

ROLE OF LATVIAN ZOO COLLECTIONS ON NATIVE BIODIVERSITY PRESERVATION

Jelena Litvinceva, Mihails Pupinš

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Both Zoo collections - global and Latvian - level was seen as extensive information centers where citizens can learn a lot about their surrounding biodiversity and the need for its protection. Zoo collections for Europe are taken to define all the institutions that keep live wild animals there and who are exhibited to the public 7 days of the year. Such collections should play on public environmental awareness, based on biodiversity conservation on national level. Proximity to the great experience of nature conservation projects, to be beginner and leader in the formal and informal education zoo collection teaching activities should be aimed at the promotion of environmental protection, as well as the social and cultural aspects, as well as on population behavior and attitudes.

In the Latvian region is about for 90 animal collections, only 20 of them are registered in Nature Conservation Department as wildlife collections. Latvian territory they deployed unevenly. Mainly collection are in natural parks (which consists of introduced species collections as bison, wild horses), farms, with livestock breeds or individual collections, or collections in major cities, Riga, Daugavpils, where it is stored in the local protected species. Most of around (84%) of the animal collections is non-native protected species. Most of the animal collection: Riga National Zoo in a small proportion (9%) of all animal species, occupying the threatened species, Latgale Zoo around 3% of all animal species. A small proportion 3% of the described collections, are projects with local significance of animal species. Latvian zoo collections and the consequent implementation of the project native biodiversity conservation need to promote public participation in environmental protection and management. Messages must be involved in the collection planning, exhibition design, conservation projects and the preparation work with the public. Animal collections should seek to promote local interest in endangered species.

Key words: animal collection, biological diversity, sustainable development, zoo.

Jelena Litvinceva, Mihails Pupins, Daugavpils University, Latgale zoo, Vienibas iela 27, Latvia, eco@apollo.lv

INTRODUCTION

Zoo collections of both global and Latvian level were seen as extensive information centers where

citizens can learn a lot about their surrounding biodiversity and the need for its protection. Zoo collections for Europe are taken to define all the institutions that keep live wild animals there

and who are exhibited to the public at 7 days of the year (Directive 1999/22/EC, MK 2001). By contrast, such collections should play in public environmental awareness, based on biodiversity conservation at national level.

In National Program of Biodiversity conservation of the species in-situ in specific cases is necessary for the ex-situ species protection and conservation measures outside their natural environment. *Ex-situ* methods are often used in particular endangered and threatened species. Zoological and botanical gardens have important role as education and information centers for certain species conservation and recovery plans. The National Program aims to provide and develop conservation methods, the development of rare and endangered species of wild animal protection programs for zoos outside their natural habitat.

The main *ex-situ* conservation objective is to establish a “reserve stock”, this action is the part of an overall conservation strategy, what ensure survival of the species in wild nature. *Ex-situ* conservation is to provide materials for education and demonstration. Authorities, which exposed animal and plant life of the country and a fixed collection of exhibits, such as botanical and zoological gardens, nature museums, has always played an important role in educating the public. Today, their mission with the protection of species, demonstrations and research includes public education on biological diversity conservation matters (Reid et al. 2008).

Proximity to the great experience of nature conservation projects, to be beginner and leader in the formal and informal education, zoo collection teaching activities should be aimed at the promotion of environmental protection, as well as the social and cultural aspects, as well as on population behavior and attitudes (Шваммер 2007, Васильева & Левченко 2002).

MATERIALS AND METHODS

Data collection and information gathering methods

During the study information was searched in the literature on: biodiversity, nature protection, zoo collections, environmental planning. Topics covered include nature conservation and environmental planning, therefore, was important to find the information what is available about the Latvian zoo collections. To be able to judge how well works the environmental planning and nature conservation in the environmental communication process, must available information for public. Period the study, was discussed tourism website with information available about the zoo collections. Term “zookolekcijas”(zoo collection) was searched in tourist sites (1,2). Also investigation have been done in the Nature Conservation data about registered animal collections that have been granted a permit (Registered wild ..) in this information using information, about animal collection, and native species in this collection. Using information about the animal collection or its name, its location (planning region, county, municipality), as well as information about the collection or view of nature protection has been granted regulatory permit the keeping of animals, as well as information on the type of animal, which is a collection.

