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MSc in Primate Conservation Newsletter

Letter from the Editors...

Welcome to the winter edition of *Canopy*, the in-house journal of the Primate Conservation MSc at Oxford Brookes University. We hope that this issue will serve to inspire current and future students and spark the interest of those in the wider primatological community. Though we are just starting out on our careers in primatology, we are lucky enough to benefit from the huge experience of our tutors and lecturers. It is a testament to our tutors how many graduates from the course go on to become professional primatologists and conservationists.

The future of primates, like the critically endangered black-faced lion tamarin of Brazil and the brown-headed spider monkey of Ecuador, hangs in the balance. It is only by combining our efforts and working together that we might just give these primates a chance of survival.

We hope you will join us.

Best wishes,

Heidi Douglas, Rosalyn Ridlington,
Leslie Bratton, Lorient Parker
and Nicky Gordon



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Introductory Letter from Professor Simon Bearder...

The MSc in Primate Conservation is now in its sixth year and we recruit some 30 students each year – people who are highly committed to making a difference. The enthusiasm and determination of these students has been pivotal in gaining the support of the University, which has just launched a major fundraising campaign (see page 24) to make it possible to recruit more students from primate habitat countries and to provide the resources and teachers that will help them achieve the best possible training and academic qualification. Rather than asking people to contribute money towards specific projects, we feel that an effective way to raise awareness about the consequences of the loss of primates and their habitats, and to slow their decline, is to invest in the conservationists of the future. *Canopy* is written and edited by these students as a vehicle for showing you what they are doing and where their interests lie. You will find further information about their activities on our website <http://ssl.brookes.ac.uk/primate/home.htm>

If you are in a position to collaborate with our students, or to take part in the activities of the MSc course, you are warmly invited to contact us (see below). For example, we run a weekly primate conservation seminar series on Mondays at 6-7pm in the Lloyd Boardroom of the Gypsy Lane campus, which is open to all. Perhaps you could be persuaded to give a talk, or to advise us on specific projects. Or simply to join us for the talk and afterwards at the Angel and Greyhound pub!

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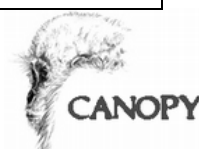
Prof. Simon Bearder
Chair, Course Planning Committee
November 2005



TOP 25 ENDANGERED PRIMATES 2004-2006

Canopy 4

Madagascar		
<i>Prolemur simus</i>	Greater bamboo lemur	Madagascar
<i>Eulemur albocollaris</i>	White-collared lemur	Madagascar
<i>Propithecus candidus</i>	Silky sifaka	Madagascar
<i>Propithecus perrieri</i>	Perrier's sifaka	Madagascar
Africa		
<i>Galagoides</i> sp. (undescribed)	Mt. Rungwe galago	SW Tanzania
<i>Procolobus pennantii pennantii</i>	Pennant's red colobus	Bioko Is., Equatorial Guinea
<i>Procolobus rufomitratus</i>	Tana River red colobus	Kenya
<i>Cercocebus atys lunulatus</i>	White-naped mangabey	Côte d'Ivoire, Ghana
<i>Cercocebus sanjei</i>	Sanje mangabey	Tanzania
<i>Gorilla beringei</i>	Eastern gorillas	Rwanda, Uganda, DRC
<i>Gorilla gorilla diehli</i>	Cross River gorilla	Cameroon, Nigeria
Asia		
<i>Loris tardigradus nycticeboides</i>	Horton Plains slender loris, Ceylon mountain slender loris	Sri Lanka
<i>Simias concolor</i>	Pig-tailed langur, Pagai pigtailed snub-nosed monkey, Siberut pig-tailed snubnosed monkey	Mentawai Is. Indonesia
<i>Presbytis hosei canicrus</i>	Miller's grizzled surili	Indonesia
<i>Trachypithecus delacouri</i>	Delacour's langur, whiterumped black leaf monkey	Vietnam
<i>Trachypithecus poliocephalus poliocephalus</i>	Golden-headed langur, Tonkin hooded black langur	Vietnam (Cat Ba Island)
<i>Semnopithecus vetulus nestor</i>	Western purple-faced langur	W. Sri Lanka
<i>Pygathrix nemaeus cinerea</i>	Grey-shanked douc	Vietnam
<i>Rhinopithecus avunculus</i>	Tonkin snub-nosed monkey	Vietnam
<i>Nomascus nasutus hainanus</i>	Hainan black-crested gibbon	China (Hainan Is.)
<i>Pongo abelii</i>	Sumatran orangutan	N. Sumatra, Indonesia
Neotropics		
<i>Leontopithecus caissara</i>	Black-faced lion tamarin	Brazil
<i>Cebus xanthosternos</i>	Buffy-headed tufted capuchin	Brazil
<i>Ateles hybridus brunneus</i>	Brown spider monkey	Colombia
<i>Brachyteles hypoxanthus</i>	Northern muriqui	Brazil



Primate Conservation Seminar Series

This last semester we have had some interesting and varied speakers at our seminar series. We would like to acknowledge and thank those who came to speak to us and shared their knowledge and experience with us.

Monday 27 September

Dr. Mika Peck, University of Sussex Department of Biology and Environmental Science

Parabiologists to the rescue? Developing a sustainable network for primate conservation in Ecuador

Tuesday 4 October

Dr. Jo Thompson, Lukuru Wildlife Research Foundation

Rescuing the bonobo: a community based project to protect bonobos in the democratic republic of Congo

Monday 10 October

Student talks

Monday 17 October

Dr. Volker Sommer, Department of Anthropology, University College London

Saving the Fourth Chimpanzee. Research and Conservation in West-Africa.

Monday 24 October

Dr. Michelle Desilets and Helen Buckland, Borneo Orang-utan Survival Foundation

Oil Palms and Orang-utans: campaigning to save the rainforests of Borneo and Sumatra

Monday 31 October

Long Thang Ha, Department of Biological Anthropology, University of Cambridge

Conserving the Leaf Monkeys of Vietnam

Monday 7 November

Dr. Christoph Soligo, The Natural History Museum, London

Size and ecology of the first primates

Monday 14 November

Dr. Elizabeth Pimley, Central Science Laboratory, Woodchester Park

Using home range analysis to examine social organisation in nocturnal primates, pottos and Allen's bushbabies, in Mt. Kupe, Cameroon

Monday 21 November

Professor Vernon Reynolds, University of Oxford

Conservation of chimpanzees in the Budongo Forest, western Uganda

Monday 28 November

Julian Matthews, Discovery Initiatives

Finding a balance between tourism and conservation



Identification, Abundance, and Behaviour of Galagos (Primates, Galagidae) in the Shire Highlands, Malawi

By Graham Wallace

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Although galagos are widely distributed across sub-Saharan Africa as a taxonomic group, many species of galago are only partially described both in terms and throughout their range. In particular, there is a lack of data for species occurring in the Shire Highlands of Malawi, and one form at Thyolo Mountain awaits description.

