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Status, distribution and protection of the European pond turtle (*Emys orbicularis*, L.) in western Poland

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Abstract: This paper presents the results of studies on the biology and distribution of *Emys orbicularis* in western Poland and conservation activities that have been implemented in this region. The data on distribution were collected from literature, field interviews and personal observations. Most records concerned single individuals. A total of 170 localities were recorded. They constitute almost 50% of all localities known in Poland. The majority of localities (42%) were recorded in Lubuskie Province, the most forested province in Poland. The occurrence of *Emys orbicularis* in 16 localities was confirmed. The pond turtle occurred mostly in river valleys, which act as ecological corridors for this species. Turtles were found mainly in forest swamps (35% localities) and in lakes (34%). In western Poland only one population consisted of about 50 adults and five other populations harbored 10 adults. The hatching of young turtles was noted at three localities, while turtle nests were found at six others. The main threats to *Emys orbicularis* in western Poland include vegetational succession of its aquatic and nesting habitats and destruction of eggs by predators. Conservation actions concentrate mainly on habitat improvement and an increase in breeding success: tree removal from nesting sites, nest protection against predators, the release of young turtles after rearing in captivity. The protection of the last breeding populations of *Emys orbicularis* in western Poland is important for the survival of this species not only in Poland, but also in eastern Germany, where some populations still exist.

Key words: conservation, distribution, *Emys orbicularis*, European pond turtle, Poland.

Resumen: Estatus, distribución y protección del galápagos europeo (*Emys orbicularis* L.) en Polonia occidental. – Se presentan resultados relativos a la biología y distribución de *Emys orbicularis* en Polonia occidental, así como medidas de conservación llevadas a cabo en esta región. Se incluye un total de 170 citas procedentes de la revisión de la literatura disponible, entrevistas del campo y observaciones personales. El conjunto, referido mayoritariamente a avistamientos de individuos aislados, constituye casi el 50% de todos los conocidos en Polonia, situándose la mayor parte de ellos (42%) en la provincia de Lubuskie, la más arbolada del país. Hasta 16 localidades fueron confirmadas. El galápagos europeo se distribuye principalmente en valles fluviales que actúan como corredores ecológicos, localizándose la mayor parte de los ejemplares en pantanos (35%) y lagos (34%). En el oeste de Polonia sólo se conoce una población formada por aproximadamente 50 ejemplares adultos y otras cinco por sólo unos 10. La incubación fue constatada en tres ocasiones y en otras seis se localizaron nidos. Las principales amenazas incluyen la alteración de la vegetación de sus hábitats y la depredación de sus huevos, centrándose las acciones de conservación principalmente en la mejora de los hábitats y el refuerzo de las poblaciones, favoreciendo los lugares de anidamiento, protegiendo los nidos de depredadores e incorporando ejemplares procedentes de la cría en cautividad. La protección de las últimas poblaciones reproductoras de *Emys orbicularis* en Polonia occidental es importante también para el futuro de las poblaciones de Alemania oriental que todavía existen.

Palabras clave: conservación, distribución, *Emys orbicularis*, galápagos europeo, Polonia.

INTRODUCTION

The European pond turtle (*Emys orbicularis* L., 1758) is one of the rarest vertebrates in Poland. In the Polish Red Data Book of Animals it is included in the “endangered” category (JABŁOŃSKI, 1992b). This species was probably much more abundant in Poland in the 19th century and in the first half of the 20th century (MĘYNARSKI, 1971; RYBACKI & MACIANTOWICZ, 2001). Since 1945 intensive draining has been undertaken in many parts of Poland resulting in the destruction of most turtle habitats (ZEMANEK, 1991; JABŁOŃSKI, 1992a; MITRUS, 2000).

In the beginning of the 1990s knowledge on the distribution of *Emys orbicularis* in Poland was scanty. In the first summary of its distribution, 130 squares (10 x 10 km) with turtle localities were marked, but only 30% involved sites at which turtles were observed after 1975 (JABŁOŃSKI, 1992b). At present only a few pond turtle populations in Poland number over 50 individuals. Most populations are much smaller, consisting usually of a few individuals (MITRUS & ZEMANEK, 2000; RYBACKI & MACIANTOWICZ, 2001).

