Niche differentiation between Common Palm Civet *Paradoxurus hermaphroditus* and Small Indian Civet *Viverricula indica* in regenerating degraded forest, Myanmar

SU SU[1] and John SALE[2]

Abstract

In Hlawga Wildlife Park, Myanmar, a 624 ha protected area consisting of degraded mixed deciduous forest and shrubland, Common Palm Civet *Paradoxurus hermaphroditus* greatly outnumbered Small Indian Civet *Viverricula indica*. Both species were solitary and nocturnal, occupying secluded resting sites during daytime. *Paradoxurus* resting sites were typically (92%) high in the dense canopy of tall (> 10 m) forest trees; those of *Viverricula* (99%) were at the ground level in a dense tangle of shrubbery. The activity level of *Paradoxurus* rose steadily during and following sunset, then remained on a plateau from 19h30 to 03h00, after which there was a steady decline towards dawn. *Viverricula* was relatively inactive following sunset but showed major peaks of foraging activity between 19h30 and 22h00 and again from 00h30 to 03h00. Mean distances moved per night were similar (*P. hermaphroditus*, 212 m; *V. indica*, 232 m). Faecal analysis showed *P. hermaphroditus* to take between 8 and 21 species of fruit per 2-month period throughout the year, with little seasonal fluctuation in total intake. Very small amounts of vertebrate and invertebrate remains were found in *P. hermaphroditus* faeces. A large percentage of *V. indica* faeces contained vertebrate and invertebrate fragments year-round, with a pronounced peak during July/August, corresponding to an abundance of arthropods and relative scarcity of fruits; the latter were taken in very small amounts by this species in some seasons. The most frequently selected fruit and prey species were the same for both civets. The niche of *P. hermaphroditus* in Hlawga can be defined as that of a solitary, nocturnal frugivore, resting, feeding and spending most of its time in the canopy of mixed deciduous forest. The niche of *V. indica* is that of a solitary, nocturnal predator of small vertebrates and arthropods, that forages widely at ground level in different habitat types and rests during daytime in dense shrubbery near the ground.

Keywords: diet, ecological overlap, fire, habitat use, Southeast Asia

Introduction

The family Viverridae includes 18 genera and 34 species (Wozencraft 1989) and shows more ecological diversification in trophic specialisation and substrate use than does any other family of carnivores (Eisenberg 1981). There is a wide dietary range including vertebrates, invertebrates, flowers, and fruits. Despite the many species of viverrrids and their wide distribution throughout the old world tropics, the basic biology of most species is known largely from unsystematic field observations and captive studies, with rather little quantitative ecological information on Asian civets (e.g., Joshi *et al*. 1995, Rabinowitz 1991). Carnivores, including some viverrids, are threatened by habitat degradation and illegal killing in at least some parts of Asia (e.g., Johnsingh 1986). Hence, a study of the ecology and threats to the small carnivore community in Hlawga Wildlife Park, Myanmar (formerly Burma) was carried out between 2000 and 2003. A total of seven small carnivore species was encountered, including three civets (one found only by an evidently released animal), two mongooses and two small cats (Su Su 2005). The present contribution reports on the relative abundance, diel activity, habitat use, nature and location of resting sites, and feeding ecology of the two most numerous small carnivores in Hlawga, Common Palm Civet *Paradoxurus hermaphroditus* and Small Indian Civet *Viverricula indica*. Information on these aspects of the two species' ecology provides an insight into the way in which their respective niches are differentiated. It also reveals aspects of their ecology which may render them vulnerable to human impacts on the Hlawga ecosystem. Under Myanmar conservation legislation, all members of the family Viverridae are accorded at least "protected" status (= all-year protection from any form of harvest or killing), while *V. indica* is "totally protected" (= all-year protection from any form of harvest or killing with especially high penalties).

