

## Denezhkin Kamen

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Russia and the former Soviet Union has been the scene of an unusually comprehensive attempt at biodiversity conservation through the establishment of an extensive network of protected natural areas. These natural areas include several categories of territory which today account in aggregate for some one-and-a-half percent of the land area of Russia.

Territory categories include: zapovedniks - the strictly protected scientific Nature Reserves (World Conservation Union or IUCN category I State Nature Reserves or Scientific Reserves); National Parks - (IUCN category II); Natural Parks - (IUCN category V); zakazniks - natural refuges and wildlife sanctuaries (IUCN categories IV, V); natural monuments - small scale areas protecting unique biological objects (IUCN category III); arboreta (dendrological parks) and botanical gardens.

The zapovednik, or Russian Federal Nature Preserve, is a specially protected natural territory that excludes all forms of management, even general visiting (except for the needs of research or protection), in order to preserve its indigenous complexes in their untouched natural state. At the same time, a zapovednik is an institution designed not just for the conservation of its territory but also for study.

A combination of four features of the zapovednik system distinguishes it from most protected natural areas in other parts of the world.

First, efforts were made to set aside entire ecosystems, which would function normally without human interference. Historically the zapovednik system was based on a biogeographical zoning of the country thus, the resulting system as we see it today protects a tremendous diversity of natural communities over a wide range of many distinct biogeographical regions as well as preserving rare species and unique habitats.

Another distinguishing feature of the zapovednik system is their archive system. For decades, long-term research and monitoring have been conducted on preserve territories and the results accumulated in zapovednik archives called "Chronicles of Nature". The Chronicles of Nature comprise a valuable but seriously under-utilized informational resource. A third unique characteristic of the zapovednik system is that all research is related to spontaneous natural processes or phenomena. The research conducted on zapovedniks is not manipulative or experimental. Finally, human activities are rigorously restricted within the zapovedniks, and the public is not allowed to visit.

The organization of an individual zapovednik reflects its main tasks. Here are two sides to its staff structure, the wardens and the scientific personnel. The wardens exist primarily to prevent violations of the preserve's regime including trespassing, fishing, hunting and so forth, but they also participate in a number of research activities such as mammal and bird counts. Wardens fill out questionnaires designed by the scientific personnel and help provide data on animal and plant distribution, phenology, and disturbance events. The scientific department is responsible for organizing monitoring activities, collecting data, "and compiling records for the long-term data archives, the "Chronicles of Nature". Additionally the zapovednik staff will usually include a number of ancillary specialists and workers including accountants, research technicians, and drivers. Some zapovedniks have set up an educational section.

Zapovednik "Denezhkin Kamen" is located in the Northern Ural geographical region of the Main Ural Mountain Ridge and is situated 40 km to the northwest of the town of Severoural'sk, Russia. Its most southern point is located at 60°20' northern latitude, and its most northern point at 60°50' northern latitude. The average longitude is 59°30'.

The frontier position of the "Denezhkin Kamen" zapovednik between Europe and Asia; as well as between northern and middle taiga regions, makes it unique among the Ural Preserves.

The total area of the preserve has varied over time. When it was first created in 1946, zapovednik "Denezhkin Kamen" encompassed an area of 121,800. In 1951, the area of the zapovednik was reduced to 35,349 ha, but was later expanded up to 146,719 ha in 1959. During the 1960's the government began eliminating zapovedniks and in 1961 zapovednik "Denezhkin Kamen" was liquidated. During this period, the territory was managed by a federal forestry organization that harvested timber (over 1% of the area) and permitted hunting, as well as berry and pine-nut harvesting. In 1991, zapovednik "Denezhkin Kamen" was reestablished and currently covers a total area of 78,192 ha. Geographically, the territory of the zapovednik is located in the North-Ural province of the Ural Mountain region, central zone. The climate is continental, with long cold winters and short summers of moderate warmth. Stable snow cover is in place for 6-7 months.

The diversity and structure of the biological complexes of the territory are a function of geomorphologic structure. The western part of the preserve territory (Main Ural Ridge, 1,410 m elevation) is comprised of solid pre-Cambrian rocks that do not easily erode to form soil. The mountain, Denezhkin Kamen (1,492 m elevation), in the center of the zapovednik is comprised of intrusive rocks where soil formation is faster. The tree line in this area is determined by the speed of soil formation not by the elevation and thus, the tree line is higher on Denezhkin Kamen Mountain than on the Main Ural Ridge. Although the Ural mountain ridge is an old geological formation, there are two relatively active geomorphologic processes. Uplift of the ridge is due to the European and Asian continental plates colliding against each other. At the same time, the ridge is breaking down due to its advanced age and erosion. As a result of the complexity of the geomorphologic features of the territory, all stages of vegetative succession, from primary to climax, can be identified within the "Denezhkin Kamen" zapovednik.

