

# New Data on Systematic Analysis of Hunting of Animals and Birds in the Hunting Plains of Uzbekistan

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**Abstract** The article presents a systematic analysis of mammals and birds officially permitted for hunting in the lowlands of Uzbekistan, by classes, orders, families and species. As a result of the conducted research, it was established for the first time that animals permitted for hunting in the lowlands of Uzbekistan represent 2 classes, 12 orders, 20 families and 54 species. The biodiversity, taxonomy, distribution, abundance, and bioecological characteristics of commercial species harvested in the lowlands of the desert zone of Uzbekistan, the impact of anthropogenic factors on the fauna, and measures for the protection and sustainable use of species are analyzed. The article describes in detail the activities of organizations involved in hunting in the lowlands of Uzbekistan. Biodiversity loss is one of the biggest environmental problems today, and protecting animals, along with hunting them, is of great importance.

**Keywords** Bukhara, Navoi, Khorezm, Republic of Karakalpakstan, Unique, Global climate change, Recreational load, Birds, Economic, Biodiversity, Protection, Hunting grounds, Wild animals, Anthropogenic

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## 1. Introduction

Natural biodiversity in key habitats has declined by 20% over the past century, and many species are threatened with extinction. The loss of a single species can have widespread ecological consequences affecting the global ecosystem. Today, special attention is being paid to the protection and sustainable use of wildlife, which is an important component of biodiversity. In particular, the widespread and sometimes irrational use of wild animals for hunting purposes, as well as existing problems in the field of hunting management, in many cases lead to the extinction or reduction in the number of species, sometimes turning them into rare or endangered species [2,15].

## 2. Literature Review

Based on the zoogeographic characteristics of each region,

foreign scientists conducted research on game population management, game species composition, hunting volume, hunting and game resource management, and the sustainable use of game species. Including B.T. Gray (1994), J. Madsen et al., (1995), J. Madsen (1995), H. Kokko et al., (1998), C.D. Fitzgibbon (1995), A. Gammell (1999), L. Munro (1999) G. Griffin (2000), F. Barends (2002), Ph. Chardonnet (2002), Y. Moy (2010), Michael Stokes (2011), A. Benitez-Lopez et al., (2017), R. Castillo-Contreras (2018), A. Hirschfeld (2019), Emmanuel Serrano (2020), Paulino Fandos (2023), T. Htay et al. (2023), Inmaculada Navarro (2025) and conducted by other scientists [4].

## 3. Materials and Methodology

The study utilized basic zoological and ecological methods, as well as questionnaire surveys and statistical and comparative analysis. Wildlife use is highly diverse, and in Uzbekistan, this activity is primarily carried out through recreational hunting, and partly for sport and other (scientific and medical) purposes [7,10].

The following methods were used to identify animals and record populations:

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Received: Feb. 26, 2026; Accepted: Mar. 19, 2026; Published: Mar. 26, 2026

Published online at <http://journal.sapub.org/ijge>

1. Visual observation: Identification of animals by direct observation in their natural habitat.
2. Identification by tracks and remains: Species identification using paw prints, fur, bird remains, and negative tracks.
3. Traps and camera traps: Animal activity and species were recorded using special sensor cameras.
4. Acoustic monitoring: identification using the vocalizations of birds and some mammals.
5. Biological samples: laboratory analysis of soil, bird eggshells, fur, and food samples.

Each method was applied in a manner that caused minimal environmental harm to the animals [7,10,11,12].

During the count, it is necessary to move slowly and quietly along the route, periodically stopping to observe the surroundings. Accordingly, birds encountered during the count are recorded in a diary. Observations and calculations were conducted along designated routes and at stationary observation points. Pedometers and large-scale maps were used to determine the route lengths. The routes ranged from 1 to 5 km along the coastline of lakes owned by hunting grounds and other lakes, with route widths up to 100 to 300 meters. In other areas, the routes ranged from 1 to 20 km, with route widths of 50 to 200 meters. Calculations were conducted in clear weather from 6:00 to 9:00 AM and from 5:00 to 8:00 PM (Table 1).

