6.7.4 Czech Republic & Slovakia

6.7.4.a Method

Geospatial datasets:

Region	Czech Republic: Regions divided into Districts Slovakia: Kraje divided into Okresy		
Applications	QGIS		
Geospatial data	**DIVA's** SVK_adm.zip + CZE_adm.zip + adjacent countries (http://www.diva-gis.org/gdata) **EEA reference grid** "Czech Republic shapefile.zip" and "Slovakia shapefile.zip" (from https://www.eea.europa.eu/data-and-maps/data/eea-reference-grids-2) **Buchar National Grid**: To be developed in this project		
Grid ref	EEA reference grid or Czechoslovakia Grid (Buchar, J., 1982)	**CRS**	ETRS89 / ETRS-LAEA (EPSG:3035) or WGS84 (EPSG: 4326)
Project	new (always use copies once constructed, never this original)		
Save project	/ F:\MapData\World\Europe\Czech Czechoslovakia_[nn].qgs		

Mapping agency: Czech Office for Surveying, Mapping and Cadastre (COSMC) (see http://fig.net/organisation/comm/5/wg52/mapagencies.asp)

Gazetteer: http://slovakia.places-in-the-world.com/723689-place-ruske.html

National Grid

In 1982 Buchar devised a grid system for wildlife recording in Czechoslovakia. A number of authors have since used this system, for example:

Beran, L. (2002). First record of Stagnicola fuscus (Mollusca: Gastropoda) from the Czech Republic. Acta Soc. Zool. Bohem., 66, 1–2.

Opravilová, V. (2006). Sladkovodní houby (Porifera : Spongillidae) CHKO Kokořínsko Protected Landscape Area. Bohemia Centralis, Praha, 27, 19–22.

Roháček, J., & Barták, M. (1990). Micropezidae (Diptera) of Czechoslovakia. Casopis Slezskeho Zemskeho Muzea Opava (A), 39, 97–111.

Ružicka, V., & Holec, M. (1998). New records of spiders from pond littorals in the Czech Republic. Arachnologische Mitteilungen, 1–7.

From the Roháček, J., & Barták, M. (1990) paper (a scan of a photocopy) it is clear that Buchar's grid system encompassed all of Czechoslovakia at the time. Buchar's paper is not available online but the system can be seen clearly in Beran's 2002 article for the Czech Republic, but it is clear how the system extends across Slovakia. The grid is important because the papers use the grid codes to detail locations, in all of them the location is prefixed with a 4 digit code. In more recent papers these authors are availing themselves of additional technologies to present location details.

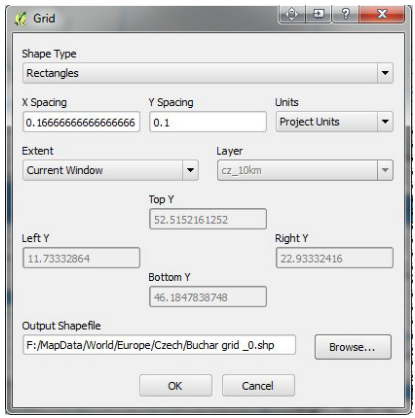
6.7.4.b Method: Creating the Czechoslovakia Grid

From examination of a photocopy (Roháček, 1990) it is clear that the grid is based upon Latitude and Longitude degrees. The Y axis gridded in 0.1 degree intervals and the X axis has the degrees divided into 6 (thus 0.1666666 degree intervals). The single distribution diagram in Beran, 2002 clearly indicates how the tiles are assigned their 4 digit code.

Geospatial datasets:

- EEA reference grids for Czech Republic and Slovakia (from http://www.eea.europa.eu/data-and-maps/data/eea-reference-grids-1)
- DIVA's Country outlines and Regions for Czech Republic and Slovakia (http://www.diva-gis.org/gdata)
- TDWG country outlines to provide a contextual background layer

1. In QGIS construct a combined map of Czech Republic and Slovakia using methods described above (starting with the EEA grids to establish the CRS)
2. Change the project's CRS to WGS84 (EPSG:4326) using the command at the extreme lower right, under the canvas. Carefully centre the country outlines on the canvas so as to leave a little space between their edges and the canvas edges.
3. From the QGIS menu select **MMQGIS** (see 5.3.3 about this plugin) **| Create | Create grid layer** which results in the following dialogue:



Selections:
Shape type = rectangles (for tiles),
X & Y spacing to match the Buchar grid intervals,
Extent = Current Window, meaning that the entire visible canvas will be filled with tiles,
Output shapefile in a project folder (never use the default)

