Darwin Project Information

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Project Title	Iimbovane Outreach Project: Exploring South African Biodiversity and Change
Country(ies)	United Kingdom and South Africa
UK Contract Holder Institution	Biodiversity and Macroecology Group – University of Sheffield (UoS)
UK Partner Institution(s)	Not applicable
Host country Partner Institution(s)	DST-NRF Centre of Excellence for Invasion Biology (C·I·B) – University of Stellenbosch
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Project Leader Name	Professor Kevin J. Gaston
Project website	www.sun.ac.za/iimbovane
Author(s), date	Kirsten Mahood, Brigitte Braschler, Natasha Kruger, Sue Shaw, Steven Chown and Kevin Gaston; April 2008.

1. Project Background

The Iimbovane project is implementing a biodiversity monitoring programme that improves teacher and learner knowledge of spatial patterns of biodiversity and ecosystem functioning, and their change over time. The project is based within the Western Cape Province (WCP) of South Africa and involves Grade 10 life science learners of 13 schools selected for the project. In conjunction with the schools, Iimbovane project team members collect ants in additional pristine sites to examine ant diversity patterns over large spatial and temporal scales, and their likely mechanistic underpinnings.

South Africa's second report to the Convention on Biological Diversity states that invertebrate monitoring and inventorying is poorly developed for this country. In addition, the Framework Convention on Climate Change Country Studies Programme for South Africa identified the lack of knowledge on how species are distributed in the matrix and how these distributions are changing, as major constraints. In South Africa, there is virtually no annual monitoring of biodiversity, with the exception of water bird counts and smaller-scale monitoring of selected taxa within individual protected areas. The Iimbovane project is making a significant contribution to establishing an inventory and monitoring programme for an important group of insects (ants), which are also widely agreed to be excellent indicators of the effects of landscape change. This is especially important in the fynbos biome of South Africa, where approximately 20% of the 6500 strictly fynbos plant species rely on ant-assisted seed dispersal.

This project addresses the problem of teacher capacity within the field of biodiversity, while simultaneously addressing the issue of a lack of biodiversity knowledge within the Cape Floristic Region.

2. Project Partnerships

The partnership between the UoS and C·I·B continues to work well, with assistance coming from both partners. Dr. Braschler (UoS) remained in South Africa for approximately half of the reporting period, remaining in touch with Prof. Gaston (the UoS principal investigator) through regular e-mails. The PIs are in weekly contact via e-mail and by voice over internet discussions. Dr. Shaw and Ms. Mahood are in regular contact regarding administrative issues relating to the project, ensuring sound overall project management. Dr. Braschler has remained in regular contact with the South African project partners through e-mail since her return to the UK in November 2007; she continues to have access to the South

African data management system where all data collected and products developed by the project are housed.

The partnership with Western Cape Education Department (WCED) continues successfully. WCED continues to request the Iimbovane project to be rolled out to all 360 secondary schools within the Western Cape. Buy-in from the 13 schools currently involved and their enthusiasm for the project and the Iimbovane team remains high. The Iimbovane team are busy developing the necessary tools to make expansion possible and are writing a business plan to ensure that the project can remain sustainable after Darwin funding ceases, while growing it into more schools.

Collaboration with researchers within the C·I·B who are undertaking ant biodiversity studies is ongoing. The anticipated joint ant reference collection (see first annual report to the Darwin Initiative) to be used by researchers in the WCP is in preparation as new species are still being collected. Iimbovane staff continue to provide advice on and identification of species for other researchers. Currently the C·I·B has two additional projects sampling ants in a similar way to Iimbovane (but without learners). One project is located in the northern region of the Western Cape (Cederberg, Western Cape Province); the other is on the eastern seaboard of South Africa (Sani Pass, KwaZulu-Natal Province). It is anticipated that a third project located in the northern regions of South Africa (Soutpansberg, Limpopo Province) may be included in 2008. Due to the continued collection of long term data on ant distributions within South Africa by the C·I·B, in August 2008 this organisation will host a workshop on long term monitoring. This will ensure continuity of work within the projects as well as excellent cross pollination of ideas and potential outputs.

Other Collaboration:

Iimbovane maintains sampling sites in the South African National Parks (SANParks). Co-operation with SANParks is ongoing and all necessary permits for the coming year have been renewed. Students working within SANParks continue to accompany the Iimbovane team on sampling visits when they are available. A select group of Coastcare employees continues to assist the Iimbovane team with sampling in Wilderness National Park, receiving on-the-job training from the Iimbovane team in data collection.

The relationship with the Western Cape Nature Conservation Board (CapeNature) is ongoing. The permit for ant sampling has been renewed until 2012. This extended permit period is an indication of the value CapeNature places on the work Iimbovane is doing. The relationship with the City of Cape Town continues to develop slowly. Students working for the City of Cape Town continue to assist with fieldwork when they are available. The partnership with the Iziko Museum of Cape Town is ongoing. This partnership is vital as it provides taxonomic guidance in the development of the reference collection and assists in the development of taxonomic skills within the Iimbovane team, thus further building capacity in South Africa.

Two new partnerships developed during the reporting period. The first is with the South African National Survey of Arachnida (SANSA). Samples collected by the Iimbovane team (once all ants have been removed) will be sent to SANSA for further analysis of all arachnids captured by the pitfall traps. This is an extremely meaningful partnership, as the data collected by Iimbovane is being used to broaden the distribution knowledge for a host of other invertebrates, creating a multiplicative impact in the generation of knowledge of South Africa's biodiversity.

