

European pond turtle (*Emys orbicularis*) conservation program in Switzerland

JEAN-MARC DUCOTTERD,¹ DENIS MOSIMANN¹ & ANTOINE CADI²

¹ *Protection et Récupération des Tortues, Grand Pâquier,
CH-1373 Chavornay, Suisse (www.tortue.ch)*

² *UMR CNRS 5023, Ecologie des Hydrosystèmes Fluviaux,
Université Claude Bernard Lyon 1, 69622 Villeurbanne Cedex, France
(e-mail: a.cadi@fnh.org)*

Abstract: A study undertaken by Florence Nuoffer with the collaboration of the University of Neuchâtel in Moulin-de-Vert in 1999 confirm the recent presence of viable populations of this species in our country. This study was followed in collaboration with the University of Neuchâtel, but by adding to it a new method of study with captures. The results showed that the population of the Moulin-de-Vert comprised more than 300 animals, 50 years only after the first official releasing of around fifty animals of various origins. The determination of suitable sites of basking of the European pond turtle was also studied: the preferred sites are above the floating trunks and the dry clusters of reeds in edge and inside the reed vegetation (more than 60% of the observations). The study confirm also the presence of the species in the "Grande Cariçaie", and the extinction in Fräschels.

Those 4 years work, the European pond turtle currently changes from the status of disappeared species in Switzerland to species in critical danger of extinction (CR = critically endangered, according to the category list of the UICN). This criterion is also based on the smallness of its distribution in Switzerland. *Emys orbicularis orbicularis* becomes a priority species of the herpetological fauna in Switzerland from the point of view of the conservation and reinforcement of the populations.

Key words: conservation, *Emys orbicularis* status, Switzerland.

Resumen: Programa de conservación del galápago europeo (*Emys orbicularis*) en Suiza. – Un estudio emprendido en 1999 por Florence Nuoffer en colaboración de la Universidad de Neuchâtel en Moulin-de-Vert, confirma la presencia de poblaciones viables de *Emys orbicularis* en Suiza. A partir de las capturas efectuadas se estima que la población de Moulin-de-Vert está formada por más de 300 individuos resultado de introducciones anteriores con ejemplares de varios orígenes. El estudio también confirma la presencia de la especie en "Grande Cariçaie" y su extinción en Fräschels. Respecto a la selección de lugares de asoleamiento adecuados, se pone de manifiesto una preferencia por troncos y masas de vegetación flotante (más del 60% de las observaciones). Estos datos, junto a lo limitado de su distribución, modifican el estatus de protección de *Emys orbicularis* en Suiza, que se incluye como especie en peligro crítico de extinción (CR, según la UICN) situándola como una especie prioritaria desde el punto de vista de la conservación y el refuerzo de las poblaciones.

Palabras clave: conservación, estatus de *Emys orbicularis*, Suiza.

INTRODUCTION

For many years, contacts were made with French and German *Emys orbicularis* conservation programs that proved fruitful enough

to encourage us to initiate as soon as possible the preservation of this species in Switzerland. The *Emys orbicularis* conservation program was initiated by PRT (Protection et Récupération des Tortues) in 1999. Its goal is

to initiate a cohesive program of preservation of the European pond turtle *Emys orbicularis* in Switzerland. We gather scientific and professional breeders together to advise and manage this program. Our initial objective is to get an actual overview of the present status of the European pond turtle, *Emys orbicularis orbicularis*, in Switzerland, as no reliable data have been published on the subject for many years. Based on methods developed in France with the help of the French Rhône-Alpes "Emys" Group, a major population of European pond turtles was found in Moulin-de-Vert (Geneva area). Since, different things were initiated: 1) insure a link between the various interested partners who are working on the European pond turtle; 2) insure a scientific follow-up of every action proposed for this species in Switzerland; 3) highlight and value the European pond turtle wild populations' status (a threatened but still alive turtle in the wild in Switzerland); 4) census and study the relictual populations and establish a country-wide picture of the status of the pond turtle; 5) provide guidelines for the husbandry, breeding and potential restocking decision of the European pond turtle; and 6) insure long-term monitoring of any restocking developed

In 2003, we have started various actions. Depending on our results, goals will be reassessed for next year. We consider this first year as a major stage for the preservation of the European pond turtle in Switzerland because it has renewed a national interest in the local turtle species.

