Bale Mountains National Park (BMNP) is a national park in Ethiopia. The park encompasses an area of approximately 2,150 square kilometres (530,000 acres) in the Bale Mountains and Sanetti Plateau of the Ethiopian Highlands.
The park's Afromontane habitats have one of the highest incidences of animal endemicity of any terrestrial habitat in the world. The park was nominated to the World Heritage Tentative List in 2009.[1][2]
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Geography[edit]
Bale Mountains National Park is located in southeastern Ethiopia, 400 km southeast of Addis Ababa and 150 km east of Shashamene in the Oromia Region National State.[3] The boundary of the BMNP lies within five woredas (districts): Adaba (west), Dinsho (north), Goba (northeast), Delo-Mena-Angetu and Harena-Buluk (southeast). The park area is encompassed within geographical coordinates of 6º29' – 7º10'N and 39º28' – 39º57'E. The Bale Mountains are part of the Bale-Arsi massif, which forms the western section of the southeastern Ethiopian Highlands.[4]
Geology and glaciation[edit]
The Bale Mountains were formed prior to the formation of the Great Rift Valley, from lava outpourings which covered all underlying rock formations between 38 and 7 million years ago. The rocks of the volcanic outpourings are predominantly trachytes, but also include rhyolites, basalts, and associated agglomerates and tuffs. The main Bale highlands consist of the vast lava Sanetti Plateau, with at least six volcanic cones, each more than 4,200 meters high and considerably flattened by repeated glaciations.
There have been at least two glacial periods in the history of the mountains and they were glaciated as little as 2,000 years ago. During the Last ice age, the Bale Mountains were one of the most extensively glaciated areas in present-day Ethiopia, with a total area of ice in Bale of approximately 180 km2. There was a 30 km2 ice cap around the peak of Tulu Dimtu (the

second highest mountain in Ethiopia) on the Sanetti Plateau and individual glaciers of considerable thickness reached down to 3,200 meters. As a consequence, the landscape as we see it today is the lava outpourings much modified by over 20 million years of erosion by water, wind and ice.

There are certain geological features that remain an enigma to geologists and glaciologists such as the striations that appear on shallow hillsides on the Sanetti Plateau. Boulder grooves (large stone sorted stripes two to four meters wide and eighty meters long), till ridges and numerous glacial valleys, such as the Togona Valley on the northeast facing slopes of the Sanetti Plateau, provide evidence of the ice-age effects on the landscape of BMNP. Until the beginning of deglaciation (13,000 to 14,000 years ago) the snowline was at 3,700 meters and the upper tree limit in the Bale Mountains was well below 3,000 meters. Fluctuations in climate over the last historical period, including the last 3,000 years, have dramatically affected the vegetation and other biodiversity in the highlands.

Hydrology[edit]

The Bale Mountains play a vital role in climate control of the region by attracting large amounts of orographic rainfall, which has obvious implications for livestock and agricultural production. Some 600 - 1,000 mm fall annually in the lower altitude areas, while 1,000 - 1,400 mm fall in areas of higher altitude, and over 12 million people from Kenya, Somalia and Ethiopia are dependent on water from the Bale massif.

A total of 40 rivers rise in the BMNP area, contributing to five major rivers: the Web, Wabe Shebele, Welmel, Dumal and Ganale. Additionally, the Bale massif is the source for many springs in the lowlands, which are of paramount importance as they are the only source of water year-round. People living south of the national park are completely dependent on good management of the water resources from the highland areas. If the flow of these rivers is altered in any way – through deforestation, overgrazing of pastures and/or over abstraction for irrigation (all of which are occurring at present) – a highland/lowland imbalance results with loss of perennial water in the lowlands. If such a situation arises, the dry season range of the people and their livestock reduces dramatically and they concentrate about whatever water source remains. It is widely recognized that such uneven distribution of people and livestock leads to rapid and lasting degradation. The people are, therefore, likely to become increasingly food-aid dependent if the water catchment areas of the Bale Mountains are insufficiently protected. There is already evidence that over abstraction of water in the Bale Mountains is occurring.

