Feedback report for period 2007-2008

ARC • LNR

SOUTH AFRICAN national biodiversity institute
SANBI

CONTENTS

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A. Milestones and deliverables

1. DATA CAPTURING

1.1 SANSA database: complete the collation and digitization of existing records from literature.
1.2 NCA database: the digitizing of new records collected.
1.3 Museum data: visit museums and investigate their databases and unidentified material.

Deliverables

- Report containing an inventory of data in databases of museums and other collections, as well as recommendations on priority collections.
- All existing collections and literature data captured in SANSA database.

DATABASES USED

The SANSA and NCA databases were developed in a MYSQL engine with a web browser based front end user application, They were developed by the ITC division at the ARC to accommodate all the SANSA data.

1.1 SANSA database

The SANSA database has been developed to digitize all the arachnid species of South Africa. Data from all available published scientific papers have been entered. This database contains information on:

- species data
- type status
- type deposits
- georeferenced distribution data (locality, biome, province, collector, where deposited, number, notes)
- reference (where published).

RESULTS

A team of five people worked to capture all the data. All available information on the spiders has been entered, as well as data on the solifugids and pseudoscorpions. Data of the scorpions and other smaller orders are presently being entered, as well as new revisions for 2008.

- **Total number of records digitized: 10 462**
- **Number of museums involved: 29**

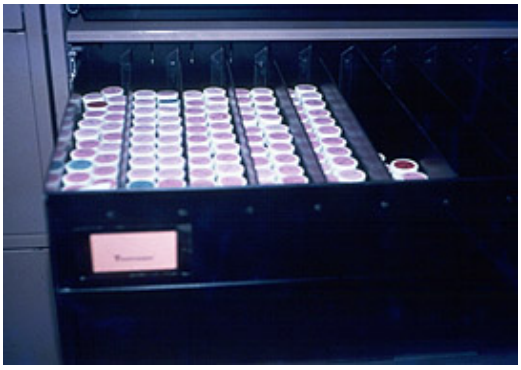
Files at ARC-PPRI containing descriptive data on all the arachnid species of Africa. All this data has been added to the database.

1.2 National Collection of Arachnida (NCA) database

The NCA is a database containing information on specimens collected and housed in the National Collection of Arachnida. Although a young collection established in 1972. It contains > 32 000 records representing about 140 000 specimens.

RESULTS

Since the launch of phase II of this project in 2006 more than 7455 records of specimens have been identified and data entered into the database of the National Collection of Arachnida. This material came from surveys and unidentified material at the Spider Research Centre. About 2000 bottles are waiting to be databased while > 2500 still need to be identified.



Specimens housed in the National Collection of Arachnida.

1. DATA CAPTURING (continued)

1.3 Museums data

At the first SANSA workshop and the first SANSA steering committee meeting it was agreed that only recently revised and published data should be included in the SANSA database as most museums do not have professional arachnologists as curators and identifications captured in existing museum databases could be incorrect. However, unidentified material in museums need to be examined and included.

RESULTS

- **Museums visited**: Transvaal Museum, Natal Museum, Albany Museum and African Museum in Tervuren, Belgium.
- **Unidentied material requested from museums for identification**: Albany Museum (Corinnidae); National Museum Bloemfontein (Thomisidae); Natal Museum (Thomisidae; Corinnidae); Transvaal Museum (Thomisidae; Cyrtaucheniidae; Corinnidae); African Museum in Tervuren (Thomisidae; Corinnidae); Senkenberg Museum (Thomisidae).
- Total of newly identified records added to SANSA database: 1511.

Corinnids, a group of spiders presently studied by C. Haddad and R. Lyle

Thomisids a group of spiders presently studied by A. Dippenaar-Schoeman, A. Honiball and P. van Niekerk

SUMMARY– DATA CAPTURING

- Total number identified and digitized 2007 (NCA) = 4 526
- Total number identified and digitized 2008 (3 mth) = 1 848
- Total number identified but waiting to be digitized = 2 500
- Total number of species digitized to date (NCA) = 32 271
- Total number of records digitized (SANSA) = 10 462
- Records of museums involved: 29

2. SURVEYS

2.1 SANSA: Code of conduct
2.2 GAP analysis: Carry out a gap analysis to highlight priority areas for additional fieldwork.
2.3 SANSA survey strategy: Develop a strategy for field surveys, based on gap analysis, known methodologies and the experience of other atlassing programmes such as SARCA. Obtain steering committee approval of field methodology.
2.4 SANSA surveys: Survey team to carry out six months of intensive fieldwork during the summer seasons; aim to fill spatial and taxonomic gaps in coverage, according to priorities set by the revised gap analysis.
2.5 Other surveys: numerous other surveys underway, including surveys by the public, all this data to be fed into database.
2.6 Review survey methodology document based on the first season's experience.

Deliverables

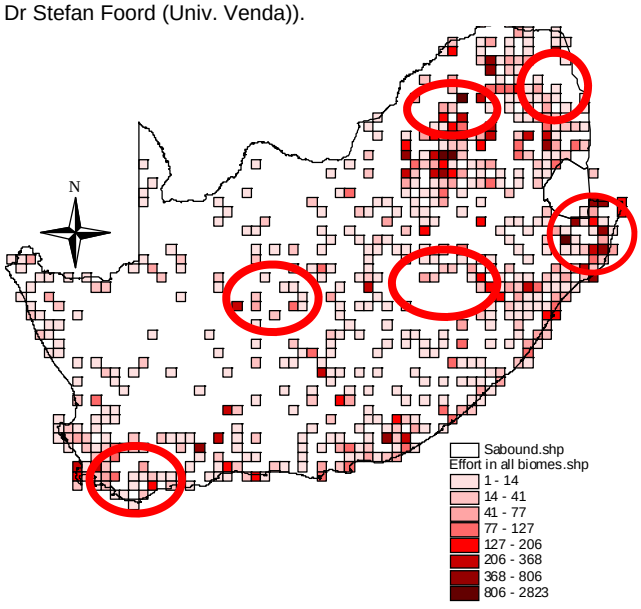
- Code of conduct document.
- Gap analysis report..
- Field survey methodology document.
- Results of field surveys.
- Updated project database, populated with the balance of the records from museum collections.

2.1 Code of conduct document (appendix 1)

A document on the SANSA code of conduct was compiled and posted on the SANSA website (www.arc.agric.za see quick link SANSA or www.arc.agric.za/home.asp?pid=3272).

2.2 Gap analysis

A GAP analysis was carried out (based on > 42 000 records) which showed that parts of all the provinces except maybe Gauteng still need to be sampled. This analysis was used to determine where the first SANSA field surveys were to take place. Team 1 surveyed two areas in the northern parts of Limpopo Province, Team 2 surveyed areas in the Northen Cape Province, Team 3 surveyed areas in the Free State and Team 4 several areas in KwaZulu-Natal and Western Cape (Gap analysis: Dr Berndt van Rensburg (Univ. Pretoria) and Dr Stefan Foord (Univ. Venda)).



