

# Golden Jackals in human dominated landscapes of the Manaslu Conservation Area, Nepal

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## Abstract

The population of the golden jackal is subjected to decrease over the past decade in Nepal. We deployed two camera traps for 18 night hours in different habitats close to human settlements in an elevation ranging from 1550 m – 3300 m a.s.l. at Tsum valley of the Manaslu Conservation Area, Nepal in March 2013. Semi-structured interviews with local people were conducted to understand the distribution and behaviour of the golden jackal in this area. Altogether, we captured 23 independent photographs of golden jackals; the trapping rate was 1.27 photos per trap night. According to local people cattle, pheasants, rodents and lagomorphs were commonly preyed upon by the golden jackals. But no retaliatory killing was observed during our visit. Thus, the population of the golden jackal was found to be increasing in the Tsum valley.

## Key words

Golden jackal, settlements, camera traps, population, Tsum valley.

## Introduction

The golden jackal (*Canis aureus* LINNAEUS, 1758) is a versatile predator and opportunistic feeder (LANSZKI *et al.* 2010). It mostly feeds on small mammals, rodents as its chief prey (LANSZKI & HELTAI 2002, MUKHERJEE *et al.* 2004, JAEGER *et al.* 2007, JHALA & MOEHLMAN 2008, LANSZKI *et al.* 2010, SIMENEH 2010, MONDAL *et al.* 2012), ungulates (LANSZKI & HELTAI 2002, LANSZKI *et al.* 2006, RAICHEV *et al.* 2013), cattle and poultry (YOM-TOV *et al.* 1995, SIMENEH 2010, RAICHEV *et al.* 2013), occasionally birds and invertebrates. It is also a scavenger, feeding on carcasses (YOM-TOV *et al.* 1995, LANSZKI & HELTAI 2002, RAICHEV *et al.* 2013). It is abundantly distributed in cultivated land, shrub land, desert, semi arid area, marsh land, forest and near human settlement (GIANNATOS 2004, JAEGER *et al.* 2007, JNAWALI *et al.* 2011).

The golden jackal is a common species in Nepal. Many folk tales of golden jackals are popular in the Nepalese society since time immemorial. But in a scientific paper, it was recorded for the first time by BRAIN

HODGSON in 1833. It is recorded from almost all protected areas and districts of Nepal from 65–4000 m a.s.l. (SUWAL *et al.* 1995, BARAL & SHAH 2008, JNAWALI *et al.* 2011). It is also widespread in north and north-east Africa, central Europe, Asia and entire Indian Subcontinent (MACDONALD & SILLERO-ZUBIRI 2004, GIANNATOS 2004, JHALA & MOEHLMAN 2008, ARNOLD *et al.* 2012). It is vagrant in Austria, Italy, Slovakia and Slovenia (JHALA & MOEHLMAN 2008). However, little is known about its densities and distributions across the globe (SILLERO-ZUBIRI *et al.* 2004). This medium sized canid has a buff-grey or golden coat interspersed with black, brown and white hairs which varies with the season, a bushy tail with black at the tip, throat and areas around the eyes and lips are white (JHALA & MOEHLMAN 2004, BARAL & SHAH 2008, HUNTER 2011) and is social, usually lives in pairs or small groups.

The population of golden jackal is increasing across the northern and western territories of the Balkan Peninsula

(KRYŠTUFEK *et al.* 1997), central Europe (HELTAI *et al.* 2000); mainly in Hungary (SZABÓ *et al.* 2007, 2009), on the Indian Subcontinent (JHALA & MOEHLMAN 2008), but is decreasing in Greece (GIANNATOS *et al.* 2005). It is getting more attention in Europe (JAEGER *et al.* 2007, SZABÓ *et al.* 2007, MONDAL *et al.* 2012) but least concern in the Indian Subcontinent, which might be due to high population numbers. However, it is assumed that the population of the golden jackal is decreasing over the past decade in Nepal (JNAWALI *et al.* 2011). Persecution, poaching for medicine and reduction of prey has threatened the species in Nepal (JNAWALI *et al.* 2011). Though, Manaslu Conservation Area (MCA) was designated as protected area one and half decade ago, its biodiversity is less explored due to lack of comprehensive research (KATUWAL *et al.* 2013). MCA has a considerable population of golden jackals (KMTNC 1998, BHUJU *et al.* 2007, KATUWAL *et al.* 2013). However, the distribution and behavior of the species are still unknown. We placed camera traps in human dominated landscapes of the Tsum valley of MCA with the objectives to document the distribution and behaviour of the golden jackal.

