

At 1819 m/5968 ft, the Tyatya volcano is the second tallest volcano in the Greater Kuril Ridge, and one of the most beautiful in the world. It is a stratovolcano of the Somma-Vesuvius type (“volcano in a volcano”). The somma is a 1485 m/4872 ft tall frustum with a basal diameter of 15–18 km (9.3–11.2 miles), and the central cone raises 337 m/1105 ft above the adjacent caldera. *Photo: E. Kozlovskiy*

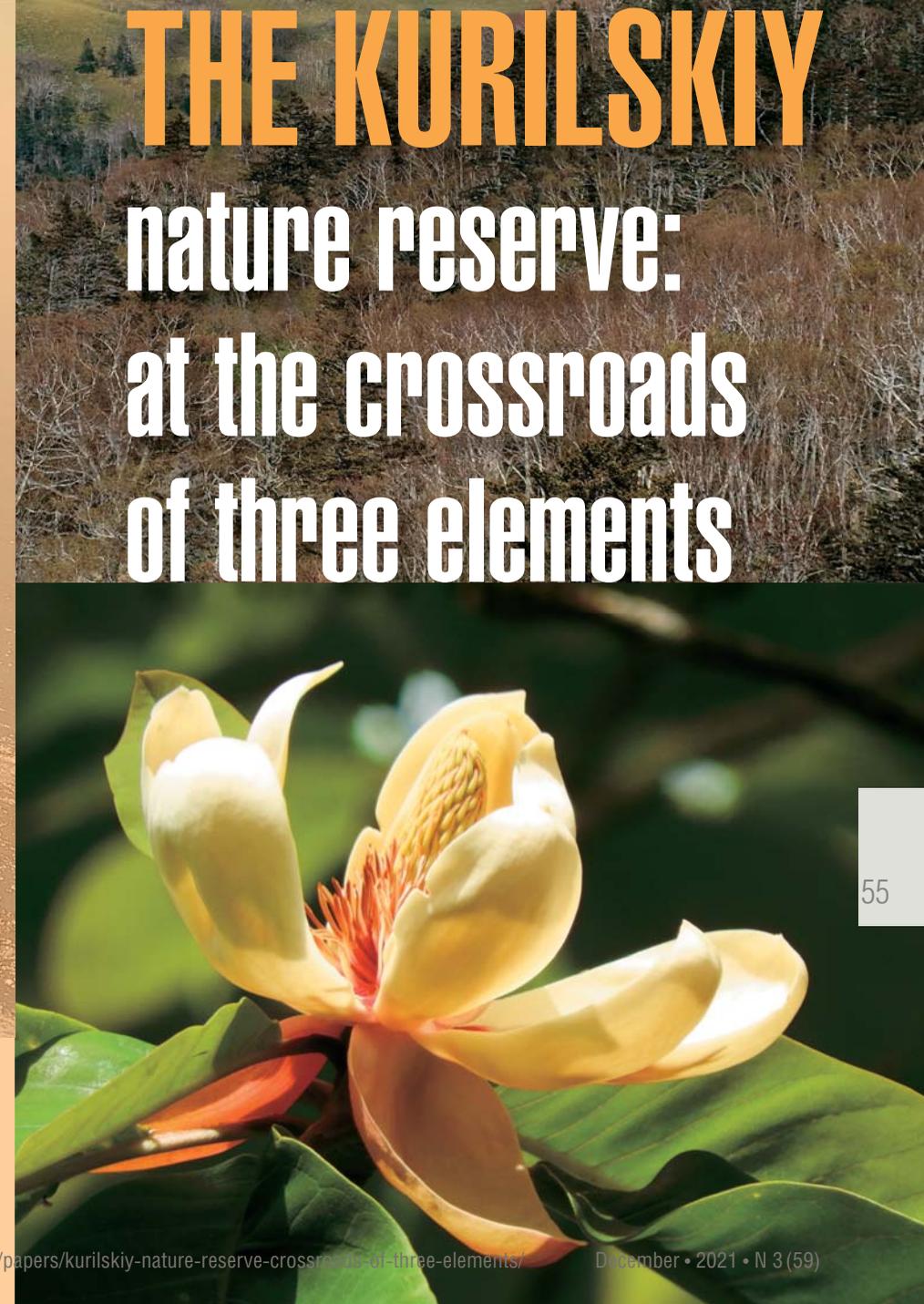


The Oskolki (“Shards”) are a group of small rocky islands in the Lesser Kuril Ridge. They are home to various marine mammals, including the southernmost rookery of the Steller sea lion, and numerous seabird colonies. *Photo: N. Pavlov*

