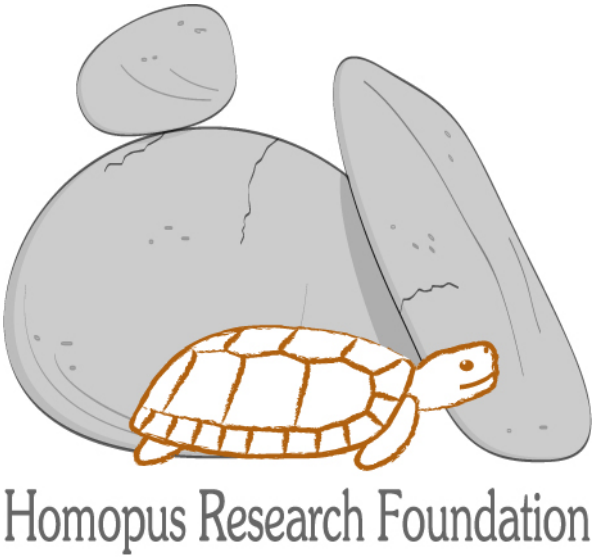
Homopus Research Foundation



Annual Report

2011

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1. INTRODUCTION AND ACHIEVEMENTS IN 2011

The Homopus Research Foundation aims to facilitate the long-term survival of *Homopus* spp. in the wild, by gathering and distributing information about their biologies and by the formation of genetically healthy *ex situ* populations. In 2011, several activities contributed to this aim. The current report presents an overview of achievements in 2011, as well as activities planned for 2012 and thereafter. Moreover, the actual studbook populations for *Homopus areolatus*, *Homopus femoralis* and *Homopus signatus* are described, focussing on changes that occurred in 2011. All previous annual reports can be found on the website of the Homopus Research Foundation, http://www.homopus.org, section Publications.

The 2010 annual report anticipated on several results for 2011. The following table summarises these plans, with results obtained in 2011.

Result	**Due**
Presentations held at:	
• Symposium of the Herpetological Association of Africa (HAA), South Africa	Jan-2011
• Meeting of the Arbeitsgemeinschaft Schildkröten (AG), Germany	19-03-2011
2011: Presentations held on survival of wild *H. signatus* (HAA), and wild and captive *H. femoralis* (AG). The latter presentation was repeated at a meeting of the Dutch-Belgium Turtle and Tortoise Society, Belgium. In addition to these presentations, three presentations (keeping and breeding of *H. areolatus*, adapting *H. signatus* to captivity, and veterinary aspects of keeping *Homopus* in studbooks) were held at a general meeting organised for the studbook *H. signatus* (see Appendix 1). Another presentation (the role of tortoise keepers in species conservation) was held at a symposium of the Platform Verantwoord Huisdierbezit, Netherlands. Furthermore, two lectures on Namibian and South African tortoises were presented in Basel and Luzern, Switzerland.	
Fieldwork conducted on *H. femoralis*	Spring 2011
2011: Fieldwork conducted in October. See Paragraph 1.2.	
General meeting future studbook *H. signatus*	03-12-2011
2011: Meeting held on 3 December. See Appendix 1 for the meeting report.	
Manuscripts submitted on:	
• Annual fluctuations of the relative humidity in the habitat of *H. femoralis*	31-12-2011
• Thermoregulation in wild *H. signatus*	01-03-2011
2011: The 2010 annual report mentioned that relative humidity data were available for *H. femoralis*. However, these data did not include the relative humidity in the tortoises' microhabitat (e.g., crevices), and provided little insight. Therefore, it was decided not to publish the data. A scientific paper on thermoregulation in *H. signatus* was submitted in 2011. In addition to this paper, a comparative popular paper on captive reproduction of *H. areolatus* in Namibia and Switzerland was submitted. Furthermore, a paper on reproduction in *H. signatus* that had been submitted in 2008 was finally published. See Chapter 6.	

Further progress that is worth listing:

- In order to warrant the continuity of the *Homopus* studbooks, a co-studbook keeper (Martijn Kooijman, Netherlands) was appointed. The operational studbook management will be the responsibility of the co-studbook keeper, while the studbook keeper will focus on the tactical and strategic levels (e.g., studbook management plans, annual plans and reports, finances).
- The European Studbook Foundation (ESF) was sent a back-up file of the studbook registration, including the key to the participant names and addresses. The board of the ESF has explicitly confirmed that the files will only serve as a back-up for the studbook and will not be made available to anyone.
- In response to rumours regarding illegal activities in the studbooks of the Homopus Research Foundation, a formal policy was developed and distributed among all studbook participants and CITES authorities in the participants' countries:

  About two years ago, there were rumours regarding Homopus studbook participants involved in

illegal activities, such as obtaining illegal Homopus in the commercial trade, misleadingly reporting commercially acquired Homopus as studbook tortoises, and connecting paperwork of studbook tortoises to different tortoises than the paperwork was prepared for. After these rumours had made their way it became quiet, but recently similar rumours reached us again.

Since no evidence was presented to us, we consider these rumours to be just rumours. Nevertheless, we thought it would be important to clarify the policy of the Homopus Research Foundation regarding illegal and fraudulent activities. The Homopus Research Foundation has a good reputation at CITES authorities worldwide that should be treasured. More importantly, the aim of the foundation is to facilitate the long-term survival of Homopus in the wild, and illegal activities may pose a serious threat to this aim.

The Homopus Research Foundation strongly condemns illegal activities. All Homopus kept in the studbooks and at studbook locations have legal and traceable origins. Each participant is responsible for the paperwork for his or her tortoises and will not fraud. The Homopus Research Foundation will fully collaborate with the authorities in case of legal investigations, providing backgrounds of studbook tortoises, DNA samples, etc. Moreover, illegal activities noted within the studbooks will be actively reported to the authorities, to facilitate prosecution. Obviously, participants involved in illegally activities will be unable to continue their participation.

We would like to state once again that we have no evidence of illegal activities within the studbooks, and we trust that such activities do not occur.

The Swiss CITES authorities responded to the message and requested information regarding Swiss keepers of *Homopus*.

- Several private tortoise keepers in France, Germany, Hungary, Italy, Netherlands, Spain, and U.K. asked to obtain *Homopus* spp. Some of them received *H. signatus* in 2011.
- One zoo in the Netherlands requested *H. signatus*.
- Information about *Homopus* spp. and the Homopus Research Foundation was distributed to the studbook on *Pyxis arachnoides*, the Interessengemeinschaft *Pyxis*, the Interessengemeinschaft *Testudo kleinmanni*, and various internet forums.
- Information requests were received regarding:
    - Identification of *H. femoralis* by a South African tortoise keeper
    - Identification of juvenile *Stigmochelys pardalis* that were mistaken for *Homopus* sp. by a South African tortoise keeper
    - Means to obtain scutes of *S. pardalis* for research purposes (University of Cape Town)
- Reprint requests for *Homopus* papers were received from:
    - Indiana University Southeast, U.S.A.
    - Belgrade University, Serbia
    - University of Swaziland
    - University of Zürich, Switzerland
- Review requests were received from:
    - Amphibia-Reptilia
    - Journals of Agriculture and Biological Sciences
- Photographic material was provided to:
    - WAZA Virtual Zoo (www.waza.org/en/zoo)
    - Bernd Wolff (tortoise book author), Germany
    - Website www.landschildpad.be
- The website of the Homopus Research Foundation was updated with new publications, actual studbook overviews, update of sponsors, the draft studbook management plan *H. signatus* with accompanying discussion paper and meeting report, and fieldwork photos.

1.1. Long-term studbook management plan Homopus signatus

A draft studbook management plan for *H. signatus* was prepared and reviewed by all studbook participants and the South African authorities in 2008. Summaries of their comments are listed in the 2008 and 2009 annual reports. In 2010, it was decided that a meeting of the studbook participants was required

to set the long-term aims for the studbook.

On 3 December 2011, a meeting was held in Isernhagen, Germany (see Appendix 1 for the meeting report). The participants discussed several alternatives and their rationales as outlined in a discussion paper, and unanimously decided that the studbook should remain a conservation-orientated studbook. Nevertheless, the draft studbook management plan requires several alterations. The plan will be adjusted and finalised in 2012.

As a side note, the meeting recommended that the studbook participants of all *Homopus* studbooks should share their names and contact details among one another, to facilitate information exchange. A form will be distributed among the participants to select which details should be made available within the studbooks.

For 2012, the actual breeding advice to studbook participants with pairs of unrelated *H. signatus* remains in place: participants may breed unrelated F1 individuals, but egg incubation methods should shift the sex ratio in the studbook towards females (e.g., eggs should be incubated in a strictly controlled environment at relatively high temperatures). The annual reports of 2009 (pages 20 and 25) and 2010 (page 20) contain references to incubation temperatures that should be used. Incubation results should be submitted to the studbook coordinator for inclusion in the annual reports.

1.2. Progress long-term field study Homopus femoralis

This study was permitted by CapeNature (South Africa). The permits require annual progress updates for CapeNature. Because this information may be informative for *Homopus* studbook participants, it will be included in the annual reports of the Homopus Research Foundation.

After poor fieldwork results due to lack of tortoise activity in March 2006, December 2008, and February 2010, the 2011 fieldwork took place in October, immediately after a major rainfall event. To that extent, the region's rainfall was monitored daily via the internet, and a last-minute flight to South Africa was booked once substantial rainfall had been predicted.

Field conditions appeared excellent for tortoise activity, with moderate to warm temperatures, high primary production including many flowering annuals and geophytes, and standing water. Tortoise activity was observed in the first few days (including gravid females), but ceased thereafter. The total number of measured tortoises was only five.

The field study on *H. femoralis* had to be aborted due to consistent lack of activity, and permits were returned to the South African authorities. The four fieldwork episodes have provided detailed information on activity in *H. femoralis*, and scattered data on behaviour, diet, body condition, and reproduction. Results will be condensed in a scientific manuscript in 2012. Since this was the first study on the ecology of *H. femoralis*, even a limited dataset will be an important expansion of the knowledge on this species.

