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Newly discovered vital population of the European pond turtle *Emys orbicularis* in Prilipe oxbow lakes (SE Slovenia)

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Abstract. In this study we examined the population of the European pond turtle (*Emys orbicularis*) in the Prilipe oxbow lakes along the Sava River. The species' sex and age structure were estimated as well its population size. In the area of approximately 5.9 ha of water surface, 3 individuals were found in 2008 and 70 in 2019, when a more detailed survey was conducted. The population size was estimated at 125 individuals. According to the age structure and confirmed reproduction, the population is recognized as viable. The main threats to the survival of European pond turtles in this area are potential direct interventions into habitat as well as indirect changes such as alterations in flood regime or in groundwater level. Additionally it is threatened by the invasive red-eared slider (*Trachemys scripta elegans)*, the reproduction of which was also confirmed during our survey. Although the studied area meets all conditions for the establishment of the Natura 2000 site, it was not included in this network in 2003 due to lack of knowledge as far as this species was concerned.

Key words: *Emys orbicularis*, population size, age structure, invasive species

Izvleček. Novo odkrita vitalna populacija močvirske sklednice *Emys orbicularis* v mrtvicah Prilipe (JV Slovenija) – V članku predstavljamo izsledke raziskave populacije močvirske sklednice (*Emys orbicularis*) na območju mrtvic reke Save pri Prilipah. Ugotovili smo spolno in starostno strukturo populacije ter ocenili njeno velikost. Na približno 5,9 ha velikem območju mrtvic smo leta 2008 našli 3 osebke, leta 2019, ko smo območje podrobno raziskali, pa 70 osebkov. Populacijo smo ocenili na 125 osebkov. Starostna struktura in potrjeno razmnoževanje sta dokaz, da je populacija viabilna. Glavni dejavniki ogrožanja močvirske sklednice na tem območju so morebitni direktni posegi v habitat, prav tako pa tudi indirektni posegi, kot so spremembe v vodnem režimu in spremembe gladine podtalnice. Dodatno jo ogroža pojavljanje tujerodne invazivne želve rdečevratke (*Trachemys scripta elegans*), saj se, kot smo potrdili, na tem območju tudi uspešno razmnožuje. Čeprav so izpolnjeni vsi pogoji za uvrstitev območja v Natura 2000 omrežje, pa je to ostalo zunaj njega, saj leta 2003 ni bilo veliko znanega o močvirski sklednici na tem območju.

Ključne besede: močvirska sklednica, velikost populacije, starostna struktura, tujerodne vrste

Introduction

The knowledge on the distribution and conservation status of the European pond turtle *Emys orbicularis* (Linnaeus, 1758) in Slovenia has significantly increased in the last decade (Vamberger 2009, Krofel et al. 2009, Vamberger & Kos 2011, Grželj & Grželj 2012, Vamberger et al. 2013, 2015, 2017, Pekolj et al. 2015, Govedič et al. 2016). Interestingly, even though prior to 2008 almost nothing was known about this species in Slovenia, the European Commission within the Biogeographic Seminar concluded in 2006 that a sufficient percentage of the European pond turtle populations were included into the Natura 2000 network in Slovenia (Zagmajster & Skaberne 2006). Thus some very important and vital populations have remained outside of Natura 2000 sites (Govedič et al. 2016). The species is listed in Annex IV (strict protection regime) and Annex II (Sites of Community Importance) of the Habitats Directive and fully protected by the Slovenian national legislation (Ur. l. EU 1992, Ur. l. RS 2004a). Its habitat is protected as well, especially egg deposition sites that are subjects of environmental liability (Ur. l. RS 2009), irrespective of whether they are located within Natura 2000 sites or not. Before the authorities issue any environmental permit for new activities in all potential habitats of the European pond turtle, conservation status of the species needs to be evaluated. To make the right decisions regarding measures of nature conservation, good quality data on the natural history of the species are necessary. For each location, where the European pond turtle was observed, it is crucial to define the viability, reproduction success and the size of the population. In case of any interventions in the turtle's habitat, it is necessary to find egg deposition sites. Detailed studies on the present status, individual numbers and natural history of *E. orbicularis* are lacking in Slovenia and were undertaken only at Ljubljansko barje (Vamberger & Kos 2011, Vamberger et al. 2017) and in Bela krajina (Vamberger et al. 2013). No detailed study has been done along the Krka River and in the Posavje region, even though the European pond turtle was observed in the clay pit north of Brežice (Hudoklin 1995). In this region, only the preserved oxbow lakes along the Sava River (Prilipe is also called Cola or Topla struga) in the Posavje region with constant water are suitable for the European pond turtle (Ivanovič 1991). They are defined as hydrological, geological, botanical and ecosystem value of national importance (Ur. l. RS 2004b). Tome (2003) did not mention the European pond turtle for the Prilipe oxbow lakes or neighbouring areas, but this species does live downstream along the Sava River in Croatia (Šalamon et al. 2013) and thus they were expected also at Prilipe.

