The ENETWILD data exploration tool (ENETWILD-DET): Manual to visualize and download wildlife population data

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1. INTRODUCTION

The *ENETWILD* project seeks to create a platform for the collection, management, and sharing of data on wildlife populations across Europe (www.enetwild.com). To achieve this goal, *ENETWILD* has developed several applications.

The *ENETWILD* DATA EXPLORATION TOOL (*ENETWILD*-DET), is an exploration app designed to gain access to wildlife validated population data by diverse providers across Europe. By using dynamic filters based on spatial, temporal, and taxonomic criteria, it is possible to easily navigate and query, visualize and download available data after performing searches using specific criteria. This app, whether users are external (e. g. researchers, policymakers), EFSA risk analysts, and/or administrators of the database, respectively, provides different levels of access to data.

Here, we provide a guidance on its use.

2. GUIDANCE ON *ENETWILD-DET* USE

2.1. INTRODUCTORY TAB (“ABOUT”)

The application is divided into two separate tabs, facilitating seamless navigation (Figure 1). On the header it can be found a link to the use manual.

Figure 1: Tab distribution and useful links.

The first tab presents to users a comprehensive array of features, including a summary table, an informative graph, and project-specific details. Within the interactive table, users can explore the various species collected, along with the corresponding number of records attributed to each species (Figure 2).

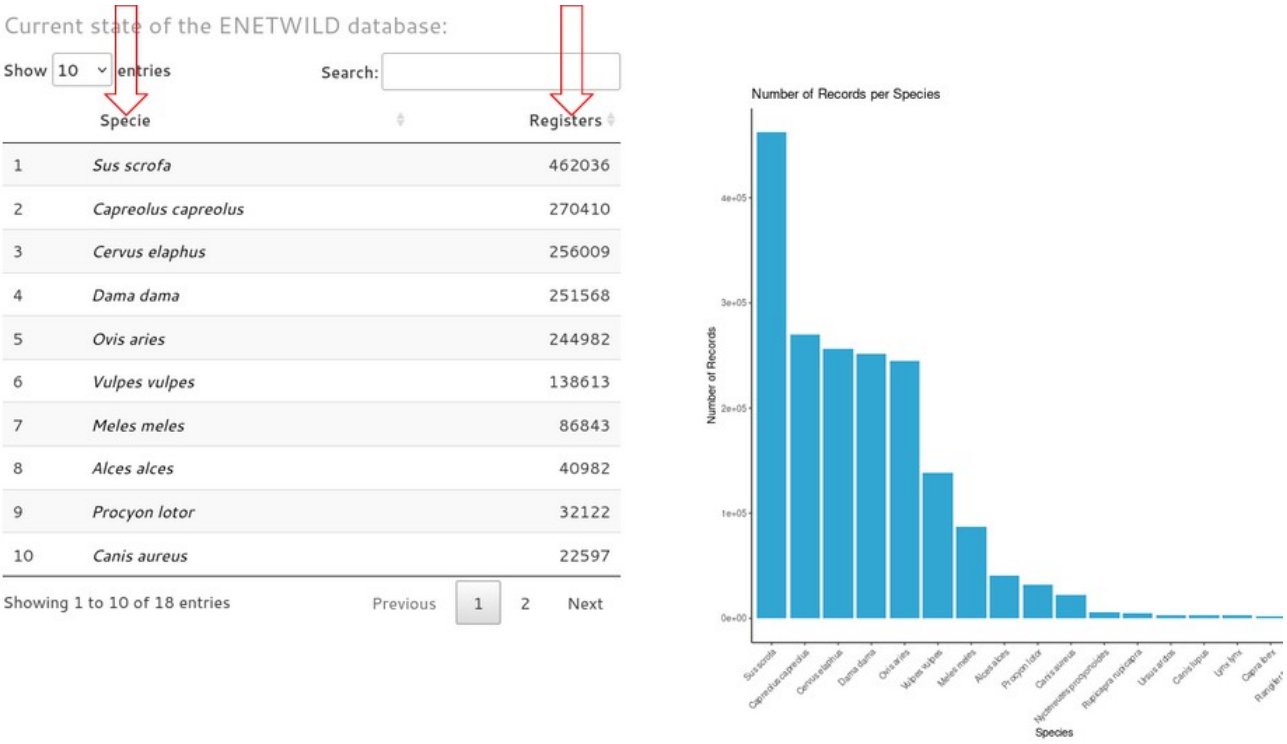

Figure 2: Interactive features on first tab indicating as a table and histogram, the species and number of records available.

