

# DARWIN INITIATIVE FOR THE SURVIVAL OF SPECIES: APPLICATION FOR GRANT FOR ROUND 10 COMPETITION

Please read the accompanying Guidance Note before completing this form. Give a full answer to each section; applications will be considered on the basis of information submitted on this form. Applicants are asked not to use the form supplied to cross-refer to information in separate documents except where this is invited on the form. The space provided indicates the level of detail required but you may provide additional information on a separate sheet if necessary. Copies of this form are available on disk or by e-mail on request. You are asked also to complete the summary sheet. Although you may reproduce this sheet in a reasonable font, you should not expand it beyond an A4 sheet (leaving the allocated space for DEFRA comments to be made) as additional information will not be taken into account.

## 1. Name and address of organisation

**Anglia Polytechnic University, School of Applied Sciences, Dept. Life Sciences, East Road, Cambridge CB1 1PT**

## 2. Principals in project

Details	Project leader	Other UK personnel (if working more than 50% of their time on project)	Main project partner or co-ordinator in host country
<b>Surname</b>	Norton	Hawkins	Mofulu
<b>Forename(s)</b>	Guy William	Dawn May	Frederick
<b>Post held</b>	Senior Lecturer	Senior Lecturer	Park Ecologist - Warden
<b>Institution (if different to above)</b>	Same	Same	Tanzania National Parks
<b>Department</b>	Life Sciences	Life Sciences	Park Ecology Dept., Mikumi National Park
<b>Telephone</b>			
<b>Fax</b>			
<b>Email</b>			

Please provide a one page CV for each of these named individuals.

## 3. Project title (not exceeding 10 words)

**Elephants of Mikumi National Park, Tanzania: Conservation, Education & Research**

## 4. Abstract of study (in no more than 750 characters)

This is a program for research, training and conservation on the African Elephant in Mikumi National Park, Tanzania. It will establish the population size and structure, habitat use and ranging patterns of elephant within the most protected and diverse habitats of the largest and one of the most significant populations of open country elephant left in Africa. It will create an integrated park-wide system for identifying and surveying elephants and train park ecologists, senior wardens and rangers in the appropriate methods. Wardens will supervise rangers who will collect the quantitative data on elephant and elephant habitat use along foot transects during their normal patrols throughout the park. Road transects will be monitored by the Park Ecology department and the ABRU research project. The data collected will be analysed as part of the duties of the park ecology program. Surveys along boundaries and of local human populations will assess the extent of human-elephant conflicts. Data generated will be used to investigate a number of vital issues relating to poaching, crop raiding, migration, population heterogeneity and resource limitations. In conjunction with vegetation monitoring these data will also allow elephant impact on habitat to be assessed.

**5. Timing. Give the proposed starting date duration of the project.**

July 2002 Three Years

**6. Describe briefly the aims, activities and achievements of your organisation. (Please note that this should describe your unit, institute or department within a university.)**

**Aims**

Life Sciences is within the School of Applied Sciences. Its aims reflect are to sustain and continue to develop an academic department of international standing and quality. It has the mission to serve the particular educational economic and cultural needs of the Anglian region thereby assisting the regions development and identity within the European and wider international communities. The Animal Behaviour Research Unit is maintained in Mikumi National Park, Tanzania with the support of Life Sciences. Its aims are continuous behavioural & ecological research within the park and collaborative programs with Tanzanian colleagues which further the conservation and management needs of the park.

**Activities**

Life Sciences runs postgraduate and undergraduate course schemes to meet the needs of students and employers. Staff are engaged in research and other scholastic activities. Environmental research & consultancies are ongoing within UK, Africa, USA, Asia and the European Community. The Animal Behaviour Research Unit (ABRU), runs a research, training and conservation programme in Mikumi National Park Tanzania. ABRU projects include: Long-term research on the behaviour and ecology of yellow baboons. This is one of the longest running continuous studies on any wild-living vertebrate species and one of the 5 longest running studies of wild primates. In addition ABRU runs a habitat and vegetation monitoring program in collaboration with park management and Tanzania's universities. For the past 8 years population studies of elephant have been ongoing and these have been continuous since 1998. ABRU founded and manages the Friends of Mikumi National Park and edits and publishes its newsletter, 'Mkata' The unit works closely with Mikumi park management, especially the Park Ecologist and parks ecology program. There are a number of collaborative projects ongoing with local institutions. These include the monitoring of road kills along highways, the collections of tissue and dung samples for the veterinary department of Sokoine University of Agriculture and the running of field trips and lectures for local universities and schools.

