

## Distribution, Population Status and Habitat Utilization of Common Otter (*Lutra lutra*) in Neelum Valley, Azad Jammu and Kashmir

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**Abstract.-** Neelum Valley comprises of fascinating wildlife, yet it is not explored due to multiple factors including inaccessibility, no appropriate means of transportation and communication and cross border firing between Pakistan and Indian armed forces. Common otter (*Lutra lutra*) listed as near threatened by IUCN in the Red List of 2008, has been extinct in much of its range with many populations still thinning and is firmly protected by the Azad Jammu and Kashmir (AJK) Wild Life Act. The present study aimed to find out the distribution, habitat utilization and population status of common otter in Neelum Valley. Study area was divided into zones and localities and eight months surveys of each locality were conducted from December, 2004 to July, 2005. The important vegetation of the area was *Rumex histatus*, *Adhatoda zeyloanica*, *Cynoglossum lanceolatum*, *Salix sp*, *Pinus sp*, *Cedrus deodara* and *Celtis eriocarpa*. Common otter was found to adapt to rocky area with cave type places, sands and pebbles. Average population was measured by the indirect method of sampling. The animal was distributed in all three zones and 22 localities apart from Nosada locality. A total population of 35 animals was estimated with the average population density of 2.29 animals/km<sup>2</sup> in the study area. Highest average density (2.83 animals/km<sup>2</sup>) was observed in zone B followed by zone C (2.26 animals/km<sup>2</sup>) and A (1.68 animals/km<sup>2</sup>). Locality Salkhala was highly populated with average population density of 3.08 animals/km<sup>2</sup> followed by Palri (3.00) and Athmuqam (2.96) while minimum density (0.00) was observed at Nosada locality. Otter population is facing threats from habitat disturbance, hunting and pollution. Cumulative approach is needed to develop a conservation strategy for the survival of common otter in the study area.

**Key words:** Common otter, population status, Neelum Valley, Azad Jammu & Kashmir.

### INTRODUCTION

Otters (*Lutra* spp.) are long and streamlined animals covered with close fur that provides insulation and minimize friction during swimming (Roberts, 1997; Ahmed, 1998). There are many species of otter, which are distinguished on the bases of their body sizes, color, and shape of their claws or body weight (Ahmad, 1998; Lanszki *et al.*, 2001). The species under study, the common otter (*Lutra lutra*) has pale silvery color on throat and dark brown color dorsally and the tail is concave in cross-section (Stanek, 1972; Roberts, 1997; Mirza, 1998; Lanszki *et al.*, 2001). Common otter has a number of very stiff short white vibrissae around the muzzle, which may assist it in searching under stones and in turbid water for its food prey (Roberts, 1997). Eyes are placed high on the head so that it can see when the rest of the body is below

water. The Himalayan species is smaller in average size than the European form, with the head and body varying from 60–76 cm (24–30 inches) in length and the tail from 35–46 cm (14–18 inches) (Roberts, 1997; Ruiz *et al.*, 2002). The thick and muscular tail is flattened dorsoventrally in paddle shape to aid during swimming. The species weight varies from 5 kg (11 lb) of small females to 7.5 kg (16.5 lb) of males. The hind foot averages around 10–11 cm (4.5 inches) and the ear 15 mm (0.58 inch) in length. Females generally have only two pairs of mammae (Roberts, 1997).

Otters are nocturnal and by day they shelter in burrows at the banks of river, usually having their entrance half a meter below water level, and thus are very difficult to locate (Roberts, 1997; Ruiz *et al.*, 2002). They feed opportunistically, with seasonal and spatial patterns in their diet, related to prey availability (Cope and Roche, 2003). They are carnivores and eat any kind of flesh, which they can find or catch: fish, snakes, frogs, toads, crayfish and even duck (Trippensee, 1953). They hunt alone as well as in groups, sometimes forming a big circle

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inside the water and surrounding a large number of fish to catch them easily (Ahmed, 1998). In Pakistan, the common otter feeds mainly on the snow trout. During summer some migration takes place to streams which are inhabited by the snow trout up to 3,500 m (12,000 ft), and the Deosai plateaus of Baltistan literally swarms in this season because of the availability of abundant food supply (Mirza, 1998).