Mathematical methods for data processing

During the research findings have been applied mathematical methods for data processing. With the program MS Office Excel 2003 was created a database of every animal collection Latvian planning region. Using the Chart Wizard function was of the common chart of different types of data.

Geomatic methods

The study of cartographic material has been drawn up ArcGIS 9.2. software. Were made a map what showing the study area with planning regions. On the base data were used for thematic layers: rajoni_poli.shp, pagasti_poli.shp, autoceli_line.shp, repubpilsetas_poly.shp from “Envirotech” database “GIS Latvia”. GIS format *.shp file creation was used in ArcView 9.2. function ArcCatalog. New file creation function was used with Create New Shapefile. All the files were defining the LKS-92 coordinates system.

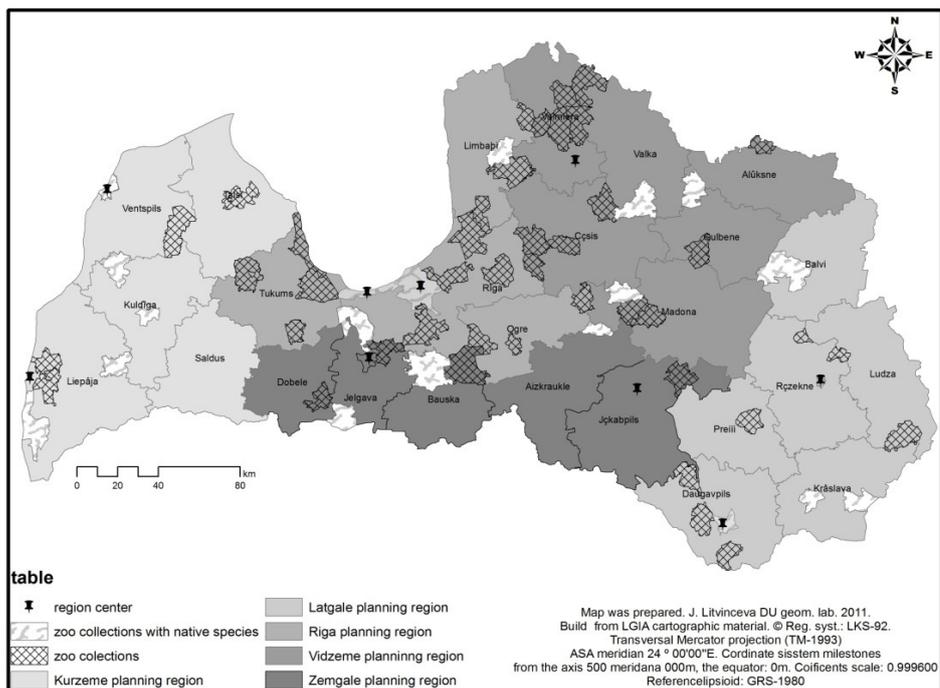


Fig. 1. Districts in Latvia were are located zoo collections.

