

Supplementary materials

A first survey of the global population size and distribution of the Scottish Crossbill *Loxia scotica*

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Appendix 1. The call types

The survey was dependent on identifying crossbill species from the appearance of the sonograms of their calls. Whilst these have been described previously (Summers *et al.* 2002), there were some slight changes to the appearance of calls, making a review necessary. The characteristic feature of flight call 1 is the upward component at the start of the note. This was small (see Fig. A, flight call 1b) or absent on some recordings, such that it resembled flight call 2 (Fig. A). However, the strong association between flight calls 1b and 2 with excitement call A confirmed this pairing to define this call-type (Table A). Several B excitement calls were recorded and when the associated flight call was recorded, it was a distinct form of flight call 1 (Fig. B, flight call 1a). In the previous study, this excitement call was paired with flight call 2, though the sample size was small. Therefore, there appeared to be overlap in the association with flight calls 1 and 2 with excitement calls A and B, so the separation of these into two call-types is less distinct. Nevertheless, all these calls characterise Common Crossbills. The final call-type that characterises Common Crossbill was 4E. Only a few were recorded, but there was no difference with the earlier recordings (Figs. A and B).

The excitement call C that typifies Scottish Crossbill has a series of harmonics and an additional low frequency modulation that gives the call an additional audible quality (Fig. B). It can be described as a “too-yoop” instead of a single “toop” note. The calls recorded in the survey showed less clear harmonics than in the early study, and often the additional modulation was indistinct (Fig. B). The associated flight calls (3) had two distinct components, often seen as parallel almost vertical lines on the sonogram (Fig. A). This was slightly different from previous recordings that had more energy within the first component of the call. Excitement call C was only associated with flight call 3 confirming this distinct call-type, diagnostic of the Scottish Crossbill (Table A).