Study Area

Hlawga is a 624 ha protected area, constituted in 1982, 35 km north of Yangon at 17°02'–04'N, 96°05'–08'E. It is surrounded by a large rural population housed in 17 villages and two military camps. A central core area of 327 ha is separated by a 2-m high chain-linked fence from a surrounding buffer zone and a public highway along the southern boundary. The core area contains undulating terrain, with streams and lakes, covered by secondary mixed deciduous forest consisting of fairly tall trees bearing a variety of creepers and climbers, interspersed with a few small patches of rattan cane. The buffer consists of degraded forest from which most large trees have been removed and has a mosaic of dense patches of small trees (including planted exotics) and shrubs, separated by grass and herbaceous ground cover. A monsoon climate defines three distinct seasons: a rainy season from mid-May to October; a cool 'winter' from November to February and a hot season during March and April. Over the three-year study the mean annual rainfall was 210 cm; the mean maximum and minimum temperatures throughout the study period were 32.8 ºC and 22.4 ºC respectively, the extremes being 37.5 °C in April and 17.7 °C in January.

In addition to the seven species of small carnivores, the core area contains four species of deer, Eurasian Wild Pig *Sus scrofa*, and a large and increasing population of Rhesus Macaques *Macaca mulatta*; no large carnivores are present. A variety of small mammals including rats and mice, two species of squirrel, a treeshrew *Tupaia* and bats are present. The known avifauna comprises 147 forest and shrubland species and 34 species of waterfowl, including migrants (Khin Swe Win 2003), and many more species no doubt occur. Reptiles include monitor lizards *Varanus* sp(p)., smaller lizards and various snake species; anuran amphibia are abundant in the vicinity of the water bodies that also contain many species of freshwater fishes. Arthropods abound, including

ants, termites, Orthoptera, Coleoptera, millipedes, centipedes and scorpions.

Methods

Abundance and distribution data on the target species were gathered from observations using a spotlight at night and systematic recording of signs (footprints, faeces and resting sites). Camera-traps (Cam-Trak South Inc., Georgia, USA) were deployed over fortnightly periods at random locations along trails throughout the core area from September 2000 to October 2002 (total 783 trap nights). Live traps (wire mesh: 63 × 20 × 20 cm) were also placed randomly to sample small carnivores.

Habitat use (home range; distances moved) information was obtained from a small number (*P. hermaphroditus*, eight; *V. indica*, two) of radio-collared individuals (164–166 MHz; Biotrack, UK) located at 1–3 day intervals using a hand-held receiver and Yagi antenna (Telonics TR2, Arizona, USA). Overnight locations at 2.5-hour intervals yielded data on nocturnal activity patterns. All location points were recorded as UTM by G.P.S. (Garmin International Inc., Kansas, USA) and analysed by ArcView 3.3 software (Environmental Systems Research Institute, California, USA).

Seasonal availability of flowers and fruits, as a potential food source, was estimated by monthly phenology recording. Observations on the relative abundance of potential prey, in the form of small vertebrates and arthropods, were recorded regularly and seasonal fluctuations noted. A more precise estimate of small mammals available was obtained by systematic live-trapping.

Diet was assessed by monthly analysis of faeces collected throughout the study period. Faeces were identified to species as described in Su Su (2005). They were first assessed with the naked eye or a magnifying glass. Dry faeces were then broken up and, after removing discrete fragments with forceps, passed through a fine sieve to remove unwanted particles. Wet faeces were rinsed several times with a formalin: ethyl alcohol: acetic acid (2:1:1) solution, pouring off unwanted particles. Identifiable fragments (seeds, bones, hairs, etc.) were put into a Petri dish for grouping by taxa and checking against a previously prepared reference collection of identified seeds (Hundley & Chit Ko Ko 1961, Hundley 1987, Kress *et al*. 2003), arthropod parts and mammalian hairs, bones and teeth (Lekagul & McNeely 1977, Mukherjee 1998). Each sample was scored for presence or absence of food items on the list of identifiable fragments and then all fragments were counted to establish proportions in the monthly samples for each species.