**Key words:** Southern Kuriles, Kunashir, Shikotan, Kurilsky Nature Reserve, Small Kuriles Nature Reserve

Many have heard of the Kunashir Island and the Lesser Kuril Ridge as the subject of the ongoing territorial dispute between Russia and Japan. Much fewer people are aware that since 1984, these territories have hosted the State nature reserve “Kurilskiy”, which, together with the Federal State nature preserve “Lesser Kurils”, founded in 1983, is a true gem in the registry of special protection natural territories of Russia. These small patches of land have unique volcanic landscapes, hot springs that equal the world’s best spas, dark conifer rainforests and lush “southern” vegetation, noisy seabird rookeries and coastal waters rich in marine mammals...

The Japanese cucumber tree, or Japanese bigleaf magnolia (*Magnolia obovata*, or *M. hypoleuca*) is the only representative of the genus native to Russia. The Kunashir Island is the only place where this relict occurs naturally. *Photo: E. Linnik*



# THE KURILSKIY nature reserve: at the crossroads of three elements

The nature of this secluded region owes its unique richness and extreme biodiversity to its position at the intersection of three elements: land, water, and fire.

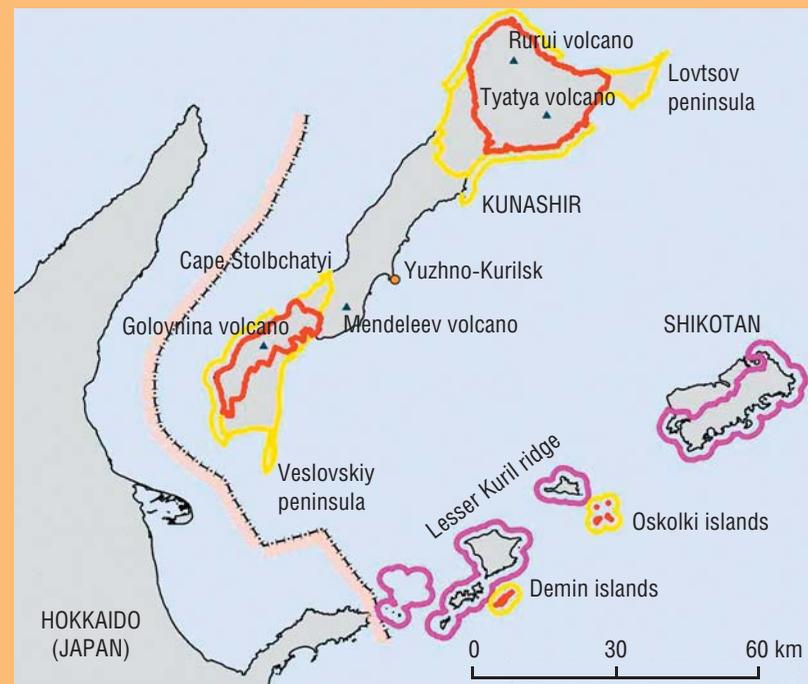
The Kurilskiy nature reserve, occupying a mere 1% of the territory of the Sakhalin region, is situated on three islands surrounded by a marine protected perimeter area, which occupies over 26 thousand hectares (100 square miles). The Lesser Kurils nature preserve, which is a subject of the reserve, also has a one-mile-wide protected perimeter covering over 40 thousand hectares (over 150 square miles). There is logic in it: the Southern Kurils are among the most biologically productive zones of the ocean, and it is very important to protect and preserve these territories.

Moreover, the Kurilskiy nature reserve is one of the two nature reserves in Russia to have active volcanoes. Volcanic activity, including thermal water discharge, actively influences the local natural communities. The Neskuchenskiye hot springs are a good example – it is a fumarolic-thermal zone at the root of the Rurui volcano stretching along 1.5 kilometers (1 mile) of the shoreline that includes about 50 outlets of hot sulfide and hydrosulfuric gases and hot springs, with the water temperature reaching 96 °C (204.8 °F). The local microclimate has made the area a refuge for rare thermophilic reptiles, including one of the largest population of the «rainbow lizard» – the Far Eastern skink (*Plestiodon*

The picturesque cape Stolbchatyi is made up of rhyodacites – volcanic minerals 4 to 6 million years old, forming characteristic columns resulting from uneven cooling of lava streams. It is a popular tourist spot in the protected perimeter area of the nature reserve.

