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Distribution and conservation status of the European pond turtle in Slovenia

STAŠA TOME

Trnovska 8, SI-1000 Ljubljana, Slovenia
(e-mail: stasa.tome@guest.arnes.si)

Abstract: Although the biodiversity in Slovenia is very high, only one turtle species, i.e. the European pond turtle (*Emys orbicularis*), has been recorded in the country. In the past, however, it happened to be a very common species in Slovenia. In the past, VALVASOR (1689) reported that it was present all over the country. Particularly large populations inhabited the Ljubljana Moors (Ljubljansko barje) and the SE part of Slovenia (Bela krajina). At the beginning of the 20th century, the species found itself on the very edge of extinction. Between 1960 and 1970, there followed a large input of turtle and tortoise specimens from southern parts of the former Yugoslavia (Macedonia, S Croatia). At that time, several trucks of these animals (*Emys orbicularis, Mauremys caspica, Testudo graeca, Testudo hermanni*), meant for export as pets, were dumped at Ljubljana Moors.
Recent data on the distribution of the European pond turtle are scarce. *Emys orbicularis* lives in all zoogeographical regions of Slovenia (to some, it was introduced), but it is probably rare in all of them. Currently we have no information on its national population size or density, and neither have we sufficient data to even speculate about it. Nothing is also known about the ecology of the species in our country. Formally, the species is protected by law. In spite of the lack of all kinds of data, some Natura 2000 Sites of Community Importance have been proposed in order to protect the species and its habitat.
Key words: *Emys orbicularis*, European pond turtle, conservation, distribution, Slovenia.

Resumen: Distribución y estatus de conservación del galápago europeo en Eslovenia. – Aunque la biodiversidad en Eslovenia es muy alta, sólo una especie de galápago (*Emys orbicularis*) se ha citado en el país. Aunque en el pasado (VALMASOR, 1689) era considerada como una especie muy común, con poblaciones abundantes en Ljubljana Moors (Ljubljansko barje) y el SE de Eslovenia (Bela krajina), al principio del siglo XX las poblaciones se encontraban al borde mismo de la extinción. Entre 1960 y 1970, se produjo una importación masiva de galápagos y tortugas como mascotas (*Emys orbicularis, Mauremys caspica, Testudo graeca, Testudo hermanni*) desde el sur de la antigua Yugoslavia. Aunque los datos recientes sobre la distribución del galápago europeo son escasos, parece que actualmente vive en todas las regiones del país (en algunas ha sido introducido) pero es escaso en todas ellas, sin que exista información fiable sobre los tamaños poblacionales. Formalmente se trata de una especie protegida y la red Natura-2000 ha propuesto LICS para su conservación y la de sus hábitats.
Palabras clave: conservación, distribución, *Emys orbicularis*, Eslovenia, galápago europeo.

INTRODUCTION

Slovenia is situated in the heart of Europe, where the Alps face the Pannonian plain and the Mediterranean meets the Karst. It covers 20 000 km^2 and has about two million inhabitants, with its population density figure reaching a little less than 97 inhabitants per km^2, which is much lower than in the majority of other European countries. More than 50%

of the country is covered by woods and forests. Owing to its high geographical diversity, the biodiversity of this small part of Europe is exceptionally high as well. For example, it is inhabited by 22 indigenous species of reptiles, including 11 species of snakes and 10 species of lizards, but by only one indigenous turtle, i.e. the European pond turtle *Emys orbicularis* (TOME, 1996).

In the 17th century, *Emys orbicularis* was very common all over the country. The renowned Slovenian polymath VALVASOR (1689) reported that people often brought this turtle in large amounts to the Ljubljana market for food. In the old cookery books you can thus find some interesting although fairly creepy recipes for the preparation of turtles (SAJOVIC, 1910).

As early as at the beginning of the 20th century, however, *Emys orbicularis* became very rare and considered almost extinct. And as there were practically no reports on the species later on, it was labelled very rare.

MATERIAL AND METHODS

In 1995, a simple investigation was carried out in Bela krajina (southeastern part of Slovenia) by its residents and school children. They established that *Emys orbicularis* was present in almost every pond within the area (HUDOKLIN, 1995).