Results

Relative abundance and distribution

The apparent 'relative abundance' of the two civets in Hlawga varied, based on the four major types of evidence collected (Table 1). Ratios of *P. hermaphroditus* : *V. indica* range from 5.5:1 to 19.1:1, indicating *P. hermaphroditus* as the more abundant of the two species. The locations of records indicate that both species are widely distributed within the park, with *V. indica* occurring in the buffer zone much more frequently than does *P. hermaphroditus*. Home ranges based on daytime resting site locations of radio-tagged individuals showed that *P. hermaphroditus* remained in the mixed deciduous forest except for a mean 8% seasonal use of the buffer zone shrubland. By contrast, *V. indica* resting sites were 99% in the shrubland but with night-time foraging in both habitat types. Both species were solitary, the only social grouping observed being that of a family of Common Palm Civets (Su Su 2005).

Activity patterns

Activity levels, as determined from radio-telemetry, showed both species to be totally nocturnal, strictly resting during daylight hours and foraging at night. Table 2 shows the pattern of night-time foraging movements of radio-tagged individuals obtained by recording each animal at approximately 2.5-hour intervals between dusk (about 17h00) and dawn (about 05h30). In the case of *P. hermaphroditus*, activity built steadily from dusk to a plateau between 19h30 and 03h00, after which it declined gradually until dawn. Conversely, *V. indica* showed relatively little movement during and immediately following dusk (17h00–19h30) but major activity from 19h30 to 22h00 and again between 00h30 and 03h00, tailing off fairly rapidly as dawn approached. There was little difference between the mean total distances moved during the hours of darkness by the two species (*P. hermaphroditus* 212 m; *V. indica* 232 m). However, as indicated above, movements of *P. hermaphroditus* were largely confined to the forest habitat, while those of *V. indica* embraced the shrubland habitat as well.

Resting sites

For their day-time resting sites *P. hermaphroditus* normally selected tall (>10 m) forest trees which have a dense tangle of climbing plants, such as lianas, in the canopy. Out of 279 resting sites observed, 42% were in *Dipterocarpus alatus* Roxb. and 15% in *Crypteronia pubescens* Blume, both of which trees are frequently over 40 feet (12 m) tall. In the buffer zone shrubland, where there are very few tall trees, *P. hermaphroditus* rested in a tangle of shrubs (sometimes surrounding a small tree) as little as 2 – 3 m above the ground. For example, 7% of all resting sites were in a complex of shrubs surrounding small *Plectocomia macrostachya* Kurz trees. The majority of resting sites were not in tree species that provide *P. hermaphroditus* with flowers and fruits, but *P.*

Table 1. Relative abundance of P. hermaphroditus *(CPC) and* V. indica *(SIC) shown by four main methods of detection.*

	Numbers		Ratio	
Method	**CPC**	**SIC**	**CPC**	**SIC**
Footprints	2499	146	17.1	1
Faeces	2373	124	19.1	1
Camera trapping	160	29	5.5	1
Spotlighting	128	16	8	1

Table 2. Comparison of P. hermaphroditus *and* V. indica *consecutive night-time foraging distances over five time periods.*

	P. hermaphroditus		***V. indica***	
Time periods	**n**	**Mean distance moved (m)**	**n**	**Mean distance moved (m)**
17h00–19h30	98	150.79	17	39.71
19h30–22h00	98	225.87	17	414.55
22h00–00h30	98	258.58	17	237.24
00h30–03h00	98	251.43	17	341.64
03h00–15h30	98	175.79	17	124.91