Furthermore, two rivers emanating from Bale, the Wabe Shebele and Yadot, (tributary of the Ganale) have hydroelectric schemes. The dam on the Yadot River supplies electricity to Delo-Mena, while the dam on the Wabe Shebele provides electricity to the Bale area.

Lastly, there are numerous natural mineral water springs, locally called horas, which provide an essential source of minerals for livestock. The mineral springs within the park are valued for their high mineral content (sodium, potassium, magnesium, zinc and calcium), and local pastoralists believe that in order to maintain good health and milk production their livestock must be given hora water. They will drive their livestock for up to two days to reach the hora springs. It is increasingly apparent, however, that the hora springs have become an excuse for local people to enter the park to gain access to better

grazing areas.[citation needed]

Climate[edit]

Temperatures vary widely throughout BMNP: on the plateau, daytime temperatures are usually around 10 °C (50 °F) with strong winds; in the Gaysay Valley average daytime temperatures are around 20 °C (68 °F), and the Harenna Forest is around 25 °C (77 °F). However, weather changes frequently and sometimes drastically. In elevations over 3,000 meters, night frosts are common. The rainy season is from May until November.

Ecology[edit]

Habitats[edit]

The park is divided into five distinct and unique habitats: the Northern Grasslands (Gaysay Valley), Northern Woodlands (Park Headquarters), Afro-alpine Meadows (Sanetti Pleateau), Erica Moorlands, and the Harenna Forest.

Habitats of the Bale Mountains National Park range from grassland areas around 3,000 metres (9,800 ft) in elevation, to Mount Tullu Demtu, the second highest point in Ethiopia at 4,377 metres (14,360 ft) above sea level.

Surrounded by East African pencil juniper (Juniperus procera) trees and St. John's wort, waist-high wildflowers and grasses grow in the Northern Grasslands and Woodlands. Tree heath (Erica arborea) is native to the Ethiopian montane moorlands ecoregion in the park.

The Afro-alpine moorlands of the Sanetti Plateau is the largest continuous area of its altitude on the entire continent of Africa. Carpeted in lichen covered rocks, and punctuated by Giant lobelia (Lobelia rynchopetalum) that grow to heights of up to 12 meters. The Plateau is also dotted with alpine lakes and streams, providing important resident wildlife resources, as well as wintering and passage stations for rare and regionally endemic birds.

The Harenna Forest plant community makes up about half of the park, a woodland of trees draped in moss and lichens that seem to drip off the branches. The area is frequently cloaked in fog, and wildlife is elusive.

Fauna[edit]

The Bale Mountains National Park is an important area for several threatened Ethiopian endemic species. Additionally, the park holds 26% of Ethiopia's endemic species including one primate, one bovid, one hare, eight rodent species, and the entire global population of the big-headed African mole-rat. There are also several rare and endemic amphibians.[citation needed]

Mammals[edit]

Mammal species in the Bale Mountains National Park include Ethiopian wolf (Canis simensis), Mountain nyala (Tragelaphus buxtoni), big-headed African mole-rat, bushbuck, common duiker, klipspringer, Bohor reedbuck, warthog, spotted hyaena, serval.[5] and the Bale Mountains vervet (Chlorocebus djamdjamensis).[6]

Other mammals of Bale Mountains National Park include the Cape bushbuck, African golden wolf, spotted hyena, colobus monkey, lion, African leopard, and African wild dog. Almost one third of the 47 mammals that live in BMNP are rodents. The rodent community, particularly of the Afro-alpine plateau are keystone species in the Bale Mountains National Park. They are the main prey for Ethiopian wolf, and natural grazers of the Afro-alpine areas where important cryoturbation processes happen.[citation needed]

The Afro-alpine area is home to over half of the global population of the Ethiopian wolf, the rarest canid in the world with only 400 animals surviving. The northern juniper-hagenia woodlands harbor the largest population of the endemic and similarly endangered Mountain nyala, estimated to be approximately two-thirds of the global population. The Ethiopian wolf is restricted to just six isolated mountainous areas of the Ethiopian Highlands and is protected in the country from any activities that may threaten its survival. Habitat loss, caused by unsustainable and rapidly expanding cattle and crop farming is the most severe threat, but diseases like rabies and canine distemper transmitted from domestic dogs are a serious immediate threat and have recently caused population crashes in the Bale Mountains.[citation needed]

Flora[edit]

Bale Mountains National Park is home to 1,321 species of flowering plants, 163 of which are endemic to Ethiopia (12%), and 23 to Bale alone (14% of Ethiopia's endemic plants).

