

V. Kamchatka Region

The Kamchatka Region includes both Kamchatka oblast and Koryak Autonomous Okrug.

Overview of the Region

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Location

Kamchatka Peninsula lies in the northeast of the Russian Far East, washed by the Pacific Ocean and Bering Strait to the east and the Sea of Okhotsk to the west. In the north, Kamchatka borders Magadan Oblast and Chukotka Autonomous Oblast. The Kuril Island chain runs from Kamchatka's southernmost tip down to Hokkaido, Japan. The Koryak Autonomous Okrug covers the northern half of the oblast.

Size

Kamchatka Peninsula covers 472,300 sq. km., with a length of 1,200 km. North to south; it is comparable to Japan in total area.

Climate

Due to the maritime influence, Kamchatka's climate is milder than that of continental regions of the RFE along the same latitude. Average temperatures range from -11C in February to 14C in July. Average annual rainfall is 50-100 cm.¹ There are heavy snows in winter.

Geography and Ecology

Located on the Pacific rim of fire, Kamchatka has 29 active volcanoes, countless geysers, boiling mud cauldrons, steam vents, earthquakes, and other forms of seismic activity. The Serebinniy (Central) mountain range stretching down the center of the peninsula was formed by volcanic eruptions. The Valley of the Geysers, in the eastern part of the peninsula and part of Kronotskiy Zapovednik, has over 200 geysers, making it second in the world to Yellowstone National Park in the United States. Klyuchevskiy Volcano, in the north, rises 4,750 m. above sea level; it is the highest and most powerful of all active volcanoes on the Eurasian continent. In the heart of the peninsula, between the central and eastern mountain ranges, lies the central Kamchatka Valley. Feeding this broad river valley is the peninsula's largest river, the Kamchatka, which stretches 720 km. The water level of its tributaries depends on summer rainfall and melting glacial snow and ice from the Klyuchevskiy-Tolbachevskiy family of volcanoes. In summer, these regions suffer from droughts, increasing the risk of forest fires. Vast lowlands define the western coast. The eastern coast is steeper, with mountains reaching down to the shoreline in many places. Permafrost covers the northern half of the peninsula. Karaginskiy Island lies just off the northeastern coast and the Kommandorskiye Islands (Beringa and Mediny) are further off the lower eastern coast. There are 160 hot thermal springs throughout Kamchatka.

Influenced by its latitude and long oceanic coastline, wetlands, stony barrens, volcanic lava, coastal sands, and tundra dominate the landscape. In the north, dwarf Siberian pine and dwarf alder run down to the shoreline. Sparse stone birch forests form the typical Kamchatka landscape. Kamchatka's most valuable forests lie in the central Kamchatka River valley.

Flora and Fauna

Kamchatka has one of the highest populations of grizzly bear in the world, numbering at least 10,000. The peninsula is also one of the world's richest salmon fisheries; the rivers are spawning grounds for all species of Pacific salmon. Kamchatka king crab flourish in the waters off the northeastern coast. Blue whales, thought to be extinct in the 1970s, have recovered and now feed along the shoreline. More than 50% of the

world's Steller's sea eagles nest on the peninsula. In the far north, the wetlands of Parapol'skiy Dol' are essential refueling stops for birds migrating along the East Asian flyway.

Other rare and endangered bird and animal species include the Kamchatka snow sheep, gray dolphin, narwhal, Greenland, gray, northern blue, and northern humpback whales, Mendovskiy fox, island seal, whooper swan, Bewick's swan, Steller's sea-eagle, gyrfalcon, peregrine falcon, spotted greenshank, spoon-billed sandpiper, Aleut tern, osprey, white-tailed sea eagle, and Pacific sea eagle.

Forests

Olga Chernyagina

The oblast's forest fund occupies 15.07 million hectares, or 87.8% of the oblast's total land area. Of these, 8.95 million hectares are covered by forest, 3.47 million of which are designated as Group I forests. The estimated timber reserves of the oblast are 510.0 million m³, of which 178 million may be harvested (70.26 million coniferous, 107.74 million deciduous). The productivity of oblast's forests is considered low, with 60% of the forested land occupied by shrub species: Manchurian alder (*Alnus fruticosa*) and Japanese stone pine shrub (*Pinus pumila*). Another 30% is dominated by stone birch (*Betula ermanii*) and other deciduous breeds. In spite of the low productivity, the oblast's Annual Allowable Cut (AAC) is set at a level more characteristic of regions with high forest productivity. As a result, many of the less desirable species are ignored altogether, while excessive amounts of more valuable coniferous species are harvested. Of the oblast's coniferous forests, only 2.1% (350,000 hectares) remain undisturbed by logging or fire. Those that have been most accessible for logging enterprises are most often located in the basins of rivers used extensively by salmon as spawning grounds. In response to dwindling reserves of spruce and larch, the Regional Forest Services of Kamchatka Oblast and Koryak Autonomous Okrug put forward a resolution in 1997 insisting that the AAC for both regions be cut by 30%. Meanwhile, as in other regions of the RFE, fires also bring enormous damage to the oblast's forests. In 1998 alone, 97 individual fires were recorded, burning a total of 37,700 hectares of forest.

Forest Hotspots:

1. "Conifer Island"
2. Bystrinskiy Nature Park
3. Kronotskiy zapovednik

Population

The population is 472,000 with a density of about one person per sq. km. Three-quarters of the population is centered around Petropavlovsk and Avachinskaya Bay. The remaining quarter are spread across the rest of the peninsula in small settlements of between 100 and 10,000 people. Twelve percent of Koryak Autonomous Okrug's population (38,000) are indigenous Koryaks.

Largest Cities

Petropavlovsk (pop. 273,000) is the administrative center, a hub of the RFE fishing industry, and a nuclear submarine base.

Elizovo (pop. 49,000) has an international airport.

Palana is the administrative center of the Koryak Autonomous Okrug.

Main Resources

The region supplies tremendous volumes of marine resources such as crab and salmon. Forests cover much of the peninsula, but only the conifer forests in the central area are of economic importance. Mineral deposits include gold (approximately 1,000 tons), silver (approximately 5,000 tons), mercury, polymetals,

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sulphur, and limestone. Large titanium deposits (30,000 tons) and gold reserves were recently discovered in the Koryak Autonomous Okrug.⁷ There are also large coal reserves. Oil and gas deposits have been discovered on the Sea of Okhotsk shelf off the western coast.

Main Industries

Fishing (75% of industrial production), ship-repair (7%), gold mining, forestry, and tourism. Russia's only geothermal power plant is on Kamchatka.

Economic Importance in the RFE

- One-third of the RFE's annual fish catch
- Seven percent of total RFE industrial output
- Seven percent of total RFE agricultural
- production

Protected Area System of Kamchatka Oblast

Vladimir Zykov

Director of the South-Kamchatsky Nature Park

Introduction

The first protected areas appeared in Kamchatka in the end of the 19th century. At the insistence of a Polish exile B.I. Dybovsky a request was filed on behalf of the citizens of Petropavlovskii district to create sable habitat sanctuaries in Krovok and Asachi rayons. Official status of protected area was given to Kronotsky area by an Imperial Decree of 1882 to protect sable, bighorn sheep and reindeer. In 1916-1917 an expedition of the Department of Land Use of Russia worked in Kamchatka. On the basis of its research, Kronotsky territory was again proclaimed protected on July 8, 1917. In 1926 Dalkraispolkom (Far Eastern regional executive committee) decree, and later in 1929 Kamchatka oblast executive committee decree confirmed creation of Kronotsky zapovednik.

