

Dr George McGavin (Oxford University Museum) and Daniel Mafunde (Mkomazi Reserve Manager) sampling invertebrate populations as part of the Darwin Initiative Biodiversity project.



distribution, abundance, diversity and phenology. In particular he and his colleagues are examining the effects of fire on vegetation structure and hope to study this in more detail on the hectare study plots that they have recently established. During the October-December season, Dr Coe was joined in the field by Dr Leonard Mwasumbi of the Department of Botany, University of Dar es Salaam. The team was also visited by Dr William Mziray (National Herbarium, TPRI, Arusha) and taxonomists from Missouri Botanic Garden. Raphael Abdullah (TPRI) has been collecting under Dr Coe's direction during the 1993 and 1994 seasons and will continue to collect plants during 1995.

The Oxford Mkomazi '93 Expedition and Dr Peter Lack reported 260 bird species in Mkomazi during the dry season of summer 1993. During 1994 Neil and Liz Baker, renowned Tanzanian ornithologists, and their colleagues have visited the Reserve several times to record the visiting passage migrants during the short rains. So far the count is well over 300 birds, including five species never seen before in Tanzania. Many European Swallows, Bee eaters and Rollers have been spotted including thousands of Eastern Red-footed Falcons. Conservative estimates suggest a possible final bird count of 400 to 450 species, making Mkomazi one of the richest savanna locations for birds in Africa and possibly the world.

Over Christmas 1994 Dr Graham Stone from Department of Zoology, Oxford University was in Mkomazi during the short rains to study pollination. He was accompanied by Bruno Nyundo, an MSc student from the University of Dar es Salaam. Graham reports that "The insects and birds which visit these flowers not only pollinate and so ensure the

reproduction of these plants, but also form links in food webs for many other species". He will be back in Mkomazi to make comparisons in both the dry season and the long rains.

Running parallel with the Mkomazi Ecological Research Programme is a study by Dr Katherine Homewood and her student Daniel Brockington from the Department of Anthropology at University College, London. Her research will focus on local resource use by, and for, Maasai, Pare and other members of the local human population by gathering information on livestock and land holdings, diet and nutrition, demographic status and live stock performance.

Looking Ahead

Despite the successes of previous months, the Programme still needs funds to complete the full research required to put together effective management plans. In addition, a section of the budget is targeted at training of young Tanzanian scientists and developing close links with educational bodies such as the University of Dar es Salaam, the National Herbarium and Tropical Pesticides Research Institute, all of whom welcome the research possibilities opened up by the Mkomazi Research Programme.

Funds are also needed to improve the facilities of Ibaya Camp. Whilst essential improvements have been made to the living conditions; regard for safety, security and hygiene for both the scientists and their invaluable field support team of cooks and rangers remain a high priority. Many necessary modifications are still needed to achieve an acceptable standard of field living conditions.

Over the next two and a half years further research will be carried out in Mkomazi covering important fields of soils, climate, vegetation, small mammals,

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The Programme would also like to thank the following for their help and support:

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birds, frogs, snakes and other vital links in the ecological jigsaw. At the end of the Programme conferences to present the results will be held in both Dar es Salaam and, funds permitting, London at the Royal Geographical Society.

The scientific research data collected by all the participants of the Mkomazi Research Programme will be passed to the Tanzanian Department of Wildlife to support management plans for the Parks and Reserves of Tanzania; juggling as they must, the important and difficult problem of ever increasing land use demands. In particular it will help judge the best way to secure the safe future of Mkomazi for both the animals, insects and plants contained therein, and the peoples who live around the periphery of the Reserve.

Dr Malcolm Coe
Programme Leader & Scientific Director
Mkomazi Research Programme



HABARI ZA MKOMAZI

Newsletter of the Mkomazi Research Programme

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Nº2

A collaborative programme between Department of Wildlife, Tanzania; Royal Geographical Society, London and Department of Zoology, University of Oxford

The Tanzanian Government first approached the Royal Geographical Society in 1989 to consider a joint programme of research with its Department of Wildlife to help rehabilitate the Mkomazi Game Reserve. The proposal follows an earlier survey of the *Acacia-Commiphora* savanna region of Kora National Reserve, Kenya, led by Dr Malcolm Coe.