The aim of our study was to confirm the presence of the European pond turtle in the area of the Prilipe oxbow lakes and to determine the population size, age-structure and, therefore, the viability of the population.

Methods

Study area

The oxbow lakes along the Sava River situated near the village Prilipe are known by the locals as Cola or Topla struga. However, we decided to use the name Prilipe oxbow lakes in our paper. The study area is located in south eastern Slovenia near Čatež (45°53' N 15°37' E), bordered by the Čatež Spa to the north, by the Sava River to the east and by the highway to the south (Fig. 1). It covers 140 ha, while 5.9 ha of the area is covered by water. To the west of the Prilipe oxbow lakes stretches an open area with prevailing agricultural surfaces.

Climatic conditions in the study area are mainly continental, with a mean annual air temperature of 10–12°C and annual rainfall of 1100–1200 mm (ARSO 2006). Mean annual river water temperature in the region is 12°C (Jaklič & Vrezec 2011). However, this data doesn't reflect temperature of water in the oxbow lakes. There is an influx from the underground hot springs and outflow from the pools inside the Čatež Spa (section A, Fig. 1), which is the most distant part from the main river. Actually, section A is a man-made channel that connects hot springs with the oxbow lake. Therefore the water gradually cools down towards the outfall (section E, Fig. 1), in winter from 35 to 5°C (Jaklič & Vrezec 2011).

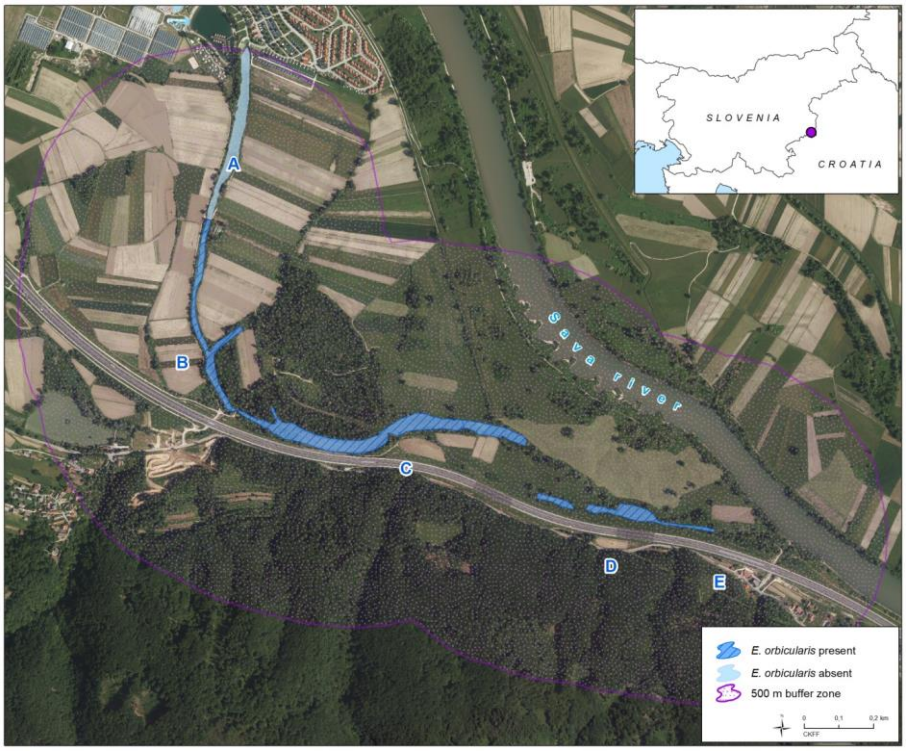

Figure 1. Area of the Prilipe oxbow lakes with 500 m buffer zone. Different sections are marked with capital letters A–E.
Slika 1. Območje mrtvic Prilipe s 500 m puferskim pasom. Posamezni odseki so označeni s črkami A–E.

