NAT. HIST. SIAM SOC. 41 : 23–30, 1993

IDENTIFICATION OF TRACKS AND OTHER SIGN OF THREE SPECIES OF OTTER, *LUTRA LUTRA, L. PERSPICILLATA* AND *AONYX CINEREA,* IN THAILAND

Hans Kruuk*, Busabong Kanchanasaka**, Sean O'Sullivan† and Sawai Wanghongsa**

ABSTRACT

The common otter *Lutra lutra,* smooth otter *L. perspicillata* and small-clawed otter *Aonyx cinerea* were studied in Huai Kha Khaeng, Uthai Thani Province, Thailand. The species were identified from direct observations and photographs with automatic cameras, and we describe difference in their tracks, faeces ('spraints') and charateristics of spraint sites as methodology for further study.

INTRODUCTION

There is a great deal of concern about the decline of populations of several species of otter in many countries (FOSTER-TURLEY et al., 1990), especially since otters are often seen as indicator species for natural wetland communities. Possible causes of this decline are, amongst others, pollution, loss of habitat, and decline of numbers of prey. Despite this international concern, and despite the rapid increase of environmental pollutants in Thailand (PHANTUMVANIT & PANAYOTOU, 1990) and the disappearance of its wetlands (SCOTT, 1989), very little is known about the presence and distribution of otters in this country. The present paper aims to facilitate the identification of field sign of the different species, so as to enable field workers to increase our knowlege on the occurrence of these important but rather secretive, often nocturnal species, and to contribute to conservation management of otters.

In Thailand three species are known to occur (LEKAGUL & MCNEELY, 1977): the smooth otter *Lutra perspicillata,* the common otter *L. lutra* and the small-clawed otter *Aonyx* cinerea. There is also a small possibility of the hairy-nosed otter *L. sumatrana* occurring in the far south, but this last species will not be discussed here. Of the three confirmed otters, the original distribution of *L. lutra* in Thailand was the North and North-West of the country, whilst *L. perspicillata* occurred throughout and in the neighbouring countries, and *Aonyx cinerea* especially in West and South Thailand (LEKAGUL & MCNEELY, 1977). The presence of *L. lutra* has recently been referred to as now doubtful (FOSTER-TURLEY

* Institute of Terrestrial Ecology, Banchory, Scotland
** Wildlife Conservation Division, Royal Forest Department, Bangkok 10900, Thailand
† O'Sullivan & Sons Seafood Co., Pascagoula, MS 39567, USA

et al., 1990), but we found the species to be abundant in the Huai Kha Khaeng in Uthai Thani Province, West Thailand, together with the other two (KRUUK et al., submitted).

Even where otters are common, they are rarely seen, as most species are active largely at night, and dense semi-aquatic vegetation also makes direct observation difficult. However, many of the river banks, lakes or seashores have muddy or sandy areas where tracks show up well, and the highly characteristic footprints have proved to be a good means for identification, as well as for study of various behaviour patterns, social grouping, etc. (ERLINGE, 1968).

Additionally, the faeces of otters or 'spraints' make it possible to study diet (summaries in MASON & MACDONALD, 1986) and spacing behaviour related to feeding (KRUUK, 1992). Recognition of spraints from different species of otters is a prerequisite for such studies in Thailand, which may provide important data for conservation management (KRUUK et al., submitted). This paper aims to describe species differences in otter spraints, to facilitate recognition.

METHODS

In November and December 1992 a survey was carried out of the otters of the Huai Kha Khaeng Wildlife Sanctuary in Uthai Thani Province, Thailand (KRUUK et al., submitted). Observation were made of tracks in mud or sand, combined with observation on defaecation sites ('spraint sites'), and with direct observations of the animals, as well as photographs taken with automatic cameras. Three cheap, self-focus and automatic rewind cameras were placed near sites frequently used by otters. The shutter release was activated by a solenoid, powered by a 12-V battery, and triggered by the otters when they touched a concealed treadle in which a magnet activated a reed-switch.

Tracks on mud or sand banks were also identified by comparison with tracks of otters in Europe, where only one species *(L. lutra)* occurs, or after direct observation of otters which were identified visually (*L. perspicillata* and *Aonyx cinerea*). Footprints were measured with a ruler, taking the greatest width, i.e. across toes one and five, of animals which had been walking at 'normal' pace (i.e. not running), and in mud or sand in which they did not sink further than 0.5 cm deep. Care was necessary in the interpretation of combinations of field sign, such as tracks and spraints, because all three species present could visit the same sites.

RESULTS

Description of Tracks

Figure 1 shows the common otter *Lutra lutra* on a sandbank in the Huai Kha Khaeng, as an example of pictures taken with the self-releasing camera set-up; clear footprints were found on the sand the morning after the picture was taken. The species was identified from the shape of the rhinarium (LEKAGUL & MCNEELY, 1977), and overall appearance. The rhinarium of *L. perspicillata* is broader and larger (Figure 2).