macrostachya is an exception to this. Generally the animal simply slept hidden in the centre of the densest part of the canopy or shrubbery without any apparent modification of its surroundings. However, in a few cases twigs and leaves appeared to have been pulled together to form a spherical 'nest' in high canopy. About 45% of resting sites were used once only and the highest number of repeat uses of a single site by an individual was 55 (over a period of 294 days). *Viverricula* resting sites were normally at or only a little above ground level within the cover of extremely dense shrubbery. Some 68% of sites were located in a dense tangle of shrubs surrounding a *P. macrostachya* tree. Unlike *P. hermaphroditus*, *V. indica* only eats the fruit of this tree only occasionally. A shrub complex consisting of *Licuala peltata* Roxb., *Pandanus wallichianus* Martelli and *Plectocomia* sp. accounted for a further 16% of *V. indica* resting sites. *Viverricula* occasionally rested in a hole in the ground, such as a cavity formed by earth movements resulting from heavy rain. Both tagged *V. indica* used 60% of their resting sites only once and the greatest number of repeat uses of a single site was 15 (over a period of 250 days). *Viverricula* showed a greater mean distance moved between consecutive resting sites per 24 hours (214 m) than *P. hermaphroditus* (160 m), a ratio of *V. indica* : *P. hermaphroditus* = 1:0.75.

Feeding ecology

Phenology records obtained over 17 months revealed 42 species of trees, shrubs, and climbers in Hlawga that produced a profusion of flowers and fruits. Of these, seven species bore flowers or fruits for 10–12 months each year. Between 16 and 34 species were available in any one month, with a major peak during December to February and a minor peak in September. Availability was lowest between June and August at the height of the rainy season.

Field records of potential prey showed a year-round occurrence of small vertebrates, including murid rodents and squirrels, birds, lizards and snakes, and anuran amphibians. Invertebrate prey, such as millipedes, scorpions, and crickets, are subject to seasonal fluctuations in numbers. Some 1041 trap nights, using banana as bait, produced only squirrels *Callosciurus*, of which 105 were trapped, confirming their availability as potential prey for small carnivores.

The faeces of *P. hermaphroditus*, often consisting of a pale gelatinous mass containing undigested fruits and seeds, were frequently found on trails and clear patches of forest floor. The faeces of *V. indica* varied in size but were basically cylindrical with tapering ends. They were dark in colour, smelly and contained hairs, bone fragments and arthropod remains (often relatively intact), as well as a few seeds. From September 2000 to May 2003, 2373 *P. hermaphroditus* and 124 *V. indica* faeces were collected and analysed.

Fruits and/or seeds from 31 plant species were identified (plus a small number which remained unidentified) in the faeces of the two civets. The distribution of the ten most frequently eaten species between the two, on a 2-monthly basis, is shown in Table 3. *P. hermaphroditus* ate a variety of fruits throughout the year, varying from eight to 21 species per 2-month period. The percentage of *V. indica* faeces containing fruits was much lower, with no evidence of fruit during July/August and November/December. For the remaining periods, between two and four species were recorded per 2-month period. The most commonly eaten fruits by both civets were of a climbing plant, *Gnetum scandens* Roxb., which formed a high percentage of fruits eaten in all 2-month periods in which fruits were taken by respective species. The highest percentage of faeces containing this fruit was 95% (January/February) for *P. hermaphroditus* and 19% (May/June) for *V. indica*.

In all seasons, a much greater percentage of *V. indica* faeces contained animal remains than those of *P. hermaphroditus* (Table 4). The first four items listed appeared in a mean 32% of *V. indica* faeces year-round and in only 2.5% of *P. hermaphroditus* faeces. However, both civets are consuming similar prey and the numbers of species eaten during respective 2-month periods are similar, being greatest in January/February (*P. hermaphroditus,* 7; *V. indica,* 9) and least in November/December (*P. hermaphroditus,* 3; *V. indica,* 4). Fruit was the dominant type of food consumed by *P. hermaphroditus* year-round, with very little fluctuation. The intake of animal prey by this species is low throughout the year, being almost zero from March to August. Conversely, *V. indica* shows a high intake of prey throughout the year, with a pronounced peak in species fragments during the wet months July/August when

