

New Records of the Tian Shan (or Himalayan) Brown Bear *Ursus arctos isabellinus* Horsfield, 1826 (Carnivora: Ursidae) in Zailiyskiy Alatau Mts., Kazakhstan

Bakhyt Mynbayeva^{1*}, Nina Voronova², Ainur Tanybayeva², Karlygash Musdybayeva¹, Gulzhan Yerubayeva³ & Bakytkul Amirasheva¹

¹Department of Biology, Natural Sciences and Geography Institute, Kazakh National Pedagogical University, 13 Dostyk Avenue, Almaty, Kazakhstan; E-mails: bmynbayeva@gmail.com, mkk77@mail.ru, bahitka_85@mail.ru

²UNESCO Department in Sustainable Development, Faculty of Nature Management, 72 Timiryazev Street, Almaty, Kazakhstan; E-mails: slovonine@mail.ru, ainur.tanybaeva@kaznu.kz

³Department of Tourism and Service, Turan University, 16 Satbayev Street, Almaty, Kazakhstan; E-mail: erubaeva.turan@mail.ru

Abstract: The Tian Shan (or Himalayan) brown bear *Ursus arctos isabellinus* is known from the Tian Shan Mts. and Dzungarian Alatau Mts. in Kazakhstan. The brown bears were locally extinct due to human activities in the North and Central Kazakhstan by the Twentieth Century. A few of brown bears of this subspecies still existed in the North Tian Shan Mts. in the territory of South Kazakhstan (Zailiyskiy Alatau, or Trans-Ili Alatau) in the valley of the Bolshaya Almatinka River in the 1930s. After the middle of Twentieth Century, there was no information about the presence of *Ursus arctos isabellinus* in this mountain range and in the valley of Bolshaya Almatinka River. Recently, traces of activities of *U. a. isabellinus* in its specific habitats were recorded. The spatial and stacial distribution of the bears has been determined via their direct census count in an active period (spring-summer). This is the first time in decades we have found traces of the Tien Shan brown bear, his bed and nutritive base in Ayusai and Prokhodnaya valleys of the river Bolshaya Almatinka basin. The animals places of stay during spring and summer were detected in mountain spruce and deciduous forests. Nutrient sources, age, and sex structures of bear populations were also discovered. Thus, the present research of the Tien Shan brown bear population in Kazakhstan is a first in the past 65 years.

Keywords: bear population habitat, Kazakhstan, monitoring studies

Introduction

It is well-known that there are two subspecies of the brown bear in Kazakhstan, i.e. the Tian Shan (or Himalayan) brown bear *Ursus arctos isabellinus* Horsfield, 1826 inhabiting the Tian Shan Mts. and Dzungar Alatau Mts. and the the Eurasian brown bear *Ursus arctos arctos* (L., 1758) occurring in the Altay Mts. and Saura Mts. However, during the Twentieth Century, due to human activities, the brown bear was locally extinct from North and Central Kazakhstan. By the 1930's, the Tian Shan brown bears were rare in the Zailiyskiy (Trans-Ili) Alatau Mts. (KASHKAROV 1931, OGNEV 1940, SLUDSKIY 1953); in that time, majority of them inhabited the mountain vegetation belts along the valley of the Bolshaya Almatinka River. By the middle of the Twentieth Century, there was no more information on the presence of Tian Shan brown bears in the Zailiyskiy Alatau (northern Tien Shan). Due to the high human population in the Bolshaya Almatinka River Valley, we did not focus

*Corresponding author: bmynbayeva@gmail.com

our study in that area. Instead, we carried out our observations in other two valleys, these of Ayusai River and Prokhodnaya River. Although these small rivers are tributaries of the Bolshaya Almatinka River, their valleys are unpopulated. In addition, the climatic and trophic factors of this area are the best suited to the habitat requirements of *U. arctos isabellinus*. Moreover, we found the corpse of a three-year-old bear in the Ayusai watercourse. The young animal got caught in the mudflow and died under a heap of timber.

The aim of the present study was to assess the status of *U. arctos isabellinus* along the selected routes in valleys of the Ayusai and Prokhodnaya Rivers in spring and summer of 2015.

Materials and Methods

The Ayusai River is around 7 km long and flows from the base of the Bolshoy Almatinskiy Peak into the Ayusai Gorge. We surveyed all the typical mountain climate belts in the Ayusai Gorge, starting from a nival belt to the temperate forest and spinney on the southern open terrain. We also visited large areas of subalpine meadows and mountain fir forest. We studied some open terrains overgrown with bushes and tall grass and, sometimes, low trees (i.e., rowan trees) and small raspberry thickets. The five mountain waterfalls in the gorge provide ample drinking water for many wildlife species, including brown bears. The Prokhodnaya River (a left tributary of the Bolshaya Almatinka River) flows to the Prokhodnaya Gorge. It has an approximate length of 21 km, beginning at the glaciers of the central part of the Zailiyskiy Alatau Mts. at an altitude of 3418 m. In total, the study area was approximately 3200 ha.