The Society's Council asked Dr Coe, an experienced tropical ecologist from the University of Oxford, to head this new initiative due to his lifetime commitment to the study of the African savanna and the success of the Kora survey in 1983.

With generous support from Abercrombie and Kent and funding from Friends of Conservation and the Baring Foundation, the RGS was able to undertake a preliminary survey of the Reserve in the summer of 1993. Dr Malcolm Coe was joined in the field by Julie Cox, who undertook computer mapping of habitats; Dr Mark Ritchie, an entomologist from Natural Resources Institute; Raphael Abdullah, a plant taxonomist and Ramadhani Makusi, an entomologist, both from the Tropical Pesticides Research Institute (TPRI) in Arusha.

In addition, Dr Peter Lack from the British Trust for Ornithology and an undergraduate group led by Paul Strecker



The Mkomazi Game Reserve - a diverse *Acacia-Commiphora* savannah region in north-east Tanzania contiguous with the Tsavo National Park (Kenya)

from Oxford University completed a preliminary dry season bird survey. The results of this visit were encouraging, confirming Dr Coe's view that the variety of habitats within the Reserve supported an outstanding floral and faunal diversity.

On the 2nd August 1993 at the Programme's research base at Ibaya, Mr M. A. Ndolanga, Director of Wildlife and Dr Malcolm Coe, signed a *Memorandum of Understanding* for a three year programme of collaboration between Oxford University, the Royal Geographical Society and the Department of Wildlife.

Programme Launch Summer 1994

With support from the Programme's Corporate Patrons - British Airways, British Council, BP Tanzania, CMC Land Rover (T) Ltd, Darwin Initiative, Friends of Conservation, Land Rover and Sheraton Hotel (Dar es Salaam) - the *Mkomazi Research Programme 1994-97* was formally launched on 26th June 1994 at the Royal Geographical Society in the presence of HRH Duke of Kent.

At the launch, Mr Russell Turnham of Land Rover handed over the keys to two Defender Land Rovers, donated to the Programme. This was followed by the announcement of the winner of the Land Rover / Geographical competition. Ms Jeannette Kayes, a geography teacher from Chelmsford, stepped up to the rostrum to collect her British Airways ticket for a three week stay in Mkomazi.

Early in July, Malcolm Coe, Nigel Winsor (RGS Deputy Director) and field assistant Angus Jackson, flew to Dar es Salaam to join the Department of Wildlife in taking delivery of the Land Rovers and set up the Programme headquarters at Ibaya.



Mr Abdul Haji, CMC Landrover, outside the British Council in Dar es Salaam, handing over the keys of the Land Rovers donated to the Programme. From left to right; Mr Paul Marenga, Programme Manager, Mr Abdul Haji, Mr B.N.N. Mbano, Dept of Wildlife, Mr Robert Sykes, Director British Council, Dr Malcolm Coe, Programme Director, David Smith, CMC Land Rover

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Malcolm Coe

Mkomazi Game Reserve

The Mkomazi Game Reserve in north east Tanzania is an area of particular biological interest as it contains a high level of local physical and biotic diversity. The Reserve lies on the Kenya border adjacent to the Tsavo (West) National Park, between Kilimanjaro and the coast, covering an area of 3600km² (3°50'-4°25'S and 37°35'-38°45'E).

Altitude varies between 630m and 1594m with the land sloping in a northern and easterly direction. The surface is broken by a series of hills, which largely represent outliers of the Pare and Usambara massifs. These have a profound effect on the local climate in terms of the amount of rainfall (or lack of it), and strong seasonal winds. The annual rainfall of 300-900mm is split fairly evenly between the 'long rains' (March to mid-May) and the 'short rains' (late October to December).

The Reserve provides a wet season refuge for many of the larger herbivorous mammals from Tsavo (West) National Park. However, the higher land near the Reserve boundaries to the south and west has, unlike many other semi arid savannah conservation areas, a large human population. The Pare and Sambaa peoples are agriculturalists who have traditionally farmed the slopes of the surrounding mountains.