There are three main vertical vegetative zones on the slopes of Denezhkin Kamen and the Main Ural Ridge: mountainous taiga, sub-alpine park-like forests, and alpine tundra. Forest covers 89.9 % of the preserve territory. The main forest types of the mountainous taiga zone are: (1) dark coniferous, Scotch pine forests (*Pinus sylvestris*), (2) birch forests (*Betula pendula* and *B. tortuosa*) and (3) mixed forests. The dark coniferous forest type is represented by Siberian pine (*P. sibirica*), fir (*Abies sibirica*), and spruce (*Picea obovata*). The dominant herbaceous plants of the mountainous taiga zone include red billberry (*Vaccinium vitis-idaea*), blackberries (*Vaccinium myrtillus*) and mosses. Most of the dark

coniferous forests of "Denezhkin Kamen" are climax and have not experienced serious human disturbances. The sub-alpine forest is represented by many of the same species as the mountainous taiga, but has many openings and small alpine meadows, bare rock zones, and lichen patches. In addition, unique pure Siberian pine stands can be found in this zone, as well as stands of tamarack (*Larix sibirica*). The sub-alpine zone contains the most diversity of succession stages. The tundra zone is a mosaic of lichen tundra, grass and sedge tundra, brush tundra and rock fields. The fauna of the "Denezhkin Kamen" zapovednik comprises a typical boreal assemblage of species. The most common rodents are: blue hare (*Lepus timidus*), flying squirrel (*Pteromys volans*), common squirrel (*Sciurus vulgaris*), chipmunk (*Tamias sibiricus*), and a variety of vole specie (*Clethrionomys rutilus*, *Cl. glareolus*, *Cl. rufocanus*, *Microtus arvalis*, *M. agrestis*, and *M. oeconomus*). Carnivores represented on the preserve include wolf (*Canis lupus*), red fox (*Vulpes vulpes*), brown bear (*Ursus [Ursus] arctos*) and lynx (*Felis [Lynx] lynx*). The preserve territory is home to a remarkable collection of mustelids including sable (*Martes zibellina*), marten (*M. martes*), wolverine (*Gulo gulo*), ermine (*Mustela erminea*), least weasel (*M. nivalis*), Siberian weasel (*M. sibirica*), European and American mink (*M. sp.*), and river otter (*Lutra [Lutra] lutra*). The most typical ungulate of the zapovednik "Denezhkin Kamen" zapovednik is moose (*Alces alces*). Portions of the home ranges of wild boar (*Sus scrofa*), northern deer (*Rangifer tarandus*), and roe deer (*Capreolus capreolus*), are also located in the area and these species visit the preserve territory and the surroundings episodically. There are 140 species of birds in the avian species list of the "Denezhkin Kamen" zapovednik including 12 migratory species. Zapovednik "Denezhkin Kamen" has five representatives of the Phasianidae family, typical of boreal forests and tundra: Hazel Grouse (*Tetrastes [bonasia] bonasia*), Black Grouse (*Tetrao [tetrax] tetrax*), Western Capercaillie (*Tetrao [urogallus] urogallus*), Willow Ptarmigan (*Lagopus lagopus*), and Rock Ptarmigan (*L. mutus*). The most common waterfowl species on the preserve are: Mallard (*Anas [platyrhynchos] platyrhynchos*), Eurasian Wigeon (*A. [penelope] penelope*), Common Teal (*A. [crecca] crecca*), Garganey (*A. querquedula*), Common Goldeneye (*Bucephala clangula*), and Common Merganser (*Mergus merganser*). The order Falconiformes is represented on the territory by Northern Harrier (*Circus [cyaneus] cyaneus*), Northern Goshawk (*Accipiter gentilis*), Eurasian Sparrowhawk (*Accipiter [nisus] nisus*), Common Buzzard (*Buteo [buteo] buteo*), Eurasian Hobby (*Falco [subbuteo] subbuteo*), and Common Kestrel (*F. [tinnunculus] tinnunculus*). Owls of the "Denezhkin Kamen" zapovednik are: Eurasian Eagle Owl (*Bubo [bubo] bubo*), Long-eared Owl (*Asio [otus] otus*), Short-eared Owl (*A. flammeus*), Eurasian Pygmy Owl (*Glaucidium [passerinum] passerinum*), Boreal Owl (*Aegolius funereus*), Northern Hawk Owl (*Surnia ulula*), Ural Owl (*Strix [uralensis] uralensis*), Polar Owl (*Nyctea scandiaca*) and Great Grey Owl (*S. nebulosa*). The 7 species of woodpeckers that occur in the "Denezhkin Kamen" zapovednik are: Grey-faced Woodpecker (*Picus canus*), Black woodpecker (*Dryocopus martius*), Great Spotted woodpecker (*Dendrocopos [major] major*), White-backed Woodpecker (*Dendrocopos leucotos*), Lesser Spotted Woodpecker (*Dendrocopos minor*), Three-toed Woodpecker (*Picoides tridactylus*), and Eurasian Wryneck (*Jynx [torquilla] torquilla*). Representatives of Gruiformes (2 species), Charadriiformes (9 species), Columbiformes (2 species), Cuculiformes (2 species), Caprimulgiformes (1 species), Apodiformes (1 species), and Passeriformes (80 species) also are found on the territory of the "Denezhkin Kamen" zapovednik. The species names of the birds are given according Sibley C.G and Monroe B.L. (1990).A. Kvashnina, zapovednik "Denezhkin Kamen".