The second partnership is with the Discover Life group based at the University of Georgia, United States of America. Discover Life run various community-based ecological data collection projects within the USA. One of these projects is Ant Hunt, a project very similar to Iimbovane, where community members collect ants to provide information on ant distributions in the north eastern region of the USA. Together with Discover Life the Iimbovane team put forward a proposal to host a special session at the August 2008 *Ecological Society of America* conference in Milwaukee (Wisconsin). This proposal was accepted and the special session will go ahead. The Iimbovane project, together with projects run by Discover Life will form the basis of discussions of best practice when implementing outreach and ecological research projects without compromising on either the science or community interaction.

The C·I·B has strong links with the South African National Biodiversity Institute, which is the premier biodiversity organisation in South Africa, responsible for implementing many requirements of the CBD on behalf of the Department of Environmental Affairs and Development planning, which is the CBD focal point for South Africa.

3. Project progress

3.1 Progress in carrying out project activities

Teacher training workshops and school implementation

The teacher information workshop, originally scheduled for April 2007, was included in the teacher training workshop which took place in January 2007 (see second report to Darwin). This ensured that teachers taking part in the project could attend the training workshop before the start of the school year. The workshop was well attended and very successful.

Some school implementation visits were delayed due to the extensive industrial action by the largest South African teachers' union during June and July of 2007. However, through the partnerships with the schools and the Western Cape Education Department (WCED) the project was able to catch up on lost time. The industrial action did not coincide with the Iimbovane sampling season.

Following continued requests from WCED the Iimbovane team held a training workshop for Curriculum Advisers in June. Eight Curriculum Advisers and three teachers attended the workshop. During this one day workshop a background to biodiversity and ant ecology was given. This was followed by a practical session on how to sample ants and analyse biological data. Theory on surveying and monitoring in ecology and the scientific method was also covered. This workshop ensures better continuity within schools and the WCED and Curriculum Advisers are now better placed to assist teachers in the implementation of the Iimbovane project.

In August all 13 schools were visited for a data handover activity with the learners and to deliver new equipment to schools (three IBM laptop computers and 13 Leica Stereomicroscopes purchased at the end of the 2006/2007 financial year). The laptops were given to each of the three schools that joined the project in January 2007. Each of the 13 schools received a stereomicroscope. The stereomicroscopes have built in digital cameras, allowing learners to photograph ants and make their own keys.

The teacher training workshop scheduled for October 2007 took place in January 2007 (see second report to Darwin). The Iimbovane team hosted a workshop in January 2008 during the last week of the school holidays. This workshop was originally scheduled for June 2008, however due to the South African school calendar it was decided to host the workshop in January. One teacher and two learners from 12 of the 13 Iimbovane schools attended the workshop. One school was unable to attend due to previous teacher commitments. For learners, the aim was to interact with Iimbovane learners from different environments while exploring the data collected by Iimbovane in more detail. Learners worked in groups to develop a hypothesis, test the hypothesis using Iimbovane data, and draw conclusions from their results. At the end of the week learners presented their work to the full group attending the workshop. Through this workshop learners gained a better understanding of the scientific method, and were able to develop their public speaking skills during the presentations. While learners were busy with the science, teachers worked on the production of standardised assessment tools that will be used by all teachers in the Iimbovane project to assess learners, creating a stronger link to the curriculum. The workshop included a fieldtrip which visited three of the schools and the control sites involved in the project, allowing learners and teachers to gain a better understanding of the differences between pristine and modified environments. Many of the learners and teachers had previously not had an opportunity to visit control sites. As there were three new teachers joining the project in January one day of the workshop was spent training these teachers in the implementation of Iimbovane at their schools.

Sampling, database, reference collections and keys

From April to June the Iimbovane team spent much time sorting and identifying ants collected during the March 2007 sampling period. In summary, 29 750 ants were caught, belonging to 30 genera and approximately 156 species (Annex 3). The final number of species is still to be confirmed as many ants are currently only assigned to morphospecies. New species that were collected during this sampling season were added to the reference collection that was developed in 2006.

The March 2007 season was followed by a visit to the Iziko Museum in Cape Town during June, where Dr. H. Robinson (ant taxonomist) verified the identification of more of the morphospecies collected by the Iimbovane project. Although the visit was short it was very informative and contributes to the capacity building of taxonomic skills within the Iimbovane team itself. The information is being used to ensure that the reference collection continues to develop successfully with taxonomic input.

October 2007 and March 2008 saw continued sampling at schools and control sites. Participation by learners and teachers continued, with the new group of learners joining the project in March. Sampling during both seasons was successful.

From June to August Dr. Braschler continued to develop the electronic image-based ant identification key and guide (initially developed in 2006) to include new genera and species collected in the October

2006 and March 2007 sampling seasons. Thirteen image-based keys were produced to give to schools during the August visits. Additionally, three new ant reference collections (showing different sub-families found in the project to date) were produced for the new schools that had joined the project.

Throughout the year the database developed by the C·I·B in 2006 was populated with data from the Iimbovane sampling seasons.

Planning workshop

A successful progress and planning workshop was held in September 2007 at Karoo National Park, Beaufort West. It was attended by Prof. Kevin Gaston, Dr. Brigitte Braschler, and Dr. Sue Shaw of the UoS, and Prof. Steven Chown, Ms. Kirsten Mahood and Ms. Natasha Kruger of the C·I·B. Discussions centred on the exit strategy for the project, as well as the hand-over workshop scheduled for September 2008 and the final report. Additionally, time was spent on the development of a research paper on the synergies between biodiversity research and education.

