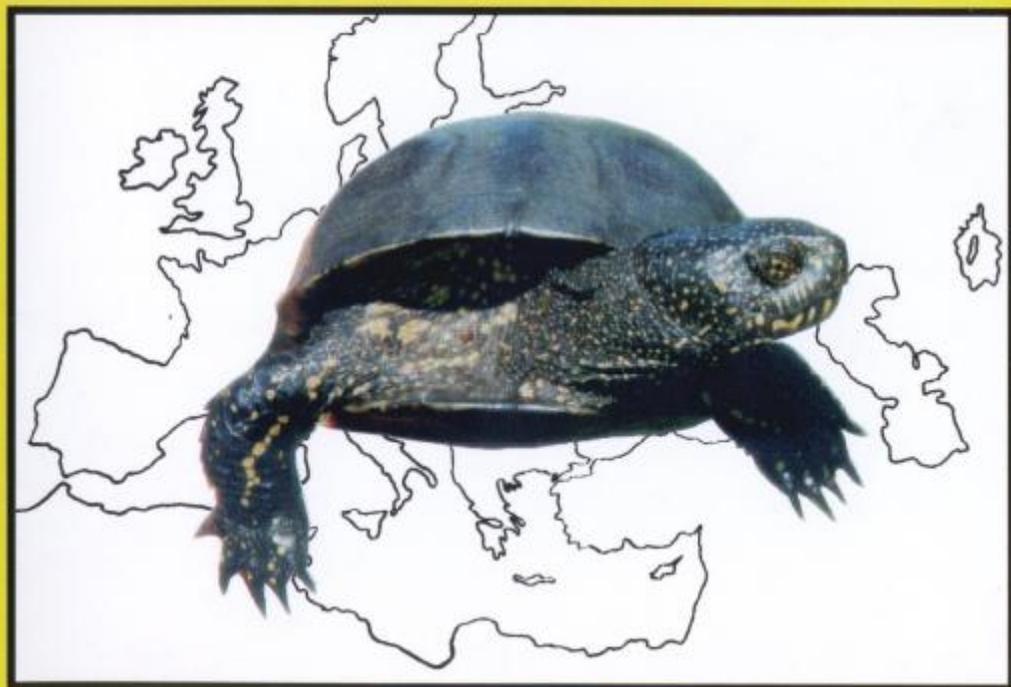


3rd International Symposium on *Emys orbicularis*

18 - 20 April 2002
Košice, Slovak Republic

Programme and Abstracts



Fauna Carpatica Košice, Slovak Republic
Východoslovenské múzeum Košice, Slovak Republic
Museum für Tierkunde Dresden, Germany
DGHT Rheinbach, Germany

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***Dear Attendees of the EMYS Symposium
at Košice,***

the 3rd International Symposium on Emys orbicularis continues a tradition which was established in 1996 at Dresden where the first symposium took place in the rooms of the State Museum of Zoology (Staatliches Museum für Tierkunde).

It is a good tradition. The “EMYS Symposiums” intend to unite researchers dealing with all zoological aspects of European pond turtles: Natural history, taxonomy, behaviour, and last not least conservation. The latter aspect is gaining more and more importance, especially due to habitat fragmentation in an European continent over-populated by man. Therefore, the 2nd International Symposium on Emys orbicularis, which was held in 1999 at Le Blanc in Central France, focussed on conservation aspects. The third symposium widens its scope again to all fields.

The first symposium at Dresden was located in Central Europe, the second one in West Europe, favouring participants either from Central or West Europe. In both cases, the participation of researchers from former East Block countries was impeded by the

comparatively high price levels in Germany and France, and this situation was even aggravated by the wide distances to travel.

This was the reason to decide in favour for Košice for the third symposium. Košice is located in the easternmost part of what was “Central Europe” for centuries. Today we are used to call it “East Europe” due to the sad history of the past century. Due to its geographic location Košice is easily reached from all directions and has a reasonable price-performance ratio, allowing the participation of researchers from countries which were underrepresented before. Thanks to financial support of DGHT (Deutsche Gesellschaft für Herpetologie und Terrarienkunde) it is possible to support even the participation of many attendees here.

Not only the exchange of research results and ideas requires that people meet. Also the idea of a Common European Society requires such an interchange. I am sure this symposium will contribute to both. Let's say cordially “thank you” to DGHT and especially for the proverbial hospitality of our Slovak hosts, guaranteeing an outstanding congress.

Košice, 18 April 2002

Uwe Fritz

Time Schedule

17 April (Wednesday) - arrival

12:00 - 24:00 Registration and time for authors to affix posters

18 April (Thursday) - lectures

07:00 - 09:30 Registration and time for authors to affix posters

08:00 - 09:00 Breakfast

09:30 - 10:00 Word(s) of wellcome

MORPHOLOGY AND SYSTEMATICS

10:00 - 10:20 GUICKING, D., FRITZ, U., LENK, P., WINK, M. and JOGER, U. Mitochondrial phylogeography of the European pond turtle *Emys orbicularis* (Linnaeus 1758)

10:20 - 10:40 POSCHADEL, J. mtDNA based metapopulation studies on *Emys orbicularis*

10:40 - 11:00 ŠIROKÝ, P., STUHLÍK, S., MORAVEC, J. and ŠPAČEK, J. Assessment of the morphology and distribution of the European pond turtle, *Emys orbicularis* (LINNAEUS, 1758), in the Czech Republic, with emphasis on findings from archeological sites

11:00 - 11:20 Discussion and break

CONSERVATION AND MANAGEMENT

11:20 - 11:40 MACIANTOWICZ, M. and NAJBAR, B. Active protection of the European pond turtle *Emys orbicularis* (L.) in the Lubuskie Province (West Poland)

11:40 - 12:00 PUKY, M., GÉMESI, D. and SCHÁD, P. Current knowledge on the conservation of *Emys orbicularis* in Hungary

12:00 - 12:20 VEYSSET, A. A story of conservation: actions to stop importation of *Trachemys scripta elegans* in France and Europe and the consequences for the conservation of *Emys orbicularis*

- 12:20 - 12:40 Discussion and break
- 12:40 - 13:00 MOSIMANN, D. and CADI, A. On the occurrence of the European Pond Turtle (*Emys orbicularis*, L., 1758) 50 years after first (re)introductions at Moulin-de-Vert (Geneva, Switzerland)
- 13:00 - 13:20 MIQUET, A. and CADI, A. A reintroduction program for the European pond turtle (*Emys orbicularis*) in Lake Bourget (Savoie, France): First results after two years
- 13:20 - 13:40 ROESSLER, M. Conservation strategies of *Emys orbicularis* in Austria combined with information of the public
- 13:40 - 15:00 Discussion and lunch
- 15:00 - 15:20 LACOMBA ANDUEZA, J. I. and SANCHO ALCAYDE, V. Advances in the action plan for *Emys orbicularis* in the region of Valencia (Spain)
- 15:20 - 15:40 CORDERO RIVERA, A. and AYRES FERNANDEZ, C. A management plan for the populations of *Emys orbicularis* from NW Spain
- 15:40 - 16:00 KIRSCHHEY, T. The EU Habitat Directive, the EU enlargement and the perspectives for conservation of *Emys orbicularis*
- 16:00 - 16:20 COIC, CH. and DÉTAINT, M. Following and valorization of two pond modifications in Lescar and Doazon (64, France): conservation actions and purposes for *Emys orbicularis* populations
- 16:20 - 16:40 Discussion and break

DISTRIBUTION AND HABITAT

- 16:40 - 17:00 KOTENKO, K. Some data on the population of *Emys orbicularis* from the Kerch Peninsula (the Crimea)
- 17:00 - 17:20 KOTENKO, T. The European pond turtle (*Emys orbicularis*) in the Crimea (Ukraine): distribution, habitats, abundance, problems of conservation
- 17:20 - 17:40 Discussion and break
- 17:40 - 19:30 Roundtables
- 19:30 - 20:30 Supper

19 April (Friday) - excursion to the Tajba Nature Reserve

- 08:00 - 09:00 Breakfast
09:30 Departure
11:00 - 14:00 Field excursion
14:00 - 16:00 Lunch
16:00 - 18:00 Excursion to Tokay cellar
18:00 Free evening

20 April (Saturday) - lectures

08:00 - 09:00 - breakfast

ECOLOGY AND POPULATION DYNAMICS

- 09:00 - 09:20 KIRSCHEY, T. Habitat requirements, causes of population decline and migration of *Emys orbicularis* in the Kuban-plain, northwestern Caucasus
- 09:20 - 09:40 MITRUS, S. and ZEMANEK, M. Survivorship of the European pond turtle in central Poland
- 09:40 - 10:00 MEESKE, A.C..M. Results of a radiotracking study of *Emys orbicularis orbicularis* in Lithuania
- 10:00 - 10:20 Discussion and break
- 10:20 - 10:40 SCHNEEWEIB, N. Climatic influences on the reproductive success of European pond turtles at their northwestern distribution border (Germany)
- 10:40 - 11:00 PAUL, R. Population viability analysis on European pond turtles (*Emys orbicularis orbicularis*, L.) in NE- Germany by computer simulation: idea and conception
- 11:00 - 11:20 NOVOTNÝ, M., DANKO, S. and HAVAŠ, P. The European pond turtle in the Tajba Nature Reserve (East Slovakia)
- 11:20 - 11:40 Discussion and break

