

SWAKOP RIVER WOODLANDS AND WILDLIFE PROJECT

ANNUAL REPORT 2011



**A collaboration between the Institute of Zoology (Zoological Society of London),
King's College London, the Gobabeb Training and Research Centre,
and the Ministry of Environment and Tourism**

The 2011 Field Team

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**Based at the Institute of Zoology, Zoological Society of London
A Partner of University College London**

Swakop River Woodlands and Wildlife Project

Second Annual Report 2011 Field Season

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1. INTRODUCTION

The Swakop River Woodlands and Wildlife Project was initiated in autumn 2009 and this year marked its second field season. The goal of the Project is to quantify and understand the causes of the reported dieback and death of trees along the Swakop River, and to determine what impact this habitat deterioration may be having on wildlife. There have been numerous anecdotal reports of dying trees along the course of the riverbed, but until now little research or management attention has been given to the problem.

In Namibia, our research is carried out in affiliation with the Gobabeb Training and Research Centre, and with the support of the Ministry of Environment and Tourism. The UK home of the Swakop River Woodlands and Wildlife Project is both the Institute of Zoology, the research arm of the Zoological Society of London, and King's College London.

In this, our second annual report, we begin with an overview of the Swakop River Woodlands and Wildlife Project (Section 3), and follow with a review of our research activities in and out of Namibia (Sections 4 and 5 respectively). Finally, in Section 6, Cass and Caitlin write short informal accounts about this year's field season, before we pass on our thanks to all those people who have supported the project (Section 7).

2. THE TEAM

In 2011, we conducted a short 2-month field season. Caitlin Douglas, the PhD student heading this project, was in Namibia in August and September, and her research team joined her during this period for three weeks of intensive fieldwork. The team comprised three international interns: Miles Keighley, Cassandra Raby and Jonathan Usherwood. The advisory committee that oversees Caitlin's study and the Swakop River Woodlands and Wildlife Project more generally comprises Dr Joh Henschel (EnviroMEND), Dr Guy Cowlshaw (Institute of Zoology), Dr Mark Mulligan (King's College London), and Dr Daanish Mustafa (King's College London).

3. PROJECT OVERVIEW

The Swakop River's catchment is the largest of all Namibia's ephemeral rivers with an area of 30,100km². Private farmland is the dominant land tenure in the catchment, but there is also communal land, national and private parkland, and a growing number of mining operations. The capital city, Windhoek, is located in the southeast corner of the catchment. Historically, the Swakop River was an important travel route from the coast to the interior of the country, and in the 1800s Otjimbingwe became a significant mission station and trading post. The Swakop River has recently

regained some of its national importance as a result of the uranium-rush occurring in the areas surrounding the lower reaches of the Swakop River.

The overall goals of this project are to determine the current health of the riverine woodlands and to determine the causes and potential consequences of the reported woodland dieback. It is hypothesized that either changes to the river's hydrological regulation and/or the *Prosopis* tree invasion may be contributing to the woodland decline. In the first case, two dams are located along the upper reaches of the river: the Sartorius Von Bach Dam, constructed in 1970, and the Swakopport Dam, erected 26km downstream in 1978. These dams have reduced both the frequency and scale of natural flooding events along the river. In the second case, a large population of the invasive tree species, *Prosopis* (mesquite), has spread along the river course. Mesquite has a reputation as an aggressive invader and is regarded as the terrestrial invasive species of greatest concern in Namibia. The mesquite invasion on the Swakop River is thought to be the most severe of all the major ephemeral rivers.

Our research focuses on three key areas:

- i) Tree Cover: Investigating the patterns and drivers of tree cover.
- ii) Tree Health: Understanding the relative roles of recruitment and mortality of tree populations in affecting tree cover.
- iii) Wildlife: Determining the patterns and drivers of wildlife occurrence.

In order to clarify the relationships between river regulation, trees and wildlife, the DESURVEY model (www.policysupport.org) will be applied to the Swakop River. DESURVEY is an existing mathematical model of land degradation dynamics previously applied to arid North and West Africa. Once the current patterns between (geo)hydrology and tree characteristics are established, the model will allow the processes behind these patterns to be explored. In this way, the model is an integral component of the study as it will facilitate an understanding of the drivers of woodland decline. At the end of the study, the model will be available to scientists and policy-makers alike as a web-based decision-support tool. The model includes components for climate (and climate change), hydrology, vegetation growth, soil erosion/deposition, and other aspects of land degradation and change. The model can be run with user-defined scenarios for land use, climate change, and land management. This means that the potential efficacy of proposed policy interventions can be tested before implementation.

4. FIELD RESEARCH

The focus of the 2011 field season was to collect data for model parameterization, to interview stakeholders and to visit archives.

Model Parameterization.

We travelled throughout the Swakop River catchment to collect the data on vegetation and soil characteristics that are necessary to run the DESURVEY model (see Section 3) and thus to apply the model to this study area. A total of 38 sites were visited in five major soil types. At these sites, small soil pits were dug to look at soil characteristics such as stoniness and density. Infiltrimeters were also used to determine how quickly water is absorbed by the soil.

Stakeholder Interviews

15 interviews were conducted with stakeholders to help understand the processes that may have shaped current land use and vegetation patterns, and to determine peoples' perceptions of environmental change, along the Swakop River. Interviews included representatives from private households, government departments, non-governmental organizations and industry. Further telephone interviews are also planned, to cover those individuals who were not available for interview during the field season. These interviews will be used to assess how the Swakop River has changed in living memory, to identify priority areas of stakeholder concern, and to help generate realistic land-use/management scenarios to explore in the DESURVEY model.