Photo: E. Linnik

Steller sea lions (*Eumetopias jubatus*) rarely fare far into the open sea, preferring to stay in groups close to isolated islands, where they form rookeries. By the beginning of the XXI century, the species was declared near threatened, however, their numbers are recovering. The species is listed in the Red Book of Russia. Photo: E. Kozlovskiy



The territory of the Kurilskiy nature reserve (65861 hectares) includes three plots, with two of the plots situated on the Kunashir, and the third plot including islands of the Lesser Kuril ridge (Demina and Oskolki). The territory is surrounded by a protected perimeter area (both land and aquatic). The territory of the Lesser Kurils nature preserve (67892 hectares) includes the majority of the Shikotan and all other islands of the Lesser Kuril ridge along with the adjacent marine protected perimeter area, which is one mile wide

- State nature reserve “Kurilskiy”
- Federal state nature preserve “Lesser Kurils”
- Protected perimeter area of the Kurilskiy nature reserve
- State border of the Russian Federation



*laticutatus*). On the barren acidic soils of the volcanic fumarolic fields grows a fungus known as the Dead Man's Foot (*Pisolithus arrhizus*), with fruitbodies that resemble rocks; on the slopes of the Tyatya volcano, one can encounter an endemic plant of the Southern Kurils – the volcano dandelion (*Taraxacum vulcanorum*).

The surrounding seas leave their mark on the mild oceanic climate of the Kurils, with mild winters and cool summers, especially on the Southern Kurils, where the protected territories are situated. The Kunashir, which is the southernmost island of the Greater Kuril Ridge with the warmest climate, is home to some typical representatives of subtropical flora: for instance, it is the only place in our country with naturally occurring wild magnolias.

The climatic peculiarities and geographical position of the Southern Kurils have made them the intersection point of several different floras and faunas typical for the Sea of Okhotsk, Manchuria, Norther Japan, and the adjacent Pacific Ocean. Along with representatives of various common «boreal» species of plants and animals, a number of «exotic» species occur here, typical for natural communities of Japan, China, and Korea, contributing to the immense biodiversity of this unique land.

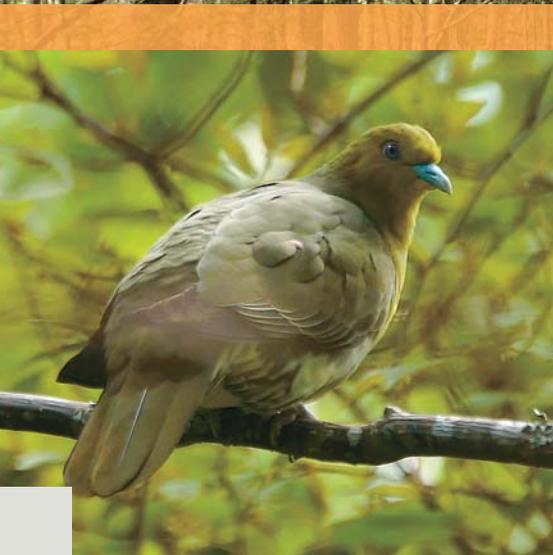
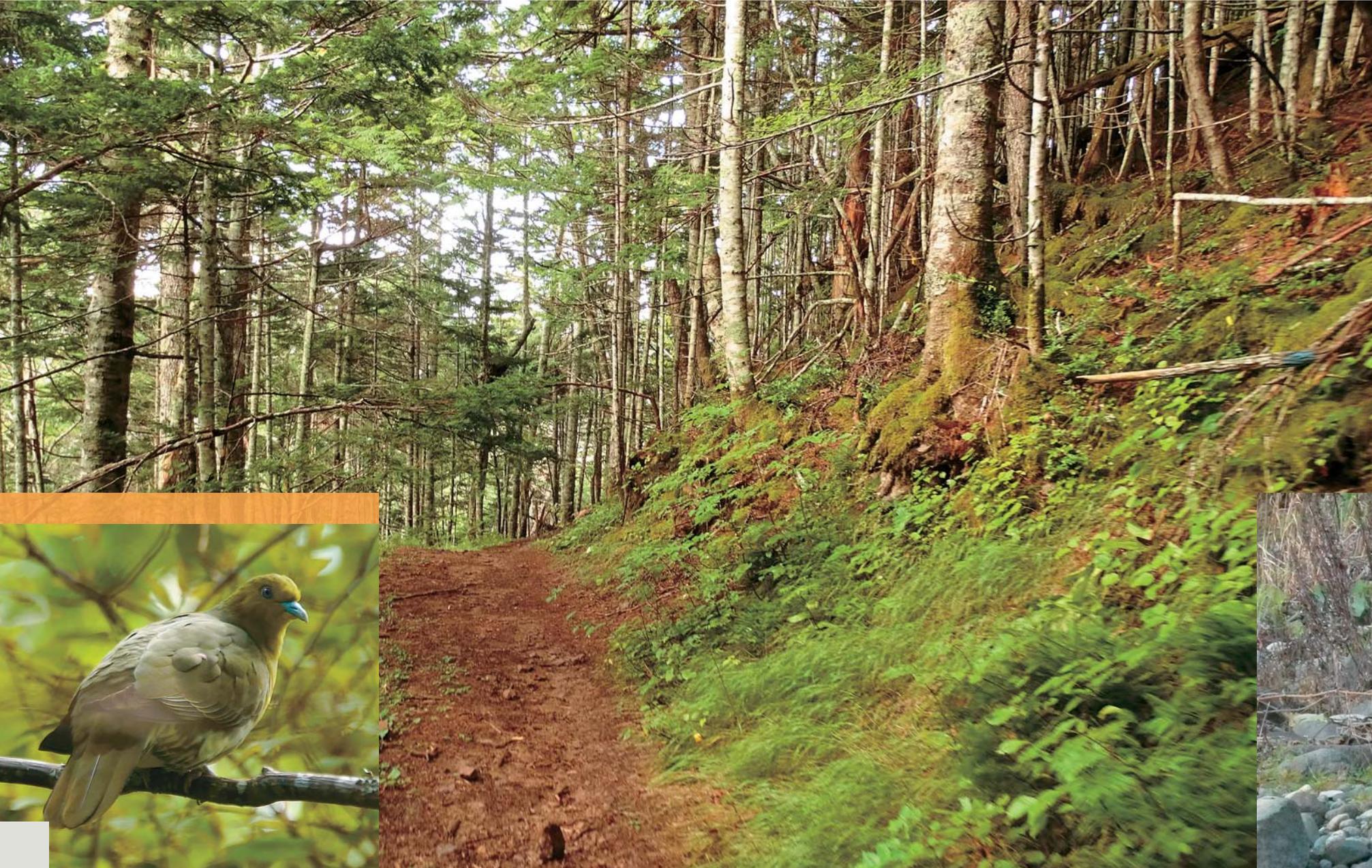


