

Checklist of Mammals in Ikh Nart Nature Reserve

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Abstract

We present a checklist of mammal species recorded in Ikh Nart Nature Reserve, Dornogobi Aimag from August 2004 to August 2007 to add to existing knowledge about mammal distribution in Mongolia. We recorded the presence of mammals through opportunistic observations and live captures as part of on-going research projects in the reserve. We recorded 33 mammal species representing seven orders, 15 families, and 28 genera. Rodentia ($n=14$ species) represented the most speciose order and Perissodactyla ($n=1$ species) the least speciose. Of mammals present, one third are classified as IUCN threatened or near threatened in Mongolia, five are listed in CITES appendices, and six are categorized as rare under the Mongolian Law on Fauna. Ikh Nart reserve harbors a quarter of the native mammal species known to occur in Mongolia, yet its size covers <0.05% of the country's land area. Given the high diversity, high proportion of declining species, and small land area of the reserve, we suggest that Ikh Nart should represent a priority area for mammal conservation efforts in Mongolia.

Key words: checklist, diversity, Dornogobi, Ikh Nart, mammal, Mongolia, species

Mongolia covers approximately 1,565,000 km² that encompasses a variety of biomes ranging from low-elevation grasslands (~550 m) to alpine zones exceeding 4,300 m (Mallon, 1985). The mammal community in Mongolia is diverse and includes 128 native species in eight orders, including shrews, bats, rodents (>60 species), hedgehogs, pika and hare, carnivores, and ungulates (Sokolov *et al.*, 1991; Clark *et al.*, 2006). Four non-native mammals also occur in Mongolia and additional native species are thought to be present (Clark *et al.*, 2006; Dolch *et al.*, 2007). In Dornogobi Aimag, which extends across three major vegetation zones in the country (Mallon, 1985), few details on the distribution of mammals exist, yet are needed for managing, protecting, and conserving populations of several species. The dearth of distribution data is largely due to a lack of systematic surveys in recent years, limited publication of survey results, and the difficulties associated with detecting some species.

Here, we present a checklist of mammals recorded in the Ikh Nart Nature Reserve of Dornogobi Aimag, Mongolia from August 2004

to August 2007. Our aim is to provide a relatively comprehensive record of mammals in the reserve and to add to existing knowledge about mammal distribution in Mongolia. We also comment on conservation issues facing some species in the reserve.

The Ikh Nart Nature Reserve (hereafter Ikh Nart) is a small protected area located in the northwest region of Dornogobi Aimag (N 45.72°; E 108.65°). Established in 1996, Ikh Nart protects 666.2 km² of rocky outcrops and harbors one of the largest remaining populations of argali sheep (*Ovis ammon*) (Myagmarsuren, 2000; Reading *et al.*, 2006). Two soums overlap the reserve, including Dalanjargal and Airag, and jointly manage its protection. Dalanjargal Soum covers the northern 57% of the reserve (37,919 ha) and Airag Soum covers the remaining southern region (28,700 ha).

Ikh Nart lies at the interface of semi-desert and grassland steppe vegetation zones and typifies the Gobi-steppe ecosystem (Mallon, 1985; Reading *et al.*, 2006). A unique mix of habitats occurs in the reserve, including rocky outcrops,

grassland plains, shrublands, and dry creek beds (Reading *et al.*, 2006). The average elevation in Ikh Nart is approximately 1,200 m. Climate is continental and highly variable throughout the year. Temperatures reach $-40\text{ }^{\circ}\text{C}$ in winter and exceed $+40\text{ }^{\circ}\text{C}$ in summer. Precipitation is low ($<100\text{ mm/year}$) and falls mostly as rainfall from June through August.

