

Long-tailed goral (*Naemorhedus caudatus*) in southwest Primorskiy Territory

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ABSTRACT. In the Land of the Leopard National Park, we have recorded the presence of several long-tailed gorals using camera traps over the years. The photos we obtained indicate the existence of a grouping of these animals in southwest Primorskiy Territory. Specific research is needed in areas of potential habitat for this species. We give a brief historical description of the goral's presence in the area.

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KEY WORDS: camera traps, Land of the Leopard National Park, *Naemorhedus caudatus*, Russian Far East.

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Амурский горал (*Naemorhedus caudatus*) на юго-западе Приморского края

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РЕЗЮМЕ. В национальном парке “Земля леопарда” мы зарегистрировали присутствие нескольких амурских горалов с помощью фотоловушек в течение нескольких лет. Полученные нами фотографии свидетельствуют о существовании группировки этих животных на юго-западе Приморского края. Необходимы специальные исследования в районах потенциального обитания этого вида. Мы даем исторический очерк присутствия горалов в этом районе.

КЛЮЧЕВЫЕ СЛОВА: фотоловушки, национальный парк «Земля леопарда», *Naemorhedus caudatus*, Дальний Восток России.

Introduction

The long-tailed (or Amur) goral (*Naemorhedus caudatus* Milne-Edwards, 1867) is a rare ungulate with a fragmented range confined to cliff habitats. Globally, the species is distributed in Northeast China, the Korean Peninsula and the Russian Far East. The goral is listed on the IUCN Red List (Bragina *et al.*, 2020) as vulnerable. The two largest local populations of gorals are found on the Korean Peninsula in the demilitarized zone between Democratic People's Republic of Korea and the Republic of Korea (Kim & Cho, 2005) and in Russia in the eastern and north-eastern part of Primorskiy Territory (Sikhotealin and Lazovsky nature reserves). The total number of gorals in the world is currently unknown. In Russia it is estimated to be 700–900 individuals (Zaumyslova & Bondarchuk, 2017).

History of Amur goral's research in southwest Primorskiy Territory

In southwest Primorskiy Territory (hereinafter, southwest) (Fig. 1), the long-tailed goral has been observed since XIX century. So, Maak (1861) reported that according to Chinese hunters, gorals inhabited basins of the Sidemi River (now Narva River) and the Adimi River (now Poima River). In 1889 M.I. Yankovsky captured 3 gorals in the Sidemi River basin for the collection of the Moscow Zoological Museum (Bromley *et al.*, 1978).

The last search for gorals in southwest was carried out by D.A. Nesterov in 1978 (Nesterov, 1985). The expedition surveyed the basins of the Amba and Krounovka rivers in the north of the study area. First were surveyed Rocky cliffs in the upper reaches of the Krounovka River. According to information from locals, a group of up to 30 animals could be seen in the area in the early 1940s. Civilian and military hunters came here from the surrounding villages to hunt specifically these