Information dissemination

The main form of communication for this reporting period was through presentations at various international and national conferences. Dr. Braschler attended the Society for Conservation Biology conference hosted in South Africa in July, and presented preliminary findings on ant distribution patterns in the Cape Floristic Region. In the same month, Ms. Mahood attended the IV World Environmental Education Congress, also hosted in South Africa; she presented Iimbovane as a novel way of implementing schools-based outreach activity in environmental education.

In August, Ms. Mahood attended the national Fynbos Forum Meeting and presented the educational outcomes of the project in terms of the advantages for learners and teachers. Ms. Mahood and Ms. Kruger gave a joint presentation at the South African Association of Science and Technology Educators (SAASTE) Mini-Conference in Cape Town in September. This interactive session, aimed at teachers, demonstrated how biological data can be used in the Information and Communication Technology Classroom. In September, Ms. Kruger presented an outline of the Iimbovane project to the Ward Council meeting for the Kraaifontein suburb of the City of Cape Town.

The Iimbovane project was involved in three youth symposia during 2007. On Women's Day in August, South African Women in Science and Engineering hosted a day to raise awareness among schoolgirls about careers in Science, Engineering & Technology. At this event the Iimbovane team had a stall displaying all the equipment used in the ant laboratory as well as a poster based on the Iimbovane team about the different career options open to women in natural science. This display was followed by a stall promoting the Iimbovane project at the Cape Town regional finals of the Eskom Expo for Young Scientists and the Youth Environmental Schools Symposium.

It was not only Iimbovane team members that were involved in disseminating information during this reporting period. In August two groups of learners from Cape Academy (a participating school) presented posters at the Eskom Expo. A group of three learners from Cape Academy developed their poster from the Eskom Expo into a presentation for the Youth Environmental Schools Symposium hosted by the City of Cape Town in August. As part of their preparation for this event the learners visited the Iimbovane team to find out more about the science behind the project. The presentation was very well received and was one of only a few presentations that included scientific data, results and conclusions. In September the learners gave the same presentation to a delegation from the British Council. Delegates (including Sir David King) were very impressed by the learners and the British Council has sponsored them to attend the National Science Festival "SciFest" at Grahamstown in 2008.

In February 2008 two learners and a teacher from Central High School attended a SAASTE Mini-Conference and presented to teachers from across the Western Cape Province an outline of what the Iimbovane project is and how it has impacted on the school.

Additional activities

During the year a pamphlet about the project was designed and produced (Annex 4). The pamphlet contains general information about the project and is used to promote the project at conferences and workshops. The pamphlet has been very useful.

In November a small group of learners from Manzomthombo Secondary School visited the Iimbovane team at Stellenbosch University campus to gain a better understanding of the science behind the Iimbovane project. During this visit the learners experienced washing samples and working with laboratory microscopes used by the Iimbovane team. Learners also had the opportunity to discuss careers in science, one-to-one, with the Iimbovane team.

Annex 5 contains a few photos of implementation over the last year.

3.2 Progress towards Project Outputs

All teacher training workshops have been hosted successfully, ahead of schedule, and more teachers were trained than initially anticipated. Five teachers, including three from previously disadvantaged communities, received Iimbovane training during this reporting period. The total number of teachers trained to date is 32. Additionally, nine Curriculum Advisers have received training. This output indicator has been straightforward to monitor. The assumption that teachers remain active and interested in the project remains. Without the buy-in of teachers, senior school management and Curriculum Advisers implementation would be extremely difficult. Should teacher support be lost, the project would be negatively impacted. The output was to have a minimum of 10 teachers trained by the third year. It can be clearly demonstrated that this output has been achieved. Currently there is a degree of trained teacher turnover within the project, due to teachers being re-allocated to teach different subjects within the school. However, teachers remain involved in the Iimbovane project. The output level assumption holds true, that trained teachers remain in participating schools.

The Iimbovane project is being implemented in 13 schools in the WCP; more schools than initially planned. Learners continue to participate in field sampling and classroom activities. Image-based keys are being used by learners in the classroom, together with additional resources provided to the schools. The output to have the project operational in 10 schools has been achieved.

The sampling transect has been established and sampled a total of five times. This sampling will continue once the Darwin project ends. Data obtained from sampling efforts are being analysed to determine baseline patterns of ant biodiversity within the WCP. Work in progress includes four articles for publication in international peer reviewed scientific journals. A manuscript on the synergies between biodiversity research and education is awaiting final input from co-authors before being submitted. The paper also reports results on the effect of disturbance on ant diversity in the fynbos and succulent karoo. The second manuscript examines whether the ant diversity of the fynbos and succulent karoo is as extraordinary as the plant diversity of the region or whether the ant diversity is more in line with expectations based on species-energy relationships or latitudinal patterns of species diversity. Using data from the Coast to Karoo Cederberg project (with which Iimbovane has collaborated), a third manuscript examining ant species turnover over time and space along an altitudinal gradient is being prepared. A major paper will examine ant distribution patterns in the Cape Floristic Region using data from the pristine and moderately disturbed sites from the Iimbovane project. This work is currently in the early stages of analyses. It is anticipated that the minimum of two papers will be submitted for publication before September 2008.

The planning workshop was held ahead of schedule in South Africa, over three days in September (section 3.1). All proposed planning workshops have taken place ahead of schedule and have been successful.

The UoS project staff spent 33 weeks in South Africa. This is longer than anticipated, as the implementation, field work and data preparation has taken longer than anticipated. This extended period in South Africa was agreed to by the UoS and Stellenbosch University.