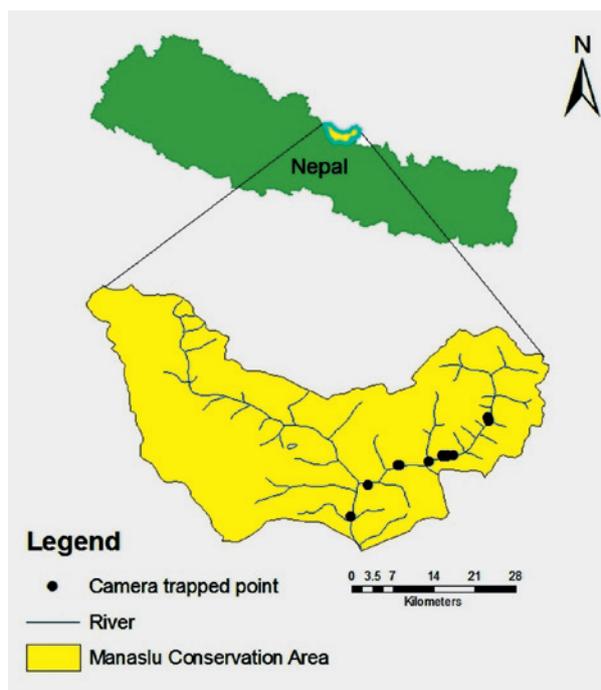


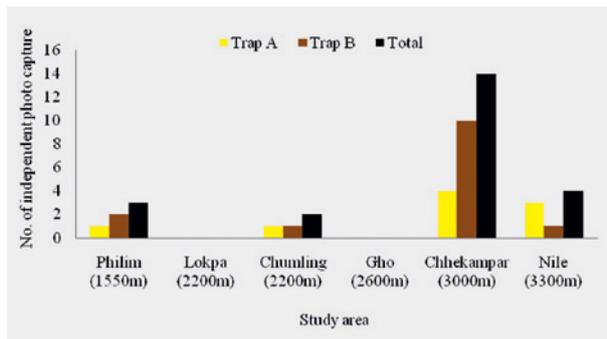
Fig. 1. Map of camera trapping localities in Tsum valley at the Manaslu Conservation Area.

## Materials and Methods

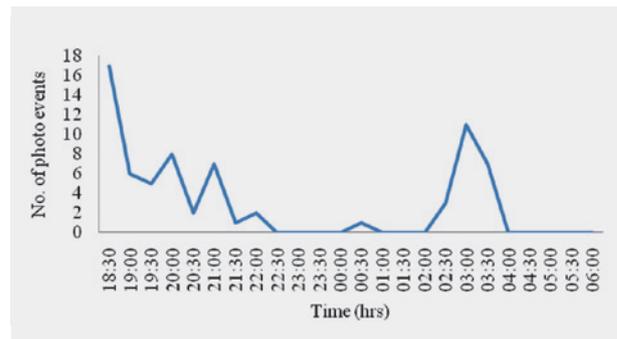
Manaslu Conservation Area lies within the latitude of 28°20.4266' to 28°45.1113' N and longitude of 85°29.2066' to 85°11.8519' E in the Gorkha district (Fig. 1) and was declared as conservation area on December 28, 1998 with an area of 1663 sq km. The Budigandaki in Nubri and The Syar in Tsum valley are the main river systems in MCA (NTNC 2009, KATUWAL *et al.* 2013). MCA has sub-tropical to nival bioclimatic zone (NTNC 2009). Monsoon occurs between June to September and winter from December to February. Precipitation is in the form of rain, drizzle and snow. Vegetation varies with the bioclimatic zone and 11 types of vegetation are found in MCA (BHUJU *et al.* 2007). Sal (*Shorea robusta*), *Schima wallichii*, *Castanopsis indica*, Blue Pine (*Pinus wallichiana*), Alder (*Alnus nepalensis*), Oak (*Quercus* spp.), Fir (*Abies spectabilis*), Birch (*Betula utilis*), Rhododendron (*Rhododendron* spp.), *Juniperus* spp. etc are common plants following the rise in elevations. Similarly 33 species of mammals, 110 species of birds and three species of herpeto fauna are reported from MCA (KMTNC 1998, NTNC 2009). The major mammalian fauna includes Himalayan Black Bear (*Ursus thibetanus*), Musk Deer (*Moschus chrysogaster*), Assamese Macaque (*Macaca assamensis*), Himalayan Tahr (*Hemitragus jemlahicus*), Yellow-throated Marten (*Martes flavigula*), Jungle Cat (*Felis chaus*), Common Leopard (*Panthera pardus*), Barking Deer (*Muntiacus vaginalis*), Himalayan Goral (*Naemorhedus goral*), Blue Sheep (*Pseudois nayaur*) etc. Pheasants like Himalayan

Monal (*Lophophorus impejanus*), Kalij Pheasant (*Lophura leucomelanos*), Blood Pheasant (*Ithaginis cruentus*) etc are also found in the area. At higher elevations, mostly people from the Lama community live and they follow Buddhism. Most of them do farming, rear cattle and harvest Yarsagumba (*Ophiocordyceps sinensis*), a very high priced medicinal plant in season for their livelihood.

