New data on reptiles and birds in the North Ustyurt

K Akhmedenov1, ORCID 0000-0001-7294-0913, M Shpigelman2

1Department of Geography, M. Utemisov West Kazakhstan University, Uralsk, Kazakhstan
2Department of Botany and Zoology, Orenburg State Pedagogical University, Orenburg, Russia

E-mail: kazhmurat78@mail.ru

Abstract. Periodic inventory of species composition of fauna is one of the first tasks in the conservation of biodiversity. The North Ustyurt is one of the natural areas with a weak spatial-temporal study of herpetofauna and avifauna in the Western Kazakhstan. According to 2020 field studies and literary sources, a reliable habitation of one species of amphibians [European green toad *Bufotes viridis* (Laurenti, 1768)] and six reptile species [grey gecko *Mediodactylus russowii* (Strauch, 1887), takir agama *Phrynocephalus helioscopus* (Pallas, 1771), desert sand boa *Eryx miliaris* (Pallas, 1773), steppe ratsnake *Elaphe dione* (Pallas, 1773), blotched snake *Elaphe sauromates* (Pallas, 1814), Halys viper *Gloydius halys* (Pallas, 1776)]. As a result of the study of avifauna of late migratory and nomadic birds on the cliffs of the Doniztau and Zheltau mountains, 7 species of birds were identified that had not previously been recorded in the area [*Tarsiger cyanurus*, *Ficedula parva* red-breasted flycatcher, *Eurasian blue tit* *Parus caeruleus*, *great tit* *Parus major*, * Brambling* *Fringilla montifringilla*, *Eurasian siskin* *Carduelis spinus*, reed oatmeal *Emberiza schoeniclus*]. In total, 33 species of birds found on the North Ustyurt. The materials obtained indicate a lack of study of herpetofauna and avifauna of the North Ustyurt and it is necessary to continue research here.

1. Introduction

The Ustyurt plateau is located in the western part of Central Asia, between the peninsula of Mangyshlak and the Gulf Kara-Bogaz-Gol in the West, the Aral Sea and delta of the Aru Darya River in the east. The plateau has the area of 200,000 km² and lies in the territory of three states: Republic of Kazakhstan, Turkmenistan and Republic of Uzbekistan.

North Ustyurt belongs to the least studied areas of the plateau. Its northwest outskirts are in the territory of Zhylyoysky district of the Atyrau region of the Western Kazakhstan. Here Sholkar's ridge, the Zheltau plateau and the site Mount Donyztau chinka are located. Chinka is the steep ledges up to 350 m high limiting the raised flat sites of the earth's surface. They appeared as a result of sea abrasion during regressions of the Caspian Sea.

The scientific publications devoted to the gerpetofauna and the avifauna of North Ustyurt aren't numerous. The majority of the published works concerns either all extensive region of Ustyurt and Mangyshlak, or its some concrete parts to the south of Mount Zheltau. For example, complete and detailed overview of modern ideas of the gerpetofauna of the next Mangystau Region is published by T.N. Duysayeva [1]. The most recent and full report on the gerpetofauna of Atyrau region in general and, in particular, Mount Zheltau is given by F.A. Sarayev and M.V. Pestov [2]. Specification of these data, including for the territory of Zhlyoysky district, is published later [3]. In literature, the first data on the gerpetofauna of Mount Zheltau are provided in V.A. Kireev's publications [4, 5].
The first review of the ornithofauna of the chinks of the North Ustyurt was carried out in 1954 by Yu.A. Dubrovsky, indicating 18 species of birds [6]. In 2007, while studying beauty drives in the south-eastern part of Atyrau region, F.A. Saraev simultaneously conducted accounts of other representatives of the local avifauna. 33 species of birds were recorded [7]. In 2011, N.N. Berezovikov and A.V. Grachev met 13 species of birds on accounting routes and at points of short-term work [8]. In 2018, a report was issued on the results of a comprehensive landscape and ecological expedition to the Zhylyoy district of the Atyrau region. During the field studies, which were conducted in September 2017, in May and June 2018, 12 species of reptiles and 79 species of birds were noted [9].

