BERENTY RESEARCH PROJECTS 2007
WITH MANAGEMENT RECOMMENDATIONS

PUBLICATIONS

PRESENTATIONS
Symposium organized by Anne Mertl-Millhollen and Hajarimanitra Rambeloarvony at the Prosimians 2007 International Congress held at Ithala Game Reserve, KwaZulu-Natal, South Africa:
Berenty Reserve, Madagascar: Research, Realities, Management, and Ethics

1. Alison Jolly: Berenty Surviving
2. Anne Mertl-Millhollen: Ring-tailed Lemurs as Seed Dispersers
3. Josia Razafindramanana: Impacts of the Introduced Brown Lemur Hybrids (*Eulemur fulvus rufus* x *Eulemur collaris*) on the Tamarind Tree, *Tamarindus indica*, and on the Native Ring-tailed Lemurs, *Lemur catta*, at Berenty Reserve, Southeastern Madagascar.
4. Hanta Rasamimanana, Voahirana Razoliharisoa, and Laurent Tarnaud: Competitive Mutualism among Three Lemur Species *Propithecus verreauxi verreauxi*, *Eulemur fulvus* ssp. and *Lemur catta* in the Private Reserve of Berenty, Madagascar
5. Takayo Soma: Differences in Feeding Behavior between Two Ring-tailed Lemur Troops in Relation to Introduced Plant Species
6. Shinichiro Ichino: Alopecia Syndrome of Ring-tailed Lemurs (*Lemur catta*) at Berenty Reserve, Madagascar: A Preliminary Report on its Impact on Female Reproductive Parameters
7. Vonjy Nirina Andrianome: Why Do Some Ring-tailed Lemurs Feeding on *Leucaena* Not Suffer from Bald Lemur Syndrome?
8. Hajarimanitra Rambeloarivony: Real Problems for the Native *Lemur catta* in Berenty Reserve, Madagascar

ARTICLES
Mertl-Millhollen, A. S. 2007. Lateral bias to the leading limb in an olfactory social signal by male ring-tailed lemurs. Amer. J. Primatol. 69: 635-640.

DIPLOMES D'ÉTUDES AVANCÉS, EESSA, Université d'Antananarivo
1. Vonjy Nirina Andrianome: Les facteurs limitant l'Effet de la Consommation de *Leucaena leucocephala* par *Lemur catta* Femelles dans la Réserve Privée de Berenty
2. Josia Razafindramanana: État et Distribution de la Population de Lémurs Bruns (*Eulemur fulvus rufus x Eulemur collaris*) dans la Réserve de Berenty

TELEVISION
10 part series, *Lemur Island*, shown by UK Channel 5 in April-May
20 part series, *Lemur Street*, shown by international Animal Planet, November-December
Scientific advisors Takayo SOMA and Alison JOLLY

MANAGEMENT INITIATIVES

RAMBELOARIVONY, H., Forest Manager

1. Removal of invasive sisal from spiny forest reserve stands
2. Removal of *Leucaena leucocephala* from cafeteria and adjacent areas.
3. Removal of invasive *Cissus quadrangularis* from selected plots. Measurement of plants damaged by cissus, plants damaged during removal, and trees over 10 cm diameter in the plots. Study of control plots for bush and tree growth.
4. Suppression of artificial water provisioning in the forest. Brown lemurs seem highly dependent on the water troughs, so this measure may change the balance of population growth somewhat in favor of the ringtailed lemurs.
5. Tree nursery for forest trees

MANAGEMENT RECOMMENDATIONS

1. *Cissus* removal by Forest Manager is excellent and should be expanded to the gallery forest where the *Cissus* is not yet as extensive and there is hope for forest regeneration.
2. Feeding evidence indicates that the brown lemurs are having a negative impact on the food available for the ring-tailed lemurs, although there has been no effect on the ringtail population in natural forest, at least so far. Pending further ecological studies, initiate pilot studies of contraception of the brown lemurs.
3. Where *Leucaena* was removed, fur condition of ringtails dramatically improved. Where it remains,ringtails have little body fur and nearly bare tails. The seven "Japanese" ringtail troops where *Leucaena* was removed suffered high female mortality, in an area of extraordinarily high population density. Females with leucaena had a higher infant birth rate than adjacent non-leucaena areas, but also a much higher juvenile mortality. Barer mothers have lower infant survival than less affected animals. (Ichino presentation in South Africa). We recommend proceeding to to remove remaining leucaena. This will lead to deaths in the densely populated north Ankoba zone, but to a much healthier population.
4. Initiate cultivation and planting of native trees in zones where invasive plants have been removed.