2. SURVEYS (continued)

2.3 SANSA survey strategy

COLLECTION MANAGER: Charles Haddad (Univ. Free State)

The final protocol for SANSA sampling is provided below. It was decided that due to problems in appointing a single field manager via the ARC system it would be better to use several teams to do the surveys. Each survey team consists of a survey manager and three volunteers. Each team covered three degree squares over a three week period. A total of four teams participated in the 2007-2008 surveys. To account for the variation in habitats present, the team leader identified four different habitat types (e.g. savanna, grassland, forest and riparian habitats) in a grid and divided sampling methods between them.

COLLECTING PER DEGREE SQUARE

1. PITFALL TRAPPING

- 200 pitfalls (9 cm diameter and 10 cm deep) are used.
- A mixture of ethanol and glycerol (50 ml per trap) is used as a preservative, which has a very low rate of evaporation. This fluid is biologically safe (non-toxic) and can be used for the long-term preservation of material.
- All material collected from the pitfalls at a habitat site, is emptied into a single container for storage until it reaches ARC – PPRI for sorting. Each container is provided with a label with complete locality and collecting data.
- Pitfalls are left out for a minimum of 3 days, preferably 4 days, with 200 pitfalls per grid. This should give a good indication of the fauna present.
- Where multiple habitats are available, the pitfalls should be **divided equally** amongst them.

2. SWEEP NETTING

- 2000 sweeps are carried out per grid on low vegetation (grass, weeds or herbs) using a standard net (35 cm diameter).
- Material is sorted directly from the net in the field or all the samples can be taken, stored in plastic bags and sorted within an hour at the camp. Cryptic species and species recovering from being knocked-out are better sampled this way.
- The 2000 sweeps are **divided equally** between the available habitats, thus 500 sweeps per habitat if four habitats are available.
- Samples from each habitat are pooled together in one bottle.

3. VEGETATION BEATING

- 2000 beats are carried out per grid, **divided equally** between the available habitats, preferably four per grid.
- Specimens are collected using a beating sheet 1m x 1m and a sturdy beating stick to beat the vegetation. This method is used to collect the arachnid fauna living on shrubs and trees.

Pittrap

Active search

2. 3 SANSA survey strategy (continued)

4. LEAF LITTER SIFTING

- 10 samples of leaf litter are taken per habitat site, using a litter sieve completely filled with litter, and this is shaken over a white sheet.
- All arachnids from the sheets are collected and preserved in a single container for each habitat site.
- Sampling is repeated **in each** available habitat.

5. *WINKLER TRAPS*

- Ten Winkler traps are used to collect leaf litter-dwelling arachnids that are often not collected by other methods.
- Upon arrival at a site, the team immediately seeks out a site where adequate leaf litter is available.
- Using a spade, litter with soil is taken to fill ten Winkler traps.
- These traps are hung for 3 days, and material collected pooled together into a single bottle for each grid (**one habitat per grid).**

6. ACTIVE SEARCH

- Arachnids are collected by active searching from foliage, grasses, leaf litter, bark, and under rocks and logs for a total of eight hours per grid, **divided equally** between habitats.
- Material from each habitat is pooled together in a single bottle.

7. NIGHT SEARCH

- Night collecting is undertaken to sample scorpions using black lights for 2 hours.
- Spiders and other arachnids are sampled for another 2 hours.
- The group is split up if needed, and two collectors help with each collection.
- Collecting is undertaken in **at least one habitat per grid**, but preferably more.
- Material is pooled together for each habitat.

Collecting and sorting

2.3 SANSA survey strategy (continued)

RESPONSIBILITIES OF SURVEY MANAGERS

- Identification of a site in each degree-square grid for sampling, liaising with the relevant landowner for permission to sample there, and conveying this information to the relevant conservation body (if necessary – arrangements regarding permits need to be finalised) and the COLLECTION MANAGER (Charles Haddad).
- Arranging accommodation for the relevant days in which a grid will be sampled. Since sampling will be carried out during the week this should improve the chances of reserving accommodation. If nature reserves have been identified as potential sites, liaise with the reserve manager and try and arrange accommodation on site. Many reserves have facilities for visiting scientists, which are often available at no charge. This should reduce spending in this department.
- Arranging a vehicle for travel. Team leaders at Universities and Museums should try and make use of their institutional vehicles, if available. Where private vehicles need to be used a competitive rate will be paid. However!! Only a single vehicle will be paid for each expedition, so any volunteers wishing to join a particular team leader (if not at the home base of the team leader – e.g. Bloemfontein) would have to do so at their own cost.
- Arranging volunteers. Each team leader will be responsible for sourcing their volunteers. The Field Work Manager (CH) will liaise with each team leader and inform them of persons wanting to volunteer in particular areas. Liaise with landowners in this regard too, as conservation managers or farmers may have staff at their disposal that could assist with putting out pitfalls etc.
- Purchasing food and other materials. The team leaders will need to provide food to their volunteers, but each person in the group should participate in cooking and cleaning etc. If necessary, team leaders should arrange for cooking equipment if the accommodation they have requested does not have the relevant facilities.

FUNDING ALLOCATION

- Each team leader received **R20 000.00 (excluding tax)** for each set of three grids sampled (one month).
- An additional **R16 000.00** is provided to cover ALL running costs (i.e. accommodation, vehicle hire, petrol, food and small consumables needed) per three grids sampled.

MATERIAL PURCHASED FOR SURVEYS

- 16 sweep nets
- 16 beating trays
- 16 beating sticks
- 16 pooters
- 16 brushes
- 4 plastic trays
- 8 UV lights
- 40 Winkler traps
- 800 pitfall traps and auger for digging
- 4 litter sieves and 4 white sheets
- 8 headlamps
- 4 plastic trunks
- 4 pruning shears
- alcohol
- bottles

2.4 SANSA surveys

TEAM 1: **Manager:** Robin Lyle (MSc student, University of the Free State)
Collecting staff: Robin Lyle, René Fourie, Joan Adendorff, Dewald du Plessis
Area: Northern Cape –ONE TRIP

- J.J. Bredenkamp farm, near Vryburg
  Grid block 2724
  Collecting dates: 8-12 January 2008
- Juluis Gers, farm Papkuil Lodge, near Danielskuil
  Grid block 2823
  Collecting dates: 12-17 January 2008
- Mokala National Park, near Kimberley
  Grid block 2924
  Collecting dates: 20-24 January 2008


Robin Lyle

TEAM 2: **Manager:** Dr Stefan Foord (Lecturer at the University of Venda)
Collecting staff: S. Foord, Jan Craffordt, M. Mashau and Anza Mboyi
Area: Limpopo Province –TWO TRIPS

- Leopard Creek Private Reserve
  Grid block: 2327
  Collecting dates: 6-11 December 2007
- Mogalakwena Nature Reserve, near All Days
  Grid block 2229
  Collecting dates: 13-17 January 2008
- Entabeni Nature Reserve
  Grid block 2330
  Collecting dates: 11-15 February 2008
- Makuya, Tshikondeni
  Grid block 2231,
  Collecting dates: 17-21 February 2008
- Venetia mines, near Musina
  Grid block 2230
  Collecting dates: 2-8 March 2008
- Lekgalameetse
  Grid block 2430
  Collecting dates: 23-29 March 2008.