- 11:40 - 12:00 MODRY, D. and KAMLER, M. Notes on the parasitofauna of *Emys orbicularis* and proposals for future research
- 12:00 - 12:20 AUER, M. and TAŞKAVAK, E. Ecology of *Emys orbicularis* and *Mauremys rivulata* at a locality in Western Turkey
- 12:20 - 12:40 SCHAFFNER, H. P. *Emys orbicularis* in Switzerland: can it continuously breed on its own?
- 12:40 - 13:00 SERVAN, J. and ROY, J..J. Is each of the females *Emys orbicularis* laying eggs every year in Brenne (France)?
- 13:00 - 14:40 Discussion and lunch
- 14:40 - 15:00 TRIPEPI, S. and ZUFFI, M. A. L. Body shape and reproductive strategies in Mediterranean *Emys orbicularis* in Italy
- 15:00 - 15:20 THIENPONT, S., CADI, A., QUESADA, R. and CHEYLAN, M. Overwintering habits of the European pond turtle (*Emys orbicularis*) in Isère (France)
- 15:20 - 15:40 CADI, A., NEMOZ, M., JOLY, P. and THIENPONT, S. Habitat use by the last European pond turtle (*Emys orbicularis*) populations in the Rhône-Alpes
- 15:40 - 16:00 KELLER, C. Population dynamics of *Emys orbicularis* in southwestern Spain: implications for conservation and management of long-lived organisms
- 16:00 - 16:30 Discussion and break
- 16:30 - 18:00 Discussion with authors of posters
- 18:00 - 19:00 Supper
- 20:00 - 24:00 Diner party

21 April (Sunday) - departure

08:00 - 09:00 - Breakfast

Posters

MORPHOLOGY AND SYSTEMATICS

AYRES FERNÁNDEZ, C. and CORDERO RIVERA, A. The incidence of assymetries and accessory plates in *Emys orbicularis* from NW Spain

TAŞKAVAK, E. and AYAZ, D. Some investigations on the taxonomic status of *Emys orbicularis* from the Aegean and Central Anatolia regions of Turkey

CONSERVATION AND MANAGEMENT

CADI, A., MIQUET, A. and FAVEROT, P. Conservation and reintroduction of an endangered species, the European pond turtle

FERRI, V. and BOFFINO, G. Recovery plan of *Emys orbicularis* in the Ticino Natural Park of Piedmont (North Italy)

SCHNEEWEIß, N. First results of the *Emys orbicularis* conservation project in Brandenburg (Northeastern Germany)

DISTRIBUTION AND HABITAT

BAKIEV, A. *Emys orbicularis* distribution in the Middle Volga river region

FATTIZZO, T. The distribution of *Emys orbicularis* (L.) in Salento (Southern Apulia - Italy)

KHABIBULLIN, V. *Emys orbicularis* in the South Urals, Russia

MAZANAIEVA, L. F. and ORLOVA V.F. Distribution and ecology of *Emys orbicularis* in Dagestan

PIOMBO, R., JESU, R., SALVIDIO, S., LAMAGNI, L., ORTALE, S. and GENTA, P. Habitat requirements and conservation measures for the European pond turtle in Liguria (NW Italy)

SEGURADO, P. and ARAÚJO, A. P. R. On the co-occurrence pattern of *Emys orbicularis* and *Mauremys leprosa* in Portugal

ŠIROKÝ, P. and ROZÍNEK, R. On the occurrence of the European pond turtle (*Emys orbicularis*) in the Natural Reserve „Vidnavské mokřiny“, Czech Republic

ECOLOGY AND POPULATION DYNAMICS

- BESHOVSKY, S., KIRSCHEY, T. and FILEV, M. European pond turtle mortality due to overrunning at the Poda wetlands near Burgas (Bulgaria)
- FERRI, V., SOCCINI, CH. and IMPERIALE, A. Epidemiology of syntopic populations of *Emys orbicularis* and *Trachemys scripta* in North Italy
- KELLER, C., DÍAZ-PANIAGUA, C. and ANDREU, A. Mortality causes of *Emys orbicularis* in a fluctuating environment
- KELLER, C. and GARCÍA-MUDARRA, J. L. Determinants of juvenile growth rates in a mediterranean populations of freshwater turtles: the relative importance of food and space
- NEMOZ, M., CADI, A. and THIENPONT, S. Has fishing an effect on the survival of *Emys orbicularis*?
- PAUL, R. Space use of European pond turtles (*Emys orbicularis orbicularis*, L.) in NE-Germany
- SCHNEEWEIß, N. The demography of European pond turtle populations at the northwestern distribution limit of the species (Germany)
- SCHWEITZER, S. The physiology of the energy metabolism of the European pond turtle (*Emys orbicularis*)
- ZINENKO, O. Hatchlings of *Emys orbicularis* L. feed on their way to the water

Abstracts

The incidence of assymetries and accessory plates in *Emys orbicularis* from NW Spain

CÉSAR AYRES FERNÁNDEZ^{1,2} and ADOLFO CORDERO RIVERA¹

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The populations of the European pond turtle in northwestern Spain are isolated from the most important nuclei of this species in the Iberian peninsula, and this species is the most endangered reptile in Galicia (Nw Spain). We did a biometrical analysis of 120 individuals measured during 1996-2001 in the valley of the Louro river. We found that 90-95 % of the individuals show at least one accessory plate, and that all the hatchlings show accessory plates. A second population sampled in 2001, isolated from the former, shows lower rates of accessory plates. Here we describe the most common abnormalities that appear in both populations and discuss some explanations for this fact.

POSTER PRESENTATION

Mitochondrial phylogeography of the European pond turtle *Emys orbicularis* (Linnaeus 1758)

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In continuation of the studies by P. Lenk et al. on the phylogeography of the European pond turtle *Emys orbicularis*, we have analysed almost 200 new samples, of which several originated from hitherto unstudied localities. Haplotypes were inferred from DNA sequences of the mitochondrial cytochrome *b* gene. Eight new

haplotypes were found, most of these differ at only one nucleotide position from previously described haplotypes. Three specimens collected in southern Turkey yielded a completely new haplotype. For several haplotypes the geographical ranges of occurrence could be extended. The new data allow further conclusions on the phylogeography and postglacial colonization routes of the European pond turtle.

ORAL PRESENTATION - 18 April, 10:00 - 10:20

mtDNA based metapopulation studies on *Emys orbicularis*

JENS R. POSCHADEL^{1,2}

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Metapopulation studies have been carried out on three *Emys orbicularis* subspecies with the intention to compare possible migration distances between subpopulations. The investigation bases on mtDNA control region sequence data, using a highly informative 360 bp fragment located at the 5'-end of this genetic marker. Two research areas with recapture data references covering at least ten years were chosen: 1) Doñana National Park in the Gulf of Cadiz (southern Spain) with 5 distinct populations separated by a maximum distance of 16 km, and 2) Brandenburg (eastern Germany) and Poland, respectively with 2 and 4 populations, probably representing two subspecies and interpopulational distances of about 100 km. The area of Brandenburg and Poland is of special interest because former studies based on morphological data suggested that only one subspecies exists in that region, whereas genetic analyses indicated the occurrence of different mtDNA cytochrome b haplotypes for german and polish specimens, which established even more clearly through the analysis of the mtDNA control region. The examination of german and polish populations indicates reduced intrapopulational differentiation, but interpopulational genetic differences are greater than, for example, between german and spanish specimens. The results agree with glacial migration hypotheses and lead to the assumption that there exists a zone of interbreeding in central Poland. It will be of great interest to uncover the metapopulational structure in region. The analyses of the samples from Doñana resulted in no substantial differences in sequence data among subpopulations, despite recapture data from C. Keller for 10 years indicate a reduced exchange rate among the 5 subpopulations examined. Recapture data for german and polish populations were kindly made available by Norbert Schneeweiss and Slawomir Mitrus.

ORAL PRESENTATION - 18 April, 10:20 - 10:40

Assessment of the morphology and distribution of the European pond turtle, *Emys orbicularis* (LINNAEUS, 1758), in the Czech Republic, with emphasis on findings from archeological sites

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Emys orbicularis is underrepresented in zoological collections, which gives evidence to our lack of knowledge about the historical and current occurrence of this species in the Czech Republic. On the contrary, the distribution of *E. orbicularis* up to 1000 years ago is much better known, due to several records of pond turtles from archeological excavations. The localities of occurrence of fossil and sub-fossil turtle records are concentrated in two natural geographic regions – the Bohemian depression along the Labe (Elbe) river, and the South Moravian lowland along the Morava (March) and Dyje (Thaya) rivers - and are dated from the Lower Pleistocene (Günz/Mindel Interglacial) to the first millenium after Christ. The relatively high number of Holocene specimens encouraged us to make a simple morphological analysis, with the aim of obtaining basic data on measurements, plastral scute arrangement, size and proportion of European pond turtles from that period. Despite unconfirmed sightings of turtles over the last years, no population of pond turtles is known to exist in the Czech Republic today.

ORAL PRESENTATION - 18 April, 10:40 - 11:00

Some investigations on the taxonomic status of *Emys orbicularis* from the Aegean and central Anatolia regions of Turkey

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In this survey we examined a total of 219 *Emys orbicularis* specimens collected at 7 localities featuring different ecological and geographical characteristics in western and central Anatolia: Izmir (18 ♂ and 18 ♀), in the Aegean region; Kütahya (5 ♂

and 4 ♀) in western Central Anatolia; Mogan (20 ♂ and 11 ♀) and Boget (72 ♂ and 25 ♀), in Central Anatolia; and Gömeç (7 ♂ and 3 ♀), Şeker (8 ♂ and 4 ♀) and Soysallar (17 ♂ and 7 ♀), in eastern Central Anatolia. In order to investigate the morphological differences and similarities among populations we compared 25 different ratios, developed through the combination of two by two morphometric measurements. In addition to the morphometric comparisons among populations, sexual dimorphism and growth parameters ($W=aLb$) were also considered. A discriminant analysis based on the 14 morphometric characters and 25 ratios clearly confirmed the differences between the *Emys orbicularis* specimens from the Aegean and Central Anatolia regions. In a future study we intend to collect specimens from southern Central Anatolia where *Emys orbicularis luteofusca* was described, with the aim of analyzing whether the morphological differences seen in southern Central Anatolia change gradually or abruptly, and whether this corresponds with a change of habitat or other ecological conditions, or otherwise with a geographical barrier.

