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Environmental characteristic of the Mount Rainier National Park (U.S.)

Charakterystyka przyrodnicza Mount Rainier National Park (U.S.A)

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Abstract: The article deals with the Natural Values of Mount Rainier National Park located in Washington State, United States. In this work, the author has gathered information both about natural and cultural values. The work also includes information of the zones of fauna and flora. The author also carefully gathered information of the past of the described area with special attention to the geology of the park. The work includes information of the climate and soils of the park. For the purpose of writing the work, the author conducted a survey of the American community, the main purpose of which was to answer questions about the age of visitors and a distance that tourists have to travel from their place of residence to reach the park. The author also mentioned the park's water resources and how important they were to residents living close to the park.

Keywords: Mt Rainier National Park; Environmental characteristic; tourism; suitability development

Abstrakt: Artykuł dotyczy wartości przyrodniczych Parku Narodowego Mount Rainier położonego w stanie Waszyngton w Stanach Zjednoczonych. W pracy tej autor zebrał informacje zarówno o wartościach przyrodniczych jak i kulturowych. Praca zawiera również informacje o strefach występowania fauny i flory. Autor zebrał również informacje o przeszłości opisywanego obszaru ze szczególnym uwzględnieniem geologii parku. Praca zawiera informacje o klimacie i glebach parku. Na potrzeby napisania pracy autor przeprowadził ankietę wśród społeczności amerykańskiej, której głównym celem było uzyskanie odpowiedzi na pytania dotyczące wieku odwiedzających oraz odległości, jaką turyści muszą pokonać z miejsca zamieszkania, aby dotrzeć do parku. Autor wspomniał również o zasobach wodnych parku i o tym, jak ważne były one dla mieszkańców mieszkających w pobliżu parku.

Słowa - klucze: Park Narodowy Mt Rainier; charakterystyka środowiskowa; turystyka; zrównoważony rozwój

1. Introduction

The article deals with the Natural Values of Mount Rainier National Park, which is located in the south part of Washington State, United States. In this work, the author has gathered information both about natural and cultural values. The work also includes information of the zones of fauna and flora. What is more, there are facts about the climate and the protected areas. The author also carefully gathered information of the past of the described area with special attention to the geology and hydrography of the park. The main goal of this article is to present the cultural and environmental potential of the park [1,2]. The park covers the area of 956,6 sm in the Cascades Range Mountains in Washington, which is the fifth park in the USA. The central point is the stratovolcano- over 4000 meters height. The highest parts of it are covered with ice caps. The volcano consists of alternate streams and andesite rocks, which are made of plutonic and volcano rocks, drifts dating back Olmnapecosh late eocene.

2. Methodology

Due to territorial research (2021-2022), analyze of Polish and American literature and the survey among American community, some conclusions were drawn and compared with similar regions.

3. Results

The climate is temperate maritime and humid continental in the east parts. Because of the Pacific Ocean influence in west part the heavy raindownfall is present from October till May. The snow is all year in the higher areas, especially since the beginning of November. The summer starts in May and lasts till June and it is the dry season. This precipitation is more intense because the Cascade belts form a barrier against the moisture of the oceanic air mass along it is western side.

3.1. Geology

The immediate origin of the manifestation of volcanism in this region is probably magmatic activity associated with the nearby subduction zone, forming so-called backward convection cells and volcanism of rocks formed from the melting of subducted oceanic crust formation and overlying sediments, also known as the Pacific Ring of Fire. It caused a number of different volcanoes in the region, including the Mt. Rainier in question. This volcano formed at the turn of the Eocene and Miocene. It consists of the Tatoosh Range, Stevens Ridge, Ohanapecosh and Fifes Peak formations [3]. The formation of the volcano was followed by volcanic erosion associated with the activity of ice sheets in the Pleistocene. The end of the Pleistocene ice age occurred about 10,000 years ago, around the same time as the eruption that formed the main cone of Mount Rainier. Then, due to the climate that prevails at the latitudes where the stratovolcano in question is located, a zone of perpetual snow is marked at an altitude of about 4392 meters. This contributes to the occurrence of mountain glaciers, alpine type, covering the slopes of the volcano. Their activity is marked by the occurrence of glacial relief in the area in question.

3.2. Characteristics of the park's substrate

Variety of the climate and diversity of surface influences the soil characteristics. The soil is divided by humidity and temperature. The ground is constantly wet thanks to snowfall and heavy rain and in the summer the level of humidity is constant because evapotranspiration is equal to spread water. The level differences generates higher temperatures, which influence soil that either are detritus or spodic soils in post-glacial areas.

