Design and Implementation of Historical Animal Database Based on Local Gazetteers

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ABSTRACT

This paper proposes the research method that using the spatial database and GIS technology to organize and arrange the ancient books data. I have analysed the data recorded in the local gazetteers and designed the entity-relationship of the database and its structure，and then established the historical animal database contained with several areas in China，several dynasties and animal diversity using object-oriented Geodatabase，which realized the description，management and visualization of the data and also made the thematic maps to analyse the distribution of the animal community，and finally published the maps to share the database. This result shows that it is advantageous to put GIS technology to the historical ancient books data organization and realizes the protection，dissemination and utilization of ancient books through information technology. Design and implementation of historical natural disasters database not only provides the basis data to assist the related scientific research work，but also proposes the new idea and method to the study of historical geography. It is beneficial to the cognition of environment and history culture，and can promote the application level of historical geography.
Keywords: Historical animal diversity; distribution pattern; Relational database; Local gazetteers; GIS;

INTRODUCTION

The geographical environment of China is complex and changeable, and diverse landform types have enriched animal diversity. Exploring the animal diversity and its distribution pattern in various regions during the historical period can reflect the ecological environment of the ancient times and provide reasonable suggestions for modern ecological restoration. China has a long history, rich historical records and human activities, which provide favorable conditions for studying the animal species and distribution patterns in the historical period[1]. This paper will represent the construction scheme and application of a relational database base on the vast historical literature.
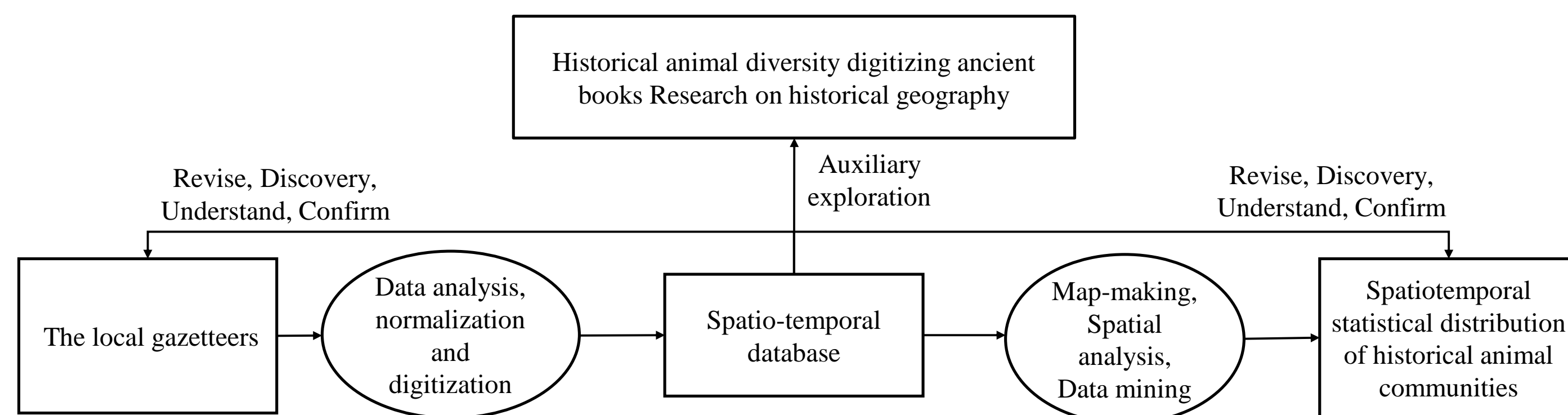