The table's interactivity allows users to sort the displayed data based on either the species names or the number of records, enabling them to derive meaningful insights from the database.

2.2. DATA EXPLORATORY TAB (DATA EXPLORATION)

The Data Exploration tab stands as a pivotal component within the application, serving as a foundational stage to maximize its performance. Prior to delving into data analysis, users are required to load the relevant data by clicking on the "Load Data" button (Figure 3).

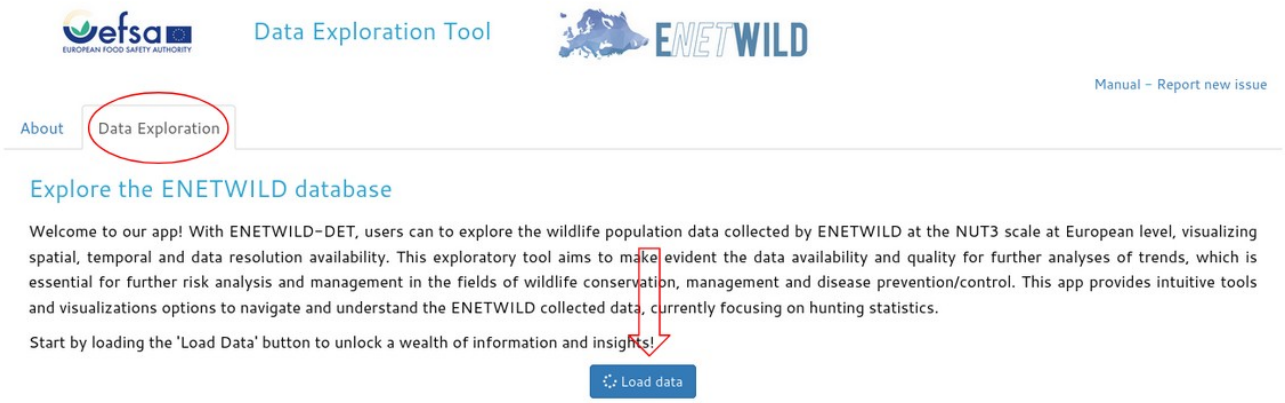

Figure 3: Data Exploration tab and “load data” button.

Upon completing this step, a pop-up message promptly confirms the successful data loading, ensuring users can seamlessly proceed with their exploration (Figure 4). Only one single species per query is allowed to be explored. Once the data are loaded, users can navigate through different sections of the web application and begin working.

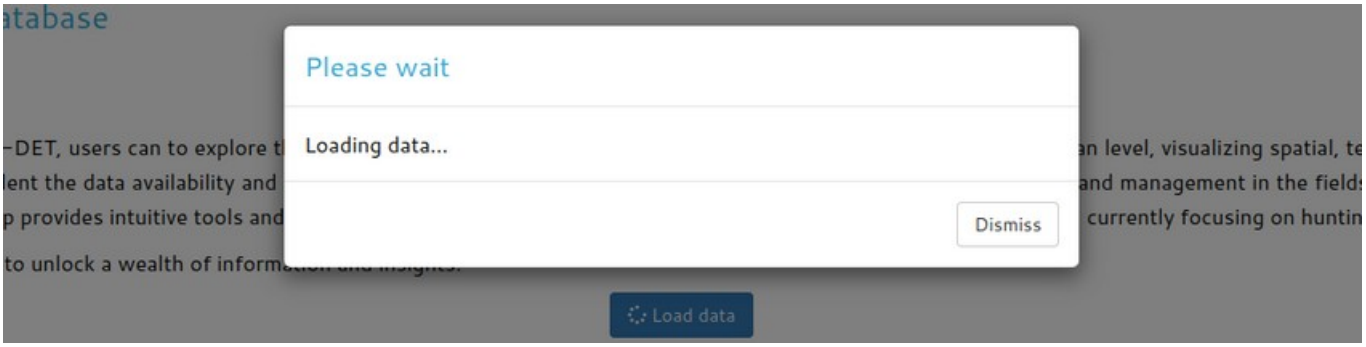

Figure 4: Loading pop-up.