The common otter is solitary except during mating period. During their mating season (December to April), both male and female are seized with a mania to wander and the females are choosy about selecting their mates (Stowe and Peatte, 1964; Ahmed, 1998) and copulation always takes place in water. The gestation period is of 63 days and usually two - five young are born in the spring or early summer (Trippensee, 1953; Ahmed, 1998; Mateo *et al.*, 1999). The young stay with the mother for approximately 13-15 months (Ahmed, 1998). They are quite vocal and get excited by calling to each other. When alarmed, their call is of a higher pitched scream almost like a whistle (Stowe and Peatte, 1964; Roberts, 1997).

Otters have been given attention due to their playful habits and are also captured and trained for trapping fish (Mason and Macdonald, 1986; Hauer, *et al.*, 2002). Their fur is used for collar and cuff of overcoats for ladies, sport coats and trimmings (Trippensee, 1953).

Common otters are found in France, Spain, Greece, Scandinavia, Scotland, Turkey, South Africa, the Middle East and Asia, but scarcely in England, and absent from Australia (Stanek, 1972; Roberts, 1997; Lanszki *et al.*, 2001). Formerly, it was widespread throughout the United Kingdom, but underwent a rapid decline in number (IUCN, 2004; Ruiz *et al.*, 2002).

In Pakistan, this animal is found throughout the whole of Khyber Puktoonkhwa, particularly in Hazara Dist., Chitral, Dir, Swat, Kohistan, Gilgit, Baltistan and all the major river systems of Himalayas (Wayre, 1972; Ahmed, 1998). It leads a semi aquatic life and is present in rivers and streams, wet grassland, wet woodland, fen and marshes, in reed beds, open water, scrub, canal and fresh water system covered by trees (Trippensee, 1953; Ahmad, 1998; Lanszki *et al.*, 2001; IUCN,

2004).

IUCN status of common otter is near threatened (IUCN, 2008). It has been extinct in much of its range while many populations are currently diminishing, hence, it is strictly protected by the Wild Life Act. The common otter cannot be killed, kept or sold without a license (Anonymous, 1996). The serious threat to this animal in Northern Pakistan is undoubtedly because of its capture for protection of fishery interests. For this reason the animal is shot and trapped, and on some rivers the Fishery Department pays a bounty on otter killing (Wayre, 1972). Human settlement on the riverbanks also effects the population of otter. Loss of extensive wetlands associated with the river that is required for otter breeding including reed beds, grass marshes and woodland angling in close proximity to halts and hunting areas may cause disturbance to otter (IUCN, 2004).

The river Neelum, populated with human settlement along its bank, is reported to harbor the otter species which is also accounted to be hunted for its fur by the locals as well as the traders from outside the area, which is used for collar and cuff of overcoats for ladies, sport coats and trimmings. So far there is no scientific data about the distribution, population status and habitat utilization of this precious animal in this area; hence, the present study has the objective of providing information on this species in the region.

## MATERIALS AND METHODS

### *Study area*

The study area comprised a 100- km strip of River Neelum, starting from Nuseri, 42 km from Muzaffarabad city and ending up at Kel Seri, 142 km from Muzaffarabad. For the convenience and collection of data systematically, based on distance and accessibility, the study area was divided into three main zones designated as A, B and C, which was further subdivided into localities. Name given to locality was the name of village nearby to that locality.

