Project Database of ICP Forests
PROJECT DESCRIPTION

PROJECT INFORMATION

Project title: **The Common Crossbill (*Loxia curvirostra*) within Europe – are call types connected with specific geographical regions?**

Project ID: 124

Contact person: Ralph Martin (ralph.martin@wildlife.uni-freiburg.de)

PROJECT DESCRIPTION

State of research

The Common Crossbill (*Loxia curvirostra*) is a bird species, living in close connection with cone crops of conifers (Glutz von Blotzheim & Bauer, 2001). Seeds of conifers are the most important food resource for the species. Therefore there are many crossbills in an area in a season with a good cone crop while during a cone crop failure there are few or none (Newton, 2006a).
A study from the Netherlands (Robb, 2000) analysed calls of Common Crossbills and discovered several different populations which could be clearly separated by their calls. They were named 'call types'. The call types occurred within the same forests and could not be separated visually, however there were slight differences in their biometric measurements (Summers in prep. & Edelaar et al. (2004)). This is the reason, why some authors (Edelaar et al. (2012) & Benkman (1993)) presume the main driver for the differentiation of these call types is a specialisation to a specific key conifer. It was presumed, these call types live nomadic (Newton, 2007) without any connection to a geographical region and just follow cone crops of their preferred conifer species.
However Knox (1992) hypothesised contradicting that these ‚nomadic' crossbills have a home range and they return to this geographical region regularly. Banded birds seem to confirm the hypothesis by a comeback of birds after an invasion into their home range (Newton, 2006b). Nevertheless the question is not finally clarified until today as a home range of the call types could be never shown.

Aim of the study

Until today it was not possible to show a home range of crossbill call types, as there was not enough data available scattered randomly in space and time. Therefore I collected recordings of 35.307 crossbills in Europe from 2006 until today.
In first own evaluations as part of my PhD (Martin et al. in prep.) we found arguments against a specialisation of the call types to tree species. In a further project, we want to evaluate our data set in space and time and put it in relation with the fructification of the conifers to check for a geographical connection of the call types.

My hypothesis:
If there is a cone crop failure within the home range of a call type, this call type leaves its home range and scatters in the surrounding areas. Therefore it occurs in areas more distant from its home range then in seasons with a good cone crop within its home range (cf. Figure 1). During a good cone crop within the core area, most of the birds of a call type should occur within its home range. We want to test this by identifying possible home ranges of the call types by their abundance in our data set and compare presence/absence data with the fructification in this and surrounding areas.

