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Annals of Biological Research, 2015, 6 (3):41-47
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Mammals and arthropod fauna of the Samur Yalama National Park and Khachmaz coastal state sanctuary

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ABSTRACT

SYNP was established in 2012. The total area of the site is 18 thousand hectares. The natural potential of the forest ecosystems of the Samur Yalama National Park is seriously affected by human activities and its self-recovery is not possible. The aim of our study was to examine the current state of the fauna of mammals and arthropods in the National Park, to identify the causes of rundown and make recommendations to eliminate the consequences of human-induced disturbance. According to the results of field research and processing data in the literature on the territory SYNP revealed, 50 species of mammals belonging to 14 families and 7 orders, 237 species of arthropods belonging to 3 classes, 20 orders, 39 families. 4 species of mammals and 8 species of arthropods included in the Red Book of Azerbaijan. The results of the research revealed the main causes of disappearance and to reduce the number of rare species and provides some recommendations for the primary protection.

Key words: Mammals, arachnids, crustaceans, arthropoda, endemic, ecosystem.

INTRODUCTION

SYNP was established in 2012. The site is located within the Khachmaz District of Azerbaijan. It includes the territory of the only large massive of lowland forests, which stretches for 24 km to the south from the delta of the Samur River along the Yalama-Khudat coast, the open sea shallow water areas (1 km wide) and the territory of the coastal stripe. The total area of the site is 18 thousand hectares. The site includes the woodlands with the total area of 12 382 hectares, including the whole territory of Yalama forestry (8 677 hectares) and a part of Khudat forestry (3 704 hectares), that belongs to Yalama Department of forest protection and recovery of the Ministry of ecology and natural resources of the RA.

The natural potential of the forest ecosystems of the Samur Yalama National Park is seriously affected by human activities and its self-recovery is not possible.

In this area there are rare lowland forests with relict species of oak, swamp, where rare species of nesting birds, mammals and arthropods nest. As a result of uncontrolled, unregulated flow of tourists in some areas of the forest there is unsanitary chaos, pollution of water reservoirs.

Clear-cutting, tapping, extraction of economically valuable tree species for thinning, severe disruption of the hydrological regime, the destruction of the lower layers of vegetation as a result of wide spread dispersed recreational use, etc. were negative impacts in the past and are partially still ongoing. Since there is no gas in the

region, the local population uses wood for heating from the forest. There was a strong destruction of forest vegetation.

Trophic relations between different groups of animals are violated, as a result, some species disappeared, some left these places and became rare. Coastal ecosystems are most prone to anthropogenic pollution. Existing for many years and increasing every year tourist recreation centers pollute the beach area, which existed here before the coastal strip of trees and bushes completely disappeared.

The aim of our study was to examine the current state of the fauna of mammals and arthropods in the National Park, to identify the causes of rundown and make recommendations to eliminate the consequences of human-induced disturbance.

MATERIALS AND METHODS

The studies were conducted on the territory of Samur Yalama National Park in 2012-2013. The following activities were performed: forests, agricultural lands, farmlands near the settlements Mugtadir, Aslanoba, Mesheli, Nabran, Shimali, Samurchay, Khudat, Yalama and the coastal zone were surveyed. Field studies were carried out visually (binoculars, camera), and partially assembled materials. In the laboratory, conducted laboratory processing of materials and the definition of species.

RESULTS AND DISCUSSION

According to the results of field research and processing data in the literature on the territory SYNP revealed, 50 species of mammals belonging to 14 families and 7 orders, 237 species of arthropods belonging to 3 classes, 20 orders, 39 families of which 4 species of mammals and 8 species of arthropods included in the Red Book of Azerbaijan (Table 1,2,3) [1-21].