The aims of this study were to address existing data deficiencies by (i) identifying and describing the species of galago occurring in Malawi's Shire Highlands, (ii) assessing their distribution and relative abundance, (iii)



providing insights into their behaviour, and (iv) gathering information with regard to human impacts that impinge upon their current and future conservation status. Assessment of the inter-relationships between these factors is fundamental to ensuring the long-term

viability of galago populations in the region.

Systematic surveys were conducted from May to July 2005 across eight sites representing the majority of suitable galago habitat available in southeastern Malawi. Analysis of vocalisations and morphological characteristics identified two species of galago in the Shire Highlands – *Galagoides granti* and *Otolemur crassicaudatus* – and indicated the presence of a regional form of *G. granti* at Thyolo Mountain. Vocal repertoires were described for each species, comprising twenty calls for *G. granti* and four calls for *O. crassicaudatus*. Call-type and frequency profiles for *G. granti* highlighted differences across sites that are likely to reflect local conditions, habitats, and selection pressures. Distribution and relative abundance were determined on the basis of detection and encounter rates in appropriate habitat, and differed between sites with only one record of sympatric occurrence. Behavioural sampling data were used to construct activity budgets and substrate-use profiles for *G. granti* that reflect habitat characteristics at sites where they were encountered. Preliminary information regarding human impacts and disturbance was also acquired.

The results of the study not only contribute to clarification of galago diversity but also provide valuable baseline data fundamental to management and conservation of galagos across the Shire Highlands.

Behaviour of the Northern Ceylon slender loris (*Loris tardigradus nordicus*) and the red slender loris (*Loris tardigradus tardigradus*) as a result of olfactory, visual, and auditory enrichment

By Kelly Ablard

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Nocturnal prosimians rely heavily on chemoreception to relay information to conspecifics and/or interspecifics as a part of their behavioural repertoire. Due to the ambiguity of what these signals may be relaying, this study sought to gain further insight by providing a behavioural bioassay of seven captive slender lorises in response to natural-simulating sensory enrichment. Scents, sounds, and animal models of nine predators and non-predators were employed to test if social behaviour (i.e. scent marking), exploration, and swift locomotion increased whilst ultimately decreasing their stereotypies such as stress as a result.

It was found that in response to predators and non-predators, patterns of scent marking were highly evident and predominantly employed by the oldest female. This provides an indication that social communication is prevalent among these lorises. Other forms of social behaviour (i.e. playing and allogrooming) also increased during the post enrichment testing phase. These findings contribute to dispelling the ideology that these are non-gregarious animals. Exploration, another important behaviour for augmenting the well-being of captive animals, significantly increased among lorises when presented with scents, sounds, and models of both predators and non-predators. Locomotion frequency and pace remained consistent in response to the enrichment regime. Although they did

not move swiftly in response to stimuli, they also did not move at a slower pace or show a pattern of freezing (i.e. crypsis), but rather increased the frequency of scent marking.



These findings contribute by alleviating the thought that slender lorises might use crypsis as their only form of anti-predatory defence. Stress responses increased during presentation of enrichment, but decreased overall when compared to their behaviour prior to any enrichment. Various applications can be derived from this study to enhance the well-being of these endangered primates and to potentially prepare them for a better chance of survival if reintroduced into the wild.

A Preliminary Study of the Effects of Forest Fragmentation on the Mantled Howling Monkeys (*Alouatta palliata*) at Ometepe Biological Field Station, Nicaragua

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Forest fragmentation is currently one of the greatest threats to the world's biodiversity. Primates are often more severely impacted by fragmentation than other mammals because they are rare, have small population sizes, slow reproductive rates, and are often arboreal. Howlers are more tolerant of forest fragmentation than other primate species due to their adaptability, folivorous diet, small home ranges, early age at first reproduction, and high rate of population increase. Despite this tolerance, forest fragmentation still poses a serious threat to howlers' long term survival.

This study was conducted in order to begin to assess the effects of forest fragmentation on mantled howlers (*Alouatta palliata*) at Ometepe Biological Field Station on Ometepe Island, Nicaragua and to begin to determine if habitat variables (such as fragment size, tree density, tree diameter at breast height, tree height, canopy cover, and basal area) are associated with howler density in different fragments in this area. From 5 June to 25 July,



2005, howler surveys and tree density surveys were conducted in four fragments of varying sizes and varying levels of anthropogenic disturbance. Howler surveys were conducted using line transect distance sampling and tree density surveys were conducted using the plotless point-quarter method. Other habitat variables were

also collected during tree density surveys. DISTANCE 5.0 was used to estimate howler densities. Spearman's rank correlation tests were conducted using SPSS 13.0 to determine if correlations existed between howler density and the habitat variables measured.

Howler density estimates for each of the four fragments were 2.37 individuals per hectare, 0.12 individuals per hectare, 0.12 individuals per hectare, and 1.23 individuals per hectare. The overall howler density estimate for all of the fragments combined was 0.63 individuals per hectare. Density estimates for each of the fragments were within and above the range of howler densities found in other studies and the overall howler density estimate for all of the fragments combined exceeded the average howler density found in reviewed studies. No significant correlations were found between howler density and any of the habitat variables measured. However, the results indicate a trend towards a positive correlation between howler density and the average diameter at breast height of each fragment.

It appears that howlers are currently persisting at Ometepe Biological Field Station despite forest fragmentation. However, the clearing of land on Ometepe has been so extensive that it will most likely have a severe negative impact on howlers if it continues. Conservation strategies, such as creating corridors between fragments, promoting shade agriculture, and community-based conservation, that have been successful at protecting howlers in other areas, should be implemented on Ometepe to ensure the howlers' long term survival.

Social Bonds, Kinship and Dominance Hierarchies in Captive Groups of Bonobos (*Pan paniscus*):

How important are mother-son bonds in bonobo society, and what are the implications for welfare in captivity?

By Marianne Solberg
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Bonobos (*Pan paniscus*) live in multi-male, multi-female fission-fusion societies with female dispersal and male philopatry. Males maintain strong bonds with and receive protection from their mothers throughout life. In fact the mother-son bond is also one of the most stable components of bonobo society. Yet, many zoos transport males rather than females between various zoos, possibly leading to increased stress for motherless males, in terms of increased aggression towards them and absence of affiliative social relationships. This study examined 1) stress-related behaviours in captive male bonobos, 2) the presence of, and importance of mother-son bonds in bonobo society, 3) the consequences for males in terms of reproductive success and rank and 4) implications for male welfare in captivity.