FOREST DYNAMICS

BLUMENFELD-JONES, Kathryn. School of Human Evolution and Social Change, Arizona State University, Tempe, AZ 85281, USA
MERTL-MILLHOLLEN, Anne, Department of Anthropology, University of Oregon, Eugene, OR 97401, USA.

The fortuitous timing of this June/July research allowed examination of the effects of high rainfall and flooding in 2006-2007 on forest vegetation. All tree species grew at a higher than average rate between October 2006 and June 2007. Additionally, tamarind seeds germinated readily and many small seedlings survived until mid-July. Dr. RASAMIMANANA's students in November found that few or no seedlings survived.

Supported in part by the National Geographic Society Research and Exploration Committee.

BLUMENFELD-JONES, Kathryn. School of Human Evolution and Social Change, Arizona State University, Tempe, AZ 85281, USA

Map of current forest structure completed like those done in 1973 and 1995. Josia RAZAFINDRAMANANA learned techniques used in creating the forest structure maps and will carry on this research. The closed canopy tamarind forest is further diminished and the brush and scrub area of the reserve is increasing. Large trees including *Tamarindus indica*, *Neotina isoneura*, and *Acacia rovumae*, continue to die. The gaps formed by the deaths of these large trees are readily invaded by non-native plants such as sisal and cissus. Thick tangles of cissus in these gaps make it impossible for tree species to regenerate and increases the likelihood that these gaps will turn to scrub. Plants such as *Rinorea, Crateva, Celtis bifida, Acacia,* and *Albizzia* provide light, not heavy shade, and support tamarind seedling survival.

Supported in part by the National Geographic Society Research and Exploration Committee.

ACTION: Sisal and cissus removal by the forest manager should be continued. In addition, test plots of native plant species should be established in the gaps previously occupied by cissus to encourage forest regeneration. The growth of any *Rinorea, Crateva, Celtis bifida, Acacia,* and *Albizzia* found surviving naturally in these gaps should be supported.

HLADIK, A., HLADIK, C.M, GENIN, F., RASAMIMANANA, R.
Plant identification guide and herbarium specimens of the spiny forest parcels.

SOMA, Takayo. Center for African Area Studies, Kyoto University, Kyoto, Japan.

Tamarind fruit abundance: census repeated each birth season since 2000. Over 400 trees censused. Some trees consistently give more fruit than others, year after year.

LEMUR NUTRITION AND FOREST USE

GOULD, L. University of Victoria, British Columbia, Canada

Feeding and nutrition of *Lemur catta* in spiny forest.

MERTL-MILLHOLLEN, Anne, Department of Anthropology, University of Oregon, Eugene, OR 97401, USA.
BLUMENFELD-JONES, Kathryn. School of Human Evolution and Social Change, Arizona State University, Tempe, AZ 85281, USA
STUDENTS: WINNOR, Kristin and MILLHOLLEN, Emily.

June/July study of nutrition, ranging and territoriality in two groups of ringtailed lemurs in gallery forest: D1A, which has been studied since 1975, and Peg Ear, in an area of tamarind regeneration near the Cattle Drove. Peg Ear lemurs fed in the cattle drove when people and cattle were not nearby and also utilized trees in Anamalangy. They made full use of tamarind flowers, green fruit, and leaves, and samples of these will be analyzed for nutritional content. Despite this being the onset of the dry season, when lemurs are expected to minimize energy expenditure, D1A used a larger home range than in prior years. They also had no tamarind flowers or fruit in their range and fed more on alternative foods. We labeled all tamarind trees that were entered by the troops, noting which were feeding trees, and assessing each tree for fruit and flower abundance. The continued use of these trees and each tree's fruit abundance will be reassessed by Dr. RASAMANANA and students in November to determine the relation of territorial defense to available resources; however, invasion of tree gaps by *Cissus* is making it very difficult to observe troop D1A.

