Ltd, Calton.
- Burton, J. A. 1984. *Owls of the World: their evolution, structure and ecology*. Peter Lowe (Eurobook edition), London.
- Cabot, D. 1999. *Ireland*. Collins, London.
- Cramp, S. (ed.) (1985) *The Birds of the Western Palearctic, Vol. 4*. Oxford University Press.
- Cramp, S., & Simmons, K. E. L. (eds) 2004. *BWPI: Birds of the Western Palearctic interactive (DVD-ROM)*. BirdGuides Ltd, Sheffield.
- Galeotti, P., & Cesaris, C. 1996. Rufous and grey colour morphs in the Italian Tawny Owl: geographical and environmental influences. *Journal of Avian Biol.* 27: 15–20.
- Karell, P., Ahola, K., Kartsinen, T., Valkama, J., & Brommer, J. E. 2011. *Nature Communications*. DOI: 10.1038/ncomms1213.
- König, C., Weick, F., & Becking, J.-H. 2008. *Owls of the World*. Second edition. Christopher Helm, London.
- Lack, P. 1986. *The Atlas of Wintering Birds in Britain and Ireland*. T. & A. D. Poyser Ltd, Calton.
- Mayr, E. 1959. Trends in Avian Systematics. *Ibis* 101: 293–302.
- Mikkola, H. 1983. *Owls of Europe*. T. & A. D. Poyser, Calton.
- Mikkola, H. 2013. *Owls of the World: a photographic guide*. Christopher Helm, London.
- Potapov, E., & Sale, R. 2012. *The Snowy Owl*. T. & A. D. Poyser, London.
- Rackham, O. 1986. *The History of the Countryside*. Dent, London.

- Sharrock, J. T. R. 1976. *The Atlas of Breeding Birds in Britain and Ireland*. T. & A. D. Poyser Ltd, Calton.
- Vooous, K. H. 1988. *Owls of the Northern Hemisphere*. Collins, London.
- Wernham, C., Toms, M., Marchant, J., Clark, J., Siriwardena, G., & Baillie, S. (eds) 2002. *The Migration Atlas: Movements of the Birds of Britain and Ireland*. British Trust for Ornithology, Thetford.
- Wingfield-Gibbons, D., Reid, J. B., & Chapman, R. A. 1993. *The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991*. T. & A. D. Poyser, London.
- Yalden, D. W., & Albarella, U. 2009. *The History of British Birds*. Oxford University Press.

A long-term study in Finland has proposed that Tawny Owls have responded to climate change by losing their typical grey plumage and adopting a rufous colouring that would be more typical of the race *S. a. sylvatica*. Ari Rantamaki



Corresponding author Jeff R. Martin (jeff.r.martin@btinternet.com) is a freelance naturalist and author, whose works include *Barn Owls In Britain* (2008). Heimo Mikkola is Adjunct Professor, University of Eastern Finland, Kuopio Campus, PO Box 1627, FIN-70211 Kuopio, Finland. He is the author of numerous papers, as well as the books *Owls of Europe* (1982) and *Owls of the World: a photographic guide* (2013).