

research, part of the Dendrogene Project (www.cpatu.embrapa.br/dendro/index.htm), aims to study the genetic diversity and population genetic structure of a natural population of *Manilkara huberi*, known as maçaranduba, using microsatellite markers to identify possible logging impacts as input for the design of conservation strategies. This species is intensively harvested due to its suitability for the construction industry. Three hundred adult trees and nine hundred seedlings were sampled in a two hundred hectare plot at the Tapajós National Forest, Pará, Brazil. All individuals were genotyped using an automatic sequencer ABI 377 with seven highly polymorphic microsatellite loci. The following estimates were obtained for adults and seedlings: observed heterozygosity (H_o) 0,71 and 0,63; genetic diversity (H_e) 0,86 and 0,82; fixation index (F) 0,17 and 0,23. All the estimates are significant (CI 95%). The adult population shows significant spatial genetic structure. This results show that this species is endogamic and will be very useful as a tool, together with more genetic studies that are being conducted, to help design strategies for forest management to meet production and conservation goals.

45. AFRICAN WILDLIFE COLLEGE AND CAPACITY BUILDING TO ADDRESS THE BUSHMEAT CRISIS THE EXPERIENCE OF GAROUA WILDLIFE COLLEGE (CAMEROON). BABALE, MICHEL; Bailey, Natalie D. Ecole de Faune de Garoua, BP 271 Garoua, Cameroun, Tel: 237 956 56 09, Fax: 237 227 31 35 (mbabale@yahoo.fr) (MB); Bushmeat Crisis Task Force, 1700 Connecticut Avenue, NW Suite 403, United States of America, Tel: 202 588 1924, Fax: 202 588 1069 (NDB).

At the start of the 21st century, the threats facing African wildlife have become increasingly alarming. In the Congo Basin in particular, the unsustainable illegal, commercial bushmeat trade consumption has reached record levels, depleting the forest ecosystem of its wildlife. To counter the bushmeat crisis, Central African institutions have engaged in a variety of initiatives to raise awareness, develop capacity, enforce laws, develop appropriate policies and identify bushmeat alternatives. Garoua Wildlife College in particular has worked to build the capacity of African wildlife managers through the development of a bushmeat training course module with the support of WWF-U. S. R. E. Train Education for Nature program and the Bushmeat Crisis Task Force. Approximately 30 professionals from nine countries have been trained during the first two training sessions. An evaluation of the module was completed following the second training session (2004). In this session, we will present results and lessons learned from the first two years of bushmeat training courses in Francophone Africa.

46. MONITORING DHOLE (*Cuon alpinus*) POPULATION AND PREY IN THE NILGIRI BIOSPHERE RESERVE, SOUTHERN INDIA. BABU, V. N. Asian Nature Conservation Foundation, c/o Centre for Ecological Sciences, Indian Institute of Science, Bangalore, 560012, India, narendra@asiannature.org.

Dhole, *Cuon alpinus*, packs were monitored between 2000 and 2003 in the Mudumalai WLS and Nilgiri North Forest Division, an area covering approximately 300 km² in the Nilgiri Biosphere Reserve, southern India. Prey densities were also monitored during the same period across different habitats and the locations of the resting sites of the dhole's principle prey - chital (*Axis axis*) were mapped. Habitats types across the study area were characterized using classified satellite imageries. Location data of four dhole packs ranging across this study area showed a home range (minimum convex polygon) that varied between 15 to 66 km². The

dhole population showed high intra annual fluctuations due to high pup mortality in the study packs. Higher mortality (disappearance) was observed among pups of smaller packs. The densities of the dhole's prey namely chital, sambar (*Cervus unicolor*) and black naped hare (*Lepus nigricollis*) were found to be stable across the study period and hence served as a good prey base. It was found that core areas of dhole home ranges had a significantly higher number of chital herds than non-core areas. Areas surrounding chital resting sites and the habitats within the dhole home ranges contained a higher percentage of open habitats.

47. BIODIVERSITY CONSERVATION IN RESTORED CORAL LIMESTONE QUARRIES ON THE KENYAN COAST. BAER, SABINE; Kahumbu, Paula. Lafarge Eco Systems, P.O.Box 81995, Mombasa, Kenya (Sabine.Baer@bamburi.lafarge.com).