Table 1 The number of species of mammals registered in SYNP

Orders	The total number of species registered in the territory		RBA	RL IUCN
	Absolute	Relative		
<i>Insectivore</i>	9	18		1
<i>Chrioptera</i>	7	14	3	3
<i>Rodentia</i>	17	34	1	-
<i>Logomorpha</i>	1	2	-	-
<i>Carnivore</i>	14	28	5	4
<i>Pinnipedia</i>	1	2	1	1
<i>Artiodactyla</i>	1	2	-	-
Total	50	100	10	9

Table 2. Mammals once lived on the territory of SYNP

Scientific name	English name	Abundance and Red list status
Order <i>Carnivora</i> Family <i>Felidae</i> <i>Felix lynx</i> L.,1758	Lynx	Rare RBA, RL IUCN
Order <i>Artiodactyla</i> Family <i>Cervidae</i> <i>Capreolus capreolus</i> L.,1758	European roe deer	numerically insignificant RBA
<i>Cervus elaphus</i> L.,1758	Deers	numerically insignificant RBA
Family <i>Bovidae</i> <i>Rupicapra rupicapra</i> L.	Caucasian chamois	Rare RBA, RL IUCN

Felix lynx once lived in all the mountain forests of Azerbaijan. Currently found on the southern (Sheki-Zagatala, Ismayilli, Shamakhi) and northeast (Guba, Devechi-Khachmaz) slopes of the mountain forests (Hajiyev, 2000). During monitoring, we did not encounter this species, but there is a possibility of its migration to the reserve.

Capreolus capreolus till 50-60-ies was widely spread in mountain forests (lowland and middle latitudes) Azerbaijan (Vereshchagin, 1942). According to our research in the 80-90-ies in the woods of Khachmaz area population

declined sharply (Aleksperov, Guliyev, 1987). In the late twentieth century, at the beginning of XXI century completely disappeared in the area. During the present study, this species were not detected as well. But if measures are taken for the protection, anti-poaching is likely to migration from neighboring areas - Guba and Qusar reserves.

Cervus elaphus in the natural area of the Greater Caucasus in Azerbaijan - in lowland and mountain forests of Khachmaz, Guba and Gusar districts became extinct in the second half of the XXI century (Vereshchagin, 1959, Guliyev, 2008). On the territory of SYNPP hasn't occurred for more than 2 centuries. Restoration of this species is only possible through the introduction.

Rupicapra rupicapra. Historical data and current research shows that this species is not in the national park. This is primarily due to the fact that there is no landscape with steep cliffs, inhabited by this species and the presence of large predators that are natural enemies.

Table 3. The number of species of arthropoda of Samur Yalama National Park

The names of classes, orders, families	English name	The number of species
1	2	3
Class Arachnidae	Arachnids	
Order Aranei		
Fam. Gnaphosidae	Spiders	7
Class Insecta	Insects	
Order Ephemeroptera	Green drakes	6
Order Odonata	Dragonflies	5
Order Blattoptera	Cockroaches	
Fam. Blatteridae	Cockroaches	1
Order Mantoptera	Mantis	1
Order Plecoptera	Europhiles	2
Order Orthoptera	Orthoptera	5
Order Dermaptera	earwig	3
Order Psocoptera	Copeognatha	2
Order Homoptera	Homoptera	
Fam. Cicadidae	Singing cicadas	1
Fam. Membrasidae		1
Fam. Psyllidae	Psillids	1
1	2	3
Fam. Triozidae		2
Fam. Aphididae	Plant louses	2
Order Neuroptera	Neuropterous	2
Order Megaptera	Alderflies	2
Order Mecoptera		2
Order Trichoptera	Caddis flies	4
Order Diptera	Flies	3
Order Siphonaptera	Flea	4
Order Hemiptera	Bugs	10
Order Coleoptera	Beetle	
Fam. Carabidae	Carabids or ground beetle	13
Fam. Scarabaeidae	leaf-horned beetles	14
Fam. Silphidae	Carrion beetles	1
Fam. Staphylinidae	Staphilinids	3
Fam. Elateridae	Click beetles	8
Fam. Buprestidae	Buprestid	10
Fam. Bostrychidae	Bark beetles	1
Fam. Anobiidae	Grinders	2
Fam. Atelabidae		3
Fam. Curculionidae	Billbug	2
Fam. Ipidae	Bark beetle	4
Fam. Cerambycidae	long horn beetles	34
Order Lepidoptera	Butterflies	
Fam. Tortricidae	Leaf	12
Fam. Noctuidae	Cutworms	14
Fam. Sphingidae	Hawk moth	1
Fam. Arctiidae	Arctiidae, bear	4
Fam. Papilionidae		4
Fam. Hesperidae		2