2. PLANS FOR 2012 AND THEREAFTER

The table below lists results anticipated for 2012 and thereafter, with progress indicated:

Result	**Due**	**Current status**
Manuscript submitted on:		
• Ecological characteristics of wild *H. femoralis*	31-12-2012	Data available
Project proposal (permit application) for a study on thermoregulation in wild *H. signatus* (2012-2013) drawn up and submitted	30-04-2012	Research questions and funding needs drafted
Fieldwork conducted on *H. signatus* thermoregulation	Aug-2012	Not yet started
Detailed studbook management plan *H. signatus* finalised	31-12-2012	Draft prepared but requires more details before it can be assessed by the South African authorities. Furthermore, the outcome of the 2011 Isernhagen meeting needs to be implemented (see Paragraph 1.1).
Form distributed to all studbook participants to indicate which contact details should be revealed to other participants, to facilitate information exchange	01-06-2012	Not yet started

Result	Due	Current status
Permit application to collect and export 5.5 wild *H. signatus* drawn up and submitted	01-07-2013	Basis for the application will be the studbook management plan.
Studbook management plan *H. areolatus* drafted	31-12-2013	Not yet started
Follow-up fieldwork conducted on *H. signatus*	Sep-2013	Not yet started

3. STUDBOOK SUMMARIES

To keep the studbook registrations up to date, it is vital that all studbook participants keep the coordinator informed of any changes. In the studbooks on *H. femoralis* and *H. signatus*, each participant has accepted this obligation in a formal agreement between participant and coordinator. Regardless of the agreements, most participants are very motivated and inform the coordinator spontaneously when changes occur throughout the year. Others choose to wait until information is requested by the coordinator in the end of each year. However, some participants remain silent for an entire year or longer, despite repeated messages from the studbook coordinator. In order to keep track of where these communication flaws occur, the annual reports will include a list of unresponsive locations. This will make it easier for the reader to assess the validity of studbook information per location, and will facilitate the coordinator when approaching a silent participant. In 2011, location A42 was unresponsive. Location A45, which was unresponsive in 2010, resumed its active participation.

Homopus areolatus
Live specimens on 1 January 2011: 72 (excluding 6 specimens lost to follow-up)
Number of locations on 1 January 2011: 15 (6 countries, 1 zoo; excluding 1 location lost to follow-up)
New registrations: 0
Births: 4, at 2 locations
Deaths: 0
Live specimens on 31 December 2011: 76 (excluding 6 specimens lost to follow-up)
Number of locations on 31 December 2011: 16 (6 countries, 1 zoo; excluding 1 location lost to follow-up)
Interpretation of changes:

Locations A16 and A46 continued to produce offspring in 2011, whereas locations A10, A44, and A56 did not reproduce this year. Nevertheless, location A10 produced eggs that died due to high incubation temperatures. In terms of survival, 2011 was extremely successful, with zero mortality despite a relatively large population size. In the history of the studbook, this is the first year with zero mortality, while the initial years had rather low survival rates.

Although breeding results may still be improved, with a larger number of locations producing offspring over several successive years, the current population growth emphasises the need for a studbook management plan that outlines the long-term aims and methods. This plan will be drawn up in 2013 (see Chapter 2).

Homopus femoralis
Live specimens on 1 January 2011: 8
Number of locations on 1 January 2011: 3 (2 countries)
New registrations: 0
Births: 2
Deaths: 0
Live specimens on 31 December 2011: 10
Number of locations on 31 December 2011: 3 (2 countries)
Interpretation of changes:

Breeding results obtained at location HRF in 2008 and 2010 were continued in 2011. For the first time, multiple eggs within a clutch hatched. Although three eggs were produced, one egg broke after oviposition. Unfortunately, location A10 ceased to produce eggs.

The accumulation of offspring at location HRF increases the risks for the captive population in case of stochastic events. Therefore, it will be explored if individuals may be transferred in 2012.

Homopus signatus
Live specimens on 1 January 2011: 62 (excluding 13 specimens lost to follow-up)

Number of locations on 1 January 2011: 27 (6 countries, 1 zoo; excluding 1 location lost to follow-up)
New registrations: 0
Births: 5, at 3 locations
Deaths: 2, at 2 locations
Live specimens on 31 December 2011: 61 (excluding 17 specimens lost to follow-up)
Number of locations on 31 December 2011: 26 (6 countries, 1 zoo; excluding 1 location lost to follow-up)
Interpretation of changes:

The total number of live tortoises decreased in 2011, but this was due to four tortoises (60, 61, 62 and 67) at location A37 lost to follow-up. Location A37 withdrew these privately owned individuals to facilitate management of the remaining population (i.e., the Isernhagen meeting [see Appendix 1] identified studbook-ownership as one of the key factors determining the success of the *H. signatus* studbook).

When the tortoises lost to follow-up are disregarded, 2011 was a successful year. Similar to 2010, three locations produced offspring, and at location A18 an egg was laid that died shortly before hatching. Furthermore, at location A10 one egg was laid (not incubated), and at location A55 two eggs were laid (no development visible). Fortunately, mortality reduced compared to the two previous years. At location A33, an adult captive-bred male was found dead in its hiding place unexpectedly. Since it was already decomposing, it was frozen for later morphological examination. At location A54, another adult captive-bred male died. Examination revealed liver dystrophy and kidney shrinkage, presumably due to a chronic cause. Although the death of the current male may not have been caused by failure at location A54, two previous males had died at the same location, and the remaining female (number 76) will be transferred to another location when an unrelated male becomes available.

As was recommended in the 2010 annual report, it is important that locations A18, A40 and A57 start breeding to fortify the presence of the genes of (deceased) bloodline 1 x 2 in the captive population. Some couples are adult and should be able to reproduce. If egg production remains absent in 2012, it may be useful to explore opportunities to exchange adult couples with couples at other locations.

4. ACTUAL STUDBOOK OVERVIEWS

Homopus areolatus: Total studbook population. MULTX are groups of unregistered specimens at locations outside of the studbook. UNKX are specimens at locations outside of the studbook. ltf means that a specimen is lost to follow-up.

Stud #	Sex	Hatch Date	Sire	Dam	Location	Date	Local ID	Event
A03								
1	F	????	WILD	WILD	KRAAIFONT	~ Jul 1997	______	Transfer
					HRF	21 Nov 1997	I	Transfer
					A03	14 Dec 1997	HZ0525	Transfer
						9 Nov 1998		Death
2	F	????	WILD	WILD	KRAAIFONT	~ Jul 1997	______	Transfer
					HRF	21 Nov 1997	II	Transfer
					A03	14 Dec 1997	______	Transfer
						13 Aug 1999		Death
6	M	????	MULT1	MULT2	KRAAIFONT	????	______	Hatch
					HRF	21 Nov 1997	VI	Transfer
					A03	14 Apr 2001	HZ0738	Loan to
						~12 Sep 2007		Death
7	M	????	WILD	WILD	ROTTERDAM	????	______	Transfer
					A03	????	HZ0457	Loan to
						5 Jul 1998		Death
32	F	????	WILD	WILD	A29	~ Jun 2000	______	Transfer
					A03	15 Jun 2001	HZ0752	Transfer
						16 May 2002		Death
33	F	????	WILD	WILD	LONDON RP	????	______	Transfer
					A03	23 Dec 2001	HZ0793	Transfer
						28 Jul 2003		Death
45	M	14 Dec 1999	58	UNK5	A46	14 Dec 1999	______	Hatch
					HRF	4 Nov 2004	V3	Transfer
					A03	5 Nov 2004	HZ0989	Loan to
						25 Mar 2006		Death

Totals: 3.4.0 (7)

A10									
4	F	????	MULT1	MULT2	KRAAIFONT	????	______	Hatch
					HRF	21 Nov 1997	IV	Transfer
					A10	27 Oct 2004	______	Loan to
5	M	????	MULT1	MULT2	KRAAIFONT	????	______	Hatch
					HRF	21 Nov 1997	V	Transfer
					A10	27 Oct 2004	______	Loan to
117	?	6 Sep 2010	5	4	A10	6 Sep 2010	______	Hatch
					HRF	6 Sep 2010	______	Ownership
					A10	4 Dec 2010		Death
Totals: 1.1.1 (3)									
A12									
8	F	????	WILD	WILD	KRAAIFONT	????	______	Transfer
					A12	~16 Sep 1999	A1	Transfer
						19 Mar 2000		Death
9	F	????	WILD	WILD	A13	????	______	Transfer
					A12	~16 Sep 1999	BLACKY	Transfer
						30 Apr 2000		Death
13	M	????	WILD	WILD	KRAAIFONT	????	______	Transfer
					A12	~16 Sep 1999	A7	Transfer
						15 Feb 2000		Death
15	F	????	WILD	WILD	A13	????	______	Transfer
					A12	~16 Sep 1999	A4	Transfer
						15 Feb 2000		Death
19	?	5 Feb 2000	MULT3	11	A12	5 Feb 2000	______	Hatch
						5 Feb 2000		Death
20	?	16 Mar 2000	MULT3	11	A12	16 Mar 2000	______	Hatch
						16 Mar 2000		Death
21	?	16 Mar 2000	MULT3	11	A12	16 Mar 2000	______	Hatch
						16 Mar 2000		Death
Totals: 1.3.3 (7)									
A16									
16	M	????	WILD	WILD	A16	30 Aug 1994	______	Transfer
17	F	????	WILD	WILD	A16	30 Aug 1994	______	Transfer
18	M	23 May 2000	16	17	A16	23 May 2000	______	Hatch
						30 Mar 2003		Death
38	F	5 Apr 2003	16	17	A16	5 Apr 2003	______	Hatch
						28 Nov 2006		Death
39	M	9 Apr 2003	16	17	A16	9 Apr 2003	______	Hatch
48	M	23 Mar 2004	16	17	A16	23 Mar 2004	______	Hatch
49	F	25 Mar 2004	16	17	A16	25 Mar 2004	______	Hatch
50	F	8 Aug 2004	16	17	A16	8 Aug 2004	______	Hatch
51	M	19 Aug 2004	16	17	A16	19 Aug 2004	______	Hatch
52	F	25 Aug 2004	16	17	A16	25 Aug 2004	______	Hatch
54	M	10 Jun 2005	16	17	A16	10 Jun 2005	______	Hatch
55	M	27 Jun 2005	16	17	A16	27 Jun 2005	______	Hatch
56	F	6 Oct 2005	16	17	A16	6 Oct 2005	______	Hatch
57	F	3 Nov 2005	16	17	A16	3 Nov 2005	______	Hatch
61	?	17 Dec 2006	16	17	A16	17 Dec 2006	______	Hatch
						~ 9 May 2007		Death
108	?	8 Mar 2010	47	37	A44	8 Mar 2010	______	Hatch
					A16	4 Jun 2010	______	Transfer
109	?	8 Mar 2010	47	37	A44	8 Mar 2010	______	Hatch
					A16	4 Jun 2010	______	Transfer
115	?	30 May 2010	16	17	A16	30 May 2010	______	Hatch
116	?	31 May 2010	16	17	A16	31 May 2010	______	Hatch