In 1996, all published and several unpublished data on the reptiles of Slovenia were gathered (TOME, 1996). Thus the very first picture on the distribution pattern of *Emys orbicularis* was obtained.

Later on, some observations of *Emys orbicularis* in the northeastern part of Slovenia were published (GOVEDIČ & JANŽEKOVIČ, 2003).

In 2003, the most recent assemblage of data on the distribution of *Emys orbicularis* was made for Natura 2000 designation (TOME, 2003). Nevertheless, we still lack any explicit data for the selection and implementation of effective conservation measures (Fig. 1).

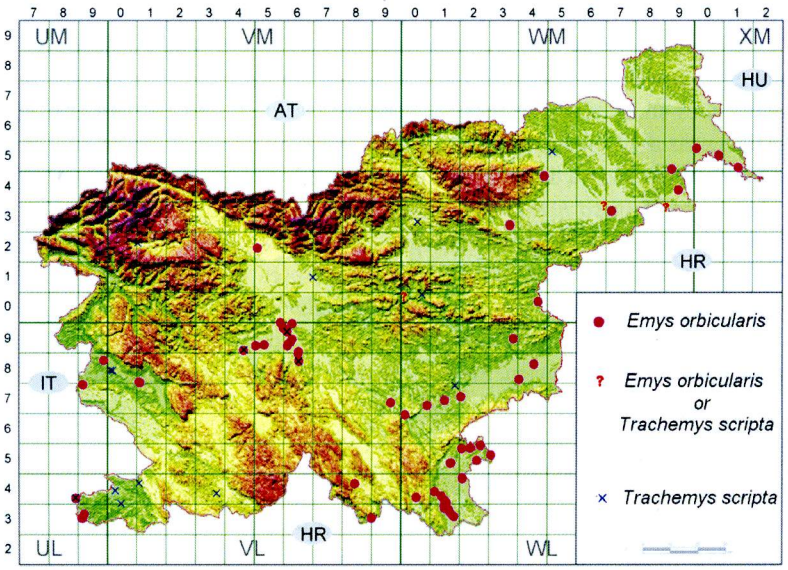

FIGURE 1. Present data on the distribution of *Emys orbicularis* in Slovenia.

FIGURA 1. Datos actuales sobre la distribución de *Emys orbicularis* en Eslovenia.

Although we have a general overview of the European pond turtle distribution, some data are old and need confirmation. It is also very likely that in some areas, for which only one or two data are at hand, the species lives in large populations. Moreover, it is possible that there are still undiscovered populations elsewhere.

RESULTS AND DISCUSSION

May as it be, we presume that there are some strong populations in the country: at Ljubljana Moors, along the Krka river, and in the lowland Bela krajina. Although we have only few observations from the Mura river, we assume that the population there is fairly strong, too. The species' population in the Vipava valley is, on the other hand, still completely unknown. We do not even know whether *Emys orbicularis* is still present there at all. Recently, a quite strong population was found in a marsh near the Sečovlje Salina on the Slovenian coast. It is known that at some localities the species *Emys orbicularis* has been introduced, for example to the Bobovek (near Kranj) and Ljutomer ponds. It can be added that the introduced species *Trachemys scripta*, sympatric with *Emys orbicularis*, is present at several localities all around the country.

Our knowledge on the ecology of *Emys orbicularis* in Slovenia is even more scarce. We know nothing about the population size and density, population oscillations caused by natural factors, breading parameters, migrations, etc.

Around 1965, several cargoes of turtles originating from the southern parts of the former Yugoslavia were released at Ljubljana Moors. They included four species: *Testudo hermanni, Testudo graeca, Mauremys caspica* and *Emys orbicularis*. Many turtles were already dead, while several perished soon. Most *Testudo graeca* and *Mauremys caspica* did not survive the first winter, whereas a great number of *Testudo hermanni* and *Emys orbicularis* found a new home there. The impacts of this introduction on the Slovenian turtles' gene pool are still unknown, as no genetic studies have been carried out so far.

