

Field report 2001 research project on the Namaqualand speckled padloper (*Homopus s. signatus*)

Introduction

In the *Tortoise Trust Newsletter* of Winter 2000/Spring 2001, I wrote about fieldwork that had been conducted on the Namaqualand speckled padloper (*H. s. signatus*). This concerned fieldwork carried out in August and September 2000, under auspices of the Homopus Research Foundation.

Information on activity, behaviour, movement, diet and reproduction was gathered. Since then, two detailed scientific papers have been written and submitted for publication (population characteristics, activity and movement, and natural diet), one of which is currently in press in *Journal of Herpetology*. The 2000 project was part of a long-term study of *H. signatus*, and therefore additional fieldwork was conducted in 2001. This was again a study on *H. s. signatus*; in 2002 and 2003 *H. signatus cafer* will be investigated. Both in 2000 and in 2001 the Tortoise Trust has provided a portion of the funding required for conducting the research. Although the participants pay for travel expenses, housing, food and a substantial portion of the research costs themselves, additional funding is absolutely required. It is therefore delighting that the Tortoise Trust has decided to support the work on *H. signatus*.

Fieldwork

It was again without too much efforts that a group of enthusiastic research assistants was found to work in the field. The *H. signatus* research projects are open to participation by enthusiasts (please feel free to contact me for details). In September/October 2001 we worked in a group consisting of three Germans, a Swedish, and myself. Many of the aspects studied were an elaboration on information gathered last year (see the previous article in *Tortoise Trust Newsletter* for details). For instance, in 2000 we found out that the habitat of *H. s. signatus* was too heterogeneous for qualitative characterisation of the way the tortoises used their habitat. Prior to the 2001 fieldwork a method was developed to gather more useful data on habitat use. Furthermore, we had found out that temperature measurements with digital household thermometers took too much time, as did taking measurements by means of standard sliding callipers. Therefore infrared thermometers were purchased, as well as digital callipers. This greatly improved the quality of the study, because it allowed a larger number of observations in the same time, with more measurements with higher accuracy for each observation. The funding provided for the 2001 study also allowed us to buy two temperature data loggers, and eleven additional (temperature and relative humidity) loggers were borrowed from two fieldwork participants and Frankfurt Zoo (Germany). This large number of loggers made it possible to monitor the temperature and relative humidity in hiding places and in open areas, in different microhabitats in the study area. Last, but not least, we had decided to use a different thread trailing method if compared to 2000, when we attached thread cocoons with surgical adhesive tape. In 2001 we used 15 ml containers attached to the shell with quick setting epoxy, to reduce stress when renewing the thread cocoons (every 24 hours). In the end of the study period, the epoxy could easily be removed from the carapace.

Population dynamics

Examining the same population for two subsequent spring seasons provides a great opportunity to identify temporal changes. Questions can be answered such as "How does the formation of scute rings occur in *Homopus s. signatus* of different age?", "What growth do specimens of different size show?", "Is the age-distribution curve the same in two subsequent spring seasons?", "Is the observed population size and sex ratio the same, and are the same tortoises still in the area?", et cetera. Since all data still have to be processed, it is impossible to answer these questions at this moment. For instance, we have close-up images of the scute rings of each specimen in the population in 2000 and in 2001, and detailed comparisons of these images will take place on the computer.

At each tortoise observation, apart from the scute ring count, shell dimensions and mass were taken, as well as the sex. Furthermore we noted a few characteristics such as tick number and distribution on the tortoise body, and scute aberrations. The tortoises were uniquely marked with small dots of black nail polish before they were released.

It appeared that a relatively large number of the tortoises we found in 2000 were still present in the same area. A larger number of tortoises was located in 2001, but nevertheless we still found new specimens in the middle of the study site at the end of the five week period. This indicates that we still have not been able to locate all tortoises during the study period, although we were with as many as five persons in the relatively small (approximately 3 hectares) area. Of one previously (in 2000) marked tortoise we only found the dead shell in 2001.

