Macaca fascicularis workshop: Understanding and managing macaque-human commensalism.

22nd Congress of the International Primatological Society
Edinburgh, Scotland, UK
August 3rd-8th, 2008

Organised by:
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Pre-Congress Workshop:
University of Edinburgh,
Psychology Building
Room B21
7 George Square, EH8 9JZ.
August 3rd, 2008 12-4:30 pm.

Roundtable Discussion
Edinburgh International
Conference Center
Ochil Room
August 6th, 2008 4-6pm

This workshop and roundtable will explore the commensal relationship between long-tailed macaques, *M. fascicularis*, and humans. The issues discussed will include crop-raiding, urban invasion, disease transmission, conservation, acquisition and breeding for biomedicine, introduced populations, habitat status, etc. An improved understanding of this relationship is a vital pre-requisite for enabling appropriate and successful planning and management techniques. The pre-congress workshop will consist of a series of presentations from an international panel of macaque specialists and the in-congress roundtable will be an open two-hour discussion on the topics presented in the workshop.

Homo sapiens have historically coexisted with long-tailed macaques (*Macaca fascicularis*) throughout South and Southeast Asia. This close association has developed into a complex relationship where both species positively and negatively impact each other. Despite our long history and intimate connection with this species, we still lack a sound understanding of the exact nature of our relationship with this monkey. Consequently, it is important to begin discussions on human-macaque commensalism aimed at developing strategies for a peaceful and healthy coexistence. Long-tailed macaques have impacted human settlements by exploiting crops, establishing urban populations, residing in religiously protected lands, and otherwise living off of our refuse, charity, and food resources. Humans have likewise impacted long-tailed macaques by trapping and/or breeding them for use in biomedical research, introducing them onto islands, hunting and utilizing these animals for food and medicine, and altering the landscapes where these monkeys live.

Our close contact with long-tailed macaques has raised human health and primate conservation-related concerns. From a health perspective, bi-directional disease transmission has been documented in areas of macaque-human commensalism. Conservation-wise, human-introduced long-tailed macaques may have a negative impact on the local flora and fauna of island habitats. Moreover, human exploitation of macaques and their habitat may ultimately lead to higher levels of macaque-human conflict and possible future population declines. Similar problems exist with other macaques, especially the rhesus macaque in India. Consequently, there is a high demand for developing proper planning and management in order to insure a safe future for commensal humans and macaques.

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August 3rd, 2008
12-4:30pm
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Psychology Building
(Room B.21)
7 George Square,
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Opening Statement

12:00 -12:20 The status and distribution of long-tailed macaques (*Macaca fascicularis*) and the dilemma of human-macaque conflict.
Michael D. Gumert

Feeding behavior and ecology

12:20 – 12:40 Activity budget and feeding ecology of *Macaca fascicularis* in Mauritius with comparisons to other populations.
Robert W. Sussman & Christopher A. Schaffer

Interaction & conflict between humans & long-tailed macaques

12:40 – 1:00 Patterns and contexts of human- *Macaca fascicularis* interaction.
Agustin Fuentes

Conflict in Indonesia

1:00 – 1:20 A preliminary study on human and primate conflict in Yogyakarta Province, Indonesia
A. Setiawan, D.W.Purnomo, Subeno, S.Nurvianto

1:20 – 1:40 Long-tailed macaques (*Macaca fascicularis*) as an agricultural threat in Java, Indonesia
Entang Iskandar, Randall C. Kyes, Joko Pamungkas

Conflict in Malaysia

1:40 – 2:00 Human-long-tailed macaque conflict in Malay Peninsula: types of pest behavior.
Badrul Munir Md-Zain, Mastura Mz, Sia Wh, Abdullah M, Wan Ms, & Inche-Ali

Conflict in Singapore

2:00 – 2:20 Human-primate conflict in an urban context - the Singapore experience
Benjamin P. Y-H. Lee

2:20 – 2:40 **BREAK**

Conflict in Thailand

2:40 – 3:00 Current situation and status of long-tailed macaques (*Macaca fascicularis*) in Thailand: drastic change in habitat environment and management philosophy and policy.
Suchinda Malaivijitnond & Yuzuru Hamada

3:00 – 3:20 Impact of overpopulation of *Macaca fascicularis* toward humans in Thailand
Nantiya Aggimarangsee