We performed two camera trap nights at Philim (1550 m), one trap night in Lokpa (2200 m), three trap nights in Chumling (2200 m), two trap nights in Gho (2600 m), six trap nights in Chhekampar (3000 m) and four trap nights in Nile (3300 m) from March 6 to 18, 2013 in the Tsum valley of the Manaslu Conservation Area. In total, we used 18 camera trap nights for trapping the golden jackal (Table 1). However, our plan to perform at least six camera trap nights in each locality had to be rejected due to heavy rain and snowfall in the area. All camera traps were placed in vicinity to human settlements (less than 200 m) in cultivated land, meadows and forests. We placed camera 40–50 cm above the ground on trees or bushes, about 1–2 m apart from the passing route of the jackal and each photo was taken as an independent event (occurrence for > 30 min was considered as one independent capture/photograph) as generally done in camera trappings (see O'BRIEN *et al.* 2003, JENKS *et al.* 2011, 2012, THAPA *et al.* 2013). We calculated the trapping rate of golden jackal by dividing the total number of independent photos by the total number of trap nights. The camera traps were placed in the evening (18:00 hr) and collected early in the morning (6:00 hr). We used chicken based instant noodles, pieces of carrots, biscuits and green vegetables for baiting in all trap points and the consumption of food was checked dur-



**Fig. 2.** Independent photo captures of golden jackals in two camera traps in Tsum valley.



**Fig. 3.** Trapping frequency of golden jackals according to all photo capture events.

ing collecting the cameras in the morning. Such mixed baiting was repeated every evening during the camera trapping sessions. Semi structured interviews (modified from NEWTON *et al.* 2008, CHIN & PANTEL 2009) were carried out with local people to understand their perception on golden jackals.

larly hunted by the golden jackal, but direct retaliatory killing was not recorded during our visit.

## Results

## Discussion

Out of a total of 131 camera trap photos, we captured 23 independent photographs of golden jackals in four of the six localities during 18 trap nights (Table 1, Fig. 2). All baits were evenly taken by golden jackals. The trapping rate of the jackal was found to be high, i.e. 1.27 independent photos per trap night. We caught three golden jackals at Philim in pine forest just near to cultivated land, two at Chumling in mixed forest containing few pine, alder and oak, 14 at Chhekampar along pine forest and cultivated land and four at Nile in meadow with scrub vegetation and cultivated land (Table 1). But at Lokpa and Gho no golden jackal was captured. We caught jackals mostly from 18:30–21:00 hrs in the early night and 2:00–4:00 hrs in the early morning (Fig. 3). Mostly single individuals were trapped; however two and three individuals were also caught once at Chhekampar. Besides golden jackal, Yellow-throated Martens *Martes flavigula* (BODDAERT, 1785) at Chumling, a rat at Gho, cats at Chhekampar and Nile and domestic dogs at Nile were also captured at very lower rates.

We trapped the golden jackals in cultivated land, scattered pine forest and scrub vegetation close to cultivated land near human settlements. According to SZABÓ *et al.* (2007) and ROTEM *et al.* (2011) habitat quality (poor sanitation, hiding place and fewer disturbances) is the key factor for attracting, increasing and expanding the range of golden jackals near settlements. All carnivores are mostly nocturno-crepuscular (HUNTER 2011), but the golden jackal is also frequent during daytime. Most of the earlier studies on golden jackals were performed during the day or were based in scat analyses (LANSZKI & HELTAI 2002, MUKHERJEE *et al.* 2004, LANSZKI *et al.* 2006, JAEGER *et al.* 2007, LANSZKI *et al.* 2010, SIMENEH 2010, MONDAL *et al.* 2012). As we installed the camera only in the evening, we cannot report its movements during daytime. According to our data, the jackals trapped at Tsum were most active during 18:30–21:00 hrs at night and 2:00–4:00 hrs in the morning. They might have entered the settlements during 18:30–21:00 hrs to search their prey and have left the areas between 2:00–4:00 hrs. The jackal's movement at a closed forest in Chitwan National Park was also trapped more during night than day (RAMA MISHRA pers. comm. 2013). However, its sighting and trapping is highly influenced by the weather conditions. The unsuccessful trapping of the jackal at Gho and Lokpa might have been due to weather conditions as it had rained after the installation of traps for a longer period of time, and less food availability due to fewer settlements as compared to other localities. Despite the heavy rain and continuous snowfall, the trapping rate of golden jackals was 1.27 photos per trap night during our study which too suggests that MCA has a considerable population of golden jackals (KMTNC 1998, BHUJU *et al.* 2007, KATUWAL *et al.* 2013). Local people also told us that its population was increasing and ex-