Fam. <i>Notodontidae</i>		2
Fam. <i>Orgyidae</i>		1
Fam. <i>Saturniidae</i>	Emperor	1
Fam. <i>Cymbidae</i>		1
Fam. <i>Syntomidae</i>		1
Fam. <i>Sesiidae</i>		1
Fam. <i>Cossidae</i>		1
Order <i>Hymenoptera</i>	Hymenoptera	
Superfamily <i>Apoidea</i>		
Fam. <i>Colletidae</i>	Colletes	4
Fam. <i>Andrenidae</i>	Andrenids	4
Fam. <i>Halictidae</i>	Halictids	7
Fam. <i>Megachilidae</i>	Megachilids	2
Fam. <i>Anthophoridae</i>	Anthophorids	5
Fam. <i>Apidae</i>	Bumblebees	3
Class <i>Crustacea</i>	Crustaceans	
Order <i>Amphipoda</i>	Amphipods	
Fam. <i>Gammaridae</i>	Gammarids	5
Fam. <i>Corophiidae</i>	Corophids	1
Total :		237

8 species of arthropods included in the Red Book of Azerbaijan:

***Anax imperator* Leach, 1815** (*Odonata, Aeshnidae*) - Emperor dragonfly
NT;IV.1.IV.2.

***Carabus (Procerus) caucasicus ssp.caucasicus* Adams, 1817** (*Coleoptera, Carabidae*) - Caucasian splashing snail-eater
NT;II.3.

Azerbaijan is common in forest and foothill areas of the Lesser and Greater Caucasus at a height of 1200 m above sea level. The small species found in rich aquatic and riparian plants standing water. The reasons for reducing the number of pollution and drainage ponds, the use of pesticides.

***Calosoma cophanta* Linnaeus, 1758** (*Coleoptera, Carabidae*) - Pretty ground beetle
NT; II.3.

Inhabits on the stem and leaves of deciduous trees of the forests, on soils.

The reasons for reducing the number of deforestation, excessive use of pesticides, the collection of collectors.

The reasons for reducing the number of deforestation, excessive use of pesticides, gathering by collectors.

***Rosalia alpina* Linnaeus, 1758** (*Coleoptera, Cerambycidae*) - Rosalia longicorn
VU;II.3,IV.2.

Inhabits in humid areas of broad-leaved forests, in the trunks of fallen trees.

The reasons for reducing the number of deforestation, removal of stumps of decomposed beech trees where these beetles inhabit.

***Manduca atropos* Linnaeus, 1758** (*Lepidoptera, Sphingidae*) - Death's-Head moth
NE.II.3,II.4

Widely spread species. The reasons for downsizing, the use of chemical fertilizers, gathering by collectors

***Callimorpha dominula* Linnaeus, 1758** (*Lepidoptera, Arctiidae*) - The scarlet tiger moth
NE.II.2,II.3,IV.2.

Inhabits in the foothills and mountainous forests. Their caterpillars inhabit in nettles, strawberries, raspberries, blackberries, forget-me-not, as well as willow and poplars.

The reasons for downsizing, cultivation habitats of these butterflies in order to sowing and gathering by collectors.

***Arctia caja* Linnaeus, 1758** (*Lepidoptera, Arctiidae*) - The garden tiger moth
NE.II.2,II.3,IV.2.

Inhabits in patches of the foothills and mountain forests, riparian forests. Feed on mostly grasses and shrubs. Damages birch, willow, raspberries, strawberries, blackberries and sugarbeet.

The reasons for downsizing cultivation habitat, riparian forest felling, gathering of butterflies by collectors.

***Arctia villica* Linnaeus, 1758** (*Lepidoptera, Arctiidae*) - The cream-spot tiger
NE.II.2,II.3,IV.2

Inhabits in low-lands and mountain-desert xerophytes biotopes. Their caterpillars feed on plantain, nettle, yarrow, strawberry and so on.

The reasons for downsizing cultivation habitat, gathering of butterflies by collectors.