In the 1980s extensive research on the biology and distribution of *Emys orbicularis* in various regions of Poland had commenced. Moreover a “Programme for Protection of the European Pond Turtle in Poland” was initiated (MITRUS, 2000). These activities were sponsored by the EcoFund, National Fund for Protection of Environment, GEF/SPD (Global Environmental Foundation) and local administration. Several regional groups of herpetologists participated in this programme. One of these was the “Wielkopolska Team” from western Poland, comprised of the authors and our co-workers. The results of our activities were published in a few papers (MACIANTOWICZ & NAJBAR, 2000; RYBACKI *et al.*, 2000c; NAJBAR & MACIANTOWICZ,

2001; RYBACKI & MACIANTOWICZ, 2001; RYBACKI, 2003).

The aim of this paper was to present the results of studies on the biology and distribution of *Emys orbicularis* and conservation activities in western Poland after 1945.

MATERIALS AND METHODS

The distribution of *Emys orbicularis* in western Poland was studied in Zachodniopomorskie, Wielkopolskie, and Lubuskie provinces (Fig. 1). The main rivers of this region are Odra, Warta, Noteć, Obra and Drawa. Lubuskie Province is the most forested province in Poland, 50% of its area is covered by forest whereas the average for Poland is 28% (GŁÓWNY URZĄD STATYSTYCZNY, 2005).

Data on the occurrence of the pond turtle were collected from 1985 to 2004 from literature, field interviews and personal observations. The distribution of localities on the maps is shown in 10 x 10 km squares, on a grid of geographical coordinates (as used in

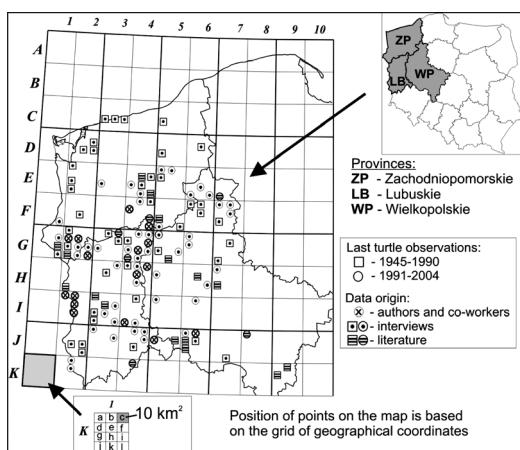


FIGURE 1. Distribution of *Emys orbicularis* in western Poland in 1945-2004 period.

FIGURA 1. Distribución de *Emys orbicularis* en Polonia occidental en el periodo 1945-2004.

the Polish Red Data Book of Animals) (JABŁOŃSKI (1992b). In some cases several localities are situated in one square.

RESULTS

Distribution, abundance and breeding success

In western Poland overall 170 localities, situated in 136 squares (10×10 km), in which the pond turtle occurred were collected for the period from 1945 to 2004 (Fig. 1, Table 1). Most of them are records of single individuals (RYBACKI *et al.*, 2000a, b, c; NAJBAR & MACIANTOWICZ, 2001; RYBACKI, 2002, 2003).

The majority of these localities (42%) were within Lubuskie Province. The occurrence of the pond turtle in 16 localities was confirmed personally by the authors or our co-workers (Fig. 1).

In western Poland *Emys orbicularis* localities are situated mostly in the valleys of the Odra, Warta, Noteć, Drawa and Kosa rivers, which constitute ecological corridors for this species (Fig. 2). Turtles were found mostly in forest swamps (35% localities) and in lakes (34%). They were also observed in small rivers, old riverbeds, ponds, gravel and sand-pits (Table 2).

The abundance of turtles in particular localities was usually small (1-3 individuals). The most numerous population consisted

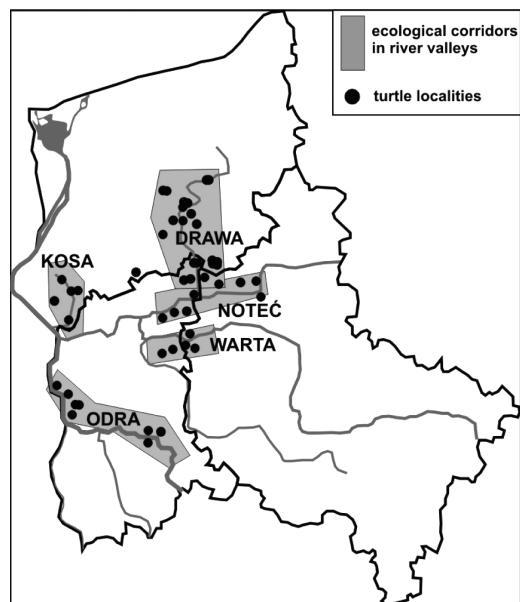


FIGURE 2. Ecological corridors of *Emys orbicularis* delimited on the base of localities distribution.