Archival Research

Archives and bookstores were searched for documents that may provide insights into the histories of the Swakop river and the invasive *Prosopis* species. Knowing the history of the river will provide insights into its current condition. Scenic photos and scientific reports were found which should help us to better understand the river.

5. RESEARCH ACTIVITIES IN 2012

Using the field data collected across the 2010 and 2011 field seasons, the DESURVEY model can now be applied to the Swakop River catchment. In 2012, a key focus will be the application of this model to the study area to help elucidate the relationships between floods and vegetation health. In addition, statistical investigations will be conducted into the determinants of tree cover, tree health, and wildlife in the Swakop River.

In 2012, Louis Parker, an MSc student in Water Science and Governance at Kings College London will be identifying the number and distribution of small dams within the Swakop catchment. He will use remotely sensed images to locate the dams and then use the DESURVEY model to investigate what impact they have on runoff.

6. PERSONAL ACCOUNTS

In the final part of our Annual Report, Cassandra Raby and Caitlin Douglas write about this year's field season.

Dirty Times

Cassandra Raby

As we drove along the long dirt roads, a trail of dust following, I would look out at Namibia in awe. Long stretches of undeveloped sandy plains and rocky mountains across the horizon make up most of the landscape. It may have seemed beautiful at the time but once we started the study this feeling quickly turned into frustration against the land. Sometimes digging into the ground could be easy, the spade would ease through the sand and take us only moments to complete. Usually, however, it was more of a challenge. We would end up using our fingers to loosen soil around rocks trapped in the ground causing dirt to become compacted under fingernails. Meanwhile the dust would become layered on my skin, and in my lungs. Despite being covered in dirt, however, the lack of a shower in the evening was more than compensated by an unobstructed, beautiful sunset with a fire-cooked dinner.

Sampling all along the Swakop River meant we got to visit really interesting sites in Namibia. From camping among ancient *Welwitschia* to the rocky Bloedkoppie we saw some amazing places. There were some interesting moments too, like trying to camp in Otjimbingwe whilst being watched by most of the town's inhabitants. It meant we had some interesting entertainment during our dinner as children were bombarding us with questions and stories all evening.

The Year of the River

Caitlin Douglas

Early in 2011 I began to receive e-mails from Namibia with the good news that the Swakop River was in flood. Little did I realise that this was just the beginning, and that in fact the Swakop River would flow for several months. After Guy (Dr Guy Cowlshaw, Advisory Committee Member) returned from Namibia in June and reported that the river was still flowing, I quickly re-assessed my fieldwork plans. I had intended to re-visit last year's sampling sites in the Namib Naukluft National Park and take photographs in the same locations to see how the river had changed. However, as the chances of getting stuck in the riverbed were now extremely high, I reluctantly

made alternate plans. I managed to re-visit a few of last year's sampling sites along the river (where there was road access), and the changes in the river landscape were dramatic: a completely clear channel (except for the occasional Ana tree), trees with denser and more vibrant canopies, and ample amounts of grass and herbs in the woodlands.

This field season wasn't about the river, however, and I spent very little time in the riverbed. I spent most of my time travelling and soil sampling across the wider catchment. As always, Namibia didn't disappoint in providing beautiful scenery. Particularly awe-inspiring moments were: 1) the eastern part of the Namib Naukluft National Park around Bloedkoppie and Tinkas which provided endless vistas and abundant wildlife; 2) driving through the Welwitschia plains; and, 3) driving the D roads southeast from Okahandja towards Windhoek, which surprised with their breathtaking geology and scenery.

Each time I am in Namibia I find new places to rave about, and this year was no exception. In addition to being the year that the Swakop River flowed, 2011 also marked my final field season on the Swakop River Woodlands and Wildlife Project. It seems a fitting year for my fieldwork to end.

7. ACKNOWLEDGEMENTS

Our successful field season would not have been possible without the help and support we have received from so many people.

First of all, we would like to thank all the people who generously gave of their time to be interviewed as part of this project. The names of these people are not mentioned here to preserve anonymity.

We would also like to thank the following people for logistical support in Namibia (by affiliation, in alphabetical order): Gudrun Winston-Smith (GK Consultancy); Theo Wassenaar (Gobabeb Training and Research Centre); Coleen Mannheimer (Independent); Vera Marx (Independent); Lizett Strydom (Independent); Charles Cleghorn, Werner Petrick (Langer Heinrich Uranium Ltd); Mr. Smith (Local Government Otjimbingwe); Winnie Metzger (Metzger Drilling); Penda Shimali, Toivo Uahengo (Ministry of Environment and Tourism); John Mannheimer (Namib Pharmacy); Wotan Swiegers (Namibia Uranium Institute); Uwe Rental (Navachab Mine); Uahorekua Usurua (Rural Water); Herman Strydom (Strydom and Associates); Dean Esau, Barry Parker, Eddie Techman (Swakop Uranium Ltd.); Katharina Dierkes (The Maproom); Jonathan Neumbo (Traditional Authority for Otjimbingwe). We also thank the staff of the Namibian Scientific Society, the National Archives of Namibia, the National Library of Namibia, the Swakopmund Scientific Society, and the VK Workshop.

In the UK, we'd also like to thank the following (by institution, in alphabetical order): Tim Blackburn (Institute of Zoology); Michael Chadwick, Trevor Allen (King's College London).

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Photos

This page: Sights around the Swakop River catchment. Clockwise from top:

- 1 - Swakop River in Namib Naukluft Park;
- 2 - geological formations near Okahandja;
- 3 - Welwitschia Plains at sunset;
- 4 - Swakop River in flow near Goanikontes.

Cover: Swakop River in Namib Naukluft Park

Picture Credits:

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