Stefan Foord and his team

TEAM 3: **Manager**: Leon Lotz (Researcher at the National Museum, Bloemfontein)
Collecting staff: Leon Lotz and Trudi Peyper
Area: Eastern Free State

- Sandveld Nature Reserve
  Grid 2725
  Collecting dates: 22-25 & 28-31 January 2008
- Koppiedam Nature Reserve
  Grid 2727
  Collecting dates: 18-22 & 25-29 February 2008
- Kalkfonteindam Nature Reserve
  Grid 2925
  Collecting dates: 3-7 & 10-14 March 2008


Leon Lotz

2.4 SANSA surveys (continued)

TEAM 4: **Manager:** Charles Haddad (Lecturer at the University of the Free State)
Collecting staff: various
Area: various

Anysberg Nature Reserve (Grid 33S20E)

During September 2007 Charles Haddad and Robin Lyle undertook a collecting trip to the Western Cape. The first collecting point was the Anysberg Nature Reserve (ANR) near Laingsburg in the Karoo. Initial collecting was very successful and nearly 90 species of arachnids were collected in the reserve. Reserve Manager Collette van Deventer has shown great interest in including ANR as one of the sites for the SANSA field surveys, and Robin Lyle will include this as one of her sites in the 2008-9 season. Collette has field rangers that will assist with the field work then, but who will also be collecting material for ARC-PPRI during the coming year.

Ithala (Grid 27S31E) **and Ophathe Game Reserves –KZN** (Grid 28S31E)

During June-July 2007 students from the University of the Free State undertook a trip to various conserved areas in KwaZulu-Natal. This included visits to the Ithala and Ophathe Game Reserves, and to the Greater St Lucia Wetlands Park. Arachnids were intensively collected at all three sites, and several new species were collected at each. The data generated will make an important contribution to SANSA as both Ithala and Ophathe have not been previously sampled. More than 80 species were collected in each reserve, and gives some idea of the diversity of these two savanna reserves. During the next SANSA Phase II sampling season (2008-9) it is hoped that these two reserves can be included in the field surveys, which will make a valuable contribution to the SANSA surveys in conserved areas.

Other surveys 2007-2008

Greater St Lucia Wetlands Park (Grid 29S26E)

Marloth Nature Reserve (Grid 33S20E)

De Hoop Nature Reserve (Grid 34S20E)

Fernkloof Nature Reserve & Fisherhaven (Grid 34S19E)

Jakobsbaai (Grid 32S17E)

Hogsback (Grid 32526E)

2.5 Other surveys

Several other surveys took place during the report period. Some material has been collected and is still being identified and entered into the SANSA database.

1. Augrabies National Park

Elton le Roux was recently appointed as a ranger in Augrabies National Park and he is busy with a survey of the arachnids in the park. The first collection of the park is presently being sorted and identified in Pretoria. With arachnids collected previously in the park 25 families of spiders are known represented by 39 species. The Solifugae is represented by 2 families and 4 species. The scorpions still need to be identified.

2. Blouberg Nature Reserve

The first north-south transect across the Western Soutpansberg was completed in November-December 2006 by a team of nine that included students and lecturers from the University of Venda. Nine sites were set out at 200m altitudinal intervals and sampling included at least 16 one hour samples at each site spread over beating, sifting, sweepnetting, pitfall trapping and below and above the knee searches. The scorpions have been processed, and included a total of 12 species and 2 endemics, *Opisthothalmus lawrencei* and *Hadogenes soutpanbergensis*. Grace Tshivhandekano, an honours student, will analyse determinants of turnover along this transect and include three additional taxa as part of her project report: Thomisidae, Aranaeidae and Gnaphosidae. Mulalo Muelelwa is writing up her thesis that investigated spiders as surrogate measures of biodiversity. She also looked at sampling protocols to determine diversity in the Savanna biome. Eight habitats (relative ly homogenous within each habitat), four of which were in the Blouberg Nature Reserve and the rest on the farm Little Leigh in the interior of the Western Soutpansberg, were sampled using a standardized protocol, and she has subsequently identified 1953 adult spiders up to morpho-species. Identifications presently being confirmed at PPRI and the material entered into database.

3. Botanical Gardens

- In January 2006 a project was launched jointly by the Departments of Arachnology (Leon Lotz and Trudie Peyper) and Entomology (Riana Poller and Sonnika Otto) of the National Museum, to survey the Arachnida and insects of the National Botanical Gardens in Bloemfontein. From January 2006 to January 2007 pitfall traps were set to collect the surface active fauna. During 2007 sweeping and beating of the grass, shrub and tree species will be carried out to determine the associated fauna. The material collected so far still has to be sorted and identified.
- In October 2007 a project started which was organized by Elizabeth Kassimatis (ARC-PPRI) with volunteers from the University of Pretoria and nearby schools. The aim of the survey is to compile a checklist of the arachnids of the Botanical Gardens in Pretoria using different trapping methods. This will continue over a period of one year.
- The Spider Club (Astri and John Leroy) is busy with surveys in the Laeveld National Botanical Garden and the Walter Sesulu National Botanical Garden.

4. Beaufort West survey

Spiders collected with pittraps from a farm in the surroundings of Beaufort West are presently being sorted and identified. This survey was undertaken by Dawid Jacobs.

5. Cape Peninsula

A checklist of the spiders of the Table Mountain National Park and the rest of the Cape Peninsula has been compiled. The results are based on all published records, as well as records in the National Collection of Arachnida and the Iziko Museum. At present a total of 44 families represented by 174 species have been collected. New surveys are now underway under leadership of Norman Larsen and Ruth-Mary Fisher of the SANparks. Some additional data has also been generated through a project of James Pryke, a PhD student from the University of Stellenbosch. His project title is “Conservation of the Arthropod Fauna of the Cape Peninsula”. He has been collecting a variety of invertebrates for the last two years on the Cape Peninsula, using pitfall traps, window traps, Berlese/Tulgren funnels, D-Vac sampling and both aerial and ground visual searches. About 80 spider species have been collected and are being identified in Pretoria. Some material from Winkler traps collected by members of the Iziko Museum is also presently being sorted in Pretoria.