122	?	2 Jul 2011	16	17	A16	2 Jul 2011	______		Hatch
Totals: 7.7.6 (20)										
A26										
27	M	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A26	9 Jul 2001	______	ltf	Transfer
28	F	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A26	9 Jul 2001	______	ltf	Transfer
Totals: 1.1.0 (2)										
A27										
29	M	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A27	9 Jul 2001	______		Transfer
						9 Nov 2001			Death
30	F	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A27	9 Jul 2001	______		Transfer
						11 Nov 2001			Death
Totals: 1.1.0 (2)										
A37										
22	M	????	WILD	WILD	UNKNOWN	????	NONE		Capture
					A20	????	______		Transfer
					A21	17 Oct 2000	______		Transfer
					A37	15 Sep 2002	1		Transfer
23	F	????	WILD	WILD	UNKNOWN	????	NONE		Capture
					A20	????	______		Transfer
					A21	17 Oct 2000	______		Transfer
					A37	15 Sep 2002	2		Transfer
24	F	~ 1993	UNK1	UNK2	A20	~ 1993	______		Hatch
					A21	17 Oct 2000	______		Transfer
					A37	15 Sep 2002	3		Transfer
46	?	30 Sep 2004	22	24	A37	30 Sep 2004	______		Hatch
107	?	8 Mar 2010	47	37	A44	8 Mar 2010	______		Hatch
					A37	5 May 2010	______		Transfer
111	?	29 Mar 2010	47	37	A44	29 Mar 2010	______		Hatch
					A37	7 Jun 2010	______		Transfer
Totals: 1.2.3 (6)										
A42										
35	M	9 Jul 2002	16	17	A16	9 Jul 2002	______		Hatch
					A42	~30 Sep 2005	______		Loan to
Totals: 1.0.0 (1)										
A43										
10	M	????	WILD	WILD	A13	????	______		Transfer
					A12	~16 Sep 1999	ERNST		Transfer
					A43	~ May 2004	______	ltf	Loan to
11	F	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A12	~16 Sep 1999	A5		Transfer
					A43	~ May 2004	______	ltf	Loan to
12	F	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A12	~16 Sep 1999	A6		Transfer
					A43	~ May 2004	______	ltf	Loan to
14	F	????	WILD	WILD	KRAAIFONT	????	______		Transfer
					A12	16 Sep 1999	BABY		Transfer
					A43	~ May 2004	______	ltf	Loan to
Totals: 1.3.0 (4)										
A44										
37	F	7 Aug 2003	5	4	HRF	7 Aug 2003	IV-3		Hatch
					A10	21 Aug 2004	______		Loan to
					HRF	27 Oct 2004	IV-3		Transfer
					A44	31 Oct 2004	ESMERA		Loan to
41	M	????	WILD	WILD	WUPPERTAL	28 Mar 1991	91586B		Transfer
					A44	27 Aug 2010	H.BERT		Loan to
47	M	~ Jun 1993	UNK3	UNK4	A47	~ Jun 1993	______		Hatch
					A48	~ 2000	______		Transfer
					A44	21 Nov 2004	HUGO		Transfer

62	F	~25 Nov 2007	5	4	A10	~25 Nov 2007	______	Hatch
					HRF	~25 Nov 2007	______	Ownership
					A44	27 Mar 2011	______	Loan to
94	?	7 Jul 2009	16	17	A16	7 Jul 2009	______	Hatch
					A44	5 Jun 2010	AUGUST	Transfer
113	M	30 Mar 2010	47	37	A44	30 Mar 2010	______	Hatch
					HRF	30 Mar 2010	______	Ownership
					A44	20 Aug 2010		Death
114	M	30 Mar 2010	47	37	A44	30 Mar 2010	______	Hatch
					HRF	30 Mar 2010	______	Ownership
					A44	26 Aug 2010		Death

Totals: 4.2.1 (7)

A45

25	F	15 Sep 2001	5	4	HRF	15 Sep 2001	IV-1	Hatch
					A10	24 May 2003	______	Loan to
					A16	4 Dec 2004	______	Loan to
					A45	27 Feb 2005	______	Loan to
34	M	30 Jun 2002	16	17	A16	30 Jun 2002	______	Hatch
					A45	27 Feb 2005	______	Loan to
53	M	12 Jun 2005	34	25	A45	12 Jun 2005	______	Hatch

Totals: 2.1.0 (3)

A46

58	M	????	WILD	WILD	A46	9 Sep 1997	03	Transfer
59	F	????	WILD	WILD	A46	9 Sep 1997	01	Transfer
60	F	????	WILD	WILD	A46	25 Mar 1999	02	Transfer
95	?	~15 Jan 2010	58	MULT4	A46	~15 Jan 2010	______	Hatch
96	?	~18 Jan 2010	58	MULT4	A46	~18 Jan 2010	______	Hatch
98	?	11 Feb 2010	58	MULT4	A46	11 Feb 2010	______	Hatch
100	?	3 Feb 2010	58	MULT4	A46	3 Feb 2010	______	Hatch
						25 Sep 2010		Death
101	?	~12 Feb 2010	58	MULT4	A46	~12 Feb 2010	______	Hatch
102	?	~24 Feb 2010	58	MULT4	A46	~24 Feb 2010	______	Hatch
103	?	3 Apr 2010	58	MULT4	A46	3 Apr 2010	______	Hatch
						18 Sep 2010		Death
104	?	3 Mar 2010	58	MULT4	A46	3 Mar 2010	______	Hatch
						13 May 2010		Death
105	?	~ 3 Apr 2010	58	MULT4	A46	~ 3 Apr 2010	______	Hatch
106	?	9 Apr 2010	58	MULT4	A46	9 Apr 2010	______	Hatch
						16 Sep 2010		Death
119	?	~20 Jan 2011	58	MULT4	A46	~20 Jan 2011	______	Hatch
120	?	~21 Jan 2011	58	MULT4	A46	~21 Jan 2011	______	Hatch
121	?	~ 2 Feb 2011	58	MULT4	A46	~ 2 Feb 2011	______	Hatch

Totals: 1.2.13 (16)

A48

90	F	3 Feb 2009	47	37	A44	3 Feb 2009	______	Hatch
					A48	3 Feb 2009	______	Ownership
						10 Feb 2009	______	Transfer
93	M	7 Jul 2009	16	17	A16	7 Jul 2009	______	Hatch
					A44	5 Jun 2010	______	Transfer
					A48	13 Jun 2010	______	Transfer

Totals: 1.1.0 (2)

A54

79	M	~15 Mar 2007	58	MULT4	A46	~15 Mar 2007	______	Hatch
					A54	~15 Jun 2008	______	Transfer
80	?	~15 Mar 2007	58	MULT4	A46	~15 Mar 2007	______	Hatch
					A54	~15 Jun 2008	______	Transfer
						15 Oct 2008		Death

81	F	~15 Mar 2007	58	MULT4	A46	~15 Mar 2007	_____	Hatch
					A54	~15 Jun 2008	_____	Transfer
82	F	~15 Mar 2007	58	MULT4	A46	~15 Mar 2007	_____	Hatch
					A54	~15 Jun 2008	_____	Transfer
83	?	~15 Mar 2007	58	MULT4	A46	~15 Mar 2007	_____	Hatch
					A54	~15 Jun 2008	_____	Transfer
						15 Oct 2008		Death

Totals: 1.2.2 (5)

A56

67	F	8 Apr 2004	58	MULT4	A46	8 Apr 2004	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
70	F	14 Mar 2004	58	MULT4	A46	14 Mar 2004	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
						8 May 2009		Death
72	M	14 Mar 2004	58	MULT4	A46	14 Mar 2004	_____	Hatch
					A56	~21 May 2006	_____	Transfer
73	M	14 Mar 2004	58	MULT4	A46	14 Mar 2004	_____	Hatch
					A56	~21 May 2006	_____	Transfer
75	M	6 Jan 2004	58	59	A46	6 Jan 2004	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
76	F	11 Jan 2004	58	59	A46	11 Jan 2004	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
78	F	23 Mar 2005	58	MULT4	A46	23 Mar 2005	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
86	?	~ 7 Feb 2008	58	MULT4	A46	~ 7 Feb 2008	_____	Hatch
					A56	23 May 2011	_____	Transfer
87	?	~25 Feb 2008	58	MULT4	A46	~25 Feb 2008	_____	Hatch
					A56	23 May 2011	_____	Transfer
88	?	5 Feb 2009	58	MULT4	A46	5 Feb 2009	_____	Hatch
					A56	23 May 2011	_____	Transfer
89	?	6 Feb 2009	58	MULT4	A46	6 Feb 2009	_____	Hatch
					A56	23 May 2011	_____	Transfer
91	?	12 Feb 2009	58	MULT4	A46	12 Feb 2009	_____	Hatch
					A56	23 May 2011	_____	Transfer
92	?	~ 7 Mar 2009	58	MULT4	A46	~ 7 Mar 2009	_____	Hatch
					A56	23 May 2011	_____	Transfer
97	?	27 Jan 2010	75	67	A56	27 Jan 2010	_____	Hatch
99	?	17 Feb 2010	75	67	A56	17 Feb 2010	_____	Hatch
118	?	13 Nov 2010	75	67	A56	13 Nov 2010	_____	Hatch

Totals: 3.4.9 (16)

A66

68	M	8 Apr 2004	58	MULT4	A46	8 Apr 2004	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
					A66	18 Sep 2009	_____	Transfer
77	F	14 Feb 2005	58	MULT4	A46	14 Feb 2005	_____	Hatch
					A56	~15 Jun 2008	_____	Transfer
					A66	18 Sep 2009	_____	Transfer

Totals: 1.1.0 (2)

A70

110	?	8 Mar 2010	47	37	A44	8 Mar 2010	_____	Hatch
					HRF	8 Mar 2010	_____	Ownership
					A70	5 Sep 2010	_____	Loan to
112	?	30 Mar 2010	47	37	A44	30 Mar 2010	_____	Hatch
					HRF	30 Mar 2010	_____	Ownership
					A70	5 Sep 2010	_____	Loan to

Totals: 0.0.2 (2)

