

# Studbook breeding programme

## **TESTUDO GRAECA**

(North African spur thighed tortoise)



Photo by: Lutz Geiszler

## Annual report 2012/2013

**H.A. Zwartepoorte, studbook keeper**

**P. Bulsing, co-studbook keeper**



**E**uropean  
**S**tudbook  
**F**oundation

KvK nr. 41136106

[www.studbooks.eu](http://www.studbooks.eu)

## **Contents:**

- 1. Introduction and activities 2012 and 2013**
- 2. Studbook population**
- 3. Locations**
- 4. Births**
- 5. Imports**
- 6. Deaths**
- 7. Transfers**
- 8. Discussion**
- 9. Acknowledgements**

### **1. Introduction and activities 2012 and 2013.**

The past two years were not spectacular regarding reproduction. Just limited births were reported. Remarkable were the large numbers of deaths. Also disappointing to see is the large number of Lost to Follow Up (LTF) numbers. The species seems to lose interest within the tortoise keeping society. On the contrary large numbers are still illegally imported from northern African countries and in particular from Morocco. With respect to DNA sampling we had to look for another DNA laboratory as the one at the Gent university in Belgium stopped with that. At present some sampling is executed by Gendika BV in the Netherlands. A good picture now shows up on the different DNA haplotypes/subspecies within the studbook population; see also under 8.1. The response to the request for data was rather high which is encouraging. This way only the passionate and committed participants remain.

### **2. Studbook population:**

December 31, 2013 the total studbook population counts 146.138.178 (462) meaning an increase of 4.2.4 (10) specimens compared to the previous report. The total living population however is a lot smaller. Since the start of the studbook in the early 90ties an historic number of 75.59.71 (205) deaths were reported. This can be considered as dramatic and certainly a matter of great concern. Remarkable is the higher number of male deaths, but it can be very well possible that among the 71 unknown sexed dead animals the majority was females. We will never know, but important to note here is that autopsies are also important regarding this.

The number of LTF (Lost to Follow up) animals is also significantly high. The number of deaths and LTF animals together mean that of the total registered population only 173 are presently alive and actively participating within the studbook population.

### **3. Locations:**

Due to the number of 84 LTF animals and along with that the LTF participants as well as a high number of deaths at several locations the number of participants has dropped to 32 in six European countries.

The majority is kept in the Netherlands (23), Belgium (1), Germany (2), England (3), Italy (2) and Spain (1).

The number of participants is continually dropping. It seems people lose interest in the species.

### **4. Births:**

During the past two years four births (in 2012) of subspecies *T.g.nabeulensis* have been reported by participant Lansbergen. Two births (in 2012) of the same subspecies entered the studbook from an outside breeder.

### **5. Imports:**

Deliberate imports of wild caught animals are not reported to the studbook. The Sparks software program however considers new entries into the studbook as imports and as such these imports will be reported and discussed here.

In 2012 two new arrivals are reported and four in 2013.

### **6. Deaths:**

In 2012 17 deaths and in 2013 five deaths were reported.

In general the cause of death is very unclear. No autopsy reports were received by the studbook.

For confiscated dead tortoises in general there might be a suspected reason. Between the moment of capture, mainly occurring in North African countries such as Morocco and Tunisia and the moment of arrival at the studbook participants collections often lies a long period.

In the 2010/2011 report the situation regarding this was already explained. This unwanted situation regarding confiscated tortoises has to be discussed with the Dutch responsible authorities and is still a matter of great concern.

### **7. Transfers:**

In 2012 four and in 2013 14 transfers within the studbook were reported. This concerned mainly transfers from breeders to other studbook locations.

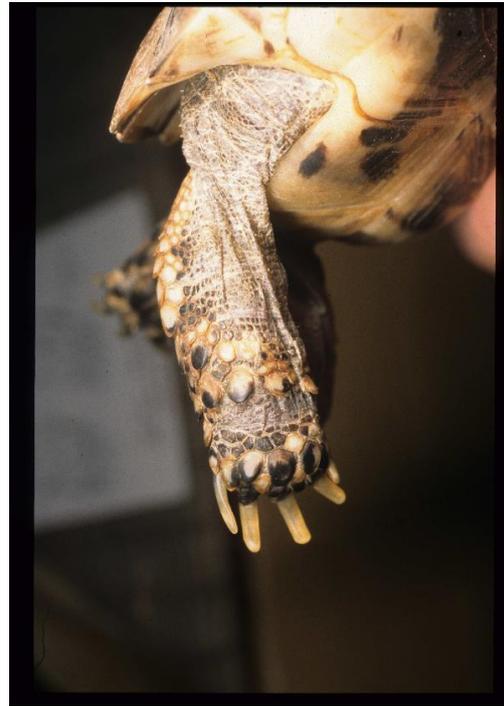
### **8. Discussion:**

#### **8.1 DNA sampling in relation to subspecies:**

Important progress was the assessment of DNA haplotypes and subspecies of a increasing number of studbook animals. See for this the leg scutes drawings by Bulsing and the distribution map and publication by Fritz et al (2009) the annual report 2010-2011.