**Achievements**

Life Sciences has demonstrated an increasing excellence in University education and academic research. Life Science provides education and supports research at all levels. Most staff are involved in academic research and the department supports the Environmental Research Centre. There are strong links to world ranked research organizations such as British Antarctic Survey and the University of Cambridge. Life Sciences has developed a number of unique courses including Animal Behaviour (the first degree course for this subject in Britain), Ecology & Conservation and Natural History. Life Sciences is a member of the Tropical Biology Association and a founder member of the Cambridge Conservation Forum. The Animal Behaviour Research Unit (ABRU) has a twenty-seven year history of accomplishment in wildlife biology research, training and conservation. Its principle focus has been the behavioural ecology of yellow baboons but has expanded to other species as well as habitat assessment, ecological monitoring, and conservation training. Outputs include over 60 reviewed publications, 15 PhD projects, and masters & undergraduate projects of Tanzanian & international students. Recently ABRU helped organise and hosted a 5 day work shop for the Tanzania Parks Ecology program and arranged a UK study tour for the Mikumi Park Ecologist, who will be collaborating on the current project. A refurbishment of the parks museum and visitors center has just been completed in cooperation with park staff.

**7. Has your organisation received funding under the Initiative before? If so, please give details.**

No

**8. Which overseas institutions, if any, will be involved in the project? Please explain the responsibilities of these institutions.**

The principle collaborative institution will be Tanzania National Parks (TANAPA). In particular, the Park Ecology program will be directly involved in the establishment and running of the project. The anti-poaching department will be directly involved by providing the staff time of senior rangers for training in methods for elephant identification, identity cataloguing and the establishing foot transects. Quantitative data collection by field rangers on elephant and elephant habitat use will be supervised by the park ecologist and his staff. The parks community conservation department will implement surveys in conjunction with the ecology department and ABRU to survey park boundaries and villages outside the park who are possibly effected by elephant raids and movements. The park ecology program in collaboration with ABRU will also establish a centralised regime for maintaining the elephant identity catalogue and for data analysis and reporting. This will be a continuous assessment of the parks elephant population.

The Tanzania Wildlife Research Institute (TAWIRI) is charged with directing and monitoring all research conducted within Tanzania National Parks. It works closely with TANAPA. Its collaboration in this project will be largely supervisory. It will be the principle agency (along with TANAPA head office) overseeing and monitoring progress, outputs and results through reports and papers submitted.

## PROJECT DETAILS

### 9. Define the purpose (main objective) of the project in line with the logical framework.

This project will expand on ongoing UK- based research it's protocols and long-term data base to establish a research and monitoring program on elephants within the entire area of Mikumi National Parks. This in turn will establish a capacity within TANAPA to monitor large mammals and their habitats using trained park rangers. It will further establish a capacity within the park ecology program to analyse the information obtained and to construct species or habitat management plans based on that analysis. This is a pump-priming pilot project within a single park that can be expanded to regular monitoring using ranger patrols within the nationwide system of 12 parks. It builds on two existing systems within TANAPA: the regular use of ranger patrols through all major areas of national parks and the revitalised park ecology programs currently established in all parks. It has the following specific goals: Establish foot transects within the areas of anti-poaching patrols; Train patrolling rangers in the identification and monitoring of elephant and elephant use of vegetation along those transects; Refine an ABRU based protocol for the maintenance of an elephant identity catalog. This will use digital cameras, laptop computers and a centralised database maintained at park headquarters and ABRU. The identity catalogue will be a major asset and output of the project allowing the continued monitoring of this species over the long-term.