Landscape and ecological conditions and the zoogeographic position of the region form its features. The latter include a difficult dissected relief, a wide variety of habitats, a mixed nature and a complex history of fauna formation, location at the intersection of transcontinental migration routes. The distance from large settlements (to the city of Atyrau 400 km), the lack of paved roads makes this area difficult to access and therefore herpetological and avifaunistic studies are carried out here irregularly.

Considering this, in August and October 2020 we conducted a comprehensive environmental-faunal survey of the North Ustyurt, including the study of herpetofauna and avifauna.

2. Materials and Methods

During the expeditions, in August and October 2020, we collected material on the distribution of some species of reptile and birds in North Ustyurt. Figure 1 shows a general view of one of the hills of North Ustyurt - Mount Zhelttau.

![Figure 1. General view of Mount Zhelttau of North Ustyurt (photo of the author).](image)

Standard environmental-faunal techniques were used in the collection of field materials. Observations and records of the number of reptiles and birds were carried out on automobile and foot routes, as well as at points of short-term stops. When detecting rare and new species, GPS coordinates were recorded and their photo documentary shooting was carried out. Hiking routes covered sections impossible for vehicles.

For field determination of birds the following optical devices were used: binoculars BMPTs-12 * 50 and Yukon 10x100 visual tube. For photo shooting - a Nikon D7200 camera with a Tamron SP AF 150-600 mm f/5-6.3 Di VC USD G1.

The basic principle in the study of snakes was the minimum effect on animals. Therefore, all studies were carried out by bloodless methods, without injuring snakes. Caught animals after photographing, measuring and other necessary manipulations were returned to the places of capture.
The snake species were identified by external morphological characteristics. Snake locations were recorded using the GPS navigator Garmin eTrex Touch 35, 2019. The reptiles encountered, and the biotopes in which they live, were photographed using Nikon D500 digital mirror camera.

3. Results and Discussion

Black-bellied sandgrouse *Pterocles orientalis*. In total, several flocks fed on wormwood areas were met on the routes. According to literature, it is a common breeding species [7-18].

Pallas’s sandgrouse *Syrrhaptes paradoxus*. By previous researchers, it is noted as an ordinary breeding species [7-18]. We met a flock of 5 individuals near one of the artesian wells. Coordinates: N 46°31'04.2" E 55°04'46.1".

Mute swan *Cygnus olor* family pair with a brood of two flight chicks was observed near an artesian well. Coordinates: N 46°31'04.2" E 55°04'46.1". Previously, it was also recorded on reservoirs near artesian wells [7].

Ruddy shelduck *Tadorna ferruginea*. A flock of 5 individuals is recorded on an artificial reservoir at one of the artesian wells. Coordinates: N 46°31'04.2" E 55°04'46.1". In 2018, during a joint expedition, the Ruddy shelduck was noted as a rare breeding species [9].

Eurasian teal *Anas crecca*. A small group sat on the lake next to the artesian well. By previous researchers, it was noted as a not abundant migrating species [8, 9].

Kestrel *Falco tinnunculus*. Three birds circled in the Sholabay tract near Mount Zheltau. According to literary data, an ordinary breeding species [7, 9-16].

Merlin *Falco columbarius*. It is mentioned in the literary review of the report for 2018, but the authors themselves did not note it. The merlin is not recorded in lists of previous researchers [9-16]. We recorded a migrating female on 06.10.2020 in the Zheltau mountains, in the area of the Sholabay tract.

Pallid harrier *Circus macrourus*. A transitory female was recorded next to one of the artesian wells. Coordinates: N 46°31'04.2"E 55°04'46.1". According to literary data, it is a relatively ordinary breeding species [7, 9-18].

Long-legged buzzard *Buteo rufinus*. Presumably, a nest of this species was found on the fence of one of the graves. An egg was found under it, which obviously fell out of the mold and did not crash, as it fell on the bedding from last year's soft grass. Previous authors attribute the Long-legged buzzard to the usual nesting species of the Northern Ustyurt [7, 9-18].

Steppe eagle *Aquila nipalensis*. Previous researchers indicate this predator as a common breeding species [7, 9-18]. We met a single bird in the Zheltau mountains.