Until 1934 no money was allocated for the protection regime enforcement in the area, no rangers or research staff existed. On June 1, 1934, the zapovednik was enlisted in the register of the state nature reserves and it began to receive state funding.

Today there are two zapovedniks in Kamchatka, one federal zakaznik, 16 regional (oblast-level) zakazniks, 55 nature monuments, 28 forest reserves, 2 resort zones (Paratunskaya and Malkinskaya), and green belt zones of Petropavlovsk and Elizovo cities. In addition to that, 60 objects are placed on the register of historical and recreational objects. In 1995 Nalychevskii, South-Kamchatskii, and Bystrinskii nature parks were created in Kamchatka. According to the decision of the 20th Session of the UNESCO Committee on World Cultural and Natural Heritage (Mexico, December 3-6, 1996), Kronotsky state biosphere zapovednik, South-Kamchatskii republican zakaznik and the above-mentioned three nature parks were included in the World List of Cultural and Natural Heritage Sites.

Zapovedniks

Kronotsky State Biosphere Zapovednik

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Kronotsky zapovednik is located on the East Coast of the Kamchatsky peninsula within Elizovo rayon (administrative district) between 54 5' and 55 0' N and 159 5' and 162 0' E. In 1992 a parcel of conifer forests in the Kamchatka rover valley was added to the zapovednik within Malkovsky administrative district between 55 5' and 55 0' N and 159 5' and 160 5' E. Kronotsky state biosphere zapovednik was created by VTsIK of RSFSR decree of June 1, 1934, to replace "Sable preserve" that had existed on the same territory since 1882. In 1951 the zapovednik was liquidated. In 1959 it was restored by the decree of the Council of Ministers of RSFSR on June 1, 1959, # 1162. In 1961 the zapovednik was liquidated second time. Five years later, zapovednik was again restored by the decision of the Executive Committee of the Kamchatsky Oblast Soviet of People's Deputies on July 29, 1966, # 459, "On the restoration of Kronotsky State Zapovednik", the Decree of the Council of Ministers of January 17, 1967 # 34 "On the Creation of Kronotsky Zapovednik", and the Order of Glavohota (Department of Hunting) of RSFSR of February 7, 1967 # 41 "On the Creation of Kronotsky state zapovednik in the Kamchatka Oblast". On the basis of the Order of the Council of Ministers of RSFSR of October 15.

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In 1982 #1674-p "On the inclusion of 3-mile zone of the adjacent Pacific Ocean within the Kronotsky Zapovednik", additional 135,000 ha of the Pacific Ocean were added to the preserve. On February 5, 1985, Kronotsky zapovednik became part of the international biosphere preserve network by the Bureau of the International Coordination Council of the "Man and Biosphere" Program. According to the Decision of the Central Committee of CPSU and the Council of Ministers of the USSR, on January 7, 1988, Kronotsky zapovednik was put under the authority of the State Committee on Nature Protection. On January 1, 1992, Kronotsky zapovednik was placed under the jurisdiction of the Ministry of Ecology and Natural Resources of Russian Federation.

On July 2, 1992, the Head of the Administration of Kamchatka Order # 407-r added 43,134 ha Atlasovsky mehleshov (state forestry unit) of the Lazovskii Forest within Milkovskii rayon. Since December of 1996 Kronotsky zapovednik was transferred under the authority of the Department of Zapovedniks of the State Committee on Environmental Protection due to reorganization of the Ministry of Ecology.

Currently the total area of the preserve is 1,142,134 ha with 654 895 ha under forests, 16, 847 ha under wetlands, 484 327 ha under open dry range, 166 720 ha under water, including 31 720 ha under rivers and lakes and 135,000 ha within the 3-mile ocean buffer zone. The Zapovednik is located within the Eastern Volcanic Province of Kamchatka, it has 25 volcanoes, 12 of which are active, on its territory. Many unique geologic objects are can be found in the preserve, the best known include the Geysernaya river valley, Uzov volcano caldera, and Burlyaschij volcano. Zapovednik has a rather dense grid of rivers and creeks, about 650 m per 100 ha. All rivers drain into the Pacific Ocean. There area numerous small lakes and one of the largest lakes in Kamchatka - Lake Kronotskoe - covering 242 sq. km. All together, there is about 800 water bodies within the preserve. Vascular plant flora (excluding the territory added in 1992) is characteristic of eastern Kamchatka coast. It includes 728 species representing 303 genera and 86 families. 679 species grow in pristine habitats, the other 49 are weedy species growing near human dwellings, along trails and roads (Yakubov, 1997).

Isolated patches of conifer forests include Cayander's larch near Lake Kronotskoe and the Nikolski groves of spruce in the Kamchatka river valley. The only grove of Sakhalin fir grows near the southern border of the zapovednik. According to the Zapovednik's "Regulations", a few areas are designated for "limited resource use by the staff", where berries and mushrooms can be picked, fuel wood can be collected, and vegetables can be cultivated. Limited licensed fishing of salmon for food is allowed on the rivers Chazhma, Kronotskaya, Bogachevka, Olga, and in Semyachikskii Estuary. The exact area covered by residences, warehouses, and private vegetable plots is unknown. One helicopter tourist route exists leading to the Geyser Valley, where a trail ramp is maintained with 7 viewing areas. Not more than 1800 people can visit the valley each year. No visits are allowed in April-May for about one "month of silence" during the breeding season of bears and other animals.

The following objects are found within or near Kronotsky reserve:

1. Ecological Education Center in the Valley of Geysers" (235 sq. meters inside the reserve).
2. Climate station in the town of Kronoki on 1.5 ha (outside the reserve boundary).
3. Seismological station in Kronoki on 1.5 ha (outside the reserve).
4. Hydrographic lighthouse on Kronotsky Point on 1.5 ha (outside the reserve).
5. Field Station of the Volcanology Institute in the Uzov volcano caldera (200 sq. meters inside the reserve).
6. Scientific station of Kamchatsky Research Institute of Fisheries (KamchatNIZRO) on Lake Kronotskoe (120 sq. meters inside the reserve) .
7. A 22-ha parcel on Kozlov Point has been occupied since 1986 by a military unit and has not yet been returned to the reserve.

According to the staff roster as of November 1, 1998 zapovednik should have had 69 staff (including South-Kurilskii Zakaznik), but in reality only 40 staff were employed.