### 10. Is this a new project or the continuation of an existing one?

This is a new project, the need for which was identified by a more limited research effort in a smaller area of Mikumi National Park. and by the expansion of the TANAPA park ecology program (see #11. Below)

### 11. What is the evidence for a demand or need for the work? How is the project related to conservation priorities in the host country(ies)? How would the project assist the host country with its obligations under the Biodiversity Convention?

#### How was the work identified?

The intense and acute poaching of elephant throughout Africa during the late 1970's and most of the 1980's lead to a dramatic decline in elephant numbers and extinguished or put under intense threat a number of elephant populations. The largest remaining population of open country elephants is that of the Mikumi-Selous but this has only been surveyed intermittently from the air. Recent ground studies in 1/3 of Mikumi suggest that the population is much larger and more mobile than earlier surveys suggest. Patterns once taken as evidence of poaching appear to be more consistent features of the population. This highlights both the need for more frequent and extensive surveys and the regular assessment of important conserved populations by

#### How is the project related to conservation priorities in the host country?

The Tanzanian government and wildlife agencies have been at the forefront of efforts to reduce poaching and conserve elephants in eastern and southern Africa. Tanzania contains a number of important elephant populations including that of the Mikumi-Selous complex. This world heritage site comprises the largest protected area in Africa (> 55,000 km<sup>2</sup>) and contains a high diversity of species and habitats. The elephant population is an integral part of these diverse communities but its ecological influence is as poorly understood as the population itself. Tanzania's conservation priorities include the maintenance, protection and informed management of the rich biodiverse natural heritage protected within its Parks, Forest Reserves and Games Reserves. Tanzania's efforts to conserve and manage its biodiversity are often linked to important keystone and flagship species such as the elephant. And the Mikumi-Selous complex has often been view as primarily a reserve for the elephant population and its range of habitats. One of the important priorities for wildlife management and conservation in Tanzania is an informed management policy based on quantitative data and a local management capacity to both obtain that data and derive policies.

#### How will the project assist the host country meet its obligations under the Biodiversity Convention?

The well known biodiversity of Tanzania requires for its protection and sustainable maintenance a great deal of investment by the government and agencies of the country involved in protected area management. The current project will assist this process in a number of ways. It will create a low cost capacity to monitor large mammals and their habitats within existing host country institutions. This will have a number of continuing benefits to Tanzania's responsibilities under the convention. For example, elephant populations are one important aspect of this biodiversity and are mostly conserved within reserves. The sustainable use of this species is permitted especially in the Selous Game Reserve where elephant hunting generates an important income for local populations and conservation efforts. The hunted population is continuous with the protected population in Mikumi but there is no information on the patterns of movement between these areas or how hunting effects the larger population. This project will provide this information allowing more informed management. Much of Tanzania's biodiversity has yet to be studied and described. One important area which need further study is the southern 2/3 of Mikumi which despite it's obvious importance is virtually unknown. This project will establish permanent research and monitoring transects within that area and train the rangers who regularly patrol it to systematically record the information needed to document, understand, protect and maintain the biodiversity it contains.

**12. In what ways can this project be considered a Darwin project? How does the project relate to the Darwin principles? How would the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?**

This project targets most if not all of the five principle areas outlined by the Advisory Committee. It will build **institutional capacity** to monitor and study both habitats and large populations using existing Tanzanian park systems, in particular the park ecology program and the regular ranger patrols throughout the park. It is planned that this capacity will be transferred to other parks and reserves. It will provide **training** for rangers to establish this capacity as well as advanced training for the senior staff of the park ecology department. It draws on the previous and continuing research base and expertise of the **UK based research and conservation expertise** at ABRU. Because it uses the abilities and existing regimes of park rangers and park ecologists, the project is very cost effective giving **good value for money**. This also means that once established the project is easy to maintain with a simple exit strategy. As important, the methods and capacities are transferable to other protected areas, species and habitats within Tanzania. The data obtained from this work will be published by ABRU and TANAPA participants and the Darwin Initiative would be acknowledged in these papers. Vehicles and other capital equipment would prominently display the Darwin Logo. The computer database of elephant identities created will provide a model protocol for field. Because of the importance of this elephant population, the successful achievements of the project will be widely published as will the Darwin Initiative support. A greater understanding of the elephant population in Mikumi will have tremendous collateral benefits in providing an increased knowledge and understanding of the large and biodiverse habitats within the park that have yet to be described in a quantitative scientific way. The information on movement between the fully-protected national park and the game reserve where a **sustainable offtake** is permitted will provide the first independent and quantitative analysis of the effects of the hunting offtake on the elephant population and its movements over a wider area.

