

G.K. Turlybekova

*Ye.A. Buketov Karaganda State University, Kazakhstan  
(E-mail: gulzhazira\_t@mail.ru)***The current ecological state of mountain ram (*Ovis ammon collium*)  
of population of GNPP «Buyratau»**

This article in is showed the ecological features of mountain sheep's (*Ovis ammon collium*) population of «Buyratau», a state national nature park. It is belong to rare and endangered category from the Red book. Area of existence of animals is local. It is one of five mountain sheep's subspecies, which exist in Kazakhstan. Argali use winter and summer pastures, with which their seasonal movements. Daily activity changes at seasons of year and depends on factors as: temperature of air, light intensity, air humidity, the frequency of rains and snowfalls, influence of sanguivorous insects and physiological state of animals. Food allowance of argali includes 87 species of plants. Today the number of population of argali in «Buyratau» depend of several complex of factors, anthropogenic and natural factors. The most important natural factor is death from wolves. Strategy creation of biological defence, reproduction and rational use is impossible without detailed knowledge of the animal's ecology and of factors that influence on its population in specific conditions which correspond to objectives of Convention on Biological Diversity, which was approved by the government of Republic of Kazakhstan.

*Keywords:* GNPP «Buyratau», populations, territory, movement, mountain ram, arkhar, hoofed animals, area, factors, activity, delivery, number.

Today one of the important problems of biology is conservation of biological diversity. Conservation of biodiversity and sustainability problem of biotic communities appears to be the priority direction of modern biology and ecology. Therefore studies of ecological features, lifestyle and changes of population of mountain sheep is one of the current problems of population ecology. President of Kazakhstan noted as important the problem of conservation and rational use of country's biodiversity as one of the main long-term priorities of Kazakhstan's development. Despite of the ecological plasticity, resources and economic importance of argali is decreasing day by day. Against the background of its common decrease in Kazakhstan various reserves and natural parks where breed red deer, for the purpose of increase in their number in Kazakhstan, and also its preservations. Arkhara are included in the Red List, the mountain ram is included, in the list of the most dangerous invasive types according to the International Union of Conservation.

The type from category of «infrequent and disappearing», is included in Red Lists of the USSR, and Republic of Kazakhstan and appears in the Appendix 2 «Convention on international trade in the types of fauna and flora which are under the threat of disappearance». The range of argali is very broad. They inhabit Pamir, Himalayas, Dzhungarian Alatau, Tarbagatai, Saur, Kazakh Highlands, south and south-east Altai, mountains of Mongolia and China.

Now mountain rams are widespread in the Central Kazakhstan very widely and can be met on shallow heights. They live practically in all large mountain as Semizbuga, Karaganda, Zhartas, Zheltau, Dyn, Hankashta, Karkaraly, Koshubai, Kent, Tungatar, Besobinsky, Ulken-Karakus, Narshoky, Kyzyltas, Kyzylaray, Chingiztau, etc. This same time isolation of some groups from the main area is observed.

The Ermentau mountain massif covers the area over 200 thousand hectares. About a half of this territory (88 968 hectares) are belong to the especially protected natural territory (EPNT) — Republican public organization «State national Buyratau natural park» formed in March, 2011. Around the park a security zone created equal territory of the park (88064 hectares) with differentiated mode of protection of the nature works. All these actions are directed to preservation of unique natural complex of Ermentau mountains

The mountain ram — *Ovis ammon collium* — the representative of the Bovidae, Artiodactyla group, the class Mammalia [1–6] lives in Ermentau uplands. The area is focal. It is one of five subspecies of the mountain rams living in Kazakhstan.

Three types of movements are allocated at arkhar: seasonal, daily and compelled. Seasonal movements are most noticeable. First of all they are caused by existence of a forage during particular seasons of year, so our arkhar move in the winter to the southern and east areas where on slopes of mountains and valleys the stern is more. Before a genus of female go to more protected places with the sharp crossed relief. The considerable movements are observed during rutting when adult males pass into habitats of females. But all the-

se movements happen, is routine in the territory of population if arkhar not to disturb. The compelled movements can be caused by natural disasters (the fires, hurricanes) or with emergence of some. Also paths of distant migrations of arkhar within its area are known, they are constant.

The description of the modern distribution of arkhars is rather authentically provided by Berbera (1999) [5–6].

