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**THE SMOOTH-COATED OTTER IN NEPAL**

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The Smooth-coated Otter (*Lutra perspicillata*) was the subject of a four month field study between November, 1904 and February, 1985 within the Royal Chitwan National Park, Nepal. This study was undertaken by myself and three other newly graduated scientists and was supported through a variety of fund raising activities and sponsorships.

This species of otter has not been previously studied in Nepal so that the resulting information forms a good basis for further studies. Two other species of otter have ranges that include the Indian subcontinent, the Oriental small-clawed otter (*Aonyx cinerea*) and the common otter (*Lutra lutra*). The Smooth-coated otter cannot be confused with the former species, which is much smaller in size, but it has similar dimensions to the common otter. The sightings we had fitted closely the description of the Smooth-coated otter and a few years previously, a young otter had been captured in Chitwan and reared at the Otter Trust. The Naryani River, the focal point of this study, forms one of the four boundaries to the National Park, with local villages established directly outside. Faecal material from the banks of the river was collected and analysed to determine the otters' diet and various other factors were recorded, such as otter tracks, sprainting sites, scrape marks, holt sites, slides and otter sightings.

A total of 75 km was surveyed and for the purposes of data analysis, it was divided into 8 regions, ranging from deep slow moving water with cliff and boulder shores in the north east, to fast flowing water with extensive mud and pebble shores in the west. The banks on the southern side of the river, within the National Park, were dominated by riverine forest or elephant grass, whereas those on the northern non-park side were dominated by short grass due to over-grazing by domesticated animals.

A reference collection was compiled from the jaws, pharyngeal teeth and spines of each species of fish caught along the length of the Naryani during the four month period. The components of the 172 spraints analysed were compared to this reference collection, enabling 26 of the commonest fish species to be identified. Other spraint components were frog, crab, shrimp, snake and insect. A percentage of the total represented by each prey component was estimated for each spraint and these were totalled for each of the eight regions of the river. The results indicated variation along the length of the river, a predominantly fish diet in the southernmost regions, to more of a frog dominated diet, with other components becoming more frequent in the northern regions. These dietary differences could be attributed to a number of factors. The topography of the river varies, which is likely to affect both the prey availability and the most effective foraging methods. Competition with other fish predators,

especially man, also influences the prey available to the otters. In the extreme south-easterly regions, both river banks are within the National Park so that human access is more limited. The broadness and depth of the river also prevents the use of fish traps and damming and drainage methods, all of which are used in the shallower and channelled regions further upstream. The north westerly regions are more accessible as the northern river bank is not within the National Park.

Regional variations were also shown for 5 of the commonest fish species found in otter spraints, again possibly due to similar theories suggested for the variation in spraint composition.

The comparison of fish remains in bird pellets with those in otter spraints demonstrated that otters take a much wider size range of fish from a wide variety of habitats.

The large number of signs, covering the whole length of the Narayani within the Park, would seem to be indicative of a healthy otter population. However, it was not possible to determine the actual numbers of otters present from our study, since there is no direct relationship between the number and density of spraints and that of otters.

Signs of otters were found both on the undisturbed and the disturbed banks, although those on the disturbed side were restricted to tracks and solitary spraints. Large sprainting and holt sites were found only on the undisturbed banks within the National Park. The sprainting behaviour and formation of scraped mounds is similar to that demonstrated by *Lutra lutra*.

The banks of the river suffer greatly from erosion, especially during the monsoon - so exposing tree root systems and leaving wood debris. These are exploited by the otter as holts and lying up sites. Nine holt sites were discovered in total and eight of these occurred in areas such as these. The ninth was tunnelled into a steep sandbank stabilised by elephant grass. The land immediately backing the banks where holt site entrances occurred had substantial vegetation cover. The lack of holts on the disturbed bank of the river may be attributable to direct human disturbance and a lack of suitable habitat. Almost complete deforestation and the subsequent overgrazing means that there are fewer tree root systems to be exploited and there is an absence of general cover.

It is interesting to note that otter sites were only found in the southernmost regions during the latter part of the study. At this time otter signs in the middle regions also became more plentiful. This phenomenon may be associated with the breeding season, when territorial behaviour increases. More spraints would therefore be found during the breeding season. It may also indicate an increase in otter numbers, which could fit in with a theory that the otters in Chitwan exhibit seasonal migration, as they are not seen during the monsoon period from May to September.

This movement could be in pursuit of migratory fish heading north or in search of a cooler, more suitable environment, or it could be due to the breakup of groups after breeding. They may not leave Chitwan entirely but may retreat further inland to the tals and tributaries of the Naryani.

This study has shown that the Smooth-coated otter is common along the length of the Naryani river and that it relies heavily on fish. It also suggests their feeding habits are sufficiently flexible to adapt to local variations in their food supply. A comparison of river banks suggests human activities decrease the availability of suitable habitat and over-fishing decreases food supply. Extensive deforestation in the hills causes flooding and increases the turbidity of the lowland changing both the aquatic environment and the river's topography. Pollution, resulting from chemical discharge is increasingly an important problem in Nepal. For example, the activities of a new papermill upstream of the Park, discharging untreated waste can only be having a deleterious effect. Although designated and isolated as a National Park, Chitwan is not removed from the influence of external factors, and without an effective management plan controlling these, those animal species dependent on the riverine system may rapidly decrease in number or even disappear permanently.

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