Financing in 1997:

Federal Budget - 983 680 rubles (\$164 000)

Non-budgetary financing - 516 174 rubles (\$86 000)

Grants- 14 500 rubles (\$2 400)

Due to insufficient funding, zapovednik practically lost its guard, monitoring, and research system that had been in place since 1970s. A program on ecotourism development was organized in the zapovednik to help supplement the budget, which will inevitable lead to further acceleration of the recreational development on the territory, in direct contradiction with the state regulations and the reserve status. The worldwide acclaimed Geyser valley can be threatened by the continuous increase in the number of visitors, even though planned and built trail helps mitigate the impact.

Komandorsky State Zapovednik

Address: Zapovednik, pos. Nikolskoe, Aleutskii rayon, Kamchatskaya oblast. Phone (41547) 2-25_

Zapovednik "Komandorsky" was created within the Aleut National Rayon of Kamchatka and includes parts of Bering Island, islands Medny, Arij Kamen, Toporkov, other small islands and the surrounding 30-mile zone in the Bering Sea and the Pacific.

Brief history

1. In 1980 oblast-level zakaznik "Commodore Islands" was established.
2. On April 23, 1993, Russian Government signs Order # 359 creating a new zapovednik "Komandorsky".
3. Order of the Ministry on Nature Protection on May 7, 1993 # 90 on creation of "Komandorsky" Zapovednik.

The total area of the reserve is 3,648,679 ha, including 185,379 ha of land and 3,463,300 ha of the Bering Sea and the Pacific Ocean.

Zapovednik borders:

Bering Island.

Zapovednik is located in the southern half of the island. On this territory are found the core reserve in the south and the buffer zone in the middle of the island.

Medny Island.

Zapovednik includes the whole island, except the following areas:

- National border patrol station;
- former Preobrazhenskoe village including cemetery on both banks of the Gavanskaya river;
- spit separating Lake Zhirovoe from Zhirovaya Bay;
- spit separating Lake Gladkovskoe from Gladkovskaya Bay.

Two buffer zones are designated on Medny Island: one on the southeastern tip of the island and in the vicinity of the former Preobrazhenskoe village. The rest of the island's territory is included within the core reserve.

Toporkov Island lies entirely within the zapovednik. A buffer zone exists on the island in the south including tide zone along the south-western coast.

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The rest of the island south of the buffer zone is completely included within the core reserve.

Ariy Kamen Island is completely included within the core reserve with the exception of the strip along the east slope of the rock outcrops, which is designated as the buffer zone. The 30-mile wide marine zone is included in the reserve, with the exception of 5-mile wide zone north of Bering island.

Within this 5-mile zone two 1-mile wide zones around Toporkov and Ariy Kamen islands are considered buffer zones. Also, three 1-mile wide buffer zones adjacent to the terrestrial buffer zones of Bering and Medny islands are designated.

- The parcel covering one half of Bering island has boundary running from the mouth of the Myakishevskaya river (in Sosnovaya Bay) southwestward along the coastline as far as Razvalnyi Point (inner boundary) and within one-mile distance away from the parcel (outer boundary).

- The southwestern parcel on Medny Island has boundary running from Peresheek Ostrovnoj Bay southeastward along the coastline, includes southeastern corner of the island with Southern (Yuzhny) and Southeastern (Yugovostochny) Points, then follows the coast line towards northwest up to Sekachinskaya Bay (inner boundary); and within one-mile distance away from the parcel (outer boundary).

- Preobrazhensky parcel on Medny island - the boundary goes from the northern end of Peschanaya Bay towards southwest along the coast line down to the mouth of the river Topalevskaya (inner boundary) and within one-mile distance away from the parcel (outer boundary).

The Ministry for Environmental Protection does the inner zoning of the rest of the oceanic part of the zapovednik Komandorsky. The same Ministry is responsible for managing the zapovednik.

The Commodore Islands are the summit of underwater mountains. Bering Island reaches 150 to 755 m a.s.l., Medny - 360 to 647 m. The islands are objects with world-class natural and cultural values. One of the small indigenous peoples of the Russian North - the Commodore Aleuts - inhabits the islands.

The islands are a choice nesting spot for many sea birds. During migrations, geese and shorebirds use the islands as a stopover. A few species listed in the Red Data Book (RDB) of Russia inhabit the islands, e.g., Mednov subspecies of the Arctic fox ("blue Arctic fox"), northern sea otter, antur ?, gyrfalcon, peregrine falcon, grey-winged gull, red-legged warbler?. The shores team with about 300,000 marine mammals. A few of marine mammal species are listed in the IUCN Red Data Book, e.g., sea otter, Minke's whale, etc. Introduction of red vole, rat, American mink, and reindeer on Bering island created large disturbance of the ecological balance on the island where of all mammal species only Arctic fox had lived before. It is very probable that the recent itch disease pandemic that nearly extirpated all the foxes on Medny island was caused by ticks brought over with the domestic and introduced wild animals. About 475 species of vascular plants on the islands belong to 65 families. Man introduced thirty-five of these species. Maritime quillwort and large-flowered ladyslipper are listed in the RDB. Most of the islands are occupied by mountain tundras. Some grasslands also occur, while trees or shrubs are rather infrequent and do not impact the overall character of vegetation.

The main goal of zapovednik is preservation and monitoring of unaltered rhythm of natural processes in pristine conditions. Other goals are preservation of wild populations of plants and animals, typical and unique ecosystems, and preservation of traditional lifestyles of the Aleuts. Within the preserve core areas and buffer zones all land, minerals, waters, and natural objects are forever reserved by the state and are given for zapovednik to manage in perpetuity. Outside of the zapovednik borders (northern half of Bering Island) use of natural resources can take place in accordance with the current legislation.

As of today, zapovednik has little supply of materials and insufficient financing, which lowers effectiveness of the protective measures undertaken by the staff to protect spawning grounds, bird nesting colonies, marine mammal breeding grounds.

State Preserve Yuzhno [South]-Kamchatsky

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State preserve [zakaznik] Yuzhno-Kamchatsky is established on the territory of Elizovo and Ust-Bolsheretsky rayons of Kamchatka. Between 54 5' and 55 0' N and 159 5' and 162 0' E. The total area of the zakaznik is 225,000 ha. The preserve is subordinate to Kronotsky zapovednik. In 1880, together with the formation of Kronotsky sable reserve, two other preserves were established: Asachinsky Sable Preserve and Lopatkinsky Beaver [i.e., sea otter - trans.] Preserve. In 1882, by the Highest Tsar's Decree, Asachi and Kronok districts were proclaimed reserved for sable trade. In 1927, Soviet of People's Deputies of RSFSR officially designated "Beaver breeding grounds of Lopatka Point" as zapovednik. To protect the zapovednik from 1928 to 1932 a ranger post existed, later it was dismantled. Due to the efforts of the nature protection organizations of Kamchatka and with the active support of the Main Department of Hunting of the Council of Ministers of RSFSR, a decision #8-41 of April 11, 1975, was passed by the Kamchatka regional Soviet of People's Deputies to create a republic-level zoological zakaznik (wildlife sanctuary). The actual preserve was finally organized in 1982 in Elizovo and Ust'-Bolsheretsky rayons on 247,000 ha. A number of unique natural objects are located on the territory of the zakaznik, the most famous being Lake Kurilskoe surrounded by a group of active volcanoes Kamabalny, Il'insky, Dikij Greben, Kosheleva. In the fall, the lake shores and the rivers in the area team with hundreds of brown (grizzly) bears. White-shouldered and white-headed eagles nest within the lake watershed, hundreds of whooper swans and many ducks.