MATERIALS AND METHODS

The different sites were sampled monthly from May 2000 to September 2001 (Table 1). Drift-type traps made of a 5 m long net were stretched perpendicularly to the shoreline, with a hoop trap fastened to the end of the net,

TABLE 1. Details of blood samples taken in the Moulin-de-Vert.

TABLE 1. Análisis de sangre tomados en Moulin-de-Vert.

Number of samples	Age	Sex
23	Adults	Females
10	Young adults (8-14 years old)	Females
9	Adults	Males
4	Young adults (5-9 years old)	Males
1	Juvenile (3 years old)	–

so that turtles swimming in either direction along the shoreline are driven towards the traps. Traps were placed in the water along the margin of each site (one trap each 50 meters). Trap were checked and rebaited daily. Each site was trapped continuously for four nights. A minimal interval of 30 days was left between two different sessions in the same site (more details available in CADI, 2003; CADI & FAVEROT, 2004).

Turtles were individually marked with notches on the marginal scutes (STUBBS *et al.* 1984) and examined for establishing sex and life stage (juvenile vs adult, by secondary sexual characters; ERNST *et al.* 1994). For recaptured individuals, date, individual number, and trap number were recorded for the three years sampling period. Turtles were released into the water at the end of the session, on the shore near the trap in which they have been caught.

RESULTS

Moulin-de-Vert population

The results showed that the population of the Moulin-de-Vert comprised more than 300 animals, 50 years only after the first official releasing of around fifty animals of various origins (NUOFFER, 2000; MOSIMANN, 2002). The determination of suitable sites of basking

of the European pond turtle was also studied: the preferred sites are above the floating trunks and the dry clusters of reeds in edge and inside the reed vegetation (more than 60% of the observations).

The study of this population was then carried out by the *Emys*-Project. This follow-up of population made it possible to compile the data of the 3 years on the field, indicating that the population of the Moulin-de-Vert is perennial and even tends to increase somewhat. All the age classes of a population were captured and the natural breeding confirmed by the discovery of hatchings freshly hatched in the autumn 2001 and by the capture of a great number of young and subadult turtles, without interruption of age in the years of births. Good conditions for this species are present in this place, in contrary to other sites of (re)introductions: wetland (medium of life) and dry meadows (laying zones). Moreover, the extreme growth of the animals was also proven at this place (until more than 100 g of bodyweight taken in one year), proving the very favorable conditions for this species in some regions of Switzerland.

Sexual maturity is reached very quickly on this site since they are 5 years old. In some areas two to three annual layings are observed. The average number of eggs laid by a female European pond turtle approximates eight. The sex-ratio is 3 females for 2 males in the Moulin-de-Vert. The density of the site of Moulin-de-Vert was estimated to 64 turtles/ha (MOSIMANN & CADI 2004).

Fräschels population

The current situation of the reintroduced populations between 1975 and 1977 in Fräschels was studied in 2003 by the *Emys*-Project. The results showed the total absence of the European pond turtle at this place, less than 30 years after the first reintroductions. European pond turtles were regularly

observed at this place until the Nineties. The reasons of this disappearance can be multiple: unfavorable laying zones, dispersion of the animals via the neighbouring channels located at less than 200 m of the principal pond or the introduction of predatory fishes species. The last option remains most probable, two *Silurus glanis* of more than 1 m, several pikes of more than 50 cm and large carps having been captured at this place. The aquatic fauna is very poor besides these predators.

