

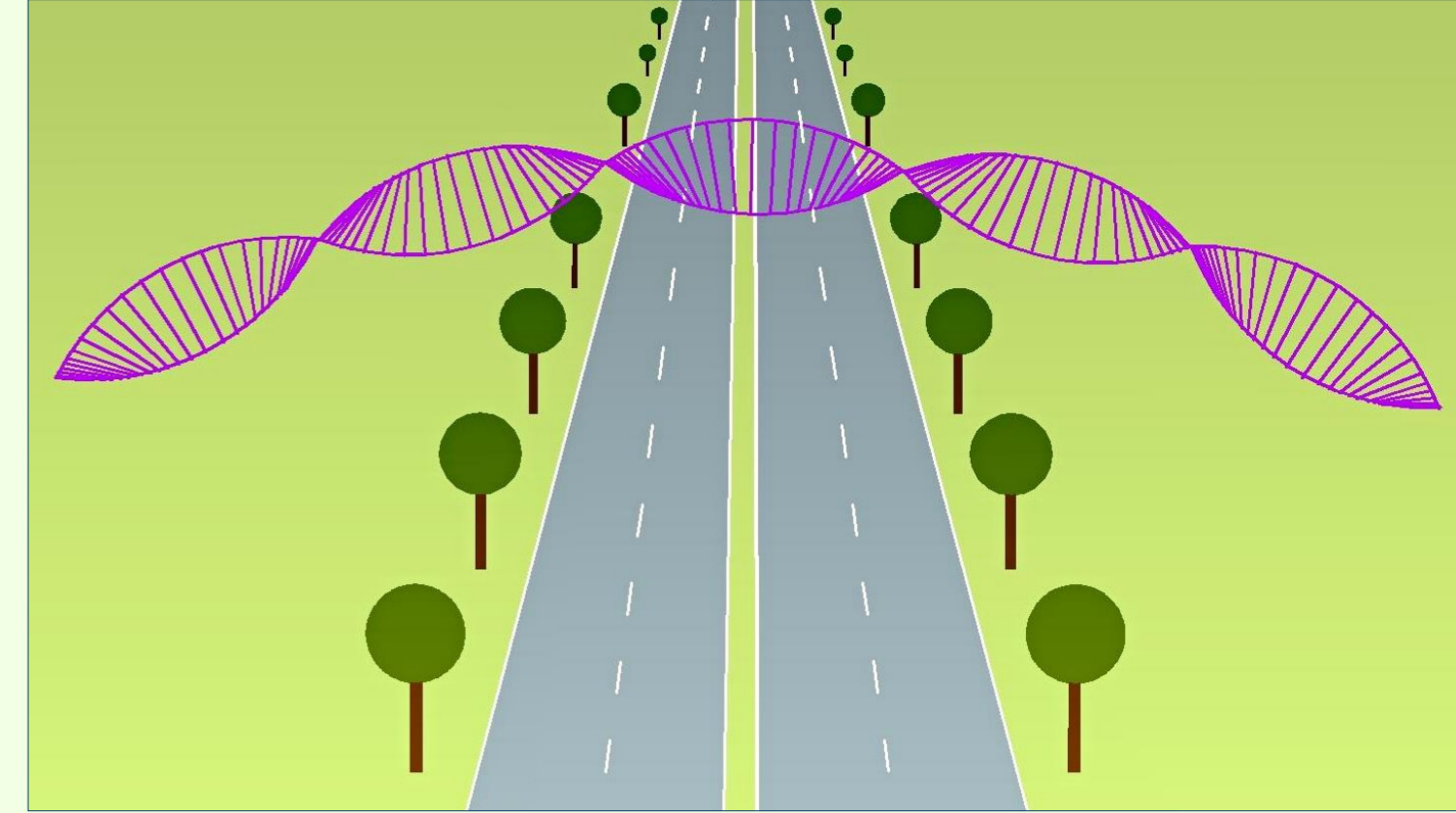
GeneDBase

Genetic Database of Selected Species of Mammals of the Czech Republic

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About the project

GeneDBase is a name for a database application created in the grant project: "Creating a genetic database of selected species of mammals in the Czech Republic to be used for sustainable transport development". The contractor is a private road design company, HBH Projekt spol. s r. o., together with a project participant, Mendel University in Brno, Department of Forest Protection and Wildlife Management. The aim of the grant project is to create and evaluate a genetic database, which will contribute to a more objective and more complex assessment of the barrier effect of the transport infrastructure on wildlife populations, especially on their genetic variability. Project is focus on these mammals species: deer, roe deer, wild boar, fox, badger, hare and moose.