Individual foot prints of the three species of otter were relatively easy to distinguish

Figure 1. Common otter *Lutra lutra* on spraint site on the bank of the Huai Kha Khaeng, taken at night with self-release camera (H. Kruuk).

Figure 2. Smooth otter *Lutra perspicillata* in the Huai Kha Khaeng, showing the characteristic broad rhinarium (T. Devakul).

Figure 3. Tracks of small-clawed otter *Aonyx cinerea*. Note absence of claw marks, long fingers and small size (B. Kanchanasaka).

Figure 4. Tracks of smooth otter *Lutra perspicillata*. Note pointed toes and claw marks, and large size (B. Kanchanasaka).

Figure 5. Tracks of common otter *Lutra lutra* (left) and the much larger smooth otter *L. perspicillata* (right). Note pointed toes, and claw mark (H. Kruuk).

from each other (Figures 3, 4 and 5). All three frequently showed five toes in each print, which characterized them as mustelids, in contrast to similarly sized viverrids, felids or canids which show only four toes. The webbing between the toes was often unclear.

The common otter *L. lutra* had clearly pointed toes, often showing the imprint of the claws in the mud or sand, and the width of individual prints, of an otter walking at 'normal' speed on sand or mud where the animal did not sink in more than about 0.5 cm, was less than 5.5 cm.

In contrast, the prints of the smooth otter *L. perspicillata* were relatively large, often more than 8 cm wide; they also showed rather pointed fingers and toes frequently with claw marks, and with relatively long fingers and toes compared with the common otter (the last digit free from the webb for about half its length).

The small-clawed otter *Aonyx cinerea* made prints less than 4.5 cm wide, with less webbing between fingers and toes than the other otters, i.e. a completely free last digit on each finger. The imprints of fingers and toes appeared to be long, therefore, with very round tips, and diagnostically never showing claw marks.

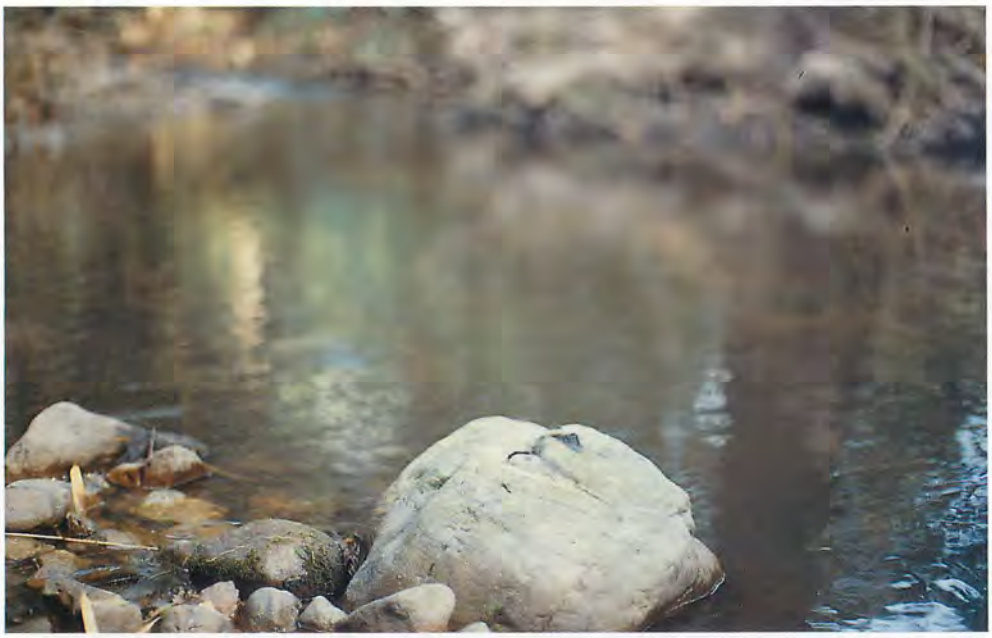

Figure 6. Spraint site of common otter *Lutra lutra* on edge of Huai Kha Khaeng. Note small size and lack of shape of scat (H. Kruuk).

Spraints and Spraint Sites

Although there were distinctions between the faeces ('spraints') of the three otter species and the sites where they were deposited, there was also large variation and overlap in appearance. To complicate matters, the three species visited and sometimes used each other's spraint sites, and other species of carnivores could also defaecate on these sites. Evidence from spraint sites should be used with caution, therefore.

The small-clawed otter fed mostly on crabs *(Potamon smithianus),* and at least in our study area crab remains dominated the spraints (Kruuk et al., submitted). The spraints were much larger than those of the other two species (although the animal is smaller), often 3 cm diameter and 8 cm long or more. Spraint sites often contained large quantities of faeces, which were conspicuous because of their crab content, and in our study area they were situated on large rocks on the bank. On 10 spraint sites where individual bolusses of spraints could be separated, six contained only one deposit, the others two or three. In 18 sites we measured distances; the spraints were all at least 0.5 m above water level, six were more than 1.5 m up, and all were 1–5 m from the edge of the water. Frequently the spraints were placed not on the highest part of the rock, but in a depression or saddle, out of sight from the water. Occasionally scats were found singly, on sand banks (and could then be confused with scats of the crab-eating mongoose *Herpestes urva,* which are smaller in diameter).