The Kuril sasa (*Sasa kurilensis*) is a herbiforous species of bamboo; it can reach 2.5 meters (10 feet) in height. Its range spans across Japan and Korea; in Russia, it grows on the Sakhalin and the Kurils (up to the island of Ketoi). The nature reserve is home to 12 species of the genus as well as a number of hybrids. Bamboo quickly colonizes deforested areas, forming dense thickets. It plays an important role in soil preservation, preventing water and wind erosion, but hinders the natural reforestation process.  
Photo: Yu. Sundukov

The sea otter (*Enhydra lutris*) is tied to the sea closer than seals. These animals can sleep, give birth and nurse their young on the surface of the sea, but strong storms will push them ashore. Hunting and trapping sea otters has been banned since 1912, and the population has almost completely recovered and is currently expanding. Around the islands of the Lesser Kuril Ridge, one can encounter groups of up to 100 sea otters.  
Photo: I. Byshnev

The red-crowned crane, or Manchurian crane (*Grus japonensis*) is one of the largest cranes, known for its spectacular mating dance and for its images in the Japanese and Chinese cultures. Its current population is less than 2 thousand individuals. In Russia, it lives on the Southern Kurils (island population) and in the Primorskiy Kray. Photo: E. Kozlovskiy





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The white-bellied pigeon (*Treron sieboldii*) is the only member of the green pigeon subfamily native to Russia. It is a resident, albeit elusive inhabitant of the Kunashir and the Shikotan, easy to recognize by its melodious song. It lives in mixed and deciduous forests and feeds primarily on berries. *Photo: I. Byshnev*

The Stolbovskaya eco-trail runs for 3.5 kilometers (~2.2 miles) across the protected perimeter area of the nature reserve and crosses a number of typical ecosystems with a high diversity of plant life. The trail passes through young birch groves, fir stands and mature forests with relict magnolias and Japanese yews (*Taxus cuspidata*), tangled vines and deciduous valley forest and reaches the sea. The inhabitants of the area include mountain hares (*Lepus timidus*), sables, foxes and brown bears; one can hear white-bellied pigeons and see varied tits (*Parus varius*). Part of the trail goes along the Zmeinyi ("Snake") creek, where the Stolbovskiye hot springs are located, surrounded by thermophilic communities of animals and plants. *Photo: S. Stefanov*

## Islanders and their neighbors

All in all, over 8500 known species of plants and animals occur in the protected territories of the Southern Kurils.