POSTER PRESENTATION

Conservation and reintroduction of an endangered species, the European pond turtle

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We have created an exposition to be used for educational purposes by teachers and other persons involved with the promotion of environmental awareness and the conservation of the European pond turtle (*Emys orbicularis*). The material is composed of nine posters that were designed by the Conservatoire Rhône-Alpes des Espaces Naturels and the Conservatoire du Patrimoine Naturel de la Savoie as part of the activities of the Life Program “Lake Bourget”, with support from the European Community. Each poster explains one aspect of the biogeography, life history or conservation of *Emys orbicularis*:

Poster 1: History and distribution of the European pond turtle

Poster 2: A cold blooded animal

Poster 3: An aquatic life

Poster 4: Reproduction

Poster 5: An endangered species

Poster 6: The introduced slider turtle (*Trachemys scripta elegans*)

Poster 7: The release protocol

Poster 8: The reintroduction project of Lake Bourget

Poster 9: Habitat conservation

POSTER PRESENTATION

Following and valorization of two pond modifications in Lescar and Doazon (64, France): conservation actions and purposes for *Emys orbicularis* populations

CHRISTOPHE COIC ^{1,2} and MATHIEU DÉTAINT ¹

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No abstract.

ORAL PRESENTATION - 18 April, 16:00 - 16:20

A management plan for the populations of *Emys orbicularis* from NW Spain

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The European pond turtle is the most endangered reptile in Galicia (NW Spain). Only 2-3 large populations are known in the region, and the species is almost absent from North Portugal, suggesting that Galician populations are isolated at present. Here we present an analysis of the population at the Louro river (Pontevedra province), that is constituted of approximately one hundred animals. Field work was carried out from 1996 to 2001 and allowed us to estimate the sex-ratio, survivorship and recapture rates, reproduction, mobility between ponds, and size distribution of the population. We were unable to find the nesting areas of the studied population and, therefore, had no information about clutch size. Nevertheless, we show from a review of published information about other populations that clutch size can be estimated from body size (SCL) of adult females. Population demographic parameters were entered into the VORTEX program to perform a Population Viability Analysis.

We identified 6 main problems for the conservation of this species in the area:

- (1) Introduction of exotic species (predators: black-bass; competitors: *Trachemys scripta*);
- (2) Capture of wild animals for the pet trade;
- (3) Direct disturbance to the animals;
- (4) Population stochasticity due to small population size;
- (5) Habitat destruction due to conversion of wetlands to industrial soil;
- (6) Water and soil pollution.

ORAL PRESENTATION - 18 April, 15:20 - 15:40

A recovery plan for *Emys orbicularis* in the Ticino Natural Park of Piedmont (Northern Italy)

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The Parco Naturale della Valle del Ticino and the Regione Piemonte (North Italy) have started a recovery plan for *Emys orbicularis* in wetland areas of the Ticino river in 1998. The goals of this conservation program are:

- a) define the actual status of *E.orbicularis* in the Ticino valley, with ecological and distribution information, for use in conservation decisions;
- b) identify areas where relictual natural populations exist and provide them with long term protection;
- c) determine all actual threats to the species in the Park;
- d) collect a reproductive stock of *E.orbicularis* in a suitable area for controlled breeding;
- e) find suitable areas in the Park for the long-term release of hatchlings;
- f) promote public education campaigns about the species and its conservation.

We present the results of four years of activities and discuss the future perspectives of the recovery plan.

POSTER PRESENTATION

The EU Habitat Directive, the EU enlargement and the perspectives for conservation of *Emys orbicularis*

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The EU Habitat Directive of 1992 is the most important nature conservation law on the EU level. Presently about 15 % of the EU area consist of so called Natura 2000 sites or Sites of Community Interest. *Emys orbicularis* is listed in Appendix II of the Habitat Directive, which has important legal implications for the species' conservation in EU member states and candidate states. I present an overview of the relevant developments in conservation regarding *Emys orbicularis* in the EU, with

emphasis to differences in the interpretation and implementation of European pond turtle conservation among some member states.

ORAL PRESENTATION - 18 April, 15:40 - 16:00

Advances in the action plan for *Emys orbicularis* in the region of Valencia (Spain)

J. IGNACIO LACOMBA ANDUEZA^{1,3} and VICENTE SANCHO ALCAYDE²

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The distribution and status of *Emys orbicularis* was the subject of a previous communication presented by the authors during the Second International Symposium. The distribution was determined after field research carried out by the authors and bibliographic scrutiny. Additionally, a poster on the Action Plan for the species was also presented. Since then, significant advances on the knowledge of the distribution, conservation and management planning for the species have been achieved. Recent sampling has confirmed the presence of the species in 4 out of the 16 localities where it had previously been detected (nevertheless, the fieldwork is still going on). Conservation measures for the species are focused on habitat protection, which is being implemented through the local Nature Parks network, local Wetlands network, and the Natura 2000 network. The development of the above mentioned Action Plan has allowed the implementation of complementary preservation measures.

ORAL PRESENTATION - 18 April, 15:00 - 15:20

Active protection of the European pond turtle *Emys orbicularis* (L.) in the Lubuskie Province (West Poland)

MAREK MACIANTOWICZ^{1,3} and BARTŁOMIEJ NAJBAR²

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In the Lubuskie Province the presence of *Emys orbicularis* has been established in 74 localities along the XX century. In 21 of these localities turtles have not been observed since 1980, and therefore it is assumed that at present the species continues to exist in only 53 of the original localities. In 28 localities only single, old individuals have been observed. There are four active breeding sites. Populations with a typical age structure occur only very rarely. The local extinction of pond turtles in Poland is mainly related to the degradation and decay of their habitats. Land ameliorations carried out in 1960ies and 1970ies contributed to the drying of many bogs and waterlogged lands. Many breeding grounds located on xero-thermal turfs, fields and wastelands were destroyed by tree plantation projects. Predators considerably threaten eggs and young turtles. Since the mid-1990ies activities related to active protection of this species in Western Poland have been undertaken. Water-muddy biotopes have been restored through the construction of water gates and cultivation and the restoration of natural breeding grounds through the cutting off trees and bushes. Egg-laying sites are fenced in to protect them from predators. At the same time populations in better conditions are receiving legal protection. In Poland *E. orbicularis* is considered an umbrella species, and protection zones are established around localities where populations of pond turtles still exist. Since 1999 a breeding program has been conducted. In 2000 – 2001 55 individuals (41 in 2000 and 14 in 2001) were released into the wild. Currently there are 25 individuals from this area in the breeding program. Education activities are also carried out, including lectures and training of school children, forest wards and naturalists. The protection of pond turtles is getting public attention and space in the local media. The concept of gradual restoration of turtle habitats has been developed, with the aim of recovering populations at localities along the ecological corridor of the Odra river valley. The first objective was the selection of several localities where *E. orbicularis* had been present for the release of young turtles from captive breeding programs, with the aim of providing these localities at the central Odra river with turtles from local breeding stocks. During the next years, besides the maintenance of the captive breeding program, one of our main tasks will be the location and management of new potential breeding grounds along the Odra river ecological corridor.

ORAL PRESENTATION - 18 April, 11:20 - 11:40

On the occurrence of the European Pond Turtle (*Emys orbicularis*, Linnaeus, 1758) at A reintroduction program for the European pond turtle (*Emys orbicularis*) in Lake Bourget (Savoie, France): First results after two years

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The reintroduction program of the European pond turtle (*Emys orbicularis orbicularis*) in Lake Bourget was designed in 1995. The release site is a complex of two ponds comprising 6 ha of reedbeds and 6 ha of open water surface, with a water depth of 20 - 150 cm. The two ponds are connected by a 150 m long ditch, on the edge of Lake Bourget (18 km long), close to a 3 km extension of reedbeds (with *Nuphar* and *Nymphaea* stands). Twenty seven adult pond turtles were captured in the wild in central France (Brenne) and were released at the Lake Bourget ponds in three groups between 2000 and 2002. All animals were radio-tracked daily during the activity season and once a month during winter. Individual home-range sizes and habits were recorded. The following indicators of the establishment of a founder group were obtained:

- most animals stayed within the releasing pond all year long, in spite of summer emptying for management purposes;
- several individuals (mostly females) explored a part of Lake Bourget (1 to 6 km away);
- these movements were shorter and less frequent in the second group;
- all dispersing individuals returned to the release point for overwintering;
- several females were observed in digging activity within the artificial nesting site, while others shifted to other habitats around the "egg-laying site" during the same period;
- of the 27 individuals released in 2000 and 2001, one subadult was found dead, and radio-transmission stopped working for 6 individuals (two of them were recaptured by trapping in 2001).

The results obtained so far - high survival rates, fidelity of turtles to certain areas, habitat exploration, and apparent nesting behaviour - indicate that the prospects of the reintroduction program of *E. orbicularis* in Lake Bourget are positive. However, other important parameters, like reproductive output, nesting and hatching success and juvenile survival) need to be estimated in order to ascertain the successful establishment of the population.

ORAL PRESENTATION - 18 April, 13:00 - 13:20

On the occurrence of the European Pond Turtle (*Emys orbicularis*, L., 1758) 50 years after first (re)introductions at Moulin-de-Vert (Geneva, Switzerland)

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A group of more than 25 *Emys orbicularis* (16 females and 9 males) was introduced in 1950 in Moulin-de-Vert (Switzerland), ten years after the construction of three ponds. In 2001 we spent 6 months estimating the status of this population. Our data is composed of 1457 sightings with binoculars and 462 trapped turtles. Population density was 89 turtles per ha, with a balanced ratio between adults and juveniles, and a sex ratio of 1 M : 1.47 F. This density far exceeds that of typical wild populations. Our presentation summarizes the distribution of *E. orbicularis* in Switzerland. The recent decline of *E. orbicularis* and the poor outcome of relocations lack clear explanations. Another study in 1998 and a national census published in 2001 reveal how little is our knowledge about the present status of the species in Switzerland.