The forests of the Bale Mountains are important for genetic stocks of wild forest coffee (Coffea arabica) and for medicinal plants in Ethiopia. Three medicinal plant hotspots have been identified: two in the Gaysay area and one in the Angesu area, spanning the park boundary. The female flowers of hagenia contain anthelmintic, which is used to treat tapeworms among the local populations.[7] St. John's wort is used to combat depression. A 2006 study estimated the value of the medicinal plants industry to be approximately two billion Ethiopian birr annually, some 8% of Ethiopia's Federal budget at the time.

Avifauna[edit]

Rated by the African Bird Club as the number four birding site in Africa, the Bale Mountains are home to over 282 species of birds, including nine of the 16 species endemic to Ethiopia. Furthermore, over 170 migratory birds have been recorded within the park. Bale Mountains National Park is home to almost every highland Abyssinian and Ethiopian endemic.

With over 863 species of birds recorded, representing approximately 9.5% of the world's bird diversity and 39% of the bird species in Africa, Ethiopia is often considered one of the most avifaunal-rich countries in Africa. Sixteen of Bale's bird species are endemic to Ethiopia.

Due to the diversity and density of rodents, the Bale Mountains are also an extremely important area for resident as well as wintering and passing raptors.

Ethiopian endemic birds found in the Bale Mountains include: blue-winged goose (Cyanochen cyanoptera), spot-breasted lapwing (Vanellus melanocephalus), yellow-fronted parrot (Poicephalus flavifrons), Abyssinian longclaw (Macronyx flavicollis), Abyssinian catbird (Parophasma galinieri), Bale parisoma (Parisoma griseiventris), Ethiopian siskin (Serinus nigriceps), fawn-breasted waxbill (Estrilda paludicola) and the Abyssinian owl (Asio abyssinicus).

People of Bale[edit]

The people of the region are dominantly Oromo-speaking farmers and cattle herders. The population of the entire Bale Zone is approximately 1.5 million. Afan Oromo is the official language of Oromia. It belongs to the Cushitic languages, and serves as a sort of lingua franca for over 25 million Oromos. However, most people in Bale Mountains speak some Amharic.

The predominant religion in the Bale Mountains is Muslim (77%), followed by Orthodox Christian (20%) and Protestant (1%).
The Bale Mountains are the true ancestral home of the Oromo, the largest single ethnic group in the Horn of Africa. Living as pastoralists and farmers, the population grew quite quickly and expanded to different corners of the country beginning in the 16th century. Little is known about the Oromo people of the area and how they came to be there. They are part of the eastern Cushitic people stemming from a branch of the Caucasoid race (which includes Western Asians, Arabs and Europeans), and are distributed from Wello in Ethiopia's north, to Mombasa in Kenya to the south. Some 3,000 years ago, they passed on practices such as the initiation ceremony of circumcision and habit of not eating fish to Nilotic peoples in the West. Furthermore, they incorporated the ideas of the Gadaa system and cattle husbandry into their own society. The Gadaa system is based on the principles of classifying a society into 11 functional grades, each of which has its special roles and statuses.
Currently people subsist mainly on agriculture. They follow a traditional transhumance system known as the Godantu system, a key feature of traditional human use of the Bale Mountains. In this system, livestock, particularly cattle, are sent to higher grazing grounds during the months when crops are growing in lower altitudes or into the forest for shade during the dry season. However this should not be confused with the cattle movements that are a consequence of the loss of grazing land outside of the park, thus forcing cattle into the park to graze.
Bale houses are circular in shape and locally referred to as "mana citaa". Juniper and sometimes eucalyptus are used to make the walls and roof. The roof is covered with thatched grass cut from "citaa" (tussock grass) or stubble, especially barley, and supported by a wooden pillar, which stands in the middle of the floor. The house is divided into portions by walls made of bamboo or mud mixed with stubble of barley or grass.
History[edit]
In contrast to other parts of Ethiopia, very little was written about the Bale Mountains prior to the 1950s, despite the facts that Goba (a main town within the mountains) was connected to Addis Ababa by a telegraph line in 1931, was served with Ethiopian Airlines DC-3 aircraft prior to the 1950s, and that the brief period of Italian government (1935-1941) reached the region with stations in Goba, Dinsho and Delo-Mena.
As records begin to appear at the beginning of the 20th century, the Bale Mountains were largely uninhabited. The first recorded visit was by the German naturalist and explorer Carlo Von Erlanger who reached the Bale Mountains between 1899 and 1901. During his time in the region, he documented the existence of the giant molerat. Thereafter, a Frenchman, the Vicomte du Bourg, spent two months in Goba in 1901 hunting elephant to the south and traveling around the mountains. He recorded the existence of elephant and buffalo in the Harenna Forest, and commented on the ivory hunting of the area - primarily by mounted horsemen using guns.
Following these early records, there is no information until the late 1950s, when Finnish geographer, Helmer Smels, arrived in Bale. He made three journeys to Bale and crossed the area from Goba, through Rira to Delo-Mena. By the time of his visits, just 50 years after