2.5 Other surveys (continued)

6. Cederberg Wilderness Area

- The first survey samples collected by Dr Antoinette Veldtman and her team are presently being identified in Pretoria. Rika du Plessis (manager of the Cederberg Wilderness area) is the new regional ecologist for the Boland Mountains and Cape Metro Business Units of CapeNature and she and her team are very enthusiastic to participate in SANSA and do arachnid collecting in the Western Cape. This collection will be another important contribution to determine the arachnid biodiversity of the Western Cape Province.

- The Centre for Invasion Biology (CIB) at Stellenbosch University manages two projects which aim to collect long term data on ant distributions in the Western Cape. Currently they collect data in the Cederberg (transect from Lambert's Bay to Wupperthal), as well as along the N1 and N2 national roads from Cape Town to Oudtshoorn and Beaufort West. They collect the data using a standardised pitfall trapping method at all the sites, sampling twice a year, in March and October. Data from the Cederberg from 2004 to present, and for the other two transects for 2006, are available. Currently they only remove the ants (and beetles from the Cederberg) from the pitfall traps, leaving a lot of other good material behind. All the arachnids in the by-catch from these samples are now available for use in the South African National Survey of Arachnida programme.

7. De Hoop Nature Reserve

The checklist of the De Hoop Nature Reserve was recently submitted to *Koedoe* for publication. A total of 275 arachnid species were recorded in this survey, with spiders the dominant group (252 species, 53 families). The study indicates that fynbos and associated habitats contain a fauna and community composition similar to more structurally complex habitats such as savanna. It is hoped that this study will form the baseline for further research on arachnids in the Fynbos Biome.

8. Erfenis Dam Nature Reserve

Since September 2005 a survey has been continuing on the arachnid fauna of the Erfenis Dam Nature Reserve near Theunissen. Initially, the project aimed to assess the impacts of controlled burning on the ground-dwelling arachnid fauna (Charles Haddad), but the opportunity was taken to investigate the spider faunas of three common tree species (René Fourie and Anel Grobler) and also the spider communities in four contrasting grassland types in the reserve (René Fourie). The latter studies were completed during August 2007 and will be submitted for publication during 2008. In total, 54 species were collected from the three tree species and 84 species from the grassland. Pitfall material from the fire study will be sorted during 2008.

9. Greater St Lucia Wetlands Park

Arachnids are now part of the Greater St Lucia Wetland Park (GSLWP) project. The GSLWP was listed as South Africa's first World Heritage Site in 1999, and is situated on the south-eastern coast of Africa, and forms the southernmost extremity of the Moçambique coastal plain, stretching from Kenya in the north. Because of its unique positioning, it hosts numerous species not found anywhere else in South Africa. The GSLWP - Rare, Threatened and Endemic Species Project is a joint initiative of Ezemvelo KZN Wildlife, The Wildlands Conservation Trust, and the GSLWP Authority within the context of the Lake St Lucia Living Lakes program.

Mkuzi Game Reserve**:** The GSLWP conducted a field survey in the uMkhuze section of the Park from 10 July - 25 August 2007 using Operation Wallacea (www.opwall.com) volunteers, with some school children, but mostly undergraduate students, from UK universities. A variety of vertebrate and invertebrate taxa were targeted for the survey: small terrestrial mammals, bats, reptiles, frogs and birds and arachnids. Specimens were collected using pitfall traps, sweep netting and bush-beating. Twenty five buckets serving as pitfalls were set out at each of the 10 trapping stations, and the collected material was gathered each morning for further sorting. Carol Smith of the Spider Club led the arachnid collecting part of the survey, and 193 bottles of specimens were generated and will be identified in due course at the ARC-PPRI. The second phase started in November 2007.

10. Hluhluwe Nature Reserve

In another project a total of 450 spiders represented by 48 species was identified from the Hluhluwe/iMfolozi Nature Reserve as part of a survey to study spiders as bioindicators of the effect of the invasive plant *Chromolaena odorata* on invertebrate diversity. Nearly all the protected areas in KwaZulu-Natal have already been aggressive colonized by this weed. Historical maps showing *C. odorata* invasion within the reserve were analysed and areas that have been invaded for *ca* 20, 10 years and less than 1 year were identified and sampled. This study also determined the effects of mega herbivores on invertebrate diversity, compared the diversity and density patterns of spiders in relation to the different rainfall regimes of Hluhluwe/ iMfolozi, and also determined the difference between the diversity indices of the different grass types. The material is ready to be entered into the database.

2.5 Other surveys (continued)

11. Kogelberg Nature Reserve

We have received the first spiders (33 bottles) collected at the Kogelberg Nature Reserve. This reserve lies in the Western Cape, 60 km SE of Cape Town in the "heart of the fynbos". It falls within the Kogelberg Biosphere Reserve. From the first samples 12 spider families have been identified including a trapdoor spider and specimens from the family Drymusidae, which is endemic to the Western Cape.

12. Kruger National Park

The first survey of the spiders of the Kruger National Park (KNP) was published in 2003 listing 152 species from 40 families, The number of known species from the KNP has increased after additional collecting by Meg Cumming , the Spider Club, Kyle Harris and a survey underway by researchers in the park during the report period. An updated checklist listing 259 species from 43 families will soon be available on the SANSA website. This is an increase of 107 species. About 13 % of the spider fauna of South Africa is presently protected in the KNP.

13. Mpetsane Conservation Estate –Free State

A survey is underway to determine the arachnid diversity of the Mpetsane Conservation Estate near Clocolan in the Eastern Free State Highlands. Allen Jones and Jenny Lotter the owners of the Estate, are both keen naturalists. Members of the Spider Research Centre undertook a collecting trip to the Estate to collect arachnids in March 2007. They were joined by Charles Haddad of the University of the Free State and Leon Lotz of the National Museum, Bloemfontein**.** A total of about 400 specimens were collected, represented by 30 families and 113 species. Two new species—a very interesting bird dropping spider and a new *Thysanina* sp. (Corinnidae) have been collected on the estate. Presently the photo gallery contains more than 1600 images of spiders photographed by Allen Jones.

14. Nylsvley Nature Reserve

A checklist of the spiders and scorpions of the Nylsvley Nature Reserve has been completed for publication. Spiders and scorpions have been collected over a period of 30.years. The spider check list contains 173 species, 132 genera from 37 families. A total of 158 species are new records for the reserve and 6.5 % of the total known South African spider fauna is protected in this reserve. The scorpion fauna of Nylsvley comprises five species in four genera and two families (5 % of the scorpion species recorded in South Africa). Buthidae are more diverse in the reserve, with three species.

15. Polokwane Nature Reserve

Under supervision of Susan Dippenaar and Ansie Dippenaar-Schoeman two students, Mokgadi Modiba and Thembile Khoza, of the University of Limpopo have completed their MSc studies. They are currently waiting for the results. Their studies were a year long survey of the biodiversity of the spiders of six habitat types using four collecting methods in the Polokwane Nature Reserve, Limpopo Province. A total of 13 854 specimens were sampled. The first paper on the results is in press.