The smooth otter fed mostly on fish, and this was obvious from the spraints and their smell. Large spraint sites could often be located from several metres away, by their strong smell of rotting fish. Most spraint sites were small, and 50% had only one spraint on them; the mean number of spraints per site was 2.2 ± 1.8 (SD; N = 38). The individual spraints were usually shapeless, 1–3 cm^3, with bones and /or scales clearly in evidence. The location of spraint sites was highly variable, with many of the smaller ones on sand banks or small rocks, but some of the large spraint sites located on top of large boulders, 1–3 m above water level, or on flat rocks or flat sandy banks close to the water. The large spraint sites were invariably characterized by large quantities of faeces completely flattened and spread out by otters rolling or rubbing, with spraints plastered right across the sites (N = 8; these sites were not incorporated in the above calculations of mean numbers of spraints). Rolling also frequently occurred on sand banks, leaving conspicuous imprints of the large tail and the flanks. Occasionally 'sand castles' were made on sand banks, i.e. cones of sand made by scraping.

The common otter also produced spraints which smell fishy, but they were smaller than those of the smooth otter, usually less than 2 cm^3, often only a fraction of that, and similarly shapeless. Almost half of the spraint sites had no more than one spraint; the mean number per site at Huai Kha Khaeng was 2.3 ± 1.6 (SD; N = 147). Spraint sites were boulders in the river (Figure 6), or directly along the shore, or conspicuous places on sand banks or short vegetation, rarely on logs. Common otters did not roll in spraints as did smooth ones. This species frequently made 'sand castle' scrapes on sand banks, as elsewhere (ERLINGE, 1968), but rolling was far less common than in the smooth otter.

In general, in areas such as Huai Kha Khaeng where both smooth and common otter occurred, there were many single spraints which we found difficult to identify to species unless accompanied by tracks.

DISCUSSION

Although tracks in sand or mud, when clear, were diagnostic of the species of otter, often the faeces by themselves were not. Thus, a combination of field sign would be needed for correct identification, and even then the possibility has to be borne in mind that the various otter species visit each other's spraint sites. The character of spraint sites differed, but it is possible that otters elsewhere show different preferences for spraint sites; for instance, common otters in Europe frequently use logs for sprainting (e.g. MASON & MACDONALD, 1986), but this was rare in Huai Kha Khaeng although many suitable logs were present. Nevertheless, if used critically the above methods will make it possible to establish the presence of any of the three species elsewhere, and to collect information on feeding habits and other aspects of their ecology. There is an urgent need for further data (especially in Thailand, HUMPHREY & BAIN, 1990), with the common otter classified internationally as 'vulnerable', and the others as 'insufficiently known' (IUCN, 1988).

ACKNOWLEDGMENTS

We are grateful to Mr. Thaswan Devakul for the use of one photograph, to Belinda Stewart-Cox for initiating and organizing the survey, to Drs. Schwann Tunhikorn and

Warren Brockelman for advice, to Mr. J. Morris for making the automatic camera release system, to field staff of the Royal Forest Department for unlimited practical help in the field, to the British Council for travelling expenses of HK and to WWF (Thailand) for transport and field expenses.

REFERENCES

ERLINGE, S. 1968. Territoriality of the otter *Lutra lutra* L. *Oikos* 19: 81-98.

FOSTER-TURLEY, P., S. MACDONALD, and C. MASON. 1990. *Otters, an Action Plan for Conservation*. IUCN, Gland, Switzerland.

IUCN. 1988. *1988 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland.

HUMPHREY, S.R. AND J.R. BAIN. 1990. *Endangered Animals of Thailand*. Sandhill Crane Press, Gainesville, Florida.

KRUUK, H. 1992. Scent marking by otters *(Lutra lutra)*: signalling the use of resources. *Behav. Ecol.* 3: 133-140.

KRUUK, H., B. KANTSANASAKA, S. WANGHONGSA, and S. O'SULLIVAN. (submitted). Niche separation in three sympatric otters *Lutra perspicillata, L. lutra* and *Aonyx cinerea* in Huay Kha Khaeng, Thailand.

LEKAGUL, B. and J.A. MCNEELY. 1977. *Mammals of Thailand*. Assoc. Conserv. Wildlife, Bangkok.

MASON, C. and S. MACDONALD. 1986. *Otters, Ecology and Conservation*. Cambridge University Press, Cambridge, U.K.

PHANTUMVANIT, D and T. PANAYOTOU. 1990. *Industrialization and Environmental Quality: Paying the Price*. Thailand Development Research Institute, Bangkok.

SCOTT, D.A. (ed.) 1989. *A Directory of Asian Wetlands*. IUCN, Gland, Switzerland.