We used several different methods to document traces of activities of brown bears in the study area. We used the visual observation method (sighting) via binoculars and trail cameras and recorded the animal presence by studying the paths of bears. We also examined footprint morphometry using a biometric method through measuring the bear's palmar-plantar padcallus. Search and analysis of animals beds was also carried out. We determined the animals distribution based on the results of the visual recording of bears, their traces and living activities via direct census counts in the active period of animals during spring and summer. All used photographs are copyrighted.

Results

In August of 2015, we recorded the presence of a bedding site of *Ursus arctos isabellinus* in the south-

ern terrain of the Ayusai Gorge. Animals usually came out for feeding in the morning or night; in the daytime, they rested in their beds in the forest and shrubberies. We found a bear's daytime bed in the form of a depression among the sinewed roots of a Schrenk's spruce, along with a small amount of excrement. So we noted their preferred habitat is in the southern slopes of Ayusai Gorge, an open broad gull and fir forest. We also found bear's pugmarks with the pad's indentations, calluses and the claw markings that clearly indicated the presence of a bear. The characters of the pugmarks were clearly visible on the soft ground and sometimes on solid ground as well.

In May 2015, we detected pugmarks of a brown female bear with cub on the wet ground in the Prohodnaya River Valley. Perhaps this could be explained with the good food source, which included thickets of raspberry and cow-parsnip that mostly grew on the broad gulls and gentle slopes of the Prohodnoe Gorge that were more convenient for the feeding of the bears.

We identified five bear tracks of good quality on the ground of both gorges. The most specific characters of the bear's pad prints are shown in Fig. 1. The bear pad prints had an average width of the palmar-plantar pad callus of 16 ± 1.7 cm, while the average height was 7 ± 0.6 cm. The prints of the yearlings were significantly smaller: palmar-plantar pad callus (autopodium) had an average height of 8 ± 0.5 cm and an average width of 5 ± 0.3 cm.

A single adult of brown bear in the studied mountain region was recorded when using the installed trail camera in the evening (Fig. 2). No specimens were noticed during the daytime observation



Fig. 1. The pad prints for biometrics: female bear's track in the Prohodnoe Gorge.



Fig. 2. Photography of the Tian Shan brown bear from the region studied.

over the entire study period. A possible explanation of the lack of animals during the day could be the high temperatures and dry climate in the summer months of the studied area of the North Tian Shan Mts. (Zailiyskiy Alatau). These animals prefer to move during the cool period of the day. Therefore, it is extremely difficult to see them in summer, especially in the afternoon.

We found bears' excrement, consisting of partially digested plant residues, quickly blackened by the sun, and animal remains, i.e. parts of bones, hooves and hairs an eaten casualties (carrion).

In the Prohodnoe Gorge, in the same hogweed thickets, we discovered another location of a daytime bed of *U. a. isabellinus*. This was shallow oblong pit with a strongly trampled grass and a small amount of excrements within its perimeter.

Discussion

The Tian Shan (or Himalayan) brown bear population has decreased in Kazakhstan. Previous researchers have found significant areas of brown bears distribution in the first half of Twentieth Century but currently both their geographical distribution and abundance have been declining. The last scientific publications on this animal subspecies in Kazakhstan were dated from 1980s. *Ursus a. isabellinus* is listed in Appendix I of CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora) and in the Kazakhstan Red-data Book as a rare and endangered specie. Thus, these animals are under the protection of the Republic of Kazakhstan.

There are no recent studies on the state of *Ursus a. isabellinus* in Kazakhstan and its ecology. The neighbouring Central Asian countries Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan and Russia are concerned about the conservation of this specie (SERYODKIN et al. 2003). The numbers of the brown bears has declined also due to anthropogenic factors.

We found five traces of the Tian Shan (or Himalayan) brown bear in the studied territory (an area of about 3200 hectares) in the Ayusai and Prohodnoe Gorges and valleys of the corresponding rivers in 2015. Therefore, the abundance of the brown bears of this subspecies increased as we discovered them in the Zailiyskiy Alatau Mts., where they had not been recorded during the last 80–85 years.

It is well-known that in Kazakhstan *Ursus a. isabellinus* prefers vegetation as their main food source are arbuscular juniper, thickets of apple and walnut trees as well as hawthorn shrubs (ZHIRYAKOV 1980). According to the other sources (GRACHEV 1981), coinciding with our observations during the summer period, brown bears of this subspecies eat herbaceous vegetation, in particular cow-parsnip *Heracleum dissectum* (Ledeb, 1829). In addition, brown bears are known to eat meat (DAHLE et al. 1998, MCGRADY et al. 1999).

We have determined that the ecological basis for the optimal living for the bears included appropriate types of landscapes, climatic mountain belts and availability of the appropriate vegetation used as food. We consider that the population status and ecological habitat conditions of the brown bears are good for today.

As a result of our study, research we gathered information about the status of the population (animal numbers) of the Tian Shan (or Himalayan) brown bear in the Northern Tian Shan Mts. (Zailiyskiy Alatau Mts.). In addition, we identified forest areas with good protective properties and feeding conditions that could aid the survival of animals of this subspecies in Kazakhstan.

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