

# THE FLIGHT CALLS OF CROSSBILLS MIGRATING OVER A SOUTHERN PENNINE WATCH POINT IN AUTUMN 2019

D.H. Pennington, January 2020

## INTRODUCTION

In recent years, my birding interest has increasingly been focussed on autumn visible migration in the South Pennines. This has mostly taken place at Harden, on the border of South and West Yorkshire, in the company of Nick Mallinson and, until 2016, Mick Cunningham. In 2014, I began experimenting with sound recording at this site, and this, among several other benefits, soon had the effect of drawing attention to the variations in the flight calls of migrating Common Crossbills. At first, virtually all of these variations were shown by sonograms to belong to one or the other of just two 'types'. However, this all changed in 2019, when despite it being a very poor autumn in terms of the number of birds passing over (see [here](#) for a yearly comparison), at least five different crossbill flight calls were detected. The aims of this article are to document these latest occurrences and, drawing on recently published research, put them into a wider context.

## CROSSBILL 'TYPES'?

Variability in the vocalisations of Common Crossbills has long been acknowledged, with their flight calls and excitement calls showing the most obvious diversification. However, several studies over the past three decades have shown that individuals are in fact very limited in their call repertoire, and that birds using any particular flight call will invariably use the same associated excitement call. Hence, each individual can be assigned to a vocal 'type' (see e.g. Groth 1993, Robb 2000).

As well as vocally, these types are known to differ in at least some cases in their morphology (e.g. mean bill depth) and in their food preferences. Perhaps more significantly, they have also been shown to breed assortatively, with females choosing to mate only with males of their own call type, even when other types are present and breeding sympatrically (see Edelaar 2008 for an overview). For these reasons, vocal types are not the same as the local dialects known in many other songbirds. Nor are they the same as subspecies, whose breeding distributions are, by common definition, geographically discrete.

In contrast, any genetic distinction has so far proved more difficult to detect, with DNA sequences being unable even to separate three of the four currently recognised European crossbill species.<sup>12</sup> However, a study published in 2006<sup>10</sup> described small but significant genetic differences between vocal types in North America, and similar techniques were recently used to show that divergence also exists in three sedentary subspecies of Common Crossbill in the Western Palearctic.<sup>11</sup>

## ATTEMPTS TO CLASSIFY THESE TYPES

The earliest major efforts to systematically classify and name these types took place in North America in the early 1990s (e.g. Groth 1993). In a European context, these were followed by the work of Magnus Robb, whose findings were published in *Dutch Birding* in 2000.<sup>9</sup> In this paper, Robb analysed an extensive collection of crossbill vocalisations, mostly from the Netherlands and other parts of north-western Europe, and identified nine distinct types, examples of which were included on an accompanying CD. Six of the nine were ascribed to Common Crossbill, and each of these was designated with a letter from A to F, along with a name describing the perceived sound of their flight calls (e.g. 'weet', or 'glip'). Subsequent wider-scale investigations led Robb to make some amendments and additions to this set, which was published in a revised version in Constantine & The Sound Approach (2006). Here, several of Robb's types were given a new name (e.g. 'phantom', or 'Bohemian'), and it was noted that some had become much scarcer since first being described.

In the meantime, a different classification had been proposed by Summers *et al.* (2002). In this paper, published in *Ibis*, they described four different flight calls (named 1-4) and five excitement calls (named A-E). Combining these, Common Crossbills were separated into three groups (1A, 2B, and 4E), with other combinations referring to Parrot and Scottish Crossbills. However, this research was primarily based on recordings from northern Scotland, and hence on a much smaller geographical scale than that of Robb.