Activity

By making additional recordings we intended to answer questions about tortoise activity such as "Do tortoises still inhabit the same activity area they inhabited in the previous spring season?" and "Is the activity area and daily movement distance the same as in 2000?". We expect to find many differences here, since the environmental conditions were completely different in the two spring seasons. The spring 2000 was following a winter with average rainfall, whereas spring 2001 was following a winter with the highest rainfall in the past forty years, and with rather low temperatures (extending into spring). Some plant species that were flowering in August 2000 were still not flowering as late as mid-September 2001, presumably because of the low temperatures. Vegetation looked also very different in the two seasons, with much denser and higher vegetation in spring 2001. In that respect, we also found out that the microhabitats we recognised in spring 2000 have their own dynamics in terms of size and location, depending on weather conditions.

It is possible that also the behaviour of the tortoises will be different because of the different environmental conditions. To find this out we first need to process the activity data. We used the same behaviour classes as had been used in 2000. Since we had identified virtually all plant species in the area for the diet study in 2000, we were also able to use floral aspects to characterise habitat use by the tortoises. And, as stated previously, we conducted detailed temperature measurements of the tortoises and their habitat.

Reproduction

The reproductive data gathered in 2000 (ultrasound scans and radiography) will be combined with the data from 2001 (radiography) to write one paper dealing with reproduction in the population (first thing to do right now). We will attempt to reveal whether the same tortoises developed and produced eggs in both years, if there are differences in the percentage of reproducing females in the population, differences in egg size, et cetera. Whereas none of the tortoises actually produced eggs during the six-week study period in 2000 (presumably due to low temperatures), some did during the 2001 study, after some occasional warm days. The fact that wild tortoises are able to retain their calcified eggs for six weeks during periods of apparently unfavourable temperatures is interesting when considering captive husbandry of species. The study of reproduction in the current study will certainly improve the understanding of the reproductive strategy of this tiny, rock-living species.

Other observations at the study site

The participants in the two *H. s. signatus* studies had a broad interest in biology. Although the actual fieldwork on *Homopus* (searching and processing) took most of the time, there was also time for examining and photographing other animals and plants in the study area. An impressive list of 21 reptile species, 82 plant species (in 25 families), several amphibians and small mammals and countless birds and insects were recorded on the three-hectare area! Even though we had spent six weeks in the area in 2000, we were able to locate two reptile species that we had missed in 2000 during the 2001 period.

Occasionally the weather conditions were too bad for fieldwork, as there was no tortoise activity. These days were spent in the vicinity of the study site, at locations with better weather. This allowed us to observe even a larger number of species.

Future

As mentioned in the introduction, within the current project *H. s. cafer* will be investigated in spring (September-October) 2002 and 2003. This subspecies is in much higher need of investigations, as it occurs in an even smaller distribution range, that is more densely populated by humans, without being present in any major nature reserve. Furthermore the area is developing more rapidly than the drier north. Therefore this subspecies has been included in the South African Red Data Book and IUCN lists it as 'Lower Risk/Near Threatened'. The preceding studies on *H. s. signatus* will allow us to conduct the proposed studies in an efficient way and constant contact with the University of the Western Cape (South Africa) and Western Cape Nature Conservation (South Africa) (next to *ad hoc* contacts with other universities in South Africa and Europe) is available to make sure that the project meets the justification and requirements that are placed upon all research endeavours in South African herpetology. A research proposal for 2002-2003 has been drawn up and can be downloaded from <http://www.homopus.org>.

Obviously, the work can only continue as long as sufficient funding is available. I am aware of the fact that there are more turtle projects in need of money, but nevertheless I would like to ask you to consider making a donation to the Homopus Research Foundation for the *H. s. cafer* project. This can be done through the bank account of the foundation (Homopus Research Foundation in IJsselstein,

Netherlands; account number 591278952; bank: ABN AMRO NV, PO Box 20, 3400 AA IJsselstein, Netherlands; Swift address ABNANL2A), or via the Tortoise Trust.

For the 2002 and 2003 research projects I have received several applications from potential field assistants. Approximately six to ten assistants can be placed for both years together. Being a research assistant would allow one to actively involve in tortoise research, but it is also important to realise that this is something else than a holiday. It means sometimes hard labour (a good physical shape is absolutely required, as the study site is on a steep mountain slope) and long working days. However, it also means being close to nature and the local people. Please realise that costs that have to be covered by each of the participants include travel expenses (flight and a share of the car rental), housing (camping), food and a portion of the research expenses (approximately 175 Euro per person). Fortunately camping, food and petrol are cheap in South Africa. It is also required that one is able to stay for three or six weeks in 2002, or two, three or five weeks in 2003. If you are interested, please contact me.

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