**13. Set out the proposed timetable for the work, including the programme's measurable outputs using the attached list of output measures.**

PROJECT OUTPUTS		
Year/Month (starting April)	Output Number (see standard output measures)	Description (include numbers of people involved, numbers of publications printed or produced and days/weeks where applicable)
2002/April to 2002/July.	20, 23	Purchase, shipment and setup of capital equipment and preparation of offices and buildings. (1-2 UK participants in field)
2002/July	12A, 14A, 6A, 8	Planning meetings for transect protocol refinement, setting up of identity database on computers, herbarium methods. Analysis planning, Senior TANAPA staff and park ecologists from other parks to attend to ensure an efficient dissemination network (2-3 UK participants in field)
2002/late July to 2002/October	4AB, 6AB, 8, 12A, 13B, 22	Field transects and vegetation plots established in southern 2/3 of park. Keeping and updating of elephant identity database established, Training of senior rangers from each ranger post in database, identification and transect monitoring. Expansion and systematic sampling of road transects and current vegetation plots. Training of undergraduates from Dar and Morogoro Universities during field trips.
2002/October to 2005/September	4AB, 6AB, 8, 9, 11B, 12A, 15A	Data collection, periodic training and reliability testing workshops. Joint analysis of population and habitat use data, Completed analysis and publication of historic park records on elephant mortality and damage. Preliminary management report to TANAPA. Popular report to 'Tanzanian Wildlife' magazine.
2003/October to 2004/July	2	Fredrick Mofulu to UK to complete MSc based on data collected.
2005/July-Sept.	4AB, 6AB, 8, 9, 11A, 12A, 12B, 14A, 15A, 17AB	Final workshop. Training of rangers from other parks by trained rangers. Preparation of final management plan to TANAPA and publications.

<b>Key Milestones</b>	
Year/Month (starting April)	Description (include travel dates, drafts and other processes that support the delivery of outputs)
2002/April to 2002/October	Protocols finised, initial training of rangers, foot and road transects established, vegetation plots expanded to southern 2/3 of park. Centralised database and systems of analysis established. Workshop with senior staff from TANAPA head office and other parks. Collation and preliminary analysis of historic park records on elephant poaching and mortality. Preliminary surveys of local human populations and crop monitoring scheme set up. University field courses
July-October 2003	Completion of analysis and publication of historic park records. Annul review workshop attended by staff from TANAPA head office and other parks. Review analysis and accessment of first years data collection. Preliminary report on the management requirements for the Mikumi-Selous elephant populaiton and habitats. Meetings with local populations to review their assessment of project to date. University field courses
July 2004	Completion of Mscat Anglia Polytechnic University by Fredrick Mofulu, park ecologist
July-October 2004	Annual review workshop attended by staff from TANAPA head office and other parks. Review analysis and accessment of data collection. Revision of the management plan for the Mikumi-Selous elephant populaiton and habitats based on MSc. work of park ecologist. Meetings with local villiage populations. University field courses
April-July 2005	Final review workshop with refresher training for staff from all parks. Preparation of management plan and publications of results. Implementation of exit plan with ABRU & Park Ecology to continue elephant work in Mikumi

**14. Do you know of any other individual/organisation carrying out similar work? Give the details of the work, explaining the similarities and differences.**