The flora of the protected territories is exceptionally rich: it includes about 2000 species, with almost a half of the diversity represented by *vascular* plants –the group which includes all higher plants except mosses. There are typically southern, East Asian species, such as deciduous arboriform vines, as well as northern species typical for harsh climates, such as firs (*Abies*).

A good example is the above mentioned Japanese big-leaf magnolia, a deciduous tree up to 17 meters (56 feet) tall with a pyramid-shaped crown and fragrant cream-white blossoms up 25–30 cm (10–12 inches) in diameter. Its main range lies in Japan and Korea. In Russia, the species is treated

The Ussuri brown bear (*Ursus arctos lasiotus*) is a subspecies of the brown bear that occurs in the Primorskiy Kray, on the Kuril islands, and in Japan. Like all bears, it is omnivorous, but on the Kurils, its diet consists primarily of plant matter and beached sea animals. In the fall, bears gather along salmon spawning rivers, where they eat fish. Many bears of the Kurils have pale coat color, which is hypothesized to be connected to the presence of polar bear genes in their genome. *Photo: A. Milichkin*



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as endangered, and there is an ongoing effort in the nature reserve to restore the population numbers by germinating seeds and planting the saplings in the wild.

The Kurilskiy nature reserve, and the protected part of the Kunashir island in particular, with 60% of its territory covered by forests, is a true refuge for rare plants. 83 local plant species are redlisted in Russia, including 9 species of vascular plants endemic to the island. The area is the northern limit of the ranges of such plants as the Japanese bigleaf magnolia (*Magnolia obovata*), Japanese maple (*Acer japonicum*), monarch birch (*Betula maximowicziana*), serrate-leaf chloranthus (*Chloranthus serratus*), Korean mulberry (*Morus australis*) and other southern species.

Slopes of hills, rocky outcrops and river valleys of the Lesser Kurils nature preserve, and the island of Shikotan in particular, which has a remarkably mild climate, are inhabited by 45 rare species of plants, including such well-known species as the large-flowered lady's slipper orchid (*Cypripedium macranthos*), Amur cork tree (*Phellodendron amurense*), and pink rhodiola (*Rhodiola rosea*). In the Tserkovnaya cove, here is a relict grove of the Kuril larch (*Larix kurilensis*).

The Shikotan is home to a regional natural monument – the Phellodendron grove, covering 0.14 hectares (0.35 acres). It is a community of 109 recorded species of vascular plants, including 26 species of trees, dominated by the Amur cork tree (*Phellodendron amurense*, syn. *Ph. sachalinense*) and the Japanese yew (*Taxus cuspidata*), with trunks reaching a diameter of 90 centimeters (35 inches).

The flora of the area is equaled by its fauna, and birds in particular. The Kurils lie on one of the world's key migratory pathways – the Kuril bridge, making its ornithofauna exceptionally rich and diverse. On the Kunashir alone, 288 species of birds belonging to 18 orders have been registered.

During seasonal migrations and summer movement, as well as during the winter season, one can observe waterfowl by the hundreds: loons, cormorants, gulls, petrels, and many others. The protected territories serve as nesting grounds to rare and endangered birds such as the osprey, white-tailed eagle, and white-bellied green pigeon; the Steller's sea eagle is a common wintering species. The Kunashir has the highest concentration of one of the world's rarest raptors – the Blakiston's fish owl.

The Glehn spruce (*Picea glehnii*) differs from other spruce species by its short needles and thin branches. The main range of this tree lies in Japan; in Russia, it also occurs on the Sakhalin and the Southern Kurils (Kunashir, Shikotan, and Iturup). It prefers soils with excessive moisture, and can reach 20 meters (65 feet) in height; old trees sometimes have flag-shaped crowns and can be up to 300 years old (right). In hollows, the spruce forms communities with fruticose lichens of the genus *Usnea*, which hang from its branches as spectacular tangled frills (below).

