

# Introduction and radio-tracking of a population of European Pond Turtle (*Emys orbicularis*) in a restored habitat in Massamagrell, Valencia, Spain.

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V.A.E.R.S.A

## INTRODUCTION

The present study has been realized in the "Marjal de Rafalell i Vistabella" (Massamagrell), a wetland of the Valencia Community coastland located 10 km from the north of Valencia city. This natural area counts with a total surface of 100 hectares delimited by an urban area to the north, by the Mediterranean Sea to the east and by a motorway to the west. Between years 2006 and 2007, the restoration of the wetland area has been carried out through V.A.E.R.S.A. according to the existing agreement between the "Conselleria de Medi ambiente, agua, urbanismo y vivienda" (Council of environment, water, urbanism and housing) of the Valencia Community and the "Confederación Hidrográfica del Júcar del Ministerio de Medio ambiente" (Water agency of the environment ministry) financed by the F.E.D.E.R. program of the European Union.

On the other hand, the scientific project of the introduction of a new European pond turtle population (*Emys orbicularis*) and the control of its behaviour via radio tracking has been started after the restoration of the area in July 2007.

## BACKGROUND

### Habitat restoration

The restoration has been achieved by following these concrete actions:

- The creation of a pond linked together with the existing ditches network.
- The removal of solid residues.
- The cleaning of ditches.



### Introduction of freshwater fauna: the European Pond Turtle *Emys orbicularis*

Once the good ecological state and the good water quality checked, various autochthonous fish species have been introduced in the recent aquatic system, such as the Samaruc (*Valencia hispanica*), ray-finned fish (*Squalius sp*) and more.

In addition, an intensive trapping all over the wetland during spring season, has allowed making sure that the competitive species abundance, such as the Red eared slider *Trachemys sp*, was not significant. This exotic species has spread over numerous wetlands of the Valencia Community very quickly these last years.

Therefore, 26 individuals of *Emys orbicularis* (14 females, 11 males and 1 juvenile) have been released on July 2007; 4 of them (2 males, 2 females, one of them gravid) have been tagged with transmitters. All the individuals were coming from the "Centro de recuperación de fauna salvaje de El Saler" (wild fauna centre) where they were living in semi-liberty.



Introduction of 2 exemplars of *Emys orbicularis* tagged with transmitters.

## AIM

The main aim of this study was to obtain information about the behaviour and the adaptation of the 26 exemplars of *Emys orbicularis* introduced in the recently restored wetland via radio tracking with a sample of 4 individuals. At middle term, the objective is to succeed in establishing a stable and viable population in a restored habitat.

## MATERIAL AND METHODS

Four pond turtles have been tagged with TW-3 Biotrack® transmitters. They have been tracked by means of the "Sika" receiver of Biotrack® with frequency of about 149 MHz and a flexible and directional three element Yagi antenna.

The radio tracking has been realized from the introduction date, the 27<sup>th</sup> of July 2007, until the 07<sup>th</sup> of December, twice or three times a week depending on the activity periods. All the individuals have been located with the best accuracy (<5m).



*Emys orbicularis* with transmitter

## CONCLUSIONS

### Habitat use:

-The studied European pond turtles have shown a preference for the ditches (during this period of study) rather than for the open water of the restored pond. Occasionally, they have remained in low depth wetlands with dense vegetation which provides them shelter.

### Home range and migration route:

All the individuals have left the pond through ditches toward the south of the wetland. Some of them have been able to reach a 600m distance in a day by following a ditch flow that remains very low all year long. Some turtles have remained 8 weeks in a same determined little area, in this case, the shallowest part of the pond (August-September).

### Further study:

At present, data are still obtained from the same radio tracking to complete the full annual life cycle of the four tagged individuals. In addition, four other individuals have been released into the restored area during spring 2008. One of them was tagged.



Detail of the hibernation ditch

## RESULTS

The first observation was that location results obtained have been surprisingly precise since the transmitters have been able to emit 2 meters deep under the water level.

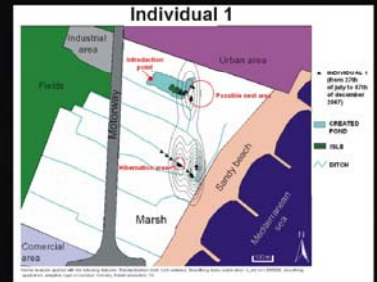
The radio tracking movements during 133 days of 3 individuals is illustrated below. Only 3 are represented because the signal reception of one of the male individual has been lost 2 weeks after its introduction.



Aerial view of the Rafalell i Vistabella marsh

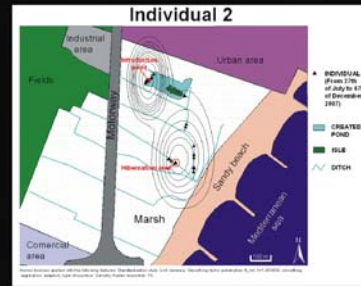
### INDIVIDUAL 1 ♀

- Female of 569g weight and 142mm of carapace length
- Released gravid
- Movement toward the extreme east of the pond since the first day where it possibly laid its eggs during August.
- Early September: it was located and captured 400m far to the south (without eggs).
- Has remained in the same area (200m segment East-West) until the start of the hibernation, inside a ditch, mid-November.



### INDIVIDUAL 2 ♀

- Female of 502g weight and 136mm of carapace length
- Has remained the 2 first months around the introduction point of the pond.
- Late September: left the pond through the eastern ditch, in direction of the wetland southern part.
- Has hibernating out of the water half buried, 10 meters far from a ditch since mid-November. The hibernation area remains relatively wet all winter long.

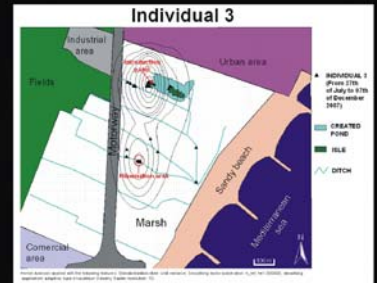


### INDIVIDUAL 2 ♀

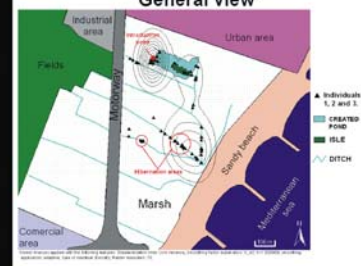
- Female of 502g weight and 136mm of carapace length
- Has remained the 2 first months around the introduction point of the pond.
- Late September: left the pond through the eastern ditch, in direction of the wetland southern part.
- Has hibernating out of the water half buried, 10 meters far from a ditch since mid-November. The hibernation area remains relatively wet all winter long.

### INDIVIDUAL 3 ♂

- Male of 301g weight and 119mm of carapace length
- Has remained around the introduction point of the pond during the 2 first months.
- Late September: left the pond through the eastern ditch and has remained in the parallel ditch of the pond during 3 weeks.
- Started a migration toward the south by crossing wetlands and ditches.
- The hibernation period has been realized inside a ditch, starting mid-November.



### General view



### GENERAL VIEW

Thanks to the Kernel analysis of density, two different areas of turtle presence could be determined. The first one corresponded to the proper pond where the turtle introduction had been done. The second one was located south of the wetland, where pond turtles have started their hibernation period after being present in the same area during a relatively large period.