16. Rustenburg Nature Reserve

Spiders were collected monthly over a period of 4 years from the Rustenburg Nature Reserve (RNR), South Africa using beating, sweep netting and active search. A total of 139 spider species, 95 genera from 33 families have been collected. The Thomisidae is the most diverse spider family with 28 species (20 % of total) followed by the Araneidae with 21 species (15 % of total) and Gnaphosidae with 13 species (9.3 %). The majority of species (91) are wandering spiders (65.5 %) while 48 species (34.5 %) build webs. The free-living ground dwelling spiders comprise 35 species while 56 species have been collected from the plant layer.

Mpetsane Conservation Estate with the tropical tent-webs commonly found in the grass.

2.5 Other surveys (continued)

17. Tembe Elephant Park

Spiders were collected in three habitats, namely undisturbed sand forest, elephant disturbed sand forest and mixed woodland. To ensure a thorough representation of all spider guilds, spiders were collected by tree beating, sweep netting, active searching, leaf litter sifting and pitfall traps. A total of 2808 individual spiders, representing 36 families, 144 determined genera and 251 species have so far being identified. Additional material collected by students of the University of the Free State and members of the Spider Club, has recently been sorted and identified. A checklist of the park is in preparation.

18. Welgevonden Nature Reserve

This reserve is situated in the Waterberg district in the Limpopo Province. It is a declared heritage site of 33000 hectares bordering the Marekele National Park. Hanno Kilian, the reserve manager and his team are busy collecting arachnids from the reserve for SANSA. The first collecting of > 100 specimens resulted in a checklist containing 24 families and 75 species. The survey continues.

2.5 Other surveys –public participation

The following material collected by the public is presently sorted and being identified at the ARC

Baviaanskloof (Jackye Leroux—30 samples)

Clocolan (Allen Jones— 34 samples)

Hermanus (Victor Hamilton-Atwell— 48 samples)

Jeffreys Bay (Linda Wiese— 250 samples)

Gauteng (Warren Smidth— 32 samples)

Gouritzriver Mouth (Helen Leibel—65 samples)

Loxton (Stuart—25 samples)

Moos River Valley (Sonja Martens— 23 samples)

Kommetjie (Swannie— 20 samples)

2.6 Review survey methodology document based on the first season's experience

- A questionnaire has been compiled to be completed by all the collecting managers addressing the present collecting procedures.
- After all the material has been sorted and identified the sample size will be re-evaluated.

3. IDENTIFICATION OF SPECIMENS

3.1 AFRAD database: complete the collation and digitization of existing records from literature.
3.2 Identifications: the digitizing of new records.
3.3 Visiting scientists: visit museums and investigate their databases and unidentified material.
3.4 **Museum material**: material identified.

Deliverables

- To have all specimens collected correctly identified.

3.1 African Arachnida Database

A database developed by the ITC team at ARC Central Office enables the compilation of information on African Arachnida. At the end of 2007 the first phase of the AFRAD database went live on the ARC website. Data on all 72 African spider families can be printed out as fact sheets including information on: diagnostic and descriptive characters; behaviour; distribution; list of genera and species. The information is richly illustrated with black and white line drawings, as well as colour photographs. The AFRAD expert system is available online on the ARC web site (www.arc.agric.za see quick link AFRAD). The second phase with information on the spider and scorpion genera and species with images went live end of March 2008. Large numbers of information with images are added to the database on a daily basis. Photographs taken by A.S. Dippenaar-Schoeman (ASD) and C. Haddad (CH) are added to the database.

3.2 Identifications

The identification of specimens is time consuming and mainly done by ASD and CH. More than 15 000 spiders were sorted and identified during the report period. Material was also sent to arachnologists abroad to assist with the identifications (USA, UK, Poland and Belgium).

3.3 Visiting scientists

The first arachnologist from UK (Dr Tony Russell-Smith) will visit South Africa in August 2008.

3.4 Museum material

Unidentied material requested from museums for identification: Transvaal Museum (Thomisidae; Cyrtaucheniidae; Corinnidae); Natal Museum (Thomisidae; Corinnidae); Albany Museum (Corinnidae); African Museum (Thomisidae, Corinnidae); Senkenberg Museum (Thomisidae).

Material being sorted at ARC-PPRI

4. MARKETING

4.1 **Virtual museum**: Maintain and promote the virtual museum.
4.2 **Website**: Maintain and update the project website.
4.3 **Newsletter:** Publish the newsletter quarterly.
4.4 **Public awareness**: Promote public awareness participation by continuing public talks, courses etc.
4.5 **Congress:** Present a project report at the International Congress in Brazil.

Deliverables

- Up-to-date web site.
- Virtual museum being populated and promoted.
- Quarterly newsletters.
- Feedback from the International Congress in Brazil.

4.1 Virtual museum

The Virtual Museum is now up and running. There was great interest from the public after reading about it in the press, and we have received more than 400 photographs since September 2006. The images and primary data of each image is added into a module of the SANSA database.

Photographs added 2007-2008 = 380 entries about 1200 photographs
Photographers participating = 56

4.2 Website

The website is updated regularly and results of surveys and information on taxa added, as well as copies of the newsletters.

4.3 Newsletter

Four electronic newsletters of the South African National Survey of Arachnida have been distributed. The aim of the letter is to keep everybody updated on the arachnid activities in South Africa. This fully electron newsletter is distributed to all interested persons free of charge. This newsletter is produced every three months. The newsletter can be downloaded from the SANSA website at www.arc.agric.za (see SANSA).

4.4 Public awareness

- ***Radio talks***

Arachnologists are frequently asked to participate in radio talks and TV presentations on a variety of topics. During the report period a total of 53 radio talks were broadcast on arachnid research. These include weekly live broadcasts that are transmitted every Tuesday over Radio Laeveld. A radio series on RSG “Hoe verklaar jy dit?”, as well as talks on Monitor (RSG), Radio Pretoria, Radio 702 and Radio Rosestad, are occasionally given regarding SANSA and spiders.

- ***TV presentations***

Dr **Ansie Dippenaar-Schoeman** was interviewed for 6 programmes for Semaka 50/50 on SABC2. She also participated in a programme “Spve it” for SABC2.

- ***Other media releases***

Articles also appeared in Spider Club News, CREW news and Beeld.

4. MARKETING (continued)

- ***Course at the University of Pretoria***

Ansie Dippenaar-Schoeman presented a three lecture course to the second year students of the Department of Zoology and Entomology of the University of Pretoria. The course "Arachnida of medical, veterinary and agricultural importance in South Africa" is supplemented by a 40-page course manual.

- ***Course at University of the Free State***

Charles Haddad presented the ENT694 course as a *capita selecta* available to B.Sc (honours) students. The course deals with various aspects of arachnid diversity and identification (Acari excluded), biology, biodiversity in South Africa, and feeding ecology and biological control in crops. Medically important arachnids are also discussed. The main aims and workings of SANSA and AFRAD are also explained to the students.