ORAL PRESENTATION - 18 April, 12:40 - 13:00

Current knowledge on the conservation of *Emys orbicularis* in Hungary

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Emys orbicularis is the only native chelonian species in Hungary. Although it is protected under the Hungarian Environmental Act with a fine of 50,000 HUF (appr. 200 EUR) for harming or killing an individual, little is known on the actual

conservation status of the species. It used to be abundant in the lowlands, where most of its aquatic habitats have disappeared in the past 150 years. Besides semi-natural lentic and lotic waters, today it is also present in channels, fishponds and other artificial water bodies. Viable populations exist even in forest ponds in mountainous areas, where suitable egg-laying sites are present. It was recorded from nearly 150 10 x 10 km UTM squares in the past 30 years, which makes it the reptile with the fourth largest known distribution area in the country. Both natural and anthropogenic factors are known to endanger *Emys orbicularis*, causing local extinctions e.g. through habitat destruction or fragmentation. Drought seemed to affect *Emys orbicularis* populations in less stable aquatic systems. Urbanisation and the extensive use of aquatic systems pose a serious threat on the species, together with isolation due to the development of the national road network and increasing traffic. Sporadic records of *Trachemys scripta elegans* in the wild are known as well. Since the launching of the “1998 - The Year of *Emys orbicularis*” conservation and education programme by the Toad Action Group and the Nymphaea Nature Conservation Association, distribution data on the species are more systematically collected. The educational aspect of *Emys orbicularis* conservation is also of special importance, since it is a species with perfect biological characteristics (e.g. body size, life span, etc.) to increasingly captivate human attention, as is evidenced by ancient mythology and modern art as well. *E. orbicularis* has the potential to become not only a keystone species in biological monitoring but also a symbol of wetland conservation.

ORAL PRESENTATION - 18 April, 11:40 - 12:00

Conservation strategies of *Emys orbicularis* in Austria combined with information of the public

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Since 1999 a management plan for the population of *Emys orbicularis* in the Austrian part of the Lower Donau-Auen National Park has been in operation. The first measure to be implemented was to stagger the times of mowing in relation to the egg-laying and hatching seasons. Since 2000 five new nesting sites were found in the Viennese part of the National Park, posing new challenges for the conservation of sites laying so close to a large urban center like Vienna. The information of the public is now one of our most important tasks. Up to now we issued articles in newspapers, folders, a book and four exhibitons, telling about the

biology, life history and ecological requirements of this endangered species. Since 2001 a new *Emys*-center combines conservation measures with information for the visitors of the National Park. People are lectured about the importance of avoiding disturbances to the water arms where turtles live and to the nesting sites, and are urged not to go to these places in order to look for turtles. With the aim of enabling the visitors to watch turtles, a fish pond inhabited by *Emys orbicularis* was adapted as an observation center. Basking turtles can be observed from two observation hides. Up to 96% of the turtles living in the pond started to use the new basking possibilities offered to them. Nesting sites at the pond were protected to avoid predation, and only one nest was destroyed since the onset of protection measures. From the observation hides it was possible to watch basking turtles on 82 occasions during 22 days - only on 4 days no turtle could be seen. Our objective in creating this center was to combine practical management strategies and public awareness campaigns at a site of actual importance for the pond turtles, located in the heart of the National Park. In this way we intend to be able to achieve the effective conservation of the population of the European pond turtles, including the possibility of migration of individuals to and from other sites, while at the same time giving the visitors the opportunity to experience the pond turtles in their wild habitat.

ORAL PRESENTATION - 18 April, 13:20 - 13:40

First results of the *Emys orbicularis* conservation project in Brandenburg (Northeastern Germany)

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A conservation project for the last residual populations of *Emys orbicularis* in Brandenburg (Northeastern Germany) was started in 1994. The aims of the project were: (1) to determine the current number and conservation status of *E. orbicularis* populations in Brandenburg; (2) to determine the factors that threaten populations; (3) to obtain knowledge about the biology and ecology of existing populations; and (4) to achieve the recovery, stabilization and sustainable management of these populations. Only 6 autochthonous residual populations, each composed of 3 to 12 adult animals were identified in the course of the project. Most of the populations known from earlier studies are now extinct. The most important conservation measures that are being carried out are: (1) the creation of conservation areas; (2) the protection of aquatic habitats (water level and habitat structure management);

(3) the protection of egg-laying sites (creation and management of meadow areas with adequate insolation levels, protection against predators); and (4) ex-situ support measure through the artificial breeding of eggs and release of juveniles into the wild. In addition to the above mentioned conservation activities a long term study on the dynamics, habitat relations and climatic constraints on the performance of the Brandenburg populations of *E. orbicularis* is taking place.

POSTER PRESENTATION

A story of conservation: actions to stop importation of *Trachemys scripta elegans* in France and Europe and the consequences for the conservation of *Emys orbicularis*

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European pond turtles (*Emys orbicularis*) remain relatively unknown to the general public in France. The cistude turtle came out into the open only ten years ago when a national campaign was launched to stop the importations of North American turtles (among them *Trachemys scripta elegans*). These turtles destroy the natural surroundings of the cistude. From 1992 until 1997 numerous actions have been undertaken by a limited number of conservationist people, originally the founders of the Group Cistude of S.H.F. who were quickly followed by members of associations for the defense of nature or animals. Delegations were organised to further the dialogue with authorities, and petitions, press conferences and demonstrations have followed one another. At the same time various books, scientific publications, educational exhibits, and a film have been devised covering both species, aimed at discovering animals in their natural surroundings while improving our knowledge on their biology. Our objectives are to develop better eradication policies for exogenous species and to manage native populations so as to rediscover a preserved natural habitat.

ORAL PRESENTATION - 18 April, 12:00 - 12:20

The distribution of *Emys orbicularis* in the Middle Volga river region

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Data on the distribution of the freshwater turtle *Emys orbicularis* in the Samara and Ulyanovsk provinces of Russia are presented, based on own observations and those of other experts working in that region (V.A. Krivoshejev, D.V. Magdejev, V.M. Shaposhnikov). Observations were made during 1977-2001 in 11 districts of the Samara province (Bolshechernigovskij, Borskij, Volzhskij, Kinelskij, Krasnojarskij, Pestravskij, Pokhvistnevskij, Sergievskij, Stacropolskij, Syzranskij, Khvorostianskij) and 9 districts of the Ulyanovsk province (Karsunskij, Kuzovatovskij, Melekesskij, Nikolaevskij, Novospasskij, Pavlovskij, Surskij, Terengulskij, Ulanovskij). Records of *E. orbicularis* in water reservoirs in a city of Samara were obviously owed to the release of turtles from captivity.

POSTER PRESENTATION

The distribution of *Emys orbicularis* (L.) in Salento (Southern Apulia - Italy)

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In some parts of Southern Italy reliable and up to date information on the current conservation state and activity of *Emys orbicularis* (Linnaeus, 1758) is scarce. It is for this reason that a detailed study has been undertaken on the distribution of pond turtle populations in the region known as Salento (Southern Apulia – “the heel” of Italy). Fifteen sites have been studied and censused, at least five of which are inhabited by reproductive populations. All the localities studied are situated along the Adriatic and Ionic coast. The study confirmed that *E. orbicularis* populations are dwindling and might face extinction in the very near future. From a historical perspective, from the end of the nineteenth century to the first half of the last century the wet zones of the Salentine peninsula have been subjected to great environmental upheaval, which radically transformed the landscape. This has been

due to various factors, mainly large scale land reclamation projects undergone in the past, and, more recently, the intense and at times unauthorized urbanization of the coast for tourism, the cementation of channel banks, the alteration of the sand-dune system caused by natural erosion and coastal withdrawal, and the increasing exploitation of ground water resources. All of these factors have jeopardized the already precarious state of *Emys orbicularis*, thereby causing an ever increasing populational decrease. Three of the sites studied represent a particular cause of concern, because they are inhabited by the exotic pond terrapin *Trachemys scripta*, which is well adapted to the local environment, as evidenced by its reproductive success. At present only two populations of Salentine *Emys orbicularis* can be considered as sufficiently protected. The other sites are not subject to any form of protection. It is therefore suggested that various safety measures should be adopted in order to save this species from possible extinction in the region, through proposals for the creation of special protection zones, and programmes of assisted breeding and the reintroduction of the species.

POSTER PRESENTATION

***Emys orbicularis* in the South Urals, Russia**

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The northeastern border of the distribution area of the European pond turtle *Emys orbicularis* (L., 1758) extends along the territory of the South Urals (within the limits of Bashkortostan, Orenburg and Chelyabinsk regions). Some aspects of the biology of *E. orbicularis* are presented. The data on distribution of *E. orbicularis* are based on original field research (1994-1999), as well as on data obtained from museum collections, literature and personal communications from the South Urals. In the western part of the South Urals *E. orbicularis* has been registered far more to the north (at least 180 km) than in the Trans-Urals. Thus the southern foothills of the Ural mountains serve as an obstacle for the northward expansion of this species (Khabibullin, 1999). We think that at present the European pond turtle inhabits the basins of the Ural and Belaya rivers and that the northern distribution border of *E. orbicularis* can be drawn as an approximate line passing Buguruslan - Abdulino - Fyodorovka - Meleuz - Zilair - Sibay - Bredy. The reduction of the turtle's distribution area and the decrease in its population density (Yakovlev et al., 1997) is probably caused by habitat fragmentation, environmental changes, as well as by increasing anthropogenic pressure and uncontrolled captures of turtles. In the future

there will probably occur further reductions in the distribution area of the European pond turtle in the South Urals.