We recorded the presence of wild (non-domestic) mammals while conducting other studies that examined community ecology in the Dalanjargal portion of the reserve (Reading *et al.*, in press). The Dalanjargal portion contains all major habitats known in the reserve (Jackson *et al.*, 2006) and largely resembles the Airag portion, which differs mainly by containing fewer rocky outcrops. We recorded mammal presence in two ways: 1) through direct observations – we noted presence through seasonal ($n=3$) line transect surveys for ungulates (155 km transects walked per season using Distance methods), monthly spotlight surveys that covered ~ 60 km of roads, and opportunistic encounters; and 2) through captures – as part of a carnivore study we surveyed the abundance of small mammals (<2 kg) using grids of live traps (XLK folding trap, H. B. Sherman Traps, Tallahassee, Florida, USA) in major habitats (six 1 ha grids of 100 live traps surveyed for five consecutive days each season) and trapped carnivores for radio tagging using padded leghold traps (Victor Softcatch 1 & 1.5, Woodstream Corporation, Lititz, Pennsylvania, USA) set throughout the study area ($\sim 1,800$ trap nights). We also used nets (3 m high x 800 m long) to capture and radio-collar argali sheep and Siberian ibex (*Capra sibirica*) during September of each year. We captured bats opportunistically with a net set over a prominent freshwater spring in the area. Taxonomy and common names

presented here follow the Mongolian Red List of Mammals (Clark *et al.*, 2006) to be consistent with other studies. For alternative taxonomy, see Wilson & Reeder (2005) and for alternative common names (in English and Mongolian), see Reading *et al.* (1994).

We recorded 33 mammal species (32 native and 1 non-native) representing seven orders, 15 families, and 28 genera (Table 1; Figure. 1). Of these, we directly observed 25 species and captured 23 species (Table 1). Rodentia represented the most speciose order ($n=14$ species), while Perissodactyla represented the least speciose ($n=1$ species) (Figure. 1).

Mammals in the reserve included five species listed as regionally endangered (EN) or vulnerable (VU) by the World Conservation Union (IUCN), including argali sheep (EN), Mongolian gazelle (EN; *Procapra gutturosa*), goitered gazelle (VU; *Gazella subgutturosa*), Asiatic wild ass (EN; *Equus hemionus*), and Siberian marmot (EN; *Marmota sibirica*) (Clark *et al.*, 2006). IUCN regionally near threatened (NT) species in the reserve included Siberian ibex, grey wolf (*Canis lupus*), corsac fox (*Vulpes corsac*), red fox (*V. vulpes*), Eurasian lynx (*Lynx lynx*), and Pallas's cat (*Otocolobus manul*) (Clark *et al.*, 2006). We also identified two species listed as regionally IUCN data deficient (DD), the marbled polecat (*Vormela peregusna*) and Asian particoloured bat (*Vespertilio superans*) (Clark *et al.*, 2006). Ikh Nart mammals listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Mongolia include argali sheep, Asiatic wild ass, grey wolf, Eurasian lynx, and Pallas's cat (UNEP, 2007). The Mongolian Law on Fauna lists species as 'Rare' or 'Very Rare' (Wingard & Odgerel, 2001). Under this law, argali sheep, Siberian ibex, Asiatic wild ass, Goitered gazelle,

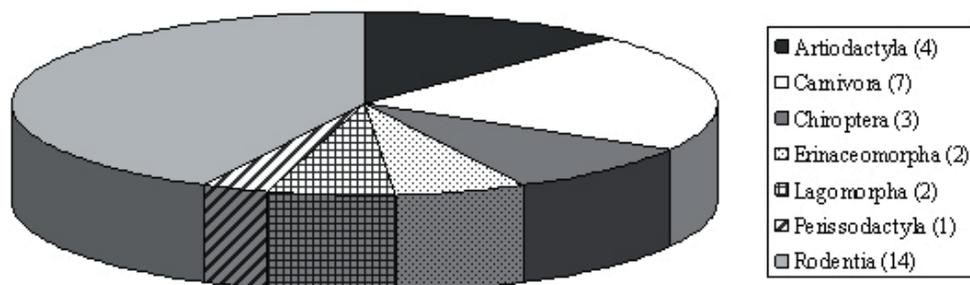


Figure 1. Distribution of mammal species by order recorded in Ikh Nart Nature Reserve, Dornogobi Aimag, Mongolia from August 2004 to August 2007. Number of species indicated in parentheses.