Motherless males displayed significantly more stress related behaviours than males that were housed with their mothers. Males with mothers present also spent

significantly more time in proximity to and grooming with her than other conspecifics, indicating strong mother-son bonds. Males with mothers present furthermore tended to be higher in rank and more reproductively successful than motherless males, but these results were not significant. There were exceptions, and it appears that some males may be able to attain high rank without their mothers' support by exploiting social situations. Furthermore, one hand reared low ranking male had high reproductive output and coped well in resource acquisition, possibly by means of tactical deception. From a welfare and captive conservation point of view, this report argues that though the captive management of bonobos remains a complex challenge, if a balanced and naturalistic group composition, genetic management, and welfare of the animals are to be considered important goals, males should be left with their mothers in captivity as far as possible as they are frequently targets of aggression when transferred into new zoo groups.



Seed Dispersal by Chacma Baboons within the Fynbos Biome, South Africa

By Erin Guth

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Critical to all conservation efforts is an understanding of the interaction among keystone species in ecosystems including, but not limited to, the role of seed dispersal agents in the maintenance of plant communities (Serio-Silva & Rico-Gray, 2003; Russo & Augspurger, 2004). This study assesses the role that chacma baboons play in seed dispersal and/or predation of alien and native seed plants within the Kogelberg Biosphere Nature Reserve by determining their effectiveness as seed dispersal agents.

The effectiveness of seed dispersal is measured by combining quantitative and qualitative measures of dispersal ability (Schupp, 1993). The quantity of dispersed seeds depends on the number of seeds dispersed while the quality of a disperser is reliant upon seeds' potential for germination after seed handling and/or gut passage as well as the probability that a deposited seed will survive to adulthood (Schupp, 1993; Wrangham et al., 1994; Chapman & Onderdonk, 1998; Poulsen et al, 2001; Kaplin & Lambert, 2002). In terms of quantity the baboons were effective dispersal agents depositing a seed rain rate of between approximately 12000 and 36000 seeds/km² during the study period and a mean of 46 seeds per faecal sample.

In terms of seed handling, the baboons acted as seed predators and seed dispersers depending on the plant species, and in the case of *Acacia cyclops* they acted as both. Germination trials proved that seeds from many native plants as well as from alien *Acacia cyclops* were capable of germinating after passage through the baboon digestive tract. In addition, the long daily travel distances and scattered defecation patterns of the baboons may improve seedlings' likelihood of survival by depositing seeds far from parent plants in low densities (Janzen, 1970). Furthermore, the baboons ranging patterns throughout the fragmented protected area network effectively increased gene flow between and among the reserve zones and vegetation communities (Frankham, 2002).

The attributes making the baboons effective seed dispersers of native species can potentially aid the invasion of alien *Acacia cyclops* that is currently threatening the Reserve network. Overall, the baboons acted as low quality dispersers for alien *Acacia cyclops* and high quality dispersers for 'Other,' assumed to be native, seed species during the months of May-July.



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Crop Raiding by Bonnet Macaques and Nilgiri langurs in Tamil Nadu, South India

By Marie Davies

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A survey of primate crop raiding was carried out, by interviewing 229 farmers in Nilgiris, Coimbatore and Pudukkottai districts of Tamil Nadu in southern India. The aims of the study were to; (i) assess the importance of crop raiding as a problem for farmers, (ii) document farmers' accounts of crop raid characteristics, (iii) record quantitative estimates of perceived crop losses, (iv) find out what control measures are being employed by farmers and the government, and (v) assess farmers' feelings towards monkeys and their attitudes towards the problem.

Farmers face various difficulties with farming, including unfavourable weather conditions, lack of water, insect pests, poor soil and crop damage caused by wildlife. Wildlife damage is considered to be the most significant of these problems by just over half of farmers interviewed. Many animals damage crops and the most common crop raiders are bonnet macaques, Nilgiri langurs (Nilgiris district only), wild boar, bison, elephants (Coimbatore district only), birds and squirrels. Either monkeys, or monkeys and wild boar equally, are considered to be the most damaging animals, by over half of farmers interviewed. For most farmers, cultivating crops is their main source of income; therefore crop raiding problems are detrimental to their livelihoods. Farms that are situated very close to the forest boundary are particularly likely to suffer substantial damage caused by primates.

Primates have reportedly been crop raiding for an average of 17 years in these areas, and the majority of farmers think the problem is getting

worse compared to previous years. Farmers report that these primates eat most types of fruits and vegetables that are cultivated, and they are very wasteful of crops, damaging more than they actually consume. Farmers also report that monkeys damage the commercially valuable parts of the plants, so that these plants are then of no use to the farmer.

For most farmers, crop raiding occurs in all months in which crops are growing, with similar amounts of damage usually being sustained in each month. Primates reportedly raid farms five to six days each week on average. However many farmers experience daily crop raiding and sometimes multiple raids per day. Crop raids typically occur at any time of the day between 6am and 7pm. Averages of 58 bonnet macaques, and 14 Nilgiri langurs, are reported to participate in a single raid.

The average percentage crop loss caused by primates (as estimated by farmers) is 26% of total yield. Over three quarters of farmers consider the resulting loss in income to be significant.

Some farmers additionally experience other types of trouble, caused by both bonnet macaques and Nilgiri langurs, such as food being stolen and household items being broken in their homes. Both species reportedly may also act aggressively towards people, scaring women and children.

All farmers have to guard their fields and a few employ workers just to watch for monkeys. Farmers also use various methods to scare monkeys away when they actually enter a crop field. These include shouting, throwing



stones, chasing (sometimes using sticks), keeping dogs and setting off firecrackers. However these deterrence methods are relatively unsuccessful because they are generally only temporary measures. Reportedly bonnet macaques often retreat to nearby trees, watch the field and return when the field is left unguarded.

The government has not reportedly done a lot to address the problem of crop raiding in these areas. No financial compensation is given for crop losses. In a few locations in Nilgiris district, the forest department has previously trapped and relocated bonnet macaques. However this has not apparently been successful in solving the problem, because either monkeys were left behind, or more arrived to fill the vacant niche, and crop raiding is still occurring. The majority of farmers do want government intervention and translocation is the most favoured option. Many farmers however have negative attitudes toward the government, and feel that not enough

help is given to farmers, whilst wildlife remains protected. Some farmers have not reported their problems but many have complained to the authorities many times with no response.