POSTER PRESENTATION

Some data on the population of *Emys orbicularis* from the Kerch Peninsula (the Crimea)

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This communication presents my analysis of the data obtained by T. Kotenko in the field (36 parameters), and the comparison of our results with literature information and collection material of the National Museum of Natural History (Kiev). Field research was carried out on 14–16.06.2001 in the settlement Eltigen, southward of Kerch. In this locality *E. orbicularis* inhabits artificial water bodies made on the sandy coast of the Kerch Strait, that connects the Black Sea with the Azov Sea. Turtles were caught in one pond by means of 2 fishpots. During 2 days 19 turtles were caught, of which 6 were adult males, 6 adult females, and 4 juvenile females. Measurements were as follows, indicating maximum and minimum values, with the arithmetic mean and one standard deviation in parenthesis. Adult males: age 5–8 years (according to growth annuli counts), body weight 400–460 g (428.3 ± 9.5), straight carapace length (SCL) 135.3–140.7 (138.60 ± 0.95); adult females: age 7–11 years, body weight 620–950 g (743.3 ± 50.4), SCL 147.5–172.5 (158.53 ± 3.51); juvenile females: age 3–4 years, body weight 120–300 g, SCL 82.6–115.3 mm. Three females for which sexual maturity was controversial were 5 years old, had 440–450 g body weight and SCL 130.0–132.6 mm. Although comparisons with other populations should be made with caution, due to our small sample size, body size of the Eltigen turtles seems to be close to that of the Dnieper Delta specimens and larger than in specimens known for the Crimea from literature (Shcherbak, 1966).

ORAL PRESENTATION - 18 April, 16:40 - 17:00

The European pond turtle (*Emys orbicularis*) in the Crimea (Ukraine): distribution, habitats, abundance, problems of conservation

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Data on distribution and ecology of *E. orbicularis* in the Crimea were summarised in a monograph by N. Shcherbak, published in 1966, and since that time this information was neither widened nor updated. The presence of *E. orbicularis* was known for only 6 localities in the Lowland Crimea. In 2000–2001 new data on the species' distribution, habitats and abundance were obtained for this region. The presence of *E. orbicularis* was confirmed for 15 new localities. In some ponds of the Kerch Peninsula *E. orbicularis* is abundant. In the Sivash area its abundance and occurrence have obviously increased after the construction of the North Crimean Canal (NCC). Our findings allow us to suppose that *E. orbicularis* is widely distributed in the Sivash area along the NCC and in adjacent territories. In the mountainous part of the Crimea *E. orbicularis* was abundant near Luchistoe (surroundings of Alushta): in 5 small ponds, during 6 days, 65 turtles were observed – up to 14 specimens being caught in a single day (Shcherbak, 1966). It was still abundant in the 80s of the last century. But in 2000 only 3 individuals were detected in 8 ponds during a period of 5 days. The decline in the abundance of *E. orbicularis* in this area is owed mainly to illegal commercial overcatching, which took place in the 90s of the last century. The mountain populations of *E. orbicularis* differ in morphology and genetics from the lowland populations of the Crimea and need strict protection.

ORAL PRESENTATION - 18 April, 17:00 - 17:20

Distribution and ecology of *Emys orbicularis* (Linnaeus, 1758) in Daghestan

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The European pond turtle is the most common chelonian in Daghestan. It inhabits almost all freshwater and brackish water reservoirs of the lowland and foothill zone, up to altitudes of 800-900 m above sea level. In the Tersko-Kumskaya lowlands, the distribution the European pond turtle has a patched character and population density is low (10-20 specimens per 100 m water edge). In the southern Tersko-Sulakskaya lowlands, living conditions for *E. orbicularis* are most favorable, including abundant feeding resources and egg-laying sites. Populations of the river Terek delta and of the Agrakhanskiy Bay are presumably the most abundant (20-30 specimens per 100 m water edge). A considerable part of the Primorskaya lowland territory is urbanized, and pond turtles became nearly a synanthropic species here. They occur in irrigation channels, shallow water bodies of river valleys, and small water reservoirs of towns and villages, including strongly polluted ones. In this region *E. orbicularis* has a fragmentary distribution and their numbers are lower (5-10 specimens per 100 m along the banks of the Rubas and Sulak rivers). In the foothills, up to altitudes of 500-600 m above sea level, the pond turtle inhabits most water bodies, but its numbers are lower compared to the lowland part. European pond turtles hibernate from late October – early November to late March – to early April. In warm weather they can be active also in winter months. Depending on the region and weather conditions, mating occurs from the end of April to the end of May. Turtles start breeding after reaching straight carapace lengths of 8-10 cm in males and 9-11 cm in females. They lay three clutches in a season, with clutch size varying from 2-14 eggs. Hatchlings have a length of about 3 cm and hatch in August - September. Only the specimens from the first clutch come out to the surface. During the last decades, the numbers of the pond turtle in the Primorskaya lowlands decreased considerably, which is related to the drastic reduction of water level in rivers, caused both by the deviation of water from rivers for economic purposes and by the aridization of the climate.

POSTER PRESENTATION

Habitat requirements and conservation measures for the European pond turtle in Liguria (NW Italy)

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We present data on the ecological conditions of the wetland habitats in the Albenga plain (province of Savona) inhabited by the last remaining individuals of the European pond turtle *Emys orbicularis* in Liguria. Most of the turtle's primary habitats in this region – coastal temporary ponds, river pools, slow-flowing streams - have been heavily altered or destroyed during the 1960s and 1970s, when traditional farming activities have been substituted by intensive agriculture. For this reason, the present occurrence of pond turtles seems to be mainly restricted to secondary habitats showing environmental conditions similar to natural primary habitats: slow-flowing water bodies created by the construction of small dams on fast-moving streams, permanent or temporary pools within abandoned quarries on clay substrate. The conservation measures undertaken in order to protect these biotopes and to ensure the survival of pond terrapins in Liguria are discussed.

POSTER PRESENTATION

On the co-occurrence pattern of *Emys orbicularis* and *Mauremys leprosa* in Portugal

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On the Iberian Peninsula the western limit of the geographical range of *Emys orbicularis* overlaps with the northern limit of the range of *Mauremys leprosa*. Given their distinct distributions, which probably reflects distinct ecological adaptations, we expect some geographical segregation to occur between the species on the Iberian Peninsula. Coexistence patterns of both species in Portugal were analyzed at coarse and local scales. At a coarse scale occurrences were related to environmental variables (climate, geomorphology, landscape features and human population density) compiled in UTM 10 x 10 km grid squares, using a generalised additive modelling (GAM) procedure and a Geographic Information System (GIS). We used presence/absence data as response variables for the models, compiled from a recently updated Atlas of the Portuguese Herpetofauna. Although some isolated populations of *Emys orbicularis* occur in northwestern Portugal, most occurrences

are located within the geographical range of *Mauremys leprosa*. For both species, the highest probabilities of occurrence predicted by the models are mostly located at the southeastern part of the country. At the local scale, *E. orbicularis* occurrences were related with the abundance of *M. leprosa* estimated through visual censuses along 200 m transects along streams. At this scale *E. orbicularis* tends to prefer habitats where *M. leprosa* is more abundant. No marked spatial segregation between both species seems to occur in Portugal, at least at the geographical scales analyzed in this study.

POSTER PRESENTATION

On the occurrence of the European pond turtle (*Emys orbicularis*) in the Natural Reserve „Vidnavské mokřiny“, Czech Republic

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Despite the scarcity of reliable sightings of *Emys orbicularis* in some areas of the Czech Republic it is possible that the species still occurs naturally in these areas. The Natural Reserve „Vidnavské mokřiny“ (wetlands of Vidnava) has frequently been mentioned as one of the places with highest probability of occurrence of *E. orbicularis*, with many sightings of *E. orbicularis* having been recorded for this site. These sightings, however, are generally unreliable. Some local inhabitants of Vidnava are quite familiar with turtles. The Natural Reserve is located very close to the Polish border, and pond turtles entering the Reserve could only come Poland. However, we have obtained not yet confirmed information that in 1968 a few pond turtles, probably brought from the Ropotamo river basin in Bulgaria, might have been released in the Reserve. We started a monitoring program for European pond turtles in the Reserve in 1996. In September 2000 the remains of an adult male with expected indigenous morphology were found. This finding encouraged us to carry out a thorough survey of the whole Reserve, employing 12 traps borrowed from Germany. Traps were baited with fowl cow heart, and were used during 23 days in May and June 2001. No turtle was captured during this period. We are quite sure now that there is no significant population of *Emys orbicularis* in „Vidnavské mokřiny“ Natural Reserve.

POSTER PRESENTATION

Ecology of *Emys orbicularis* and *Mauremys rivulata* at a locality in Western Turkey

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Ecological studies were carried out on a sympatric population of *E. orbicularis* and *M. rivulata* in a mountainous area near Foca in Western Turkey, from May to October 2001. *Emys* and *Mauremys* live in small and shallow natural and man made ponds, whereas only *Mauremys* was seen floating in the water of a near spring. Telemetry studies showed that both species leave the drying out water bodies in summer (July-October) to aestivate in dry places under nearby vegetation. Adults and juveniles inhabit the same ponds; juveniles prefer the shallow parts and stay for longer periods in drying out water. Samples of faeces taken from different size groups of the two species showed that *Emys* has a preference for animal food, mainly insects and mollusks, but also including some fruit. *Mauremys* seemed to eat everything available in and near the water, including plant material like grass and different fruits. Three nests destroyed by predators were found close to a pond in a meadow in September. We captured and marked 13 adult males, 9 adult females, and 27 juvenile *Emys orbicularis* and 41 adult males, 16 adult females, and 41 juvenile *Mauremys rivulata*. Survival of the population is discussed in the context of land use recommendations that will ensure the protection of turtles.

ORAL PRESENTATION - 20 April, 12:00 - 12:20

European pond turtle mortality due to overrunning at the Poda wetlands near Burgas (Bulgaria)

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Data on mortality of European pond turtles from overrunning at the area of Poda, near the city of Burgas (Bulgaria) are presented, along with some inferences on the phenology, age structure and migration habits of turtles in that region.