In January 2019, a new system of nomenclature was published in the journal *Ecoscience*.<sup>6</sup> This paper presented findings from analysis by Ralph Martin and colleagues of 8216 recordings made between 2010 and 2016 in 33 countries across the Western Palearctic. Call types were separated into two groups, northern and southern, and each given a number preceded by N or S. In the northern group, at least 16 vocal types of Common Crossbill were described, with several having ranges spanning thousands of kilometres. Four further northern types related to other crossbill species, which were generally more localised. With regard to flight calls in particular, the authors found surprisingly little accord with previously published types, and this was one of the reasons why a new classification was deemed necessary. A summary of this paper (including detailed descriptions of the named types) has since been published online.<sup>7</sup>

### IDENTIFYING THE HARDEN MIGRANTS

Between 18<sup>th</sup> September and 6<sup>th</sup> November, 2019, a total of 14 crossbills were counted as they passed south or south-east over the Harden watch point. The flight calls of 11 of these were sound-recorded, and the resulting sonograms were found to correspond most closely with the type classification of Martin *et al.* (2019). As expected, most were recognisable as belonging to Common Crossbill, but one of the recordings has yet to be conclusively identified to species.

On 18<sup>th</sup> September, a single Crossbill flew SE at 07.40hrs., giving flight calls of type N11 (Fig. 1).

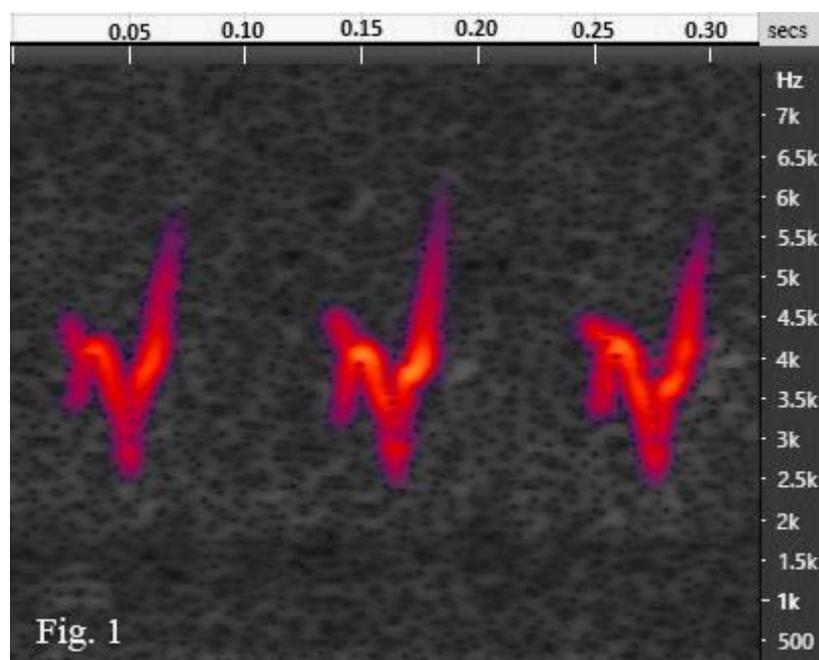


Figure 1. Call-type N11, Harden, 18 September 2019. <https://www.xeno-canto.org/511902>

In continental Europe, type N11 is very common in central latitudes, but unknown in the far north.<sup>7</sup> In Britain, no prior recordings of this type have so far come to light, but another single was recorded on visible migration in the West Midlands shortly afterwards (see [www.xeno-canto.org/505603](https://www.xeno-canto.org/505603)). Martin *et al.* (2019) made no connection between N11 and any of the types described in earlier classifications, although they did acknowledge some similarity with a particular flight call recorded in Greece in 1999, which Robb (2000) used as an example of his type B ('weet') call.

On 17<sup>th</sup> October, two birds flew SSE at 08.50hrs. Their calls were noted at the time as sounding somewhat unusual, and this was later confirmed by sonograms which were of a shape difficult to assign to any recognised type (Fig. 2).