The ant database was developed and populated with test data in the previous reporting period is now being populated with data on an ongoing basis, as information is extracted from the data collected during fieldwork. The expected output to have a database ready for hand over in August 2008 will be achieved.

The main mechanism the Iimbovane team has used to publicise lessons learned and best practice has been through the presentation of the project at various public forums (section 3.1). The list of presentations given during this reporting period and the planned presentations for the coming year are an indication that this output is being achieved.

The indicators are being achieved and the output level assumption that taxonomic skills remain available to the project holds true.

3.3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Total planned from application
7	Number of training materials produced	6	4	2		14	0
8	Weeks spent in host country	12 + 15	26 + 19	26 + 7		105	76
11B	Number of papers submitted to peer reviewed journals		2			2	2
13A	Number of species reference collections established		1			1	0
14A	Planning workshop	1	1	1		3	3
14A	Teacher information workshop	1	1	0		2	2
14A	Teacher training workshop	1	1	1 + 1		4	3
14B	Workshops/Seminars attended	2	2	5		9	0
15A/B	Local/National articles in SA (including websites)	2 + 3	1+ 14			20	3
15C/D	Local/National press release in UK	1				1	3
18A	National TV Interview in SA	1		1		2	0
19A	National Radio Interview in SA	1 + 2	1	0		4	2
20	Value of assets to be handed over to host country	£9,840	£23,270			£33,110	0
22	Number of permanent field plots	29	2	2		33	0
23	Additional resources raised	ZAR 412,511 (c. £29,120)	ZAR 337,805 (c. £23,847)	ZAR 788, 524 (c. £55,663)		c. £108, 630	£140,310
New -Project specific measures							
(6A?)	Number of people to receive training	17 teachers, 1 CA* - 2 days	4 teachers - 2 days, 10 teachers - 1 day	3 teachers – 1 day; 34 learners – 4 days; 8 CAs & 3 teachers – 1 day		80**	10
(6B?)	Number of training weeks provided	0.4	0.4	0.2; 0.8 & 0.2		2	Not specified

*CA = Curriculum Adviser

**Many teachers came for follow-up training in consecutive years – they are therefore counted twice in the above table. The total number of individual teachers and Curriculum Advisers trained is given in section 3.2. [Numbers of individual school learners have not been included, but total over 3000 to date.

Outputs additional to those specified in the original proposal are shown in red.

Table 2 Publications

Type * (eg journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
Pamphlet*	Iimbovane pamphlet. K. Mahood, N. Kruger, B. Braschler, S.L. Chown, K.J. Gaston. 2007	C·I·B, Stellenbosch, South Africa	Iimbovane project office at Stellenbosch University, Private Bag X1, Matieland, 7602	Free
Magazine	Eyewitness: Franco Eagleton. Anonymous. 2007.	New Media Publishing (Pty) Ltd., Cape Town, South Africa	New Media Publishing (Pty) Ltd., Cape Town, Tel: +27 (21) 417 1111 or www.newmediapub.co.za	£9.00 for subscription to receive 8 editions of magazine - magazine not sold individually)
Thematic Review	Communication, Education and Public Awareness. Thematic Review. Ian Edwards, Kirsti Thornber, Stephanie Walker, Rob Wild, March 2007*	ECTF and Darwin Initiative, UK	http://darwin.defra.gov.uk/reports/thematic_review.CEPA.pdf	Free
Newsletter article	Darwin Initiative Newsletter. Issue 10, Dec. 2007, p3. Iimbovane Outreach Project: Exploring South African Biodiversity and Change.	ECTF and Darwin Initiative, UK	http://darwin.defra.gov.uk/newsletter/DARWIN_NEWS_10.pdf	
Newspaper article	Personeellede oor breë spektrup vir voortreflikheid beloon. Anonymous 2007.	Stellenbosch University Kampusnuus, Stellenbosch, South Africa	Stellenbosch University, Private Bag X1, Matieland, 7602	Free
Programme/ abstract	Ant diversity patterns in the Cape Floristic Region. B. Braschler, K. Mahood, N. Kruger, K.J. Gaston, S.L. Chown. 2007	Society for Conservation Biology	http://www.nmmu.ac.za/scb/ctalks.htm	Free
Abstract	Iimbovane: it's about the learners. K. Mahood, B. Braschler, N. Kruger, K.J. Gaston, S.L. Chown. 2007	Fynbos Forum, Cape Town, South Africa	Botanical Society, Tel: +27 21-799 8824 Email:paisley@botanicalsociety.org.za Website:http://www.botanicalsociety.org.za/	Free
Newsletter article	Learners explore ant diversity in the Western Cape 2006	South African National Parks, Pretoria, South Africa	South African National Parks	Free

* Mentions the Iimbovane project several times and gives details as Case Study 4.

** Gives details of Iimbovane outstanding achievements, as given in project Annual Report No. 2 (April 07)

3.4 Progress towards the project purpose and outcomes

The Iimbovane project is achieving over and above its agreed outcomes in capacity building. In two years the Iimbovane project has trained more teachers than anticipated and interacted with over 3,000 learners, thereby building capacity in general science skills and in monitoring biodiversity in South Africa, which contributes directly to the project purpose. Buy-in from the schools and their enthusiasm for the project and the Iimbovane team remains high, showing that the assumption of continued enthusiasm of teachers and learners in the participating schools holds true.