Testudo graeca marokkensis-haplotype 4.2  
Photo by: Peter Bulsing



Testudo graeca lamberti-haplotype 5  
Photo by: Henk Zwartepoorte

The studbook holds 12 breeders. Four DNA haplotypes/subspecies have been reproduced over the past few years. Aim will be to reproduce all different DNA haplotypes/subspecies at least once and preferably in such numbers where proper new locations can be found for.

The originally described subspecies *T.g.graeca* still is valid for a specific type in Morocco; the number of subspecies is now six.

Furthermore the types *Testudo whitei* BENNETT, 1836 and *Testudo flavominimaralis* HIGHFIELD & Martin, 1989 are still discussed and by some people considered as a valid species or subspecies. Pieh and Perala however consider these taxa as nomina dubia.

The taxonomy of *Testudo graeca*, in the Northern African region as well as the Middle East and western Asia is still under discussion. As communicated earlier elsewhere the ESF *Testudo graeca* studbook now focuses only on the North African population.

Currently within the wild population in Morocco, Algeria, and Libya four subspecies are described by Pieh and Perala:

*Testudo graeca cyrenaica* (Pieh and Perala, 2002),

*Testudo graeca soussensis* (Pieh, 2000),

*Testudo graeca lamberti* (Pieh and Perala, 2004),  
*Testudo graeca marrokensis* (Pieh and Perala, 2004).  
From Tunisia by Highfield *Testudo nabeulensis* is described (Highfield, 1990).  
Within the studbook these subspecies are now represented as follows:  
27 specimens of DNA haplotype number 1 – *Testudo graeca graeca*  
42 specimens of DNA haplotype number 2 - *Testudo graeca nabeulensis*  
4 specimens of DNA haplotype number 4 (4.1, 4.2 and 4.3) - *Testudo graeca marokkensis*  
6 specimens of DNA haplotype number 5 – *Testudo graeca lamberti*  
1 specimen of DNA haplotype number 6 – *Testudo graeca unknown subspecies*  
So 80 adults and offspring have a known subspecies status. Perhaps of more specimens the DNA haplotype is known; this must be researched.

*Testudo graeca soussensis* and *T.g.cyrenaica* are not represented within the studbook. Of

Of *Testudo* "whitei" (this "species" can be considered to belong within the DNA haplotype 4 group) a very limited number is kept within the studbook.

Over the past decade a few births of DNA haplotype number 4.1 is reported within the studbook; the offspring however did not survive. Of DNA haplotype number 5 no offspring is reported.

These numbers mean that within the studbook two aims can be discussed.

Aim 1 can be continuing breeding all DNA haplotypes; it will become difficult to find homes for all offspring.

Aim 2 can be just focus on DNA haplotypes 1 and 2.

The relatively high number of tortoises of DNA haplotypes number 1 and 2 means that these two have a high breeding potential.

Reproduction of DNA haplotype number 1 is still low. Physical condition of the adult founder animals is still not particularly good. Focus must be to get these animals in breeding condition as well as proper pairs must be established. With 27 adult and captive born animals within the studbook this DNA haplotype may have a future in captivity.

Reproduction of DNA haplotype number 2 is slowly increasing, although the number of breeding adults is still low. Anyway with 42 adult and captive born animals within the studbook the future for this species is promising.

In the course of this year and 2015 perhaps it will become clear which of the two options turn out to be feasible to achieve.

Limited progress is made regarding the photo gallery of the studbook specimens. However all new arrivals are accompanied by photos of a significant number of historic specimens photos still need to be sent to the studbook. The photo archive will be updated during 2014 and 2015.

Photos of head, plastron, carapace and scutes on front- and backside of the front legs are required and those participants who did not deliver photos so far will be reminded. This photo identification tool in combination with DNA tests is vital for proper assessment of the DNA haplotype/subspecies. Costs for DNA-sampling are now assessed at €50 per sample. Co operation will be voluntarily but a contribution into the costs will be asked. At present the Gendika BV company is executing DNA analyses on the first 8 Rotterdam Zoo specimens.