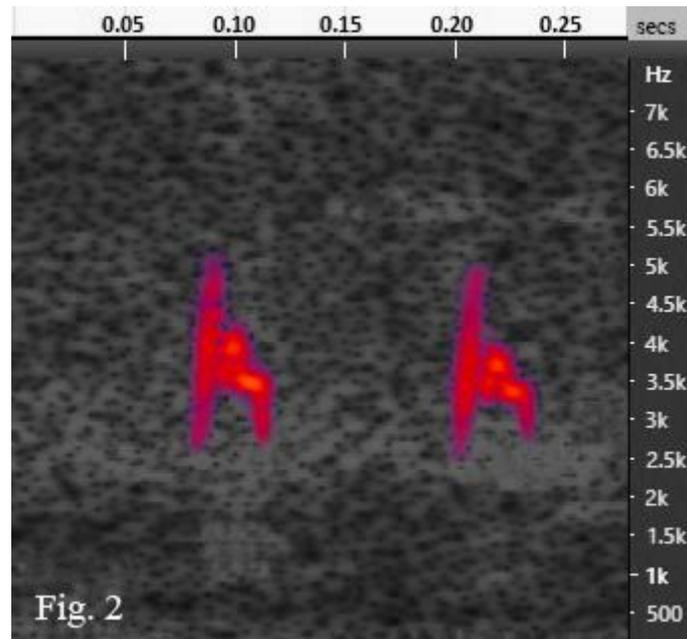


Figure 2a. Call-type undetermined, Harden, 17 October 2019. <https://www.xeno-canto.org/504233>

Adding to the puzzle of these calls, a series of three photographs taken at the time showed the bill of at least one of the two birds to be relatively large, with a structure appearing more typical of Parrot Crossbill than of Common (Figure 2b). It is known that a partially open bill, for instance when a bird is calling, can give a false impression of its depth, but the size and shape were consistent across all three images, making it very unlikely that this was the case here. So, the sound file and a photograph were sent to Magnus Robb, who kindly responded as follows. 'I have to be honest with you and say I've never heard crossbill calls exactly like that. I made sonograms... and the shape really doesn't look familiar. However, the energy is very concentrated in a narrow band between 3 and 4.3 kHz, and that does suggest Parrot.... The photo (also) looks very suggestive of a Parrot to me.' He added that Parrot Crossbills do seem to show some regional variations and that, since influxes originate from different areas, the birds reaching furthest west in any given year may sound different to those involved in previous influxes (Robb, pers. comm.). With this in mind, attempts have been made to locate recordings of similar sounding calls from around the same time, but the search has so far been fruitless. Hence, the specific identity of these birds remains, for now at least, unproven.



Figure 2b. Unidentified crossbill sp., Harden, 17 October 2019.

On 25<sup>th</sup> October, two distant birds flew SE at 08.40hrs. Sonograms (Fig. 3) showed them to be of type N8, which Martin & Rochefort (2019) classed as ‘probably identical’ with the Sound Approach’s type X (‘parakeet’) call.