Fig. 1. Research framework of historical animal database

DESIGN

Various animal communities in certain time and geographical space were recorded in the local gazetteers[2]. According to the modern zootaxy system, ancient animal names are transformed into modern animal names. According to the modern administrative divisions, I have searched the latitude and longitude coordinates of the ancient places. Make these information digitization and associate history and modern spatial information to build the spatio-temporal database. Thematic maps are used to explore and display the temporal and spatial differences of historical animal communities. What's more, thematic maps and the local gazetteers can be mutually verified, modified.
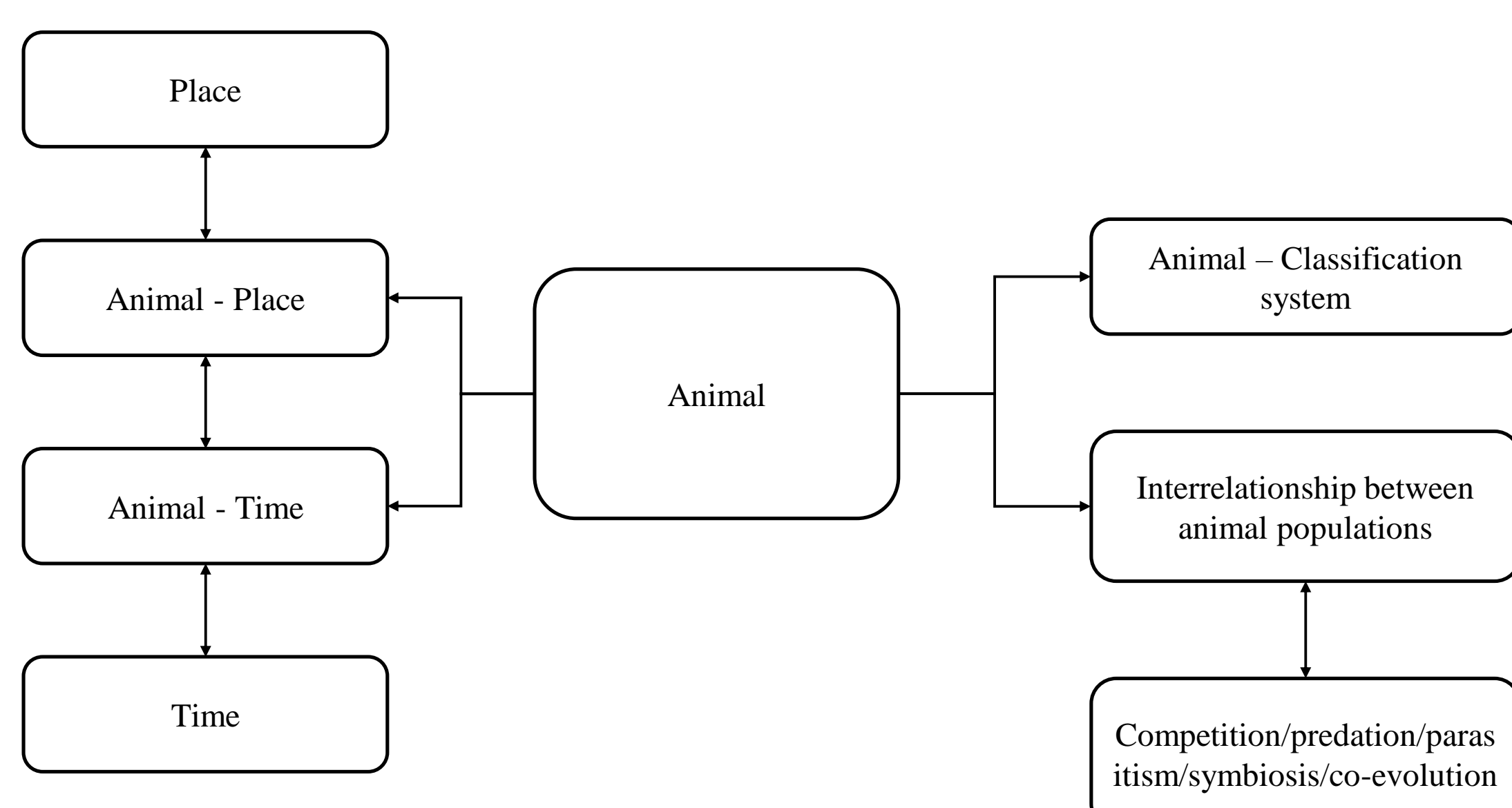

Fig. 2. Entity-relationship of historical animal database

RESULTS

The local gazetteers are the main data sources of Fig.3 and Fig.4.[3]. Fig.3 is the distribution map of tiger (*Panthera tigris*) in the Beijing-Tianjin-Hebei region during the Ming and Qing Dynasties. The figure shows tigers are distributed in the Taihang mountains. Most of the areas are characterized with having high mountains and deep valleys, highly dense mountain streams and lush vegetation, providing shelter and breeding grounds for tigers. Fig.4 is the distribution map of fox (*Vulpes vulpes*) in the Beijing-Tianjin-Hebei region during the Ming and Qing Dynasties. Foxes are mainly distributed in the vast north China plain. Now the tiger is extinct in this area, and the fox is rare in the area.