Eurasian lynx, and marbled polecat are listed as Rare. No mammal species inhabiting Ikh Nart is listed as Very Rare.

Most of the species recorded in the reserve live there year-round. Some of the species appear to occur only seasonally. We observed Asiatic wild ass only during the summer months of July and August, for example, and it seems likely that they moved into the area searching for better foraging conditions. We observed wild ass singly and in groups (up to 40 individuals) during the study. As Mongolia represents an important stronghold for the species (Reading *et al.*, 2001), our observations suggest that Ikh Nart provides suitable habitats for wild ass at the fringe of their range. Both gazelle species also seem to occur seasonally, migrating into the area during the summer months, the extent to which may be determined partly by plant productivity (Leimgruber *et al.*, 2001). However, we occasionally observed Mongolian gazelles in the reserve during winter months. Although prior to 2003, we frequently observed goitered gazelle in Ikh Nart and their skulls remain common within the reserve, we have not observed an animal since 2004.

Argali sheep and ibex live in the reserve year-round. The argali population, in particular, represents one of the few, large (i.e., hundreds of individuals) remaining populations in Mongolia (Reading *et al.*, 2003). Argali and ibex face significant threats in Ikh Nart, including competition for food from domestic livestock (Wingard, 2005), predation from domestic dogs (Reading *et al.*, 2005), and government-sanctioned trophy hunting in the Airag Soum part of the reserve. Despite the federal permit for argali trophy hunting, Mongolian law clearly bans all hunting in nature reserves (Wingard & Odgerel, 2001).

Among carnivores, the most commonly observed species was the red fox, followed by corsac fox. We directly observed other small carnivores in the study area as well, including Pallas's cat and Eurasian badger (*Meles meles*). We also spotlighted one marbled polecat, captured another in a live trap, and identified the remains of a third in a cinereous vulture (*Aegypius monachus*) nest. We observed wolves (both live and dead) and their spoor. Hunting and trapping of wolves occurs frequently in Ikh Nart and surrounding areas, particularly in October and March. We did not directly observe or capture Eurasian lynx.

However, a local herder captured a lynx and cubs in the reserve in 2005. We also identified lynx tracks, observed a lynx skin purportedly killed by another local herder, and obtained reports of lynx sightings in the reserve during the study. Most carnivores we recorded in the reserve are near threatened and appear to be declining from over-hunting and illegal poaching countrywide (Clark *et al.*, 2006; Wingard & Zahler, 2006).

We recorded rodents in every major habitat in the reserve. The most commonly captured species included gerbils (*Meriones meridianus*, *M. unguiculatus*), jerboas (*Allactaga sibirica*, *Dipus sagitta*), and Phodopus hamsters (*P. cambelli*, *P. roborovskii*) (Table 1). We captured three other hamster species (*Allocricetulus curtatus*, *Cricetulus barabensis*, and *C. longicaudatus*) and silver voles (*Alticola semicanus*) less frequently as well as one non-native house mouse (*Mus musculus*) in the vicinity of a ger (Table 1). We captured one Brandt's vole (*Lasiopodomys brandti*) during the study in an open grassland area. Brandt's voles, however, exhibit large population cycles (Zhang *et al.*, 2003) and probably represent the most common species in the area during eruptions. We observed Siberian marmots regularly from spring through autumn and the carcasses of dead animals killed by poachers. Although considered endangered in Mongolia (Clark *et al.*, 2006), hunting and trapping marmots for skins and meat occurs intensively at the end of summer/early autumn and represents a major threat to the species (Wingard & Zahler, 2006). We observed only one long-tailed ground squirrel (*Spermophilus undulatus*) in the northern tip of the reserve.