A73

69	M	~22 Apr 2004	58	MULT4	A46	~22 Apr 2004	_____	Hatch
					A56	~21 May 2006	_____	Transfer
					A73	19 Jun 2010	_____	Transfer

```
    71    F   ~ 6 Mar 2004      58   MULT4  A46       ~ 6 Mar 2004 ______     Hatch
                                          A56       ~21 May 2006 ______     Transfer
                                          A73        19 Jun 2010 ______     Transfer
Totals: 1.1.0 (2)
-------------------------------------------------------------------------------------

A74
    74    M   ~11 Feb 2004      58   MULT4  A46       ~11 Feb 2004 ______     Hatch
                                          A56       ~21 May 2006 ______     Transfer
                                          A74         ~ Mar 2009 ______     Transfer
Totals: 1.0.0 (1)
-------------------------------------------------------------------------------------

A77
    84    F   ~ 7 Feb 2008      58   MULT4  A46       ~ 7 Feb 2008 ______     Hatch
                                          A77         2 Jun 2011 ______     Transfer

    85    M   ~ 7 Feb 2008      58   MULT4  A46       ~ 7 Feb 2008 ______     Hatch
                                          A77         2 Jun 2011 ______     Transfer
Totals: 1.1.0 (2)
-------------------------------------------------------------------------------------

HRF
     3    ?       ????       MULT1   MULT2  KRAAIFONT     ????     ______     Hatch
                                          HRF        21 Nov 1997    III     Transfer
                                                     29 Oct 1999            Death

    26    ?    15 Oct 2001       5       4  HRF        15 Oct 2001   IV-2     Hatch
                                                     26 Apr 2002            Death

    31    ?    11 Nov 2001       5       4  HRF        11 Nov 2001 ______     Hatch
                                                     11 Nov 2001            Death

    36    ?    12 Oct 2002       5       4  HRF        12 Oct 2002 ______     Hatch
                                                     12 Oct 2002            Death
Totals: 0.0.4 (4)
-------------------------------------------------------------------------------------

WUPPERTAL
    40    M       ????        WILD    WILD  WUPPERTAL  28 Mar 1991 91586A     Transfer

    42    F    22 Feb 1999      58   MULT4  A46        22 Feb 1999 ______     Hatch
                                          HRF         4 Nov 2004 NOMARK     Transfer
                                          WUPPERTAL   9 Nov 2004 91586C     Loan to
                                                     14 Apr 2005            Death

    43    F    21 Dec 1999      58   MULT4  A46        21 Dec 1999 ______     Hatch
                                          HRF         4 Nov 2004    CR1     Transfer
                                          WUPPERTAL   9 Nov 2004 91586D     Loan to
                                                     26 Mar 2005            Death

    44    F    20 Dec 2001      58   MULT4  A46        20 Dec 2001 ______     Hatch
                                          HRF         4 Nov 2004    CL2     Transfer
                                          WUPPERTAL   9 Nov 2004 91586E     Loan to
                                                      4 Nov 2005            Death
Totals: 1.3.0 (4)
-------------------------------------------------------------------------------------
=====================================================================================
TOTALS: 34.40.44 (118)
```

Homopus femoralis: Total studbook population.

```
=====================================================================================
Stud # | Sex | Hatch Date | Sire  | Dam   | Location | Date      | Local ID | Event    |
=====================================================================================

A08
     1    M       ????        WILD    WILD  A28         ~ Jan 2001 ______     Transfer
                                          HRF        23 Dec 2001       I     Loan to
                                          A08        17 Apr 2002 ______     Loan to

     6    F       ????        WILD    WILD  BEAUF W    16 Mar 2006    NONE     Capture
                                          HRF        19 Mar 2006 ______     Transfer
                                          A08         2 Apr 2006 ______     Loan to
Totals: 1.1.0 (2)
-------------------------------------------------------------------------------------

A10
     2    M       ????        WILD    WILD  A28         ~ Jan 2001 ______     Transfer
                                          A08        23 Dec 2001 ______     Loan to
                                          A10        30 Jul 2006 ______     Loan to

     5    F       ????        WILD    WILD  BEAUF W    16 Mar 2006    NONE     Capture
                                          HRF        19 Mar 2006 ______     Transfer
                                          A10        30 Jul 2006 ______     Loan to
Totals: 1.1.0 (2)
```

HRF									
3	M	????	WILD	WILD	A28	~ Jan 2001	______	Transfer
					HRF	23 Dec 2001	III	Loan to
4	F	????	WILD	WILD	BEAUF W	16 Mar 2006	NONE	Capture
					HRF	19 Mar 2006	______	Transfer
7	M	7 Jun 2008	3	4	HRF	7 Jun 2008	______	Hatch
8	?	30 Jun 2010	3	4	HRF	30 Jun 2010	______	Hatch
9	?	26 May 2011	3	4	HRF	26 May 2011	______	Hatch
10	?	28 May 2011	3	4	HRF	28 May 2011	______	Hatch
Totals: 2.1.3 (6)								
TOTALS: 4.3.3 (10)								

Homopus signatus: Total studbook population. MULT1 are specimens 18 and 19, MULT2 specimens 20 and 21. UNK1 and UNK2 are unknown specimens outside of the studbook. ltf means that a specimen is lost to follow-up. Specimen number 95 is inbred and not available for further breeding.

Stud #	Sex	Hatch Date	Sire	Dam	Location	Date	Local ID	Event
A07								
35	M	????	WILD	WILD	SPRINGBOK	4 Oct 2001	NONE	Capture
					HRF	6 Oct 2001	______	Transfer
					A07	16 Dec 2001	______	Loan to
36	F	????	WILD	WILD	SPRINGBOK	3 Oct 2001	NONE	Capture
					HRF	6 Oct 2001	______	Transfer
					A07	16 Dec 2001	______	Loan to
103	M	10 Aug 2008	35	36	A07	10 Aug 2008	______	Hatch
					HRF	10 Aug 2008	______	Ownership
					A07	27 Feb 2009		Death
108	?	~27 Sep 2009	35	36	A07	~27 Sep 2009	______	Hatch
					HRF	~27 Sep 2009	______	Ownership
					A07	~15 Dec 2009		Death
116	?	12 Aug 2010	35	36	A07	12 Aug 2010	______	Hatch
					HRF	12 Aug 2010	______	Ownership
					A07	16 Nov 2010		Death
Totals: 2.1.2 (5)								
A08								
42	F	20 Aug 2002	1	2	HRF	20 Aug 2002	II-11	Hatch
					A08	19 Apr 2003	______	Loan to
73	M	2 Aug 2005	37	38	HRF	2 Aug 2005	HSS73	Hatch
					A08	18 Apr 2009	______	Loan to
95	M	18 Sep 2007	41	42	A08	18 Sep 2007	______	Hatch
					HRF	~18 Sep 2007	______	Ownership
101	?	10 Nov 2008	41	42	A08	10 Nov 2008	______	Hatch
					HRF	10 Nov 2008	______	Ownership
					A08	~24 Nov 2008		Death
Totals: 2.1.1 (4)								
A10								
6	M	8 Nov 1996	1	3	HRF	8 Nov 1996	III-2	Hatch
					A10	4 Aug 2001	______	Loan to
					A31	7 May 2002	______	Loan to
					A10	8 Dec 2002	______	Loan to
						5 Sep 2009		Death
7	F	24 Dec 1996	1	3	HRF	24 Dec 1996	III-3	Hatch
					A06	22 Nov 1998	______	Loan to
					A07	5 Jul 2000	______	Loan to
					A18	14 Dec 2001	______	Loan to
					A31	6 May 2002	______	Loan to
					A10	8 Dec 2002	______	Loan to

44	M	31 Oct 2002	35	36	A07	31 Oct 2002	_____	Hatch
					HRF	31 Oct 2002	_____	Ownership
					A10	24 Jul 2004	_____	Loan to
80	?	10 Sep 2006	44	7	A10	10 Sep 2006	_____	Hatch
					HRF	10 Sep 2006	_____	Ownership
					A10	1 Mar 2007		Death
81	?	3 Sep 2006	44	7	A10	3 Sep 2006	_____	Hatch
					HRF	3 Sep 2006	_____	Ownership
					A10	8 Apr 2008		Death
94	M	27 Aug 2007	44	7	A10	27 Aug 2007	_____	Hatch
					HRF	~27 Aug 2007	_____	Ownership
119	?	~20 Apr 2011	44	7	A10	~20 Apr 2011	_____	Hatch
					HRF	~20 Apr 2011	_____	Ownership
120	?	~19 Sep 2011	44	7	A10	~19 Sep 2011	_____	Hatch
					HRF	~19 Sep 2011	_____	Ownership

Totals: 3.1.4 (8)

A12

45	?	~ Jun 2002	MULT1	20	A12	~ Jun 2002	_____	Hatch
						~ Jun 2002		Death
46	?	~ Jun 2002	MULT1	20	A12	~ Jun 2002	_____	Hatch
						~ Jun 2002		Death
48	?	~ Jul 2002	MULT1	20	A12	~ Jul 2002	_____	Hatch
						~ Jul 2002		Death
49	?	~ Jul 2002	MULT1	20	A12	~ Jul 2002	_____	Hatch
						~ Jul 2002		Death

Totals: 0.0.4 (4)

A16

11	M	10 Nov 1997	1	3	HRF	10 Nov 1997	III-4	Hatch
					A06	22 Nov 1998	_____	Loan to
					A07	5 Jul 2000	_____	Loan to
					A16	16 Sep 2000	_____	Loan to
14	M	22 Oct 1998	1	3	HRF	22 Oct 1998	III-5	Hatch
					A07	22 Nov 1998	_____	Loan to
					A16	16 Sep 2000	_____	Loan to
97	F	15 Sep 2007	35	36	A07	15 Sep 2007	_____	Hatch
					HRF	15 Sep 2007	_____	Ownership
					A16	14 Mar 2010	_____	Loan to

Totals: 2.1.0 (3)

A18

15	F	20 Sep 1999	1	2	HRF	20 Sep 1999	II-6	Hatch
					A31	6 May 2002	_____	Loan to
					A18	8 Dec 2002	_____	Loan to
69	M	9 May 2005	37	38	HRF	9 May 2005	HSS69	Hatch
					A33	28 May 2006	NURI	Loan to
					A18	3 Sep 2007	_____	Loan to

Totals: 1.1.0 (2)

A25

3	F	????	WILD	WILD	SPRINGBOK	26 Sep 1995	NONE	Capture
					HRF	30 Sep 1995	III	Transfer
					A25	12 Jun 2004	_____	Loan to
						22 Aug 2008		Death

Totals: 0.1.0 (1)