The historical database not only provides essential data for related scientific research, but also proposes new ideas and methods for historical geography research. It is helpful to strengthen the cognition of environment, history and culture and promote the harmonious development of the relationship between human and nature.
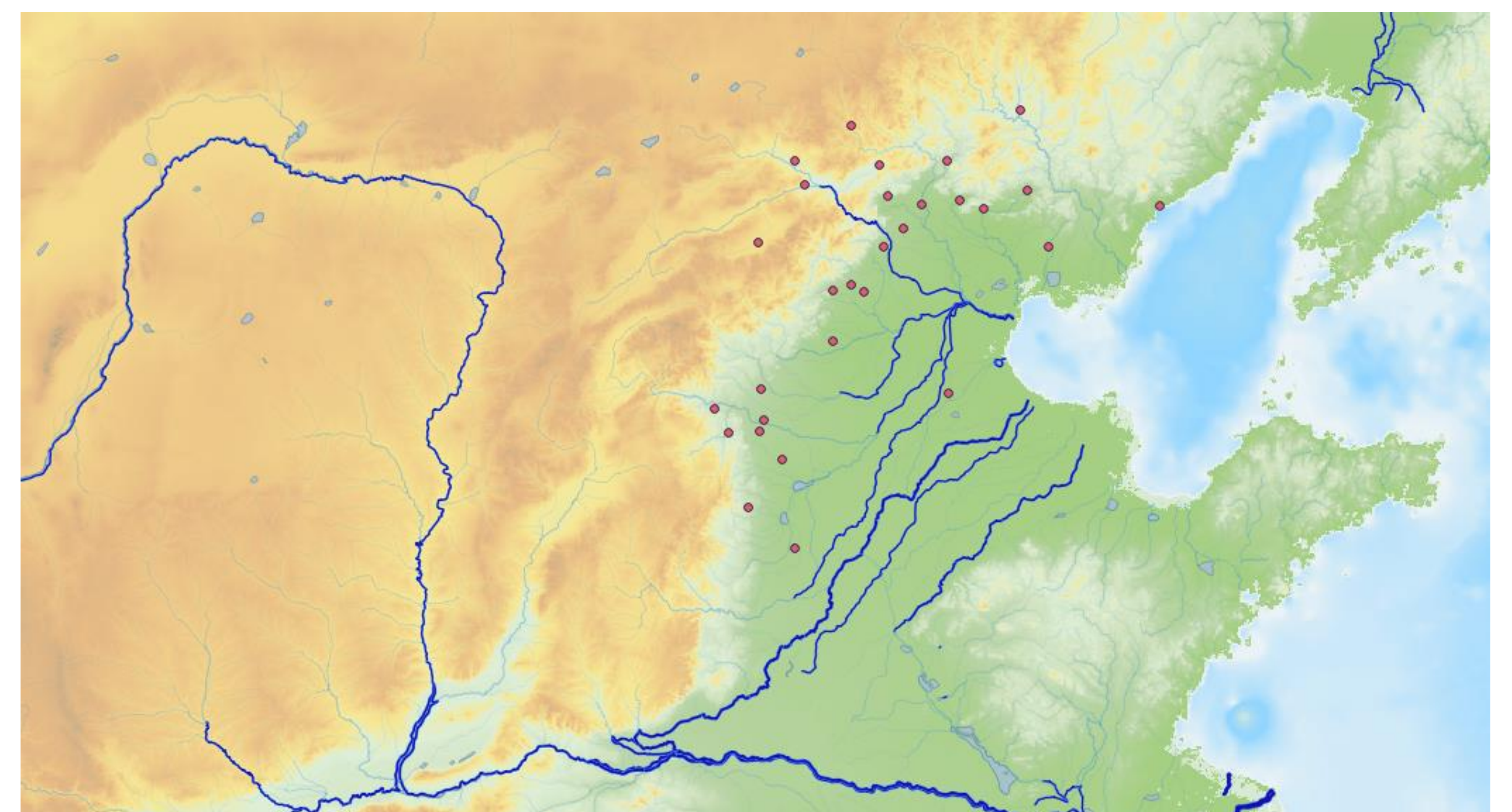