Golden eagle *Aquila chrysaetos*. It was recorded in the Zheltau mountains, in the area of the Sholabay tract. Previous researchers attribute golden eagles to the usual nesting species in the study area [7, 9-18]. Figure 2A shows a picture of the golden eagle.

Eurasian blue tit *Parus caeruleus*. The first registration on the cliffs of North Ustyurt. A solitary individual was found in the Kainar tract. No other researchers recorded this species [11-18]. The nearest nesting sites of this species are known 260 km northeast of the study area - in the floodplain forest of the Emba river at the village of Zhagabulak in Aktobe region [17]. Figure 2B shows a photo of this tit.

Great tit *Parus major*. The first registration on the cliffs of the North Ustyurt. A solitary individual was observed in the Kainar tract. Previously, this species was not recorded here [11-18]. As in the previous case, the nearest known nesting sites of great tits are located in the floodplain forest of the Emba river at the Zhagabulak [17].

Green sandpiper *Tringa ochropus*. A single bird was seen on the lake next to one of the artesian wells. Coordinates: N 46°31'04.2" E 55°04'46.1". In the 2018 report it recorded as a rare migrating species [9].

Common pigeon *Columba livia*. Previously, as a rare species, it was noted only by F.A. Saraev [7]. We met a single bird in the Doniztau Mountains, near the Kainar tract. It was observed at the farm.
Steppe lark *Melanocorypha calandra*. Numerous breeding species [9-18]. It is found throughout the North Ustyurt.

![Image](image_url)

**Figure 2.** Some representatives of the herpetofauna and avifauna of North Ustyurt:
A – Golden eagle *Aquila chrysaetos*; B - Eurasian blue tit *Cyanistes caeruleus*; C - Halys pit viper *Gloydius halys*; D – Steppe ratsnake *Elaphe dione* (authors’ photo).

Crested lark *Galerida cristata*. Previous researchers indicated the crested lark as a rare nesting species [6-18]. We met a single bird only in the tract Kainar.

White wagtail *Motacilla alba*. A numerous migrating species, during our observations, was found near all artesian wells. Other researchers also observed seasonal migrations [6, 7, 10-18].

European black redstart *Phoenicurus ochruros gibraltariensis*. Previously, it was recorded only in 2018 on migration, without indicating subspecies [9]. We met a single migrating male near the Kainar necropolis on 05.10.2020. Since the European black redstart was not registered earlier by other authors in the North Ustyurt [10-18], it can be concluded that due to modern resettlement of its European form to the east, a new migration route was formed within the research area.

Red-flanked bluetail *Tarsiger cyanurus*. The first registration in the North Ustyurt and in the Northeast Caspian Sea. A migrating (passage?) male was found in the tract Egindypulak, in the area of Mount Kolenkeli. It was observed in a ravine near a spring near an unnamed necropolis. The coordinates of the registration point are N 46°24'17.9" E 55°24'24.4".

Isabelline wheatear *Oenanthe isabellina*. In some authors, it is referred to as numerous [6, 7], in others [9] as a rare species, which is undoubtedly due to the timing of the collection of materials. We recorded this wheatear in the study area as a regular common species.

Western black-eared wheatear *Oenanthe hispanica*. As a rare nesting species of Northern Ustyurt, it is indicated only in the report for 2018 [9]. We met a small number in the Zheltau mountains, in the area of the Sholabay tract.

Red-breasted flycatcher *Ficedula parva*. Previously, in the North Ustyurt was not registered [10-18]. We span a female flycatcher in the Zheltau Mountains, in the Sholabay tract. It stuck to the thickets of willow.
Common chaffinch *Fringilla coelebs*. According to literary data - a rare migrating species [8, 9]. We registered a rather large-scale migration. Migrating flocks of 7 to 15 individuals were found in the Zheltau mountains (Sholabay tract), and in the Egindybulak tract near the nameless necropolis in the Kolenkeli mountains. The coordinates of the last point are N 46° 24' 17.9" E 55° 24' 24.4".

Brambling *Fringilla montifringilla*. First registration in the North Ustyurt. A single male is found in the Zheltau Mountains in the area of the Sholabay tract. Previous researchers did not mention it.