POSTER PRESENTATION

Habitat use by the last European pond turtle (*Emys orbicularis*) populations in the Rhône-Alpes

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The European pond turtle (*Emys orbicularis*) is presently considered as an umbrella species, because its biological cycle requires the conservation of both aquatic and terrestrial habitats. In order to design efficient management actions for an endangered species a solid knowledge on its biological and ecological requirements is needed. To achieve this objective the population parameters, movement pattern and home range size were estimated for two wild populations in Nord Isère inhabiting areas of mixed natural and agricultural habitat. One of the populations was regarded as a more stable population, because its connection with other ponds and thus other turtle populations is still preserved. The second population was regarded as threatened, because it is isolated from other aquatic habitats. Our specific objective was to examine whether habitats were used differentially by turtles of different sex and life stage (juvenile, sub-adult and adult). In each population we monitored 10 females and 10 males for 18 months using radiotelemetry. We also trapped turtles in both areas to obtain additional data on population size and habitat use (more than 700 capture events in 2000 and 2001). We put in evidence a seasonal pattern in habitat use by the European pond turtle (regarding overwintering, growth, foraging and nesting sites) and highlighted the importance of certain habitat types. Our results also showed the importance of large scale protection of mixed habitats. Distance and connectivity between the aquatic environment and the nesting sites are critical for the survival of the population, especially in the face of anthropic modifications of the environment. Therefore the protection of both wetlands and meadows is essential for the conservation of the European pond turtle.

ORAL PRESENTATION - 20 April, 15:20 - 15:40

Epidemiology of sintopic populations of *Emys orbicularis* and *Trachemys scripta* in Northern Italy

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During first three years of our Pond Turtle Disease Monitoring Project groups of *Trachemys scripta elegans* introduced in artificial and natural ponds in North Italy were examined for an epidemiological survey of infectious agents. From May 2001 onwards we began, in the province of Modena, a survey of some sintopic populations of *Emys orbicularis*. All analyses were done at the Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, in Brescia. Observation, isolation and identification of micro-organisms have been accomplished using standard procedures. We present results of the analysis of a total of 195 samples collected from *T.s.elegans*. and 34 from *E.orbicularis*. Fifty percent of *T.s.elegans* and 9% of *E.orbicularis* presented shell pathologies, mainly Septicemic Cutaneous Ulcerative Disease. All the animals were free of virus and fungal infections. Approximately 76% of *T.s.elegans* and 97% of *E.orbicularis* had positive results for bacteriological analysis. Only 58% of these samples for *T.s.elegans* and 57% for *E.orbicularis* were recognized as specific chelonian infectious agents (as *Aeromonas hydrophila*, *Citrobacter freundii*, *Pseudomonas* spp., *Edwardsiella tarda*). Only 1,5% of *T.s.elegans* individuals were found to be infected with *Salmonella* spp. Most other recognized microbic organisms are pathogenous opportunists that penetrate micro lesions and secondary infections.

POSTER PRESENTATION

Population dynamics of *Emys orbicularis* in southwestern Spain: implications for conservation and management of long-lived organisms

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A population of *Emys orbicularis* inhabiting a pond system in a fluctuating environment in southwestern Spain was studied over nine years, including dry years (1992-95+1999) and favourable years of high rainfall (1991+1996-98). A marked population of 1285 individuals (since 1972) and a 85% recapture rate in 1999 indicate that the parameter estimates were representative of the total population. The resulting series of repeated measures of demographic parameters rendered some insight into the long-term dynamics of the population and its adaptive strategy to local climatic conditions. Minimum reproductive frequency (RF) as estimated from egg-bearing females on radiographs ranged from 17% in dry to 55% in wet years. RF for a sample of 10 females monitored intensively during one wet and one dry year was, respectively, 100% and 30%, while average clutch frequency varied from 2-3 clutches in the wet to 1 in the dry year. Clutch and egg size did not vary significantly between dry and wet periods. Population size estimated through analysis of mark-recapture data in the main trapping area varied from 650 individuals in 1992 to 249 individuals in 1998. The population decrease presumably was owed to a great extent to predation during movements on land in dry years. Yearly survival estimates from mark-recapture analysis decreased sharply along the 1992-95 drought period, generally ranging between 0.87 - 0.58 for adults, and 0.70 - 0.53 for juveniles. The number of captured yearlings and 2-year-olds was much higher in rainy years, indicating a higher recruitment rate in wet periods. The juvenile (individuals <115 mm SVL) fraction of the population was not only smaller in dry years, but also composed of older turtles (0-4 growth rings in wet years and mostly 2-6 growth rings in dry years), suggesting that growth rates are slowed down during drought periods, which might affect important parameters such as age and/or size at maturity and the time to reach refuge sizes. The results indicate that climatic fluctuations associated with rainfall are paramount to the responses of population dynamics of *E. orbicularis* in the southwestern Mediterranean region, and that population growth is highly dependent on the amount and distribution of wet years along time. Within this scenario human impact factors like the overexploitation of ground water reservoirs, which enhances the temporality of ponds and streams in the region, are likely to seriously affect population stability of turtles, even within otherwise well protected areas, like Doñana National Park.

ORAL PRESENTATION - 20 April, 15:40 - 16:00

Mortality causes of *Emys orbicularis* in a fluctuating environment

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We assessed mortality causes and survival rates of adult *Emys orbicularis* inhabiting a pond system in southwestern Spain. Some ponds are permanent, but most dry out in summer, filling again with autumn and winter rainfall. The study was carried out during a severe drought period, when even normally permanent ponds dried out, forcing all turtles to leave ponds and seek shelter under nearby vegetation for prolonged periods of aestivation. Turtles were followed through radio-tracking during four years in an area of large, permanent to semi-permanent ponds, and another area of small, isolated, temporal ponds. All mortality cases were registered in summer, in the large pond area, due to predation of individuals leaving dry ponds. The overall yearly survival rate estimated from radio-tracking data for the years 1992-95 was 0.82, but only 0.71 in the large pond area. Carapaces of dead individuals found in the same area confirmed predation as the main mortality cause, and also included occasional deaths caused by over-running. The proportion of marked individuals found dead in the large pond area indicated a maximum absolute survival rate of 0.94 for 1992-95. Adult survival rates in the large pond area estimated through analysis of capture-recapture matrices averaged 0.77 for 1992-95. Both survival rates estimated from radio-tracking and mark-recapture data are lower than those generally believed to be necessary for the maintenance of stable chelonian populations. The data indicate that *E. orbicularis* in southwestern Spain are most susceptible to predation in summer during dry years, when a high number of turtles leaves drying ponds to aestivate on land. Predation events concentrate in areas of large turtle populations, probably because the encounter rate with turtles is maximized, and predators learn to search for turtles more efficiently.

POSTER PRESENTATION

Determinants of juvenile growth rates in mediterranean populations of freshwater turtles: the relative importance of food and space

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We examined the relation among diet, body size and population density of yearling and 2-year-old *Emys orbicularis* in four ponds (SOP, SOL, BOL and PIM) and *Mauremys leprosa* in three ponds (SOP, SOL and BOL) in southwestern Spain. Our aim was to provide empirical support for the widely accepted assumption that a higher proportion of animal matter in the diet of juvenile reptiles enhances growth rates, as a function of higher energy content of animal protein. Diet was estimated through analysis of excrements. Hatchling size, which could have a headstarting effect on body size, tended to be significantly larger for *E. orbicularis* hatchlings from the region of PIM and SOP, when compared with hatchlings from the SOL region (no data on hatchling size was available for *E. orbicularis* from BOL and *M. leprosa* from BOL and SOP). *E. orbicularis* had diets exclusively composed of animal matter in SOP, BOL and PIM, and consumed an average of 36% plants in SOL. *M. leprosa* juveniles had varying proportions of vegetal matter in their diets, with a minimum of 15% in SOP and a maximum of 68% in BOL. Body size of 2-yr-old *E. orbicularis* was significantly smaller in PIM, where turtle density was a hundredfold higher than in the other ponds and despite the tendency for larger hatchling size in this area. Body size of *M. leprosa* yearlings and 2-yr-olds did not vary significantly among ponds. Our data indicate that a varying proportion of animal matter in diet has no effect on the body size of yearling and 2-yr-old *E. orbicularis* and *M. leprosa*, but that high population density, which possibly limits access to food resources, may significantly affect growth rates of juvenile turtles.

POSTER PRESENTATION

Habitat requirements, causes of population decline and migration of *Emys orbicularis* in the Kuban Plain, northwestern Caucasus

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Field observations were made on the habitat requirements of *Emys orbicularis* in different wetlands during an expedition to the southern Russian plain of the Kuban river. The occurrence of turtles seemed to depend strongly on the conditions of the aquatic vegetation cover, with a preference for water bodies covered by large and dense *Phragmites* stands. At the Krasnodar reservoir habitat use of a population of

48 individuals was studied intensively. A total of 119 sightings were made, including basking and nesting behaviour. Migration of 3 individuals captured at the coastal zone of the Taman peninsula showed the ability of the turtles to migrate over large distances. Probably the most important causes of population decline are fishing and wetland draining.

ORAL PRESENTATION - 20 April, 09:00 - 09:20

Results of a radiotracking study of *Emys orbicularis orbicularis* in Lithuania

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Between 1997 and 2001 investigations on a local population of the European pond turtle *Emys orbicularis* (L.) were led in the herpetological reserve Kuculishkes and its surroundings. The study area lies in south-western Lithuania (23°90'E, 54°40'N) and includes different types of ponds, partly seasonally wetland areas and sandy dry areas, deciduous and afforested pine forests and agricultural land with extensive use. Turtles were captured with aquatic and land traps and every individual was measured, weighed and colour marked. Radio transmitters (weight: 8-10 g, duration of life: 6-12 months) were glued onto the carapace of a total of 31 adults (8 males, 23 females). In the water bodies animals were located up to three times each day. Their positions were determined by triangulation using a receiver (Stabo XR 100) connected to a hand operated unidirectional antenna. Direct migration routes, e.g. during the nesting period, were established by walking in the direction indicated by the antenna (Homing-in-on the-Animal). During May and October habitat use, activities, migrations, activity ranges (the area used by the animals in one single pond) and home ranges (encompassing more than one water body and the nesting area for females) were recorded by radiotracking, capture/recapture and direct observation. The Lithuanian turtles preferred standing waters with a soft and muddy bottom and abundant floating aquatic vegetation. The two largest water bodies in Kuculishkes were permanent ponds. The animals of the local population used most of the ponds and areas in larger ponds only during spring and summer. There was a concentration of animals in the permanent ponds in late summer and autumn. In winter turtles stayed only in small areas of these ponds. Throughout the activity season juveniles were also observed to migrate among ponds. During the 5 study years 3 of 10 males shifted their home ponds, but no females. At least 3 of 13 females changed their nesting area in different years.