A31

22	M	19 Jun 2000	1	2	HRF	19 Jun 2000	II-7	Hatch
					A31	6 May 2002	_____	Loan to
						14 Sep 2002		Death
29	?	15 Jul 2001	1	3	HRF	15 Jul 2001	III-9	Hatch
					A31	6 May 2002	_____	Loan to
						14 Aug 2002		Death

Totals: 1.0.1 (2)

A33

53	F	20 Jul 2003	13	5	HRF	20 Jul 2003	030720	Hatch
					A51	16 Sep 2006	_____	Loan to
					A33	30 Dec 2007	_____	Loan to

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    63    M     6 Jul 2004      35      36  A07         6 Jul 2004 ______      Hatch
                                            HRF         6 Jul 2004 ______      Ownership
                                            A51        14 Aug 2006 ______      Loan to
                                            A33        30 Dec 2007 ______      Loan to
                                                       12 Nov 2011             Death

    66    F     6 Aug 2004      13       5  HRF         6 Aug 2004 040806      Hatch
                                            A51         2 Jun 2006 ______      Loan to
                                            A33        30 Dec 2007 ______      Loan to
Totals: 1.2.0 (3)
--------------------------------------------------------------------------------

A35
    31    M     3 Aug 2001       1       2  HRF         3 Aug 2001  II-10      Hatch
                                            A31         6 May 2002 ______      Loan to
                                            A35        30 Nov 2002 ______      Loan to
                                                       ~ Jul 2006              Death

    34    M    30 Sep 2001       1       3  HRF        30 Sep 2001 III-11      Hatch
                                            A31         6 May 2002 ______      Loan to
                                            A35        30 Nov 2002 ______      Loan to
                                                      ~ 1 Apr 2007             Death
Totals: 2.0.0 (2)
--------------------------------------------------------------------------------

A36
    12    M    21 Nov 1997       1       2  HRF        21 Nov 1997   II-4      Hatch
                                            A07        22 Nov 1998 ______      Loan to
                                            A18        14 Dec 2001 ______      Loan to
                                            A31         6 May 2002 ______      Loan to
                                            A36         8 Dec 2002 ______      Loan to
                                                       20 Oct 2003             Death
Totals: 1.0.0 (1)
--------------------------------------------------------------------------------

A37
    33    M    19 Aug 2001       1       3  HRF        19 Aug 2001 III-10      Hatch
                                            A31         6 May 2002 ______      Loan to
                                            A37        11 Dec 2002 ______      Loan to
                                                       26 Dec 2003             Death

    60    F       ????        WILD    WILD  UNKNOWN        ????       NONE     Capture
                                            A37       ~15 Mar 2003 ______ ltf Transfer

    61    M     7 Oct 2003    WILD      60  A37         7 Oct 2003 ______      Hatch
                                                       18 Dec 2011 ______ ltf Transfer

    62    F     5 Jun 2004    WILD      60  A37         5 Jun 2004 ______      Hatch
                                                       18 Dec 2011 ______ ltf Transfer

    67    M     5 Aug 2004    WILD      60  A37         5 Aug 2004 ______      Hatch
                                                       18 Dec 2011 ______ ltf Transfer

    83    ?   ~15 Jan 2006      25      60  A37       ~15 Jan 2006 ______      Hatch
                                                      ~15 Jan 2006             Death

    84    ?   ~15 Feb 2006      25      60  A37       ~15 Feb 2006 ______      Hatch
                                                      ~15 May 2006             Death

    85    ?   ~15 Mar 2006      25      60  A37       ~15 Mar 2006 ______      Hatch
                                                      ~20 Mar 2006             Death

    86    M   ~20 Apr 2006      25      60  A37       ~20 Apr 2006 ______      Hatch

    87    M   ~15 Oct 2005      25      60  A37       ~15 Oct 2005 ______      Hatch

    89    M    18 Jan 2007      25      60  A37        18 Jan 2007 ______      Hatch

    92    M    10 Aug 2007      25      60  A37        10 Aug 2007 ______      Hatch
                                            HRF       ~10 Aug 2007 ______      Ownership

    98    M    29 Dec 2007      25      60  A37        29 Dec 2007 ______      Hatch
Totals: 8.2.3 (13)
--------------------------------------------------------------------------------

A39
    40    M     2 Jul 2002       1       3  HRF         2 Jul 2002 III-13      Hatch
                                            A39        12 Apr 2003 ______      Loan to

    88    M   ~15 Nov 2005      25      60  A37       ~15 Nov 2005 ______      Hatch
                                            HRF       ~15 Nov 2005 ______      Ownership
                                            A69        30 Aug 2010 ______      Loan to
                                            A39        24 Nov 2011 ______      Loan to

   111    F    13 May 2010      37      38  HRF        13 May 2010 ______      Hatch
                                            A39         3 Dec 2011 ______      Loan to
Totals: 2.1.0 (3)
--------------------------------------------------------------------------------
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A40
    43    F    29 Sep 2002       1        2  HRF        29 Sep 2002 ______      Hatch
                                              A40         6 Jun 2003 ______      Loan to

    91    M     3 Aug 2007      37       38  HRF         3 Aug 2007 ______      Hatch
                                              A40        14 Nov 2009 ______      Loan to
Totals: 1.1.0 (2)
-------------------------------------------------------------------------------------------

A42
    41    M    25 Jul 2002       1        3  HRF        25 Jul 2002 III-14      Hatch
                                              A08        19 Apr 2003 ______      Loan to
                                              A60        12 Oct 2009 ______      Loan to
                                              A42        22 Jan 2010 ______      Loan to

    55    ?     3 Sep 2003       1        2  HRF         3 Sep 2003  II-14      Hatch
                                              A42         7 Nov 2003 ______      Loan to
                                                         13 Mar 2004             Death
Totals: 1.0.1 (2)
-------------------------------------------------------------------------------------------

A43
    17    M       ????        WILD     WILD  A12         8 Sep 1999 ______      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    18    M       ????        WILD     WILD  SPRINGBOK ~16 Sep 1999   NONE      Capture
                                              A12       ~16 Sep 1999  VIEJO      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    19    M       ????        WILD     WILD  SPRINGBOK ~16 Sep 1999   NONE      Capture
                                              A12       ~16 Sep 1999 STUMPY      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    20    F       ????        WILD     WILD  SPRINGBOK ~16 Sep 1999   NONE      Capture
                                              A12       ~16 Sep 1999  MIDGE      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    21    F       ????        WILD     WILD  SPRINGBOK ~16 Sep 1999   NONE      Capture
                                              A12       ~16 Sep 1999 BERTHA      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    27    ?    17 Oct 2000   MULT1    MULT2  A12        17 Oct 2000  SASHI      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    28    ?    15 Nov 2000   MULT1    MULT2  A12        15 Nov 2000 PEANUT      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    30    ?    26 Jul 2001   MULT1       20  A12        26 Jul 2001 ______      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    32    ?    10 Aug 2001   MULT1       20  A12        10 Aug 2001 ______      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    47    M       ????        UNK1     UNK2  A12         ~ Jan 2002  ERNST      Transfer
                                              A43         ~ May 2004 ______ ltf Loan to

    56    ?    22 Aug 2003   MULT1       20  A12        22 Aug 2003 ______      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    57    ?    17 Sep 2003   MULT1       20  A12        17 Sep 2003 ______      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to

    58    ?    20 Sep 2003   MULT1       20  A12        20 Sep 2003 ______      Hatch
                                              A43         ~ May 2004 ______ ltf Loan to
Totals: 4.2.7 (13)
-------------------------------------------------------------------------------------------

A50
     1    M       ????        WILD     WILD  SPRINGBOK  27 Sep 1995   NONE      Capture
                                              HRF        30 Sep 1995      I      Transfer
                                              A25        12 Jun 2004 ______      Loan to
                                              A50         8 Mar 2009 ______      Loan to

     5    F    27 Feb 1996     WILD        3  HRF        27 Feb 1996  III-1      Hatch
                                              A50        16 Sep 2006 ______      Loan to
                                                         24 Mar 2009             Death

    13    M    26 Sep 1998       1        2  A07        22 Nov 1998 ______      Loan to
                                              A18        14 Dec 2001 ______      Loan to
                                              A31         6 May 2002 ______      Loan to
                                              HRF         8 Dec 2002   II-5      Transfer
                                              A50        16 Sep 2006 ______      Loan to
                                                         15 Sep 2010             Death

    64    M    29 Jul 2004       1        3  HRF        29 Jul 2004 III-19      Hatch
                                              A50        17 Apr 2005 ______      Loan to
                                                         25 Mar 2009             Death
Totals: 3.1.0 (4)
```

A52									
	70	M	24 Jun 2005	1	3	A25	24 Jun 2005	DOPPIE	Hatch
						HRF	24 Jun 2005	_____	Ownership
						A52	5 Jan 2007	_____	Loan to
							11 Jun 2007		Death
Totals: 1.0.0 (1)									
A54									
	68	M	14 Aug 2004	35	36	A07	14 Aug 2004	_____	Hatch
						HRF	15 Aug 2004	_____	Ownership
						A61	8 Oct 2006	_____	Loan to
						A60	~18 Sep 2008	_____	Loan to
						A54	~16 Apr 2011	_____	Loan to
							~17 Oct 2011		Death
	75	M	9 May 2006	13	5	HRF	9 May 2006	_____	Hatch
						A54	24 Mar 2007	_____	Loan to
							~27 Oct 2010		Death
	76	F	20 Jun 2006	13	5	HRF	20 Jun 2006	V-4	Hatch
						A54	24 Mar 2007	_____	Loan to
	102	M	28 Jun 2008	35	36	A07	28 Jun 2008	_____	Hatch
						HRF	28 Jun 2008	_____	Ownership
						A54	2 Jan 2010	_____	Loan to
							~27 Oct 2010		Death
Totals: 3.1.0 (4)									
A55									
	74	M	31 Jul 2005	1	3	A25	31 Jul 2005	_____	Hatch
						HRF	31 Jul 2005	_____	Ownership
						A55	24 Mar 2007	_____	Loan to
	96	F	30 Jul 2007	35	36	A07	30 Jul 2007	_____	Hatch
						HRF	30 Jul 2007	_____	Ownership
						A61	13 Apr 2008	_____	Loan to
						A64	10 May 2009	_____	Loan to
						A55	12 Sep 2009	_____	Loan to
Totals: 1.1.0 (2)									
A57									
	10	M	22 Oct 1997	1	2	HRF	22 Oct 1997	II-3	Hatch
						A10	4 Aug 2001	_____	Loan to
						A31	7 May 2002	_____	Loan to
						A33	8 Nov 2002	UHURU	Loan to
						A57	6 Apr 2008	_____	Loan to
	79	F	9 Aug 2006	37	38	HRF	9 Aug 2006	_____	Hatch
						A57	5 Nov 2009	_____	Loan to
Totals: 1.1.0 (2)									
A58									
	71	M	25 Jun 2005	44	7	A10	25 Jun 2005	_____	Hatch
						HRF	25 Jun 2005	_____	Ownership
						A58	6 May 2008	_____	Loan to
	109	F	3 Feb 2010	44	7	A10	3 Feb 2010	_____	Hatch
						HRF	~ 3 Feb 2010	_____	Ownership
						A58	10 Nov 2011	_____	Loan to
	110	F	23 Mar 2010	44	7	A10	23 Mar 2010	_____	Hatch
						HRF	~23 Mar 2010	_____	Ownership
						A58	10 Nov 2011	_____	Loan to
	118	F	1 May 2010	44	7	A10	1 May 2010	_____	Hatch
						HRF	~ 1 May 2010	_____	Ownership
						A58	10 Nov 2011	_____	Loan to
Totals: 1.3.0 (4)									
A59									
	51	M	1 Jul 2003	1	2	HRF	1 Jul 2003	II-13	Hatch
						A41	2 Nov 2003	_____	Loan to
						A59	13 Sep 2008	_____	Loan to
	113	F	16 Jun 2010	37	38	HRF	16 Jun 2010	_____	Hatch
						A59	3 Dec 2011	_____	Loan to
Totals: 1.1.0 (2)									