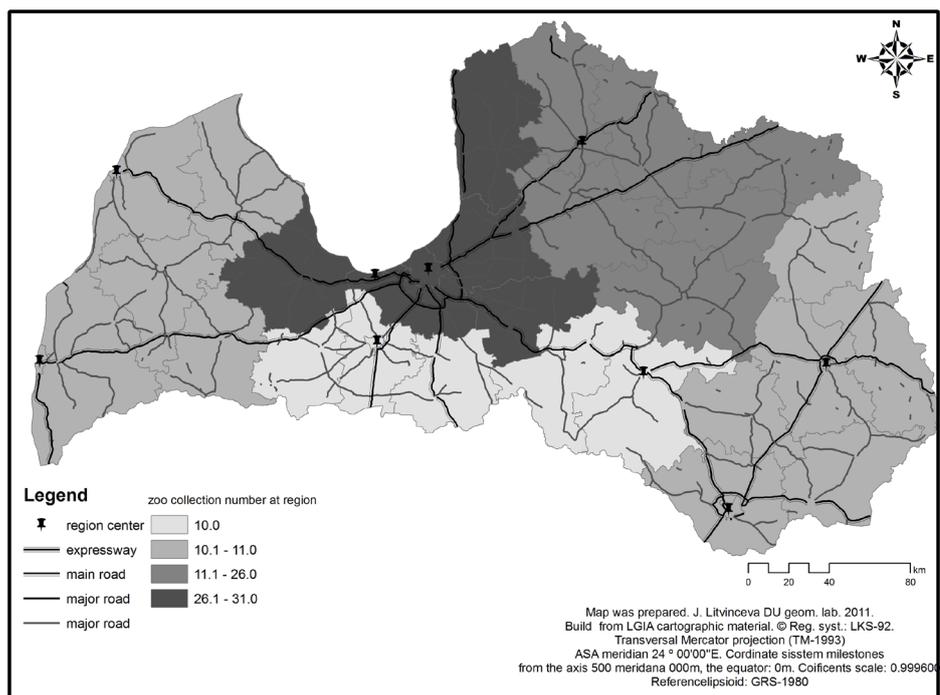


Fig. 2. Zoo collections distribution at Latvia planning regions.

With ArcToolbox tools, functions Analysis Tools/Extract/Select the *. Shp file pagasti_poly.shp was selected only those parishes which were collections of animal, from a file repubpilsetas_poly.shp selected only the city, which is a collection of animals and create a new *. Shp files: zookolekcijas.shp. With the function Insert/Object was added to the chart created by MS Office Excel 2003 Chart Wizard software feature. Map show zoo collection what have native collections that are important for Latvian biodiversity, species that are valuable in terms of biodiversity and culture-forming species (*Bombina Bombina*, *Dama dama*, *Hyla arborea*, etc.).

RESULTS

On the during period of study, was studied available data on the Internet; was obtained information about 90 zoo collections. The obtained data about zoo collections in the Latvia area can be divided in to three groups:

1st. group. State/national meaning zoo collections, belonging to one of the local municipality and dealing with exotic animal collection and display the local animal breeding or reintroduction of species (Riga National Zoo, Latgale Zoo). This group has an important role in educating the public, in accordance with this zoo collection appearance and the information what is made for public, will depend on public attitudes about animal collections, the importance of protecting biodiversity.

2nd. group. Private collections (farm, safari parks, Deer Park, guest house or rural house), which deals with animal exhibition and the visitors, hunting, animal production and sales (or quail eggs, ostrich, venison, rabbit meat, fish, etc.).

3rd. group. Private collectors collection that deals with the collection of exotic animals (cats, insects, amphibians or reptiles, exotic birds), which is showcased to visitors.

2nd. and 3rd. groups are difficult to manage, because they don't have a responsibility.

In the information, what was studied in Internet, in Latvia territory is 90 animal collections, mainly private, but only 20 of them are registered in Nature Conservation Department as wildlife Collections and received a license as a wild animal collections (Registered wild ..). Only in the zoo collections, which have received authorization, state can to regulate, control, or affect the sustainable use of biodiversity.

During the study was created the maps what showing Latvian districts in where is the animal collection, map show infrastructure and roads connecting with the regional centers, and do they are dealt with by local authorities (see Fig. 1.).

In Latvian territory zoo collections are located unevenly. Mainly collections are located in nature parks (which consists of introduced species collections as bison, wild horses, wild cows), farms, with livestock breeds or individual collections or collections in major cities like Riga and Daugavpils, where protected local animal species are maintained.

The largest quantum collections are in Limbaži, Sigulda, Ķegums, Burtnieki, Alūksne, Līgatne, Krāslava and Ergļi districts, they have from 3 to 7 collections at district.