Vicomte du Bourg had noted the presence of elephants, they had disappeared from the Harenna Forest. Smels noted that although the Sanetti Plateau was uninhabited, people drove their cattle to the plateau for grazing during the dry season, sometimes for up to three months. Additionally, the mountains were used for their mineral springs or horas, to which the pastoral people also drove their cattle. People stayed overnight in simple, temporary shelters made of split bamboo. The Harenna Forest was uninhabited but for small groups of temporary huts in some of the clearings where people grazed their cattle for part of the year. Although not dwelling there permanently, honey gatherers have always been active in the Harenna Forest.

During the same period, a British botanist, Herbert Mooney, visited the Harenna Forest and Sanetti Plateau. He noted the growing settlement of Rira within the Harenna Forest and other hamlets of honey gatherers and pastoral people. Although the Harenna Forest was probably quite populated towards the end of the 19th century, the area was depopulated again as a result of a rinderpest epidemic that killed most of the cattle in the early 1890s.

The impetus for the present national park began with two visits to the area in 1963 and 1965 by the British naturalist, Dr. Leslie Brown who was in the area explicitly to assess the status of mountain Nyala. The major recommendation of his visits was that a national park should be established in the Bale Mountains to protect their habitat. John Blower, advisor to the Ethiopian Wildlife Conservation Organization (now Ethiopian Wildlife Conservation Authority (EWCA)) and a Peace Corps volunteer, followed through with Dr. Brown's recommendation by surveying the area and proposed boundaries of the park. In 1969 the Bale Mountains National Park was established.

Threats[edit]

Bale Mountains National Park is faced with many threats associated with an ever-developing and an increasingly populated Ethiopia. One of the biggest threats to the park is grazing. For example, within the Web Valley, a prime Ethiopian wolf habitat, cattle density is estimated at 250 per square kilometer. Other threats include increasing settlements within the park. Currently over 40,000 people live within the park's boundaries, increasing pressure on the natural resources of the area and diminishing natural habitats of wild animals. With these settlements come domestic dogs, which pose a great threat to the Ethiopian wolf. Dogs transmit rabies and canine distemper, and in 2010 killed 106 individuals (approximately 40% of the Bale population). Other serious threats include the use of the wolf habitat by livestock for grazing which significantly reduces the availability of rodent prey. Over 12 million people, their livestock and the environment in the south of Ethiopia as well as neighboring Somalia and northern Kenya rely on the water that originates from the Bale massif. Unsustainable use and pollution are major threats. Conservationists suggest that if conservation efforts in the Bale Mountains are not successful and people continue to exploit the resources in an unsustainable way, more species of mammal would go extinct than any other area of equivalent size on the planet.

Activities[edit]

The Bale Mountains National Park is open year-round although the most popular time to visit is November through April when the rains have stopped. The park can be reached by private car or public transportation from Addis Ababa. Visitors may choose to trek

throughout the park either by horseback or on foot, or alternatively to visit the park entirely by car. Treks range from one to 12 nights and travel through all the different ecosystems of the park.

See also[edit]

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