Study zone A comprised of seven localities, started from Nuseri and ended at Bata covering a 31 km long strip with the elevation range between 1100 m to 1250 m. Other localities included this

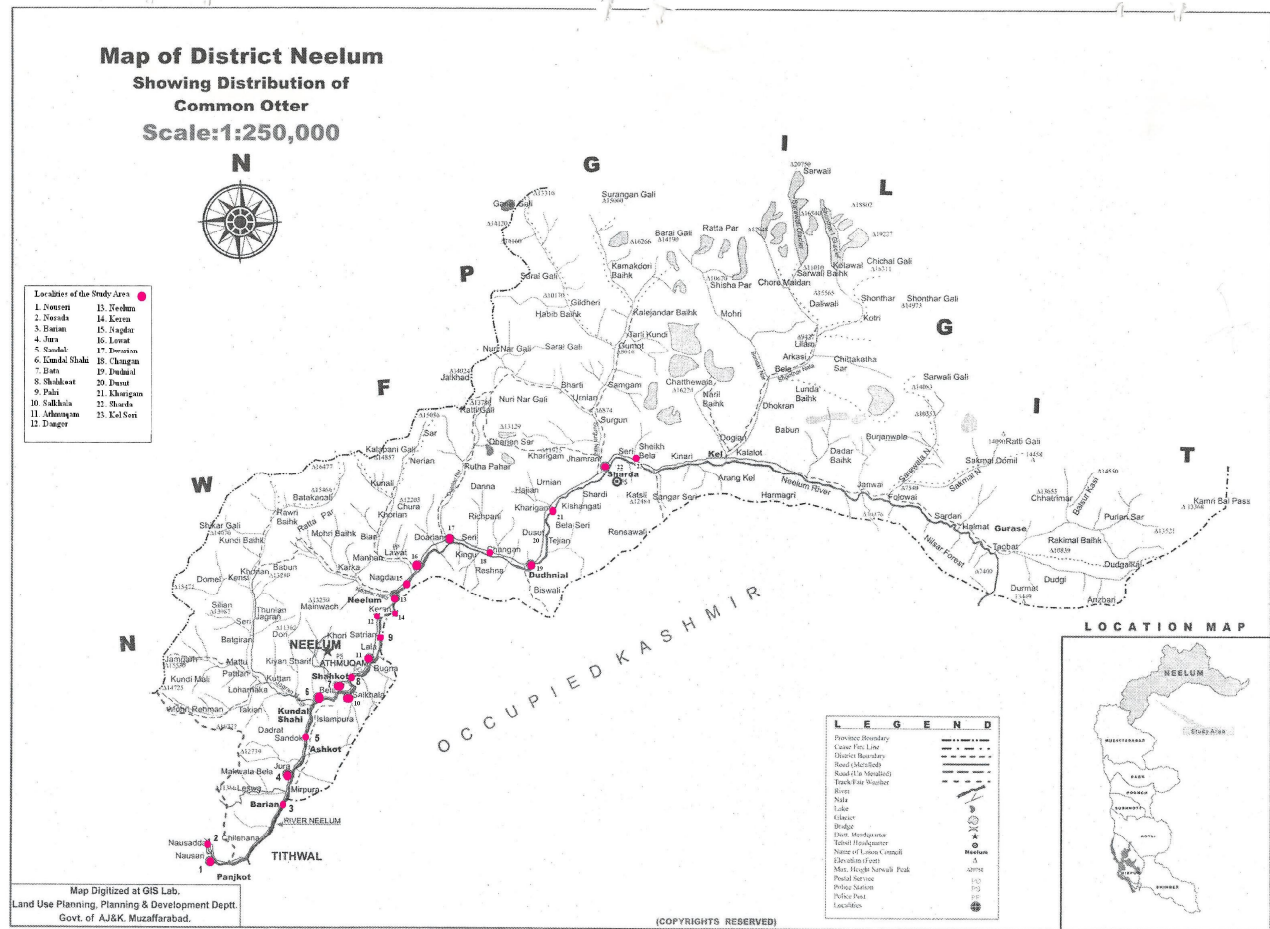


Fig. 1. Map of the District Neelum showing the different study localities.