4. Set the resultant layer's colour to transparent. Trim away the tiles not required by opening the Attribute table of the layer and using a combination of the Select Features button on the toolbar and the editing commands on the Attribute table (some of these are duplicated on the main QGIS toolbar). At this stage simply aim for one large matrix of tiles which comfortably includes both country outlines (trimming to country outlines can be done later). To avoid errors, save the layer under a different name occasionally (not Duplicate which just displays the same layer twice.)
5. To begin to assign the 4 digit codes to the matrix of tiles, refer to the diagram in the Beran paper. In the Attribute table use the commands to add a new field "X". In the **Properties | Labels** of the layer enable the display of field X. Using the **Select Features** button again, select the entire column of tiles matching the same column identifiable on Beran's diagram.
6. Enable editing on the layer which results in a command row appearing in the Attribute table. Select X from the first dropdown and enter the 2 digits identifying this column into the text box. Select "Update Selected" (avoid the other one at all costs). Press the Save edits button and then turn off the editing mode.

Those two digits should now appear as labels on all your selected tiles.

7 Repeat step 6 for all columns across the matrix.

8 Add a second field "Y" to the layer using the commands in the Attribute table change the displayed label to "Y" and the selected field in the editing dropdown to "Y" and repeat the above steps, this time selecting the rows of the tile matrix using the Select Features button.

9 Enable editing on the layer and add a third field to the table - "YX" (text), select this field in the drop-down list and use the formula button to construct the expression "Y" * 100 + "X" into the text box. Confirm that this formula works as expected by selecting the top row in the Attribute table and clicking **Update Selected.**

Select the entire table (use the unmarked gray button at the top left of the Attribute table - just as you would for an Excel spreadsheet) and click **Update Selected**. Save the edit and disable editing mode.

The WGS84 CRS has been useful to this point as it has displayed the Lat Long grid in a way that has facilitated the selection of rows and columns. Not the best display for publishing however as the tiles are 1.6 times too wide. To adjust these back into squares as in Beran would require an artificial CRS, an alternative is to change the project back to EPSG:3035:

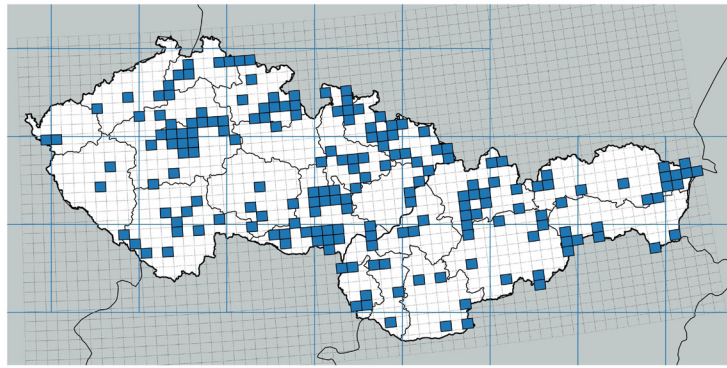


Figure 23.Czech Republic + Slovakia. [EPSG:3035] EEA grid in blue, Buchar grid in gray (constructed to WGS84 = EPSG:4326 and thus skewed). Distribution tiles are of the collecting localities in Roháček & Barták, 1990

The table produced by this method is useful in the following ways.

1. Copy and paste the table to a spreadsheet (then delete the first column, it's filled with geospatial junk) and by the judicious use of Excel's INDEX & MATCH functions its possible to enter the 4 digit grid code (on a separate Sheet) and obtain the Latitude and Longitude of locations referred to in any Czech Republic, Slovakian or Czechoslovakian paper that used the Buchar grid. The default fields that were created with the MMQGIS function refer to the bottom left and top right corners of the tile, it may be prudent to devise a grid reference formula in your spreadsheet which splits the difference so that the centre of each tile is specified..
2. Replication of distribution maps from previous publications are straightforward. To obtain the above record of Roháček & Barták's sites was simply a matter of highlighting the Buchar grid layer and using **Select Features** to select all the tiles on

the paper photocopy. Then **Edit | Copy features** and **Edit | Paste Features as ...** and saving as a new layer in a project folder.

Review

In countries or for taxa where there is a good deal of recording the technique of acquiring data by copying dots from a map is clearly an enormously labour intensive process. A lot of valuable data however is available from published papers for more obscure taxa and in countries where there have only ever been a handful of specialist workers who used the best available technology at the time to record species occurrences. Recreating grids and researching locations in this way may be the only means of mobilising valuable historic data from such paper publications.