Supported in part by the National Geographic Society Research and Exploration Committee.

MERTL-MILLHOLLEN, Anne, Department of Anthropology, University of Oregon, Eugene, OR 97401, USA.
BLUMENFELD-JONES, Kathryn. School of Human Evolution and Social Change, Arizona State University, Tempe, AZ 85281, USA
ASSISTANT: RAZAFINDRAMANANA, Josia
STUDENTS: ZIMBLER, Kelly and FROEHLING, Sonja, Sussex University, Brighton, UK.

The effects of feeding competition between brown lemurs and ringtailed lemurs. In June, Josia RAZAFINDRAMANANA trained the students to collect feeding and ranging data on a troop of brown lemurs that coexist with ringtailed lemur troop D1A, Anne MERTL-MILLHOLLEN and Alison JOLLY trained them to observe troop D1A, and Kathryn BLUMENFELD-JONES taught them methods of assessing tamarind fruit abundance. They will continue to observe the two troops through August, repeatedly assessing the impact of their feeding, and labeling all trees utilized by either species.

(RASAMIMANANA, Hantanirina)
STUDENTS: FAHARISON Sahoby Marin
TSARAMANANA Donald

Sahoby and Donald planned to assess ripe fruit abundance in the utilized trees to determine the impact that feeding by the two species of lemur had on the availability of ripe fruit. However there is no tamarind fruit this year in forests with or without brown lemurs. They are therefore studying the feeding behavior of matched troops of ringtailed

and brown lemurs in the gallery forest in this exceptional year, including impact on Rinorea fruit and leaf cover.

Supported in part by the National Geographic Society Research and Exploration Committee and by a generous personal grant from Gary and Ulrika CALABA.

GENIN, Fabien, University of the Witwatersrand
Microcebus distribution, nutrition and behavior.

SIMMEN, Bruno,
HLADIK, Annette, Museum Nationale de l"Histoire Naturelle, Paris
HLADIK, Marcel, Museum Nationale de l"Histoire Naturelle, Paris
PASQUIER, P., Museum Nationale de l"Histoire Naturelle, Paris
RAZAMIMANANA, H., Ecole Normale Supérieure, Antananarivo
RATOVONIRINA, IRSM
Comparison of feeding quantities and expenditure of energy in *E. rufus x E. collaris, L. catta,* and *P. verreauxi* by means of double-labelled water.

KABURU, Stephano, University of Turin,
Feeding ecology of *Propithecus verreauxi*

LEMUR BEHAVIOR

ANTONACCI, Daniela (Student). Università di Pisa, Italia.
NORSCIA, Ivan (PhD). Museo di Storia Naturale e del Territorio, Università di Pisa, Italia.
PALAGI, Elisabetta (PhD, curator vertebrate section). Museo di Storia Naturale e del Territorio, Università di Pisa, Italia.
KABURU, Stefano (Student). Università di Firenze, Italia. Feeding ecology of *Propithecus verreauxi*
Social structure of Berenty *Propithecus verreauxi,* especially play and reconciliation.
Supported by Giardino Zoologico di Pistoia, Parco Zoo di Falconara e Parco Punta Verde Lignano Sabbiadoro (Italia).

FICHTEL, Claudia Fichtel, Dept. Behavioral Ecology & Sociobiology
German Primate Center
Recent studies of anti-predator behaviour in Verreaux's sifakas suggest differences in alarm call usage and comprehension of alarm calls between sifakas in Kirindy forest/CFPF and Berenty (Oda 1998, Fichtel & Kappeler 2002). In order to study these differences in more detail, I conducted playback experiments with the same experimental design with which sifakas in Kirindy forest/CFPF were studied. Since the production of vocalizations in nonhuman primates is innate I also collected faecal samples to study potential genetic influences in alarm call production between the two populations.