<p>There are a number of research projects on elephant and elephant habitats in Africa. The range and diversity of the species makes these studies necessary. Most similar to the current project is the work at Amboseli in Kenya which trains host country nationals in methods of identifying and studying elephants. This project differs in that training is integrated into a continuous research and monitoring project that utilises host country staff already involved in conservation and management responsibilities within Mikumi National Park. There are periodic aerial surveys of the Mikumi-Selous area but these are limited in time and scope. One important reason for this project are the limitations and possible inaccuracies of this counts in the hilly heavily wooded Mikumi habitats. Conservation research on the Selous (not Mikumi portions) of the elephant population is conducted by GTZ especially to establish the relationship of this population with that across national boundaries in the south.</p>
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**15. Will the project include training and development? Please indicate how many trainees will be involved, from which countries and what will be the criteria for selection. How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length of any training course.**

Training Activity	Dates	Who will participate, how many will participate and for how long?
Training of Rangers in elephant identification, use of field data recording equipment, transect protocols, vegetation monitoring,  Supervised training by trained rangers above of there junior staff at ranger posts.	July-Oct 2002	Senior field rangers rank of lance corporal and above. Two rangers from each ranger post team for a total of 15 rangers.
Training of park ecology team in data analysis and reports by UK research team	September-October 2002	30 junior field rangers trained (selected from current staff by Park ecologist and rangers)
Senior Park Ecologist to use data obtained to complete MSc. at Anglia Polytechnic University	September 2003 to July 2004	1
Training of senior rangers from & at other parks	Annually July-August during project and at end	Variable depending on staff levels in various parks.

## 16. How will trainee outcomes/destinations be monitored after the end of the training?

Ranger posts will be visited monthly by ABRU researchers and park ecology staff. The transect and identity catalogue data collected will be collated and placed on the centralised at park headquarters. The senior rangers in charge of post data collection will be interviewed and the monitoring work reviewed. Regular meetings at park headquarters between all trained rangers and senior staff will monitor reliability and consistency of methods. This will also allow regular updating by all involved of the identity catalog and maintain a consistency of identifications across survey areas. UK staff will prepare regular progress reports for TANAPA and TAWIRI. Progress, consistency and reliability will be annually assessed during annual progress meetings. Both the park ecology department and law enforcement department of the parks are responsible for ranger supervision and this will facilitate monitoring of ranger training and performance.

## 17. How is the work of the project expected to continue after the end of grant period? A clear exit strategy must be included.

Once established in Mikumi, the project will require little continued financial input for its maintenance as it relies strongly on modifying routines and job responsibilities of existing park staff. The end of project workshop will further train park ecologists and senior rangers from other parks who will apply the methods learned to the particular habitats and species identified as important by specific park management plans and/or the park ecologist and management teams. The success of this project will establish capacity for cost-effective monitoring by existing park staff and departments. This will be at least partially sustainable by the current TANAPA budgets as additional staff are not required and the funding for the rejuvenated park ecology program which will direct it is currently available from several sources. TANAPA can apply directly to funding bodies for the relatively small amount of funding needed for the equipment necessary to establish ranger based programs in other parks. (primarily digital cameras, laptops, data recorders and simple transect equipment). Given the high expected return from the relatively small investment needed (an expected average of £30,000 per park). Such funding should be forthcoming, especially if the program is implemented on a park by park basis over a number of years. Equipment and expertise extant at Mikumi can also be transferred to other parks during the set-up phases in those parks. An extensive expertise in these methods will eventually be self-perpetuating as trained personal are transferred from park to park in the normal progress of their careers.

## MONITORING AND EVALUATION

### 18. Describe how progress on the project would be monitored and evaluated in terms of achieving its aims and objectives, both during the lifetime of the project and at its conclusion. How would you ensure that it achieves value for money? What arrangements will be made for disseminating results? If applicable, how would you seek the views of clients/customers?