zone were Nosada, Barian, Jura, Sandok and Kundal Shahi. Zone B covering an area of 33 km with elevation range of 1420-1610 m was divided into eight/nine localities. It started from Salkhala and terminated at Lowat locality, while other localities included in this zone were Shah Koat, Palri, Athmuqam, Dangar, Nagdar, Neelum and Keren. Zone C occupied a comparatively larger area (36 km) than other zones and covered 1680-1900 m elevation from sea level. This zone was divided into seven localities, started from, Dawarian including Changan, Dudnial, Dusut, Kharigam, and Sharda and ended at Kel Seri locality (Fig. 1).

### Methodology

The study was conducted from December 2004 to July 2005 (eight months of regular survey)

to collect the data on the distribution, population status and habitat utilization of common otter in River Neelum, district Neelum.

During surveys, direct as well as indirect methods were used to observe and gather the information about the animal. Due to the nocturnal habit of the animal and difficult terrain, direct sighting was limited, however, population was estimated on the basis of indirect evidence including calling, fur, fecal dropping, dead remains, footprints and information collected from local residents, hunters, shepherds, fishermen and game watchers of that area through detailed interviews. While surveying, most of the time was spent walking along the bank of the river and binoculars (8x36 mm) were used for observing animals. A zoom camera was used for taking the snapshots of natural habitats

utilized by animal and other evidences. An altimeter was used to measure the altitude of the places where the animal was reported or indirect evidence of presence was found. Prominent vegetation within localities, speed of water (fast, moderate or slow) and habitat (rocky, sandy covered or uncovered) were also noted.

## RESULTS AND DISCUSSION

Evidence of the animal such as footprints, fecal droppings and dead remains were recorded in all localities of the study area, except at Nosada, to indicate the distribution of otter in all localities. There was no pertinent data found on the distribution and status of common otter in the Nosada study area (Table I).

During the present study, a total population of 35 individuals of common otter was recorded with the average population density of 2.29 animals/km<sup>2</sup>. The maximum population (n=16) was recorded in zone B, followed by zone C (n=11), and zone A (n=8) with the population percentage of 45.71%, 31.43% and 22.86%, respectively (Fig. 2).

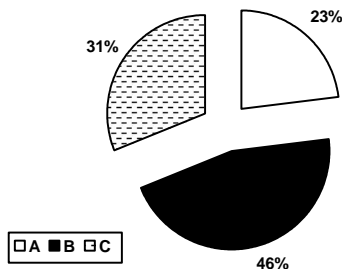


Fig. 2. Common otter's estimated population distribution (present by zone) in the zones of the study area (Neelum Valley) during 2004-2005.

The average highest population density (3.08 animals/km<sup>2</sup>) was recorded at locality Salkhala followed by Palri (3.0 animals/km<sup>2</sup>) and Athmuqam (2.96 animals/km<sup>2</sup>). No population density was recorded at locality Nosada (Table I).

The zone A has a total population of 8 recorded the highest population density (2.67 animals/km<sup>2</sup>) of common otter was noted in two localities: Kundal Shai and Bata. Nouserri was noted as the second highly populated locality with its

population density of 2.29 animals/km<sup>2</sup>, followed by Barian and Jura (1.16 animal/km<sup>2</sup>). A minimum population density (1.33 animals/km<sup>2</sup>) of common otter was recorded at locality Sandok. The overall average population density of zone A was recorded as 1.86 animal/km<sup>2</sup> (Table I).

The zone B had a total population of 16 recorded and the highest average population density (2.28 animals/km<sup>2</sup>) than the other zones. This represented 45.71% of the total population distributed in the eight localities. The highest population density (3.08 animals/km<sup>2</sup>) was estimated in the Salkhala locality followed by Palri (3.0 animals/km<sup>2</sup>), Athmuqam (2.96 animals/km<sup>2</sup>) and Lowat (2.86 animals/km<sup>2</sup>). A cave used as a holt by the otter was also recorded at Palri. Otters were distributed evenly in the remaining four localities: Karen, Nagdar, Danger and Shah Kot of zone B with equal population densities of 2.67 animals/km<sup>2</sup> (Table I).