## **8.2 High mortality:**

The total 146.138.178 (462) historically reported studbook animals might show a positive image. However 205 historic dead animals and the decreased interest during the past two decades of studbook keeping is a matter of great concern. At present the studbook counts 32 participants. This decrease is caused by the LTF-participants. Aim for the next few years is to increase this number again to around 40 and between 300 and 400 living animals which seem reasonably to be managed numbers.

Still very unwanted and illegal are the ongoing imports of North African tortoises from in particular Marocco. This is a matter of great concern within both the private ESF and EAZA studbook population. Cooperation and participation with EAZA institutions (European Zoos) is vital and highly demanded.

Current participation with zoos is highly appreciated. Both EAZA and ESF are supposed to participate as equal Turtle Survival Alliance (TSA) partners building the Turtle Ark.

A viable ex situ population of this very attractive species must belong to the possibilities and the studbook keeper calls upon the studbook participants to achieve this goal.

## **9.Acknowledgements:**

Thanks to Peter Bulsing for using his photo of the *Testudo graeca marokkensis*-haplotype 4.2

Further reading:

Bulsing P. (2000): De Noord Afrikaanse moorse landschildpad (Testudo g. graeca) toch een probleemloze schildpad?. Special ter gelegenheid van het 125-jarig bestaan van de Nederlandse Schildpadden Vereniging: 27-31.

Bulsing P. en H.A. Zwartepoorte (2007): Herkenning van enkele types van Testudo graeca uit Marocco, Algerije en Tunesie: Trionyx ( ).

Ballasina D.L.Ph., A.C. van der Kuyl, J.T. Dekker, J. Maas, R.E. Willemsen en J. Goudsmit (2001):

Phylogenetic relationships among the species of the genus *Testudo* (Testudines: Testudinidae) inferred from mitochondrial 12S rRNA Gene sequences, *Congres International Sur le genre Testudo* –

7 au 10 mars 2001 Hyeres – France / Actes du Congres.

Fritz U, D.James Harris, Soumia Fahd, Rachid Rouag, Eva Gracia Martinez, Andres Gimenez Casalduero, Pavel Siroky, Mohsen Kalboussi, Tareek B.

Jdeidi, Anna K. Hundsorfer (2009) :

*Amphibia-Reptilia* 30 (2009) : 63 :80.

Harris D.J., M. Znari, J.C. Mace, M.A. Carretero (2003) : Genetic variation in *Testudo graeca* from Morocco estimated using 12S rRNA DNA sequencing.

*Revista Espagnola de Herpetologia*, 17: 15-9.

Highfield, A.C. & Martin J. (1989): Description of a miniature tortoise *Testudo flavominimalis* n. species from North Africa. The Tortoise Trust, London; 4 S.

Pieh A. (2002): *Testudo graeca soussensis*, eine neue Unterart der Maurischen Landschildkröte aus dem Sousstal (Sudwest-Marokko). *Salamandra* 36(4) : 209-222.

Pieh A., J. Perala (2004) : Variabilität der Maurischen Landschildkröten (*Testudo graeca* – LINNEUS, 1758 – Komplex) im Zentralen und nordwestlichen Marokko mit Beschreibung zwei neuer Taxa. *Herpetozoa* 17 (1/2): 19-47.

Fritz U., A.K. Hundsorfer, P. Siroky, M. Auer, H. Kami, J. Lehmann, L.F.

Mazanaeva, O. Turkozhan, M. Wink (2007): Phenotypic plasticity leads to incongruence between morphology-based taxonomy and genetic differentiation in western Palearctic tortoises (*Testudo graeca* complex; Testudines, Testudinidae). *Amphibia-Reptilia* 28 (2007): 97-121

Hufer H. & Buddenfeld V. (2000): Haltung und Zucht der Tunesischen Landschildkröte. *Radiata*, Rheinbach; 9 (20): 3-14.

Pieh A. & Jarmo Perala (2002): Variabilität von *Testudo graeca* LINNAEUS, 1758 im östlichen Nordafrika mit Beschreibung eines neuen Taxons von der Cyrenaika (Nordostlibyen). *Herpetozoa* 15 (1/2): 3-28.

Zwartepoorte H.A. (2000): Project DNA-typing moorse landschildpad (*Testudo graeca*). Special ter gelegenheid van het 125-jarig bestaan van de Nederlandse Schildpadden Vereniging: 24-26.

June 1, 2014,

Henk Zwartepoorte, studbook keeper.

Peter Bulting, co-studbook keeper.

-----