Eurasian siskin *Carduelis spinus*. According to literary data, this species was not previously recorded in the North Ustyurt [11-16]. We recorded a flock of 3-5 individuals in the Doniztau Mountains (Sholabay tract) on 06.10. 2020.

Desert finch *Rhodospiza obsoleta*. Mentioned only in the 2018 report, as an ordinary nesting species [9]. Earlier in the study area was not recorded [11-16]. We observed small groups of Desert finches on October 6 in the Sholabay tract, located in the Zheltau mountains.

Common reed bunting *Emberiza schoeniclus*. Was not mentioned by previous researchers on the cliffs of the North Ustyurt [11-16]. We met a single individual at one of the artesian wells on 05.10. 2020.

Actual data on the herpetofauna of Mount Zheltau were provided for the first time in the publications of V. A. Kireev [4, 5], which included 1 species of amphibians for this area (Bufoates viridis (Laurenti, 1768)) and 13 species of reptiles: Alsophylax pipiens (Pallas, 1814), Tenuidactylus caspius (Eichwald, 1831), Phrynocephalus helioscopus (Pallas, 1771), Phrynocephalus guttatus (Gmelin, 1789), Eremias arguta (Pallas, 1773), Eryx miliaris (Pallas, 1773) - the name unites the desert sand boa and Tartar sand boa species which were considered as different species, Natrix tessellata (Laurenti, 1768), Natrix natrix (Linnaeus, 1758), Elaphe dione (Pallas, 1773), Elaphe sauromates (Pallas, 1814), Psammophis lineolatus (Brandt, 1838), Gloydius halys (Pallas, 1776).

According to Kireev V.A. [4], the Tartar sand boa is recorded on the northern slope of the ridge, and 3 km east of its foot, and the desert sand boa in the sands 7 km southeast of the ridge. Steppe and pallas ratsnake are ubiquitous, with the largest number (0.2-0.7 individual/hectare) on the slopes of the northern exposition. Copperhead snake is recorded twice on the slopes of the ridge of the northern exposition.

The following data on the distribution and partially abundance of herpetofauna species directly on Mount Zheltau were obtained during expeditionary research 2017-2018 as a part of the implementation of the MSF/203/17 project "Initiative on the Deserts of Central Asia" [9, 19]. Participants of expeditions in the south-eastern part of Zhylyoysky district, including the Sholkara ridge, the remnant Zheltau plateau and the Doniztau chink section and the lower plains surrounding them, and in the nearest areas in May 2018, found 1 species of amphibians and 9 species of reptiles in 33 locations; in June 2018 - 6 species of reptiles in 16 locations. Additionally, in June 2017, one species of amphibians and four species of reptiles were identified on the neighbouring area of the Doniztau cliff within the Aktoe region [19].

Directly on the plateau Zheltau [9], one species of amphibians (green toad) and five species of reptiles (gray gecko, toad head agamas, steppe ratsnake, pallas ratsnake, common copperhead snake) were found. Different-age specimens of gray gecko in May were detected at 9 points on the sub vertical surfaces of rocks on the chinks of the Zheltau plateau, in June - at 3 points on slabs and under stones at the brow of the chink of the Zheltau plateau [9]. Single individuals of the toad head agamas were found in May 2018 and in June 2018 they were recorded at the edge of the chink of the northern
facade of the Zheltau plateau [9]. In June, the only individual of the steppe ratsnake caught by the Long-legged buzzard was found on the cliff of the southwestern edge of the Zheltau plateau [9]. 2 individuals of the Pallas ratsnake were recorded, including one on the Zheltau plateau, the second in reeds at the outcome of artesian waters at the foot of the cliff of the north-eastern edge of the Zheltau plateau. The common copperhead snake is recorded at 2 points, including on the northern tip of the Zheltau plateau - 1 ex. and at the foot of the remnant at the eastern tip of the Zheltau plateau - 7 ex. At the last point in the settlement of the small ground squirrels, the maximum density of this species - up to 3 ex. per 1 hectare [9].

In August and October 2020, we recorded 3 species of reptiles living within Mount Zheltau: a steppe ratsnake, a common copper snake and a desert sand boa.