Trade of long-tailed macaques

3:20 -3:40 Trade and trafficking of *Macaca fascicularis*
Ardith A. Eudey

Comparisons with other macaque species

3:40 – 4:00 Crop raiding in *Macaca nigra* – another macaque example and a possible solution from Sulawesi
Antje Engelhardt & D. Perwitasari-Farajallah

4:00 – 4:20 Consequences of urban commensalism of rhesus macaques in India.
Charles H. Southwick & Heather M. Southwick

4:20 – 4:30 **Closing Statements and Discussion**

1. The status and distribution of long-tailed macaques (*Macaca fascicularis*) and the dilemma of human-macaque conflict.

Michael D. Gumert
Division of Psychology,
Nanyang Technological University, Singapore

Long-tailed macaques have one of the widest geographical ranges among primates and they are distributed throughout much of South and Southeast Asia. They have also been carried by humans to locations outside of their natural range, resulting in the establishment of at least four exotic satellite populations. Long-tailed macaques are frequently reported near human settlements. Consequently, they are highly visible to the public, creating the perspective that long-tailed macaque populations are excessively large. The most recent estimates suggest that there are 3 million long-tailed macaques surviving today, and this estimate is 40% lower than estimates in the 1980s. Long-tailed macaques are not currently endangered, but overall, long-tailed macaque habitats and populations are decreasing. Long-tailed macaques appear to survive well in places where they live commensally with humans. In these regions, local population sizes may be increasing, as they crowd into human settlement. Consequently, these human-macaque interface zones are characterized by conflict between humans and macaques for food and space. There are also health and safety concerns due to aggression and pathogen transmission between humans and macaques. Remedies are needed to alleviate these conflicts and concerns. Macro-level strategies need to be versatile and micro-management tactics need to be context specific to each region. In interface zones, strategies will need to focus on repairing conditions that create conflict, raising the utility of the macaques, maintaining healthy and stable macaque populations, establishing education programs, and developing better health and safety programs. Through a multidisciplinary approach to human-macaque conflict, we could devise management programs that will allow macaque populations to persist, while improving the livelihoods of humans living with macaques.

2. Activity Budget and Feeding Ecology of *Macaca fascicularis* in Mauritius with Comparisons to Other Populations

R.W. Sussman, C. A. Shaffer
Department of Anthropology,
Washington University, St. Louis, MO, USA

Macaca fascicularis is one of the most widely distributed species of primates, yet long-term studies of wild populations of this species are few. Here we report results from a long-term study of activity budget and feeding ecology of long-tailed macaques (*Macaca fascicularis)* on the island of Mauritius. This non-native population provides a unique opportunity to explore the dietary patterns of *M, fascicularis* that allow it to succeed in a variety of environments, including those close to human habitation. 565 hours of scan sampling data were collected from September 1979 to October 1980.

Feeding was the most common activity (30% of observation time), followed by moving (23%), resting (22%), and grooming (13%). The monkeys were eclectic feeders, eating more that 53 species during the study. Six species (*Leucaena leucocephala*, *Acacia concinna, Tamarindus indica, sugar cane, Mangifera indica,* and *Psidium sp.*) made up over 50% of the diet. The macaques were predominantly frugivorous, relying on fruit, pods, and seeds for

37% of their feeding time. They exploited a wide range of other food items, including leaves, flowers, insects, bark, snails, mushrooms, exudates, water plants, molasses, and sugar cane. Dietary patterns showed some seasonal differences.

These results are consistent with studies of *Macaca fascicularis* populations throughout Southeast Asia. While the species eaten by the Mauritian population differed from native populations in Asia, their activity patterns, dietary patterns, and the types of plant parts consumed were quite similar. This species-specific behavioral pattern may be one of the primary reasons for the ability of macaques to exploit a variety of different habitats, and to be so successful in living in proximity to human settlements.

3. Patterns and contexts of human- *Macaca fascicularis* interaction

Agustin Fuentes
Department of Anthropology,
University of Notre Dame, Notre Dame, IN, USA

In many cases macaques and humans co-exist and interact in a myriad of ways, ranging from competitive to commensal to mutualistic. In particular, the genus Macaca appears to be the most successful of the non-human primates in anthropogenic ecologies. To date studies focusing specifically on macaque-human interactions have been undertaken at Padangtegal, Bali, Indonesia; the Gibraltar Upper Rock Nature Reserve, Gibraltar; Upper Thomson Road and Upper Pierce Reservior, Singapore, and Mt.Emei, China. *Macaca fascicularis* has been the focal species in two of these projects (Bali and Singapore).