Table 3. Percentages of faeces of P. hermaphroditus *(CPC) and* V. indica *(SIC) containing fruits/seeds of the ten most commonly eaten plant species, with a summary based on all 31 species identified.*

	Jan/Feb		Mar/Apr		May/Jun		Jul/Aug		Sep/Oct		Nov/Dec	
Plants	**CPC**	**SIC**	**CPC**	**SIC**	**CPC**	**SIC**	**CPC**	**SIC**	**CPC**	**SIC**	**CPC**	**SIC**
Gnetum scadens	95	9	78	4	47	19	46		25		32	
Plectocomia macrostachya			4		13		45		21	4	11	
Grewia microcosm L.	2		<1		7		9		39	8	29	
Wallichia disticha T. Anderson			<1		8	5	10		3			
Licuala peltata			1		15							
Uvaria macrophylla Roxb.	3		1						4		25	
Bridelia burmanica Hook. f.			5		3						3	
Pandanus wallichianus Martelli			1		4		1		<1			
Ficus religiosa L.	3	9	2				<1				3	
Carallia brachiata Merr.	1	9	2	4			1				1	
Number of faeces	317	23	592	23	376	21	673	17	321	24	94	16
Total number of single species fragments in faeces	343	8	601	2	400	7	757	0	317	4	99	0
Number of species in faeces	9	4	21	2	20	4	10	0	13	3	8	0
Number of species fragments / Number of faeces (%)	108	35	102	9	106	33	112	0	99	17	105	0

Table 4. Percentages of faeces of P. hermaphroditus *(CPC) and* V. indica *(SIC) containing fragments of the six most commonly eaten prey, with a summary based on all prey categories identified.*

Item fragments	Jan/Feb		Mar/Apr		May/Jun		Jul/Aug		Sep/Oct		Nov/Dec	
	CPC	SIC	CPC	SIC	CPC	SIC	CPC	SIC	CPC	SIC	CPC	SIC
Jullus remains	5	35	<1	17	3	19	1	82	8	42	13	38
Bones & hair (*Rattus*)	1	39	1	57	3	52	<1	41	3	21		13
Scorpion remains	2	35	<1	35	1	10	1	47	3	17	11	44
Insect remains (unidentified)	<1	17	1	30		38	1	35	1	4		
Gryllus remains				4	<1	5	1	29	6	13	8	19
Bird feather	<1	4	<1	9								
Number of faeces	317	23	592	23	376	21	673	17	321	24	94	16
Total number of single species fragments in faeces	31	34	14	35	29	28	45	38	71	25	29	18
Number of species in faeces	6	8	5	6	5	6	5	5	8	7	3	4
Fragments / number of faeces (%)	10	148	2	152	8	133	7	224	22	104	31	113

millipedes *Jullus*, scorpions, and crickets *Gryllus* are abundant. A small amount of fruit was taken during most seasons except in July/August, when fruit is relatively scarce, and during November/December.

Discussion

All methods of recording *P. hermaphroditus* and *V. indica* in Hlawga point to the population of the former being at a much higher density. This could be predicted by the diets of the two species, with the largely frugivorous *P. hermaphroditus* showing the relatively high density of a herbivore with an abundant food resource and *V. indica* a much lower density typical of a predator that forages widely on a seasonally fluctuating food supply.

Results from radio-tagged individuals show the two species to use their shared mixed deciduous forest and shrubland habitats in largely different ways. *P. hermaphroditus* found most of its year-round needs of food and shelter in the tall trees of the forest habitat, except for limited (8%) seasonal use of the shrubland. *V. indica*, by contrast, foraged widely in both habitat types but spent 99% of its day-time resting hours in the shrubland. This distinction of habitat use reflects the difference in type and location of the resting sites of the two civets. While the rather arboreal *P. hermaphroditus* preferred the security of dense canopy high above the ground, the more ground-dwelling *V. indica*, which might well be better able to defend itself against predators, selected dense cover in shrubbery near to the ground. Thus, there is limited potential competition for resting sites between the two species.

