

## **TRIMmaps: creating distribution maps from monitoring data and casual observations**

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Information on the spatial distribution and changes in the distribution is gaining importance in nature management and policy. Although many European countries have one or more breeding bird monitoring schemes that provide information on temporal changes in population sizes, only a few countries are able to make new distribution atlases every 10-20 years. Given the increasing demand for recent information on distributions and changes in distributions we need additional information sources to create distribution patterns with shorter intervals.

With the aid of spatial statistical modelling techniques bird monitoring data are a very good of information to create distribution maps with at least information on the relative abundance of birds. And since monitoring projects provide yearly information this gives us the possibility to create yearly distribution maps. Moreover, it gives us the opportunity to create maps that depict spatial changes in abundance. Next to monitoring data we see a fast increase in the collection of casual observations through web-based platforms. These observations can also be used to probability maps showing presence and absence of bird species.

Creating reliable maps from monitoring data and casual observations requires the use of advanced (geo-)statistical software. Programmes like Maxent and ArcGIS provide easy-to-use solutions to create maps from casual observations (presence-only data; Maxent) or basic interpolation techniques ((co)kriging and comparables; ArcGIS), but no software is available that combines the wide range of regression-type statistics with spatial interpolation techniques. In order to provide the EBCC-community with a state-of-the-art programme for the creation of distribution maps we have developed TRIMmaps.

**TRIMmaps** is developed as a suite of scripts in the R-statistical language. R is an open source, freeware programme that is increasingly used for statistical analyses. Many dedicated additional packages have been made to suit the need of specific statistical analyses. TRIMmaps is intended to become one of these packages. The use of TRIMmaps requires some basic knowledge of R for which we have made a short R-course. TRIMmaps can read various kinds of observation files, amongst which the input files for TRIM. The minimum requirements to run TRIMmaps is information on the location of the observations, but the quality of the maps will in general greatly improve with the addition of environmental information like climate data or land use. Although the programme is still fully in development, we feel that the time has come to provide it to the EBCC-community.

In the last years we have successfully used the programme to create distribution maps from presence-only data for a wide variety of species and abundance maps from both CBC-monitoring plots and point counts. In one of the latter cases we combined distance information on point counts and automated territory interpretation to create abundance maps that depict estimated territory-density instead of bird numbers.

In order to run TRIMmaps the open-source statistical programme R has to be installed first. The windows-version of R can be downloaded directly from <http://www.stats.bris.ac.uk/R/bin/windows/base/release.htm>. Users of other operating systems can download R from <http://www.r-project.org/>.

**TRIMmaps** can be downloaded from <http://s1.sovon.nl/zip/trimmaps.zip>

This zip-file (30 Mb) contains the TRIMmaps-programme with manual, examples and Maxent.

A zip-file with additional material (110 Mb) is available at:

[http://s1.sovon.nl/zip/trimmaps\\_additional.zip](http://s1.sovon.nl/zip/trimmaps_additional.zip)

This zip-file contains the following folders and a zip-file:

‘Literature’: some literature on species distribution modelling

‘Presentations’: some Powerpoint-presentations on spatial modelling

‘R-course.zip’: a zip-file with a basic R-course (‘R in a few days’) and lots of additional information and literature.