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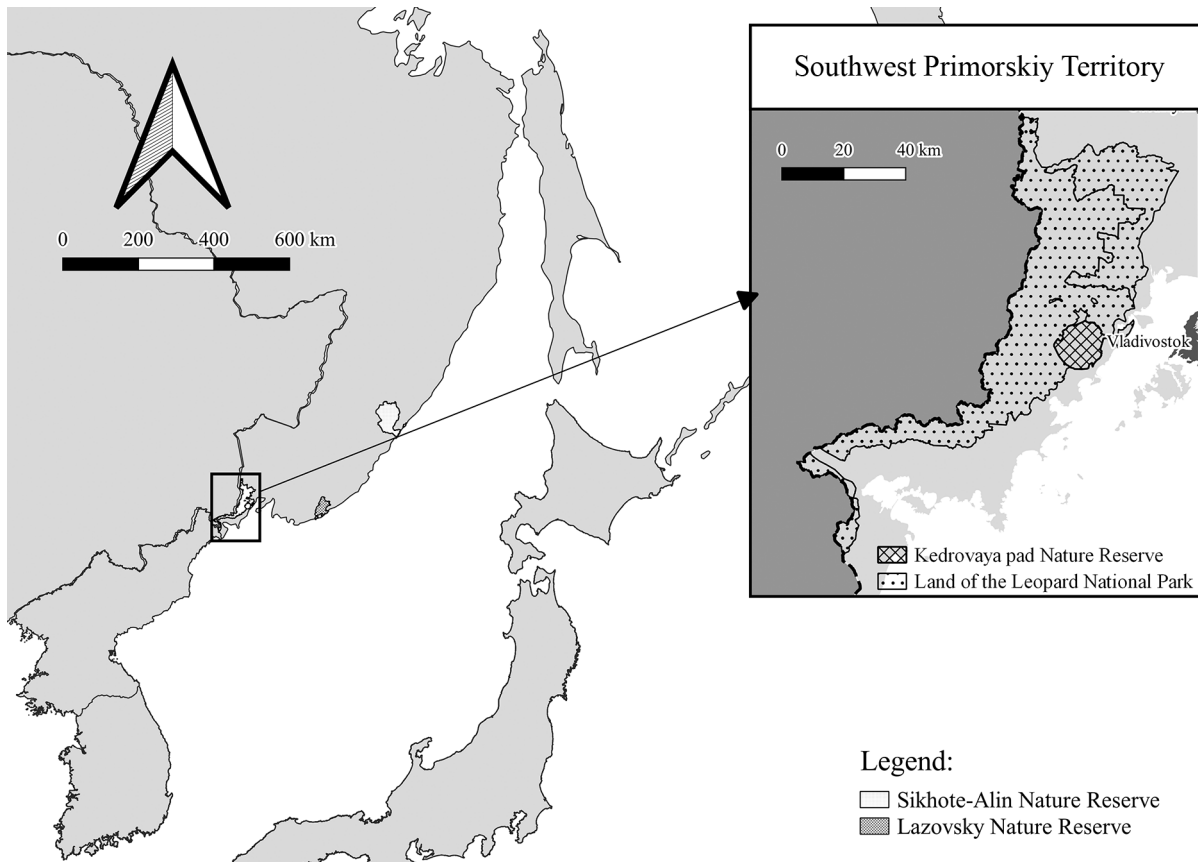


Fig. 1. Southwest of Primorskiy Territory.

animals. In spite of a thorough survey of the area in 1978, the presence of gorals in cliffs on north of Krounovka River was not documented.

At next Nesterov's expedition surveyed cliffs at the head of the Amba River, 20 km west from the village of Zanadvorovka. Before that, the latest information on the area dates back to the early 1960s, when A.G. Pankratyev established the fact of gorals' habitation on the mounts Chushkina Golova, Oleniy Cliff and at the headwaters of the Nezinka River. The Nesterov's survey of cliff outcrops on Chushkina Golova did not confirm even the temporary nature of the goral's habitat at the time. A survey of the Oleniy Cliff confirmed the evidence of goral's presence in the form of latrines, footprints and "scratchers" (thin trees on which animals periodically rub their horns). Of the 12 goral latrines found, only one had pellets a week old, the others contained pellets at least 2–3 months old and more. The old name for Oleniy Cliff was Immanyi Cliff. Interestingly, the word "iman" is derived from the Chinese "iman-yang", which means goral (Bromley, 1963). It appears that this tract has long been known as a goral habitat.

Nesterov noted that according to information received from border guards goral tracks were often found on trails in the upper Amba River in the 1960s. The author suggested that goral used this location as a migration corridor between Russia and China.

According to the Annals of Nature of the Kedrovaya Pad Nature Reserve (1987: 117), in the 1970s–80s the presence of gorals was documented around mounts Sinii Utyos and Skalistaya. In 1954, a single goral was seen near the headquarters of the Reserve. In 1976, the goral carcass was found in Ostrosopochnyy Creek. On 24 November 1986, Yuri Shibnev, a staff member of the Reserve, observed a goral on the Gakkelevskiy Ridge. According to interviews of local people, in the 1990s, gorals were hunted several times in the proximity of mount Skalistaya at the head of the Barabashevka River.

Current data on the distribution of the Amur goral in southwest Primorskiy Territory

First reliable observation of the species in southwest Primorskiy Territory since 2000 was confirmed using camera traps. The photograph of a single goral was obtained on May 21, 2012 by members of expedition organized by A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences (Moscow) to study rare species such as Far Eastern leopard (unpublished data).