The main issue of concern within all schools is the high teacher turnover. This turnover does not necessarily see teachers leaving schools, but rather being assigned to teach different subjects within the same school. However, by continuing to offer regular training workshops much of this concern is alleviated. At many schools a single teacher has been identified as the contact for the Iimbovane project. This means that although the teacher may not necessarily be involved with the Grade 10 learners in consecutive years, they are aware of the project and co-ordinate activities for the project within their schools. Additionally, we have found that once teachers are trained they remain active in the project, even though they are required to teach other subjects.

3.5 Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

Through the monitoring programme, spatial and temporal data are being collected on an important invertebrate group (ants), assisting the scientific community to better understand how species are distributed in the matrix and how these distributions are changing over time and with different land management strategies. The new partnership with SANSA (South African National Survey of Arachnida) will greatly contribute to a better understanding of South Africa's biodiversity.

The Iimbovane project is being widely heralded in the Western Cape as the way to ensure sustainability in public education at the schools level regarding the importance of biodiversity. This can be seen in the continued requests for project expansion and training.

Appreciation by local communities of the importance of biodiversity and ecosystem services and their long-term maintenance is a central outcome of the Iimbovane project. Poor, often rural, communities frequently have many other challenges to contend with on a day-to-day basis, rather than having to worry about biodiversity and ecosystem services. By teaching learners about their local environment and making this learning relevant to them, the Iimbovane project is already stimulating an appreciation of the importance to society of biodiversity and environmental conditions. Additionally, interactions between learners and scientists and learning about the scientific method is stimulating learners to consider environmental science as a realistic career option. In consequence, local, regional and inter-regional activities aimed at improving sustainability of ecosystem services are likely to be far easier to implement because the rationale underlying them is better understood, as the general awareness of environmental issues is being raised.

4. Monitoring, evaluation and lessons

WCED does not give the Iimbovane project a formal evaluation. However, the impact that the project has had within the WCED is evident in the continuous requests from WCED to the Iimbovane project to expand the project to include every school within the WCP, as well as the request for specific training of curriculum advisers. In a letter of thanks received by the Iimbovane team from the WCED at the end of 2007, the WCED states that "*Your energy, enthusiasm and knowledge of your subject are invaluable to our teachers and learners*." The Iimbovane team are looking for ways to expand the project to include all schools within the Western Cape, although there are still currently a number of constraints that would have to be overcome.

A letter received from The Western Cape Nature Conservation Board stated: "*CapeNature is unequivocally supportive of your project which monitors ant biodiversity across the Western Cape landscape"*. This is another indication of the impact the project is having on the region's understanding of biodiversity.

In 2007 it was anticipated that the teachers would again complete information sheets about the impact Iimbovane had on their school during the year. However, due to the industrial action, teachers faced severe time constraints. It was decided that the form would not be completed, as this would add to the already busy schedules they faced. It must be remembered that, for teachers, the project aims to reduce their workload, not increase it.

It became evident after the first main sampling season that a significant rate-limiting step to the development of the project was in the preparation and identification of the ant samples. This challenge remains and will require careful management as expansion is considered.

Learners preparing and presenting their own talks based on the project is a good indicator of achievement and buy-in from schools.

During the August visit to schools it was discovered that the laptop computer provided to one of the schools by the project had been stolen. As the conditions set out in the Memorandum of Understanding were not met by the school in terms of securing the laptop, Stellenbosch University's insurance would not cover the cost of the stolen laptop. Additional steps have been taken at all schools to ensure laptops are better secured in the future.

5. Actions taken in response to previous reviews (if applicable)

The review of the 2006/2007 annual report did not make any recommendations.

6. Other comments on progress not covered elsewhere

The project implementation has not changed since the previous reporting period. The exit strategy is being led through the development of a business plan which sets out a strategy to implement the Iimbovane project in additional schools within the Western Cape Province, without compromising the current project format and the schools involved. This strategy recommends an opportunity to expand the project with strategic input from the Iimbovane team, and a scaled system of implementation within schools, depending on the school's financial constraints to implement the project. The business plan will be used to guide the future of the project when Darwin funding ceases as well as provide a structure with which to approach potential funders.

The biggest difficulty faced by the project during this reporting period was the industrial action by teacher unions during June and July 2007. This was beyond the control of the Iimbovane project, and fortunately had no lasting impact on the project.

South Africa, as in many parts of the world, has a shortage of skills in invertebrate taxonomy. This lack of taxonomic skills, although being addressed by the project, could in the short term lead to a bottleneck in the identification of samples collected by the project. Should the project expand too rapidly into the future there is a chance that a sampling backlog would develop that would be difficult to clear. Therefore it is essential that expansion take place in an organised and logical way.

7. Sustainability

The sustained interest in the project and its high profile during its third year has been due to the continued efforts of the Iimbovane team (sections 3.1 and 8). WCED continues to recommend the Iimbovane team as a source of high quality training, and has recommended that the National Department of Education (DoE) use the Iimbovane team to train Life Science Curriculum Advisers from across the country in biodiversity and ecology. The Iimbovane team has subsequently been approached by DoE to tender on the training, however, the outcome of the process will only be finalised in April 2008.

Evidence for increasing interest and capacity in biodiversity can be seen in the increased numbers of teachers, curriculum advisers and learners trained in project implementation as well as other biodiversity topics. We are particularly pleased that enthusiastic learners have themselves presented posters and given oral presentations based on their findings, which is a clear demonstration that learners are interested in and enjoying the Iimbovane project and are incorporating it into their school work and extracurricular activities. Two learner groups visited the Iimbovane laboratory on Stellenbosch Campus, which again highlights the interest in biodiversity that the Iimbovane project is stimulating. In addition, Iimbovane pitfall samples are now being passed on to SANSA for analysis of arachnids (section 2). This partnership will provide a huge boost to the biodiversity knowledge of the Western Cape and will produce excellent opportunities for further research and collaboration.