Both species foraged during the hours of darkness. There was little difference between their respective periods of major activity, both being most active between 19h30 and 03h00. However, that *V. indica* showed little activity during the sunset twilight (17h00–19h30) may indicate a need for complete darkness before successful predation, especially on vertebrates, can be readily achieved. It may also reflect a fear of meeting humans wandering around during this period. There is a sharp distinction between the storeys at which most of the foraging of the two species takes place. While the largely fruit diet of *P. hermaphroditus* is obtained high above ground level from tall fruiting trees and climbers, the majority of *V. indica* food is available at ground level, except potentially for limited seasonal intake of the same fruit species as consumed by *P. hermaphroditus*. Even so, it is possible that at least some of this is ripe fruit which has fallen to the ground. Because fruit consumption by *V. indica* occurs during seasonal fruit abundance, it is unlikely that there is competition for this resource.

Linked to habitat use and foraging styles, the respective diets of these two small carnivores show their niche differentiation clearly. Although both species are in a strictly literal sense omnivorous, *P. hermaphroditus* is predominantly a frugivore, and *V. indica* is primarily a predator of small vertebrates and arthropods. It seems, however, to minimise the amount of energy required for hunting by selecting opportunistically both animal and plant food items, such as arthropods and fruit, during seasons of local abundance. This is most clearly illustrated by the large peak in mainly millipede remains in its faeces during July/August when fruit is relatively scarce and is not eaten at all. Conversely, prey remains are at a low in September/October when advantage is taken of a brief peak in fruit availability. While both species of civet tend to feed on some of the same plants and many of the same animal species, the limited intake of animal items by *P. hermaphroditus* and the fact that increases in the normally low level of fruit intake by *V. indica* are confined to periods of seasonal fruit abundance suggests there is little competition for food during any season.

Hence the niche of *P. hermaphroditus* in Hlawga can be summarised as that of a small, solitary, nocturnal frugivore which mostly feeds and rests in the canopy of trees typical of mixed deciduous forest, in which habitat type the population spends the great majority of its time. The niche of *V. indica* is different, being that of a small, solitary**,** nocturnal predator on small vertebrates and arthropods, that forages widely in different habitat types at ground level and seeks daytime shelter in dense vegetation near to the ground.

The lifestyle of *P. hermaphroditus* might render it vulnerable to the cutting of forest trees for timber or fuelwood, which reduces both its daytime shelter and its food supply. *V. indica*, on the other hand, is vulnerable to the seasonal burning of shrubland that destroys its resting sites and the ground cover that facilitates its hunting, particularly of small vertebrates. Both vertebrate and invertebrate prey species are killed by large-scale fires, so that *V. indica* food supply in the shrubland habitat is seasonally depleted. Conservation management in relation to both these small carnivores thus should enforce measures (already legally in place) aimed at minimising illegal felling of trees and burning of shrubland, both of which are prevalent in Hlawga Wildlife Park in spite of its status as a protected area.

Acknowledgements

The senior author wishes to express her thanks to the Division of Nature and Wildlife Conservation, Forest Department for permission to work in Hlawga and for logistic assistance, and to the Wildlife Conservation Society International and Myanmar Programs, notably Saw Tun Khaing, Than Myint and Alan Rabinowitz, for financial support, the lending of camera-traps, and advice and discussion. Women in Conservation, UK provided radio-collars and a radio receiver was lent by the Smithsonian Institution. This author is grateful to Dr Soe Yin, Rector of the University of Yangon, and Professor Tin Nwe, Zoology Department, University of Yangon, for their encouragement. Chris Wemmer and Peter Leimgruber from Smithsonian Institution, who shared their knowledge, are also gratefully acknowledged. The junior author acknowledges financial assistance for visits to Myanmar from ITTO and the Third World Academy of Sciences.