- ***PPRI Spider Educare programme***

At PPRI the Spider Educare group presented a total of eight lectures and road shows to schools and other interested parties.

The International Congresses of Arachnology, organized by the International Society of Arachnology (ISA) is held every third year and are the most important meeting on the international arachnological calendar. The 17th ISA congress was held in Sao Pedro Brazil from 5-10 August 2007

The African Arachnological Congresses organized by the African Arachnological Society (AFRAS) is held every third year. It is the most important meeting on the African arachnological calendar. The 9th African Arachnological colloquium was held at Lajuma in the Soutpansberg from 3-7 February 2008.

The second SANSA workshop was held during this meeting.

5. CAPACITY BUILDING

5.1 Training: continue with training of taxonomists and parataxonomists.

Deliverables

- Trained taxonomists and parataxonomists.

Charles Haddad busy PhD on systematics of groups within the Corinnidae

Robin Lyle busy with MSc on systematics of groups within Corinnidae →

Allet Honiball busy with MSc on systematics of a subfamily of the Thomisidae

Renee Fourie- busy with MSc on the spiders of the Erfenis Dam Nature Reserve →

Sma Mathebula studying through UNISA and receiving parataxonomic training at ARC

6. PRODUCT DEVELOPMENT

6.1 Products: scientific papers.
6.2 Products: posters.

Deliverables

- Publications, courses, lectures and talks.

SCIENTIFIC PAPERS (printed and in press dealing with aspects of SANSA)

Ecological surveys

Dippenaar, S.M., Dippenaar-Schoeman, A.S., Modiba, M.A. & Khoza, T.T. (in press)**.** A checklist of spiders (Arachnida, Araneae) of the Polokwane Nature Reserve, Limpopo Province, South Africa. *Koedoe.*

Foord, S.H., Mafadza, M., Dippenaar-Schoeman, A.S., Van Rensburg, B.J. (under review). Small-scale heterogeneity of spider (Arachnida: Araneae) species composition and assemblage structure in the Soutpansberg, South Africa: implications for conservation. *African Zoology.*

Haddad, C.R.,Honiball, A.S., Dippenaar-Schoeman, A.S., Van Rensburg B.J. & Slotow, R. (under review). Spiders as indicators of elephant-induced habitat changes in endemic sand forest, Maputaland, South Africa. *Conservation Biology*

Harris, K.R., Van Rensburg, B.J., Robertson, M.P., Coetzee, J.A. & Dippenaar-Schoeman, A.S. (under review). How beter to collect spiders (Araneae) in an plant invaded African savanna using the Kruger National Park as a case study. *African Entomology.*

Lovell, S., Hamer, M., Slowtow, R. & Herbert, D. 2007. Assessment of congruency across invertebrate taxa and taxonomic levels to identify potential surrogates. *Biological Conservation* **139**: 113-125.

Mafadza, M.M., Foord, S.H., Van Rensburg, B.J., & Dippenaar-Schoeman, A.S. (in press). Vegetation structure, spide diversity, and small-scale heterogeneity in spider (Arachnida: Araneae) assemblages in a Savanna Biome, Soutpansberg, South Africa. *African Entomology*

Mandisa, P.M., Somers, M.J. & Dippenaar-Schoeman, A.S. (in press). Spider responses to alien plant invasion: the effect of short- and long-term *Chromolaena odorata* invasion and alien clearing. *Journal of Applied Ecology*

Uys, C. Hamer M. & Slotow, R. 2007. Effect of burn area on invertebrate recolonization in grasslands in the Drakensberg, South Africa. *African Zoology* **41**: 51–65.

Systematics

Foord, S.H. (in press). Cladistic analysis of the Afrotropical Hersiliidae (Arachnida, Araneae) with the first records of Murricia and the description of a new genus from Madagascar. Afrotropical Zoology.

Haddad, C. R., 2006. *Spinotrachelas*, a new genus of tracheline sac spiders from South Africa (Araneae: Corinnidae). *African Invertebrates* **47**: 85–93.

Haddad, C.R. (in press). A new species of *Corinnomma* (Araneae: Corinnidae) from southern and eastern Africa, with taxonomic notes on *C. olivaceum* and *C. semiglabrum*. *African Invertebrates.*

Lotz, L. N. 2006. Afrotropical Archaeidae: 3. The female of *Eriauchenius cornutus* and new species of *Afrarchaea* (Arachnida: Araneae) from South Africa. *Navorsinge van die Nasionale Museum Bloemfontein* **22:** 113–127.

Lotz, L. N. 2007. The genus *Cheiracantium* (Araneae: Miturgidae) in the Afrotropical region. 1. Revision of known species. *Navorsinge van die Nasionale Museum Bloemfontein* **23:** 1-76.

Lotz L.N. (in press). Revision of the Afrotropical genus *Cheiracanthium* (Araneae: Miturgidae: Eutichurinae): 2. new species. *Navorsinge van die Nasionale Museum Bloemfontein*

Lyle, R. & Haddad, C.R. (in press). A revision of the Afrotropical tracheline sac spider genus *Thysanina* Simon, 1910 (Araneae: Corinnidae). *African Invertebrates*.

6. PRODUCT DEVELOPMENT (CONTINUED)

POSTERS AND PAPERS PRESENTED AT INTERNATIONAL CONGRESS

Dippenaar-Schoeman, A.S. & Haddad, C.R. [paper]. The South African National Survey of Arachnida (SANSA): the first ten years.17th International Society of Arachnida congress , Sao Pedro Brazil, 5-10 August 2007.

Dippenaar-Schoeman, A.S.. & **Van den Berg A.M**. [poster]. Spiders in citrus orchards in South Africa (Arachnida: Araneae).17th International Society of Arachnida congress , Sao Pedro Brazil, 5-10 August 2007.

Foord, S.H. , Dippenaar-Schoeman, A.S., Van Rensburg, B.J., Haddad, C.R. & Van den Berg A.M. [poster]. Preliminary patterns of spider (Arachnida: Araneae) diversity in the Savanna Biome of South Africa.17th International Society of Arachnida congress , Sao Pedro Brazil, 5-10 August 2007.

Foord, S.H., Mafadza, M.M., Van Rensburg, B.J. & Dippenaar-Schoeman, A.S. [poster]. Small-scale heterogeneity of spider (Arachnida: Araneae) species composition and assemblage structure in the Soutpansberg, South Africa: implications for conservation.17th International Society of Arachnida congress, Sao Pedro Brazil, 5-10 August 2007

PAPERS AND POSTERS PRESENTED AT WORKSHOP 9th AFRICAN ARACHNOLOGICAL COLLOQUIUM

Dippenaar-Schoeman, A.S. & Haddad, C.R. [paper]. The South African National Survey of Arachnida (SANSA): the way forward.