Discussions on the future of the Iimbovane project and the exit strategy once Darwin funding ceases are making good progress. WCED is keen to see the project implemented in all its secondary schools, and we are confident that the project will continue, albeit in a modified form. A business plan, which sets out the process to be followed to implement the project in more schools in the Western Cape has been written and will be used to solicit funds from various corporate organisations. Work on the Iimbovane manual is progressing and it is anticipated that it will be completed by September 2008. Continuous training of teachers in both project implementation and additional topics related to biodiversity provides

WCED with potential lead teachers that are able to assist new teachers to implement the project, ensuring a sustained capacity building impact. The worksheets and lesson plans developed by the project, especially those that were developed in January 2008, will enhance the implementation process, as there is now a standard learner assessment activity for the project.

Data are now available and being used to write a variety of manuscripts (section 3.2) and will be presented at various conferences in South Africa and abroad in 2008. The C·I·B will host a workshop on long term monitoring in August 2008 to facilitate exchange of information and ideas between monitoring projects in South Africa. This will ensure continuity of work within the projects as well as excellent cross pollination of ideas and potential outputs.

As the major local partner, the C·I·B is in the process of seeking new, extended support for the Iimbovane project. The C·I·B has provided the project with a dedicated laboratory and office suite.

Western Cape Nature Conservation Board (CapeNature) has already renewed the permit for ant sampling until 2012. This extended permit period is an indication of the value CapeNature places on the work Iimbovane is doing and its support for the continuation of the project.

8. Dissemination

The major form of dissemination for this reporting period was via presentations made at conferences, workshops and youth symposia (section 3.1), to audiences including scientists, educationalists, government representatives (including British Council), students and learners. Ms. Mahood was interviewed for a television programme entitled “Beyond the classroom” and broadcast by the South African Broadcasting Corporation. The insert was aired on 2 December 2007 and repeated on 3 December 2007. A full list of media interactions is given in Annex 6.

During the March 2008 field season the Iimbovane team was requested by park management to give a talk to 20 residents of Karoo National Park, including a number of secondary school learners, to inform them of the project and about the importance of ants in the ecosystem. Additionally, the Iimbovane team will give a talk to visitors to Wilderness National Park during the October 2008 field season. These talks contribute directly to assisting the country in meeting the Convention on Biological Diversity Article 13: Public Awareness.

We expect that similar dissemination activities will be continued when the project begins its new phase after Darwin funding ceases.

9. Project Expenditure

Table 3 Project expenditure <u>during the reporting period</u> (Defra Financial Year 01 April to 31 March)

Item	Budget *	Expenditure	Balance
Rent, rates, heating, overheads etc			
Office costs (eg postage, telephone, stationery)			
Travel and subsistence			
Printing			
Conferences, seminars, etc			
Capital items/equipment			
Others			
Salaries (specify)			
TOTAL			

*Based on figures agreed with Darwin 30th March 2008. Small variations in expenditure are the result of some printing costs having been charged to the ‘Office costs’ budget, and a small overspend on the ‘Travel’ budget being covered by somewhat lower than expected costs on ‘Other’ items.

10. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for ECTF and the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

In November 2007 Ms. Mahood received the Stellenbosch University Rector's Award for Excellence in Community Interaction for her work in the Iimbovane project. This was the inaugural year of this award, and highlights the focus Stellenbosch University is now placing on community interaction. After a rigorous process of documenting activities carried out for the project and an interview process, Ms. Mahood was one of only ten staff members to receive the award. This award highlights Ms. Mahood's enthusiasm for and commitment to the project.

Learners using the Iimbovane project to take part in activities that were not initiated by the Iimbovane team was a highlight in this reporting period. These activities included the Eskom Expo and the Youth Environmental Symposium, as well as a presentation to a delegation from the British Council, and will include attendance at the Science Festival to be hosted in Grahamstown in 2008. This is a clear demonstration that learners are interested in and enjoying the Iimbovane project and are incorporating it into school work and extracurricular activities.

Two learner groups visited the Iimbovane laboratory on Stellenbosch Campus during this reporting period, which enabled them to gain a better understanding of the science behind the Iimbovane project as well as providing an opportunity to discuss careers in science. This again highlights the interest that the Iimbovane project is stimulating.

The partnership developed with SANSA (South African National Survey of Arachnida) during this reporting period will provide a huge boost to the biodiversity knowledge of the Western Cape and will produce excellent opportunities for further research and collaboration. The partnership contributes directly to addressing Articles 7, 12, 17 and 18 of the Convention for Biological Diversity.