Grande-Cariçaie population

The *Emys*-Project also carried out trapings in 2003 in the Grande-Cariçaie. Unfortunately, no European pond turtle was captured there. A survey in the neighbourhood showed that this species has never been observed at this place for at least 50 years. A survey was also carried out with professional fishermen working in this zone. The results showed that the great flooded wetlands disappeared since the time of the first correction of the "eaux du Jura" and that the habitat since never seemed good for *Emys orbicularis*. The survey near other professional fishermen showed the presence of the species until the Sixties around Portalban. In this precise zone, a fisherman frequently fished European pond turtles in the Fifties-Sixties, at the time of pike fishing, using bow nets. Fishing began again in the Eighties. From this date, only exotic turtles were captured there (*Trachemys scripta elegans* and *Pseudemys concinna hieroglyphica*). It should be noted that a female *Emys orbicularis* was captured on egg laying under Champmartin in 1965. It seems that currently only some rare zones of the Grande-Cariçaie are still favorable for European pond turtles. Several observations of European pond turtles were transmitted from naturalists to the Study and Management Group for the Grande-Cariçaie (GEG) in the last years.

Genetic status of *Emys orbicularis* in Switzerland

In Eastern Switzerland, the populations of European pond turtles are attached to the nominal form, *Emys orbicularis orbicularis*. The repeated observations of hatchlings in this area prove the breeding in nature. Moreover, the two older precise mentions of the species are only distant from less than 10 km of current sites.

In Western Switzerland also, some populations are probably of natural origin. They must be attached to a Mediterranean subspecies. Sporadic observations are made each year in this region. Some European pond turtles are also mentioned in Tessin. Their origin seems probably to be indigenous. For the mentioned reasons, it is difficult to affirm if the actual populations of European pond turtles are indigenous, mixed or introduced. The genetic studies in progress (in collaboration with a German laboratory via U. Fritz, European specialist in the taxonomy of the European pond turtles) of these populations will make it possible to clarify the medium-term situation, although indices show already the natural presence of turtles of the correct haplotype for Switzerland. Indications are given that the rarefaction and the splitting of favorable habitats could be the principal cause of the regression of *Emys orbicularis* in this country.

In 2003, several blood samples were taken from turtles of the Moulin-de-Vert and from a female found on the road, in the area of "La Côte". Blood was taken on the level of the caudal vein in order to stress the animals as less as possible. This operation is not easy but thanks to the motivation of volunteers, it could be carried out in a record time. Each blood sample is preserved in alcohol and in the refrigerator. After having lengthily searched a qualified laboratory in those analyses and with correct costs, we made contact with U. Fritz which enabled us to give our samples away to be ana-

lyzed in a laboratory at handsome price. Those are currently still in analysis.

DISCUSSION

In Switzerland, the red list of Amphibians and Reptiles species threatened and rare in Switzerland from 1980 indicates the European pond turtle like an extinct species (SCHAFFNER, 2002; WÜTHRICH, 2002). The causes of extinction indicated in this list were first of all direct hunting by man, the destruction of the vital habitats by the draining of marshes, the correction of waters..., as well as the climatic changes (too cold summers).

Thanks to the recent studies on this species, it was shown that indigenous individuals could have survived in some places of the Plateau Suisse and in Central Switzerland. Its status evolved in 2005, thanks to the work of the *Emys*-Project in Switzerland and similar projects, the European pond turtle currently changes from the status of disappeared species in Switzerland to species in critical danger of extinction (CR = critically endangered, according to the category list of the IUCN). This criterion is also based on the smallness of its distribution in Switzerland. *Emys orbicularis orbicularis* becomes a priority species of the herpetological fauna in Switzerland from the point of view of the conservation and reinforcement of the populations.

After the studies undertaken in the canton of Geneva by the *Emys* Project, contacts were taken with authorities of the SFPNP (conservation group) of this canton. A great interest was shown by the various protagonists in order to launch a project of reinforcement of populations and reintroductions in favorable places. Before going further with this project, the genetic analyses in progress will make it possible to have a precise idea of the genetic pool present in Geneva region. Everyone

hopes to be able to find indigenous individuals in order to reinforce such populations or to use some (eggs recovered and incubated, taking away of some individuals in large and well known populations...) for a global project of breeding and reintroduction. This program is currently under study and the *Emys* Project is happy to be able to collaborate with the authorities for this key stage of the conservation of the European pond turtle in Switzerland.

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