Dippenaar-Schoeman, A.S. & Myburgh, J. [paper]. A review of spiders from Caves in South Africa

Dippenaar-Schoeman, A.S., Prendini, L. & Van den Berg A [paper] The rich fauna of the Nylsvley Nature Reserve.

Dippenaar-Schoeman, A.S., Jones, A., Haddad, C. & Lotz, L. [poster]. SANSA surveys in the Free State: the spider fauna of the Mpetsane Conservation Estate (Arachnida: Araneae).

Foord, S.H., Mafadza, M.M., Van Rensburg, B.J. & Dippenaar-Schoeman, A.S. [paper] Small-scale heterogeneity of spider (Arachnida: Araneae) species composition and assemblage structure in the Soutpansberg, South Africa: implications for conservation.

Fourie, R. & Haddad, C.R. [paper]. Diversity and abundance of spiders (Arachnida: Araneae) in the field and tree layers of Erfenis Dam Nature Reserve, Free State Province.\

Haddad, C., Lyle, R., Bosselaers, J. & Ramirez, M. [paper]A revision of the endemic South African spider genus Austrachelas Lawrence, 1938, with its transfer to the Gallieniellidae (Arachnida: Araneae).

Lyle R. & Haddad, C. [paper]. Tracheline sac spiders of the Afrotropical region, with a revision of the genus Cetonana Strand, 1929 (Araneae: Corinnidae).

Marais, P., Van den Berg A.M. & Dippenaar-Schoeman. [poster]. Spiders in Bt cotton.

Matabula S. & Dippenaar-Schoeman, A.S. [poster] First survey from the North West Province: The Rustenburg Nature Reserve.

Van Niekerk, P. & Dippenaar-Schoeman, A.S. [paper]. A revision of the spider genus *Simorcus* Simon (Araneae: Thomisidae) of the Afrotropical Region

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7. STEERING COMMITTEE

- Organise at least one meeting of the Steering Committee to consolidate policies and provide guidance.
- Meet the financial management requirements as set out by steering committee and SANBI.

Deliverables

- At least one meeting of the Steering Committee held.
- Project progress and financial reports approved by the steering committee.

Chimimba Chris	ctchimimba@zoology.up.ac.za	University of Pretoria
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Engelbrecht Ian	adustus@ananzi.co.za	Spider Club
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Hamer Michelle [CHAIR]	HamerM@nu.ac.za	University of KZN
Solly Nkoana*	NkoanaS@sanbi.org	SANBI
Haddad Charles	HaddadCR.SCI@mail.uovs.ac.za	University Free State
Harrison James (WC)**	batlas@adu.uct.ac.za	University of Cape Town (Reptile Atlas)
Harrison James (Gauteng)	Harrison@nfi.org.za	NFI-Transvaal Museum
Prinsloo Gerhard	prinsloogl@arc.agric.za	ARC- Plant Protection Research Institute

* *James Harrison resigned from committee

A summary of meeting. The following recommendations were made:

- SCORPIONS and only some SPIDER SPECIES must be included in this second phase of SANSA.
- A collection manager must be appointed to coordinate the surveys.
- Three collecting points in each degree square grid of South Africa must eventually be sampled.

Prof Michelle Hamer was elected as chairperson.

8. CONSERVATION ASSESSMENT

8.1 Initiate the conservation assessment process for identified species.

Deliverables

- Copy of National Threatened Species database in place for use in Arachnid Red Listing.

Due to the large amount of material that still need to be identified, little has been done on the conservation accessment process except for attending workshops.

B. BUDGET 2007-2008

SANSA Budget 2007-2008	SANBI	ARC
Project Manager (Ansie Dippenaar-Schoeman)	60,000.00	420,640.00
Assistant Project Manager (Charles Haddad)	21,200.00	0
Survey Managers [1] (5)	120,000.00	0
Financial Manager (Almie van den Berg)	20,000.00	28,610.00
Admin Assistant (Annette van den Berg)	40,000.00	97,550.00
Data Capturer (Petro Marais)	100,000.00	84,320.00
Data Capturer (Simangele Mathebula)	30,000.00	117,680.00
Data Capturer (Elizabeth Kassimatis))	70,000.00.	47,680.00
Students (x2)(100%*)	10,000.00	0
COST OF EMPLOYMENT TOTAL	**471,200.00**	**688,800.00**
CAPITAL EXPENSES TOTAL	0	0
Visit 4 museum collections & ADU (4x8 days 32d)	10,000	0
Field work (incl S&T)	100,000	20,000
Field equipment (consumables)	5,000	3,000
Telephone, fax	0	1,000
Photocopying, printing, paper	0	1,000
Computer consumables	0	1,000
Postage	0	2,000
Stationery	0	1,000
Sundries	0	2,000
2x Steering Committee (S&T) 2 per year	10,000	0
SANSA workshops	0	0
Visiting scientists (2 x 10 days S&T)	40,000	0
OPERATING EXPENSES TOTAL	165,000	31,000
GRAND TOTAL	**636,200**	**719,800**

Money to roll over to 2008-2009

[1] Due to problems to appoint people at ARC, no field manager was appointed but several surveys were undertaken by different survey managers and paid for as contract workers.

April 2008 – March 2009

Main activities (as listed in contract document)

- Conduct field surveys.
- Review survey methodology document based on the previous season's experience.
- Produce interim distribution maps by the end of the year and post these to the website.
- Conduct Red Listing activities
- Organize a SANSA workshop at African Arachnological Society's Colloquium.
- Ongoing identification of material.
- Hold at least one meeting of the Steering Committee.
- Continued identification of specimens.
- Coordinate visits by overseas specialists and/or send material abroad for identification.
- Maintain and promote the virtual museum.
- Maintain and update the project website.
- Continue with training of taxonomists and parataxonomists.
- Publish the newsletter quarterly.
- Promote public awareness participation by continuing public talks, courses etc.
- Meet the financial management requirements as set out by steering committee and SANBI.

Deliverables:

- Project database updated with new records from field surveys, literature, museum collections and other surveys.
- Updated gap analysis.
- Field surveys conducted.
- Threatened Species database updated with Red Listing information for priority species.
- Red List assessments conducted where sufficient data exists.
- Workshop at the African Arachnological Society Colloquium.
- Interim distribution maps, posted on the project website.
- At least one meeting of the Steering Committee held.
- Continued identification of specimens.
- Visits by two specialists from abroad.
- Training of taxonomists and parataxonomists.
- Quarterly newsletters.
- Up-to-date web site.
- Courses, lectures and talks.
- Virtual museum being populated and promoted.
- Project progress and financial reports approved by the steering committee.