Steppe ratsnake Elaphe dione (Pallas, 1773). Location: 132 km east of the city Kulsary, on the northern ridge of Zheltau, near the necropolis Sholabay 2, Zhelyovsky district of the Atyrau region of the Republic of Kazakhstan, 1 individual. Coordinates: N 46°28'38.9" E 55°34'10.7", height 185 m. Date: 15 august 2020, 8 hours 40 min. Figure 2C shows a photograph of the steppe ratsnake.

The second location of the steppe ratsnake: 132 km east of the city Kulsary, on top of the northern ridge of Zheltau, Zhelyovsky district of Atyrau region of the Republic of Kazakhstan, 1 individual. Coordinates: N 46°28'56.3" E 55°34'23.1", height 213 m. Date: 5 October 2020, 13 hours 38 min.

Halys pit viper Gloydius halys (Pallas, 1776). Location: 132 km east of the city of Kulsary, on the north-eastern part of Mount Zheltau, Zhelyoy district of Atyrau region of the Republic of Kazakhstan, 1 individual. Coordinates: N 46°28'41.0" E 55°35'59.7", height 213 m. Date: October 5, 2020, 11 hrs. 58 min. Figure 2D shows a photograph of Halys pit viper.

Desert sand boa Eryx miliaris (Pallas, 1773). Location: 132 km east of the city Kulsary, on the northern ridge of Zheltau, near the necropolis Sholabay 2, Zhelyovsky district of Atyrau region of the Republic of Kazakhstan, 1 individual. Coordinates: N 46°28'44.9" E 55°34'17.2", height 187 m. Date: 15 august 2020, 10 hours 15 min.

Unlike the results of the research 2017-2018 [9,19], we recorded a steppe ratsnake on Mount Zheltau. Earlier it was found in the neighbouring area, its only juvenile specimen was recorded on June 10 in a Great gerbil colony in the lower section of the chink of the outer facet of the Tamda remnant massif (chink Doniztau).

Unfortunately, we did not found the rare eurytopic species listed in the Red Data Book of the Republic of Kazakhstan [20] - Pallas ratsnake Elaphe sauromates (Pallas, 1814). Also, according to our data and the 2017-2018 data [9, 19], the arrow snake Psammophis lineolatus (Brandt, 1838), which, as reported by V. A. Kireev [4], is widespread in all biotopes of Zheltau and its number everywhere is stable and does not exceed 0.7-1.2 individual/hectare.

4. Conclusion
During the expedition to North Ustyurt in early October 2020, we found 33 species of birds. Seven of them (blue tail Tarsiger cyanurus, red-breasted flycatcher Ficedula parva, Eurasian blue tit Parus caeruleus, great tit Parus major, brambling Fringilla montifringilla, siskin Carduelis spinus, common reed bunting Emberiza schoeniclus) previously in North Ustyurt were not registered. In part, this may be due to the relatively late dates of the trip to this area - during a period when previous authors did not work here practically. At the same time, given modern climatic changes, altering routes are being rebuilt, the timing of migratory activity of birds is shifting, new, more northern wintering areas appear. In this context we should probably consider some of the registrations of new species for the North Ustyurt. No doubt, that further research will significantly expand the list of birds of this interesting natural area, especially in the areas to which late migrants, new nomadic and wintering species.

According to the results of our studies in 2020, and also in accordance with earlier studies of 2017-2018, we can state that 1 species of amphibians (green toad) and 6 species of reptiles reliably live on Mount Zheltau of the North Ustyurt: gray gecko, toad head agamas, desert sand boa, steppe ratsnake, pallas ratsnake, The habitation of 8 more species here - even-fingered gecko, Caspian bent-toed gecko,
steppe-runner, spotted toadhead agama, steppe ribbon racer, desert sand boa, dice snake and grass snake, recorded earlier, has not yet been confirmed and needs clarification. Particular importance is the large role of artesian wells drilled for cattle watering and artificial lake-type reservoirs formed near them in increasing the regional diversity of reptiles and birds.

We consider it necessary to preserve biodiversity of this unique and valuable nature area through creation of a specially protected nature area - the North Ustyurt Natural Park.

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