Zone C started with Changan and ended at Kel Seri. It was divided into seven localities with the average population density of 2.26 animals/km<sup>2</sup> that comprised of 31.43% of the total population of the study area. It had a total population of 11 recorded. Among the localities of this zone, Kharigam has highest population density (2.16 animals/km<sup>2</sup>) followed by Dowarian (2.67 animals/km<sup>2</sup>), Sharda (2.35 animals/km<sup>2</sup>) and Dosut (2.16 animals/km<sup>2</sup>). The same population densities (2.67 animals/km<sup>2</sup>) of common otter were observed in Changan and Dudnial localities while a minimum population density was observed in Kel Seri (1.60 animals/km<sup>2</sup>).

Roberts (1997) reported the trade of skin of the otter from the Neelum Valley (our study area) and Jhelum valley to the Peshawar and Rawalpindi (Punjab). He also reported the traces of common otter in the rivers of northern areas such as Shyok, Ghizar, Kunhar and Hunza in Baltistan, Gilgit and Chitral. The finding was supported by Ahmed (1998), who reported this animal at the same sites of the northern areas in addition to the Jhelum river of Azad Kashmir, Punjab (Lal Sahanra National Park and River Ravi) and Sindh province of Pakistan. The otter was reported by Wayre (1972) in the Palearctic region up to Indomalayan region including northwest of Himalayas and adjacent area.

**Table I.- Distribution, elevation and estimated population density of common otter in different localities of the study area during December, 2004 to July, 2005.**

Zone	Sub-locality	Elevation (m)	Area surveyed (km <sup>2</sup> )	Estimated population	Estimated population density
A	Noseri	1100	0.875	2	2.29
	Nosada	1120	0.75	0	0.00
	Barian	1190	0.625	1	1.60
	Jura	1200	0.625	1	1.60
	Sandok	1250	0.75	1	1.33
	Khundal Shai	1260	0.75	2	2.67
	Bata	1260	0.375	1	2.67
B	Shahkot	1420	0.75	2	2.67
	Palri	1450	1	3	3.00
	Salkhala	1460	0.65	2	3.08
	Athmuqam	1530	0.675	2	2.96
	Danger	1560	0.75	2	2.67
	Nagdar	1570	0.375	1	2.67
	Keren	1570	0.75	2	2.67
	Lowat	1610	0.7	2	2.86
C	Changan	1680	0.5	1	2.00
	Doarian	1750	0.75	2	2.67
	Dudnial	1820	0.5	1	2.00
	Dosut	1900	0.925	2	2.16
	Kharigam	1900	0.725	2	2.76
	Sharda	1920	0.85	2	2.35
	Kel Seri	1950	0.625	1	1.60

The common otter was distributed throughout in the study area (River Neelum) in wide rocky habitat, covered by semi submerged tree roots, herbaceous vegetation and associated with slow to mostly moderate speed waters. Durbin (1997) reported that otters spent a greater proportion of their time in relatively wide habitat with high boulder cover and gravelly areas with many trees and herbaceous vegetation on the bank which is used for both foraging and resting. Vegetation including trees does not have much effect on otters distribution (Kruuk *et al.*, 1986).