By analyzing the percentage distribution of animal collections in the planning regions, the region that is leader is the Riga region, Vidzeme region (Fig. 2) around 30%, Latgale, Kurzeme, Zemgale

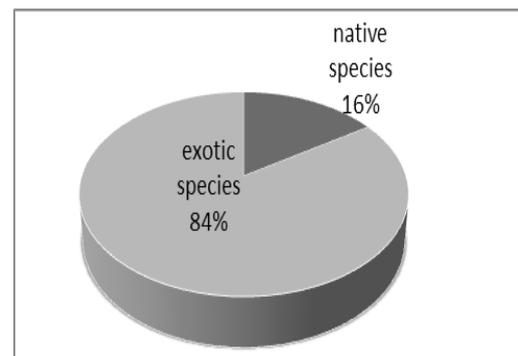


Fig. 3. Percentage distribution at exotic species and native species at zoo collections in Latvian planning regions.

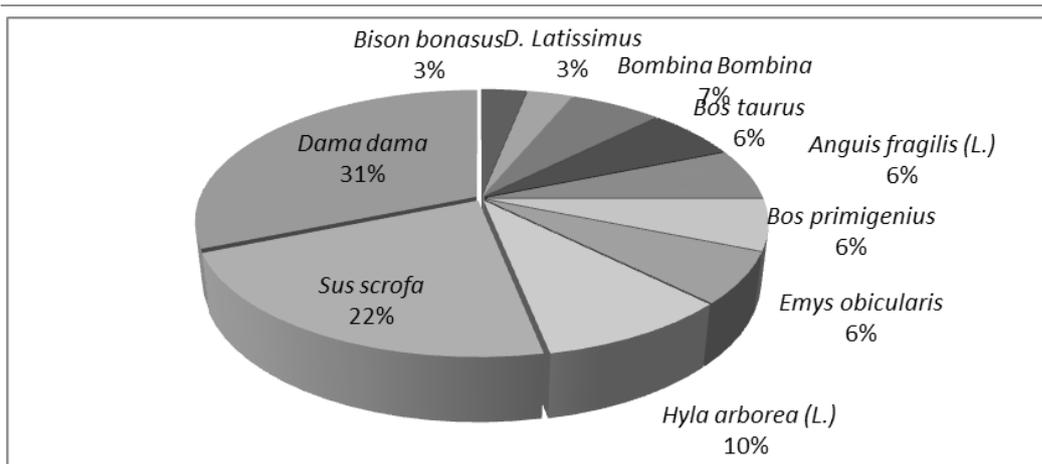


Fig. 4. Animal kinds at zoo collections in Latvia planning regions.

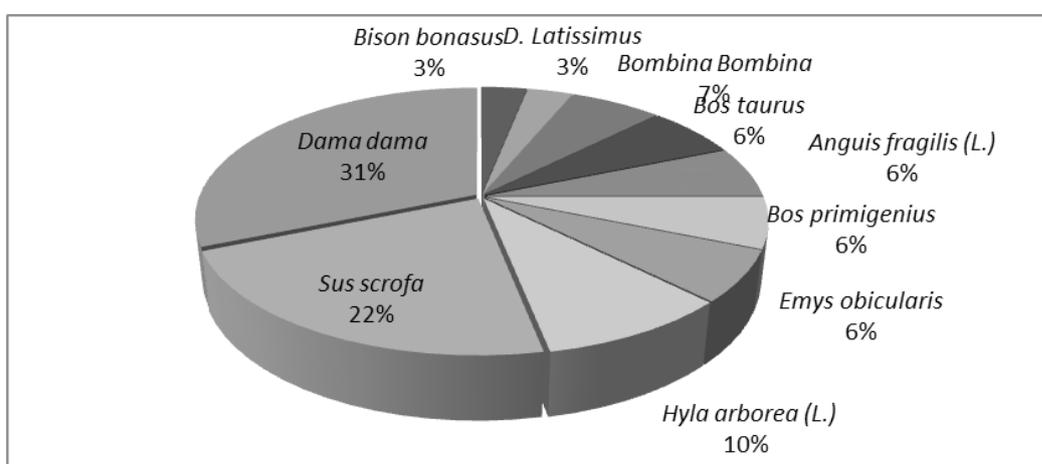


Fig.5. Animal species at native zoo collections in Latvia planning regions.

region from 11% to 13% Riga.