Three quarters of Hindu farmers worship the monkey god, Hanuman, and still consider all monkeys to be sacred animals. Most farmers think it is wrong to harm monkeys in any way and think they should be protected in the forest. Many are happy for monkeys to live alongside people, providing they do not cause trouble, although most farmers also wish that monkeys did not live so close to agricultural land, because of the damage they do to crops. However despite the crop damage sustained, most farmers have generally positive attitudes towards primates. It appears that this form of human-wildlife conflict is not threatening the continued survival of primates in the study areas, which is a positive finding from a conservation point of view.



Predator Training of Black Lion Tamarins (*Leontopithecus chrysopygus*) at the Durrell Wildlife Preservation Trust

By Rob Bacon

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Introduction:

The black lion tamarin (*Leontopithecus chrysopygus*) is a small-bodied Neotropical primate endemic to interior Atlantic forest region of Brazil is one of four distinct forms of the genus *Leontopithecus* (Kierulff et al., 2002) and is currently classified as critically endangered under the IUCN red list (IUCN, 2004). The wild population of black lion tamarins was last estimated at around 990 individuals (Valladares-Padua et al., 2002), fragmented into eleven subpopulations of varying size (Rohe et al., 2003). The Morro do Diabo State Park is home to a subpopulation of approximately 820 individuals, leaving just 170 individuals sparsely distributed about the remaining ten subpopulations.

Hence, one of the most pressing issues for the conservation of *L. chrysopygus* is the genetic degradation of these small and fragile subpopulations, still existing naturally in the wild. In an attempt to increase the gene flow between these segregated subpopulations, a metapopulation management scheme incorporating; managed dispersals, reintroductions (of captive stock) and translocations of the species have been implemented. As part of this scheme, a relatively small captive population of *L. chrysopygus*, known as the 'nucleus' population, serve to maintain 95% of the species genetic diversity through a managed inflow and outflow of individuals between captivity and the wild (Valladares-Padua et al., 2002). To date however, the release of genetically important, captive-born, individuals back into the wild has proved relatively unsuccessful, with two out of three

individuals falling prey to terrestrial predators on reintroduction.

Due to their small size and high metabolic demands, callitrichid primates spend a large proportion of their time foraging, often looking for concealed invertebrate prey, potentially jeopardise an individual's ability to visually detect predators. This conflict between fitness maximising behaviours, coupled with the small body size of callitrichid primates, leaves them susceptible to a wide array of aerial, terrestrial and arboreal predators. It would seem therefore, that due to the terminal nature of predation, species have evolved to learn and develop a suitable anti-predator repertoire early on in life. Many suggest that such anti-predator behaviour is therefore innate (genetically hard-wired), however, if this was the case, reintroduced captive-born lion tamarins would stand the same chance of survival as their wild-born counterparts, which we know is not the case (Kierulff et al., 2002a).

The exact reason for this susceptibility of captive-born individuals to predation on reintroduction is somewhat unclear. Studies of oldfield mice (*Peromyscus polionotus subgriseus*) have shown that relaxed selection pressures concordant with captivity, reduce the survival critical behaviours of captive individuals. Captive-born lion tamarins have been shown to express similar immediate responses to potential predatory threats as wild-born members of their species (Castro, 1990). It would seem therefore that there is some other aspect of anti-predator behaviour which is insufficient within captive-born individuals.



Predator training protocols have been successfully employed in the past, to enhance the immediate anti-predator behaviour of a variety of predator naïve species; including Siberian ferrets (*Mustela eversmannii*) (Miller et al., 1998) and tamar wallabies (*Macropus eugenii*) (Griffin et al., 2001), although it has not been proven that such training enhances the survival chances of the individual on reintroduction.

Project aim:

The primary objective of this research was to assess whether a succession of simulated predator encounters would alter the long-term anti-predator behaviour of *L. chrysopygus*. In addition to this main focus, the effects of two separate predator training methods on the immediate behavioural response of *L. chrysopygus* were to be determined, including any potential for habituation to the training methods.

The study consisted of three two-week long observation periods, which were separated by two one-week long training periods.

Days throughout observation periods, were divided into three sectors from 8.30-11.00am/ 'Morning', 11:15am-2:15pm/ 'Midday' (with a break between 12:30-1:00 due to low levels of activity after the 12:30 feed) and 2:30-5:00pm/ 'Afternoon'. This allowed for an even distribution of observation sessions for each individual throughout each day, accounting for any discrepancies in daily activity budgets. Additionally, observation sessions were evenly spread across each week, with weekends left free to allow for additional data collection due to poor weather conditions.

Observation sessions were 20 minutes long and focal animal sampling was used with instantaneous point samples collected at 15 second intervals. Behavioural characteristics observed were recorded under five categories; locomotion, social, foraging, feeding

and stationary. Additional behavioural variables considered to influence susceptibility to predation were also recorded in categories; these included height, cohesion and direction of vigilance.

During each week-long predator training period a predator stimulus was presented for three minutes to the group. Presentations occurred at one of three locations in the enclosure, on three separate days, selected at random.

During the first training period, a stuffed toy cat, 50 cm in length (100 cm including tail), with forward facing eyes and distinct markings was used to simulate a terrestrial predator.

During the second training period the cat model was again presented along with a play-back of a callitrichid 'scream' vocalisation. On unveiling the predator stimulus, a Panasonic NV-DS15B camcorder was used to record scan samples of all visible group members at one minute intervals, which were later transferred to data sheets. During the scan samples, behavioural variables were recorded in a similar manner to the observation periods along with 'distance from predator' which was again broken into several categories.

Response to predator training:

After exposure to the first predator training period, reductions in foraging behaviour were observed. This illustrates that under a greater perception of threat from terrestrial predators individuals of *L. chrysopygus* reduce the amount of time they allocate to foraging behaviour. This supports the theory that foraging behaviour and predator detection are non-compatible activities which are influenced by the threat of predation. Additionally, repeated increases in the height distributions of group members were observed after the first and second training period. Although improving weather conditions

may have had some influence, these alterations in potential anti-predator behavioural traits may suggest that with increased perception of threat from terrestrial predators, captive-born *L. chrysopygus* seek refuge higher in the canopy. These long-term alterations in behaviour may suggest why in the past, captive-born, reintroduced individuals have fallen prey to predators. Therefore, it could be interpreted that predator training is a useful method in reducing the susceptibility of predation and ultimately enhance the survival of reintroduced *L. chrysopygus*.

On comparing responses to both predator training methods it was apparent that the amount of foraging behaviour expressed and height distributions reduced on exposure to the second training method, whilst group cohesion increased (i.e. individuals were closer to one another). From these responses, along with a greater vocal response to the second training period, it was thought that the second training method provoked a greater perception of fear amongst the study group. It would therefore seem more beneficial to

combine aversive stimuli when training individuals to express appropriate anti-predator behaviour in the future.