The animal count results were extrapolated to a 10-hectare area and the animal population density was determined using the following formula:

$$D = \frac{n}{2 \cdot L \cdot W};$$

Here D is the density; n is the number of birds encountered; L is the route length; W is the route width, or the distance from the route axis to the edge of the counting strip. The formula uses a factor of 2 to account for birds to the left and right of the route axis, but our calculations were based on one side of the route axis due to the lake's characteristics.

The percentage of a particular species in the prey population (%) was determined using the following formula:

$$X = \frac{a \cdot 100}{b};$$

Here a is the number of representatives of a specific species; b is the number of representatives of all species counted at the census location.

## 4. Results and Discussion

Climate change, uncontrolled livestock grazing, recreational activities, and large-scale construction are leading to the degradation of natural ecosystems and a reduction in biodiversity in the lowlands of Uzbekistan. Rational use and protection of wild animals and animal products are of national and international importance. A systematic analysis of animals harvested in the lowlands of the desert zone of Uzbekistan revealed the presence of 2 classes, 12 orders, 20 families, and 54 species of animals and birds (Table 1) [6,9,13].

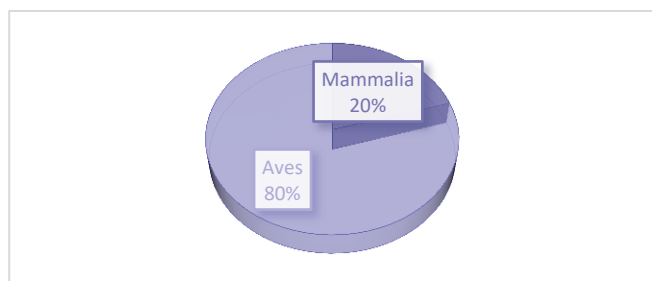
**Table 1.** Distribution of animal species permitted for hunting in the lowlands of the desert zone of Uzbekistan in the study areas

№	Name of the genus, family and species	Bukhara	Navoi	Khorezm	Republic of Karakalpakstan
	<b>Phylum</b>			Chordata.	
	<b>Subphylum</b>			Craniata.	
	<b>Superclass</b>			Tetrapoda.	
	<b>Class</b>			Aves.	
	<b>Subclass</b>			Neornithes.	
	<b>Superorder</b>			Carinatae.	
	<b>Order.</b>			Pelecaniformes.	
	<b>Family.</b>			Phalacrocoracidae.	
1	<i>Phalacrocorax carbo</i>	+	+	+	+
	<b>Order</b> Ciconiiformes				
	<b>Family.</b> Ardeidae				
2	<i>Botaurus stellaris</i>	+	+	+	+
	<b>Order.</b> Anseriformes.				
	<b>Family.</b> Anatidae.				
3	<i>Anser anser</i>	+	+	+	+
4	<i>Tadoma ferruginea</i>	+	+	+	+
5	<i>Tadorna tadorna</i>	+	+	+	+
6	<i>Anas platyrhynchos</i>	+	+	+	+
7	<i>Anas crecca</i>	+	+	+	+
8	<i>Anas strepera</i>	+	+	+	+