The major habitat types are largely determined by altitude, rainfall and soil type. Over 70% of the total land area is occupied by a range of habitats broadly classified as *Acacia-Commiphora* scrub or bush. Travelling from west to east within the Reserve it is clear that the percentage of *Acacia* canopy cover

decreases from figures as high as 80% to little more than 20%. This is attributed to soil type, decreasing altitude and rainfall, but may also be a result of the pressure from increasing human population and their livestock living around the periphery and encroaching into the Reserve.

A further cause of change is the recurrence of fire, either generated by pastoralists, agriculturalists or naturally. From our present studies it is clear that the effect of fire has been severe. In many areas, where the natural habitat appears open grassland, the presence of scattered mature *Commiphora* trees indicate an original habitat of fairly dense *Acacia-Commiphora* woodland, as still exists to the east of the Ndea Hills.

The result of burning is progressive reduction in tree cover, eventually resulting in loss of the upper soil seed bank and establishment of open grassland.

The Department of Wildlife camp at Ibaya, at the south-east end of the Reserve, to be the research base for the RGS during the course of the Programme.

Ibaya Camp

After discussions with the Department of Wildlife, it was decided to locate the Programme headquarters at Ibaya; an existing, if somewhat run down camp in the south west corner of the Reserve, comprising a series of huts providing accommodation for up to 25 people. The presence of bat colonies and problems with the water supply were overridden by the desire of the scientists to be close to the subjects of their research. Eventually the bats were encouraged to roost elsewhere, and we are most grateful to the George Adamson Wildlife Preservation Trust for funding a new motor for the water bore hole. This now provides running water for the kitchen, bathroom and toilets. It will also mean the scientists will no longer have to share their bush facilities with, on one occasion, a herd 70 buffalo!

A further, and important facility to be built at the Ibaya camp, made possible by the generous donation of funds from Friends of Conservation, is a dedicated Conservation Centre, for use by visitors and scientists alike. This will provide a laboratory and a meeting room, ensuring the camp and the Reserve remain a focus for research and an invaluable source of local environmental information.

There are plans to establish nature trails and provide visual displays to demonstrate to visitors the richness of the reserve surrounding them.

Sharing the future of Mkomazi

A highlight of summer 1994 was the well attended workshop, held on the 28th July 1994, in the British Council's conference hall in Dar es Salaam. Entitled *Research Priorities in Mkomazi Game Reserve*, the workshop was opened by the Hon. Juma Hamad Omari, Minister for Tourism, Natural Resources and Environment and chaired jointly by Mr Ndolanga and Dr Coe. The Minister emphasised his Ministry's hope that the research would help identify long term sustainable plans for conserving Mkomazi as a protected area for the benefit of the local community, as a tourist asset to the nation and as an example of community conservation for the world. During his speech he commented "this three year study is more than just producing a detailed inventory of animals and plants. It is also about bridging a geographical gap between the conservators of nature on one hand and the needs of the guardians of the regions on the other. To do this we need a new generation of Tanzanians committed to finding these solutions and I believe there is a plan to involve a good mix of young and old field scientists."

Representatives from many other environmental groups were present, together with Members of Parliament and District Commissioners from the Mkomazi-Pare-Usambara area, underlying the keen shared interest in the future of Mkomazi.

Report of the 1994 Scientific Programme

The aim of the scientific programme is to provide baseline ecological data to help underpin longer term development priorities.

One of the first scientists to arrive at Ibaya with Dr Coe was Dr George McGavin from the Hope Entomological Collections, Oxford University Museum. This was George's first visit to Mkomazi. His funding comes from the Darwin Biodiversity Initiative and he is collaborating with Dr Mark Ritchie, Dr Tony Russell Smith of the Natural Resources Institute (NRI) and Jonathan Davis of the Natural History Museum (NHM). George McGavin's objective was to begin sampling the insect species associated with tree canopies. Whilst the material he collected has still to be fully sorted and identified, his findings reveal an amazingly rich and diverse insect fauna, even at the height of the dry season.