From the behavioural alterations observed after exposure to the second training protocol, it could also be suggested that on detection of a terrestrial predator, *L. chrysopygus* aim to deter a predator in accordance with the 'perception advertisement' hypothesis (Zuberbuhler et al., 1997) a form of predator deterrent whereby the group of individuals signal to the predator that they have detected it, thus illustrating that it no longer has the element of surprise needed to catch its prey.

One concern arising from this project was that the immediate responses of the group over the three sessions of each predator training period tended to decline in amplitude. It could therefore be suggested that predator training may be counter-productive if employed too frequently and without variability. This relaxation in response to an imminent threat caused by training in captivity could unintentionally jeopardise the survival chances of reintroduced individuals.



The role of woolly monkeys as a flagship species for conservation in the Colombian Amazon (work in progress)

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Introduction

Amazonia is the largest tropical forest, representing 53% of the world's remaining tropical rain forest; it plays a critical role in regulating climate at both regional and global levels (Bunyard, 2005). The Amazon basin has the largest concentration of primate diversity in the world with 81 primate species (CI 2002). Primates comprise 25 to 40% of the frugivore biomass in Neotropical forests (Terborgh, 1983; Palacios and Peres, 2005), and large-bodied primates play an important role in ecosystem dynamics as seed dispersers, being important agents in the renovation and diversification of the forest (Stevenson, *et al.*, 2002; Peres and Van Roosmalen, 2002). These primates are increasingly threatened by anthropogenic habitat disturbance and from subsistence hunting (Chapman and Peres, 2001) (Fig1).



Fig 1. A hunter from the Tikuna indigenous community of San Martín de Amacayacu. (Photo source: Angela Maldonado).

Little is known about the impact of subsistence hunting within protected areas and indigenous land in the Colombian Amazon. Palacios and Peres (2005) stated that it is critical to obtain long-term baseline information on the abundance and distribution of the harvest-sensitive mammals, in order to propose conservation actions alongside the government component (Colombian Park System Unit). With the aim of meeting these information requirements, The Woolly Monkey Project (TWMP)¹ began a census to provide a baseline for future monitoring by assessing the status of primates and other harvest-sensitive vertebrates in the Southern part of Amacayacu National park (Colombian Amazon), an area intensively exploited by Tikuna indigenous communities.

The woolly monkey as a flagship species

The common woolly monkey (*Lagothrix lagothricha*) is widely distributed throughout the Amazon. However, it is restricted to primary and continuous forest, and 50% of its total distribution is represented by the Colombian population (Defler and Rodriguez, 2003; Defler 2004). *Lagothrix lagothricha* is one of most threatened Amazonian species as a result of hunting, so that even at subsistence level, the wild population has been depressed to the point of local extinction (Peres, 1990; Mena, *et al.*, 2000).

¹ The Woolly Monkey project (TWMP): A community-based research project in the Colombian Amazon.



Fig 2. *Lagothrix lagotricha*: Conservation status downgraded to Lower Risk "Least Concern" (Lc) (Photo source: Angela Maldonado).

The most recent classification of *Lagothrix lagotricha* by the IUCN has downgraded its status to Lower Risk: "Least Concern" (Lc) (Rylands et. al. 2000) (Fig 2).

Large mammals are the highest biomass seed predators of intact Amazonian communities and at risk due to human disturbance; they are potentially a central mechanism for maintaining tree species diversity (Wyatt and Silman 2004). Ateline primates and particularly woolly monkeys are the most effective seed dispersers in western Amazonia (Stevenson 2000). Owing to the important role of this charismatic species in the fragile Amazonian ecosystem, woolly monkeys were chosen as the *flagship species*. In 2004 Mocagua, one of the indigenous communities involved in this research, agreed to implement a prohibition on the hunting of woolly monkeys and a restriction on the hunting of tapirs (Amacayacu National Park, 2005).

In March 2005 **TWMP** started a census of large-vertebrates and a preliminary phase of the environmental education programme. This programme involved two Tikuna indigenous communities (Mocagua and San Martin), which have permanent settlements in the southern part of Amacayacu National Park. The government component, the Colombian Park System, which is currently co-managing the natural

resources of the area alongside the indigenous communities is also involved. This project includes the development of biological and socio-economic baseline information to examine hunting off-take rates and determine the degree to which they are sustainable, and its implications for local people and large mammal conservation.

Preliminary results

Fieldwork: During the first six months of field work, a group of 20 co-investigators, comprised of local hunters, were trained in line transect method; currently, the team members are completing the data recording sheets.

The data to determine population density estimates are under analysis. Nevertheless, we performed a preliminary Chi-square analysis with significance set at $p < 0.05$, employing the programme SPSS 12.0.

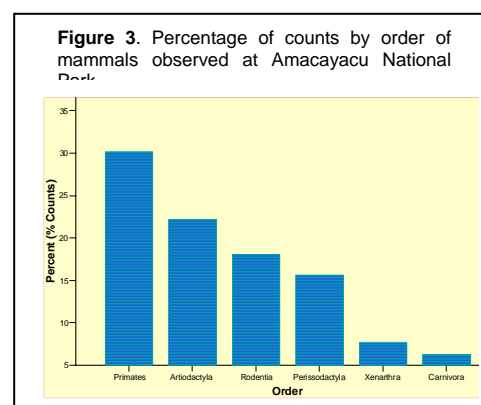


Figure 3 summarises the percentage of counts recorded by order of mammals in the communities of Mocagua and San Martin from March to August 2005. The preliminary results illustrate that encounters with primates were more frequent than with other groups of mammals, representing 30% of the total counts, followed by the order Artiodactyla, which includes red deer, grey deer, collared peccary and white-lipped peccary with 22% of the counts. It is important to note that the primate species most frequently observed was the small-bodied Black-mantled Tamarin (*Saguinus nigricollis*). The order Rodentia (which

comprises paca, black agouti, porcupine and capybara), and order Perissodactyla (tapirs) had a similar representation of 18% and 16% respectively. The lowest number of counts was recorded for the Xenarthra (8%) and the Carnivora order (6%). The order Xenarthra consists of armadillos, three and two toed sloths, giant anteater and tamandua. Carnivora order includes the ocelot, maragay, jaguar and tayra.

Environmental education: Currently **TWMP** has a group of 30 people (mainly children and women) taking weekly lessons on basic biology and English. During a preliminary approach to local people, we asked adults and children what they thought about woolly monkeys and their answers were:

Hunters in Mocagua: *“they are very difficult to find now, and because we decided to stop hunting them, we prefer to search for peccaries or tapirs”*.