FIGURA 2. Corredores ecológicos de *Emys orbicularis* delimitados sobre la base de la distribución de las localidades.

probably of over 50 adults, inhabiting old riverbeds close to the Polish-German border, in Lubuskie Province (NAJBAR, 2005). Five other populations numbered about 10 individuals (one population: personal observations, four other: interviews with foresters) (Fig. 3A). Reproductive success –the hatching of young turtles– was noted only at three localities (all confirmed by turtle team). Turtle

TABLE 1. Number of *Emys orbicularis* localities in three provinces of western Poland.

TABLA 1. Número de localidades de *Emys orbicularis* en tres provincias de Polonia occidental.

Province	Number of localities			Number of 10 x 10 km squares
	1945-1990	1991-2005	Total	
Zachodniopomorskie	37	16	53	40
Lubuskie	26	46	72	57
Wielkopolskie	24	21	45	39
Total	87	83	170	136

TABLE 2. Types of aquatic habitats of *Emys orbicularis* in western Poland.

TABLA 2. Tipos de hábitats acuáticos de *Emys orbicularis* en Polonia occidental.

Type of habitat	Number of sites	%
forest swamps	28	35
lakes	27	34
rivers	14	17
old riverbeds	3	4
natural ponds	3	4
fish ponds	2	3
gravel and sand pits	2	3
Total	79	100

nests were found at five other sites, at two of them by our co-workers (Fig. 3B) (RYBACKI *et al.*, 2000a, b; NAJBAR & MACIANTOWICZ, 2001; RYBACKI & MACIANTOWICZ, 2001; NAJBAR & SZUSZKIEWICZ, 2005).

Threats and conservation

The main threats to *Emys orbicularis* in the investigated area are various forms of degradation of aquatic environments, especially overgrowth and shallowing due to drainage, overgrowth of nesting sites and pressure from predators that destroy eggs and embryos (NAJBAR & MACIANTOWICZ, 2001; RYBACKI, 2001; NAJBAR, 2005; NAJBAR & SZUSZKIEWICZ, 2005).

Several localities of the pond turtle are situated within protected areas, i.e. in Drawieński National Park (Fig. 1 - square 4F) and some nature reserves. However, only one reserve was created solely for the protection of this rare species. This is the “Rezerwat Ostoja Żółwia Błotnego” (The Pond Turtle Refuge Reserve) in Leszno county (Fig. 1 - square J6), which was established in 1974. The pond turtle still exists here but seldom reproduces (RYBACKI, 2001).

Our present conservation actions concentrate mainly on analysis and habitat improvement including the localisation and

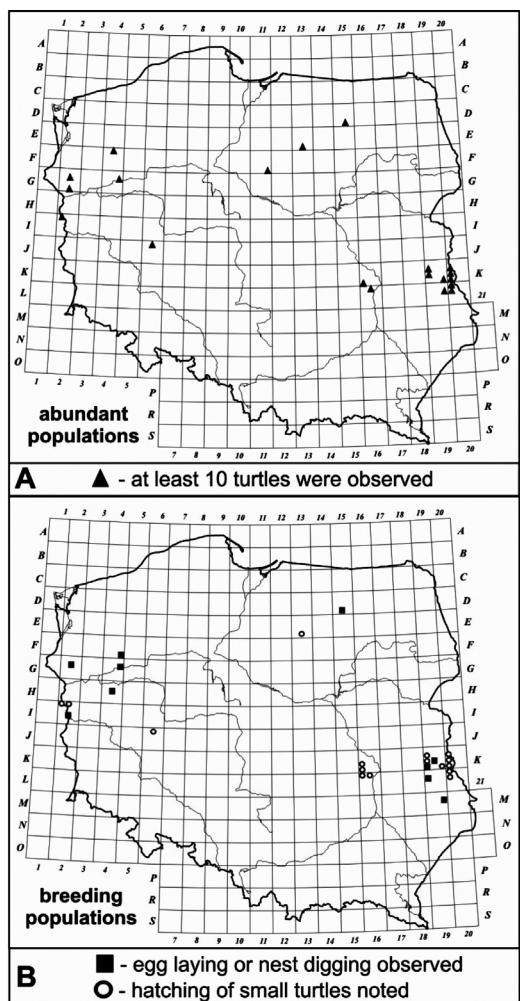


FIGURE 3. Distribution of *Emys orbicularis* in western and eastern Poland. (A) Abundant populations. (B) Breeding populations (RYBACKI & MACIANTOWICZ, 2001; BOGDASZEWSKA *et al.*, 2004).