The sizes and body weight of animals, their body height and development are depend not only from a genotype, but also from conditions of life. Growth rates, development and a metabolism are not identical even at the close sibling species. At the North Kazakhstan mountain rams number of chromosomes 56.

Legs at these animals are thin. Hoofs are large, are well adapted for movement on snow, the weak soil and rocks. Horn substance very solid, and in the tail of a hoof acts a finger pulp which does not slide on smooth stones. The area of forward hoofs (38,6 cm<sup>2</sup>) considerably exceeds the area back (29,3 cm<sup>2</sup>).

Brown-brown or grayish-brown coloring of an upper of the head and trunk at it to a thicket is sharply separated from a white bottom, and below of the frontal part of hind legs there passes the dark strip [5–10].

Nutrition is one of the most important forms of communication of organisms with environment of dwelling of animals. Searching and eating of forages as not discontinuous acts of activity at mountain rams to a large extent, than at many other hoofed animals, define placement of animals on the area, promoting at the same time development of a special rhythm of daily activity, a way of getting of a forage, the nature of movements, etc. [6].

Daily activity of a mountain ram changes on seasons of year and is defined by many factors: air temperature, illuminating intensity, humidity and amount of precipitation, influence of blood-sicking insects, and also physiological condition of animals.

In the mountains Ermentau, Koshubais, Temirshi apxap eats in the summer, in the fall and winter of 87 species of plants (including 19 species of bushes) and 1–2 types of lichens of the sort *Parmelia* [11–15].

Distribution of arkhars on biotopes has particular regularity: females with lambs prefer territory enriched by food, males — the most protected prefer. Summer and winter pastures to which their seasonal movements are bound clearly are expressed. These hoofed animals make also slight daily movements, and at natural disasters can migrate on long distances.

In the summer daily activity has pronounced recurrence. Arkhars begin to be grazed early in the morning with sunrise (Fig. 1) and late at night.



Figure 1. Arkhara at pasturage

In August activity of arkhar increases. In the evening they begin to be fed with 16–17 ch, and to twilight (from 19 to 22 o'clock) their activity increases. In especially hot days of arkhars at 7 o'clock already lay down or disappear in a shadow under rocks, in a bush or in the wood. During rest some individuals rise, fed on average 9–12 min and again lay down, changing the place, but not moving away from a from place more than on 25–30 m.

The pronounced cyclic mode of daily activity in June-October. In November of the grazed arkhars it is possible to meet at any time. During this period physical activity of males increases. They look for females or rivals and are a little fed.

Winter time arkhars spend for pasturage more time, than in the summer. Intensive feeding is the share of morning hours, and the greatest number of vacationers is noted in December and January from 13 to 16 o'clock and in February from 11 to 13 p [9, 10]. In spring–summer period to arkhara in the Kazakh uplands the great trouble is caused by midges, mosquitoes, gadflies and blood taken flies [11].

Important factor changes of number of arkhars are epidemics and epizodiya. Death caused by necrobatsilesis a pyroplasmosis are known [12]. The most significant effect on the number of population of arkhars in Ermentau uplands, as well as in other regions of its habitats, is rendered by wolves (Fig. 2).



Figure 2. Remains of a young female

Population of arkhars in GNPP «Buyratau» (winter route accounting of migration) in 2012–2016 (Fig. 3).

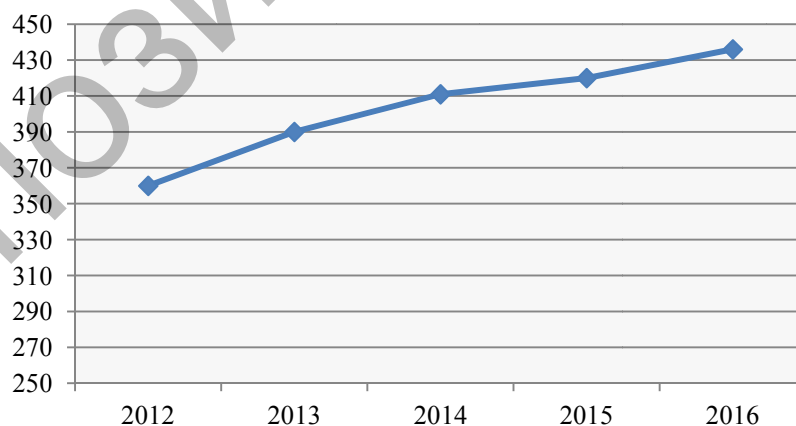


Figure 3. Population of arkhars in GNPP «Buyratau» winter route accounting of migration of animals in winter period 2012–2016

The number of an arkhars was stabilized in compared with 2012 and tends to increase (Fig. 3). The annual increase of a livestock of population is noted, it is promoted by the favorable factors in the territory of GNPP «Buyratau».