San Martin: *“We have to walk for more than six hours to find a woolly monkey, if by chance we find a group we hunt them”* (A. Maldonado, unpubl. data) (Fig 4).

Children: *“woollies are cute, nutty, funny, greedy and fat, I haven’t seen one in the forest”* (A. Maldonado, unpubl. data) (Fig 5).

At international level, I have been giving oral presentations about **TWMP** in academic and funding institutions and overall, people agreed that woolly monkeys are a key species for habitat conservation. During a Primate Conservation Fundraising Campaign Launch Event at Oxford Brookes University, Jon Snow (BBC 4

News) refers to woolly monkeys as:

“charismatic and beautiful monkeys deserving our effort and dedication to preserve them in the wild”.



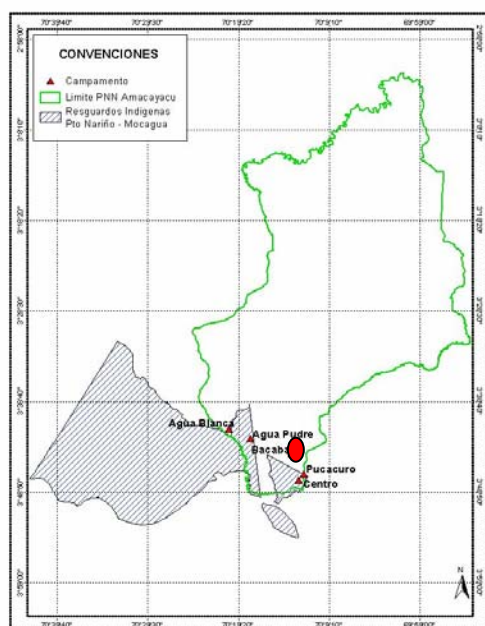
Fig 4. Hunters, women and elderly people from San Martin sharing information on their perception about woolly monkeys (Photo source: Alex King).

Discussion and conclusion

Although the attitude of local people have been changing very slowly, woolly monkeys have enabled us to gain support for habitat conservation, exemplifying the relationship between species, habitat and human well-being, reflected not only in the hunting prohibition, but more importantly in its application by Mocagua’s community.

During our fieldwork we noticed some confusion about the limits of the indigenous territories for local people as well as for the national park management. For instance, one of the hunting areas (Bacaba-Mocagua) (Map 1) used by local people is actually outside the official indigenous territory demarcated by the ministry of environment (oval).

SITIOS DE ESTUDIO



Map 1. Mocagua and San Martín territories and study sites into Amacayacu National Park.

As one of the priorities for the management plan of Amacayacu National Park is to monitor human activities within the park, The Woolly Monkey Project is well received as it fits the park's aims without using their limited financial resources. As a result we have received a two year extension of our research license.

The future of the Amazon forest depends on long-term conservation initiatives which involve local people, government and conservationists. A charismatic species can gain regional, national and international support for a whole ecosystem. A wide distribution or its presence in a protected area does not guarantee that the woolly monkeys' future will be stable. A re-evaluation of its conservation status, and *in-situ* efforts are essential for its long-term conservation.

Acknowledgments: This work would not have been possible without the generous assistance of many people and institutions. Firstly, I would like to give my deepest thanks to the local communities for their priceless support during the field work, and to the staff of Amacayacu National Park, Colombian Park System and Dr. Sara Bennett for the logistical support. Thanks to Oxford Brookes University for the institutional support. Thanks to the volunteer team: Hannah Parathian, Alex King, Clair Tucker (The UK), Andrea Barrera, Jenny Zambrano and Juan David Sanchez (Colombia) for their valuable help. Finally, I wish to thank the Rivet-Carnac family (UK), Rufford Small Grants, Royal Geographical Society, IPPL, Tropenbos, OWW, Kilverstone Trust and Reserve Life Support Ltd for funding this project.



Fig 5. Tikuna children painting a mural of the primate species found in their indigenous land, Mocagua. (Photo source: Angela Maldonado).

PRIMENET – Developing a sustainable network for primate conservation in NW Ecuador

Parabiologists to the rescue?

Principal network partners: The University of Sussex, Ecuador Terra Incognita, Corporacion Botanica Ecuadendron, Los Cedros Biological Reserve.

The Brown-headed spider monkey (*Ateles fusciceps*) is endemic to the Chocó-Darién-Western Ecuador global biodiversity hotspot. Wholly dependant on primary forest it represents an ideal indicator of ecosystem conditions; its 'critically endangered' IUCN classification, reflecting its intrinsic conservation value. A recent population reduction of 80% due to habitat destruction, principally by national and international logging operations, and hunting has resulted in surviving populations now being restricted to reserves (Reserve Etnologica Awa, Reserve Ecologica Cotacachi-Cayapas and the Los Cedros Biological Reserve). The survival of the species is now dependant on the unknown premise that the refuges provided by these protected areas are sufficient.

In June 2005 the Darwin Initiative (DEFRA) funded the PRIMENET project with the objective of bringing together Ecuadorian and UK expertise to address this conservation issue providing an invaluable opportunity for the sustainable conservation of the brown-headed spider monkey, other vulnerable primates (i.e. Black Mantled Howler, *Alouatta palliata*, White-throated Capuchin, *Cebus capucinus*), and the unique biodiversity of their associated habitats. The PRIMENET project will ensure that conservation efforts are underpinned by a scientific understanding of the effects of habitat destruction, habitat fragmentation and species ecology of the primates at risk. However, their sustainable conservation requires more than scientific understanding: reserve areas remain vulnerable to hunting from local communities where economic pressures and limited educational resources obscure their conservation value. PRIMENET proposes a strategy to advance the scientific basis for their conservation management and establish a long-term programme based on:

- **Monitoring** - bioassessment of primate populations and their associated habitats through field surveys and the training of a network of 'parabiologists'.
- **Education** - raising environmental awareness through educational programmes disseminated through parabiologists and community partnership networks.
- **Identification of sustainable livelihoods** - raising awareness of economic value derived from conservation of ecological resources.

During the project life-time, the establishment of the PRIMENET Research and Training Centre at the Los Cedros Biological Reserve will provide employment opportunities for members of rural communities, members of the survey teams and offer grants to train 'parabiologists'. Parabiologists will be recruited from communities surrounding the Cotacachi-Cayapas Ecological Reserve and offered small grants for training as field biologists to monitor primates, their habitats and threats thus recognising traditional and indigenous knowledge and providing a bridge to the conservation science community. This knowledge will then be disseminated through the participatory community education programme propagating a process that will strengthen social capital associated with conservation work within both indigenous and colonist communities.