№	Name of the genus, family and species	Bukhara	Navoi	Khorezm	Republic of Karakalpakstan
9	<i>Anas penelope</i>	+	+	+	+
10	<i>Anas acuta</i>	+	+	+	+
11	<i>Anas querquedula</i>	+	+	+	+
12	<i>Anas clypeata</i>	+	+	+	+
13	<i>Netta rufina</i>	+	+	+	+
14	<i>Aythya ferina</i>	+	+	+	+
15	<i>Aythya fuligula</i>	+	+	+	+
16	<i>Bucephala clangula</i>	+	+	+	+
17	<i>Mergus merganser</i>	+	+	+	+
	<b>Order.</b> Galliforme .				
	<b>Family.</b> Phasianidae				
18	<i>Alectoris chukar</i>	+	+	+	+
19	<i>Perdix perdix</i>	-	-	+	+
20	<i>Ammoperdix griseogularis</i>	+	+	-	-
21	<i>Coturnix coturnix</i>	+	+	+	+
22	<i>Phasianus colchicus</i>	+	+	+	+
	<b>Order.</b> Gruiformes .				
	<b>Family.</b> Rallidae.				
23	<i>Rallus aquaticus</i>	+	+	+	+
24	<i>Gallinula chloropus</i>	+	+	+	+
25	<i>Fulica atra</i>	+	+	+	+
	<b>Order: Charadriiformes</b>				
	<b>Family: Burhinidae</b>				
26	<i>Burhinus oedicnemus</i>	+	+	+	+
	<b>Family: Charadriidae</b>				
27	<i>Vanellus vanellus</i>	+	+	+	+
28	<i>Vanellus leucura</i>	+	+	+	+
	<b>Family: Scolopacidae</b>				
29	<i>Gallinago gallinago</i>	+	+	+	+
30	<i>Scolopax rusticola</i>	+	+	+	+
	<b>Order: Columbiformes</b>				
	<b>Family: Pteroclididae</b>				
31	<i>Pterocles orientalis</i>	+	+	+	+
32	<i>Syrhaptes paradoxus</i>	+	+	+	+
	<b>Family: Columbidae</b>				
33	<i>Columba livia</i>	+	+	+	+
34	<i>Columba palumbus</i>	+	+	+	+
35	<i>Streptopelia decaocto</i>	+	+	+	+
36	<i>Streptopelia orientalis</i>	+	+	+	+
	<b>Order: Passeriformes</b>				
	<b>Family: Sturnidae</b>				
37	<i>Sturnus vulgaris</i>	+	+	+	+
38	<i>Acridotheres tristis</i>	+	+	+	+
	<b>Family: Corvidae</b>				
39	<i>Pica pica</i>	+	+	+	+
40	<i>Corvus monedula</i>	+	+	+	+
41	<i>Corvus frugilegus</i>	+	+	+	+
42	<i>Corvus corone</i>	+	+	+	+
43	<i>Corvus cornix</i>	+	+	+	+

№	Name of the genus, family and species	Bukhara	Navoi	Khorezm	Republic of Karakalpakstan
	<b>Class. Mammalia</b>				
	<b>Order. Lagomorpha</b>				
	<b>Family. Leporidae</b>				
44	<i>Lepus tolai</i>	+	+	+	+
	<b>Order. Rodentia</b>				
	<b>Family. Hystricidae</b>				
45	<i>Hystrix indica</i>	-	+	+	+
	<b>Family. Myocastoridae</b>				
46	<i>Myocastor coypus</i>	+	+	+	+
	<b>Family. Cricetidae</b>				
47	<i>Ondatra zibethicus</i>	+	+	+	+
	<b>Order: Carnivora</b>				
	<b>Family: Canidae</b>				
48	<i>Canis lupus</i>	-	-	-	+
49	<i>Canis aureus</i>	+	+	+	+
50	<i>Vulpes vulpes</i>	+	+	+	+
	<b>Family: Felidae</b>				
51	<i>Felis silvestris ssp.ornata</i>	+	+	+	+
52	<i>Felis chaus</i>	+	+	+	+
	<b>Family: Mustelidae</b>				
53	<i>Meles meles</i>	+	+	+	+
	<b>Order: Artiodactyla</b>				
	<b>Family: Suidae</b>				
54	<i>Sus scrofa</i>	+	+	+	+
	<i>Jami</i>	51	52	52	53

Note: Characteristics of officially hunted species: + Occurs, - Does not occur.  
This list includes animal species belonging to the classes of mammals and birds.



**Figure 1.** Analysis of animals permitted for hunting in the lowlands of the desert zone of Uzbekistan, by class

A systematic analysis of animals permitted for hunting in the lowlands of the desert zone of Uzbekistan revealed that they fall into two classes. Among the animals hunted, Aves species accounted for 43 species (79.6%), while Mammalia species accounted for 11 species (20.4%) (Figure 1). Despite the fact that hunting revenues are a vital economic factor in some countries, conservationists organize demonstrations aimed at restricting the hunting of certain species. L. Munro's research provides extensive information on such activist protests. In the American Northwest, protests have erupted against the national pastime of pigeon hunting. International animal welfare organizations are fighting against national hunting traditions in Southern Europe, Asia, and Africa.