Planning Region has the largest number of collections on the region have, which includes both national zoos and private collections.

Most of around (84%) of the animal collections do not have native protected species (Fig. 3). The biggest animal collection: Riga National Zoo in a small proportion (9%) of all animal species, occupying the threatened native species, Latgale Zoo around 3% of all animal species. A small proportion 3% of the described collections, are projects with local significance of animal species.

In assessing the percentage of species distribution of zoo collections of Latvian territory, the most popular species of animal collections are the hoofed, with such animal as *Sus scrofa scrofa*, *Dama dama* 31%; birds, most of all exotic birds are species like ibis, guinea fowl, peacocks, cranes, geese, rheas, swans, pigeons, pheasants. Very often at zoo collection have not one animal kind, but various - birds, mammals, soliped, rodents. Some collections have much exotic amphibians or reptile's species (Fig. 4).

“Starting from 18th century the deer imported into Latvia and held in Deer Park, and still now

the 21st century” (Gulbe 2011). Now that animal species is popular in private deer gardens, safari parks, or farms, obtaining a license they are allowed to hunt. A similar situation exists with the *Sus scrofa*, which occupies 22% of the native species, this species is considered to be local rather long, and has its own special place in Latvian equine team, but this species also is common in Deer Park, safari parks, or farms where they are allowed to hunt. *Hyla arborea*, more of all native amphibians and reptiles threat is greatest, it exhibits several zoo collections, but Nacional Riga Zoo branch “Cirulis” it also amplified and reintroduction nature. Likewise: *Emys obicularis*, *Anguis fragilis*, *Bombina bombina*, *Ditiscus laticostatus* the animal species can be viewed on the National Zoo in Riga and Latgale Zoo, where there are several projects that protected animal breeding ex-situ and reintroduction in nature. *Bos taurus*, are important species, in cultural and historical meaning, but animals of this collection is relatively few information (Fig. 5.).

DISCUSSION

Latvian zoo collections and the consequent implementation of the project native biodiversity conservation is the need to promote public participation in environmental protection and management. Messages must be involved in the collection planning, exhibition design, conservation projects and the preparation work with the public. Animal collections should seek to promote local interest in endangered species, not just to show exotic animals, unusual Latvian territory (Karnitis et al 2006, Kilis 2007).

Unfortunately noted, that the dominant role of creation animal collections of fashion down play trends. Mostly have exhibiting exotic animal species, various birds, deer species and hunting animals. Expense of leaving native species, which with time might will gain status as a rare species. A organizers of collection, need not only to limit the display of individual animals, but they must be able to provide a description and picture of animals and wildlife of the common political, economic, ecological and cultural

aspects, explaining the local and global processes that are based on the human impact on nature. It would be necessary to create a web site, which would be information about collections and collectors' interest Latvian sustainable development, as it provides a number of directives (Шваммер 2007, Васильева & Левченко 2002.).

CONCLUSIONS

As one of the main problems environmentally friendly society could be the fragmentation of information about the zoo and animal collections in Latvia planning regions. There is no single development, what focused on civic education and economic development. There is no single network in which the visitor can readily find needed information. Information is fragmented, as some of its animal collections are generally lacking. Most of the animal collection is not registered in Latvian environmental protection administration, and they are authorized, and these collections could not be regulated, and these collections cannot set goals and priorities. Most of the collection does not represent native species. Zoo collection tends to locate closer to the development of regional centers or the closest major city. As a general in the animal collection number is considered in Riga and Vidzeme Planning Region, with the largest number of collectors.

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