CENSUSES

ICHINO, S. Kyoto University
SOMA, T. Kyoto University
TANAKA, Chihiro, Japanese Aid to Parc Tsimbazaza

The population of the ringtailed lemurs in the Japanese study area has fallen dramatically with drought and the simultaneous clearing of leucaena.

RAZAFINDRAMANANA, Josia, ESSA, University of Antananarivo
JOLLY, Alison, University of Sussex
Assistants:
FAHARISON Sahoby Marin
RAKOTOMALALA Nirina Lalaina
RAZAFIMAHATRATRA Aingafaniry
TSARAMANANA Donald

Demography and forest locations of *Eulemur rufus x collaris* and *Lemur catta*, following the cessation of water provisioning in the forest.

This year was characterized by an almost total lack of tamarind fruit. This is usually the late dry season keystone resource, especially for newly lactating ringtail mothers. However, the population of the natural "Malaza" forest (scrub and gallery) has remained essentially stationary. Ringtail troops have increasingly moved their feeding from gallery to scrub during October, whether though lack of kilys, competition with browns, or both, returning to feed on green *Rinorea* fruit in November.

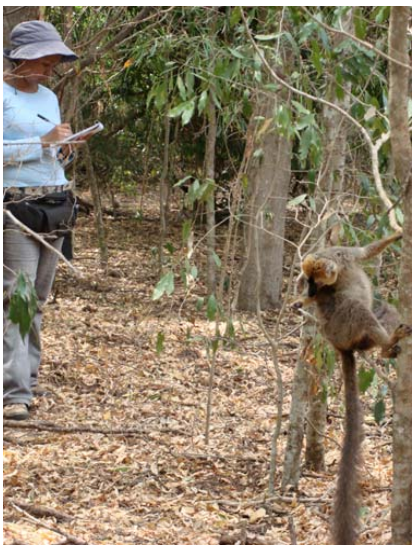
Population of the Front and the secondary forest of Ankoba has fallen, especially in the area with leucaena removed. The full census includes only animals with troops, not migrating or wandering males. If one looks only at females, who remain with their troops, the numbers are slightly up in the natural forest. Thus neither the brown lemurs nor the bad years have significantly affected ringtail population numbers in native forest, at least so far.

NORSCIA, Ivan (PhD). Museo di Storia Naturale e del Territorio, Università di Pisa, Italia.
PALAGI, Elisabetta (PhD, curator vertebrate section). Museo di Storia Naturale e del Territorio, Università di Pisa, Italia.
ANTONACCI, Daniela (Student). Università di Pisa, Italia.
Census of the population of *Propithecus verreauxi* in Ankoba and Malaza
Supported by Giardino Zoologico di Pistoia, Parco Zoo di Falconara e Parco Punta Verde Lignano Sabbiadoro (Italia).

RASAMIMANANA, H, with 20 students of all years from the Ecole Normale Supérieure, Antananarivo
Census of Malaza *Propithecus verreauxi.*

RAZAFINDRAMANANA, Josia, Oxford Brookes University, UK
RAKOTOMALALA Nirina Lalaina
RAZAFIMAHATRATRA Aingafaniry
Fetra
Fefy
Christine
Brown lemur census

1. Applying temporary hair dye for identification.



2. Josia and lemur inspect mark

VETERINARY STUDIES AND LEUCAENA EFFECTS
BERG, W.
RAMBELOARIVONY, H.
Coat condition of *Lemur catta*
year round in areas with and without *Leucaena,*
and with *Leucaena* removed.

OTHER

FOREST SURVEY OF ANALABE: F. GENIN, H.RAMBELOARIVONY
STUDENT SEMINAR, ALSO FOR GUIDES, Nov. 22, 2007
Visit to IFOTAKA, To see Sacred Gallery Forest and Tourist initiative
Visit to BEALOKA and ANJAMPOLO FORESTS
Magisterial presentation by M. **TSIAKETRAKY** on traditions of the Hazomanga