FIGURA 3. Distribución de *Emys orbicularis* en Polonia oriental y occidental. (A) Poblaciones abundantes. (B) Poblaciones reproductoras (RYBACKI & MACIANTOWICZ, 2001; BOGDASZEWSKA *et al.*, 2004).

maintenance of existing nesting sites (tree and shrub removal), the preparation of new sites and the protection of nests against predators.

Most aquatic habitats and some turtle nesting sites are situated within State Forests.

In such cases we have established effective cooperation with forestry employees who often carry out conservation projects involving small retention in forests, contributing also to the improvement of pond turtle habitats.

The protection of *Emys orbicularis* is also a part of the programme "Active Preservation of the Swamp Areas in Western Poland" initiated by The Lubuski Naturalist Club in 2003. One of the most important aims of this programme is the regeneration of the degraded habitats of the pond turtle. The basic method used is the construction of simple and inexpensive water dams, where needed.

Apart from activities at breeding sites, other actions were carried out to improve the breeding success of the pond turtle in Lubuskie Province, where the most numerous population of this species in western Poland occurs. Young turtles were reared in captivity and released next spring at their site of origin. The release took place always in the presence of the Nature Conservation Officer and a representative of the State Forests, the owner of the land. In Lubuskie province, in years 1999–2003, 150 young turtles were released (NAJBAR & SZUSZKIEWICZ, 2005).

DISCUSSION

Due to intensive studies carried out in the last 20 years, our knowledge on the distribution of *Emys orbicularis* in Poland is much more complete. The number of localities known at present is approximately four times larger in comparison with the early 1990s (JABŁOŃSKI, 1992b). Pond turtles were observed in Poland at more than 350 localities in the period between 1945–2002, but more than 90% of these observations concerned single individuals (RYBACKI & MACIANTOWICZ, 2001; RYBACKI, 2003).

Unfortunately, the number of large, stable populations of *Emys orbicularis* and evidence

of breeding success is still very low. In Poland only three populations larger than 50 individuals are known. The largest one (probably more than 600 turtles) inhabits a large area in eastern Poland close to the Ukrainian border (Fig. 3 - squares 19-20K-L) (JABŁOŃSKI & JABŁOŃSKA, 1999), the second (ca. 50 individuals) is located in central Poland, SE of Warsaw (MITRUS & ZEMANEK, 2004), and the third, mentioned above, in Lubuskie Province (NAJBAR, 2005). Moreover, about 10 turtles were observed at a few other localities (RYBACKI & MACIANTOWICZ, 2001; BOGDASZEWSKA *et al.*, 2004).

Western Poland is an important area in the range of *Emys orbicularis*. Almost 50% of all Polish localities are found here, including a few abundant and breeding populations (Fig. 3). Most are situated in Lubuskie Province and in the southern part of Zachodniopomorskie Province, the most forested areas in Poland with a low level of industrial development.

The protection of the last breeding *Emys orbicularis* populations in western Poland is important for the survival of this rare species not only in Poland but also in eastern Germany, where some populations still exist (SCHNEEWEISS & FRITZ, 2000). Populations from Lubuskie Province may constitute a connection between German and eastern Polish populations. The most important tasks in their protection programme are still habitat improvement and an increase in breeding success. We plan to carry out such actions in other populations that live in areas located within natural ecological corridors, i.e. river valleys (Fig. 2). Some of these corridors are protected under Natura 2000. Similar activities were carried out recently by NAJBAR & SZUSZKIEWICZ (2005), who reared young turtles in captivity and after winter released them into natural populations. Such conservation activities, which correspond with the

biology and ecology of the pond turtle, should improve considerably the condition of this threatened species in Poland. At present, in cooperation with herpetologists from Poland, Germany, Lithuania and Denmark, we are starting a new LIFE-Nature project: "Protection of *Emys orbicularis* and amphibians in the North European lowlands".

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