## References

- 1 Кузнецов Б.А. Определитель позвоночных животных фауны СССР. Ч. 3: пособие для учителей / Б.А. Кузнецов. — М.: Просвещение, 1975. — 208 с.
- 2 Константинов В.М. Позвоночные животные и наблюдения за ними в природе: учеб. пособие. — 2-е изд., испр. / В.М. Константинов, А.Б.Михеева. — М.: Академия, 2000. — 200 с.
- 3 Капитонов В.И. Архар / В.И. Капитонов // Красная книга Казахской ССР. — Алма-Ата: Кайнар, 1978. — Ч. 1. — С. 78–81.
- 4 Бекенов А.Б. О состоянии популяции в Карагандинской области / А.Б. Бекенов, Р.Ж. Байдавлетов, А.К. Федосенко, П.И. Вейнберг // Проблемы охраны и устойчивого использования биоразнообразия животного мира Казахстана: материалы науч. конф. — Алматы: Казахстан, 1999. — С. 13–14.
- 5 Бербер А.П. Горный баран (*Ovis ammon*) в Центральном Казахстане (биологические основы сохранения): дис. ... канд. биол. наук / А.П. Бербер. — М.: Просвещение, 1999. — 138 с.
- 6 Бербер А.П. Горный баран (*Ovis ammon*) Казахского нагорья / А.П. Бербер. — Караганда: ТАиС, 2007. — 168 с.
- 7 Сагалиев Н.А. Отчет о научно-исследовательской работе / Н.А.Сагалиев // МСХ РК КЛХ и ЖМ, РГУ «ГНПП «Бұйратау». — Караганда: Полиграфист, 2015. — С. 60.
- 8 Бербер А.П. Гельминтофауна горного барана Казахского нагорья / А.П. Бербер, Ж.Ж. Джакупов // Роль Карагандинского зоопарка в сохранении биологического разнообразия: материалы науч.-метод. конф. — Караганда: ТАиС, 1997. — Вып. 1. — С. 20–22.
- 9 Бербер А.П. Суточный образ жизни североказахстанского горного барана по сезонам года / А.П. Бербер, И.В. Калмыков, В.И. Ботов, Н.Т. Ержанов // Современные проблемы экологии Центрального Казахстана. — Караганда: ТАиС, 1998. — С. 36–43.
- 10 Бербер А.П. Современный ареал казахского горного барана и факторы, влияющие на его распространение / А.П. Бербер, Н.Т. Ержанов // Актуальные проблемы экологии: материалы Междунар. науч.-практ. конф., посвящ. 30-летию КарГУ им. Е.А. Букетова. — Караганда: ТАиС, 2002. — С. 54–57.
- 11 Федосенко А.К. Сибирский горный козел / А.К. Федосенко, Е.Ф. Савинов // Млекопитающие Казахстана. — Алма-Ата, 1983. — Т. 3, ч. 3. — С. 92–143.
- 12 Досжанов Т.Н. Мухи-кровососки Казахстана / Т.Н. Досжанов. — Алма-Ата: Кайнар, 1980. — С. 23.
- 13 Федосенко А.К. Архар / А.К. Федосенко, В.И. Капитонов // Млекопитающие Казахстана. — Алма-Ата: Наука КазССР, 1983. — Т. 3, Ч.3. — С. 144–209.
- 14 Белякова Ю.В. К паразитофауне архара (*Ovis ammon* Linn) Казахского мелкосопочника / Ю.В. Белякова, Р.Ж. Байдавлетов, К.К. Байтурсинов // Изв. НАН РК. Сер. биол. — 1994. — № 5. — С. 86–88.
- 15 Капитонов В.И. Питание архара в горах Кошубай / Капитонов В.И., Кубыкин Р.А. // Копытные фауны СССР, экология, морфология, использование и охрана. — М.: Наука, 1975. — 247 с.