Otters used areas where rocks, caves and crevices were present. During the survey, the fecal droppings were observed in caves about 4-5 m away from water and one fecal dropping was reported within the water on a stone. The study area was covered with lush green plants, and the leading species were *Rumex hstatus*, *Adhatoda zeyloanica*, *Cynoglossum lanceolatum*, *Salix tetrasperma*, *Equisetum stela*, *Pinus raxburghii*, *Cedrus deodara*, *Heteropogon contortus*, *Celtis eriocarpa*, *Ficus*

*palmate*, *Cynodon dactylone*, *Aillanthus altissima*, and *Planatigo* species. Maize (*Zea maize*) was mostly cultivated in fields laid along the bank of river in Athmuqam, Sharda, Kel Ser, Kharigam and Kundal Shai localities which gave herbaceous coverage to the banks of river. It seemed to be favorable for otter as some evidences like fecal droppings etc. were observed in the fields. Cope and Roche (2003) have also shown that otters need a lot of vegetation cover.

Population and roads have little effect on the otter population as it was reported nearer the human settlements and Neelum Road runs all along the River Neelum. Durbin (1993) observed that otter showed a high degree of tolerance to human disturbance if shelter was provided by bank-side cover. Similar results were concluded by Macdonald and Mason (1982), Elliot (1983) and Green *et al.* (1984). Otters can be tolerant of indirect forms of disturbance and this may have implication for assessing the impacts of a proposed construction scheme. Cope and Roche (2003) opposed that

conclusion, believing that otter need clean water, lots of fish and no human disturbance.

In River Neelum, the water level had been changing during the whole year. The water level was high during summer due to melting of snow and frequent raining in its catchment areas while level dropped in winter season because of decrease in snow melting and fewer rains and holts could be traced easily in this season. During winter season, one holt was reported at locality which had completely sunk into water in the summer visit.

According to observation by the local people, the common otter is sighted frequently in winter season as compared to summer, mainly due to a decrease in water level. Prenda *et al.* (2001) supported that observation, stating that water availability is strongly correlated with the distribution of the otter. Figures recorded from the study area were based on the information collected from the local people and indirect evidence that were observed easily on the sand when the water level was low. Visibility of otter was also related to vegetation cover as most of the vegetation along the bank of the river is deciduous and provided less shelter or camouflage to the animal in winter, increasing the risk of hunting to this animal. Three animals were reported killed at the Palri, Kharigam and Kel Seri localities during the period of October to December 2004. Hunters were invaders and came from Attock (Pakistan). According to Incharge of the fisheries department, one animal was also killed by a hunter in Muzaffarabad City in the previous year.

### CONCLUSIONS

During the present study a total population of 35 animals was estimated with the average population density of 2.29 animals/km<sup>2</sup>, distributed in different localities of three main zones of the study area. Locality Salkhala had a maximum population density of 3.08 animals/km<sup>2</sup> followed by Palri (3.00 animals/km<sup>2</sup>) and Athmuqam (2.96 animals/km<sup>2</sup>). The animal occupied an altitudinal range between 1100 and 1900 m, preferring wide, slow speed of water with the characteristics of rocks and submerged vegetation. Human population had little effect on the population of the animal.

Most of people were not conversant as to the importance of otters. This animal proved to be risky for fishes and the fishermen of the study area were used to killing otters to increase the fish population. Fish were caught by local peoples using nets, electric rods and explosive matter. Otter were occasionally trapped in the nets when it followed the prey (fishes) or it might be killed by electric rods, when an electrical current passed through water to kill the fish. Explosive matter caused death or migration of the animal from that territory. A large number of fish, especially young ones, died by the use of these methods which also decreased the population of the common otter. The fishery department shall to pay more attention to the prevention of illegal fish-catching methods such as blasting and electrical current in water. These methods should be banned completely because they are very dangerous and result in indiscriminate killing of aquatic animals, including otter. People should be made aware of the importance of wildlife especially the otter through a public education program. Most cultivated fields were on the bank-side and the use of insecticides also caused the death of fish and a decline in otter population. Water pollution is another alarming factor for common otter existence because it effects fish production which, in turn, can inhibit the otter population. A participatory approach is needed which should involve fishermen, local residents, wildlife staff and pelt traders to outline a strategy for a sustainable population of the otter.

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