In the oxbow lake, non-indigenous tropical species such as the tropical redclaw crayfish (*Cherax quadricarinatus*) and the fish Nile tilapia (*Oreochromis niloticus*) are present (Jaklič & Vrezec 2011). Water lettuce (*Pistia stratiotes*) spreads and fully covers sections B and C of the oxbow lake (Fig. 1). Section E (Fig. 1) represents the habitat type *Natural eutrophic lakes with Magnopotamion or Hydrocharition* (NATURA 2000 Code: 3150 (EC 2013)). The water chestnut (*Trapa natans*) and the common duckweed (*Lemna minor*) are dominant water plants in section E (Fig. 1). Otherwise, the oxbow banks are covered with sedges (*Carex* spp.), sweet flag (*Acorus calamus*) and the common cattail (*Typha latifolia*). Alder (*Alnus glutinosa*) and white willow (*Salix alba*) provide shadow for the water surface.

Field work

The survey was conducted in the years 2008 and 2019.

Due to lack of knowledge on the distribution of the European pond turtle near Sava River between Krško and the national border with Croatia, we set funnel traps in the Prilipe oxbow lakes between 12. 5. and 16. 5. 2008 to confirm the presence of the European pond turtle there. The effort invested corresponds to 46 trap days. A trap day was defined as 24-hour trapping with one trap. Turtles were also caught by hand or with a deep net.

In 2019, the survey was repeated and conducted in four periods: from 15. 4. to 19. 4., from 22. 4. to 26. 4., from 18. 7. to 22. 7., and from 16. 7. to 30. 7. The effort invested corresponds to 432 trap days. Four periods serve to estimate the population size using the capture-recapture approach. Since the European pond turtles begin with their sexual activities immediately after hibernation, we started with sampling in spring. Most females lay eggs in the first half of June (Fritz 2003) and do not feed during this time (Lukina 1966). This is why we carried out no sampling during this time.

Before setting the funnel traps, the area was thoroughly surveyed for potential individuals basking in the sun on tree trunks, dead wood, vegetation or sunny shores. Depending on the presence of turtles, the funnel traps were placed in different sections of the oxbow lake to increase the likelihood of catching them. To prevent the trapped turtles from drowning, one third of a funnel trap remained above the water surface. All traps were fixed to prevent sinking. Beef and pork liver were used for bait. Traps were controlled daily and rebaited on every second day.

We measured, weighed, photographed and individually marked turtles by marginal notching (Vamberger & Kos 2011). All captured individuals were released at the capture site immediately after processing. Sex was determined based on colour of their eyes and other sex specific morphometric characters (Vamberger & Kos 2011).

Age was estimated as a combination of the number of growth rings and shell abrasion. Age can be accurately determined by the number of growth rings only for animals of up to 10 years, where single growth rings are still clearly visible. Juveniles represent individuals of up to the age of 2 years, while 2–10 year olds represent subadults (Fritz 2003). Single growth rings are not visible any longer in old individuals, so the age cannot be determined accurately. Based on shell

abrasion, adults were divided into three classes: young adults, middle aged adults and old adults (Meeske 2006, Vamberger & Kos 2011).

Their abundance was defined as the relative measure (Krebs 1989) of the mean number of trapped turtles per 10 trap days. If turtles were trapped more than once, this was not taken into account in the calculation of relative densities.

The population size was calculated based on data from 2019 with the Schnabell method for closed population (Krebs 1989) using the formula: $N = \frac{\sum_t (Ct * Mt)}{\sum_t Rt}$, with *Ct* meaning the total number of individuals caught in sample t, *Rt* the number of individuals already marked when caught in sample t, and *Mt* the number of marked individuals in the population just before the *t*-th sample is taken.

In the short period, when the survey was conducted, we can assume there were no arrivals to the population and the mortality rate was zero. The population is geographically isolated, so there was no significant movement in or out from the area. Anglers from the local angling club confirmed one sighting of the turtle at mouth of the oxbow along the Sava River. Single movements of European pond turtles outside our area are expected in a longer period, which has no effect on our assumption of a closed population between April and August 2019.

Results

Distribution and relative density

In 2008, one European pond turtle was trapped into a funnel trap, while two additional turtles were caught by feeling them in mud (muddling technique). One individual was younger than 10 years. The indigenous red-eared sliders (*Trachemys scripta elegans*) were also observed.