We recorded the presence of one species of bat (*Myotis mystacinus*) during the study. We captured several individuals and frequently observed others in the vicinity of water (i.e., at springs and oases). Bat species *Vespertilio murinus* and *V. superans* were also captured in Ikh Nart as part of another study in 2004. Lagomorphs included tolai hare (*Lepus tolai*) and Pallas's pika (*Ochotona pallasii*). We frequently encountered hares in all major vegetation types within the reserve, but more commonly in ephemeral drainages and dry creek beds, often in association with tall vegetation (>1 m). We observed pika regularly early in the study, but more rarely toward the end of the study. Pika generally occurred in rocky areas.

We observed and captured two species of hedgehog, long-eared (*Hemiechinus auritus*) and

Table 1. Mammal species recorded in Ikh Nart Nature Reserve, Dornogobi Aimag, Mongolia from August 2004 to August 2007. Records include species directly observed (O) and captured (C) for research purposes. Taxonomy and names follow Clark *et al.* (2006).

Species	Common name	2004	2005	2006	2007
Artiodactyla					
Bovidae					
<i>Capra sibirica</i>	Siberian ibex	O	OC	OC	OC
<i>Gazella subgutturosa</i>	Goitered gazelle	O	-	-	-
<i>Ovis ammon</i>	Argali	OC	OC	OC	OC
<i>Procapra gutturosa</i>	Mongolian gazelle	O	O	O	O
Carnivora					
Canidae					
<i>Canis lupus</i>	Grey wolf	-	-	O	O
<i>Vulpes corsac</i>	Corsac fox	OC	OC	OC	OC
<i>Vulpes vulpes</i>	Red fox	OC	OC	OC	OC
Felidae					
<i>Lynx lynx</i> ¹	Eurasian lynx	-	C	-	-
<i>Otocolobus manul</i>	Pallas's cat	OC	OC	-	-
Mustelidae					
<i>Meles meles</i>	Eurasian badger	OC	OC	OC	OC
<i>Vormela peregusna</i>	Marbled polecat	-	O	C	-
Chiroptera					
Vespertilionidae					
<i>Myotis mystacinus</i>	Whiskered bat	O	O	OC	O
<i>Vespertilio murinus</i> ²	Particoloured bat	O	-	-	-
<i>Vespertilio superans</i> ³	Asian particoloured bat	O	-	-	-
Erinaceomorpha					
Erinaceidae					
<i>Hemiechinus auritus</i>	Long-eared hedgehog	O	OC	OC	OC
<i>Mesechinus dauuricus</i>	Daurian hedgehog	O	O	OC	OC
Lagomorpha					
Leporidae					
<i>Lepus tolai</i>	Tolai hare	O	O	O	O
Ochotonidae					
<i>Ochotona pallasii</i>	Pallas's pika	O	O	-	-
Perissodactyla					
Equidae					
<i>Equus hemionus</i>	Asiatic wild ass	-	O	O	O
Rodentia					
Arvicolidae					
<i>Alticola semicanus</i>	Mongolian silver vole	C	-	-	-
<i>Lasiopodomys brandti</i>	Brandt's vole	O	C	-	-
Cricetidae					
<i>Allocrietulus curtatus</i>	Mongolian hamster	-	-	C	C
<i>Cricetulus barabensis</i>	Striped dwarf hamster	-	C	C	C
<i>Cricetulus longicaudatus</i>	Long-tailed dwarf hamster	-	C	C	C
<i>Phodopus roborovskii</i>	Desert hamster	-	C	C	C
<i>Phodopus campbelli</i>	Campbell's hamster	-	C	C	C
Dipodidae					
<i>Allactaga sibirica</i>	Siberian jerboa	O	O	OC	OC
<i>Dipus sagitta</i>	Northern three-toed jerboa	O	OC	OC	OC
Gerbillidae					
<i>Meriones meridianus</i>	Mid-day gerbil	OC	OC	OC	OC
<i>Meriones unguiculatus</i>	Mongolian gerbil	OC	OC	OC	OC
Muridae					
<i>Mus musculus</i> ⁴	House mouse	-	C	-	-
Sciuridae					
<i>Marmota sibirica</i>	Siberian marmot	O	O	O	O
<i>Spermophilus undulatus</i>	Long-tailed ground squirrel	O	-	-	-

¹ Lynx killed by local herder in the reserve in 2005. Tracks observed in 2006.