Among the natural objects of worldwide significance are southern Kamchatka sea otter population of 1500, breeding grounds of hundreds of seals, and a coastal population of bighorn sheep. Among rare birds we can mention yellow-billed loon, Pacific black goose (Brent?), lesser white-fronted goose, osprey, golden eagle, Kamchatka tern, etc. A serious threat to the lake ecosystem is poaching. Poaching of sockeye salmon (*Oncorhynchus nerka* Walbaum) and brown bears is particularly acute. Zakaznik does not have funds necessary to deal with the problem. Increase in tourism also is one of concerns for the preserve staff, because recreation is explicitly prohibited in the zakaznik Regulations. The main problem is that tourism development takes place without an adequate impact assessment. Such assessment is particularly necessary with respect to the tourist hotel which is already being built in the buffer zone of Kurilskoe Lake.

Nature Park Bystrinsky

Address: Solnechnaya 19-2, Esso, Bystrinsky rayon, Kamchatskaya obl., 684310. Phone (41542) 21-4-65, E-mail: essolib@elrus.kamchatka.su.

Until 1994 the territory of the nature park only had a few buffer zones protected along the rivers with spawning grounds. A zoological zakaznik ("Ichinsky") was created by the order of the Governor of Kamchatka at the oblast level. Today the zakaznik is completely included within the park. Bystrinsky nature park was created by the Governor's Orders #192 of August 18, 1995, and #186 of July 5, 1996, on about 1,333,478 ha.

The park is subordinate to the Administration of Kamchatka. It is located in the middle of Kamchatka peninsula in Bystrinsky national rayon. Indigenous groups of evens, itelmens, and koryaks live on the territory practicing traditional nature use (raising domestic reindeer on the range, fishing, hunting, berry and mushroom picking, etc.). Two settlements are located within the park, Esso and Anavgai. Bystrinsky park territory practically coincides with one of the largest gold mining areas in Kamchatka. When the park was created, its boundaries were drawn so that the already licensed claims would not be included within the park (Aginsky and Baranyevsk). This, however, does not warrant against subsequent encroaching on the

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park's territory by the future explorers. There has been already a precedent, when nickel deposits were discovered near the southwestern corner of the park, and there was an attempt to redraw the park boundary in that area. The park has rather rugged terrain. Large wetlands are located in the headwaters of the park's rivers Rossoshina, Sopochnaya-Yamme, Tkhonma, Saichik, in the valleys of rivers Icha, Tvayan, Ozernaya, Oblukovina. Peat deposits are on average 2-3 m thick.

The main natural attractions of the park include thermal and mineralized water springs (Bystrinskie, Uksichanskie, Opapelskie) and Uksichan, Anaun, and Ichinski volcanoes. Density of introduced moose, muskrat, American mink, Canadian beaver is unusually high in the park. Kamchatka brown bears are common throughout the park. Among rare species are three bats (Daubenton's water bat, Brandt's water bat, and northern bat), collared lemming, wild reindeer, Canadian beaver, black-capped marmot. Essentially all species of Kamchatka salmon can be found in the park's rivers: Chinook, Coho, Sockeye, Pink, Chum, and Char Salmon, as well as arctic grayling, Kamchatka steelhead, and east Siberian char.

Nature Park "Nalychevo"

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In the river Nalychevo valley protected areas have existed since 1985. In September 1994 work began to create a regional nature park. Nalychevsky nature park with the area of 285 970 ha. It was established by the Governor's orders #194 of August 18, 1995 and #188 of July 5, 1996. The park is managed by the Administration of Kamchatka.

The park is located in the immediate vicinity of the cities of Elizovo and Petropavlovsk-Kamchatsky. There is about 46 km from the town of Pinachevo and the central park station. The Nalychevo river valley is surrounded by volcanoes Zhulanovskii, Koryakskii, Avachinskii, and Dzenzur. In the upper reaches of the Nalychevo river a few hundred of hydrothermal and cold mineralized water springs is concentrated. Nalychevskii Springs belong to a very rare type of "carbonated, arsenic- and boron-rich, water" with a number of microelements. The closest analogues are De Burbul Springs in France and Steamboat Springs in the USA.

Thirty-three mammal species are found in the area. Brown bear is very common in the upper reaches of the river. Volcanic cones and cliffs of Nalychev Point provide habitat for the bighorn sheep. The bird list for the Nalychevo Valley contains 145 species, about 90 of whom are nesting. Six species are listed in the RDB of Russia, including Pacific Black Goose (Brent?), White-shouldered and White-tailed Eagle, Gyrfalcon, Peregrine Falcon, and Golden Eagle.

The Nalychevo river provides spawning habitat for five species of the Pacific salmon. This park is one of the most commonly visited natural areas in Kamchatka. . Hundreds of tourists passthrough the valley every year. In the central part of the valley a "Kamchattourist" agency cabins are located. Due to unstable funding, for the last few years the buildings have not been well maintained. In 1997-1998 the Directorate of Nature Parks used funding from the World Wildlife Fund and the Ecological Fund of Kamchatskaya Oblast to build living quarters for 4 people, the Vladimir Semenov Ecological Center , a few campgrounds for primitive tourists. Funds were also used to improve the bathing areas around warm springs. The total recreational capacity of the territory has not yet been determined. Six areas of indigenous hunting and one indigenous fishing area were designated in the park for the local indigenous population.

Nature park Yuzhno [South]-Kamchatsky

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In 1882 the territory of today's nature park Yuzhno-Kamchatsky was designated as a sable reserve, which existed until the early Soviet years. In 1994 a biological zakaznik "Bereg Chubuka" was established on 49,100 ha to protect a herd of bighorn sheep. The Yuzhno-Kamchatsky nature park was created by the Governor's orders #193 of August 18, 1995 and #187 of July 5, 1996 to encompass approximately 980,000 ha. The park is subordinate to the Administration of Kamchatka.

There are a few active and a few extinct volcanoes, e.g., Zheltovsii, Ksudach, with the diameter of the base of 35 km and a 7 km caldera at the top with two scenic lakes, and one of the most active Kamchatka volcanoes Mutnovsky.

Rivers and streams are well developed, there are about 150 lakes of different origin. One of the characteristic features of the park is abundance of ground heat-related natural objects, restricted to the areas of significant geothermal activity: Mutnovsky, Zhirovsky, Khodutkinsky.

Fifty-nine mammal species inhabit the park. The most valuable are bighorn sheep, brown bear, and northern sea otter. The sheep are also protected in zakaznik "Bereg Chubuka". There can also be found such typical for Kamchatka animals as red fox, sable, river otter, wolverine, American mink, arctic ground squirrel, etc. The park boasts one of the largest populations of peregrine falcon in Kamchatka, it also has at least 20 nesting pairs of white-shouldered eagles, and some ospreys and golden eagles. All of these species are listed in the Red Data book of Russia. About 200 nesting colonies of sea birds can be found on the Pacific shores and on off-shore islands. Among these colonies is the largest in Russia colony of 5-6 thousand pairs of murrelets. Other large colonies include slaty-backed gull, murre, horned puffins, and pelagic cormorants.