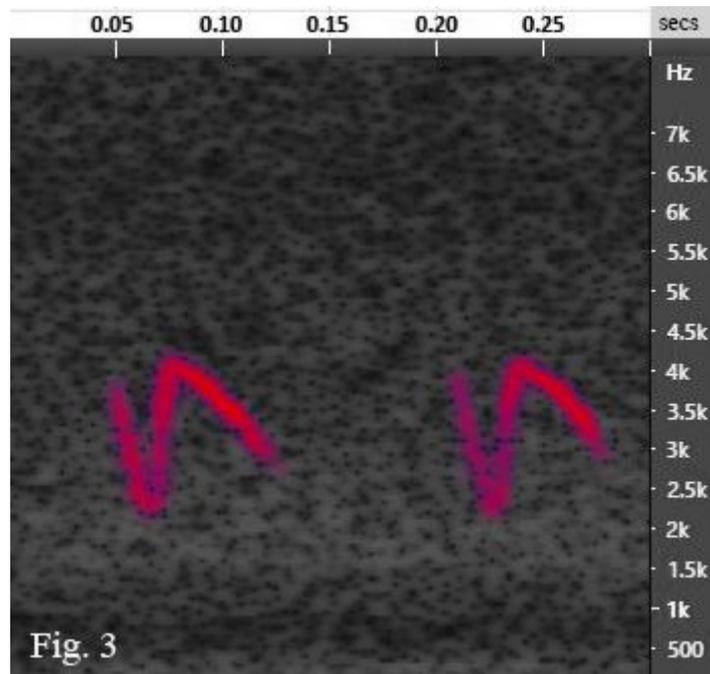


Figure 3. Call-type N8, Harden, 25 October 2019. <https://www.xeno-canto.org/521696>

This call type was first recorded by Robb in the Netherlands in 2002, and named ‘parakeet’ because of confusion that year with the flight calls of Parrot Crossbill.<sup>1</sup> Since then, it has become ‘one of the most common call types of the northern half of Europe’<sup>7</sup>, albeit one previously unrecorded at Harden.

In terms of Crossbill numbers, the morning of 6<sup>th</sup> November was our most productive of the autumn, with four flying SE at 09.15hrs. and two doing likewise at 09.28hrs. Sonograms revealed that the first four included both N4 and N6 birds, probably in a ratio of three to one. Of the two later birds, one also gave N6 calls, with the other being of an undetermined type. Examples of all are shown below.

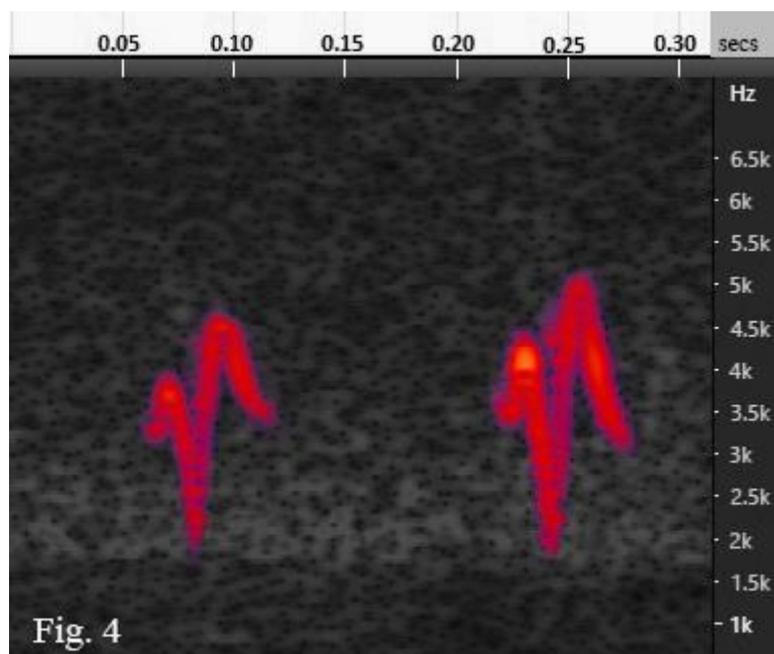


Figure 4. Call-type N4, Harden, 6 November 2019. <https://www.xeno-canto.org/521701>

The N4 flight call (Fig. 4) has been recorded at Harden on a near-annual basis, and according to Martin & Rochefort (2019) is probably the most common call type in the northern half of the Western Palearctic and 'probably identical' with type C ('glip') in Robb (2000) and type 4 in Summers *et al.* (2002). However, the call does seem to have undergone a slight change in the past two decades, with most of the more recently recorded examples having a prominent final descending component which was not shown on sonograms published in the earlier papers (pers. obs.).