Designed to develop a conservation network and simultaneously address gaps in scientific knowledge focused around the flagship species *Ateles fusciceps*, the proposed project will train parabiologists and an expert field survey team for competence in biological survey techniques, botanical inventory and rapid habitat assessment providing expert information on the current status of endangered primates in the context of their native habitat. The educational network will provide a forum to disseminate knowledge and understanding radiating from the local to the national and international level.

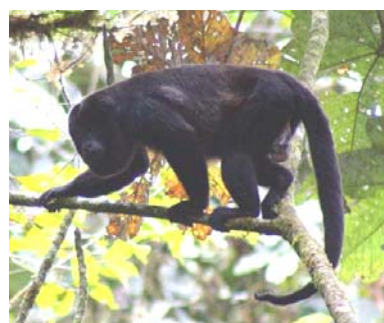
The network of local partners, created through the PRIMENET project, will provide a catalyst that strengthens institutional building the infrastructure for long-term development that will facilitate the promotion and implementation of new projects so that opportunities for sustainable livelihoods can be realised. Strategies to be explored by PRIMENET include the feasibility of developing ecotourism (with the potential for the cascade effect stimulating the local economy).

The project is designed specifically to initiate long-term, sustained activity in Ecuador by establishing the DI PRIMENET research and training centre and an educational network dedicated to conservation issues. The scientifically rigorous monitoring information provided by the assessment team within the Chocóan region will supply crucial scientific information to local and international environmental organisations, development agencies and government. Once established, the network can easily be adapted to monitor a wide variety of environmental resources of interest to specific organisations or projects.

More information can be found on the project website www.primenet.org.uk and students and volunteers are welcome to become involved in the field research. Please contact the UK coordinator Dr Mika Peck (m.r.peck@sussex.ac.uk) for further information.



Ateles fusciceps, photo © Felipe Campos



Alouatta palliata, photo © Jonathan Spangler

**Frans de Waal Lecture
Cruciform Lecture Theater, UCL, London**

Submitted by Heidi Douglas

On November 1st, students and researchers alike were delighted to have the opportunity to hear renowned biologist and ethologist Frans de Waal lecture about his current research and comment on his new book, "Our Inner Ape". De Waal captivated the audience with his vivid photographs and video footage about his past work with chimpanzees and bonobos.

Drawing comparisons between human and nonhuman primates, the lecture highlighted key areas of his research, including the topics of peacemaking, power, politics, cooperation, and culture. His arguments for the immanent presence of strategic reconciliation, coalitionary aggression, and imitation among chimpanzees and bonobos were backed up with convincing examples from his research. A primatologist who has questioned previously accepted theories of social behaviour, de Waal closed by stating the importance and relevance of continued study of primate behaviour. Bonobos, he argued, add an essential third dimension to theories of evolution and human behaviour, which, if based solely on humans and chimpanzees, would be negated by their behaviour and social organization.

Following the lecture, a long queue of attendees took advantage of the opportunity to speak with the enthusiastic de Waal and to have their newly purchased copies of his book signed. It was undoubtedly an inspiring and most interesting event for members of the general public, aspiring primatologists, and experienced researchers alike.



© Frans de Waal



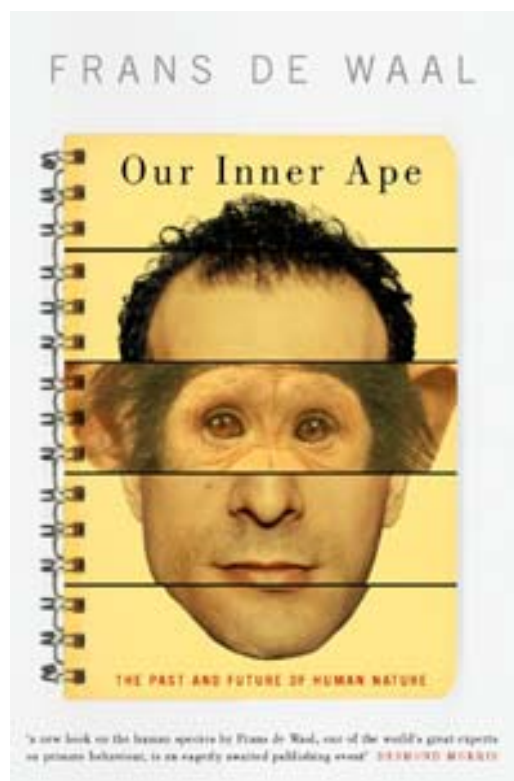
© Frans de Waal

Our Inner Ape
Riverhead Publishing, USA, 2005

Submitted by Rosalyn Ridlington

Frans de Waal's newest book examines the duality of human nature, comparing our warring, destructive, and power-hungry side with the aggressive chimpanzee, and our altruistic, peaceful side with the "hippie of the primate world", the reconciliatory bonobo. While both apes are equally closely related to us on the evolutionary tree, most of the media focus in the past has compared us to the chimpanzee. This has mainly been caused by a lack of knowledge about the bonobo. The emphasis placed upon the powerful characteristics that humans and chimpanzees share, favours theories supporting a male-dominated society; the bonobo's female-dominated cooperation and use of sex to reconcile moments of tension threaten such theories, especially those that equate aggressiveness with progress.

While recent biologists have popularized the idea of the "selfish gene", de Waal explains human nature through the evolution of commitment, community and moral responsibility. His book weaves an intricate web around the topic of human nature, taken from the mind of a primatologist. It attempts to find room for both the chimpanzee and bonobo within our minds, describing the two mirror images within us that characterise two very different sides of the human personality.



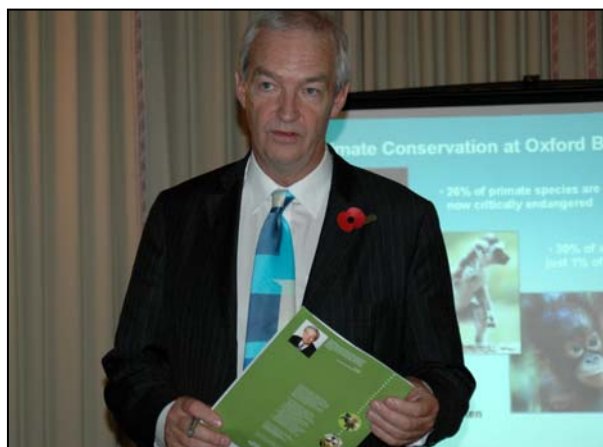
MSc Fundraising Launch

By: Tom McNeil
tmcneil@brookes.ac.uk

OXFORD
BROOKES
UNIVERSITY

Oxford Brookes University has recently launched a major fundraising campaign to develop and enhance its primate conservation MSc programme. This undertaking is partly in recognition of the outstanding achievements and successes of all the academic staff and students involved in the MSc programme since its launch in the year 2000. Yet it also reflects the fact that the next twenty to thirty years will be crucial in deciding the fate of many primate species around the globe. Our target is to raise and invest £300,000 in the MSc programme's research programme, teaching capacity and scholarship provision and help our students to make a difference in the fight to save endangered primate species before they are lost forever.