11 species of arthropoda are endemic:

***Phyllodromica schelkovnikovi*, Burr, 1913** (*Blattoptera, Blatteridae*)

***Rhagium inguisitor* Linnaeus, 1758** (*Coleoptera, Cerambycidae*)

***Fallasia elegans* Faldermann, 1863** (*Coleoptera, Cerambycidae*)

***Aphantopus hyperantus* Linnaeus, 1758** (*Lepidoptera, Papilionidae*)

***Heteropterus morpheus* Pallas 1771** (*Lepidoptera, Hesperiiidae*)

***Ptilophora plumigera* Deniz & Schiffermüller, 1775** (*Lepidoptera, Notodontidae*)

***Notodonta trepida* Esp.** (*Lepidoptera, Notodontidae*)

***Euproctis similis* Fuessly, 1775** (*Lepidoptera, Orgyidae*)

***Saturnia pavonia* Linnaeus 1758** (*Lepidoptera, Saturniidae*)

***Hylophila presinana* Linnaeus 1758** (*Lepidoptera, Cymbidae*)

***Colletes spectabilis* Morawitz, 1885** (*Hymenoptera, Colletidae*) - endemic to the Caucasus

The health condition of the forest is not favorable. In all areas the study team saw fallen trees, many trunks of trees felled, burnt trunks along tourist routes, affected specimens with various diseases, dying trees. Such trees are favorable habitats for insects, herbivores, xylophagous (there were identified numerous species of dendrophagous: capricorn beetles - 34 species, carabidae beetles - 26 species, bark beetles - 7 species, click beetles - 8 species, 12 species of butterfly leaf-roller moths, a great number of leafhoppers and others). As a result, the number of so-called harmful species (relatively harmful, because in nature there are no harmful or beneficial species) sharply increases and they move to healthy plants. The main causes of drying trees are just insects' pests - dendrophagous.

In addition it was observed that as a result of hay making and overgrazing the open areas of the forest the ground herbaceous level has been destroyed, which is the habitat of many invertebrate species is.

Another reason due to which once common species became rare is mass collection by collectors, tourists; they prefer the big, beautiful beetles, butterflies, bugs, etc.

The human activities primarily are affecting a special range of species – the endemic and relict species; these species are unable to migrate through the establishment of agricultural lands. Oligophagous, monophagous, species leading aquatic life (larvae of dragonflies and stoneflies are very sensitive to water pollution, it is observed near all streams and small rivers in the Project Area) are also threatened.

As a result of human impact some species disappear, others grow in mass. On the territory of SYNPA and adjacent areas the process of natural development of the ecosystem is disrupted. Many elements of the ecosystem were lost without compensation.

CONCLUSION

According to the results of field research and processing data in the literature on the territory SYNPA revealed, 50 species of mammals belonging to 14 families and 7 orders, 237 species of arthropods belonging to 3 classes, 20 orders, 39 families. 4 species of mammals and 8 species of arthropods included in the Red Book of Azerbaijan. Protection of animals is possible within Protected Areas. A significant obstacle to their protection is the poorly understood ecology and distribution of many species.

For the protection of rare and beneficial species it is recommended to conserve reserves and nesting habitat of these species and to protect (if needed as well the cultivation) their host plants.

Banks of freshwaters within the NP, as well as the sea coast outside the NP need special attention. Special attention should be given to the elimination of contaminated surface water and avoiding littering and garbage collection, as well as sediment, resulting from natural processes of formation of the coastal strip. Banks of freshwaters and the coast line should be monitored.

The following measures are recommended as necessary:

1. The first step towards protection of animals is inventory. Without identifying relict, endemic and rare species it's impossible to take protection measures.
2. Particularly promising form of the conservation of rare and endangered species is the creation of reserve areas (so called - micro-wildlife reserves) on abandoned lands covering 1-5 hectares and by identifying habitats preserving rare, endemic species and to establish these places as micro-reserves.
3. Limitation of grass mowing and introduction of moderate grazing on the area.
4. In order to increase environmental awareness in the areas with large concentrations of tourists to place posters, photographs of protected animals. In this case, to involve scientists working in the field of biodiversity conservation, local municipalities, schools, etc.
5. To work on the reintroduction of animals once lived but is now included in the Red Book of Azerbaijan and IUCNRL (*Capreolus capreolus*, *Cervus elaphus*).
6. To reduce sharply the number of American raccoon, introduced in 1941 as a fur animal in the US. This predator is widespread in the forests and does much harm to birds and mammals.
7. Strict control and severe sanctions against illegal logging, and construction activities.

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