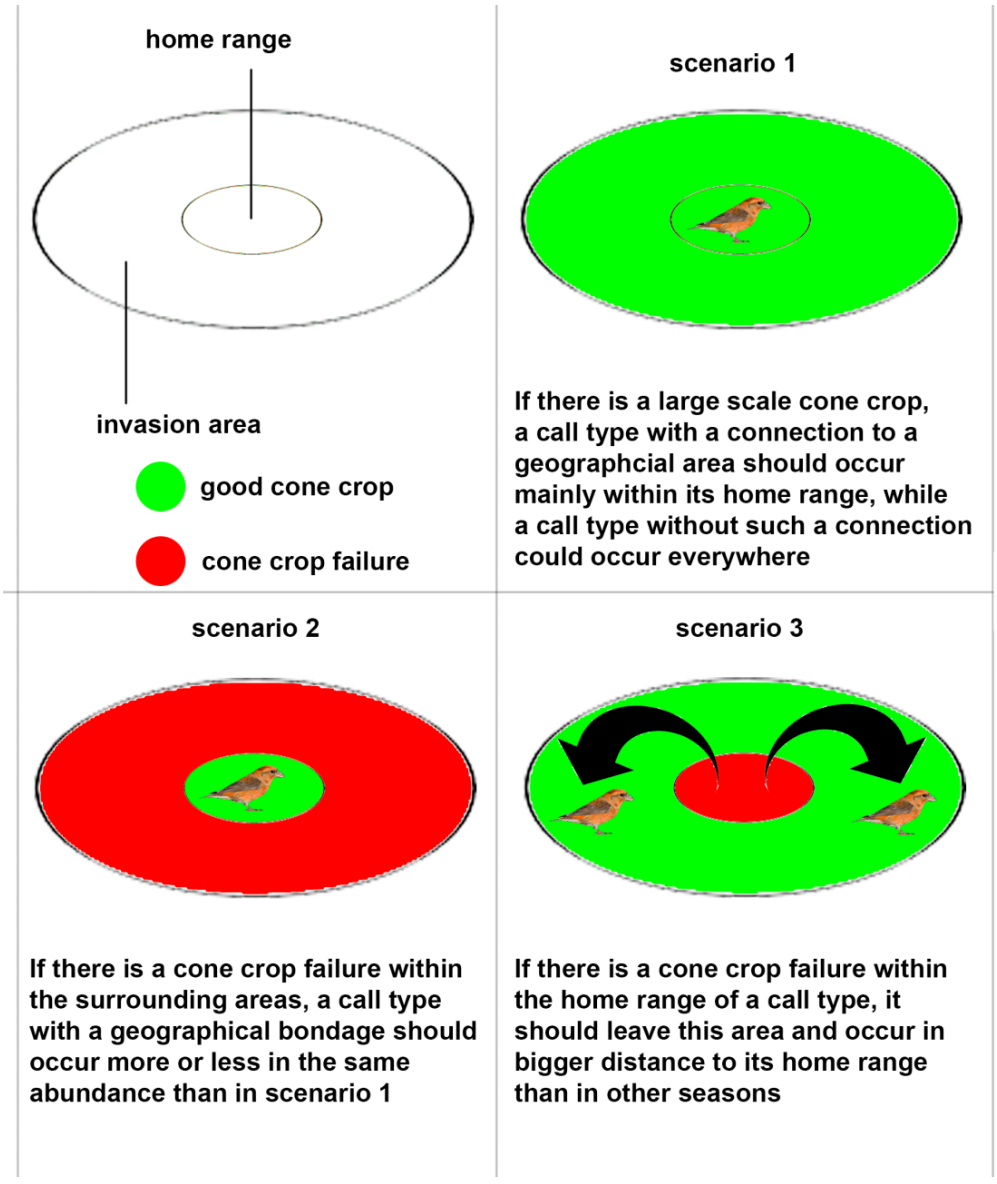

Figure 1: Relationship between the hypothetical occurrence of call types and the fructification of conifers within its home range

Project Database of ICP Forests
PROJECT DESCRIPTION

Necessary data
For this evaluation I need fructification data of the different conifer species in Europe. As I want to include the elevation as a possible influence factor, I need the detailed GPS-Position of the sample sites. If available, I evaluate the period from 2006 until today. I would highly appreciate your contribution to the project.

Literature
Benkman, C. W. (1993). Adaption to Single Resources and the Evolution of Crossbill (Loxia) Diversity. Ecological Monographs, 63(3), 305–325.
Edelaar, P., Alonso, D., Lagerveld, S., Senar, J. C., & Björklund, M. (2012). Population differentiation and restricted gene flow in Spanish crossbills: Not isolation-by-distance but isolation-by-ecology. Journal of Evolutionary Biology, 25(3), 417–430. https://doi.org/10.1111/j.1420-9101.2011.02443.x
Edelaar, P., Robb, M. S., van Eerde, K., Terpstra, K., Bijlsma, R., Maassen, E., … Björklund, M. (2004). Zijn er meerdere soorten "Gewone" Kruisbek in Nederland? Limosa, 77(1), 31–38. https://doi.org/10.1111/bij.12097
Glutz von Blotzheim, U. N., & Bauer, K. M. (2001). Handbuch der Vögel Mitteleuropas. Band 14/2 (genehmigte). Wiesbaden: AULA-Verlag GmbH.
Knox, A. G. (1992). Species and pseudospecies: the structure of crossbill populations. Biological Journal of the Linnean Society, 47, 325–335.
Martin, R., Rochefort, J., Segelbacher, G. , Mundry, R. (in prep.) Call types of Common Crossbill (Loxia curvirostra) in central and northern Europe.
Newton, I. (2006a). Advances in the study of irruptive migration. Ardea, 94(3), 433–460. https://doi.org/10.1007/s00726-012-1377-9
Newton, I. (2006b). Movement patterns of Common Crossbills Loxia curvirostra in Europe. Ibis, 148(4), 782–788. https://doi.org/10.1111/j.1474-919X.2006.00585.x
Newton, I. (2007). Migration ecology of birds.
Robb, M. S. (2000). Introduction to vocalizations of crossbills in north-western Europe. Dutch Birding, 22, 61–107.
Summers, R. W. (in prep.). Identifying crossbills in Scotland from sonograms of calls.