East African Coastal Forests are one of the 25 of the world's biodiversity hotspots, supporting one of the highest densities of plant endemism in the world. However, forest loss is considerable, and many of the endemic species are threatened with extinction. This paper presents a unique case of biodiversity conservation in disused coral limestone quarries of a cement plant on the Kenyan coast. A total of approx. 100 ha of disused quarries have been restored into indigenous coastal forest ecosystems over the last 30 years; the restoration area is increasing as mining continues. Initially *Casuarina equisetifolia* is planted as pioneer species to colonize the open quarry, and over the years create humus from leaf litter and a suitable microclimate for other plant species to grow. *Casuarina* plantations are thinned to create room for the introduction of indigenous coastal vegetation. Over the last 15 years more than 400 coastal plant species have been introduced into the mature *Casuarina* plantations. While the main aim is to create diversity, special emphasis is laid on timber trees and threatened species. 31 threatened plant species have been established successfully, 11 of them producing seeds. The restored forests are used as demonstration site for local communities.

48. BLACK RHINOCEROS BROWSING FACILITATES RESOURCE AVAILABILITY: IMPLICATIONS FOR DONOR POPULATION MANAGEMENT. BAGGALLAY, THADAIGH; Linklater, Wayne L.; Owen-Smith, Norman; Swaisgood, Ron R. Centre for African Ecology, University of Witwatersrand, School of Animal, Plant & Environmental Sciences, Jan Smuts Avenue, Private Bag 3, Witwatersrand, Johannesburg 2050, South Africa. tbaggallay@yahoo.com (TB, NOS). School of Biological Sciences, Victoria University of Wellington, P.O. Box 600, Wellington, New Zealand, and Terrestrial Ecology Research Unit, University of Port Elizabeth, South Africa (WLL). Conservation and Research for Endangered Species, Zoological Society of San Diego, P.O. Box 120551, San Diego, CA92115, USA (WLL, RRS).

Up to 27 black rhinoceros (*Diceros bicornis*) have been removed each year since 1980 from Hluhluwe-iMfolozi Park (HiP), South Africa, for introductions elsewhere and to encourage compensatory reproduction in this strategically important donor population. However, HiP's population has not responded positively to reduced densities; population size and fecundity appear static. Perhaps substantial removals actually reduce habitat quality by allowing trees to out-grow rhino reach because browsing controls tree height and encourages coppicing? We measured black rhinoceros browsing on eight preferred food species and compared them in areas of high and low removals. Black rhino select for browse

0.5-1 m high (58% of all black rhino browsing, $n=383$ trees). High removal areas had lower preferred tree densities in the selected height range (27 per 100m, $n=6$ transects) than did low removal areas (56 per 100m, $n=5$) and higher densities of trees > 1m (88 and 68 trees per 100m, $n=6$ and $n=5$, respectively), suggesting that trees had grown into taller, less selected and accessible, height classes since removals. Black rhino feeding maintains favored woody plants at the preferred browsing height. Removals of black rhinoceros from donor reserves may need to be carefully distributed across the landscape to maintain browsing pressure.

49. CHANGES IN POPULATION DENSITY OF TWO ENDEMIC PLANT SPECIES IN GUNNER'S QUOIN AN OFFSHORE ISLET OF MAURITIUS AFTER ALIEN RAT AND HARE ERADICATION. BAIDER, CLAUDIA; Florens, F. B. Vincent. Mauritius Herbarium, Mauritius Sugar Industry Research Institute, Reduit, Mauritius. cbaider@msiri.intnet.mu (CB). Department of Biosciences, Faculty of Science, University of Mauritius, Reduit, Mauritius (FBVF).

Gunner's Quoin is a volcanic islet of 76 ha situated 4 km offshore of Mauritius and home to the largest population of several threatened Mauritian endemic plants. Despite being overrun by invasive alien plants, this Nature Reserve retains great conservation value as a potential site for reintroduction of endemic reptiles presently confined to Round Island, another islet. We present the first vegetation survey of the islet eight years since the eradication of rats and hares in 1996, which predated on seeds and seedlings of the two main native species, *Latania loddigesii* (Arecaceae) and *Pandanus vandermeerschii* (Pandanaceae). The number of adult *Latania* remained unchanged over 22 years, but *Pandanus* lost 25% of its reproductive population since 1982, and presently more than 1/3 of the remaining plants are senescent. Regeneration of both species increased dramatically. However most of the plants are confined to the coastal fringe and regeneration occurs down slope under female trees due to native dispersers being extinct. Both species have already vanished from parts of the islet. In the meantime potent dispersers are reintroduced, artificially dispersing seeds is necessary to ensure the long-term maintenance of the species in one of their last localities in the wild.