The fundraising project was officially launched at Oxford Brookes by our Chancellor Jon Snow on the 2nd November. Jon Snow is also acting as lead patron for the campaign, whilst Dr Charlotte Uhlenbroek of the BBC has also lent her endorsement and will be hosting a lecture on the campaign's behalf in the spring of 2006.



Jon Snow addresses the guests of the primate conservation fundraising launch event

Although still in the early stages, we have already successfully raised £27,000 in benefactions towards the purchase of fieldwork equipment and investment in new areas of primate conservation research. We are now looking to move forwards and establish support for other key aspects of our fundraising programme. These include the appointment of a new professorship to join our academic team as well as the establishment of three international "habitat country" postgraduate student scholarships.

We are delighted to be able to take this opportunity to strengthen and develop our programme and consequently work to make even more of an impact in the world of primate conservation.

If you would like to find out more about what we are trying to accomplish, or if you would like to help our campaign in any way, please contact Tom McNeil on 01865 484 850 or at tmcneil@brookes.ac.uk.

XXI Congress of the International Primatological Society



From the 25th-30th of June 2006, Entebbe, Uganda will be host to the 21st Congress of the International Primatological Society. The theme of the conference surrounds the topic of Primate Conservation in Action and is comprised of three main aims which call for communication, global awareness in the field of primatology and support for conservation programs in habitat countries. Delegates will have the opportunity to see primates *in situ* while taking part in Uganda's traditions and culture. In collaboration with several Ugandan Institutions and Conservation NGOs, the IPS will present current research from renowned primatologists through various workshops, roundtables and symposia. The following topics outline some of the many highlights of the conference:

- *Nature Tourism & Primate Conservation: How they can work together.* Organizer: Julian Matthews
- *Primates and Poverty: Challenges and Opportunities.* Organizers: Vernon Reynolds & Tammie Bettinger
- *The Bushmeat Crisis: African Nations Take Action.* Organizers: J. Wallis, H. Eves, N. Bailey, J. Dupain
- *Teaching in the Trees: Field Courses in Primatology, a workshop sponsored by the IPS Committee for Education and Outreach.* Organizer: Lynne Miller
- *Rainforest Sifakas – Yesterday, Today and Tomorrow.* Organizer: Summer Arrigo-Nelson
- *Conservation Education at In-situ Primate Sanctuaries.* Organizer: Barbara Cartwright
- *The Mangabeys of Africa: Highly Threatened and Poorly Known.* Organizers: C.L. Ehardt, J.G. Else, & W.S. McGraw
- *Primate Reintroduction: A Tool for Conservation.* Organizer: Benoit Goossens
- *Primate Theory of Mind.* Organizer: Brian Hare
- *Conflict and Conservation: Can Non-human primates and farmers live together?* Organizers: Catherine Hill and Caroline Ross
- *Creatures of the Dark Revisited: A Reassessment of Diversity and Taxonomic Tools in Nocturnal Primates.* Organizer: Paul Honess
- *Remote Sensing Tools for Great Ape Research and Conservation: Current Applications and Future Needs.* Organizer: Lilian Pintea
- *Female Competition in Great Apes.* Organizers: Anne Pusey & Carson Murray
- *Nutritional Ecology of Primates in Uganda.* Organizers: Jessica Rothman & Colin Chapman
- *Male Aggression Towards Females: Variation with Social System.* Organizers: Richard Wrangham & Martin Muller
- *Predation and Primate Cognitive Evolution.* Organizer: Sharon Gursky and Anna Nekaris

Where are the past MSc students now?

Cara Buckley I'm currently working as a Primate Care Assistant at Monkey World Ape Rescue Centre in Dorset. I work with chimpanzees (60 in total!), woolly monkeys, stump-tailed macaques, capuchins, and golden-cheeked gibbons. In terms of my thesis, I presented the results in poster form at the PSGB winter meeting last year, and as a PowerPoint presentation at the annual ABWAK meeting (Association of British Wild Animal Keepers) in March of this year. It is currently being considered for publication in a scientific journal.

Valerie Marchal I enjoyed the course very much, and now I'm back in France, preparing a PhD project on primate crop-raiding in Indonesia, which is similar to my MSc field study but much more detailed. I'm planning to conduct a comparative study on the primate crop-raiding issue between 2 similar sites in North Sumatra and Sabah (Malaysia). I already have supervisors and am working on the methods, looking for study sites and funding and I'll register properly as a PhD student at the Museum of Natural History in Paris in the Department of Eco-Anthropology next July. I'm planning to start the field study at the end of next year.

Hannah Parathian While I work towards acquiring funding for a PhD project, I am currently working at Oxford Brookes University in the department of Continuing Professional Development at Harcourt Hill. Since returning from the field in the Colombian Amazon where I was carrying out a census of large bodied mammals with Angela Maldonado (also a past student of the MSc course) and implementing the beginnings of an environmental education project, I have been developing a research proposal to study the complex relationship between the people of the indigenous communities in Amacayacu National Park and their environment. In addition I work as a wildlife artist from home and am currently in the middle of several commissioned pieces for purchase by small companies and independent buyers.

Graham Wallace I'm currently in a PhD programme at Oxford Brookes, working with Dr. Kate Hill (as well as Professor Simon Bearder and Dr. Anna Nekaris) on human-wildlife conflict and crop-raiding. The focus is to develop tools and techniques to deter/mitigate crop-raiding by primates (mainly chimps and baboons) and other wildlife at the forest-agriculture interface around Budongo Forest in Masindi District, Uganda. Fieldwork and data collection will be conducted from January to October over the next two years.

Mark Whitten I recently accepted a two year position as a research assistant in population/evolutionary genetics. It is based at both the London Veterinary College and the McDonald Institute of Archaeological Research at the University of Cambridge. The research involves using various techniques to study genetic variation in thoroughbred horses. Samples will come from living individuals and skeletal remains. I gained a considerable portion of the skill set needed for this job through my research on my MSc final project which was done at the Primate Immunogenetics and Molecular Ecology Lab at the University of Cambridge.