Fig. 3. The distribution map of tiger (*Panthera tigris*) in the Beijing-Tianjin-Hebei region during the Ming and Qing Dynasties
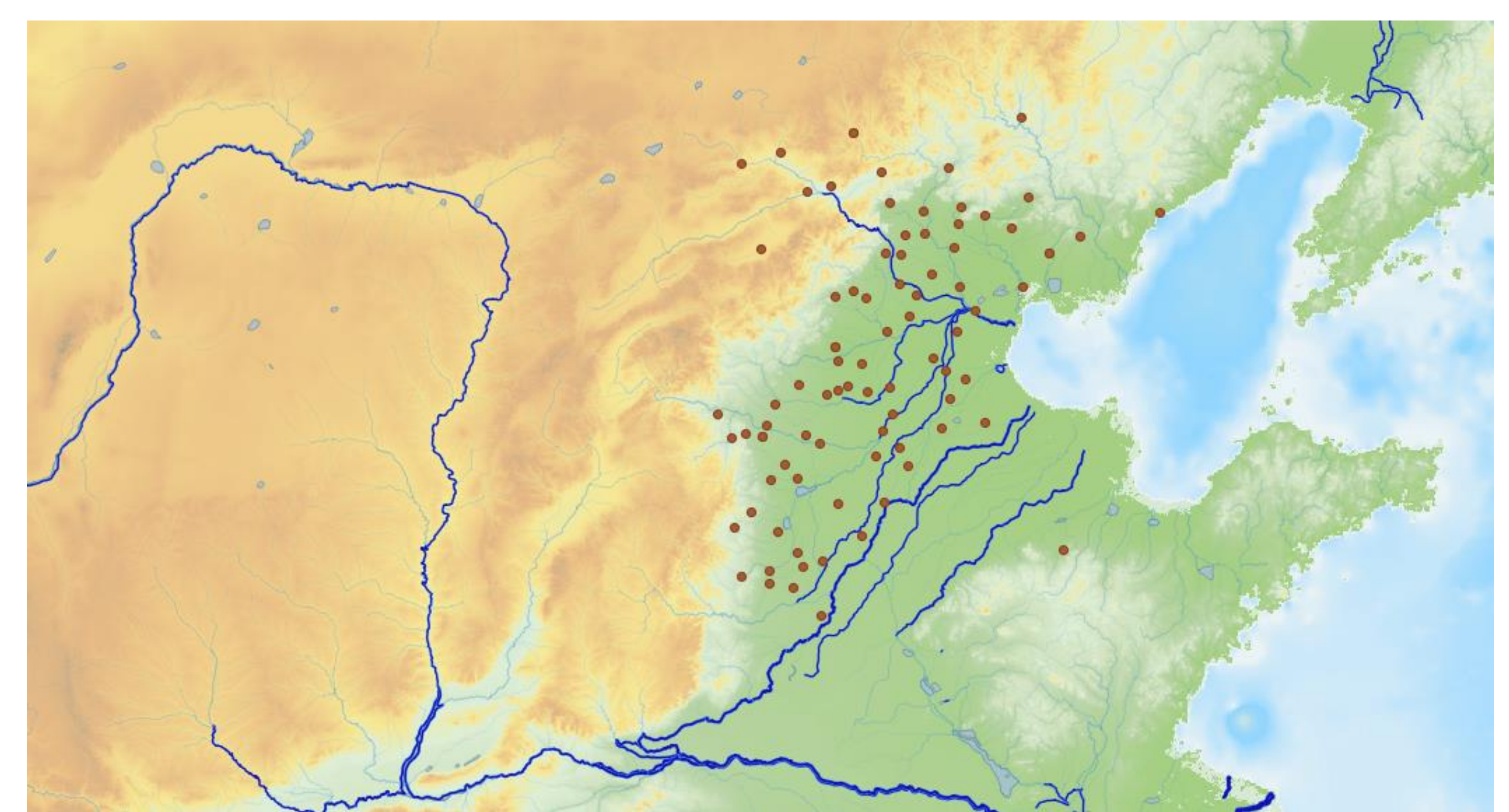

Fig. 4. The distribution map of fox (*Vulpes vulpes*) in the Beijing-Tianjin-Hebei region during the Ming and Qing Dynasties

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