50. EVALUATING IMPACTS OF PROBLEM ANIMAL CONTROL ON LOCAL COMMUNITY SUPPORT FOR PROTECTED AREA CONSERVATION AT BWINDI IMPENETRABLE NATIONAL PARK, UGANDA. BAKER, JULIA; Leader-Williams, Nigel. Durrell Institute of Conservation and Ecology, University of Kent, Canterbury, Kent, CT1 7NS, United Kingdom. jeb9@kent.ac.uk.

Improved relations with local communities are a primary motive for managers of protected areas to mitigate crop raiding by wild animals. Crop raiding patterns and impacts on local livelihoods have been established, although the assumption that problem animal control gains local support for protected areas has rarely been examined. The analysis was based on law enforcement data from 1996-2000 on patrol encounters with crop raiding by wild animals; mitigation incidents; and, farmers' complaints about crop raiding to rangers passing their fields on patrol, at Bwindi Impenetrable National Park, Uganda. We found that crop raiding patterns are highly localised around Bwindi. Baboons cause most crop loss although infrequent but severe raids by mountain gorillas and elephants occur in certain areas. Farmers experiencing raids by flagship species received most mitigation. Farmers experiencing baboon raids accounted for most complaints and exhibited a

greater mismatch between complaints and actual damage. Benefits from protected areas for rural communities are primary strategies of integrated conservation and development at Bwindi, and considered successful in conflict resolution. Yet despite community benefits, human-wildlife conflict continued for individuals not receiving mitigation. Thus, incorporating problem animal control and law enforcement with community-based programmes is recommended for the integrated policy of Bwindi.

51. IMPACTS OF CLEARFELL LOGGING ON LITTER BEETLES: ARE RESERVE CORRIDORS EFFECTIVE? BAKER, SUE C.; Richardson, Alastair M.M.; Barmuta, Leon A. School of Zoology, University of Tasmania, Private Bag 05, Hobart, Tasmania 7001, Australia. bakers@utas.edu.au.

Clearfell logging is changing the age structure and spatial dynamics of wet eucalypt forest in Tasmania, Australia. Litter-dwelling Coleoptera are sensitive to both coupe- and landscape-scale effects of logging, but if the logging is done according to natural disturbance principles, clearfell harvesting need not threaten their populations. Litter beetle assemblages did not differ between sites that had been either logged (clearfell, burn, and sow) or burned by wildfire 33 years previously. Landscape-scale impacts appear to be a greater conservation threat than the harvesting regime used. Litter beetle assemblages differed with the successional age of the forest, thus fragmentation of the landscape into small coupes greatly reduces the connectivity between remaining areas of mature forest. Streamside reserves (40 — 60 m wide) and occasional 100 m-wide wildlife habitat strips (usually riparian) preserve some older forest and provide connectivity pathways. However, the zone in which litter beetles are edge affected (up to 25 — 50 m) can extend as far into the riparian strip as the stream bank. An increase in the logging rotation period and/or more and wider reserves are probably required if these forests are to continue to provide timber as well as maintaining natural habitat values and conserving their dependent species.

52. WILDFIRE IN THE AMAZON'S TRANSITIONAL FOREST: IMMEDIATE IMPACTS AND POSITIVE FEEDBACKS. BALCH, JENNIFER K.; Nepstad, Daniel; Curran, Lisa M.; de Carvalho Jr., Oswaldo; Azevedo-Ramos, Claudia; Brando, Paulo. Yale University, School of Forestry and Environmental Studies, 370 Prospect St., New Haven, CT, 06511, USA, (jennifer.balch@yale.edu) (JKB, LMC). Woods Hole Research Center, P.O. Box 296, Woods Hole, MA, 02543, USA (DCN). Instituto de Pesquisa Ambiental da Amazônia, Av. Nazaré 669, 66035-170, Belém, Brazil (DCN, OC, CA, PMB).

The Amazon's transitional forest extends along the southern edge of the basin, concurrent with an explosive frontier pushed by big agriculture and cattle ranching. With increasing ignition sources and a conducive climate, escaped fires frequently sweep through this transitional forest. We describe the fire behavior and the immediate damage and tree mortality from one square kilometer of burned forest in Mato Grosso, Brazil - one of the largest experimental fires in the tropics. In addition to direct damage these low intensity, creeping understory fires open up the forest to future fires through positive feedbacks. We look at these feedbacks by quantifying the consequent increase in fuel loads through mortality and leaf shedding, structural opening of the canopy, and resulting changes in understory microclimate. Predictions of more severe climatic shifts and the economic pressure to transform this forest make understanding how fire influences this ecosystem key to its preservation.