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Study of Biodiversity of the Arak University Watershed

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Article Info

Abstract Biodiversity has declined in many areas because of human activities and loss of habitats. The Watershed of Arak University with a total area of 625.65 hectares is located on the southwestern slope of Mount Mudar, northwest, adjacent of Arak city and north of Karahrod. Biodiversity information of the area was collected with using linear transect and dotted transect methods by installing camera trap, camera and GPS. The results indicate that biodiversity history dates back more than 65 million years. Currently, lives 55 species of dominant rangeland species and 50 species of animal include: 34 species of birds, 10 species of mammals and 6 species of reptiles and amphibians in the area. Falcon and Fritillaria are the Endangered (EN) and Greek tortoise and persian toad agama are the Vulnerability (VU). The most important threats to biodiversity include are development of the city of Arak in the region, habitat destruction, uncontrolled hunting, livestock and dogs, road construction and the abandonment of habitats with surrounding habitats, feeding wildlife from urban waste, nature tourism and informal climbing.

Keyword:

1.   Introduction

Today we are witnessing the fastest environmental changes. The most important changes include the reduction of gene diversity, species and biodiversity of communities. Biodiversity is the foundation of life on Earth. And it has many values and functions. And encompasses all species, ecosystems and ecological processes. Understanding biodiversity distribution patterns is essential to providing conservation solutions. It also provides biodiversity of goods and services to human societies and is of economic value. Biodiversity has decreased in many areas due to human activities and habitat loss [5]. Habitat loss and fragmentation along with other factors such as pollution, poaching, land use change, introduction of non-native species have seriously threatened the health and integrity of plant and animal communities. Depend on meeting their habitat needs such as food, shelter [4]. The situation of the world's mammals is worrying. Only 25% of the world's mammals have enough data, and this number is often endangered [6]. In Markazi province, there are

mountain, plain and wetland habitats where there are 335 species of animals including 205 species of birds, 53 species of mammals, 54 species of reptiles, 4 species of amphibians and 19 species of native fish. 1336 plant species including 1019 herbaceous species, 151 shrub species, 125 shrub species and 41 tree species grow [2]. The aim of this study was to identify habitat diversity, diversity of animal and plant species in the watershed of the campus of Arak University.

2.   Materials and methods

Arak University campus watershed is located on the southwestern slope of Mudar Brick Mountain, northwest of Arak city and north of Korhrood. The area of this basin is 625.65 hectares. The average annual rainfall of the region is 327.8 mm, the average maximum temperature is 18.3 and the average temperature is at least 1.6 ° C. The climate of the region is semi-arid. The highest altitude of the peak is 2441 meters. The geographical location of the Arak University campus watershed is presented in Figure 1. This study was collected using linear transect method and point transect method by installing camera trap, camera, binoculars and GPS device and sampling biodiversity data of the region [1].

Figure 1. Geographical location of Arak University campus watershed

3.   Results

The oldest biodiversity artifacts in the region are the presence of oyster fossils of Figure (2) at the top of the mountaineering camp located on the western slope of Mount Mudar and the existence of numerous lithographs of Figure (3) dating back several thousand years of wild goats, wild rams, Wolves and leopards on the boulders located in the northeastern valley of Arak University is the beginning of the mountaineering route to Mudar Peak, which shows the rich history of rich biodiversity in the region. In addition to interviews with local mountaineers, the presence of lynx and wild sheep has been observed in the area over the past two decades. In terms of importance and size, four types of habitats were identified in this region, including: mountainous, hilly, river and forest. The most important threats to the biodiversity of the region include: the development of Arak city into the region and habitat destruction, overhunting, livestock and a large number of stray dogs, disconnection of this habitat with surrounding habitats through road construction and land use change, burial Unprincipled waste, unprincipled nature tourism, development of agricultural lands on steep slopes, drought, etc.

Figure 2. Oyster fossil

Figure 3. Wild goat petroglyph

Table 1. Area and percentage of habitats in the area

Class	Habitat	Area(ha)	Percentage(%)
1	Mountainous	362.15	57.97
2	Hill	257	41.15
3	Forest	5	0.8
4	River	0.5	0.08
Total		625.65	100

There are four types of habitats in this area: mountainous, hilly, forest and river. Mountain habitats with 57.97% are the largest and wetland and river habitats with 0.5% of the area are the smallest habitats in the region. Table (1) and Figure (10) show the location, area and percentage of habitats in the region.

During the study, 55 dominant and important rangeland plant species, 34 species of birds, 10 species of mammals and 6 species of reptiles and amphibians were observed. The most important edible plant species with a degree of protection include astragalus, wheat grass, ryegrass, rye, artichoke and salt. Gypsophila species are abundant on the north-facing slopes. Pictures of plant index species of the region are presented in Figure (5).

The most important bird species include the tall Sargape, the Golden Eagle, the chukar, the See-see partridge, the kestrel, the Great Gray-eyed Stone, the nuthatch, the Mountain Cuckoo, and the saker falcon. The most important mammal species are fox, rabbit, boar, wolf,

and pike, and the animal image captured by the camera is suspected of being a cat-like trap (Figure 6) and a suspicious footprint of a lynx in the snow. The presence of otters in the building of the Faculty of Basic Sciences was recorded with a camera trap. The most important species of reptiles and amphibians in the western spotted tortoise are toad agama, leopard snake, Caucasian agama, rock agama, large scales and toad. Images of the region's animal index species are presented in Figures (7), (8) and (9).
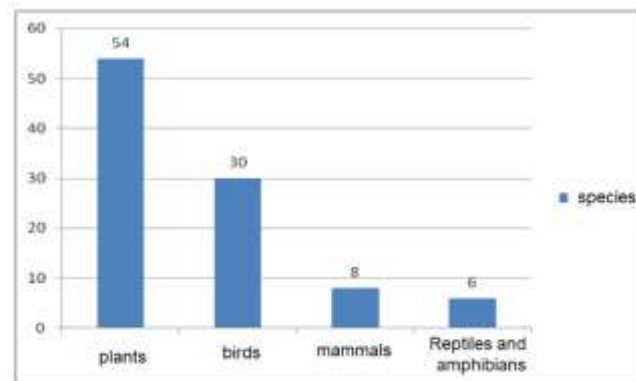

Figure 4. Status of number of plant and animal species in the area

Saker falcon is endangered (EN) and Western spotted turtle and Iranian toad agama in vulnerable position (VU) and inverted tulip are endangered (EN) (IUCN, 2019). The most important threats to biodiversity in the region include the development of Arak city into the region and habitat destruction, overhunting, livestock and dogs, road construction and disconnection of this habitat with surrounding habitats, feeding wildlife from urban waste and non-tourism and mountaineering. It is principled [3].

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