Eight hunting areas exist in the park. A tourist camp belonging to the aviation-tourism company "Krechet" [Gyr Falcon] operates in the vicinity of Khodutkinsky Hot Springs. The same company also owns 6 parcels of land ranging from 0.3 to 1.15 ha used for fish processing. Other landowners include tourist company "Morskoy Veter" [Sea Wind], fisheries "Chiruch", stock company "Friod". The latter studies the underground and surface waters and manages an experimental water pumping facility in Russkaya Bay.

The annual budget for all three nature parks in 1998 equaled 1.5 million rubles. Nalychevskii park received \$40,000 grant from WWF-Germany and 360,000 rubles from the Ecological Fund of Kamchatskaya Oblast for development. As of November 1, 1998 there were 11 staff in the Directorate of Nature Parks of Kamchatka.

Nature zakazniks at the oblast-level

1. Zoological zakaznik "Nalychevskaya Tundra"

Was created in 1972 on the territory of Milkovsky rayon. Was extended by the Decree of the Regional Governor, #9 of January 17, 1994. The area is 15,000 ha. The purpose is protection of rare waterfowl and their wintering habitat.

2. Zoological zakaznik "Reka [River] Udochka"

Was created by the Decree of the Governor of Kamchatka #216 on May 5, 1983 in Elizovo rayon. Was extended by the order of the Governor #9 of January 17, 1994. The area is 99,000 ha. The purpose is to protect areas of Canadian beaver introduction, protection of migrating birds and wintering habitat of waterfowl.

3. Zoological zakaznik "Bobrovy" [Beaver]

Was created in 1978 in Milkovsky rayon. Was extended by the order of the Governor #9 of January 17, 1994. The area is 51,000 ha. The purpose is to protect common game and introduced Canadian beaver, protection of whooper swan winter habitat.

4. Zoological zakaznik "Three volcanoes"

Was created in Elizovo rayon by the decision of the Executive Committee of the Kamchatka regional Soviet of People's Deputies #542 of January 1, 1985. Extended by the order of the Governor #93 of April 10, 1994. The area is 50,000 ha. Purpose - protection of bighorn sheep, black-capped marmot. Is included within the Nalychevo Nature Park.

5. Zoological zakaznik "Khlamovitsky"

Created in 1960 as a reserve for muskrat in Elizovo rayon. Extended by the order of the Governor #9 of January 17, 1994. The area is 900 ha. Purpose - protection of muskrat, waterfowl, including one of the largest in Russia colonies of black-headed gull, protection of Aleutian tern and migrating geese.

6. Zoological zakaznik "Ozero [Lake] Kharchinskoe"

Created in 1978 in Ust'-Kamchatskii rayon. Extended by the order of the Governor # 9 of January 17, 1994. The area is 10,000 ha. Purpose - protection of birds and Canadian beaver.

7. Zoological zakaznik "Yugo-zapadny [southwestern] tundrovyy"

Was created on December 12, 1990, by the decision #331 of the Soviet of People's Deputies of Kamchatka in Ust'-Bolsheretskii rayon. The area is 123,000 ha. Purpose - protection of wetlands and coastal tundras along the Okhotsk Sea coast.

8. Zoological zakaznik "Timonovsky"

Was created in Elizovo rayon by the decision of the Executive Committee of the Kamchatka regional Soviet of People's Deputies #216 of May 5, 1983. Extended by the order of the Governor # 9 of January 17, 1994. The area is 72,000 ha. Purpose - protection of mountain landscapes and wildlife preservation. A well-equipped tourist camp of "Krechet" company is located within the zakaznik.

9. Zoological zakaznik "Ichinsky"

Was created by the order of the Governor of Kamchatka #170 on June 8, 1994 in Bystrinsky rayon. The borders were redefined by the order #249 on September 9, 1994. The area is 183,400 ha. Purpose - protection of bighorn sheep, brown bear, sable, black-capped marmot the zakaznik is located within the Bystrinsky nature park.

10. Zoological zakaznik "Bereg Chubuka"

Was created by the order of the Governor of Kamchatka #170 on June 8, 1994 in Elizovsky rayon. Purpose - protection of southern population of bighorn sheep and brown bear. Is included in South-Kamchatsky Nature Park.

11. Zoological zakaznik "Zhulanovsky Liman"

Was created by the order of the Governor of Kamchatka #170 on June 8, 1994 in Elizovsky rayon. The area is 2,500 ha. Purpose - protection of geese.

12. Zoological zakaznik "Nalychevsky Mys"

Was created by the order of the Governor of Kamchatka #170 on June 8, 1994 in Elizovsky rayon. The area is 2,500 ha. Purpose - protection of bighorn sheep. Is included within Nalychevsky nature park.

13. Zoological zakaznik "Surchinsky"

Was created by the order of the Governor of Kamchatka #170 on June 8, 1994 in Milkovsky rayon. The area is 64,900 ha. Purpose - protection of the colonies of black-capped marmot.

14. Zoological zakaznik "Olenii Dol"

Was created by the order of the Governor of Kamchatka #268 on November 11, 1995 in Ust'-Bolsheretsky rayon. The area is 69,600 ha. Purpose is protection of Tolmachevsky herd of wild reindeer.

15. Biological zakaznik "Taezhny"

Was created by the decision of the Executive Committee of the Kamchatka Soviet of people's Deputies #607 on December 31, 1986. Was extended by the order #5 of the Governor on January 10, 1997. At that point the zakaznik received status of "biological". The area is 41,000 ha, including 24,000 ha in Milkovsky and 17,000 ha in Bystrinsky rayon. The zakaznik contains one of the few remaining stands of old-growth Yeddo spruce forests in Kamchatka.

16. "Sobolevsky" Scientific Research Station

The station was established by the decision #26-15 of the Executive Committee of the Kamchatka Soviet of People's Deputies on December 10, 1976 in Sobolevsky rayon. The station's existence was reconfirmed by the order #3 of the Governor on January 4, 1996. The area is 55,000 ha.

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Protected Area system of Koryak Autonomous Okrug (KAO)

Note: Most of Koryakia is tundra, wetlands, and arctic ecosystems with few forests. Thus, there are no forest hotspots for this region.

SE Abramov

The territory of the KAO is characterized by a high degree of landscape diversity, but the biological diversity, when compared with the more southern parts of the region, is lower. This leads to a situation wherein each species of flora and fauna is particularly valuable.

The preservation of biological variety is a serious problem throughout the world. The strategy of developing territorial forms of conservation of biodiversity is proposed as one of the solutions for this problem. The main thrust of this strategy is an increase in the share of the surface area of preserves and other Protected Areas (PA) and the creation of regional ecological networks of protected territories. By 1998, one zapovednik and eight regional biological zakazniki had been established in the okrug.