Interactions between macaques and humans in Bali vary from active provisioning to tolerance to conflict, with conflicts frequently involving physical contact and aggression by both the macaques and humans. In Singapore, conflicts are relatively infrequent and rarely involve contact aggression. The monkeys are primarily found in forested reserves and on forest/urban edges, are not marketed as a tourist attraction, and the National Parks Service makes a concerted effort to educate the public in regards to interactions with the macaques. The macaques of Singapore are not provisioned by the government or an agency but are able to feed from the substantial forest resources found in Singapore and often forage in urban areas near the reserves, occasionally leading to human-macaque conflict. In all interaction studies to date macaques were significantly more likely to interact with humans when food is present.
This suggests that food presence, or potential access to food, may be a prime instigator of macaque-human interaction. In this brief presentation I will provide an overview of the current state of affairs in macaque-human interaction studies with a focus on *M. fascicularis* datasets.

4. A preliminary study on human and primate conflict In Yogyakarta Province, Indonesia

A. Setiawan, D.W.Purnomo, Subeno, S.Nurvianto
Research Division, Wildllife Laboratory, Faculty of Forestry,
Gadjah Mada University, Yogyakarta, Indonesia

Surveys were conducted during a week in the dry season of 2007 to study human-*Macaca fascicularis* conflict in around Yogyakarta province. We have found four locations of conflict between humans and long-tailed macaque. The first locations were found in the karst habitat of Gunung Kidul regency, primarily in Saptosari and Paliyan sub-district. Two other locations were identified. One in the mountain habitat in Kulonprogo, and other in the foot hills of Merapi volcano. Based on our findings, there are different factors causing human-macaque conflict in each area. In the karst habitats of Gunung Kidul and Kulonprogo, human and macaque conflict appears to be the result of habitat destruction due to encroachment and illegal logging of the areas natural habitat. In Mt.merapi, conflicts may be the result of habitat disturbance caused by eruption activity.

5. Long-tailed macaques (*Macaca fascicularis*) as an agricultural threat in Java, Indonesia

Entang Iskandar[1], Randall C. Kyes[1,2], Joko Pamungkas[1]
[1]Primate Research Center, Bogor Agricultural University,
Bogor, West Java, Indonesia
[2]Dept. of Psychology & Washington National Primate Research Center,
University of Washington, Seattle, WA, USA

The long-tailed macaque (*Macaca fascicularis*) has been labeled a weed species for its invasive nature, capable of adapting to a wide variety of habitats both in and outside its natural range, including secondary and disturbed forest. Over the past several years, there has been increasing discussion both nationally and internationally regarding the growing conflict between humans and long-tailed macaques and the need to develop more effective management programs to help resolve the conflict. In Indonesia, the species has been reported as a crop raiding nuisance by rural farmers in Java, Sumatera, Kalimantan and is seen as an environmental threat to the indigenous biodiversity in Papua (Irian Jaya). Observations of long-tailed macaques at some conservation areas in Java have shown that the species prefers to live in secondary forest that is connected to agricultural plantations, often foraging on crops in the plantations. This is not unexpected, however, given the increasing loss of their natural habitat due to logging and habitat conversion. As the species is forced into increasing proximity with human settlement, the potential for significant economic loss to the local farmers increases. Specific cases of crop raiding by long-tailed macaques have been reported in recreation areas in Cisarua and at Gunung Simpang Nature Reserve in West Java; Nyemani village in Jogjakarta, Central Java; and Situbondo, East Java. This species is not only exploiting crops, such as banana, corn, and rice paddy, but also has been reported as taking chicken eggs in Situbondo. There is a critical need to establish effective management strategies for the *M. fascicularis* that will ensure the conservation of natural populations while minimizing its negative impact on the environment and economy.