In 2012, the Land of the Leopard National Park was established in southwest Primorskiy Territory. As part

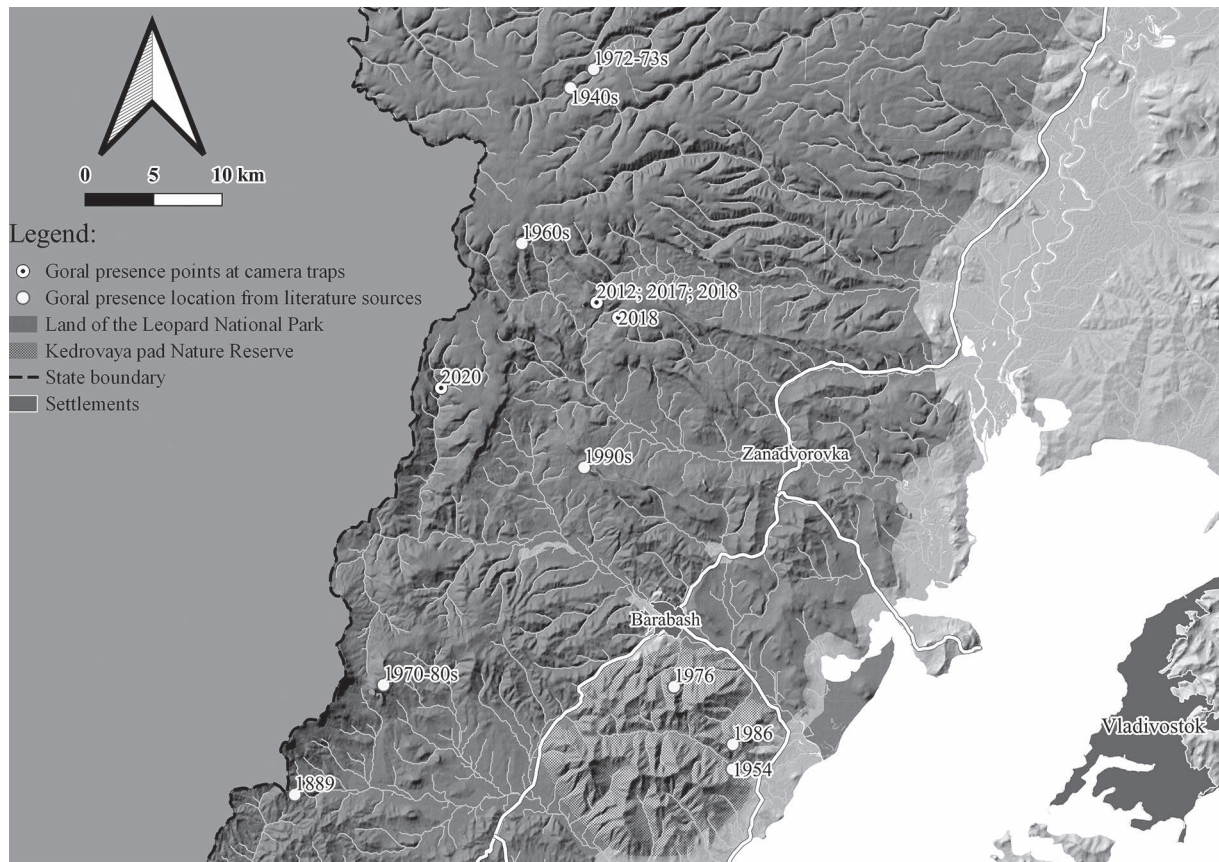


Fig. 2. Map of sightings of long-tailed gorals in southwest of Primorskiy Territory.