Koryakskiy Zapovednik

The state nature preserve "Koryakskiy" was established in 1995 with the financial support of the Worldwide Fund for Nature (WWF). The area of the preserve covers 327,156 ha, of which 83,000 ha are in the sea. The preserve is comprised of two separate sections, the "Govenskiy" and the "Parapol'skiy". The "Govenskiy" is located in the east of the KAO and incorporates a portion of the Pylginskiy Range within the boundaries of the Goven Peninsula and the upper portion of the Pylgovayam River basin. The "Parapol'skiy" section is comprised of the southern part of the Parapol'skiy depression and the adjacent spurs of the Penzhinskiy Range and the Koryakskiy plateau. In establishing this preserve, the objective was not to disrupt the natural state of the typical and unique natural systems of the Koryakskoye plateau and the Parapol'skiy lowlands, which harbor one of the largest nesting grounds of water- and marsh-fowl in Asia. Also, it was expected that establishing the preserve would solve the problem of environmental monitoring of the now protected territories.

There are some 700 species of plants growing in the preserve. Some of them are rare, for example, the Drummond anemone, the lesser candoc, and the Victor bitter-cress.

Among the animals, the greatest variety is among the birds, of which there are 153 species. Ninety-seven of these have their nesting grounds on preserve territory. Particularly numerous are the geese (bean goose and the white-fronted goose), ducks (the greater scaup duck, the pintail duck, the wigeon), sandpipers (fifi, dunlin). A number of bird species can be observed only in flight. Among them are some that are in the various Red Data Books, for example, the white-billed diver, the pacific brant goose, and the shovelnose. The ornithological complex of the rocky seashore is represented primarily by the colonial sea birds that form some 30 colonies along the shores of the Goven Peninsula. Species common to the shores of the Bering Sea are predominant, e.g., the Beringian cormorant, the Pacific seagull, the kittiwake, the puffin. Not far from the rookeries, the peregrine falcons are nesting; the falcons nest on the rocky slopes of the river valleys (both species are in the Russian Federation Red Data Book). The falcon population in the Koryak plateau is one of the largest and most stable ones in the Russian Federation.

Other rare and endangered species of birds nest on the territory of the preserve: the golden eagle (Red Data Book of the IUCN) and the Steller's sea eagle (Red Data Book of the Russian Federation). There are 28 species of mammals. Brown bear, Kamchatka sable, fox, ermine, wolverine, otter and others can be encountered here. The coastal waters of the Goven Peninsula are home to six species of marine mammals. The most common and practically always present is the seal. Located on the Cape Goven is one of the large but not permanent coastal seal-rookeries with a population of 300 to 2500 individuals, both in summer and winter. The Korf Bay, and especially the coast of Goven are favorite summer feeding grounds for the walrus. Sea beavers occasionally come into the Korf Bay, and it likely that they would appear on the shore of the preserve.

The insect world is relatively meager from the point of view of variety of species, but rare species that have been entered into the Russian Federation Red Data Book are encountered here, such as the *parusnik* Eversman, and *parusnik*-Feb.

To protect the natural systems from the effects of human economic activity, a protective zone covering some 676,062 ha had been created on the adjacent territory. Within this protective zone, only traditional forms of natural resource use are allowed, (e.g. reindeer breeding, hunting and fishing.)

Reka Moroshechnaya Zakaznik

An animal zoological zakaznik, the “Reka Moroshechnaya”, is located on the southern end of the Tigil’skiy Raion. All 150,000 ha of the reserve comprise some of the most valuable coastal and wetlands areas of the Okhotsk coast near the delta of the Moroshechnaya River.

The ornithological zapovednik

The main objective is the protection of birds and their habitat. Particular attention is being paid to the species that had been entered into the Red Data Book of the Russian Federation: the white-billed diver, the Okhotskiy yellowlegs, the shovelnose sandpiper, the Aleut morwennol, the Steller's sea eagle, the falcon and others. The territory of the reserve is extremely important as the breeding ground for the bean goose and the shovelnose sandpiper, protected on Kamchatka, as a place for mass congregation of migrating birds and as a reserve for the acclimatized black musk beaver. Kamchatka salmon (*Salmo mykiss*) also entered in the Red Data Book of the Russian Federation, lives in the Moroshechnaya River and in its tributaries. Research centers on the significance of the coastal biogeocenoses of a portion of the western Kamchatka lowlands as a baseline habitat for protected birds. Biological monitoring is being conducted on the territory of the reserve: a systematic observation of the condition of the rare, migrating, multiplying and species of animals.

Other Reserves

Somewhat farther north, still in the same Tigil’skiy Raion, another reserve, the “Utkholok”, is situated. It encompasses an area of heavily waterlogged tundra between the rivers Utkholok and Kvachino and also a mountainous cape that protrudes out into the sea and its adjacent rocks and islands. This reserve is significantly smaller in area (49,800 ha), but its prime task is the same: the protection of birds. Particular attention is given to the bean goose, the areas where it molts, and where it breeds.

The reserve took under its protection a typical section of the west Kamchatka plain: the lower portion of the Utkholok and Kvachina riverbeds. Thousands of bean geese from the western Kamchatka population molt on the lakes of the reserve. During the migration periods, hundreds of thousands of shorebirds, geese and other birds congregate here.

Three hundred km east of the “Utkholok” zakaznik, in the south of the Karaginskiy Raion, is the 17,000 ha zakaznik “Laguna Kazarok.” It encompasses the Malamvayam Lagoon and its adjacent land area, a portion of the open-sea area of the Ukinskaya Inlet, and the island Manchzhur. Here, too, the principal protected element is the bird population. The “Laguna Kazarok” zapovednik is one of the most important resting spots during the autumn migration of the brant goose, the lesser white-fronted goose, and the American white-fronted goose. Predatory birds and valuable anseriform game birds have nesting grounds on the territory of the reserve. During the migration periods and summer moves, sandpipers in the tens of thousands may be seen.

The integrated reserve “Ozero Palanskoye” is situated within the confines of the Sredinnyi Range, in the northeastern part of the Tigil’skiy Raion. Under its protection are 88,000 ha that include the Lake Palanskoye, the upper reaches of the Palana River, and the entire plant and animal system. Particular

importance is assigned to the preservation of species entered in the Red Data Book of the Russian Federation, and also the rare and economically valuable animals in the KAO: the black-capped marmot, brown bear, bighorn sheep, wild reindeer, bean goose, and the whooper swan. The lake is important for the fishing industry as the spawning grounds for the Pacific salmon. The population of kokanee in Palanskoye Lake is one of the largest on the Kamchatka Peninsula; it constitutes a very important natural resource for the indigenous peoples of the KAO.

Under special protection is also the system of the Palanskiye hot springs, with more than 100 thermal outlets. The area around the spring has evolved into a thermal ecosystem that is unique in both composition and structure. According to available information, this is the northern habitat boundary of the Okhotsk [phymbristilis] that has been entered into the Red Data Book of the RSFSR.