ORAL PRESENTATION - 20 April, 09:40 - 10:00

Survivorship of the European pond turtle in central Poland

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We used mark-recapture techniques to study the population parameters of the European pond turtle *Emys orbicularis* in the “Borowiec” Nature Reserve (central Poland). The youngest gravid female observed in the area was 12 years old. The turtles laid eggs once a year and mean clutch size was 14.6 eggs. Only 16 of 121 clutches deposited during 1987-2001 were destroyed by predators. Other 14 clutches were deposited in hazardous sites (rural roads and agriculture fields) and were transferred to safer places. Two of them were destroyed during incubation, but the hatching rate in other ones was similar to that in the non-transferred clutches. About 35-40 adult turtles live in the “Borowiec” Nature Reserve. The sex ratio in this population is 1:1. Annual survivorship of adult turtles during 1998-2001 was close to 1.0, and around 0.8 for subadult individuals (three to nine years old). Estimations of population size for the years 1990-2001 indicate that the population is growing slightly. Within the programme of active protection of the turtle (“Borowiec” Nature Reserve, 1998-2000) 123 one-year old individuals, coming from the same population, were released after 9-month rearing in the laboratory. During the first year in natural conditions survivorship of released turtles was about 0.3. The average survivorship of turtles released in 1998 over the next two years (1999-2000 and 2000-2001) was 0.78.

ORAL PRESENTATION - 20 April, 09:20 - 09:40

Notes on the parasitofauna of *Emys orbicularis* and proposals for future research

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A majority of living organisms is parasitic and parasite-host relationships thus represent one of the driving forces of evolution. Additionally, infectious organisms may represent serious threat for small, disturbed host populations. Unfortunately, our knowledge on parasites of most wild vertebrates is still in its infancy and more intensive cooperation between researchers interested in host biology and conservation and those studying parasites is needed. *Emys orbicularis* is parasitised by numerous micro and macroparasites, and every group of parasites needs its own research technique. Among parasitic symbionts reported for *E. orbicularis*, the most numerous are helminths. Unfortunately, helminthological studies are only possible on living hosts and parasitological dissection is still a key method for the collection of most of these macroparasites. Logically, such an invasive technique is hardly possible in small populations suffering from anthropogenous pressure. On the other hand, detailed helminthological examination is always recommendable in dead or euthanised specimens. A basic review of common helminths of *E. orbicularis* is presented. In contrast, some protozoan species are much more easily collected from faeces or blood samples of living specimens. *Haemogregarina stepanowi* and *Eimeria delagei* are apicomplexan parasites of *E. orbicularis*, which represent ideal targets for future studies. *H. stepanowi* is a blood apicomplexan parasite transmitted by leeches, and its stages can be easily detected in stained blood smears. *E. delagei* is an intestinal coccidium with direct life cycle, its oocysts being detectable in faeces of studied tortoises. The life cycles, examination methods, potential impact on host animals and proposals for future research are discussed.

ORAL PRESENTATION - 20 April, 11:40 - 12:00

Has fishing an effect on the survival of *Emys orbicularis*?

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Two wild populations of *Emys orbicularis* have been studied in Nord Isère (France) over two years. The first population inhabits a pond system where fishing is permitted (AREA 1), while the second one occupies a protected area where fishing is forbidden (AREA 2). Two methods were used for data acquisition: capture-recapture through trapping and radiotracking (20 radiotracked individuals in each

population). We determined habitat use during all stages of the biological cycle in both populations, and examined the effects of fishing on the survival rates of the population inhabiting AREA 1. All females trapped on the second week of June 2001 in AREA 1 were radiographed to determine the presence of calcified eggs in the oviducts. All egg-bearing females were fitted with radio transmitters. Four of the radiographed females had hooks in their oesophagus, which is likely to affect the survival probabilities of these individuals. Radiotracking data indicated that mortality rates differ between both areas. No mortality was observed in AREA 2, while in AREA 1 nearly 20% of the monitored individuals were found dead, all of them drowned and entangled in fishing yarn. We conclude that the fishing activity has an important negative impact on European pond turtle populations and needs to be addressed in the design of conservation measures for the species.

POSTER PRESENTATION

The European pond turtle in the Tajba Nature Reserve (East Slovakia)

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The Tajba Nature Reserve is the only known locality in Slovakia where the European pond turtle is currently reproducing. The population has been monitored since 1996, and it is estimated that there are between 60 and 80 reproducing adult turtles. Hibernation finishes at the beginning of April, and mating has been observed at the end of April and beginning of May. Nesting places are situated between 200 and 800 m from the nearest water body, in dry sandy meadows and vineyards. Egg-laying occurs from mid-May to mid-June. Individual females can be identified through photographs of the plastron. Most nests are destroyed shortly after oviposition by natural predators. The young turtles hatch in the autumn after egg-laying, but dig themselves out of the nest chambers only in the following spring. Soil temperature in the immediate vicinity of the nest chambers and at the same depth as eggs are laid and mortality during hibernation in the nest chamber have been recorded. After leaving the nest chamber the hatchlings migrate in several different directions.

ORAL PRESENTATION - 20 April, 11:00 - 11:20

Population viability analysis of European pond turtles (*Emys orbicularis orbicularis*, L.) in NE- Germany using computer simulation: idea and concepts

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In Germany the European pond turtle is classified as threatened with extinction. The remaining populations are restricted to NE-Germany in almost undisturbed areas with suitable habitat structure. Although they reproduce successfully in warm to hot summers, populations are small with a high percentage of old specimens. As this species occurs naturally in this area, it is assumed that they have adapted to the relatively cool local climatic conditions during their evolution. If this is true, other factors like being captured for food, habitat loss and fragmentation, must have lead to the present day threatened status of the population. A population viability analysis (PVA) provides a means of analyzing the potential effect of the main threatening factors and to estimate the minimal viable population size (MVP) of specific populations. An object-oriented computer simulation is under construction, to analyse the population dynamics of European pond turtle populations in the northern area of its range. Habitat influence is excluded from the simulation in order to keep the size manageable. In this talk the concept and functionality of the simulation model is presented as a flowchart. Before the model is finished, it is put to discussion with the aim of identifying possible shortcomings and the means of turning the model into a general tool for the conservation of *Emys orbicularis* in Europe.

ORAL PRESENTATION - 20 April, 10:40 - 11:00

Space use of European pond turtles (*Emys orbicularis orbicularis*, L.) in NE-Germany

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The European pond turtle is threatened with extinction in a great part of its distribution area. Main threats to populations are habitat loss due to water management and landscape fragmentation, but also direct disturbances by man. The detailed knowledge about the spatial requirements of this species is necessary for the design of effective protection measures for the remaining populations. Five adult females and one adult male of an autochthonous relictual population in NE-Germany were equipped with radio transmitters, with the aim of assessing information about their pattern of space use. Turtles were tracked from September 1999 to March 2001. To allow the comparison with other studies, different home range estimators were used. With all methods seasonal changes in home range size were statistically significant, but no significant differences were found among individuals. Some turtles hibernated within their summer home ranges. Two females moved over land and hibernated in the water of an *Alnus* forest during two consecutive winters. A cronogram of turtle movements in the area was drawn to aid the visualization of space use patterns in relation to biological requirements and weather conditions.

POSTER PRESENTATION

***Emys orbicularis* in Switzerland: can it continuously breed on its own?**

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Even though there are recurrent reports on sightings of *Emys orbicularis*, most of these seem to represent specimens set free by humans, and *Emys orbicularis* is considered extinct in Switzerland. One of the reasons may be an unfavorable climate. To analyze this, soil temperatures were measured by means of 25 temperature-loggers at several locations throughout Switzerland. Loggers were placed both at potential natural breeding sites and in private gardens where successful breeding of *Emys* in captivity had been reported. At two sites, loggers were dug into the soil along with eggs of *Emys orbicularis*; a total of 85 eggs from females of different origin were at disposition. Data were collected from different soil depths, and also at bare sites or sites covered by arid-type meadow. These data, once complete, should yield answers to the following questions:

- Which are the optimal conditions for natural breeding sites in Switzerland?

- Can any hatching of females be observed? (males and females develop at lower and higher temperatures, respectively).
- Which genotype/ecotype is able to regularly breed in Switzerland?

The results obtained so far clearly show that *Emys* can regularly breed in Switzerland. Thereby, the location of breeding sites and their exposure to the sun is more important than the overall climate. We observed considerable differences in the incubation time of the eggs, depending on the origin of the specimens. Surprising results were obtained with single females when part of their eggs were kept in an incubator, another part in a natural site, and yet another part kept for some time in a natural site and then in the incubator.