In 2019, we had 99 captures of European pond turtles, which include 30 recaptures. Average abundance was 2.29 (number of trapped turtles per 10 trap days). It means that, on average, two European pond turtles were trapped in 10 traps which were set for one day or, in other words, two turtles were trapped in one trap set for 10 days. Abundance was the highest in C, D and E sections (Tab. 1, Fig. 1).

One hatchling was found in a headland furrow next to the oxbow lake on 23. 4. 2019, seeking for access to water. Additionally, mating of European pond turtles was observed on 18. 4. 2019. All the individuals from our survey belonged to the subspecies *Emys orbicularis orbicularis*. The subspecies was determined based on morphological characters (colour of their eyes and body size (Fritz 2003)).

Table 1. Relative densities of the European pond turtle (*Emys orbicularis*) in different sections (A–E) of the Prilipe oxbow lakes in 2019.
Tabela 1. Relativne gostote močvirskih sklednic (*Emys orbicularis*) v različnih odsekih (A-E) mrtvic Prilipe v letu 2019.

Sections of the oxbow lake/ Deli mrtvice	Number of hunting days/ Število lovnih dni	Number of individuals/ Število osebkov	Relative density (number of individual/10 trap days)/ Relativna gostota osebkov (število osebkov/10 lovnih dni)
A	48	0	0
B	56	2	0.36
C	192	56	2.92
D	48	22	4.58
E	88	19	2.16
Sum	**432**	**99**	**2.29**

At least 20 of indigenous red-eared sliders were observed and a one year old turtle was caught on 17. 4. 2019. In addition, the yellow-bellied terrapin (*Trachemys scripta scripta*) was observed.

Sex and age structure in 2019

A total of 70 different individuals were identified in 2019: 69 individuals were caught in traps, one juvenile was found outside the water, in the nearby field. There were 34 males and 33 females (M:F sex ratio 1.03:1) in total. Sex could not be determined for 3 young turtles. Out of 67 individuals, most (26 individuals; 38.8 %) were classified as subadults (2–10 years old), followed by 25.4 % young adults, 23.9 % middle aged adults and 11.9 % old adults.

Population size estimation

The population in the Prilipe oxbow lakes is estimated at 125 adult and subadult individuals (81–212 with 95 % confidence interval) in 2019. However, this prediction was made due to the recapture success of adult and subadult individuals. Individuals below 3 years were not caught in traps and are not considered in the estimation. We also observed movements between different parts of the oxbow lakes (Fig. 1) assuming that every turtle older than 3 years could possibly be caught. The density is calculated at 28 individuals per 1 ha of water, considering that the whole population is distributed only in the southern part of the area estimated to cover 4.5 ha in total.

Table 2. Input data for population size estimation in 2019. $\mathbf{C_t}$ – total number of individuals caught in sample *t*; $\mathbf{R_t}$ – number of individuals already marked when caught in sample *t*; $\mathbf{U_t}$ – number of individuals marked for the first time and released in sample *t*; $\mathbf{M_t}$ – number of marked individuals in the population just prior to *t* sampling.
Tabela 2. Vhodni podatki za oceno velikosti populacije v letu 2019. $\mathbf{C_t}$ – število ujetih želv v lovu *t*; $\mathbf{R_t}$ – število ujetih živali v lovu *t*, ki so predhodno že označene; $\mathbf{U_t}$ – število prvič ujetih, označenih in izpuščenih živali v lovu *t*; $\mathbf{M_t}$ – število označenih živali v populaciji pred vzorčenjem *t*.

Series number of sampling/ Številka vzorčenja	Number of captures (Ct)/ Število ulovov	Number of recaptures (Rt)/ Število ponovnih ulovov	Number of newly marked (Ut)/ Število novo označenih	Number of marked individuals in total (Mt)/ Število vseh označenih osebkov
1	16	0	16	0
2	11	4	7	16
3	33	5	28	23
4	28	10	18	51

Discussion

Distribution

Our study in the Prilipe oxbow lakes along the Sava River reveals a new vital population of the European pond turtle for Slovenia and the first one in the Posavje region. The proposal of Natura 2000 sites for the European pond turtle in the year 2003 (Tome 2003) as well as for many other species listed in Habitat Directive was made on the existing data of the time, without additional research. Consequently, the vital population of the Prilipe oxbow lakes was left out from Natura 2000 site. In the case of the European pond turtle, the proposal was based on the occurrence data or observation density. According to the methodology used for defining Natura 2000 network in 2003, we believe that the Prilipe oxbow lakes certainly fulfilled all conditions for establishment of a Natura 2000 site.