References

Eisenberg, J. E. 1981. *The mammalian relations: an analysis of trends in evolution, adaptation, and behavior*. University of Chicago Press, Chicago, USA.

Hundley, H. G. & Chit Ko Ko 1961. *List of trees, shrubs, herbs and principal climbers etc. recorded from Burma with vernacular names*. Third, revised and enlarged edition. Supdt, Govt Printing and Staty, Union of Burma, Rangoon.

Hundley, H. G. 1987. *List of trees, shrubs, herbs and principal climbers etc. recorded from Burma with vernacular names* by Hundley, H.G. and Chit Ko Ko 1961. Fourth edition. Forest Department, Rangoon.

Johnsingh, A. J. T. 1986. Diversity and conservation of carnivorous mammals in India. *Proceedings of the Indian Academy of Sciences, Animal and Plant Sciences Supplement* November: 73–89.

Joshi, A. R., Smith, J. L. D. & Cuthbert, F. J. 1995. Influence of food distribution and predation pressure on spacing behavior in palm civets. *Journal of Mammalogy* 76: 1205–1212.

Kress, W. J., DeFilipps, R. A., Farr, E. & Yin Yin Kyi 2003. *A checklist of the trees, shrubs, herbs, and climbers of Myanmar*. Smithsonian Institution, Washington, DC.

Lekagul, B. & McNeely, J. A. 1977. *Mammals of Thailand*. Association for the Conservation of Wildlife, Bangkok (1988 reprint).

Mukherjee, S. 1998. *Habitat use by sympatric small carnivores in Sariska tiger reserve, Rajasthan, India*. Wildlife Institute of India, Saurashtra University (PhD thesis), Rajkot, Gujarat.

Rabinowitz, A. R. 1991. Behaviour and movements of sympatric civet species in Huai Kha Khaeng wildlife sanctuary, Thailand. *Journal of Zoology, London* 223: 281–298.

Su Su 2005. Small carnivores and their threats in Hlawga wildlife park, Myanmar. *Small Carnivore Conservation* 33: 6–13.

Wozencraft, W. C. 1989. The phenology of the recent Carnivora. Pp. 495–535 in Gittleman, J. L. (ed.) *Carnivore behaviour, ecology and evolution*. Cornell University Press, Ithaca, New York, USA.

[1] Zoology Department, Yangon University, Myanmar

Present address:
Department of Zoology, Myeik University, Myeik, Taninthayi Division, Myanmar.
Email: susurosie@mptmail.net.mm

[2] Fach Gynan, Moelfre, Oswestry, SY10 7QP, U.K.
Email: johnsale@aol.com

Announcement

25th Mustelid Colloquium, 4 -7 0ctober 2007, Trebon, Czech Republic

Czech Otter Foundation Fund and Agency for Nature Conservation and Landscape Protection of the Czech Republic.
With the support of the Ministry of the Environment of the Czech Republic.
With the auspicies of the Mayor of the Town of Trebon.

We would like to invite you to attend the 25th Mustelid Colloquium. The meeting will be held at Trebon in South Bohemia (Czech Republic) from October 4th - 7th 2007 and it is co-organised by the Czech Otter Foundation Fund and the Agency for Nature Conservation and Landscape Protection of the Czech Republic.

The conference is open to everyone with an interest in the Family Mustelidae and this year for the first time also for those interested in the Raccoon Dog. Scientists, students, conservationists, both, professionals or volunteers, are welcomed. Plenary and poster sessions will cover various aspects of ecology, behaviour, biogeography, genetics, physiology, population and habitat management, and conservation biology related to the above mammals. Additionally there will be a series of workshops and/or round tables on various topics which will be specified latter.

Additional information can be found at www.mustelid2007.org.