In the late 1980s, Australian activists identified duck hunting as a significant social problem [14].

N.A. Zarudny studied the desert fauna of Kyzylkum, collected samples, and conducted his own research on the eggs and nests of 230 different bird species. Yu.O. Mitropolskaya noted that in Uzbekistan, the region's fauna is under threat due to the irrational use of biological resources, including wildlife, illegal hunting, and ineffective management of hunting grounds [5].

Research in the desert lowlands of Uzbekistan has identified 8 orders, 12 families, and 43 species of raptors. According to the data, the population of blue geese and black grouse in Uzbekistan has declined. In our opinion, this situation is inextricably linked not to unauthorized and large-scale hunting, but to the anthropogenic transformation of their habitat [3,15,16,17].

Among the mammals hunted in the lowlands of the desert zone of Uzbekistan, there are 6 species of the order Carnivora, belonging to 3 families (Canidae, Felidae, Mustelidae), 3 species of the order Rodentia, belonging to 3 families (Hystricidae, Cricetidae, Myocastoridae), 1 species of the order Lagomorpha, belonging to 1 family (Leporidae), and 1 species of the order Artiodactyla, belonging to 1 family (Suidae). (Table 2)

**Table 2.** A list of the main orders and families of animals permitted for hunting in the lowlands of the desert zone of Uzbekistan

Squad name	Number of family	(%)	Number of species	(%)
Pelecaniformes.	1	5	1	1,86
Ciconiiformes	1	5	1	1,86
Anseriformes.	1	5	15	27,78
Galliforme	1	5	5	9,25
Gruiformes	1	5	3	5,55
Charadriiformes	3	15	5	9,25
Columbiformes	2	10	6	11,11
Passeriformes	2	10	7	12,96
Lagomorpha	1	5	1	1,86
Rodentia	3	15	3	5,55
Carnivora	3	15	6	11,11
Artiodactyla	1	5	1	1,86
total	20	100	54	100

**Table 3.** Taxonomic composition of animals harvested in the lowlands of the desert zone of Uzbekistan

Phylum	Class	Order	Family	Species
Chordata	Aves.	Pelecaniformes	Phalacrocoracidae	<i>Phalacrocorax carbo</i>
		Ciconiiformes	Ardeidae	<i>Botaurus stellaris</i>
		Anseriformes.	Anatidae.	<i>Anser anser</i>
				<i>Tadorna ferrugine</i>
				<i>Tadorna tadorna</i>
				<i>Anas platyrhynchos</i>
				<i>Anas crecca</i>
				<i>Anas strepera</i>
				<i>Anas penelope</i>
				<i>Anas acuta</i>
				<i>Anas querquedula</i>
				<i>Anas clypeata</i>
				<i>Netta rufina</i>
				<i>Aythya ferina</i>
				<i>Aythya fuligula</i>
		<i>Bucephala elangula</i>		
		<i>Mergus merganser</i>		
		Galliforme	Phasianidae	<i>Alectoris chukar</i>
				<i>Perdix perdix</i>
				<i>Ammoperdix griseogularis</i>
				<i>Coturnix coturnix</i>
		Gruiformes	Rallidae.	<i>Phasianus colchicus</i>
				<i>Rallus aquaticus</i>
				<i>Gallinula chloropus</i>
		Charadriiformes	Burhinidae	<i>Fulica atra</i>
				<i>Burhinus oedicnemus</i>
			Charadriidae	<i>Vanellus vanellus</i>
<i>Vanellus leucura</i>				
Scolopacidae	<i>Gallinago gallinago</i>			
	<i>Scolopax rusticola</i>			
Columbiformes	Pteroclididae	<i>Pterocles orientalis</i>		
		<i>Syrhaptes paradoxus</i>		