Concerning the spatial visualization module, users can select the desired filters (Table 1), clicking the "Map" button which generates the visual representation (Figure 5).

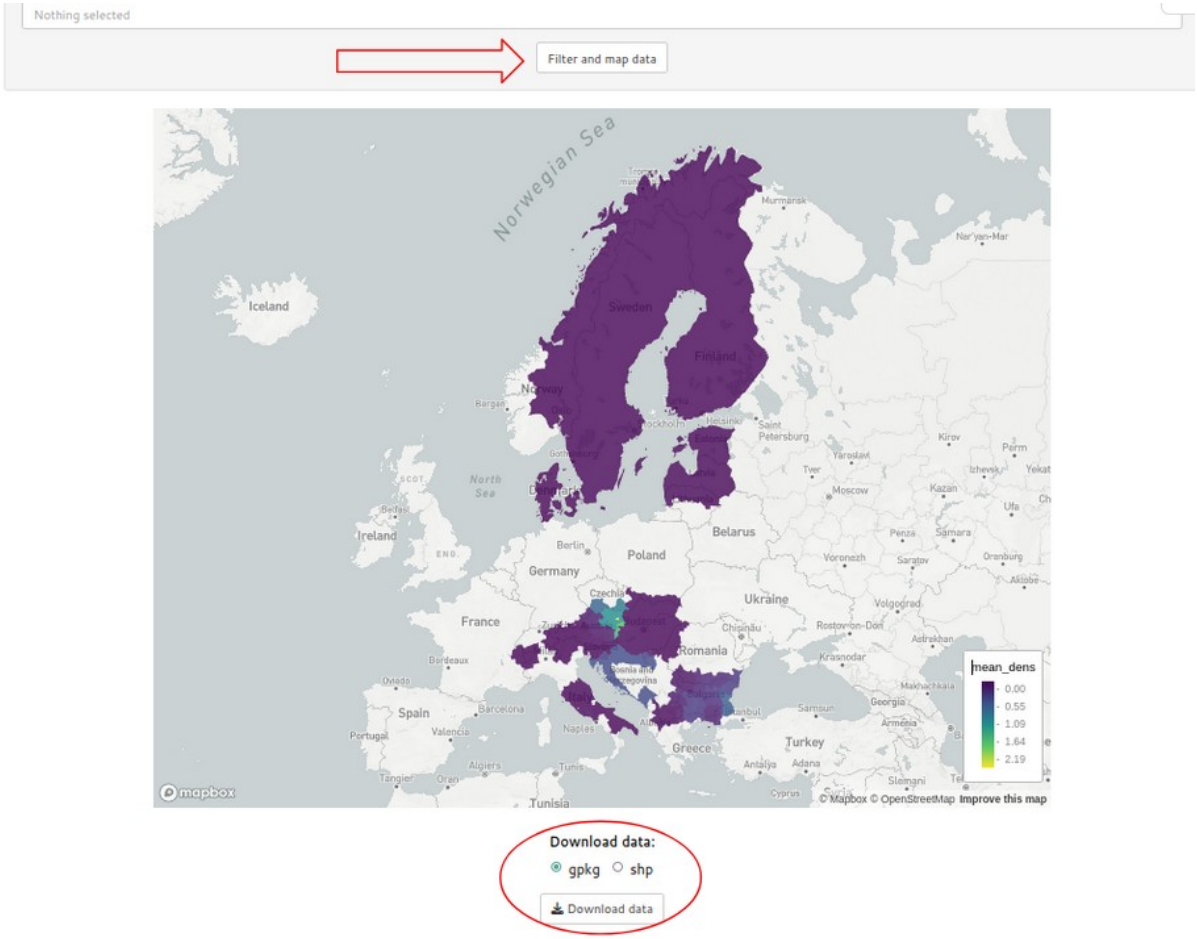

Figure 5: Map and download options.

