

# The importance of protected and unprotected areas for the Mediterranean spur-thighed tortoise demography in Northwest Morocco

Amalia Segura<sup>1,\*</sup>, Pelayo Acevedo<sup>1,2</sup>

**Abstract.** Collection for the pet trade has been considered one of the major threats to the Mediterranean spur-thighed tortoise *Testudo graeca*, since it modulates the size and structure of the species' populations and, therefore, their demography. Maamora forest is one of the most suitable habitats for this species. The proximity of the forest to Rabat indicated the possibility of these tortoise populations being particularly sensitive to over-collecting. Population demography was studied in four populations, in protected and unprotected areas in Maamora forest. The results showed significant differences as regards population size and structure between protected and unprotected areas. They specifically highlighted: i) higher density (23-17 indiv·ha<sup>-1</sup>) balanced populations in the protected areas, in which young adults were predominant, ii) a higher body condition in the protected areas, especially the females, and iii) a low density (5.5 ind·ha<sup>-1</sup>) more unbalance population in the unprotected areas, in which older females and younger males were predominant. In addition, a survey carried out by interviewing local adults (n = 200) showed that most people owned tortoises (61%, n = 200), mainly juveniles (65%, n = 123). The respondents stated that their tortoises had been captured in the forest (68%, n = 123). Maamora forest is home to one of the highest density populations of Mediterranean spur-thighed tortoises documented to date, and its conservation is essential if this species is to be maintained. Our social survey suggested that one of the challenges is to change the social perception of the Mediterranean spur-thighed tortoise as a pet and highlight its intrinsic ecological value.

**Keywords:** *Testudo graeca graeca*, pet trade, population structure, population size.

1 - Instituto de Investigación de RecursosCinegéticos, IREC (UCLM-CSIC-JCCM), Ronda de Toledo, 12,  
13071 Ciudad Real, Spain

2 - Escuela Técnica Superior de IngenierosAgrónomos (UCLM), Ronda de Calatrava, 7, 13071 Ciudad  
Real, Spain

\*Corresponding autor; e-mail: amaliassegura@gmail.com

### **Supplementary material**

**Table S1.** Results of the social surveys carried out in Rabat. Tortoise origin and age class (juvenile/adult) obtained from the tortoise owners and tortoise preference (origin and age (juvenile/adult/no preference) from people without tortoises (not tortoise owners).

|                    | n   | Origin |        |      |                 |        | Age class |       |               |
|--------------------|-----|--------|--------|------|-----------------|--------|-----------|-------|---------------|
|                    |     | Forest | Market | Shop | People transfer | Street | Juvenile  | Adult | No preference |
| Tortoise owner     | 123 | 77     | 17     | 4    | 18              | 7      | 80        | 43    | 0             |
| Not tortoise owner | 77  | 55     | 16     | 6    | 0               | 0      | 34        | 8     | 35            |