Annex 1 Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
Goal: *To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve* *The conservation of biological diversity,* *The sustainable use of its components, and* *The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources*		*(report on any contribution towards positive impact on biodiversity or positive changes in the conditions of human communities associated with biodiversity eg steps towards sustainable use or equitable sharing of costs or benefits)*	*(do not fill not applicable)*
Purpose Ant diversity monitored in Western Cape (WC) & strengthened monitoring capacity and education at secondary school level in region	New knowledge on dynamics of ant diversity in WC Biodiversity monitoring scheme functioning by yr 3 Improved understanding of biodiversity amongst learners	During this reporting period a total of 6 teachers and 8 Curriculum Advisers received training. The Iimbovane team interacted with over 1000 learners. Sampling took place twice. In total to date, over 3000 learners and 32 teachers and nine Curriculum Advisers have received training on biodiversity monitoring; simultaneously an ant monitoring programme has been implemented in 13 schools in the WC and sampling has taken place five times. Educational resources, including ant reference collections, have been established and augmented. These outcomes contribute directly to ensuring that the purpose of the project is achieved.	Data from the first five sampling efforts will be analysed during the next period; reference collections and other resources will be updated, and the database handed over in August/September 2008. Sampling will be continued in the next phase of the project. In August 2008, a workshop on long-term monitoring will be held at the C·I·B, and the Iimbovane team will co-host a special session on implementing outreach and research projects at the ESA conference in Milwaukee. At least two papers will be submitted for publication during the next period.
Output 1. Biodiversity monitoring programme established & functioning in 10 schools	Participation by schools and take up of keys	The biodiversity monitoring programme is active in 13 schools in the WC. Participation within schools has been outstanding and enthusiastic. All schools have received the image-based keys and other resources which have been used within the classroom.	
Activity 1.1 Sampling and identification programme		Sampling was undertaken in October and March. Identification, although initially slow, is going smoothly, as the ant reference collection is now available and the team are more familiar with the species associated with the programme. The coming period will see ongoing sorting and identification work. The full reference	

		collection will be updated as new information becomes available.
Output 2. Trained teachers	Minimum of 10 staff trained by yr 3 in ant biodiversity assessment	In total, 32 teachers have been trained, of which 27 are from previously disadvantaged communities. It is planned that more teachers will be trained in the next phase of the project. The indicator for teacher training is appropriate.
Activity 2.1. Workshops		The two-day teacher training workshop was replaced by a four day teacher and learner workshop, and was hosted ahead of schedule. The partner's workshop was also hosted ahead of schedule and both workshops were successful. WCED Curriculum Advisers attended an implementation training workshop, which was unscheduled. The handover workshop is scheduled for September 2008.
Output 3. Baseline patterns of ant diversity established	2 papers published in international scientific journals by end of yr 3	Data analysis is ongoing. Four papers are now in preparation. The indicators remain appropriate.
Activity 3.1. Sampling and identification programme		See above for Activity 1.1.
Activity 3.2. Data analyses		Data analysis has begun and is ongoing. Two papers which examine the data in depth are in progress and will be submitted before September 2008.
Output 4. Lessons learned & best practice disseminated	Minimum of 1 radio broadcast, 2 popular articles published	Information dissemination about the project has been ongoing, including presentations and various publications. Ms Mahood was interviewed about the project for a National television show about schools.
Activity 4.1. Publicity material		During the year a pamphlet about the project was produced and used to promote the project at various public events such as conferences and Expos. For the full list of publicity in the 2007/2008 year, please see Annex 6. Engagement with interested journalists is continuing.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources			
Purpose Ant diversity monitored in Western Cape (WC) & strengthened monitoring capacity and education at secondary school level in region	New knowledge on dynamics of ant diversity in WC Biodiversity monitoring scheme functioning by yr 3 Improved understanding of biodiversity amongst learners	South African partner institutional reports Peer-reviewed publications by project partners	Schools agreement and participation Continued enthusiasm of teachers & learners
Outputs Biodiversity monitoring programme established & functioning in 10 schools Trained teachers Baseline patterns of ant diversity established	Participation by schools and take up of keys Minimum of 10 staff trained by yr 3 in ant biodiversity assessment 2 papers published in international scientific journals by end of yr 3	Reports from schools to WC Education Department Reports from schools to WC Education Department Copies of publications sent to Darwin Initiative	Ongoing availability of taxonomic expertise Trained staff remain in participating schools N/A N/A

Lessons learned & best practice disseminated	Minimum of 1 radio broadcast, 2 popular articles published	Copies of all publications & recordings sent to Darwin Initiative	
Activities		Activity Milestones (Summary of Project Implementation Timetable)	
Workshops		Yr 1: Planning workshop with project team to establish project, conduct detailed planning & coordination; Yr 1: Teacher information workshop; Yr 2: Teacher training workshop on sampling and implementation; Yr 2: Schools implementation visits; Yr 2: Progress & planning workshop with project team & stakeholders; Yr 3: Progress & planning workshop with project team & stakeholders; Yr 3: Second teacher information workshop; Yr 3: Teacher training workshop on interactions; Yr 3: Schools implementation and follow on visits	
Sampling and identification programme		Yr 1: Major transects established by project staff, sampled & data extracted; Yr 1: Schools identified and participation agreed; Yr 1-3: School sampling established, samples sorted & data extracted; Yr 2-3: Continued sampling of transects & data extraction; Yr 2-3: electronic, image-based keys developed and tested; Yr 3: Monitoring programme and inter-school contacts established	
Data analyses		Yr 1: Database system established and populated with test data; Yr 2-3: Database populated; data from sampling analysed; Yr 3: Analyses written up	
Publicity material		Yr 1: 2 press releases, 1 radio broadcast; Yr 2: 2 popular articles, 2 press releases; Yr 3: 2 press releases and television coverage solicited, 2 papers submitted to international scientific journals	

Annex 3: Provisional list of ant species found[1].

Annex 4: Pamphlet designed and produced to publicise the limbovane project

Iimbovane has received excellent media coverage in its first year, appearing on "Groen" (a KykNet environmental programme), in regional newspapers, as well as regularly appearing in community newspapers from areas where *Iimbovane* is implemented.

Should you wish to know more about this exciting project please contact Kirsten Mahood. The *Iimbovane* project is empowering, training and providing important life skills to a new generation of budding scientists, and is simultaneously helping to develop capacity amongst South African teachers.