Photo: E. Linnik, E. Grishaeva, A. Yakovlev





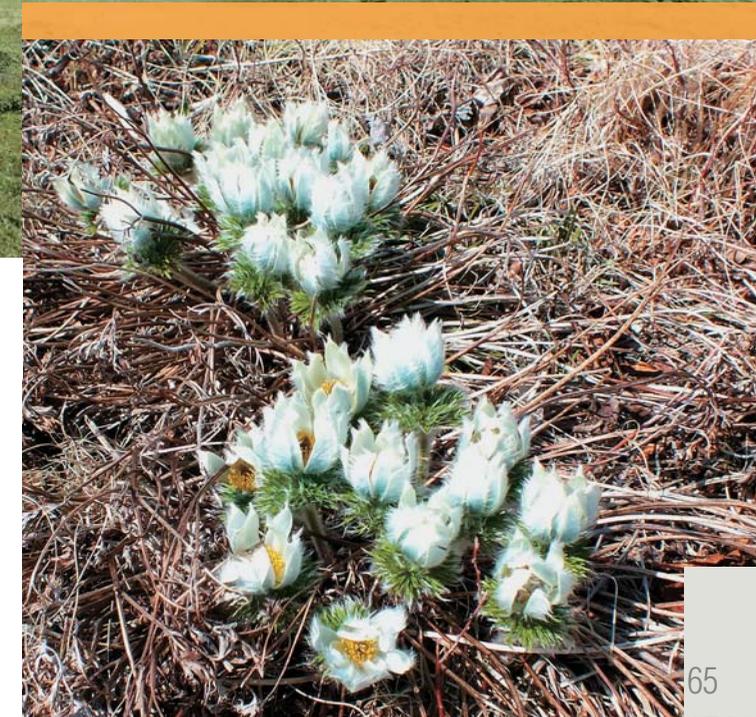
The crested kingfisher (*Megaceryle lugubris*) is one of the largest kingfishers; it has been observed in the Southern Kurils since the 1970's. Its main range spans across parts of India, Eastern and Southern China, and the Japanese archipelago. It nests in holes in steep river banks and eats fish. Photo: I. Byshnev

This tamarack grove in the southern part of Shikotan is a Pleistocene relict. The dominant species here is the Kuril larch, or tamarack (*Larix kurilensis*). Due to constant strong winds, some of the trees have short, twisted trunks, long lower branches and flag-like crowns. Photo: Yu. Sundukov



The Tserkovnaya cove ("Church cove") is one of the most picturesque places of the Shikotan coast; it hosts the largest population of the Japanese tree frog (*Hyla japonica*) on the island. There are two small islands in the waters of the cove: the Aivazovskiy island and the Devyatyi Val ("Ninth Wave") Island, named after the most famous painting by the artist. The coastal waters are rich in fish, crustaceans, molluscs, and marine mammals. Photo: L. Sundukova

On the southeastern part of the Shikotan, in the Delfin cove, there are nesting and wintering grounds of many aquatic and semiaquatic birds, including the Manchurian crane – on of the least numerous crane species in the world. The islands of Demina and Oskolki host summer rookeries of rare marine mammals: the *Steller's sea lion* and the *Kuril harbor seal* (*Phoca vitulina stejnegeri*). Its coastal waters are home to the southernmost breeding population of the redlisted *sea otter* – a semiaquatic predator with the most valuable fur. There are also numerous cetaceans, such as the *orca*, the *common minke whale*, and the *Baird's beaked whale*.



The Tarao pasque flower (*Pulsatilla taraoi*) is an endemic of the Kurils; on the Shikotan, it grows within the limits of the nature preserve. It is a short herb from the buttercup family with fuzzy leaves that prefers rocky slopes and blooms shortly after the snow melts. To thrive, it needs symbiotic microscopic fungi which only occur in specific areas. Photo: S. Karpenko



The diversity of vertebrates is not very rich. The largest representative of land mammals here is the Ussuri brown bear (*Ursus arctos lasiotus*). Many individuals of this species on the Kurils are pale-colored, which is hypothesized to be connected with the presence of polar bear genes in their genotype.

Other local predators include the red fox (*Vulpes vulpes*), sable (*Martes zibellina*), and lesser weasel (*Mustela nivalis*); there are some bats and rodents as well. The latter include the large Japanese field mouse (*Apodemus speciosus*), an insular species which only occurs in Japan and on the Kunashir, and the Shikotan vole (*Myodes sikotanensis*), an endemic of the Sakhalin region. Rare and endangered land vertebrates include reptiles, such as the Japanese forest rat snake (*Euprepiophis conspicillata*) and the already mentioned Far Eastern skink.

Freshwater bodies of the protected territory serve as spawning and juvenile fattening grounds of pacific salmon species, such as the pink salmon, chum salmon, salmon trout, etc. Some species, such as the malma trout, occur in local landlocked river-dwelling forms in addition to the pelagic form. A noteworthy example of the local salmonids is the Sakhalin taimen (*Parahucho perryi*), which can reach 2 meters in length and live up to 16 years. Overall, the ichthyofauna of the Southern Kurils is of «mixed» origin: it formed from the more southerly species of Hokkaido and the more northerly fish of the Kamchatka peninsula.