6. Human-long-tailed macaque conflict in the Malay Peninsula: Types of pest behavior.

Badrul Munir Md-Zain, Mastura Mz, Sia Wh, Abdullah M, Wan Ms, & Inche-Ali Ca
School of Environmental Science and Natural Resources,
Faculty of Science and Technology,
Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

We have conducted several surveys on the pest behavior of the long-tailed macaques (*Macaca fascicularis*) in several sites in Malay Peninsula since 2003. The surveys included selected sites such as local human residential areas, recreational parks and university campus. Scan sampling was employed as the method of observation. Our results showed that there were many types of pest behaviors caused by long-tailed macaques. The most observed behavior were garbage raiding, littering, disturbing people, breaking into houses, cafeteria and college residential rooms to steal food. There were also several cases in which macaques attacked and bit people or damaged property. From questionnaires, most respondents have negative perception towards long-tailed macaques. They considered long-tailed macaques as a serious pest that causes many problems in their residential areas. Management solutions were required and most respondents wanted any immediate actions to overcome the pest problem.

7. Human-primate conflict in an urban context - the Singapore experience

Benjamin P. Y-H. Lee [1,2]
[1]*Durrell Institute of Conservation and Ecology, Department of Anthropology,*
University of Kent, Canterbury, United Kingdom.
[2]*Central Nature Reserve, Conservation Division,*
National Parks Board, Singapore.

Human-primate conflicts occur in numerous landscape and environmental contexts and each context is unique. In Singapore, the long-tailed macaque (*Macaca fasicularis*) is the only common non-human primate species on the urbanized island and some 1300 individuals are found both within nature reserves and in unprotected forest remnants. There has been much publicity about human-primate conflicts in this island city-state in the past few years but what is the extent of this conflict and how serious has it become? This talk will present an overview of the human-macaque conflict in Singapore and discuss the challenges facing the long-term conservation of long-tailed macaques in a highly urbanized environment.

8. Current situation and status of long-tailed macaques (*Macaca fascicularis*) in Thailand: drastic change in habitat environment and management philosophy and policy.

Suchinda Malaivijitnond[1], Yuzuru Hamada[2]
[1]Primate Research Unit, Department of Biology,
Faculty of Science, Chulalongkorn University, Bangkok, Thailand.
[2]Section of Morphology, Primate Research Institute,
Kyoto University, Inuyama, Japan

In Thailand long-tailed macaques (*Macaca fascicularis*) are the most frequently encountered primates. Though they are currently categorized by IUCN as low risk of extinction, the local populations are threatened by habitat fragmentation or loss, and by the loss of genetic diversity and uniqueness. As management measures are urgently needed, we assessed the present status of long-tailed macaques through the questionnaire and field surveys. We have located 80 populations, ranging from the lower northern and northeastern (ca. 16°30' N) to the southernmost parts (ca. 6°30' N) of Thailand. Though the majority of them are descendants of those reported 30 years ago (Aggimarangsee, 1992; Fooden, 1995), their habitats have been greatly altered from the natural forests to the human settlements (mainly temples and recreation parks). Within altered habitats, vegetation is too scanty for foraging and they are almost dependent on provisioning. Without any predators, being provisioned and limitation of habitat, long-tailed macaques have become over-populated in many localities; average ca. 200 individuals/locality and greater than 1,000 in some populations. By these reasons, human-macaque conflicts have occurred in some localities and the local authorities tended to take short-term management measures, e.g., translocation and contraception, which did not always ameliorate the situation. As most of Thai people are Buddhist, their attitude to macaques is mild (not hostile, do not kill the animals especially inside the temple), however, they have not realized the situation change and the importance of management of macaque population. Based on our survey, macaques are at the low risk of extinction, they should be conserved with sound management to maintain their "wildness" (dignity). Each of local populations does possess morphological, genetic and behavioural uniqueness. The philosophy of conservation, a fundamental of management plans and conservation strategies, should be publicly established.

9. Impact of overpopulation of *Macaca fascicularis* toward humans in Thailand

Nantiya Aggimarangsee
Department of Biology, Faculty of Science
Chiang Mai University, Chiang Mai, Thailand

After the survey for semi-tame colonies of macaques in temples, monasteries and public parks all over Thailand during 1989-1991 was made, the monkey colonies have been monitored for more than 15 years. The monitoring was made by visiting the sites for direct observation and also via media such as radio, television and newspaper. Although some colonies of *Macaca fascicularis* have already extirpated but a number of colonies dramatically have increased the size. This remarkable instance raised questions of why the population has increased when the natural habitat decreased. One of the answers was because of Thai culture that strongly influenced by Buddhism and animism. Tourism was another factor especially when infrastructure of the country had improved since in 1990s. Overpopulation of this monkeys had caused several impacts to humans both local people and tourists. Many communities

considered the monkeys as nuisances, crop-raiders and robbers, etc. Nearly none of Thais, especially physical doctors or veterinarians really know about disease transmission between humans and monkeys. The basic treatments after biting were only giving vaccination for tetanus and rabies. Therefore, understanding and proper managing the monkey's population along with educating human communities are needed urgently.