3.3. Nature of the park

The vegetation layer consists of three levels: the forest layer, the subalpine layer and the highest alpine layer. In the forest zone above, which is 518 m above sea level, in the low and medium parts of the mountains, there are deciduous forests: Red Alder (*Alnus rubra*) and coniferous: Douglas Fir (*Pseudotsuga menziesii*), forming the upper border of the forest (National Park Service, 2019). The old forests of this areas are dominated by trees reaching over 76 m in height and diameters up to about 2.54 m. It occurs at 610 - 914 m above sea level. This territory is also covered by Douglas fir (*Pseudotsuga Carriere*), western hemlock (*Tsuga heterophylla*) and western cedars (*Thuja plicata*). Above 1524 meters above sea level, there is another layer of vegetation, transitional between high mountain vegetation and the forest below. There are stunted spruce (*Picea abies*) and fir (*Pseudotsuga menziesii*) trees.

This area is also called Canadian Zone, which is highly forested from park border till 1371,6 – 1524 m.a.s.l. Moss covers both the surface of the soils and trees. There are a great amount of trees and meadows [4]. which existed depends of thickness of snow layer [5]. According to Henderson, the meadows appeared due to living glaciers or rare wildfire. Starting from 1371,6 m the view of the forest is changing Since the trees are smaller and firs are more visible. It is more comfortable to sightsee the park on beaten tracks because of obstacles such as trunks and rough surfaces. Hemlocks and Douglas firs dominate on the western part of the forest, which stop plants growing and leads a limitation of food for animals. The zone is located in different lengths from the summit.

Deep forested canyon and ridges belong to this zone. Whereas main streamers are located in the hudson zone. There are thyme sandstone (*Arenaria capillaris nardifolia*), Indian brush (*Castilleja oreopola*), Black crowberry (*Empetrum nigrum*), Blue alpine phacelia (*Phacelia sericea*), Alpine yellow fleabane (*Erigeron aureus*), dwarf alpine gold (*Hulsea nana*) and others in the highest level. Eternal ice zone with glaciers is situated above 3048masl. the higher layers of the forests is the heavier snow fall compering to rain level on an annual average basis [6].

4. Discussion

Mount Rainier National Park visit 1-2 million tourists per year, because of the mountainous landscape and convenient location close to the main cities of Washington state such as Seattle. Heavy snow falls cause closing of Washington State Route 410, which leads to highway 5, between November and May. People also can reach crucial parts of the park on foot. The Paradise trail is the most popular way in the park as it leads through meadows, where are extremely attractive during the blooming season. The Long Lake trail is set on the slopes of the volcano and it starts from Lost Lake. Visitors can stay overnight in hotels such as the Paradise

Inn. In addition there are shops, tourist centres and the Longmire Museum. Most of these buildings have been listed on the National Register of Historic Places of the United States since 28 May 1987. Another popular attraction is Sunrise, which is the highest point in Mount Rainier National Park at 1,950.7 metres, and can be reached by car. In the summer, the mountain meadows are full of a great variety of flowers. A breathtaking view of Stratovolcano Rainier and the Emmons Glacier can be enjoyed from Sunrise on clear summer days.

Emmons Glacier is located on the north-eastern slope of Mount Rainier. Cultural facilities are on an excellent level in the Mount Rainier National Park such as monuments and memorials. Worth mentioning is Camp Muir, which is located on a narrow east-west ridge at 3073 metres on the Disappointment Cleaver route and has been considered the most direct route to the summit. This building is mainly used as a base camp by visitors, staff and guides. The Historical guide shelter, which was designed by Carla F. Goulda from Seattle a member of The Mountaineers, is also significant to mention. Infrastructure of the park is well developed. The park offers outstanding views and contact with nature. It is surrounded by high mountains and impressive rivers and waterfalls [7]. 8 organized trips are offered for tourists. Taking in the consideration all dangers and possibilities, it might be assumed that it can be developed more efficiently, if increased income and financial support are introduced. It might be achieved by events promoting environment protection, cooperation with eco foundation and green organization aiming at saving conservation area, which can lead to gain new funds, not just based on government grants.

The dynamic advertisement might attract more international tourists. What's more, over different kinds of discounts can be offered to various tourists who choose to sightsee on foot instead of using cars. The more time visitors would spend in the park the more money they would contribute in the park finances. Social media and tv will help in informing potential tourists about incoming events. What should be considered is the balance between expenses and income. This concept may be helpful if marketing techniques are not successful. The Park management should extend the number of toilets, facilities for disabled and parking spots on the whole area. Secondly, tourists ought to be able to rent audio guides, which can inform them about places of interests, history and environment. Thirdly, educational events and cooperation with colleges, schools and nurseries may result in making the park more popular and educate people at all ages.

5. Conclusions

The Mount Rainier National Park is one of the Tyree national parks of Washington state. A lot of international and local tourists visit this place every year. The fluvioglacial system is located on one acclivity due to stratovolcano character. A lot of glacial and volcanic forms may be seen in the park. Plant and animal diversities attract a great number of visitors. Secondly, the High infrastructure offers many attractions and facilities for tourists. In conclusion, this park is mainly visited by young tourists and middle-age people with families. They come to the park to stroll on trails and contact with nature. It is a very interesting and unique place.

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