Spatial distribution of individuals in the area is not even. The lowest number of European pond turtles was caught in the western part of the oxbow lake (sections A, B; Fig. 1) and the highest in the eastern part of the oxbow lake (sections C, D, E; Fig. 1). Section C is almost completely covered with water lettuce during the summer, and most of section E is covered with water chestnut. The water surface of section D is small and is not covered with macrophytes. We can conclude that the invasive water lettuce has no negative impact on the European pond turtle. It seems that it has the same function as other indigenous macrophytes, although it is denser and produces higher biomass than other floating macrophytes. There are probably more reasons for the absence of the European pond turtle in the western part of the oxbow lake. In section A, the water is deep and shores are steep, the surrounding area is inappropriate for egg laying and the neighbouring area is inhabited, which consequently leads to interferences caused by visitors, anglers, dog walkers, etc. In section B, water is shallow and waste water from the treatment plant is discharged there.

Sex and age structure of the population

Our results with 38.8 % of subadults are similar to those in Bela krajina where 31 % of trapped individuals were subadults (Vamberger et al. 2013). Young individuals, considered to be 1-2 years old, are rarely trapped in funnel traps. Thus the population of the Prilipe oxbow lakes and Bela krajina seem to be at first glance healthier than the population from Ljubljansko barje (Vamberger & Kos 2011, Vamberger et al. 2017), where fewer subadults have been found. However, turtle habitats of the Prilipe oxbow lakes and Ljubljansko barje (with water channels) are different. The sex ratio in the Prilipe oxbow lakes is only slightly in favour of males (1.03:1), while in Bela krajina it is significantly higher with 1.72:1 (Vamberger et al. 2013). In general, the sex ratio is often in favour of males all over the distribution range (Fritz 2003).

A stable viable turtle population is defined as one having the reproductive capability to sustain itself without immigration of individuals from other populations (U.S. Fish and Wildlife 1993). The population in the Prilipe oxbow lakes seems to be viable according to this. The age structure is comparable to the viable population from Golek in Bela krajina (Vamberger et al. 2013) and we have a proof of successful reproduction. In addition to the one hatchling found during our survey in April 2019, we caught up to 8 years old subadults, indicating successful reproduction for at least the last 8 years.

Estimation of the population size

There are only few published studies on the population size estimation of the European pond turtle in Europe (Fritz 2003, Balázs & Györffy 2006), so comparisons are not so easy to make. However, the density in the Prilipe oxbow lakes is 100 times higher than at Ljubljansko barje (Vamberger et al. 2017), but the system of ditches in agriculture area of Ljubljansko barje is not comparable with the Prilipe oxbow lakes. Compared to the density in the oxbow lake along the Tisza River in Hungary, the density of the European pond turtle of the Prilipe oxbow lakes is 20 times lower (Balázs & Györffy 2006).

Nature conservation implications

Aquatic habitats are crucial for the existence of the European pond turtle in many ways. All individuals need water while feeding, since they cannot swallow food without it, especially if it was preyed upon on land (Wermuth 1952). It literally means that despite abundance of food, the European pond turtle can not survive without water (Wermuth 1952). However, for long term survival, terrestrial habitats are important for the species as well, as they lay eggs in dry sandy places (Fritz 2003). They are important also for daily and seasonal movements. In Slovenia, habitat loss and nest destruction by intensified agriculture is a real threat to the species (Vamberger et al. 2017). Consequently, it is of outstanding importance to find the egg-laying sites to preserve the species and its habitat. The egg-laying site(s) of the Prilipe oxbow lakes remain unknown, even though one hatchling was found next to the oxbow lake in the south-east (section C). With this single finding, it is impossible to conclude where other egg-laying sites are. It is well known that even small intervention in the terrestrial habitats around the water body can impact the species significantly and may even drive it to extinction.