BUDGET April 2008 – March 2009

SANSA Budget	**2,008**	
	SANBI	**ARC**
Project Manager (Ansie Dippenaar)	60, 000	455,640
Assistant Project Manager (Charles Haddad)	22,472	0
Field Surveys (5)	127,200	0
Financial Manager (Almie van den Berg)	20,000	28,610
Admin Assistant (Annette van den Berg)	40,000	
Data Capturer (Petro Marais)	60,000	84
Data Capturer (Simangele Mathebula)	30,000	117,680
Data Capturer (Elizabeth Kassimatis)	70,000	47,680
Students (x2)(100%*)	10,000	0
COST OF EMPLOYMENT TOTAL	**379,672**	**639,564**
CAPITAL EXPENSES TOTAL	0	0
Visit 4 museum collections & ADU (4x8 days 32d)	0	0
Field work (incl S&T)	110,000	20,000
Field equipment (consumables)		3,000
Telephone, fax	0	1,000
Photocopying, printing, paper	0	1,000
Computer consumables	0	1,000
Computer software	0	0
Postage	0	2,000
Stationery	0	1,000
Sundries	0	2,000
Printing of report	0	0
2x Steering Committee (S&T) 2 per year	10,000	0
SANSA workshops *[undertaken 2007/8]	2,000	0
Visiting scientists (2 x 10 days S&T)	40,000	0
OPERATING EXPENSES TOTAL	162,000	31,000
GRAND TOTAL	**541,672**	**670,564**
SANBI TOTAL	**541,672**	
ARC TOTAL		**670,564**

APPENDIX 1
SANSA:
CODE OF CONDUCT AND COLLECTING GUIDE LINES

Preamble

Some people prefer to identify arachnids alive and then to return them to their place of collection. Whilst this will satisfy the unease that many feel about having to kill specimens in order to study them, field identification is normally only possible with certainty for the larger species. Often, closely related species within a genus are only separated by small morphological differences, and careful examination of preserved specimens, using a microscope, is then essential for an identification to be made with any confidence. For any serious taxonomic, ecological, recording or distribution studies of arachnids, it is necessary to collect and preserve the specimens. They are then available should it be necessary to obtain confirmation of the identity of new, rare or 'difficult' species by an expert, or for subsequent examination when new techniques become available or new characters are discovered. Whilst it is unlikely that collecting alone will cause the extinction of any species in South Africa, the increasing loss of habitats resulting from forestry, agriculture, and industrial, urban and recreational development means that a "Code for Arachnida Collecting for SANSA" is required in the interests of arachnid conservation.

Permission and Conditions for Collecting

- Collectors should comply with local, regional, provincial, national and international laws and regulations that govern collecting and possession, commerce and exchange, import and export and protection of species. They should also comply with additional local, regional, provincial, national and international laws and regulations governing live material
- Permission from a landowner, occupier, warden or other authority should always be sought before collecting on private land. Collecting on a Site of Special Scientific Interest requires permission both from the owner and from the local office of the appropriate national conservation agency. In most Provinces a collecting permit is need before any collecting can be done. Any conditions which might be imposed should be strictly followed.
- It is illegal to collect species listed on Provincial and/or National Protected species lists, unless permission has been granted for the restricted sampling of these taxa.
- After collecting on private land, nature reserves, or other sites of known conservation interest, a list of species, annotated with habitat data, should be submitted to the appropriate authority.

Purposes of Collecting:

- To create a reference collection for research;
- To document regional diversity, frequency, and variability of species, and provide voucher material for published records;
- To document faunal representation in environments undergoing alteration or threatened by humans or natural forces;
- To participate in the development of regional checklists and institutional reference collections;
- To complement planned research initiatives and endeavours;
- To help disseminate educational information;
- To augment understanding of their importance and ecological relationships and to educate the public.
- To collect detail location data for conservation assessment.

Data that need to be recorded with collected specimens

- Locality: complete location (with map grid reference/GPS reading),
- Name of collector,
- Date of collection and time of day,
- Method used
- Field layer sampled, notes on habitat
- Additional field data such as notes on behaviour: type of web, prey, behaviour etc. Records of behaviour and biological interaction observations in the field are very important
- Photographic data: indicate with record if photographs have been taken. Photographic data are encouraged for inclusion in the SANSA virtual museum;
- Data to be written with pencil or Indian ink on white paper that could be put in alcohol

APPENDIX 1 (cont.)

Protecting the Environment

- Whilst collecting, damage to the local environment should be minimised. For example, nesting birds should not be disturbed; if such disturbance occurs unwittingly, the area should be left immediately. Excessive trampling of vegetation should be avoided, particularly if rare plants are known to occur on the site.
- When 'beating' for arachnids, shrubs and trees should not be damaged by the use of excessive force.
- Vegetation, leaf litter, vertebrate nests or other material should not be removed from a site in excessive amounts, and then only if permission has been granted and in compliance with the laws applying to the species concerned.
- Any form of vegetation, such as moss, that is likely to recover, should be replaced in its appropriate habitat once it has been worked for specimens. Logs and stones should be returned to their original positions after searching beneath them. Only small areas of bark should be stripped from dead wood and, whenever possible, it should be replaced in position. Piles of litter should be replaced and not left scattered about after sorting.

Trapping

- If a trap is found to be catching large numbers of local or rare species, it should be re-sited if possible.
- Take precautions to ensure that larger creatures such as frogs and shrews cannot fall into pitfall traps.
- Bear in mind that pitfall trapping is indiscriminate. Keep trapping to a minimum commensurate with the studies being undertaken and do not leave traps in position when they are not required.
- Trapping will catch many other creatures other than arachnids. If possible, contact experts on other groups so that this material will not be wasted.
- If at all possible, use live traps rather than pitfalls containing liquid preservatives. If you use liquid make sure that it is not poisonous to mammals and other larger animals.

General Collecting

- Unless a very limited number of voucher specimens are required, readily identifiable species should be examined alive and released at the point of capture.
- No more specimens than are strictly required for any purpose should be killed.
- Species should not be taken from the same locality year after year.
- Visiting new sites is preferable to collecting local or rare species from well-known or overworked localities.
- Specimens for exchange or disposal to other collectors should be taken very sparingly, or not at all.
- Try to leave a collecting site in the state you would wish to find it.
- Full and relevant data should be kept together with all specimens retained.
- Species lists and habitat data should always be submitted to the national recording schemes, either through Area Organisers or directly to the National Scheme Organiser.
- Collections should be properly housed and their future value should be safeguarded.

Looking after Collected Material

- All material should be preserved in 70 % alcohol with all known data written on white paper in Indian ink or pencil and included in bottle with specimen;
- All material should be protected from physical damage and deterioration by light, mould, and drying out;
- Collections should be made available for examination by qualified researchers;
- Collections or specimens, and their associated written and photographic records, should be willed or offered to the care of an appropriate scientific institution, if the collector lacks space or loses interest, or in anticipation of death;
- Type specimens, especially holotypes, should be deposited in appropriate scientific institutions.

Acknowledgement: This Code of Conduct and collecting guidelines document has been prepared using information of several societies such as the British Arachnological Society, Spider Club of Southern Africa and the Lepsoc Africa. We acknowledge this with thanks.