The “Karaginskiy ostrov” zoological reserve has the task of preserving the unique island community. It occupies the Karaginskiy Island that lies in the waters of the Karaginskiy Bay and which is separated from the northeastern coast of the Kamchatka Peninsula by the Litke Strait. The island has no permanent population. Its entire territory, 200,000 ha and the two-kilometer coastal marine zone, is under protection. The territory of this reserve provides nesting grounds for up to 400,000 marine colonial birds and thousands of waterfowl. During migration periods, the reserve is visited by hundreds of thousands of Anseriforme and Charadriiforme birds. The reserve is also home to a number of species that are in the Red Data Book of the Russian Federation, e.g., the golden eagle, the Steller's sea eagle, falcon, peregrine falcon, Aleut murrelet, and others. Small marine mammals are encountered in the coastal waters, mostly seals. Practically all streams on the island are spawning grounds for salmon. On the Karaginskiy Island the population of musk beaver has been fully preserved since their introduction from Canada in 1928.

The vegetation of the island consists of both forests (stone birch, cedar and elfin alder) and grassland. The latter has a fairly wide distribution. The hilltops are covered with mountain-tundra vegetation. The variety of plant life is represented by more than 500 species belonging to 205 genera and 64 families. Among them are also encountered plants that are rare for Kamchatka, e.g., Lessing's Arnica, Victor bitter cress, Shumshuiskiy bluegrass, and ermania. Today, the reserve is practically unprotected because of lack of funds. For the same reason it is not possible to conduct phenological observations, or keep track of migrating waterfowl and coastal birds.

In the northern part of the Litke Strait is another regional zoological reserve, the “Ostrov Verkhoturova” [Verkhoturov's Island]. It is situated within the boundaries of the Olyutorskiy Raion and includes the 800 ha island and the two-mile marine zone surrounding it. The island is uninhabited. The reserve had been established with the goal of protecting the island's population of the white fox, the grounds of the marine animals, the walrus, the sea lion, the seal and their habitat. Two other reserves are located in the Penzhinskiy Raion of the KAO. In its southern section, the 90,000-hectares zoological reserve “Reka Belaya” was established along the central reaches of the Belaya River. It provides protection for the moose, the brown bear, raptors, and waterfowl and their nesting grounds. The American mink is being acclimatized. The reserve is situated in immediate proximity to the populated areas (it is 40 km to the village of Kamenskoye, the center of the raion). Precisely for this reason the territory of this reserve is vulnerable to the negative effects of human activity. This manifests itself in motorboat traffic on the river in the summer and snowmobiles and all-terrain vehicles in the winter.

The most northerly of the existing reserves, “Severo-Ayankinskiy Listvenichnyi”, is the only botanical reserve in the Okrug. It includes the floodplains of the Penzhin River (where the Kayander larch is found) and its tributaries: Murgal', Topolevka, Lesnaya, Khiyuznaya, Kurchugan and others. This larch forest reserve of 62,000 ha is a part of the only taiga massif in the KAO and it is one of the most easterly larch forests in Asia. The area of these forests is declining precipitously in the Penzhinskiy Raion. One can get an

idea of their former expanse only on the basis of individual trees removed from the primary forest tract, and also from the distribution of typical taiga species of mammals: the chipmunk and the flying squirrel. These species are not found beyond the boundaries of the Penzhinskiy Raion in the KAO. The larch forest serves as an important station for the moose population of the Penzhinskiy area. Evidently, an entire system of taiga species of animals and plants also living here on the boundary of the habitat is connected with this area of larch distribution. Unfortunately, the territory is practically unexplored, and only fragmentary information about its biological diversity exists.

A portion of the Okrug' territory has been designated as wetlands of international importance. This includes the Parapol'skiy lowlands, Karaginskiy Island, the Moroshechnaya River and Cape Utkholok.

The total area of the existing SPNT is 992,000 ha, which amounts to 3.3% of the entire territory of the Okrug. It should be noted that both the preserve and the reserves are not going through the best of times. There is a catastrophic lack of financial resources for needed protective measures, including air patrol of the forests and inventory, which is not being done either.

Some species of rare and disappearing species of animals and plants are not included in the various methods of protection and for this reason the matter of expanding the network of the SPNTs remains in the forefront.

In the Okrug there was developed and approved a "Program for State-supported Development and Deployment of Specially Protected Nature Territories for the Period of 1996-2000 and up to the Year 2020". Within the framework of this "Program..." five new preserves are planned (the Yuzhno-tigil'skiy, the Marine Biosphere Karaginskiy, the Ledyanoy, the Penzhinskiy Marine Coastal, and the Verkhne-Penzhinskiy) and also one national park and six nature reserves of regional significance.

The total area of the SPNT, according to the "Program...", will cover 6,678,000 ha, or 22.1% of the KAO territory. Moreover, 5,437,200 ha, or 18% of the total area, will be in the absolutely preserved (zapovednik) territories.

The implementation of this program will make it possible to preserve the unique nature of the KAO in its natural state.

Forest Hotspots of Kamchatka Oblast

- 1. "Conifer Island"**
- 2. Bystrinskiy Nature Park**
- 3. Kronotskiy zapovednik**

1. "Conifer Island"

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Description of the territory

The tall coniferous stands found on Kamchatka are found in large part in the Kamchatka River basin in the central part of the peninsula. This region is commonly referred to as "Conifer Island;" the name was first used by a German botanist, Karl Ditmar, who visited this part of Kamchatka in the 18th century.

The Kamchatka River basin is wedged between two mountain ridges, Srediniy and Vostochniy, whose maximum elevations exceed 2,000 meters. The northern part of this region is characterized by a high degree of volcanic activity, including the highest active volcano in all of Eurasia—Klyuchevskaya (4,688 meters).

The region's climate is continental, with minimal annual precipitation due to the rain shadow caused by the two mountain ridges. May and June are the region's driest months, with winter also characterized by relatively small amounts of snow.

The territory in the Kamchatka River basin has been influenced by volcanic activity for a long time, with the formation of volcanic soils layered with ash. Soils in coniferous stands are characterized by a lack of podsol and are highly permeable, with Ayan fir and Cayander's larch predominating at the northern extents of their geographical distributions. These forests are generally relic in nature, having been preserved during Pleistocene glaciation. Modern natural climatic conditions are unfavorable for their natural regeneration.

“Conifer Island's” forests have a unique value for regulating water levels in Kamchatka's rivers. Due to the region's extended snowmelt the seasonal permafrost in the soil lasts well into the growing season, which helps to conserve moisture. As the frozen earth slowly thaws, this moisture is released into the area's headwaters at a slow and stable rate. During the dry months of May and June this is particularly important for the Kamchatka River and its tributaries, which are used extensively as salmon spawning grounds. This slow release of water into the river after thorough filtering through volcanic soils provides clean water for these rivers.

Many of the coniferous and birch-dominated stands in the Kamchatka River basin are located in places that are difficult to reach, and therefore minimally impacted by human activity. They represent typical ancient forests. They also host a wide variety of taiga species not found elsewhere on the peninsula, underlining these forest's importance for the oblast's biodiversity.

At the same time, in general the forests of Conifer Island are the only source of timber on the peninsula. Commercial harvesting of these resources first began in 1930, with fire a frequent occurrence. Between 1953 and 1993, 3,300 individual fires were recorded, consuming as much timber each year as was logged for commercial use.