In accordance with the national legislation, *Emys orbicularis* is considered an endangered species. It has been preserved since the seventies. Unfortunately, the implementation of the legislation has been insufficient or practically absent in the past. In order to join EU, Slovenia as the former candidate country was obligated to transpose, in 2003, the requirements of the Habitat directive into its legislation and to prepare for the establishment of Natura 2000 in its territory (Fig. 2). As the species listed in Annex II of the Habitat directive, *Emys orbicularis* was crucial for the selection of potential Sites of Community Importance, the so-called SCIs. Considering that we had no explicit data, we had to select pSCIs using foreign literature data, very approximate estimations and assumptions (TOME, 2003).

It is estimated that the Slovenian population of *Emys orbicularis* exceeds 500 individuals, that its population is probably decreasing and that its population size is changing in view of the fact that the natural influences are not particularly strong. We proposed five potential Sites of Community Importance in Slovenia to protect the *Emys orbicularis* population. By May 1st, 2004, when Slovenia became a member of the European Union, the list of 260 proposed potential SCIs selected by all Natura 2000 criteria was submitted to the European Commission. Overall, the area of Natura 2000 covers 31.5% of Slovenian territory. All five proposed SCIs selected to protect the *Emys orbicularis* population are included. We estimate that some 10-20% of its total

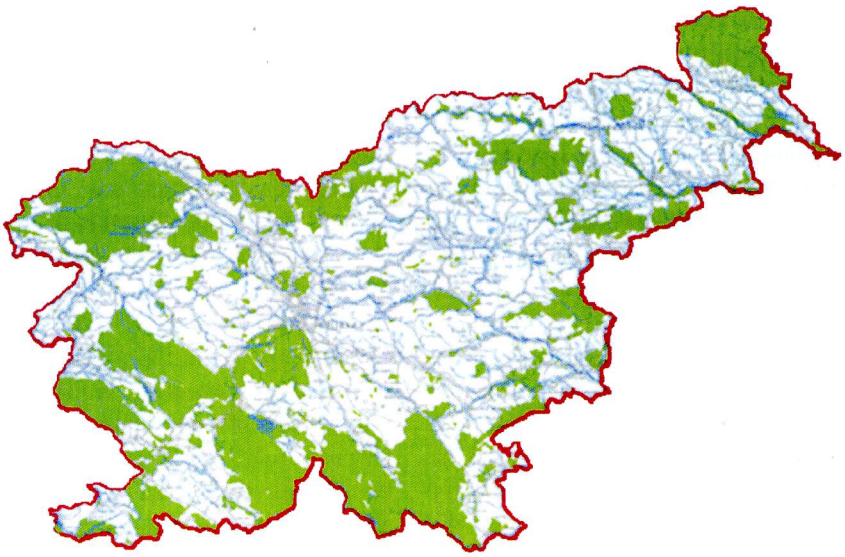

FIGURE 2. Overall, the NATURA 2000 area covers 31.5% of Slovenian territory, with 260 proposed potential SCI's delineated on the map as green areas.

FIGURA 2. La red NATURA 2000 cubre el 31.5% del territorio esloveno, con 260 LICS potenciales propuestos como áreas verdes.

Slovenian population live at the Ljubljana Moors and additional 10-20% along the Krka river. The largest part of the Slovenian *Emys orbicularis* population inhabits Bela krajina. We assume that some 5-10% of the Slovenian *Emys orbicularis* population live along the Mura river.

In 2003, when an expertise for the Natura 2000 needs was prepared, we estimated that the Sečovlje Salina and Dragonja river were inhabited by 1-5% of the total *Emys orbicularis* population in Slovenia, but considering the new data from 2006, this subpopulation is probably stronger. The proposed SCIs are under discussion in Brussels at the moment.

The major threat to the species' population in Slovenia is destruction of habitats owing to the very fast and extensive urbanisation. The consequences are not only loss of suitable places to feed, breed and hibernate, but more far-reaching as a result of fragmentation and isolation of the species' subpopulations. To provide for a vital population of *Emys orbicularis*, it is necessary to secure and protect optimal environment for feeding, breeding and hibernating. Protected sites must be large enough to sustain stable subpopulations with corresponding genetic fond and *Trachemys scripta* free. It is of utmost importance that scientifically based distribution studies and monitoring of the species' population changes are carried out immediately.

It is also of special relevance that the local inhabitants are actively included in the protection and research of *Emys orbicularis,* as they could provide ample information and an important support for the project.

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