As for invertebrates, their fauna in the islands is rich, with over 5500 species known to date, but remains insufficiently studied. Each consequent research

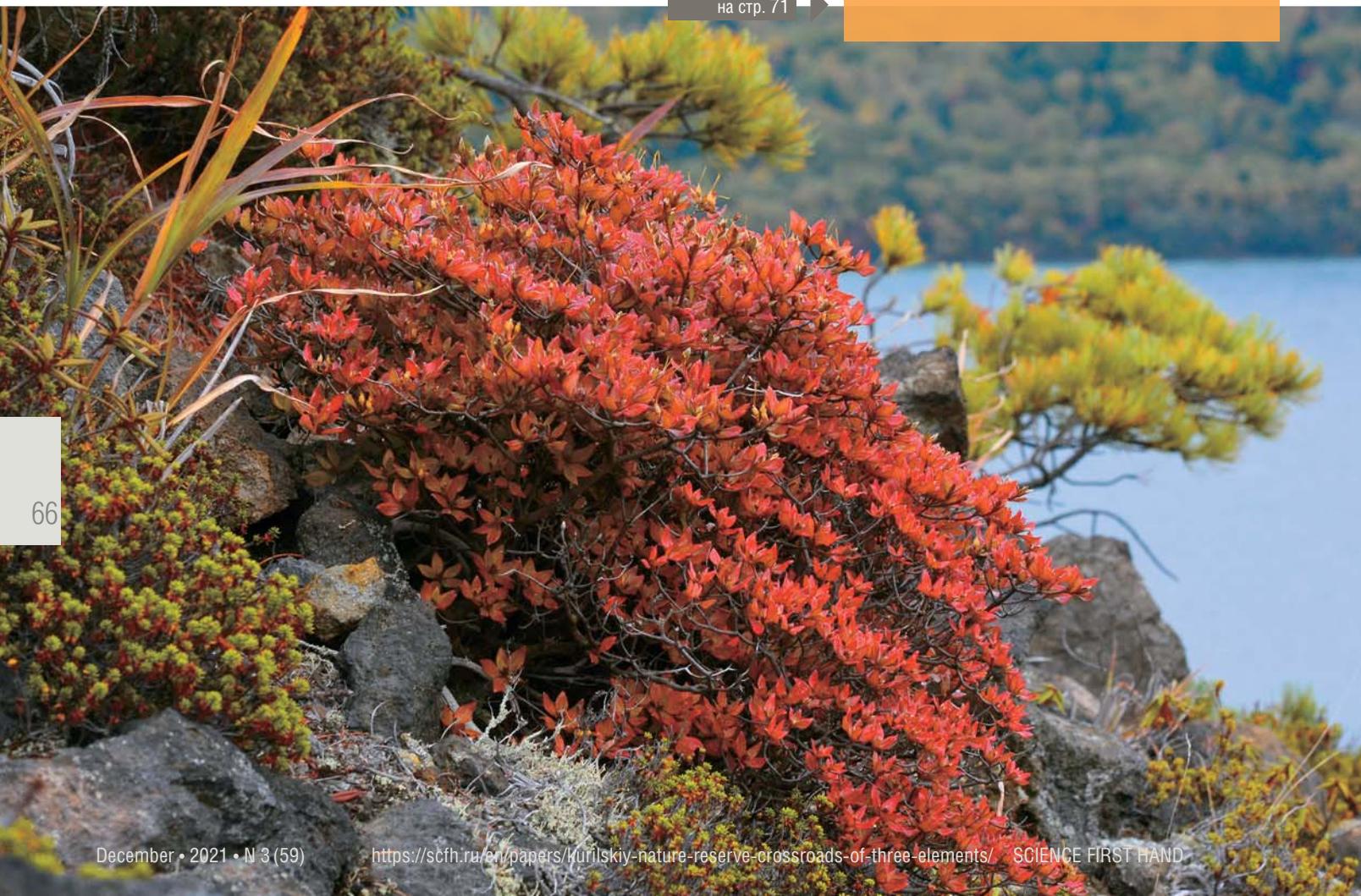
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The Chonoski rhododendron (*Rhododendron tschonoskii*) is a small slow-growing thermophilic shrub. In Russia, it only grows in the southern part of the Kurilskiy nature reserve on the Kunashir Island. It is very appealing aesthetically both during the flowering and in the fall.  
Photo: A. Yakovlev

The main range of the Japanese dog lily (*Erythronium japonicum*) lies in Japan, Korea, and China. It is considered extinct on the Sakhalin; on the Kunashir, it occurs in the coastal area, mostly along the Okhotsk sea coast. This ephemeroïd bulbous plant suffers from excessive foot traffic, fires and collection for bouquets. Photo: E. Linnik