Interventions are not only direct changes of habitat, but also changes in the flood regime or changes in the groundwater level. European pond turtles can lay eggs very close to the water body, up to 1 km away, up to 1.2 km away or even up to 5 km away (Fritz & Günther 1996, Jabłoński & Jabłońska 1998, Schneeweiss et al. 1998, Zuffi 2000). Therefore, Ficetola et al. (2004) suggested at least a 1–1.5 km wide buffer zone of terrestrial habitat around the water body to maintain favourable condition for the population and to protect the egg-laying sites. However, not even a protection of 500 m buffer zone is possible anymore for the Prilipe oxbow lakes due to human impact. The Prilipe oxbow lakes are trapped between the highway in the south, the river Sava in the east and the populated area Čatež health resort in the north. The management of the terrestrial habitats next to the oxbow lake is therefore of immense importance for this population and depends additionally on the time when hatchlings come out of the nests. For some parts of Slovenia, it is known that hatchlings overwinter in the nest and hatch in the next spring (Vamberger 2009, Vamberger & Kos 2011, Vamberger et al. 2017). Our results indicate the same for the Prilipe oxbow lakes. However, with a single observation we cannot conclude that this is true for significant proportion of hatchlings, so a more detailed study is necessary. Nevertheless, the single sighting of one hatchling is already enough to manage terrestrial habitat around the oxbow lakes very carefully and to ensure dry areas for egg-laying. Furthermore, to secure a viable population for the European pond turtle, the management of the area needs to consider that turtles need a peaceful environment, especially in the time of egg-laying (Wermuth 1952). The conditions around the south-eastern part of the Prilipe oxbow lakes (sections C, D, E) are probably the most favourable site for egg-laying from this perspective. There are no residential buildings and consequently no pets such as dogs and cats. Visitors or strollers from the Čatež Spa come mostly during the day to avoid mosquitos, so they don't disturb turtles in the evening, when turtles proceed from the water to the egg-laying sites. The banks of the oxbow lake are difficult to access, since they are overgrown with reeds and other vegetation, which is again in favour of the turtles. Predators, however, are another threat especially for hatchlings and nests. In general, most of the nests are damaged immediately after eggs are laid or during hatching (Lukina 1966) by predators like the wild boar (*Sus scrofa*) or red fox (*Vulpes vulpes*) (Fritz 2003). For the Prilipe oxbow lakes, at least the wild boar can be excluded as possible predator, since we did not find any sign of wild boars near the oxbow lake and there has been no resident population of this species confirmed by the local hunting association. But hatchlings are preyed on also in the water by predatory fish like pike (*Esox lucius*) or catfish (*Silurus glanis*) (Fritz & Günther 1996). The density of predatory fish species is similar in different parts of the Prilipe oxbow lakes (observations of the local Angling club). At the same time, there are many other fish species which are on the European pond turtle's daily menu.

Another threat for the European pond turtle are non-indigenous turtles (Vamberger et al. 2012, Standfuss et al. 2016). The overall impact of non-indigenous turtles at the Prilipe oxbow lakes is not known yet and a study should be conducted in the future. We observed at least two invasive subspecies of turtles; the red-eared terrapin and the yellow-bellied terrapin. This species is a serious threat to our indigenous turtles (Hidalgo-Vila 2009, Pérez-Santigosa et al. 2008, Standfuss et al. 2016) and in general to aquatic ecosystems worldwide (GISD 2019). Successful breeding of *Trachemys* could be confirmed in the Prilipe oxbow lakes by one hatchling of a red-eared pond slider. This is the fourth area in Slovenia (Vamberger et al. 2012, Standfuss et al. 2016), where breeding of red-eared terrapins in nature has been confirmed. Further studies are necessary to study the invasive potential of the species in this area.

For the long-term survival of the European pond turtle population in the Prilipe oxbow lakes it is of immense importance to find the egg-laying sites to minimize the potential threats like agriculture or other interventions into terrestrial habitats. The area is small and squeezed between the highway and the Sava River, but it hasn't changed much in the last 15 years. However, the north western part of the oxbow lake is not suitable for the turtles due to fishing, tourists and agriculture. The density of turtles in the Prilipe oxbow lakes is much lower than in other similar habitats in Europe (Fritz 2003, Balázs & Györffy 2006), but additional research could give more precise data on population characteristics. Improving the western part of the oxbow lake would increase the available and suitable habitat for the turtles and in the long term contribute to the growth of a stable and healthy population. In the past, the population of the Prilipe oxbow lakes was supposedly part of a big population established along the Sava River, distributed between the Jovsi, Sotla and Krka River with its tributaries. If genetic analysis would confirm that the Prilipe oxbow lakes population represents remains of the original population, individuals could be taken to repopulate SE parts of Slovenia in the future and to connect the remaining populations along the Sava River.