For more information, please contact Kirsten Mahood:

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www.sun.ac.za/iimbovane

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EXPLORING

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DARWIN INITIATIVE

C·I·B
DST-NRF Centre of Excellence for Invasion Biology

ELLERMAN RESOURCE CENTRE

defra

Iimbovane

Iimbovane:

Exploring South African Biodiversity and Change Outreach Project

Iimbovane: Exploring South African Biodiversity and Change is a science education outreach project for Grade 10 life science learners. *Iimbovane,* which means ants in isiXhosa, assists learners to investigate the distribution of ants as indicators of biodiversity in both pristine and modified landscapes. Using simple techniques learners explore how science works, encouraging them to view science as a potential career option. Learners work together with ecologists in the field and classroom to collect and analyse data, experiencing science in a research environment, while remaining curriculum focused.

Iimbovane focuses on capacity building through an active training programme, preparing teachers for the implementation of *Iimbovane* in their school, while assisting them to implement the new National Curriculum Statement in an outcomes-based fashion. Learning is enhanced through the use of a laptop computer and high quality microscope which is provided to each school.

Iimbovane links two social development areas of interest today, that of natural resource conservation and education within the formal sector. By drawing learners into science and technology, *Iimbovane* is building South African capacity and encouraging the scientists of the future.

Iimbovane, which is managed by the Centre for Invasion Biology at Stellenbosch University, works with 13 schools in the Western Cape, with a focus on rural schools. This impact extends to Grade 11 learners, where peer educators assist the subsequent Grade 10 learners to implement the project, creating a sustained capacity building effect in both teaching and learning within the life sciences at secondary school level.

In its first year the *Iimbovane* project trained 17 teachers (14 HDIs, of which 10 were women), and reached over 1000 learners. The programme is now seeking opportunities for expansion.

After one year of successful implementation of the *Iimbovane* project, what do those benefiting from the project have to say?

Western Cape Education Department stated that *Iimbovane* will: *"enhance the quality of teaching and learning in schools and enrich the lives of our learners in the Western Cape"*

Teacher comments included the statements:

"Iimbovane helped the learners to understand species diversity"

"This project changed the abstract theory into a well understood reality for our learners"

"The Iimbovane project allowed learners to relate to the scientific method"

"These resources also made my job as teacher easier"

"The Iimbovane project team was always there when we needed them"

"You [the Iimbovane team] are role models, living proof of what can be accomplished. Many learners were inspired to further their studies."

"This equipment [computer and microscope] has surely enhanced the teaching of life science in our school."

Annex 5: Selected photos from the 2007/2008 reporting period

Curriculum Advisors were put through their paces at their training workshop

Learners show what they are made of during the October 2007 fieldwork season

The January 2008 workshop saw learners exploring new environments

Annex 6: Media outputs for the Iimbovane project: 2007/2008

Newsletters and Newspapers

Darwin Initiative Newsletter, Issue 10, December 2007, p3. Iimbovane Outreach Project: Exploring South African Biodiversity and Change. ECTF and Darwin Initiative, UK http://www.defra.gov.uk/environment/darwin

Ian Edwards, Kirsti Thornber, Stephanie Walker, Rob Wild, March 2007. Communication, Education and Public Awareness. Thematic Review. ECTF and Darwin Initiative, UK. [*Iimbovane project is Case Study 4*] http://darwin.defra.gov.uk/reports/thematic_review.CEPA.pdf

Anonymous. 2007. Personeellede oor breë spektrum vir voortreflikheid beloon. Stellenbosch University Kampusnuus, Stellenbosch, South Africa

Anonymous. 2007. Eyewitness: Franco Eagleton. Hip2B² Magazine. New Media Publishing (Pty) Ltd., Cape Town, South Africa

Braschler, B. and Mahood, K. 2006. Learners explore ant diversity in the Western Cape 2006 South African National Parks, Pretoria, South Africa, South African National Parks

Mahood K., N. Kruger, B. Braschler, S.L. Chown, K.J. Gaston. 2007. Iimbovane pamphlet. C·I·B, Stellenbosch, South Africa

Conference presentations:

Braschler, B., Kruger, N., Mahood, K., Gaston, K.J. and Chown, S.L. Ant diversity patterns in the Cape Floristic Region. *21st Annual Meeting of the Society for Conservation Biology, Port Elizabeth, South Africa, July 2007.*

Mahood, K., Braschler, B., Kruger, N., Gaston, K.J. and Chown, S.L. Iimbovane: Exploring South African Biodiversity and Change outreach project. *IV World Environmental Education Congress, Durban, South Africa, July 2007.*

Mahood, K., Kruger, N., Braschler, B.M., Gaston, K.J. and Chown, S.L. Iimbovane: It's about the learners. *Fynbos Forum Meeting, Langebaan, August 2007*.

Mahood, K. and Kruger, N. Biodiversity in Action. *South African Association of Science and Technology Educators Mini-Conference, Tokai, September 2007*.

Van Zyl, E. Die Iimbovane Uitreik Projek. *South African Association of Science and Technology Educators Mini-Conference, George, January 2008*

Talks:

Kruger, N. and Mahood, K. Iimbovane: Exploring South African Biodiversity and Change outreach project: Benefiting all involved. *Ward Council meeting for Kraaifontein Municipality, September 2007*.

Television

Mahood, K. Interviews for Beyond the Classroom, SABC 2. Aired 2 December 2007 and repeated on 3 December 2007.