The displayed data can be downloaded in two formats, GeoPackage (gpkg) and Shapefile (shp), for further exploration using conventional Geographic Information System (GIS) software. This download includes not only the visible polygons on the map, but also all associated variables (Table A.1).

Table 1: Filtering options

Filter	Description
Specie	Scientific name of the specie
Year	Year of the data
Fill variable	Variable to visualize (options are detailed on table A.1)
Country	Official country name (English)
Province	Official NUTS3 name (language of origin)

The temporal exploration section allows users to observe the temporal evolution of variables through charts displayed at the NUTs0 level. Users can select the country, species, and variable of interest (keeping only those that are relevant) and click the "Plot" button to generate the visualization (Figure 6), and also can download the plot directly using the “Download plot” button at *.png* format.

Figure 6: Time series exploration module.

Finally, there is a download section that enables users to download data by species, without the need of prior visualization. Users can select the species, desired years, and file format, then click the "Download" button (Figure 7).

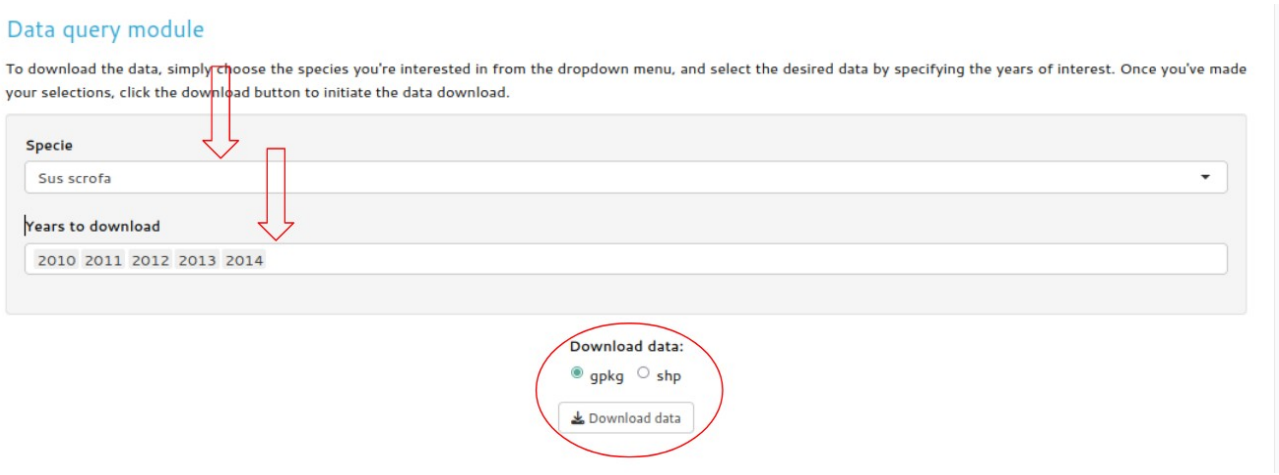

Figure 7: Data download module.

By following these steps, users can effectively utilize the *ENETWILD*-DET for data exploration, visualization, and downloading.

APPENDIX

ENETWILD has collected data from different regions of Europe at the highest possible resolution for different species of terrestrial mammals (mainly hunting statistics for ungulates and carnivores) Although this application can handle different types of data, we have focused on hunting bags data that make up the bulk of the data collected by the *ENETWILD* consortium.

There is variability in the resolution at which the data is provided to *ENETWILD*: ranging from hunting ground scale to higher scales, including data at NUTS1 and NUTS2.