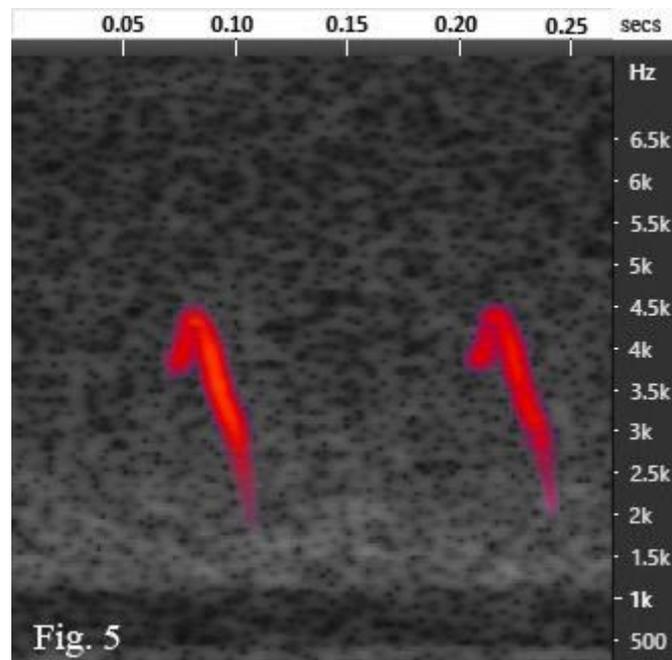


Figure 5. Call-type N6, Harden, 6 November 2019. <https://www.xeno-canto.org/521706>

Type N6 (Fig. 5) is mainly found in north-western Europe<sup>7</sup>, and over the past six years has been the most commonly recorded flight call at Harden. The fact that there are no similar calls in either Robb (2000) or Constantine and The Sound Approach (2006) suggests that it might have developed very recently, although Martin *et al.* (2019) did draw some comparisons with type 1 in Summers *et al.* (2002).

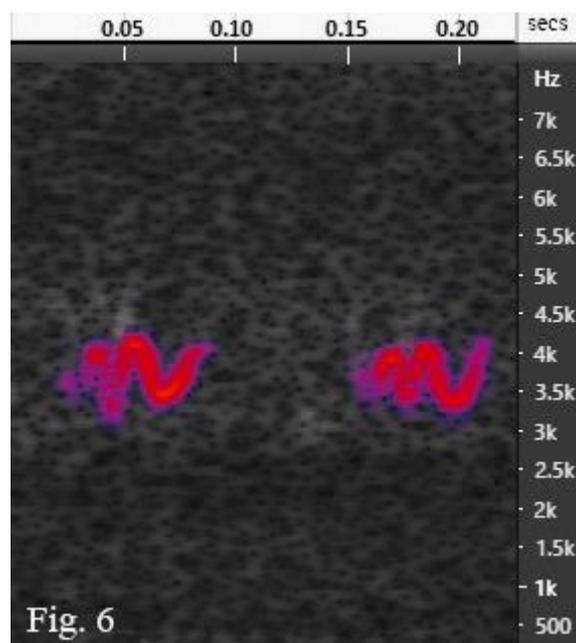


Figure 6. Call-type undetermined, Harden, 6 November 2019.

The final sonogram (Fig. 6) depicts the calls of the aforementioned undetermined type, and is included here for completeness. The calls can be heard on the same recording as the N6 type (directly above).

## MORE QUESTIONS

The extent to which Martin *et al.* failed to match their crossbill vocal database with previously published classifications (which were based on recordings mostly made less than two decades beforehand) has posed questions regarding the stability of crossbill calls over time. In their paper, they acknowledged this, and promised further research in this particular area.

Considering that DNA sequencing has so far been unsuccessful in separating the three European plain-winged crossbill species, the concept of discrete types within Common Crossbills has inevitably led to suggestions that Parrot and Scottish Crossbills might best be seen as one end of a spectrum of these types, and perhaps no more deserving of species status than some of the others. Ultimately though, this is a matter for evolutionary biologists and taxonomists to sort out amongst themselves, and one which hinges to some degree on the definition of the word 'species'.

## ACKNOWLEDGEMENTS

Ralph Martin and Magnus Robb, for their prompt and helpful responses to questions regarding particular calls.