Progress will be monitored and results disseminated in the following ways:

Quarterly reports prepared by ABRU and the Park Ecology Department for TANAPA and TAWIRI

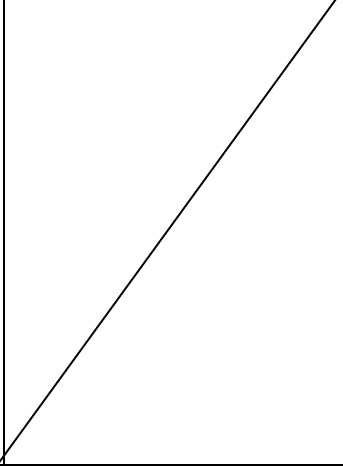
Annual Reports as above

Annual workshops during which the database is updated, and progress evaluated. These will include refresher training courses for ranger and ecology staff as well as collaborative analysis of data obtained and preparation of draft management plans for the Mikumi elephant and habitats. These to be finalised during the final years workshop.

The analysis of park records and the completion of an MSc. by Fredrick Mofulu the Senior Park ecologist in Mikumi

The project will have four major results the achievement of which will document its success. Firstly data will provide a reliable quantitative assessment of the elephant population in Mikumi. This will establish population size and structure of the elephants using Mikumi National Park. Patterns of movement between habitats and into and out of the park will have been established and the degree of movement between the Selous Game Reserve and Mikumi Park will be documented. Patterns of human-elephant conflict will have been identified. These analyses will be available and disseminated in the reports and workshops listed above and through peer review publications prepared jointly by the UK researchers at ABRU and the park ecology staff. Second a management plan for elephants and their habitats in (and possibly surrounding) Mikumi will have been prepared. Third, a long-term continuing monitoring program for Mikumi elephants and its habitats will have been established and be ongoing. Fourth, the capacity to measure and monitor large mammals and their habitats will have been established in one of East Africa's largest national parks and will be exported to other parks within Tanzania

**Logical framework. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note.**

Project summary	Measurable indicators	Means of verification	Important assumptions
<p><b>Goal</b></p> <p><i>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention</i></p>			
<p><b>Purpose</b></p> <p>To create a permanent capacity to ensure the survival of African elephants and their habitats in Tanzania. To train Tanzania park ecologists and rangers in the continuous monitoring and assessment of the wild animal species and habitats under their protection. Quantitative understanding of the Mikumi elephant population</p>			
<p><b>Outputs</b></p> <p>A permanent program within the Mikumi-Tanzania Park systems monitoring the elephant and other large mammal populations using the regular anti-poaching posts and patrols of rangers. A permanent program of trained analysis and assessment of this information by the Parks Ecology department. A core of rangers trained in</p>	<p>A permanent elephant identity database in use by park ecology program, rangers and researchers.</p> <p>Regular critical assessments of elephant status in Mikumi-Selous.</p> <p>Habitat evaluations in relation to elephant use.</p>	<p>Reports and annual assessments to TANAPA head office.</p> <p>Publications arising from the monitoring programs.</p> <p>Upgraded inventory of biodiversity in southern 2/3 of park including maintenance and use of park reference herbarium.</p>	<p>Ranger time and willingness to participate. Sufficient motivation on part of rangers reinforced by proper management of the park ecology and research teams.</p>
<p><b>Activities</b></p> <p>Training of senior patrol rangers in transect and vegetation monitoring techniques. Collection of long-term quantitative data on elephant population size, structure and habitat. Collaborative analysis of quantitative data with park ecology team. Verification, dissemination and refresher workshops</p>	<p>Vehicles for access to posts and for road transects. Computer and digital camera equipment and software for permanent identity catalog.</p> <p>Ranger training sessions</p> <p>Workshops and refresher training courses.</p> <p>Vehicle and infrastructure maintenance.</p>	<p>Workshop outputs. Ranger evaluations and performance. Analysis of village surveys. Park records and reports.</p> <p>Reports and annual assessments to TANAPA head office.</p> <p>Publications arising from the monitoring programs</p>	<p>Access to southern 2/3 of park. Maintenance of park roads, Limited interruption to climatic problems (i.e. El Nino effects during wet seasons). Rigour and reliability of digital and computer equipment for database management.</p>