Г.К. Тұрлыбекова

### «Бұйратау» МҰТП арқарының (*Ovis ammon collium*) қазіргі экологиялық күйі

Мақалада «Бұйратау» Мемлекеттік ұлттық табиғат паркінің Қызыл кітапқа енген, сирек және жойылып бара жатқан арқар (*Ovis ammon collium*) популяциясының экологиялық ерекшеліктері берілген. Таралуы, негізі, тұрақсыз. Қазақстанда мекендейтін тау арқарының бес түршесінің бірі болып табылады. Арқарлардың жазғы және қыстық жайылымдары олардың маусымдық ауысуына тікелей байланысты. Арқардың тәуліктік белсенділігі ауа температурасы, жарық, ылғалдылық және жауын-шашын мөлшеріне, қансорғыш жәндіктер таралуына және физиологиялық күйі жыл маусымына және көптеген факторларға байланысты. Арқардың рационы 87 өсімдік түрлерінен тұрады. «Бұйратау» МҰТП арқар популяциясының сандық динамикасының азаюы қазіргі таңда антропогенді, табиғи әсерден, оның ішінде қасқырлар шабуы кешенді түрде болуынан екендігі белгілі. Құнды тұяқты жануардың санын көбейту және рационалды пайдалану оның экологиясын, нақты мекендейтін аумағында сандық динамикасына әсер ететін факторларды тікелей зерттеумен байланысты. Бұл заңдылық Қазақстан Республикасы Үкіметінің Биоалуантүрлілікті сақтау конвенциясы мақсаты мен міндетіне сәйкес қорғалады.

*Кілт сөздер:* «Бұйратау» МҰТП, популяция, аймақ, ареал, арқар, жұптұяқты, экологиялық факторлар, белсенділігі, қоректену тізбегі, сандық динамикасы.

Г.К. Турлыбекова

## Современное экологическое состояние горного барана (*Ovis ammon collium*) популяции ГНПП «Буйратау»

В статье показаны экологические особенности горного барана (*Ovis ammon collium*) популяции Государственного национального природного парка «Буйратау», краснокнижного вида из категории редких и исчезающих. Ареал — очаговый, пульсирующий. Это один из пяти подвидов горных баранов, обитающих в Казахстане. У архара отчетливо выражены летние и зимние пастбища, с которыми связаны их сезонные перемещения. Характер суточной активности горного барана меняется по сезонам года и определяется такими факторами, как температура воздуха, освещенность, влажность и количество осадков, воздействие кровососущих насекомых, а также физиологическое состояние животных. Рацион горного барана включает 87 видов растений. Динамика численности популяции горного барана Буйратау в настоящее время зависит от ряда факторов, действующих комплексно: антропогенных и естественных, из которых наиболее значима — гибель от волка. Выработка биологической стратегии охраны, воспроизводства и рационального использования этого ценного копытного невозможна без детального знания его экологии, изучения факторов, влияющих на динамику численности в конкретных местах обитания, что соответствует целям и задачам Конвенции о биологическом разнообразии, одобренной Правительством Республики Казахстан.

*Ключевые слова:* ГНПП «Буйратау», популяция, территория, перемещение, горный баран, архар, копытные, ареал, факторы, активность, питание, численность.