```
A60
    54    F     5 Sep 2003       1       3  HRF         5 Sep 2003 III-17     Hatch
                                            A42         7 Nov 2003 THEODO     Loan to
                                            A60        22 Jan 2010 ______     Loan to
                                                       29 May 2010            Death
Totals: 0.1.0 (1)
-------------------------------------------------------------------------------------

A62
    25    M    12 Sep 2000       1       3  HRF        12 Sep 2000  III-8     Hatch
                                            A31         6 May 2002 ______     Loan to
                                            A37        11 Dec 2002 ______     Loan to
                                            A62       ~ 9 Oct 2008 ______     Loan to
                                                        2 Jan 2009            Death
Totals: 1.0.0 (1)
-------------------------------------------------------------------------------------

A63
    77    F    13 Jul 2006      44       7  A10        13 Jul 2006 ______     Hatch
                                            HRF        13 Jul 2006 ______     Ownership
                                            A63        14 Aug 2010 ______     Loan to

    78    M    10 Jun 2006      44       7  A10        10 Jun 2006 ______     Hatch
                                            HRF        10 Jun 2006 ______     Ownership
                                            A63         7 Mar 2009 ______     Loan to
                                                       23 Jul 2010            Death

    93    M    30 Jul 2007      44       7  A10        30 Jul 2007 ______     Hatch
                                            HRF        30 Jul 2007 ______     Ownership
                                            A63        14 Aug 2010 ______     Loan to
Totals: 2.1.0 (3)
-------------------------------------------------------------------------------------

A65
    72    M    24 Jul 2005   MULT3   MULT4  HRF        24 Jul 2005    ?-1     Hatch
                                            A65        17 Oct 2009 ______     Loan to
Totals: 1.0.0 (1)
-------------------------------------------------------------------------------------

A67
   106    ?    20 May 2009      35      36  A07        20 May 2009 ______     Hatch
                                            HRF        20 May 2009 ______     Ownership
                                            A67        13 Mar 2010 ______     Loan to

   107    ?    21 Jul 2009      35      36  A07        21 Jul 2009 ______     Hatch
                                            HRF        21 Jul 2009 ______     Ownership
                                            A67        13 Mar 2010 ______     Loan to

   121    ?    23 Sep 2011      35      36  A07        23 Sep 2011 ______     Hatch
                                            HRF        23 Sep 2011 ______     Ownership
                                            A67        18 Nov 2011 ______     Loan to
Totals: 0.0.3 (3)
-------------------------------------------------------------------------------------

A68
    99    M    21 May 2008      37      38  HRF        21 May 2008 ______     Hatch
                                            A68         5 Jun 2010 ______     Loan to

   100    M    24 Jun 2008      37      38  HRF        24 Jun 2008 ______     Hatch
                                            A68         5 Jun 2010 ______     Loan to
Totals: 2.0.0 (2)
-------------------------------------------------------------------------------------

A71
    82    M    26 Dec 2005      25      60  A37        26 Dec 2005 ______     Hatch
                                            HRF        26 Dec 2005 ______     Ownership
                                            A71        30 Aug 2010 ______     Loan to
Totals: 1.0.0 (1)
-------------------------------------------------------------------------------------

A72
   105    F    27 Jul 2009      37       9  HRF        27 Jul 2009 ______     Hatch
                                            A72        29 Oct 2010 ______     Loan to

   112    M     8 Jun 2010      37       9  HRF         8 Jun 2010 ______     Hatch
                                            A72        29 Oct 2010 ______     Loan to
Totals: 1.1.0 (2)
-------------------------------------------------------------------------------------

A75
    59    M    10 Jun 2004       1       3  HRF        10 Jun 2004 III-18     Hatch
                                            A61       ~17 Apr 2005 ______     Loan to
                                            A64        10 May 2009 ______     Loan to
                                            A75        27 Apr 2011 PANSER     Loan to
Totals: 1.0.0 (1)
-------------------------------------------------------------------------------------
```

```
A76
   114    ?     4 Jul 2010      37       9  HRF         4 Jul 2010 ______      Hatch
                                            A76       ~27 Jun 2011 ______      Loan to
Totals: 0.0.1 (1)
-------------------------------------------------------------------------------------

HRF
     2    F       ????        WILD    WILD  SPRINGBOK  26 Sep 1995   NONE      Capture
                                            HRF        30 Sep 1995     II      Transfer
                                                       14 May 2004             Death

     4    M       ????        WILD    WILD  SPRINGBOK  28 Sep 1995   NONE      Capture
                                            HRF        30 Sep 1995     IV      Transfer
                                                       24 Dec 1995             Death

     8    ?    26 Jan 1997       1       2  HRF         2 Feb 1997             Death

     9    F    30 Nov 1996       1       2  HRF        30 Nov 1996   II-1      Hatch

    16    ?     4 Oct 1999       1       3  HRF         4 Oct 1999  III-6      Hatch
                                                        4 Oct 1999             Death

    23    ?    19 Jul 2000       1       2  HRF        19 Jul 2000   II-8      Hatch
                                                       29 Jun 2001             Death

    24    ?     2 Aug 2000       1       3  HRF         2 Aug 2000  III-7      Hatch
                                                        2 Aug 2000             Death

    37    M       ????        WILD    WILD  SPRINGBOK   3 Oct 2001   NONE      Capture
                                            HRF         6 Oct 2001 ______      Transfer
                                            A25         6 Oct 2001 ______      Loan to
                                            HRF        12 Jun 2004 0612-I      Transfer

    38    F       ????        WILD    WILD  SPRINGBOK   3 Oct 2001   NONE      Capture
                                            HRF         6 Oct 2001 ______      Transfer
                                            A25         6 Oct 2001 ______      Loan to
                                            HRF        12 Jun 2004 612-II      Transfer

    39    ?    11 Jun 2002       1       3  HRF        11 Jun 2002 III-12      Hatch
                                                       20 Jun 2002             Death

    90    F    29 May 2007      37      38  HRF        29 May 2007 ______      Hatch
                                                        8 Jul 2007             Death

   104    M     4 Jun 2009      37      38  HRF         4 Jun 2009 ______      Hatch

   115    ?     6 Jul 2011      37       9  HRF         6 Jul 2011 ______      Hatch

   117    ?    12 Jun 2011      37       9  HRF        12 Jun 2011 ______      Hatch
Totals: 3.4.7 (14)
-------------------------------------------------------------------------------------

PRAHA
    50    M    17 Jun 2003       1       3  HRF        17 Jun 2003 III-15      Hatch
                                            PRAHA      20 Dec 2003 ______      Loan to
                                                        3 Dec 2010             Death

    52    F     9 Jul 2003       1       3  HRF         9 Jul 2003 III-16      Hatch
                                            PRAHA      20 Dec 2003 ______      Loan to

    65    M    31 Jul 2004      35      36  A07        31 Jul 2004 ______      Hatch
                                            HRF        31 Jul 2004 ______      Ownership
                                            PRAHA      31 Aug 2006 ______      Loan to
Totals: 2.1.0 (3)
-------------------------------------------------------------------------------------