Phylum	Class	Order	Family	Species
			Columbidae	<i>Columba livia</i>
				<i>Columba palumbus</i>
				<i>Streptopelia decaocto</i>
				<i>Streptopelia orientalis</i>
		Passeriformes	Sturnidae	<i>Sturnus vulgaris Chug'urchiq</i>
				<i>Acridotheres tristis</i>
			Corvidae	<i>Pica pica</i>
				<i>Corvus monedula</i>
				<i>Corvus frugilegus</i>
				<i>Corvus corone</i>
	Mammalia	Lagomorpha	Leporidae	<i>Lepus tolai</i>
		Rodentia	Hystriidae	<i>Hystrix indica</i>
			Cricetidae	<i>Ondatra zibethicus</i>
			Myocastoridae	<i>Myocastor coypus</i>
		Carnivora	Canidae	<i>Vulpes vulpes</i>
<i>Canis lupus</i>				
<i>Canis aureus</i>				
Felidae	<i>Felis chaus</i>			
			<i>Felis silvestris ssp.ornata</i>	
	Mustelidae	<i>Meles meles</i>		
Artiodactyla	Suidae	<i>Sus scrofa</i>		

The order Anseriformes is the most abundant in species composition in the desert lowlands of Uzbekistan, comprising 15 species (27.78%), which is more than in other orders. This is also explained by the widespread distribution of Anseriformes in nature (Table 2).

However, the above mentioned studies cannot provide detailed information on the implementation of modern and advanced methods in hunting and game management, as well as on the solution and justification of existing problems in the field of hunting and sustainable use of game species. In this context, the study of the species composition, ecology and sustainable use of wild animals in the lowlands of the desert zone of Uzbekistan, the development of recommendations for regulating the management of hunting farms, the development of hunting tourism and increasing the economic efficiency of hunting farms are of urgent scientific and practical importance.

The conservation and sustainable use of biological diversity is a key area of modern ecology and environmental protection. Wildlife use, including hunting, in the Republic of Uzbekistan is strictly regulated by the state. The use of hunting resources must be aimed at ensuring the stability of animal populations without disturbing the ecological balance. The listed species are found in different hunting zones, and the conditions for their hunting may also differ (for example, different game species have been recorded in mountain zones, steppe regions or desert zones [11; pp. 20-30]).

Birds of prey predominate in Uzbekistan. These primarily belong to the groups of field birds, steppe birds, and waterfowl. Specifically, quail, partridge, pheasant, wild duck, geese, pigeons, and waders are considered game animals. Birds regulate the populations of insects and small invertebrates in the wild, participate in the dispersal of seeds and plants, and ensure the stability of natural ecosystems. Therefore, seasonal restrictions on bird hunting are strictly enforced, and hunting is strictly prohibited, especially during the breeding season.

As a result of many years of research and scientific work, we have concluded that the game population is declining annually due to population growth, the development of natural areas, and uncontrolled hunting. Given the above, it is advisable to organize the breeding of game animals and birds on hunting grounds and begin hunting them. The first steps in this direction were taken in the lowlands of Uzbekistan's desert zone, at the Kumsultan hunting farm in the Bukhara region. The Kumsultan hunting farm is located in the Bukhara, Jondor, and Alot districts of the Bukhara region.

Leading organizations and research centers around the world conduct effective research on environmental conservation, wildlife preservation, species protection, and the stabilization of ecological balance. Consequently, preventing environmental threats, improving hunting legislation to protect wildlife, and promoting environmental awareness in society are essential for preserving biodiversity.



**Figure 2.** Laying hens in the nursery at the Kumsultan hunting farm



**Figure 3.** Breeding of animals on a hunting farm in the lowlands of the desert zone of Uzbekistan using the nursery method

## 5. Conclusions

This research, which examines hunting grounds, which are an important part of the national economy, and the species hunted there, will contribute to the proper organization of hunting, optimized management of hunting grounds, further improvement of the system for issuing quotas and permits for the sustainable use of hunting grounds and game animals, and will also help address other issues related to hunting management on a scientific basis. Scientifically based hunting of animals permitted for hunting in the lowlands of Uzbekistan's desert zone is essential for regulating natural populations, preserving biodiversity, and ensuring ecological balance. Harmonizing the ecological, biological, and economic aspects of hunting is a key factor in ensuring sustainable use of nature in the future.

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