^{2,3} *Vespertilio* spp. captured as part of another study in 2004.

⁴ Non-native species.

Daurian (*Mesechinus dauuricus*). Both species live sympatrically in the reserve and appear to be abundant. Our observations, however, suggest that long-eared hedgehogs associate more with open steppe environments and Daurian hedgehogs

associate more with rockier, semi-desert areas. The presence of Daurian hedgehog in Ikh Nart represents a range extension for the species (Murdoch *et al.*, in press).

Ikh Nart harbors a quarter of the native

mammal species known to occur in Mongolia, yet its size covers <0.05% of Mongolia's land surface. One third of the species present are classified as threatened or near threatened in the country (Clark *et al.*, 2006). Our results suggest that given the high diversity, high proportion of declining species, and small land surface area of the reserve, Ikh Nart represents a 'hotspot' of mammal diversity in Mongolia. As such, we believe it should be considered a priority area for mammal conservation efforts in the country.

As we recorded mammal presence while conducting other studies, our checklist is probably not complete and we suspect that additional species may live in the reserve. We recommend conducting further mammal surveys, especially for bats and rodents, in the Dalanjargal portion of the reserve as well as in the southern portion covered by Airag Soum. We also recommend examining habitat associations of the species present and developing a mammal monitoring program.

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Хураангуй

Бид 2004 оны 8-р сараас 2007 оны 8-р сар хүртэлх судалгааны үрдүнд Дорноговь аймгийн Их нартын байгалийн нөөц газарт бүртгэгдсэн хөхтөн амьтдын бүрдлийг толилуулж байна. Энэ нь Монголын хөхтөн амьтдын тархацын тухай мэдлэгт хувь нэмэр болох ач холбогдолтой. Хөхтний зүйлийг бүртгэхдээ тус нөөц газарт явагдаж буй судалгааны төслийн хүрээнд барьсан амьтад болон ажиглагдсан амьтдыг оруулсан болно. Бид нийт 7 баг, 15 овог, 28 төрөлд хамаарах 33 хөхтөн амьтны зүйлийг бүртгэлээ. Үүнээс Rodentia баг зүйлээр хамгийн баялаг ($n = 14$ species), харин Perissodactyla баг хамгийн ядмаг ($n = 1$ species) байв. Эдгээрээс 1/3 нь Дэлхийн Байгаль Хамгаалах Холбооны (IUCN) ангиллаар Монгол улсын хэмжээнд устаж болзошгүй, ховордож болзошгүй гэсэн ангилалд, 5 нь Вашингтоны Конвенцийн хавсралтад, 6 зүйл нь Монгол Улсын Амьтны аймгийн тухай хуулинд ховор гэсэн ангилалд хамаарагдсан амьтад байна. Их нартын байгалийн нөөц газар нь Монгол орны нутаг дэвсгэрийн <0.05%-ийг эзлэх боловч тус улсад бүртгэгдсэн уугуул хөхтөн амьтдын зүйлийн 1/4-ийг агуулдаг байна. Зүйлийн олон янз байдал өндөр, ховордож буй зүйлийн эзлэх хувь их, хамгаалагдсан газар нутгийн хэмжээ бага байгаа зэрэг нь Их нартын байгалийн нөөц газар бол Монгол орны хөхтөн амьтдыг хамгаалахад чухал ач холбогдолтой нутаг бид үзэж байна.

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