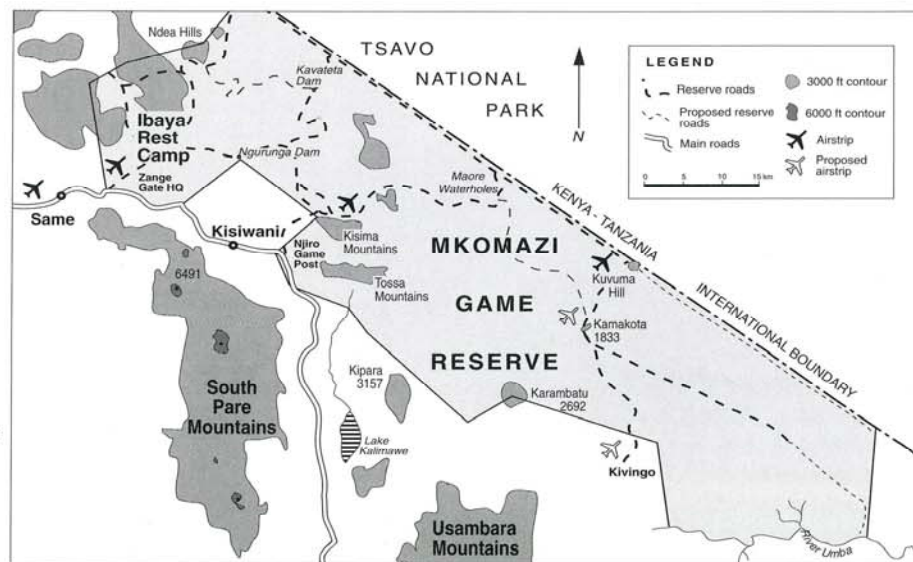
At the same time Dr Keith Eltringham from Department of Zoology, University of Cambridge was in the Reserve laying the foundations for elephant and large mammal counts. Dr Eltringham will be flown on the counts courtesy of Tony Fitzjohn from the George Adamson Wildlife Trust. With funding from the Green Card Trust, Dr Eltringham will spend the next couple of years visiting the Reserve. He hopes to be joined by Dr Larry Harris from the University of Florida. Harris' early game counts in 1964 and 1967 will provide a baseline against which to judge the status of current animal populations, following the severe poaching of the 1970's and 80's.

The removal of pastoralists from the Reserve and a recent marked reduction in poaching has led to a noticeable increase in large mammal numbers. To a large degree, the mammals showing the greatest increase are the grazing herbivores which have been favoured by the fire-generated grasslands.

Mapping of the Reserve's habitats is being carried out by Kent Cassels from Durrell Institute of Conservation Ecology (University of Kent). He visited the Reserve in October and November 1994, building on the mapping work started by Julie Cox in 1993 and Angus Jackson in 1994. Accompanied by Angus, he surveyed the Reserve and is now back at DICE constructing a base map for the Geographic Information System (GIS).

The wet season months of November and December 1994 provided a proliferation of insects to be collected by the rest of the Darwin Initiative funded team of Dr Mark Ritchie, Dr Tony Russell Smith (NRI) and Jonathan Davis (NHM), studying grasshoppers, spiders and beetles. A short period in the field produced an abundance of insects, promising to keep the scientists busy in their labs for months identifying their collections. They will return later in the Programme to make comparable collections during different seasons. An important part of their research involves working closely with the Tropical Pesticides Research Institute (TPRI) in Arusha and training young Tanzanian scientists.

Since the beginning of the Programme Dr Malcolm Coe has been studying the vegetation with regard to plant species



Tanzania & UK Field Team Appointed

We were pleased to welcome two important additions to the Programme in the autumn of 1994. Paul Marenga from the Department of Wildlife has been appointed as the Project Manager. He holds an MSc. in Natural Resource Management, and has an extensive background in park management and conservation. Paul comes to the Programme from PAWM (Planning and Assessment for Wildlife Management). Tim Morgan has been appointed Field Director to the Programme. He has spent many years in Kenya, ending his time there with five years working for the East African Wildlife Society as a pilot in the Tsavo National Park, adjacent to Mkomazi.

Daniel Mafunde (Mkomazi Reserve Ranger), Dr Malcolm Coe and Raphael Abdullah (TPRI) standing below a strangler fig, Mkomazi Game Reserve