Data aggregation

The automation of data aggregation to NUTS3 can be problematic especially in cases where data are reported at scales larger than NUTS3. So, the densities hunted per year were obtained by generating a raster (Figure A.1) of the densities hunted per year and calculating different "zonal statistics" for the different NUTS3. The official NUTS3 layer of EUROPE has been superimposed on this raster layer, pending an official version for non-European countries. The following variables that may be of interest at the NUTS3 level have been calculated (Table 1).

Figure A.1: Density raster based on Hunting Bags for the seasons 2015-2016 (individuals/km^2).

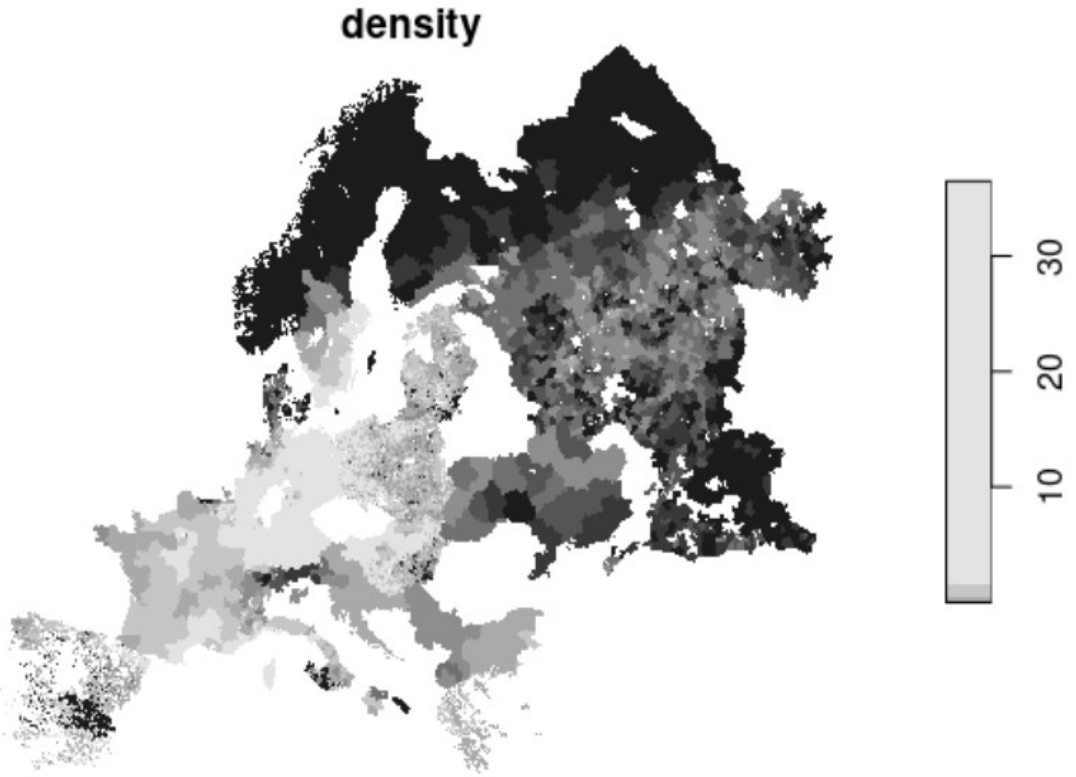

Table A.1: Different fill-in variable options and their meaning available for selection in the Data Exploration tab.

Name	Description	Formula (if necessary)
area_km2	Area in km2 of the NUT3	
coverage_area	Area in km^2 corresponding to the territory we have data inside that NUT	
area_coverage_percentage	Percentage of the NUT covered by data	(coverage_area*100)/area_km^2
mean_dens	Mean value of all the raster cells covered by the NUT3	
harvTot	Estimation of the number of hunted animals based on the density mean and area.	area_km^2 * mean_dens
standard_deviation	Standard deviation on mean density values based on all raster cells covered by the NUT3	
coef_variation	Population coefficient of variation of cell values that intersect the polygon, considering coverage fraction.	standard_deviation/mean_dens

The rest of the variables are given by the NUTS3 layer downloaded at EUROSTAT-GISCO.