

Developing Pan European bat population trends and indicators

Basic technical information for national/regional bat calculation for with program TRIM and BirdSTATs tool

Why TRIM?

National trends of bat species can be combined to overarching regional and European trends when they are calculated with the statistical program TRIM (program and guidelines are available on <http://www.ebcc.info/trim.html>) and when the TRIM output (.out and .ocv files) is made available for combination. Other statistical models and programs may produce valid and similar national results, but the output cannot be combined. So for combining to overarching trends, TRIM must (also) be used.

Why BirdSTATs?

Repeated and regular calculation and data preparation for multiple species and multiple selections of count sites can be annoying using TRIM. Therefore it is recommended to use the Access (mdb/accdb) interface BirdSTATs (available with guidelines on <https://meijtvd.home.xs4all.nl/Download/BatSTATS21.zip>). When using BirdSTATs, multiple species and site selections (e.g. all natural cave vs. artificial underground sites or different bio geographical regions) can be calculated in batch mode, results are collected and presented in a user-friendly way, while TRIM-settings and site selections are predefined and saved for future use.

VERY important note about TRIM modelling settings

If you use BirdSTATs, it will preselect these settings for you. In case you use TRIM alone, select the time-effects model (or linear model with all changepoints selected), set the first year as the base year (default), set the over-dispersion and serial correlation ON. In case of complete census data, the computation procedure is the same but over-dispersion should be set OFF.

Installation and use

a) If you want to use TRIM with BirdSTATs you must have Office2000 pro or higher with MS-Access installed on your computer. Unzip and save both TRIM and BirdSTATs with the manuals to your computer (e.g. in D/bats/trends) and make a separate map for the results (e.g. D/bats/trends/output_2016)

b) Follow the installation instructions in the file 'Getting started with BirdSTATs'. Basically this means that you should specify some settings and options that allow TRIM and BirdStats to communicate with each other and are able to find each other's files. For this reason BirdSTATs opens at first use in a tab-sheet called "*Settings, options and tables*", where you must specify the maps you use for the program and where you want to save your output data. Do not forget to also push the button "*Open Trim.exe to set options > files*" and copy the correct paths into the TRIM-window "*option/files*". Other settings and options should preferably be left default. Only when TRIM can't produce output (usually because of a lack of data) you may try running with overdispersion and/or serial correlation switched off.

c) On the next BirdSTATs tab-sheet "*Import*", you can import your data. BirdSTATs comes along with 'testdata' in mdb format and they can be used as an example how to organize

data. BirdSTATs can import several other file types, provided that the data is structured in a 'vertical' way (= one count of one species per line; see App. A) and not if your data is structured 'horizontally' (= counts of multiple species in one line; see App. B) For import choose your "file type" and search/select the path to your stored data. Then just follow the arrows to import your data into the BirdSTATs tables. BirdSTATs will report inconsistencies to you (e.g. missing values in obliged fields) and you have to correct the problems in your original data. After corrections are made, repeat the import procedure.

VERY important note about data management

Winter surveys are often made in December of year X until February of year X+1 (e.g. winter 1992/1993). Because of the different calendar years BirdSTATs/TRIM does not interpret such a period as belonging to only one "count period". However, BirdSTATs has an option setting which automatically shift your count dates forward to make sure one winter survey will be interpreted as belonging to one "count period".

Arbitrary we have decided that all data from winter surveys in year X will be transferred to year X+1. For example if your survey always starts in December you should shift the dates forward by at least 31 days. Don't worry about your original dates; BirdSTATs will save them in a separate field. Similarly if you don't have exact dates but only use years, make sure you use 1993 for winter 1992/1993.

d) On the third sheet of BirdSTATs "*Check*" check your data and if necessary correct the problems in your original data and import again (repeat step c).

e) In next sheet "*Stratification*", you must specify the species you want to calculate trends for and – for every species – define at least one 'stratum': with which you specify a selection of available data (e.g. count sites belonging to a specific region) and TRIM settings. For European trend calculation use all your count sites (keep default Plotfilter = "true") and other default settings of BirdSTATs.

VERY important note about survey period

In the case your monitoring is lasting several decades please choose year **1993** as the "*year first*" as well "*TCF basetime*" and "*TCF slope from*". This year (or better winter1992/93) was chosen on the basis of existing databases to provide enough data on continental scale. For those participants with shorter monitoring schemes just enter the first year of the monitoring or use "Autoselect" in BirdSTATs.

f) In the last sheet of BirdSTAT "*Analyses*" calculate trends pressing buttons from step 1 to step 3. You can later view results in the results part of the sheet. After calculations have finalised, check for errors in the "system reports" area on the stratification sheet.

g) For each species TRIM produces several output files. Names of those files are starting with number of species code which is predefined in the table (STAT_Species). Copy all those files in a special folder named: country_winter_year (e.g. Slovenia_winter_2015-16), zip it and send to e-mail address: t.vandermeij@cbs.nl and cc also to primoz.presetnik@ckff.si

Good luck.

Appendix A. Example of data structured in a 'vertical' way.

Site code	Site	Date	Species code	Species	Bat number
1	Deep cave	12.2.2010	3104	<i>Rhinolophus hipposideros</i>	45
1	Deep cave	12.2.2010	4101	<i>Barbastella barbastellus</i>	2
1	Deep cave	1.1.2012	3104	<i>Rhinolophus hipposideros</i>	40
1	Deep cave	2.2.2014	3104	<i>Rhinolophus hipposideros</i>	39
2	Castle cellar	13.1.2010	4412	<i>Myotis myotis</i>	9
3	Bunker no. 1	13.1.2010	4412	<i>Myotis myotis</i>	1
...

From such table you can make 3 necessary tables for import in BirdSTATs
 Names of columns in *italic* indicate names of "STAT_Fieldname" in "STAT_FieldSelection view". For details e.g. cell format see BirdSTATs Manual, page 9.

1) Plots (no duplicate sites)

Site code = <i>Plot_nr</i>	Site = <i>Plotname</i>	FFH bioregion code = <i>Region</i>	FFH bioregion	Long. = <i>Location_X</i>	Lat = <i>Location_Y</i>
1	Deep cave	314	continental
2	Castle cellar	314	continental
3	Bunker no. 1	413	alpine
...	...				

2) Counts

Site code = <i>Plot_nr</i>	Date = <i>Countdate</i>	Species code = <i>Species_nr</i>	Bat number = <i>Number</i>
1	12.2.2010	3104	45
1	12.2.2010	4101	2
1	1.1.2012	3104	40
1	2.2.2014	3104	39
2	13.1.2010	4412	9
3	13.1.2010	4412	1
...

3) Visits (unique dates of surveys on specific sites)

Site code = <i>Plot_nr</i>	Date = <i>Countdate</i>
1	12.2.2010
1	1.1.2012
1	2.2.2014
2	13.1.2010
3	13.1.2010
...	...

Appendix B. Example of data structured in a 'horizontal' way which is not suitable for import.

Site code	Site	Date	<i>Rhinolophus hipposideros</i>	<i>Myotis myotis</i>	<i>Barbastella barbastellus</i>
1	Deep cave	12.2.2010	45		2
1	Deep cave	1.1.2012	40		
1	Deep cave	2.2.2014	39		
2	Castle cellar	13.1.2010		9	
3	Bunker no. 1	13.1.2010		1	
...