Local people at Tsum valley perceived an increase in the number of golden jackals since the last decade. According to them, the jackal was expanding its range of distribution into the higher mountains along MuGumba (3700 m) and Kalung (3800 m). Predation by golden jackals was increasing in the human settlements. People reported that birds (mostly pheasants), Himalayan Marmot *Marmota himalayana* (HODGSON, 1841), Woolly Hare (*Lepus oiostolus* HODGSON, 1840) and pikas were threatened in their areas. Cattle and poultry were regu-

**Table 1.** Results of camera trapping (independent photo captures) of golden jackals in the Tsum valley, MCA (NA-trapping was not successful).

Date	Locality	Trap Nights	Trap A (Habitat)	Trap B (Habitat)	Trap A (Independent Photo)	Trap B (Independent Photo)
6 March	Lokpa (2200m a.s.l.)	1	—	Forest edge with small rivulets (28°26.483' N / 84°55.193' E)	—	—
7 March	Chumling (2200m a.s.l.)	1	—	Near grassland, cultivated land and pine trees (28°28.36' N / 84°57.981' E)	—	1 golden jackal
8 March		2	Grassland, cultivated land and pine trees (28°28.36' N / 84° 57.981' E)	Mixed forest of pine, alder, oak etc. (28°28.401' N / 84°58.18' E)	1 golden jackal	2 yellow-throated martens
9 March	Gho (2600m a.s.l.)	2	Pine forest (28°28.728' N / 85°0.87' E)	Scrub with pine (28°28.728' N / 85° 0.87' E)	NA	1 rat
11 March	Chhekampar (3000m a.s.l.)	2	Pine forest with cultivated land (28°29.283' N / 85°02.561' E)	Pine forest (28°29.245' N / 85°02.6' E)	1 golden jackal	NA
12 March		2	Pine forest with cultivated land (28°29.235' N / 85°02.527' E)	Pine forest (28°29.246' N / 85°03.078' E)	1 golden jackal	1 cat
13 March		2	Pine forest (28°29.232' N / 85°02 .132' E)	Pine forest (28°29.248' N / 85°02 .095' E)	2 golden jackals	10 golden jackals
15 March	Nile (3300m a.s.l.)	2	Meadow with scrub vegetation (28°32.844' N / 85°06.337' E)	Meadow with scrub vegetation (28°32.764' N / 85° 06.304' E)	3 golden jackals	NA
16 March		2	Cultivated land (28°32.514' N / 85° 06.380' E)	Cultivated land (28°32.557' N / 85°06.375' E)	1 cat	1 golden jackal and 2 dogs
18 March	Philim (1550m a.s.l.)	2	Pine forest near cultivate land (28°23.572' N / 84°53.643' E)	Pine forest near cultivated land (28°23.579' N / 84°53.633' E)	1 golden jackal	2 golden jackals

**Fig. 4.** Golden Jackal trapped at a: Chumling; b: Chhekampar; c: Nile; d: Philim.

panding its range along the higher mountains. KATUWAL *et al.* (2013) too had recorded a golden jackal at Kalung (Tsum) in 2012. The causes of such range expansions are poorly understood, but it can be assumed that increases of abundance of the golden jackal are a consequence of high food availability (RAICHEV *et al.* 2013). While we found an increase in the population of golden jackal in Tsum of MCA, JNAWALI *et al.* (2011) reported that the jackal's population had declined over the past decade in Nepal. Thus, more comprehensive research of the golden jackal is necessary throughout the Nepal.

We observed conflicts between jackals and the people living in the area due to the predation on cattle and poultry by this species. YOM-TOV *et al.* (1995) and LANSZKI *et al.* (2010) also reported conflicts due to poultry and cattle predation by the golden jackals in Israel and Greece, respectively. But we did not record any retaliatory killing of jackal at Tsum of MCA as the local people consider their area as a sacred region due to influence of Buddhism. However, some people disclosed that poachers were visiting their areas to hunt the animals. Thus, more detailed studies are needed. Local people

also speculated that the populations of birds (pheasants), Himalayan Marmots, pikas and Woolly Hare were decreasing due to high density of jackals. This may be true, as, jackals were observed hunting water birds in Pame, Pokhara (TEK GHARTI MAGAR pers. comm. 2013), LANSZKI & HELTAI (2002) and LANSZKI *et al.* (2006) found considerable amounts of pheasants and hares in the diet of golden jackals in Hungary and rodents as chief prey in most of the studies (LANSZKI & HELTAI 2002, MUKHERJEE *et al.* 2004, JAEGER *et al.* 2007, LANSZKI *et al.* 2010, SIMENEH 2010, MONDAL *et al.* 2012).

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