Povzetek

V zadnjem desetletju smo zaradi tarčnih raziskav dobili veliko novih podatkov o razširjenosti in ekologiji močvirske sklednice (*Emys orbicularis*) v Sloveniji (Vamberger 2009, Krofel et al. 2009, Vamberger & Kos 2011, Grželj & Grželj 2012, Vamberger et al. 2013, 2015, 2017, Pekolj et al. 2015, Govedič et al. 2016). Vrsta je uvrščena na Prilogi 2 in 4 Direktive o habitatih (OJ 1992). Zavarovane so živali in tudi njen habitat, ne glede na to, ali je v območju Natura 2000 ali ne (Ur. l. RS 2004a). Pred vsakim posegom v habitat bi bilo treba presoditi morebitne negativne vplive na populacijo močvirske sklednice. Povsod, kjer je bila opažena ali pa obstaja potencialen habitat, je treba najprej oceniti velikost populacije, preveriti razmnoževalni uspeh in na podlagi teh podatkov oceniti vitalnost populacije. Močvirsko sklednico so v glinokopu pri Brežicah opazili že pred dvajsetimi leti (Hudoklin 1995), vendar primerna območja vzdolž reke Krke in v Posavju vse do naše študije niso bila raziskana.

Prvič smo pojavljanje močvirske sklednice na območju mrtvic Prilipe potrdili leta 2008, ko smo našli tri osebke. Leta 2019 smo območje raziskali bolj natančno in sistematično. V štirih obdobjih od aprila do julija smo na območju celotne mrtvice nastavili vrše, v katere se je skupno ujelo 99 želv, od tega 70 različnih osebkov. Na podlagi zunanjih morfoloških znakov smo vsem osebkom določili spol in starost. Spolno razmerje je bilo z 1,03:1 le malenkost v prid samcem. V brazdi njive poleg mrtvice smo našli enega ravno izleženega mladiča, ki je iskal dostop do vode. Populacijo smo ocenili na 125 osebkov, gostoto pa na 28 osebkov na 1 ha vodne površine. Izsledki naše raziskave razkrivajo še eno vitalno populacijo močvirske sklednice v Sloveniji in prvo v Posavju. Zaradi pomanjkanja znanja leta 2003 območje ni bilo uvrščeno v Natura 2000 omrežje, čeprav bi po današnjih podatkih ustrezalo vsem predpisanim kriterijem.

V Sloveniji močvirsko sklednico najbolj ogrožata izguba habitatov in uničevanje gnezd (Vamberger et al. 2017). Za varovanje vrste je ključno, da poznamo mesta odlaganja jajc. Prav ta bi bilo treba najti tudi za populacijo želv v Prilipah, saj bomo lahko le tako še naprej ohranjali populacijo v ugodnem stanju. Glede na podatke iz literature bi morali okoli vodnega habitata v obzir varstva vključiti še vsaj 1-1,5 km širok puferskega pasa kopenskega habitata (Ficetola et al. 2004). V Prilipah ne moremo več zagotoviti niti 500 m širokega pasu, saj je območje že zdaj povsem stisnjeno med avtocesto, reko Savo in Čateškimi toplicami. Močvirsko sklednico v Prilipah ogrožajo tudi tujerodne želve rumenovratke (*Trachemys scripta scripta)* in rdečevratke (*Trachemys scripta elegans)*. Pri slednji smo potrdili tudi razmnoževanje.

Dolgoročno bo populacija močvirske sklednice na tem območju preživela le, če bomo zagotovili majhen vpliv kmetijstva in druge posege v kopenski habitat. Z izboljšanjem vodnega habitata v zahodnem delu mrtvice lahko dodatno spodbudimo rast populacije. V preteklosti je bila verjetno populacija močvirske sklednice iz Prilip del večje populacije vzdolž reke Save in njenih pritokov. Če bi to potrdili z genetsko analizo, bi lahko z osebki iz te populacije ponovno naselili območje jugovzhodne Slovenije in tako povezali med sabo druge, sedaj ločene, populacije vzdolž reke Save. Samo tako bomo zagotovili gensko raznolikost populacije oz. vrste, ki je nujna za njeno preživetje.

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