To reach the aim, the following steps were defined:

- establishing a DNA-bank with genetic samples (especially samples of tissue, hair bulb) of selected mammals
- creation of a database with records of collected samples (not only results of genetic analyses, but also other entries will be stored)
- creation of a database application to view and edit the database using the internet

Data collection

During the project were chosen places with significant migration barrier (highway), where the population isolation is expected due to high traffic volumes and the absence of migration objects. At these locations are collecting tissues in cooperation with local gamekeepers. After collection of a sufficient number of samples the microsatellite DNA analysis will be performed for evaluation of genetic variability and degree of population fragmentation.

Fig. 1: Collection sites

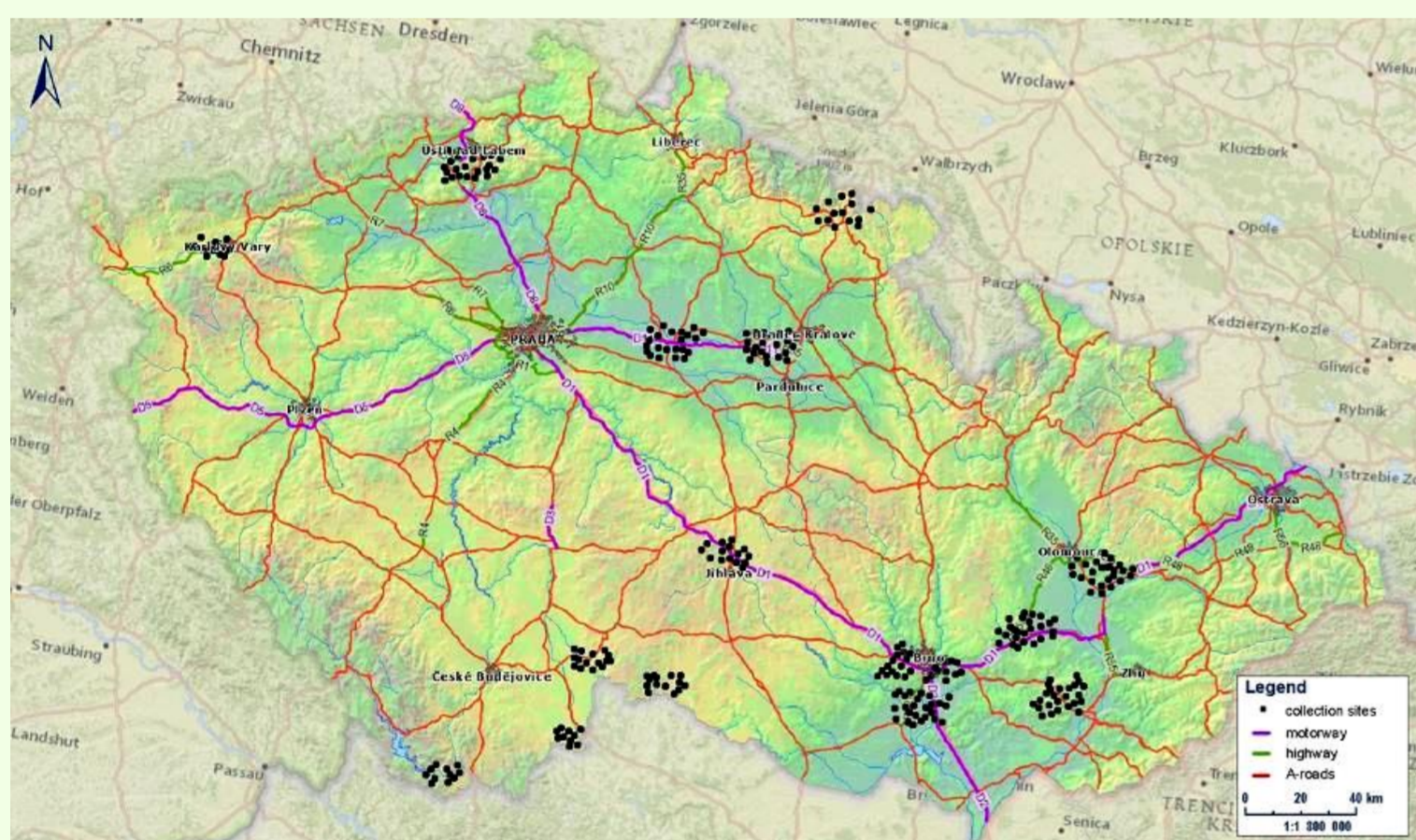


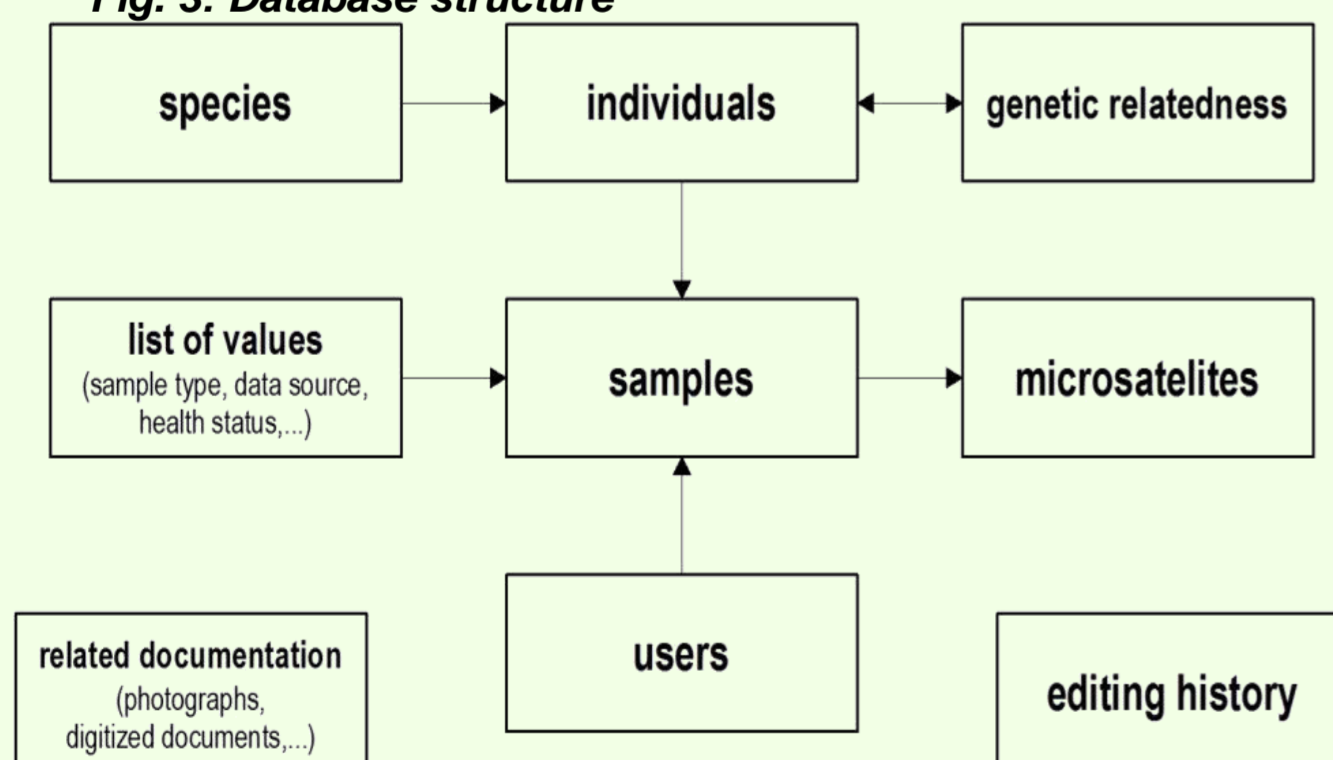
Fig. 2: Number of collected tissue samples

Mammal species		
Eurasian elk	<i>Alces alces</i>	22
Red deer	<i>Cervus elaphus</i>	210
Sika deer	<i>Cervus nippon</i>	110
Roe deer	<i>Capreolus capreolus</i>	92
Wild boar	<i>Sus scrofa</i>	450
European hare	<i>Lepus europaeus</i>	1200
European badger	<i>Meles meles</i>	4
Red fox	<i>Vulpes vulpes</i>	9

Database design

- Open source technology, MySQL database
- For storing the data collected during the project
- Keep uniform structure of data
- Using Web Map Service Data for Visualization
- available to public via Internet browser for other users
- Possible to save own data, create own project

Fig. 3: Database structure



Evaluation

- Impact evaluation of a landscape fragmentation on population genetic variability of populations of selected mammal species

Population genetic variability

- based on collection of samples from hunted animals
- storing in DNA-bank deep frozen in Mendel University
- DNA isolation, fragmentation analysis, evaluation by Genepop application
- genetic indicators: polymorphic informative content (PIC), inbreeding coefficient (FIS), heterozygosity

Landscape fragmentation

- field research
- evaluation of migration barrier permeability
- frequency of wildlife crossing and their functionality

Expected project results (2015):

1. Evaluation of population genetic variability of selected mammal species at places with significant migration barrier

- Influence of road on genetic variability of common mammal species.
- Who is killed on the roads? Locals or strangers?

2. Database of genetic information of selected mammal species

- Open to professional public
- Tool for research in the field of road ecology, landscape fragmentation, wildlife management.

The database will be available at www.genedbase.cz and www.genedbase.eu, currently the information about the project is available there.