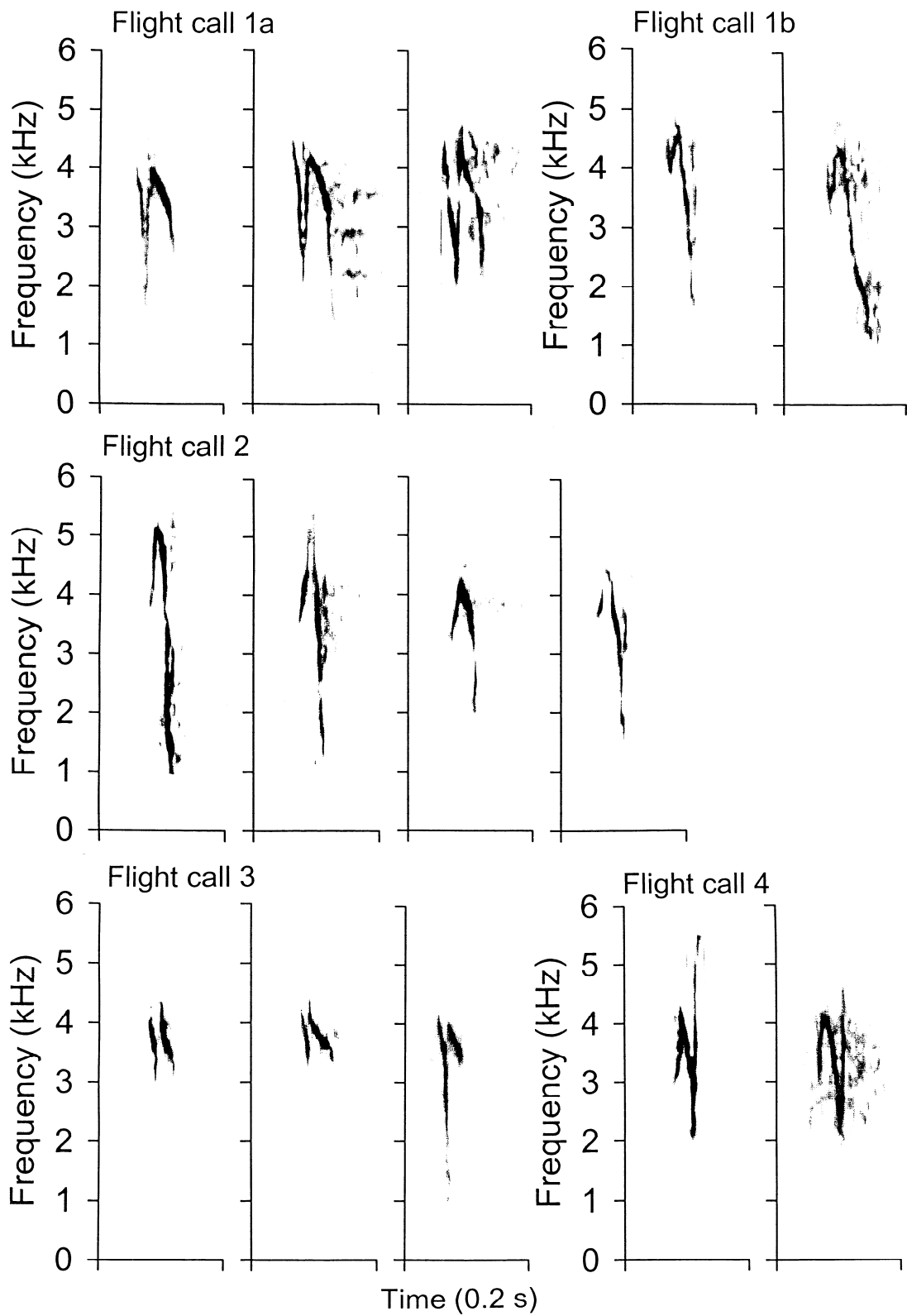


Figure A. Examples of the different flight calls given by crossbills during the survey.

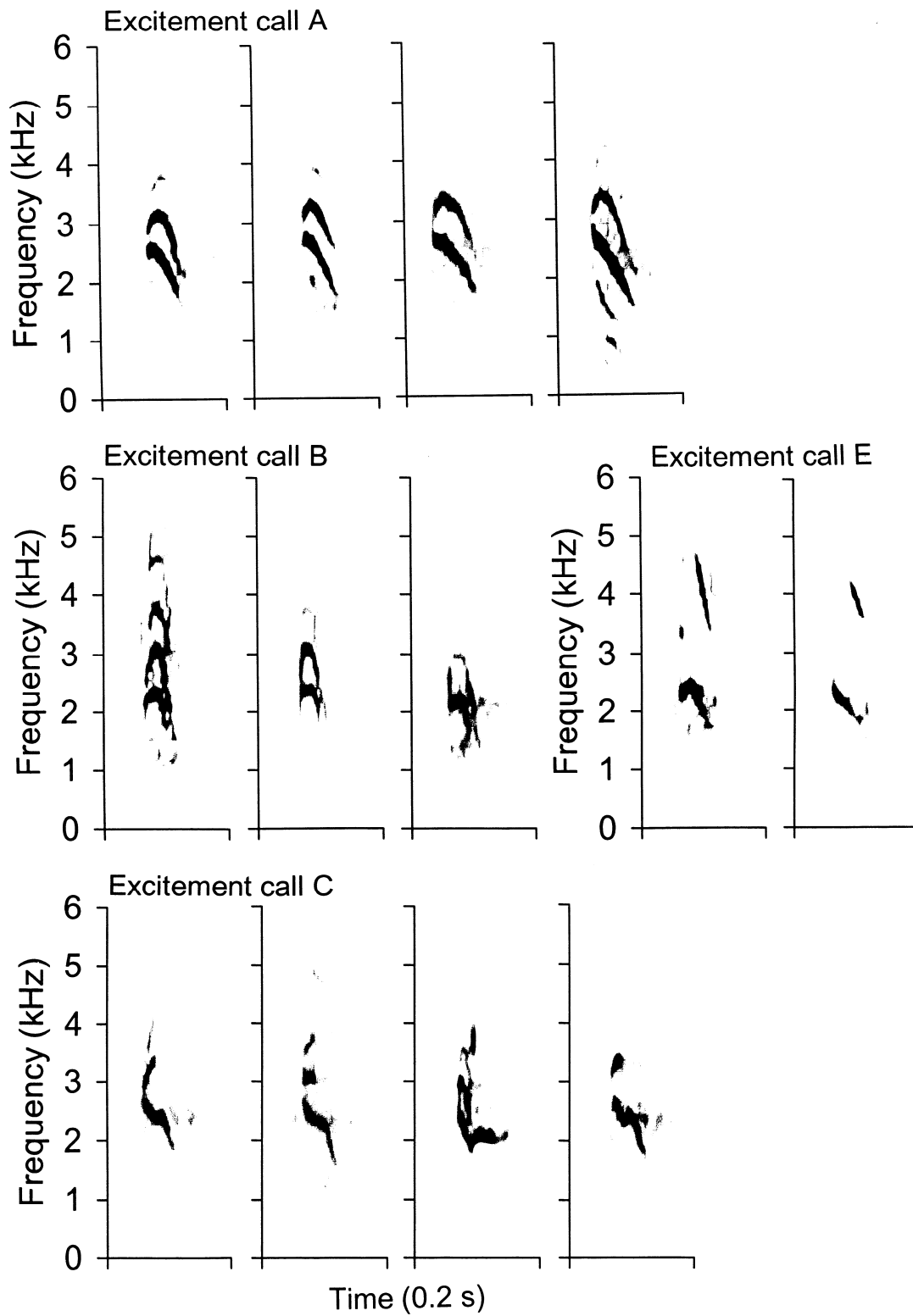


Figure B. Examples of the different excitement calls given by crossbills during the survey.

Table A. Numbers of single birds or pairs, in which different combinations of flight and excitement calls were recorded.

Excitement calls	Flight calls		
	1	2	3
A	5	17	0
B	3	0	0
C	0	0	22