The Blakiston's fish owl (*Ketupa blakistoni*) prefers mixed forests with trees that have plenty of cavities along unfreezing rivers and creeks. These large owls, which reach 70 cm (27 inches) in height, are extremely rare. The Kunashir hosts a population of the insular subspecies with about 30 breeding pairs. To increase the population numbers, the workers of the nature reserve build artificial nesting sites and feed the owls in winter.  
Photo: E. Kozlovskiy





The Far Eastern skink (*Plestiodon finitimus*) inhabits the Japanese islands of Honshu and Hokkaido outside the Russian part of its range; in Russia, it lives only on the Kunashir, preferring locations around thermal springs. The population of the species on the island is estimated at several thousand individuals. Photo: Yu. Sundukov



There are two lakes at the bottom of the Golovnin volcano, called Goryacheye ("Hot") and Kipyascheye ("Boiling"). Water temperatures of the Kipyascheye range from 30 °C near the surface to 100 °C near its fumarolic fields. There are multiple outlets of volcanic gases, thermal springs, and mud pits along the lake edges. The area is inhabited by rare species of plants and animals, such as the Chonoski rhododendron, Japanese forest rat snake, and Far Eastern skink. Photo: E. Linnik



The serrate-edged chloranthus (*Chloranthus serratus*), a relict of the local flora, only grows on the Kunashir, in the protected perimeter area of the nature reserve near the hot springs. Its main range lies in Japan, Korea, and China. It depends on ants for pollination and distribution of its seeds. The chloranthus population in the nature reserve is being monitored in several surveying plots, and a reserve population has been created in an artificial environment. Photo: E. Linnik

The Japanese forest rat snake (*Euprepiophis conspicillata*) cannot climb tree branches, unlike other Far Eastern rat snakes. Its diet consists of rodents, eggs, and chicks. In Russia, it only inhabits the Kunashir, usually around geothermal springs; outside of Russia, it is distributed in Japan, on the islands of Honshu and Hokkaido. Photo: Yu. Sundukov





The alpine black swallowtail (*Papilio maackii*) occurs on the Southern Kurils and on the mainland along the river Amur and in the Primorskiy Kray. It produces two generations during the summer. Its caterpillars feed on the Amur cork tree. Photo: A. Bobyr



The northern distribution limit of the Asian royal fern (*Osmunda japonica*), a forest fern reaching 1 meter (40 inches) in height, stretches across the southeastern parts of the islands of Sakhalin, Moneron, Iturup and Kunashir. This species prefers sloped creek banks near hot springs. Photo: E. Linnik

Killer whales, or orcas (*Orcinus orca*), members of the parvorder of toothed whales, inhabit virtually all waters of the World ocean, but their total numbers do not exceed 50 thousand individuals. Animals from different populations have different behaviors, hunting strategies, and nutritional preferences. Photo: T. Ivkovich



expedition yields species previously not recorded in the area. This is true about vertebrates as well.

The unique nature of the Southern Kurils, their peculiar flora and fauna deserve careful and wise treatment. Island ecosystems, isolated from the mainland, are especially vulnerable. They are easily disturbed, and the damage may be irreversible.

Protecting the unique landscapes and wildlife of Southern Kurils is by far not the only function of the reserve. The protected territories are a unique workspace for scientists from a variety of fields, ranging from biologists to geologists. For instance, in 2021, experts from Moscow, Kazan, Saint Petersburg and Vladivostok studied the microbial communities of hot springs and freshwater bodies, land-dwelling and aquatic invertebrates, explored forest ecosystems, and evaluated the anthropogenic pressure on the protected ecosystems. Beginning from 2018, the numbers of tourists visiting the Southern Kurils increased fourfold. In 2021, over 3 thousand visitors walked the trails of the protected territories of the Kunashir. Workers of the nature reserve are actively engaged in ecological education, especially in the Yuzhno-Sakhalinskiy district. This includes various exhibits, ecological lessons for preschoolers and schoolchildren, working with children in school-based camps and in the summer tent camp «Fregat». The website of the nature reserve publishes fresh news and interesting facts about the unique nature of the Southern Kurils.

Rurui, an active volcano, is the second highest volcano of the Kunashir, at 1485 meters (4872 feet). There are several creeks with cascades of high waterfalls (up to 10–12 meters/35–40 feet) on its western slope. Photo: E. Kozlovskiy

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*Materials on the natural objects and flora of the nature reserve "Kurilskiy" and the nature preserve "Malye Kurily" was prepared by E. V. Linnik, the deputy director of research; materials on the animal world were prepared by S. Yu. Stepanov (engineer)*