WUPPERTAL
    26    F     7 Oct 2000       1       2  HRF         7 Oct 2000   II-9      Hatch
                                            A31         6 May 2002 ______      Loan to
                                            WUPPERTAL  18 Dec 2002 ______      Loan to
                                                        2 Jun 2008             Death
Totals: 0.1.0 (1)
-------------------------------------------------------------------------------------
=====================================================================================
TOTALS: 56.31.34 (121)
```

5. SPECIFIC INFORMATION FROM STUDBOOK PARTICIPANTS

Location A10

In 2011, it was confirmed that three *H. signatus* incubated at high incubation temperatures (see the 2009 and 2010 annual reports for a detailed description; roughly 33.5°C for 18 hours and 29°C for 6

hours) are females. Incubation substrate was Seramis. A total of 150 g Seramis was put in a plastic container (500 g buttercup), the egg placed on top of the substrate, and 100-150 g of water was added at one end (not over/around the egg) of the container. A lid was placed on (part of) the container. The container was placed in the incubator (DIY; large standing freezer type, compressor and elements removed, heating cable provided). The Seramis started to dry out. In the incubator, a water container (1 l) was present at all times, with a small portion of the heating cable running through the water to provide water vapour. Three weeks before the expected hatching date, the Seramis was remoistened (circa 50 g of water). All three eggs hatched successfully. However, two *H. areolatus* eggs died shortly before hatching, and the incubation temperature appears too high for *H. areolatus*.

Location A18

On 15 May, an egg was opened after 185 days of incubation at 30-32°C. This egg contained a fully developed but dead animal.

Location A46

This year the rainy season here in Namibia showed very unusual figures. During "normal" rainy seasons, we receive a maximum rainfall of approximately 350 to 800 mm. This year we faced 1600 mm of rain around Windhoek. Most of these rains fell between mid January and the end of March. Many thunderstorms released more than 50 mm of rain in very short periods, and induced cloudy weather conditions sometimes over several days.

The result of this strange rainy season was a massive reduction on the hatching of *H. areolatus* and *H. solus*. Only the first clutch produced in mid August 2010 hatched (three specimens). All other clutches (four in total) did not develop as a result of the wet and very unusual weather conditions. The same happened in *H. solus* clutches.

The three hatchlings of *H. areolatus* were quite weak at the beginning, and we had to keep them indoors for a period to improve keeping conditions. We also put a better lighting on top of the outside terrariums to enable better warming and drying. This is weird in a sunny country like Namibia.

Growth remained low until the wet weather conditions ended in April 2011. It was difficult to keep *H. areolatus* in wet and insufficiently lighted conditions for a longer period.

Homopus solus developed skin problems after a 3 week-period of heavy rains. Tortoises stopped

feeding and became increasingly inactive. To provide better conditions for these tortoises, we offered them indoor terrariums for a couple of days. Removing them from the outdoor enclosures only during rainfall was not possible, because this resulted in stress and made the situation even worse.

For the next rainy season we plan to roof the enclosures to keep the rain out as much as possible, despite the fact that Namibia usually has more than 340 sunny days annually!

Location A54

These are some photos of the *H. areolatus* and *H. signatus* kept at this location.

Location A56

Hatchling *H. areolatus* number 118, photographed in January 2011.

Location A63

The *H. signatus* were moved to a bigger enclosure, measuring 100 x 80 cm with an open top. The animals appeared less stressed, particularly the male. The new enclosure receives more natural sunlight, and the tortoises show a clearer daily activity cycle.

In the enclosure, *Kalanchoe thryrsiflora* is used as retreat, and the male prefers is over rock crevices.

Location A68

The enclosures in which two male *H. signatus* are kept measure 130 x 50 x 65 cm (l x w x h).

Decoration consists of sand and gravel (dimensions 1.5 x 0.5 cm), polygonal plates, pebbles, and sandstone as retreats. There are several artificial plants present.

The enclosures are illuminated with tube lights (Lucky Reptile T5 Daylight Sun, 39/54 Watt), spotlights (40/60 Watt), compact fluorescents (Reptil Glow 2.0, 13 Watt), and HID lamps (Lucky Reptile Bright Sun UV Desert, 50 Watt). Photoperiod depends on season; 13-14 hours in summer, and 9-10 hours in winter, with a gradual change between these seasons.

Tortoises are fed with weeds (*Plantago* spp., *Taraxacum* sp.), and rarely endive and chicory. Flowers of *Hibiscus* sp., roses, and *Taraxacum* sp. are also accepted, both fresh and dried. Drinking water is always available. The food is enriched with a vitamin/mineral supplement (Herpetal, with 47% calcium citrate), and pieces of cuttlebone are provided every three weeks.

The males are kept separately. Initially the two siblings were housed together, but they had to be separated due to aggression. Once separated, male number 100 became more active and spends more time basking. It was probably beneficial to separate them. Both males have grown since their arrival.

Location A77

A detailed report is provided in Appendix 2.

Location HRF

All *Homopus* enclosures at this location have open tops. They were built of chipboard in 2005, and needed replacement in 2011. The following are photos of the new construction.

The adult enclosures were built of gaseous concrete (Ytong) blocks, glued to the concrete floor. Ytong blocks have little weight and are easily processed.

The corners were coated to ensure water tightness.

Subsequently, the rest of the floor and the Ytong blocks were coated.

A layer of insulating foil thermally isolates the soil substrate from the concrete floor. For aesthetic reasons, the Ytong blocks were covered with artificial (light-weight) stone strips.

The enclosures were filled with foam (Styrofoam, polyurethane plates), except the areas available for egg-laying. These areas were selected based on egg-laying behaviour in the previous years.

Eventually, the enclosures were filled with sandy loam and decorated exactly as previously, to not cause stress to the tortoises. Tortoises were released 48 hours after removing them from the old enclosures.

The juvenile enclosures were built of Ytong blocks that were glued to a water tight chipboard plate.

Similarly to the adult enclosures, the chipboard and Ytong blocks were coated.

The final enclosures do not have egg-laying sites, since they are only used for juvenile tortoises.

It appeared that female number 38 did not reproduce in 2011, but when reconstructing the adult enclosures, a fully developed dead egg was found. The egg was positioned at a cool site of the enclosure, and may have failed to hatch due to relatively low temperatures.

6. NEW PUBLICATIONS

The following overview summarises all manuscripts and articles that were submitted, accepted, published, or under review in 2011.

Subject	Submitted	Accepted	Published	Journal
Husbandry and breeding account *Homopus* spp.	2003/2008			Mertensiella (English), resubmitted for inclusion in a book edited by Prof. W. Sachsse in 2008
Annual variation in reproduction of wild *H. s. signatus*	2008	2011	2011	Copeia (English)
Road Mortality in the Greater Padloper, *Homopus femoralis*	2009/2012			Turtle and Tortoise Newsletter (English), resubmitted to Chelonian Conservation and Biology (English)
Environmental factors affecting modelled current and future distributions of *Homopus signatus*, an arid-zone chelonian endemic to South Africa (co-authored)	2009			Journal of Arid Environments (English)
Thermoregulation in wild *H. signatus*	2011			Journal of Arid Environments (English)

7. FINANCIAL REPORT

The available funds accumulated in 2011, as a result of several significant donations by studbook participants Michael Hebbeler, Martijn Kooijman, and Paul van Sloun. In addition, expenses were low due to relatively unsuccessful fieldwork in October (see Paragraph 1.2). The currently available funds are insufficient for the new study on thermoregulation in *H. signatus* that will start in 2012. While radiotransmitters may be purchased, funding for iButtons (circa € 2,500), copper models, and other small equipment (circa € 500) is still lacking. Therefore, the project proposal that will be drafted in the first months of 2012 will be used to gather additional donations.

Expenses that do not show in the financial report are those that were made privately by the participants of the Isernhagen meeting (see Appendix 1). These costs totalled circa € 1,000.

Financial report Homopus Research Foundation 2011

Revenues		***Expenses***	
Net amount €	**Item**	**Amount €**	**Item**
Project H. femoralis 2006-2011 (terminated in 2011)		*Project H. femoralis 2006-2011 (terminated in 2011)*	
9	Remaining funds 2010	9	File for notching
9	Subtotal	9	Subtotal
Project H. signatus 2012-2013		*Project H. signatus 2012-2013*	
3,096	Remaining funds 2010	1,500	Reservation rebattering radiotransmitters
1,400	Donations private individuals	2,500	Reservation purchase additional radiotransmitters
		496	Reservation for other project expenses
4,496	Subtotal	4,496	Subtotal
Other		*Other*	
128	Donation V. Loehr to cover non-project expenses	27	Chamber of Commerce 2011
45	Interest bank accounts	146	Annual costs bank accounts
172	Subtotal	172	Subtotal
4,677	Total	4,677	Total

8. PERMIT OVERVIEW

The activities reported in this document would not have been possible without the following permits issued by the South African and Namibian authorities:

Exporting of H. areolatus

- Exporting permit 49683 (Ministry of Environment and Tourism, Namibia)
- CITES exporting permit 8830 (Ministry of Environment and Tourism, Namibia)
- CITES exporting permit 3558 (Ministry of Environment and Tourism, South Africa)
- Health certificate 13\1\4\2\ 09/2- 1676/04 (Ministry of Agriculture, Water and Rural Development, Namibia)
- Various additional permits issued to individual studbook participants (Namibia)

Collecting and exporting of H. femoralis

- Collecting permit AAA004-00010-0035 (CapeNature, South Africa)
- CITES exporting permit 58679 (Department of Environmental Affairs and Tourism, South Africa)

- Health declaration dated 17-03-06 (Department of Agriculture, South Africa)

Collecting and exporting of H. signatus

- Collecting permit 331/95 (Western Cape Nature Conservation Board, South Africa)
- Collecting permit 28/2001 (Northern Cape Nature Conservation, South Africa)
- CITES exporting permits 16579 and 281/95C (Department of Environmental Affairs and Tourism, South Africa)
- Permit to move animals/animal products 2001/10/3/A (Department of Agriculture, South Africa)

Field study on H. boulengeri

- Research permits 755/05, 43/2005 and 35/2005 (Northern Cape Nature Conservation, South Africa)

Field study on H. femoralis

- Research permit AAA-004-000185-0035
- Research permit AAA-004-00020-0028
- Research permit AAA-004-000392-0035
- Research permit AAA-004-00027-0028

Field studies on H. signatus and H. s. cafer

- Research permits 137/99, 84/99, 019/2001, 010/2001, 46/2003, 26/2003, 8/2003, 168/2003, 43/2003, 158/2003, 633/2003, 25/2003, 158/2004 and 633/2004 (Northern Cape Nature Conservation, South Africa)
- Research permits 428/2002 and 41/2002 (Western Cape Nature Conservation Board, South Africa)

APPENDIX 1 - MEETING REPORT

Discussing the future of the studbook on *Homopus signatus*

Final report

Homopus Research Foundation
Victor Loehr

24 December 2011

Introduction

On 3 December 2011, 16 (including 4 ex/aspirant) participants in the studbook on *Homopus signatus* gathered in Isernhagen, Germany, to discuss the long-term future of this studbook. The central question was what the long-term aim of the studbook should be, so that the draft studbook management plan (dated May 2008) might be altered and finalised accordingly.