ORAL PRESENTATION - 20 April, 12:20 - 12:40

Climatic influences on the reproductive succes of European pond turtles at their northwestern distribution border (Germany)

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The *Emys orbicularis* populations in Northeastern Germany are located at the northwesetrn limit of the specie's distribution range. The region is located in the transition zone between Atlantic and Continental climates (Mecklenburg and Brandenburg transition climate to Eastern German inland climate). The study was carried out from 1994 to 2001 in four research areas in Brandenburg. Egg-laying dates and the hatching succes of the monitored clutches as well as the survival rates of hatchlings overwintering in nests were recorded along with data on the climate. In order to analyze the influence of temperature on the development of the embryos in the field, cumulative temperature values were calculated for each incubation season. Based on the correlation between the ground temperature at 10 cm depth and the yearly amount of sunshine over the period 1 June - 31 August at each egg-laying site we defined the range of suitable, average and unsuitable weather conditions for egg incubation in different areas of Brandenburg over a period of 40 years. Suitable weather conditions for incubation existed in 32% of the years in West-Brandenburg and 55 % of the years in East-Brandenburg. Egg incubation of *E. orbicularis* at its northwestern distribution limit is also affected by the relatively low temperatures during the temperature sensitive period for embryonic sexual differentiation. In laboratory conditions with incubation at constant temperatures, only males are produced at temperatures below 28.5 °C. Only rarely ground

temperatures exceed 28.5 °C at nesting sites in Brandenburg, thus the sex-ratio of local populations was expected to be heavily shifted towards males. On the contrary, however, a clear predominance of adult females in the small relictual populations in Brandenburg. Possible reasons for this discrepancy are a higher survival rate of females, a higher dispersal rate of males - single wandering individuals found in the field are usually males -, or that field incubation conditions produce a different sex-ratio than expected from laboratory conditions.

ORAL PRESENTATION - 20 April, 10:20 - 10:40

The demography of European pond turtle populations at the northwestern distribution limit of the species (Germany)

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Over a period of 8 years (1994-2001) the demography of small relictual European pond turtle populations in Northeastern Germany (Brandenburg) was investigated. Turtles were individually identified through photographs and by notching of the marginal scales of the carapace. The age of juvenile and subadult individuals was estimated by counting the growth rings on the plastral scales. Otherwise the age of six collection specimens was estimated through skeletochronology, using humerus slide preparations. Older animals, whose growth rings are completely obliterated, were assigned to age groups, using as reference for class assignment the evolution of shell markings of two turtles that were repeatedly recaptured over a period of 25 years. The assignment of 49 adult individuals to different age groups using this method resulted in a relatively balanced distribution across age classes. Notably there is a significantly higher frequency of females in the older age classes - 24 females were assigned to age groups above 28 years and 6 females to age groups under 30 years, while only 5 males were assigned to age groups above 28 years and 14 males to age groups under 30 years. Four residual populations, comprised in total of 31 adult individuals, had a 100% survival rate over 3-8-year study periods, despite the occurrence of two hard winters during the study periods. All populations studied show a marked lack of juveniles.

POSTER PRESENTATION

The physiology of the energy metabolism of the European pond turtle (*Emys orbicularis*)

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The physiology of the energy metabolism of the European pond turtle (*Emys orbicularis*) was investigated with special reference to its juvenile ontogeny. We made a comparison between the metabolic rates of hatchlings, juveniles and adults at an ambient temperature of 25°C. Different methods (oxygen consumption in open and closed systems) were used. The mass specific metabolic rates (J/gxh) had a strong negative correlation with body mass ($\log SW = 0,1664 - 0,0753 \log M$). The highest metabolic rates were found in hatchlings (107 ± 56 J/gxh), the lowest in adult turtles ($1,4 \pm 0,7$ J/gxh). This was expected, because hatchlings need relatively more energy than adults to fuel their development and growth. According to published values (BENNETT & DAWSON 1976), our results are in the expected range. The knowledge of the physiology of the European pond turtle can be useful in the design of management plans and recovery programmes.

POSTER PRESENTATION

Is each of the females *Emys orbicularis* laying eggs every year in Brenne (France) ?

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After laying eggs, the next year, females can be active or inactive. If they are active, they are laying eggs or not. Ten females were radio-tagged after laying eggs. All these females were active the next year. 30 females were X-rayed some days before laying. More than 90% of females had eggs in their abdominal cavity. Sub-adults animals with a very tenuous growth rings and an indetermined-sex individual had no egg.

ORAL PRESENTATION - 20 April, 12:40 - 13:00

Overwintering habits of the European Pond Turtle (*Emys orbicularis*) in Isère (France)

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Our study took place in Isère (France), with the aim of gathering information on the overwintering habits of *Emys orbicularis*. We used radiotelemetry to locate turtles once a week during winter. Ten individuals were monitored in one pond during the winter 2000/2001. During the winter 2001/2002 10 turtles were monitored in the same pond of the previous year, and an additional 20 individuals were studied in a second pond. The two ponds differ in that the first one is surrounded by several other water bodies, while the second one is isolated. The selection of overwintering ponds appeared to be consistent between years, and some turtles migrated over a considerable distance to reach the same pond each year for overwintering. They can even change from one pond to another through terrestrial displacement. We observed that turtles concentrate in limited areas for hibernation, usually in association with shallow water. Therefore it is important that the water level does not decrease over winter in the ponds where turtles hibernate. We observed three types of overwintering microhabitats: *Phragmition*, *Salicion cinereae* and *Magnocaricion*. The vegetation cover varies from 80 to 100%. These habitat structures are frequently threatened, because they are undesirable in land management, or because they break the landscape uniformity and obliterate the water surface. As a consequence these vegetation patches are destroyed or altered during the hibernation period of turtles. Our conclusion is that these impacts can have very negative effects on *E. orbicularis* populations.

ORAL PRESENTATION - 20 April, 15:00 - 15:20

Body shape and reproductive strategies of Mediterranean *Emys orbicularis* in Italy

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Several morphological subspecies of *Emys orbicularis* have been recently described throughout the range of the taxon. A transition zone has been revealed between the subspecies *E. o. orbicularis* and *E. o. hellenica* in the Po plain, northern Italy. In other parts of Italy we find *E. o. galloitalica* on the Ligurian and Tyrrhenian coasts, up to the Gulf of Policastro, *E. o. cf. hellenica* in southern Italy, *E. o. capolongoi* on Sardinia, and *E. o. lanzai* on Corsica. At the same time, a similar interest has been devoted to the study of reproductive strategies in different parts of the distribution range of the species.

The comparison of body size among populations may be one of the most intriguing questions concerning the evolutionary biology in many organisms. In ecologically different habitats distinct patterns of body size and shape, sexual size dimorphism (SSD), reproductive output and reproductive success may have evolved. Many of these patterns, however, may not result directly from adaptive evolution, but may simply reflect the adaptation to ecological stimuli. We have studied two Mediterranean populations of European pond turtles, belonging to *E. o. galloitalica* from the coastal central Italy (Tuscany; 49 males and 60 females) and to *E. o. cf. hellenica* of the mountainous part of southern Italy (Calabria; 33 males and 51 females). Our aims were i) to compare the biometry of both populations in the light of their different taxonomic status; and ii) to assess possible differences in reproductive output and biometric correlates of reproduction. SSD is very evident in *Emys orbicularis*. Intersexual differences are evident in both populations: females had significantly longer, wider and higher carapaces and were significantly heavier than males (t-tests, $P = 0.0001$ in all cases). Intrasexual differences also occurred. Males from Tuscany were, on average, larger (carapace length = 126.4 ± 11.05 mm, range = 90-148 mm, $n = 49$) than males from Calabria (carapace length = 108.21 ± 15.48 mm, range = 60-130 mm, $n = 33$) (ANOVA $F = 38.571$, $P = 0.0001$). Females also displayed a similar pattern (Tuscany = 134.84 ± 12.45 mm, range = 110-174 mm, $n = 60$; Calabria = 121.36 ± 16.5 mm, range = 80-147 mm, $n = 51$) (ANOVA $F = 24.022$, $P = 0.0001$). All these differences are better explained in terms of the overall body shape. Significant differences in body shape were observed between both populations: adults from Calabria are more rounded while adults from Tuscany are more elongated (ratio of plastron width / plastron length; ratio of carapace width / carapace length). Standardized residuals from regression of plastron

width/plastron length versus carapace width/carapace length were significantly different in both sexes.

Clutch size in the Tuscany population averaged 5.8 eggs (mode and median = 6, n = 49 oxytocin induced egg-layings) with more than 75% of females laying one clutch per season and about 25% laying two clutches in the same season. Pearson correlation coefficient between carapace length and carapace height was 0.858 (P = 0.0001, n = 60). Female clutch size of Calabria populations is known only from anecdotal data and seems to average about 3-4 eggs, and females lay only one clutch per season. Pearson corr. coeff. between carapace length and carapace height is 0.928 (P = 0.0001, n = 51).

Our preliminary analyses support taxonomic differences between *E.o. galloitalica* and *E.o. cf. hellenica* and add further relevance to the biological segregation between these two subspecies. The degree of variation between these populations that is attributable to ecological stimuli (food resource availability, thermal conditions, available places for nesting) or to phylogenetic constraints will represent the main scope of future researches.

ORAL PRESENTATION - 20 April, 14:40 - 15:00

Hatchlings of *Emys orbicularis* L. feed on their way to the water

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Investigations were carried out in 1999–2001 in Zmiyiv District of the Kharkiv Region of Ukraine. In the study area oxbows and the main river bed of the Siversky Donets form the main habitats of *E. orbicularis*. The newborn turtles stay on land for hibernation, reaching water bodies only the next spring. During the hibernation hatchlings use the resources of its yolk sack. The migration of the young from incubation sites to permanent water bodies was observed on April 17, 1999 and from April 29 till May 2, 2001. Nesting chambers were located on slopes of a ravine. The young with carapax length 25–27 mm were moving along the bottom of the ravine and a meadow of the flood plain in the direction of the river. Yolk sack was absent in all specimens.

Post-mortem examination of young pond turtles that died during migration revealed the presence of insect remnants in their digestive tracts. The following insects were identified: *Coleoptera*: *Bembidion* sp. (imago), *Cantharoidea* (larva.), *Cercyon* sp. (imago), *Ophonus* sp. (imago), *Phyllotreta* sp. (imago); *Diptera*: *Nematocera* (larva.). The presence of terrestrial insects in the stomachs of these hatchling turtles

and absence of permanent water bodies on their migration route indicate that young turtles begin to feed being still on land, before reaching their permanent aquatic habitats. One of the reasons for this could be the total exhaustion of the yolk reserves.

POSTER PRESENTATION

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