10. Trade and trafficking of *Macaca fascicularis*.

Ardith A. Eudey
IUCN/SSC Primate Specialist Group
Upland, CA, USA.

Trade and illegal trafficking are growing threats to *Macaca fascicularis*. In June 2007, for example, the former government of Peninsular Malaysia, amid accusations of corruption, temporarily lifted a 23-year-old ban on the export of macaques in a purported, but successfully contested, effort to control urban monkeys by exporting them for research and human consumption to China, where the species is not native. The greatest threat to the species appears to be in Cambodia however, where in 2003-2004, the Ministry of Agriculture, Forestry and Fishery (MAFF) began to grant to Chinese entrepreneurs harvest permits for monkey farms to breed *M. fascicularis* for export to China and, directly or indirectly, the USA NGO observers have questioned whether the Cambodian monkey farms are breeding macaques or illegally buying and selling them.

The US Fish and Wildlife Service records a significant increase in imports of *M. fascicularis* from 17,214 in 2004 to more than 24,000 annually during 2005-2007. During 2004-2006, Cambodia exported 23,000 *M. fascicularis* to China and more than 17,000 as of November 2007. In turn, China was responsible for more than half of all monkeys imported into the United States in 2006 and 2007. Impetus for this trade may be twofold: (1) "Project Bioshield", signed into US law in 2004, to encourage, with a budget of $5.6 billion, the development of vaccines or other products to counter biowarfare; and (2) outsourcing of experimentation and testing on primates to China and the associated growth of joint ventures.

11. Crop raiding in *Macaca nigra* – another macaque example and a possible solution from Sulawesi

Antje Engelhardt[1,2] & Dyah Perwitasari-Farajallah[2,3]

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Crop-raiding by monkeys typically incites human-monkey conflict. It is particularly common in the macaque genus since most of its species show an extremely high degree of flexibility in feeding ecology. In Indonesia, a developing country which is home to almost half of all macaque species worldwide (most of them endemic), crop-raiding may significantly affect crop yield and as a consequence, nutrition of people living in proximity to macaques. At the same time, perception of wildlife by villagers is negatively affected by the loss of food. Thus,

crop-raiding can seriously counteract conservation efforts and as such is a particularly important problem around protected forests. Here, we present cases of crop-raiding by *Macaca nigra* in villages surrounding the Tangkoko-Batuangus Nature Reserve, North Sulawesi, Indonesia. Observations have been made during daily follows of groups of *Macaca nigra* as part of the Macaca Nigra Project, a non-commercial collaborative project of the German Primate Centre, the Bogor Agricultural University and the University Sam Ratulangi Manado, Indonesia. This project is dedicated to the study of the biology of *Macaca nigra* and to the promotion of its conservation. We will present a possible solution against crop-raiding by macaques and the problems connected to it.

12. Consequences of urban commensalism of rhesus macaques in India.

Charles H. Southwick and Heather M. Southwick
Department of Ecology and Evolutionary Biology,
University of Colorado, Boulder, CO, USA

Rhesus commensalism in some cities of India has developed unfavorable consequences for both monkeys and humans. In New Delhi attacks on people resulting in death in a few rare cases, have produced public fear and resentment of monkeys. Rhesus groups have been harrassed, broken up, and subjected to trapping and removal efforts. A once favorable and beneficial relationship that existed in many parks and public areas is now one of antagonism and potential violence. This change from a peaceful and enjoyable mutualism to a belligerent and hostile association seems to originate in several trends: rapid population growth of both monkeys and people, excessive and unwise feeding practices for monkeys sometimes accompanied by teasing, and, of course, the strong commensal and pestiferous behavior of rhesus. Easy solutions are not clear, and are likely to be expensive, but it is evident that both macaques and people are losers in the present situation.