The meeting date was selected after consultation with all studbook participants one year earlier. On 2 September 2011, a discussion paper was drawn up and distributed among all studbook participants, and participants who were unable to attend the meeting were invited to send a response by e-mail. The Isernhagen meeting location was selected to equalise the travel distance for all participants in Belgium, Czech, France, Germany, Italy, Netherlands, and Sweden. During the meeting, English and German languages were used to facilitate the involvement of all participants.

Programme

The meeting programme consisted of two parts. In the morning, a discussion was lead by Sergé Bogaerts to determine what the long-term studbook aim should be. In the afternoon, three lectures on *Homopus* were presented.

Discussion

Part one

The discussion paper was presented, including three potential long-term studbook aims. First, the strict policies (e.g., little breeding, genetic management, non-commercial) of the current studbook were discussed and motivated.

It was questioned whether it will be feasible to maintain these strict policies in the future. It will be a matter of time until legal(ised) *H. signatus* will appear in the commercial trade, to compete with studbook tortoises for locations and space. Although this will be a challenge for the studbook, the conditions under which the South African authorities have granted our collecting permits do not allow us to relax most conditions. All founders and genetically related offspring will have to remain registered in the studbook, and commercial trade with such tortoises cannot be permitted.

The studbook will require idealistically motivated participants willing to contribute to conservation. The majority of tortoise keepers might not be interested in studbook tortoises, but this is not necessarily a problem: Aspirant studbook participants are requested to sign an agreement with the Homopus Research Foundation, and should not sign if they find the strict policies problematic. At this moment, the waiting list for *H. signatus* indicates the availability of idealistically motivated aspirants. Moreover, it was argued that the current success of the studbook, compared to many other studbooks, is mostly a result of the strict management.

A related question was whether privately owned *H. signatus* might be incorporated in the studbook. Two aspects were discussed: When privately owned *H. signatus* would be combined with studbook tortoises, the South African permit conditions require that all offspring is registered in the studbook and will not be used for commercial purposes. Secondly, tortoises with unknown origin should not be mixed with the current, location-specific, captive population, because the taxonomy of *H. signatus* remains unresolved, and location-specific tortoises may still be collected in South Africa. There is no reason to suspect that the wild donor population suffers from genetic depletion. This means that very few privately-owned *H. signatus* will be available for incorporation in the studbook.

The South African response to the draft studbook management plan requires us to involve all South African stakeholders if we were to collect and export additional founders. The authorities should be able to justify why tortoises are being removed to foreign countries. It was discussed that South African reptile dealers serve (inter)national customers that have a different purpose for tortoises (i.e., terrarium-keeping, commercial trade) compared to the studbook (conservation). Nevertheless, dealers may be involved if additional founders are collected, by collaborating in the work involved.

During the discussion, it was found that the three potential long-term aims (i.e., conservation-orientated, terrarium, or zoo studbook) in the discussion paper could be expanded with intermediate forms. For example, A conservation-orientated studbook could have a core of genetically valuable tortoises, supplemented with genetically less valuable tortoises for which genetic management might be less important. Furthermore, a conservation-orientated studbook could have a portion of the population in zoos, or a zoo studbook could have a portion of the population housed at private individuals. It was also discussed that a terrarium studbook would eventually have to reduce breeding to ensure manageability of the population, so that this aim would still have strict policies.

Part two

The second part of the discussion aimed to select a long-term studbook aim. To this extent, all participants were invited to ventilate their preferences. Unanimously, it was decided that the studbook should continue to have a conservation aim. Nevertheless, this aim should have different nuances compared to the description in the draft studbook management plan:

1. If 50 wild-caught founders would be imported at the same time, the risk of not finding suitable locations would be too high. Therefore, new founders should be imported in smaller numbers (e.g., 10 tortoises).
2. In case it will be impossible to find sufficient locations, quality should go over quantity. Trustworthy locations are required, and if a location is not trustworthy it is better to accept a slightly smaller studbook population.
3. Carefully separate genetically valuable from less valuable individuals. House valuable tortoises at the most trustworthy and dedicated locations. Provide less trustworthy locations and (in general) zoos with less valuable tortoises.
4. Breeding restrictions should not be placed upon founders. In order to maintain a large genetic diversity, founders should produce as many offspring as feasible. Offspring should be transferred to other locations as soon as possible to spread risks.
5. Continue to emphasise the non-commercial studbook setup. This avoids many problems seen in other studbooks, and raises much needed respect from relevant authorities.
6. Explore the possibility to compare possible unknown-origin tortoises genetically with the studbook population.

Finally, it was recommended to improve the gathering and exchange of information on *H. signatus*. For example, participants should be expected to have a post-mortem conducted on deceased animals, and post-mortems should be shared to avoid similar problems at other locations. The husbandry information in the annual reports should be supplemented with direct contacts between participants.

Lectures

Keeping and breeding of Homopus areolatus *(Frank van Loon)*

This lecture provided an overview of husbandry and incubation conditions over nearly 10 years. It focussed on difficulties that were encountered, and tried to find causes for these difficulties. Although breeding results with *H. areolatus* were limited, the lecture provided important data on the relationship between high incubation temperatures and egg mortality, and on threshold temperatures to incubate female *H. signatus*.

Adapting Homopus signatus *to captivity (Mark Klerks)*

The second lecture summarised how a wild-caught couple *H. signatus* was adjusted to captive conditions. Particularly, the provoking of feeding and drinking was explained. This (published) information will be important when additional founders are imported in the future. The lecture ended with an humorous overview of personal sacrifices that the lecturer had brought to enable studbook participants to keep this species in captivity.

Veterinary aspects of keeping Homopus *in studbooks (Julian Schlömer)*

The last lecture highlighted veterinary aspects that are important in a captive *Homopus* population. Besides infectious and non-infectious problems that may occur in the colony, it emphasised the risks and methods when wild founders are incorporated in the existing population, and in case of possible reintroductions. It also recommended that spreading of infectious diseases from affected locations to other locations might be avoided by transferring eggs rather than tortoises.

APPENDIX 2 - REPORT FROM LOCATION A77

First report - November 2011

From A46 we received 2 Homopus areolatus in June 2011.
This concerns hatchlings of 2/2008 Studbook No. 84 and No. 85.

The Homopus are in a terrarium, which was built particularly for their attitude.
The terrarium has a surface area of 1.5 square meter and a height of 0.5 m.
It is equipped with:

- 2 lamps Lucky Reptile Bright Sun jungle/desert flood 70 watt and Bright Sun desert 70 watt.
  Cyclic duration of 7 o'clock to 18 o'clock
- Further lamps: Dupla T5- Halogeneous fluorescent tubes 4 x 24 watt
  Cyclic duration of 7 o'clock to 18 o'clock
- An air moisturizer Lucky Reptile Super Fog.
  Cyclic duration of 8 o'clock to 8.30 o'clock.

  Further equipment with stones, sand and gravel as well as roots and plants like Sukkulenten, Bromelien, Crassula and Euphorbien.

The terrarium is located in a winter garden, which is heated in the winter not so much. That means, in the summer during sun exposure it becomes rather warm in the winter garden. In the winter the temperature falls on 6 to 10 degrees. Thus also the temperature in the terrarium varies. The different temperatures we seized in a list (see)
To hold partly the warmth of the lamps over night the Terrarium is covered with windowpanes.

In the summer, if the sun shines the Homopus are during the day in the garden. At night they remain in the Terrarium. For the next year it is planned to let them also at night outside.

Since June the Homopus grew approx. 10 mm and the weight increased by 30 gram. The exact data are to be seen in the data sheet.

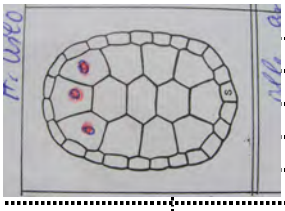
Nutrition:

Meadow-green (dandelion, clover, Spitzwegerich, Disteln) otherwise dried vegetable, Zucchini, hay. Now in the winter months I will feed salads with bitter materials. Once in the week calcium powder.

Behavior observations:
In the summer the Homopus were more active and ate more. They came in the morning at 7 o'clock from their hiding place and remained active to approx. 15 -17 o'clock. At present they come only at 11 o'clock from their hiding place, afterwards they warm approx. 3-4 hours under the lamps and afterwards they are active and run around to 18 o'clock (until the light switches off)

Lighting Terrarium from 7.00 - 18.00 Uhr

Date	Time	Weather outside	Temp. winter garden	Terr. Left (without lamp)	Terr. Middle (with lamp)	Terr. Right (without lamp)	Terr. Right (with lamp)	air humidity
	08:00	7°	15°	15°	20,4°	15,6°		80%
	14:00	12°	20°	20°	36°	24,5°	40°	66%
08.11.2011	18:00	6°	19°	20°	35,4°	21,8°		63%
	08:00	4°	13,2°	14,5°	23,5°	14,2°		78%
	14:30	18°	20,8°	20°	37,6°	29°	49°	48%
09.11.2011	18:00	6°	18,9°	19°	35,8°	23,6°		58%
	08:00	4°	13,6°	14°	29,1°	13,8°		80%
	14:30	6°	17,3°	17°	37,7°	22°	33,4°	63%
10.11.2011	18:30	5°	16,3°	16°	36,1°	17°		67%
	08:00	3°	13,1°	13°	28,5°	13,9°		83%
	14:00	4°	16,5°	18°	40°	21°		54%
11.11.2011	18:20	4°	16°	17°	40°	19°		61%
	8.00	5°	13,1°	15°	32,2°	13,3°		81%
	08:00	7°	18,8°	21°	40,9°	23,5°	39,7°	54%
12.11.2011	14:00	5°	18,2°	20°	40,2°	22,8°		59%
	08:30	2°	13,5°	15°	38,4°	15°		45%
	14:00	5°	17,5°	20°	32,6°	21,9°	31°	53%
13.11.2011	18:20	2°	16,4°	18°	43,9°	21°		57%
	08:00	1°	12°	14°	34,4°	12,3°		72%
	14:30	3°	16°	18°	38,9°	21°	32°	51%
14.11.2011	18:00	2°	15,2°	18°	42,7°	19,9°		59%
	08:00	2°	11,4°	13°	33°	12,5°		75%
	14:00	3°	15,8°	17°	40,4°	20,7°	38,3°	52%
15.11.2011	18:00	2°	15,7°	16°	40,1°	17,2°		56%
Lowest temperature at the night in the terrarium 8° - 10°								



Information in general:
Incubation period: unknown
hatching mass: 8,0 g
hatchling born in the outside terraria
oviposition: unknown
found in outside enclosure 07.02.2008

Studbook No. 84

Homopus areolatus

Date	Growth data: l x w x h in mm	mass in g	
07.02.2008	31,5 x 30,0 x 28,0	8,0	
20.04.2008		11,0	
08.06.2006	38,0 x 38,0 x 22,0	13,0	
17.10.2008	49,0 x 46,0 x 24,0	21,0	
05.02.2009	54,5 x 48,5 x 25,0	29,0	
03.05.2009	61,5 x 55,0 x 21,0	40,0	
02.09.2009	64,0 x 56,0 x 28,5	44,0	
26.11.2009	68.5 x 58.0 x 30,5	55,0	
03.04.2010	70,0 x 58,5 x 30,5	59,0	
26,08.2010	71,5 x 59,5 x 32,0	64,0	* after hibernation
19.01.2011	77,5 x 62,0 x 35,0	80,0	
19.05.2011	77,5 x 62,0 x 34,5	83,0	Sex: most possibly **female**
02.06.2011	Specimen will be send to A77		
03.07.2011	78,3 x 62,2 x 35,0	89,0	
07.09.2011	85,5 x 63,0 x 36,0	109,0	
13.11.2011	87,5 x 70 x 41,1	117,0	