### References

- 1 Kuznetsov, B.A. (1975). *Opredelitel' pozvonochnykh zhyvotnykh fauny SSSR. [Qualifier of vertebrate animals of the USSR's fauna].* (Part 3). Moscow: Prosveshchenie [in Russian].
- 2 Konstantinov, V.M., & Miheeva, A.B. (2000). *Pozvonochnye zhyvotnye i nablyudeniia za nimi v prirode [Vertebrate animals and monitoring them in nature].* (2nd ed.). Moscow: Akademiia [in Russian].
- 3 Kapitonov, V.I. (1978). Arhar [Argali]. *Krasnaia kniha Kazakhskoi SSR — Red book of Kazakh SSR.* Alma-Ata: Kainar [in Russian].
- 4 Bekenov, A.B., Baidavletov, R.Zh., Fedosenko, A.K., Veinberg, P.I. (1999). O sostoianii populatsii v Karahandinskoi oblasti [About the condition of population in Karaganda region]. Proceedings from Problems of protection and sustainable use of wildlife biodiversity in Kazakhstan: *Nauchnaia konferentsiia — Scientific conference* (pp. 13–14). Almaty: Kazakhstan [in Russian].
- 5 Berber, A.P. (1999). Gornyi baran (*Ovis ammon*) v Tsentralnom Kazakhstane (biologicheskie osnovy sokhraneniia). [Mountain sheep (*Ovis ammon*) in Central Kazakhstan (biological foundations of conservation)]. *Candidate's thesis.* Moscow: Prosveshchenie [in Russian].
- 6 Berber, A.P. (2007). *Gornyi baran (Ovis ammon) Kazakhskogo nahoria [Mountain sheep (Ovis ammon) of the Kazakh highland].* Karaganda: TAiS [in Russian].
- 7 Sagaliev, N.A. (2015). Otchet o nauchno-issledovatel'skoi rabote [Report on research work]. *MSKh RK KLKh i ZhM, RGU «GNPP «Buiratau» — MSKh RK KLKh and ZhM, RGU «GNPP «Buyratau».* Karaganda: Poligrafist [in Russian].
- 8 Berber, A.P., & Dzhakupov, Zh.Zh. (1997). Gel'mintofauna hornoho barana Kazakhskogo nahoria [Helminthofauna of mountain sheep in Kazakh Highlands]. Proceedings from The role of the Karaganda Zoo in preserving biological diversity: *Nauchno-metodicheskaiia konferentsiia — Scientific and methodical conference.* (Iss. 1, pp. 20–22). Karagada: TAiS.
- 9 Berber, A.P., Kalmykov, I.V., Botov, V.I., & Erzhanov, N.T. (1998). Sutochnyi obraz zhizni severokazakhstanskogo hornoho barana po sezonam hoda [The daily way of life of the North Kazakhstan mountain sheep by seasons of the year]. *Sovremennye problemy ekologii Tsentralnogo Kazakhstana — Modern problems of ecology of Central Kazakhstan.* Karaganda: TAiS [in Russian].
- 10 Berber, A.P., & Erzhanov, N.T. (2002). Sovremennii areal kazakhskogo hornoho barana i faktory, vliiaushchie na ego rasprostranenie [The modern range of the Kazakh mountain sheep and the factors that influence its spread]. Proceedings from Actual problems of ecology: *Mezhdunarodnaia nauchno-prakticheskaiia konferentsiia, posviashchennaia 30-letiiu KarGU im. E.A. Buketova — International scientific and practical conference dedicated to the 30th anniversary of the Ye.A. Buketov Karaganda State University.* (pp. 54–57). Karaganda: TAiS.
- 11 Fedosenko, A.K., & Savinov, E.F. (1983). Sibirskii gorny kozel. [Siberian mountain goat]. *Mlekopitaiushchie Kazakhstana — Mammals of Kazakhstan* (Vol. 3, Pt. 3). Alma-Ata: Nauka KazSSR [in Russian].
- 12 Doszhanov, T.N. (1980). *Muhi-krovososki Kazakhstana. [Sanguivorous flies in Kazakhstan].* Alma-Ata: Kainar [in Russian].
- 13 Fedosenko A.K., & Kapitonov, V.I. (1983). Arhar [Argali]. *Mlekopitaiushchie Kazakhstana — Mammals of Kazakhstan* (Vol. 3, Pt. 3). Alma-Ata: Nauka KazSSR [in Russian].
- 14 Beliakova, Yu.V., Baidavletov, R.Zh., & Baitursinov, K.K. (1994). K parazitofaune arhara (*Ovis ammon* Linn) Kazakhskogo melkosopchnika. [To parasitofauna of argali in Kazakh low hills]. *Izv. NAN RK Ser. biol. — Proceedings of NAS RK. Biology series,* 5, 86–88 [in Russian].
- 15 Kapitonov, V.I., & Kubykin, R.A. (1975). Pitanie arhara v horah Koshubai. [Nutrition of argali in Koshubai mountains]. *Kopytnye fauny SSSR, ekologiia, morfologiia, ispolzovanie i okhrana — Ungulate fauna of the USSR, ecology, morphology, use and protection.* Moscow: Nauka [in Russian].