of a study of the Far Eastern leopard (*Panthera pardus orientalis* Schlegel, 1857) and Amur tiger (*Panthera tigris altaica* Temminck, 1844), a large monitoring network of 200 camera trap stations was installed across in the Park. The goral was first recorded on March 2017 (in the Oleniy Cliff in the northwest portion of the Park, close to the border with China (Heilongjiang Province) (Fig. 2; all historic and recent goral sightings are depicted on the map). The camera trap was mounted on a tree trunk on the animal trail running along the edge of the plateau at 320 m above sea level so that to overlook the Amba River valley (43.4102° N; 131.4016° E). The south-western aspect of the plateau ends with a cliff up to 200 meters high and a 70° incline. The vegetation at the top of the plateau is broad-leaved forest dominated by Mongolian oak. The same animal was photographed four times on March 4, 18, 21 and 23. In all cases, goral appeared between 3 and 4 pm, and being present in front of the camera for 3 to 17 minutes. In all camera captures, feeding behavior was observed, which was interrupted by an orientation behavior. Visual assessment the shape of the horns, this was a young female (Myslenkov & Voloshina, 1989), well identifiable due to a chipping on the right horn.

The next camera trap recording of the species occurred a year later on 26 March 2018, a single pass of the same female with a broken horn was photographed

at the same monitoring station in the Oleniy Cliff. In addition, a single passage of a male long-tailed goral was photo captured at a camera trap station 4 km southeast (43.386° N; 131.4385° E) on 4 June 2018 (Fig. 3). The camera trap station is located on a rocky escarpment at 564 m above sea level. The terrain is also characterized by cliff formations and the vegetation is predominantly broadleaved forest type.

The most recent sighting of the Amur gorals was on 6 May 2020, at a camera trap station located on the bank of the Poperechka Creek (43.3352° N; 131.2831° E), 12 km from the Oleniy Cliff. It was not possible to identify the sex and age of the animal from the shape of the horns.

According to Chinese counterparts (personal communication), in 2018, the Amur gorals were once spotted on camera traps located in the Chinese territory bordering the northwestern part of the national park.

Conclusion

At present, the natural enemies of the goral in southwest Primorskiy Territory are the Far Eastern leopard and the Amur tiger. In 1963, G.F. Bromley reported a leopard preying on gorals; since then, not a single confirmed case of the leopard hunting this ungulate species has been recorded. Analysis of the leopard diet



Fig. 3. Photo of a male long-tailed goral.

carried out by a number of researchers between 1961 and 2013 (Pikunov & Korkishko, 1992; Salmanova *et al.*, 2013) also failed to identify the goral among the prey species of the Far Eastern leopard.

The level of poaching in southwest Primorskiy Territory has decreased considerably compared to the 1980s and 1990s. This is primarily due to the introduction of a protected area. The second important factor is the decrease of hunters due to a significant outflow of military personnel and population due to socio-economic reasons in the Far East in the 1990s.

One potential competitor species for the goral is the sika deer (*Cervus nippon* Temminck, 1838), the most abundant ungulate in southwest. In 2019 the sika deer density reached 652 individuals per 100 km² (Darman *et al.*, 2020). It has been noted that during winter periods sika deer displace gorals from pastures, so that the high density of sika deer inevitably affects the distribution of gorals (Bromley, 1963).

Bromley *et al.* (1978) and Nesterov (1985) pointed out the availability of suitable habitats for long-tailed goral in southwest Primorskiy Territory. Five records of this species in the last nine years indicate the possible presence of a grouping of these ungulates. Habitats suitable for the long-tailed goral in the Land

of the Leopard National Park are isolated from the Sikhote-Alin mountain system, where other groups of this species in Primorskiy Territory are concentrated. There are no up-to-date data on the numbers of gorals, as no special censuses of this species have ever been carried out in the area. An extensive network of camera traps deployed specifically to monitor the Far Eastern leopard population cannot be used to assess the status of this rare ungulate population. To determine the current abundance and distribution of the long-tailed gorals in southwest Primorskiy Territory, it is necessary to conduct specific surveys that would target potential goral habitat.

In February 2019, Russia and China signed a Memorandum of Understanding, in which, among other things, the parties confirmed intentions to establish the Big Cat Land Transboundary Reserve, the world's first transboundary protected area for the Far Eastern leopards and Amur tigers (Decree of the Government of the Russian Federation of 15.02.2011). Thus, the Land of the Leopard National Park on the Russian side and the new nature reserve on the Chinese side would form a huge transboundary protected area, which will help to restore populations of big cats, and many other rare species, such as the long-tailed goral.

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