Mick Cunningham, who introduced me to the joys of Pennine visible migration.

Nick Mallinson – fellow vismigger and crossbill spotter.

John McLoughlin, who joined us on 17<sup>th</sup> October and was the first to comment on the unusual sound of the calls heard that morning.

Clive McKay, for useful comments on an earlier draft of this article.

## A NOTE ON THE SONOGRAMS

The sonograms shown above were produced from each recording using Adobe Audition. To illustrate the typical variation within a series, at least two individual calls per recording were included. In some cases, the distribution of energy within a call is shown by differences in colour (with yellow the 'loudest'), but others were recorded at too great a distance for this detail to be captured. Unfortunately, there are some slight disparities in scale from one to another, but for the purposes of this article these are too small to be of any significance.

## REFERENCES

1. Constantine, M., & The Sound Approach (2006). *The Sound Approach to Birding*. The Sound Approach.
2. Edelaar, P. & Terpstra, K. (2004). Is the nominate subspecies of Common Crossbill *Loxia c. curvirostra* polytypic? I. Morphological differences among years at a single site. *Ardea*, 92 (1): 93-102.
3. Edelaar, P., van Eerde, K. & Terpstra, K. (2008). Is the nominate subspecies of Common Crossbill *Loxia c. curvirostra* polytypic? II. Differentiation among vocal types in functional traits. *Journal of Avian Biology*, 39 (1): 108-115.
4. Edelaar, P. (2008). Assortative mating also indicates that Common Crossbill *Loxia curvirostra* vocal types are species. *Journal of Avian Biology*, 39 (1): 9-12.
5. Groth, J.G. (1993). Call matching and positive assortative mating in Red Crossbills. *Auk*, 110: 398-401.
6. Martin, R., Rochefort, J., Mundry, R., & Segelbacher, G. (2019). Delimitation of call types of Common Crossbill *Loxia curvirostra* in the Western Palearctic. *Ecoscience*, 26 (2): 177-194.
7. Martin, R., & Rochefort, J. (2019). Crossbill call types in the Western Palearctic – a birders perspective. <https://avesrares.wordpress.com/2019/03/29/call-types-of-crossbills-in-europe/>
8. Newton, I. (2006). Movement patterns of Common Crossbills *Loxia curvirostra* in Europe. *Ibis*, 148: 782-788.

9. Robb, M.S. (2000). Introduction to vocalizations of crossbills in north-western Europe. *Dutch Birding*, 22: 61-107.
10. Parchman, T.L., Benkman, C.W., & Britch, S.C. (2006). Patterns of genetic variation in the adaptive radiation of New World crossbills (Aves: Loxia). *Molecular Ecology*, 19: 1873-1887.
11. Parchman, T.L., Edelaar, P., Uckele, K., Mezquida, E.T., Alonso, D., Jahner, J.P., Summers, R.W., & Benkman, C.W. (2018). Resource stability and geographic isolation are associated with genome divergence in Western Palearctic crossbills. *Journal of Evolutionary Biology*, 31: 1715-1731.
12. Piertney, S., Summers, R.W., & Marquiss, M. (2001). Microsatellite and mitochondrial DNA homogeneity among phenotypically diverse crossbill taxa in the UK. *Proceedings of the Royal Society*, 268: 1511-1517.
13. Shirihai, H., & Svensson, L. (2018). *Handbook of Western Palearctic Birds: Passerines*. London. Christopher Helm.
14. Summers, R.W., Jardine, D.C., Marquiss, M., & Rae, R. (2002). The distribution and habitats of crossbills *Loxia* spp. in Britain, with special reference to the Scottish Crossbill *Loxia scotica*. *Ibis*, 144 (3): 393-410.
15. Summers, R.W., Dawson, R.J., & Phillips, R.E., (2007). Assortative mating and patterns of inheritance indicate that the three crossbill taxa in Scotland are species. *Journal of Avian Biology*, 38: 153-162.