Because of the natural climate in the region, forests in this part of Kamchatka regenerate very slowly after fire and other disturbances, with no known successful attempts at artificial regeneration. For these reasons there has been a steady decline in the amount of forest cover, from 1.2 million hectares sixty years ago to less than 350,000 (of which 125,000 are protected Group I forests) in 1996—a 300% reduction.

The natural complex once evident at Conifer Island no longer exists. The forests that do remain are found either in isolated fragments, degraded remains of cutting areas, or immature stands on old burn areas and logging sites. At least 200,000 hectares of mature coniferous forest are now irrevocably transformed into secondary birch or aspen communities, sometimes peppered with the occasional larch. At least another 200,000 hectares are degraded by roads, fire, logging and other human impacts.

Because of the unfavorable economic climate, commercial logging has declined considerably. However, plans are afoot for future widespread commercial logging—exclusively for export. Taking into account the key role the area plays for maintaining hydrological stability in the Kamchatka River, realization of

these plans would bring with it irreversible damage to the Kamchatka River basin—and the entire Kamchatka region—in the near future.

Existing protection initiatives

At present, three portions of Conifer Island are included within protected areas: Bystrinskiy Nature Park, Kronotsky Zapovednik and Taiga zakaznik. Commercial logging is prohibited in these areas. Harvesting is also prohibited within one kilometer of spawning rivers (Group I forests), but the Regional Committee on Natural Resources has undertaken to achieve approval for narrowing these protective strips.

Recommended steps

The top priority is to protect these forests from fire, for which air patrol capability must be bolstered. In recent years these patrols have gone with practically no funding.

In addition, the forests of Taiga zakaznik and Bystrinskiy Park should be designated as Group I forests, which are protected from logging under the new Forest Code of the Russian Federation.

Another priority is to establish a series of protected areas, small in area, that cover areas representing each type of larch, spruce and birch community found in the Kamchatka River basin. The remaining ancient forests in the region should be set aside as federally administered zakazniks and natural monuments, so as to prevent their being logged.

Study of the forest ecosystems of Kamchatka must also be continued; this work has been brought to a halt by the closure of an experimental forestry station once operated by the Far Eastern Scientific Research Institute of Forestry, based in Khabarovsk.

Finally, it is necessary to resolve a variety of socio-economic problems besetting the residents of villages along the Kamchatka River basin, where economic activities in the past focused on timber harvesting.

2. Bystrinskiy Nature Park

O.A. Chernyagina, Kamchatka Institute of Ecology and Nature Use (FEB RAS)

Description of the territory

Bystrinskiy Nature Park is located in the center of Kamchatka Peninsula. It falls within the territory of Bystrinskiy national *raion*, which is populated predominantly by the Even people. Two settlements are located within the park, Esso and Anavgai. The park is an oblast-administered protected area, established by decree of the governor of Kamchatka Oblast in August, 1995. In 1996, the park was included in the UNESCO World Heritage Site, “Volcanoes of Kamchatka.”

The park measures approximately 1.33 million hectares. Most of its territory is located in a mountainous region where several peaks exceed 2,000 meters in elevation; the active Ichinskaya Volcano is the highest summit in the park at 3,607 meters. Many volcanic hot springs can be found in the park as well.

The largest river in the park is Bystraya River, and also provides the headwaters for the Kamchatka River (the peninsula’s longest), as well as several important spawning rivers on the western side of the peninsula—including the Tikhaya, Bystraya, Icha, Tigil’, and Sopochnaya rivers.

Saving Russia's Far Eastern Taiga : Deforestation, Protected Areas, and Forests 'Hotspots'

The park's vegetation is dominated by Japanese stone pine shrub and Manchurian alder, while at elevations below 600 meters there are occasional occurrences of stone birch. The mountain peaks are characterized by alpine tundra dominated by shrub species and lichens. The eastern slope of the park's Srediniy ridge hosts high-growing coniferous stands of Ayan fir (*Picea ajanensis*) and Cayander larch (*Larix cajanderi*).

The flora and fauna in the park is quite typical for central Kamchatka. However, its unique geological features and history and the presence of unique habitats makes the park a highly interesting locale for biogeographical research and ecotourism.

Planned mining activity threatens the park's bioresource potential, which serves as the foundation for the subsistence economies of the native peoples living in the area: Evens, Itel'men and Koryaks. The land's status as a regionally administered protected area provides only a minimal degree of protection, insufficient to stave off the threat posed by mining interests. At the same time the territory is an important stabilizing influence for adjacent ecosystems due to the headwaters that rise here. For these and other reasons, Bystrinskiy Park remains one of the oblast's Hotspots.

The full diversity of ecosystems found in central Kamchatka are represented in the park in their virgin state; they serve as important baselines for analyses of similar lands where anthropogenic effects are more pronounced. The high biodiversity of these ecosystems and the mosaic of ecological communities within them—all resulting from the area's volcanic activity and numerous hot springs—add to the park's value for conservation interests. Initial studies of the territory's vascular plants illustrate its distinction: a wide variety of arcto-alpine species inhabit the high plateaus and terraces while relict cryophilic/steppe species are found in insular populations among the jagged cliffs. The park forms the southern extent of many species' geographical distributions. Fifteen are found nowhere else in the oblast.

The territory of the park almost completely coincides with one of Kamchatka's richest gold deposits. The oblast administration recently redrew the park's boundaries so as to allow extraction at the Aginskoe and Baran'evskoe sites. Ichinskaya zoological *zakaznik* was also diminished in size to make room for mining at Aginskoe. In addition, nickel is being prospected along the park's southwestern boundaries, with mining interests lobbying for yet another border modification. At the same time, the park's forests and tundra ecosystems are continually scorched by fire. At present this is one of the most damaging anthropogenic influences plaguing the park.

Another potential hazard is the development of tourism. If planning for tourist activity is conducted without a preliminary appraisal of the park's carrying capacity in this respect, including detailed inventories of the flora and fauna inhabiting the park's most unique and attractive ecological communities, the threat posed to the park's biodiversity will increase exponentially. Judging by the growth of tourism in another of the oblast's regional nature parks, Nalychevskiy, there is certainly cause for concern.

Existing protection initiatives

In addition to Bystrinskiy Park itself, there is also a zoological *zakaznik*, Ichinskiy, whose land area comprises 183,400 hectares. Bystrinskiy Park has no financing or staff.

Also, a joint program, "People and the Park—Social and Ecological Priorities," has been initiated by the Kamchatka Institute of Ecology and Nature Use with Cambridge University (U.K.). In the summer of 1998 program participants successfully conducted an expedition to Bystrinskiy Park, "Project Kamchatka '98." The results of the expedition will be published, and will include findings on the administration and regulation of natural resources in the park, prospects for the continued development of the park and its meaning for local residents, an appraisal of local needs and experience in land use planning, and the conclusions of a study on the biodiversity of the park's flora.

Recommended steps

When the park was created, many ideas and suggestions of several scientific organizations were not taken into account; the territory was initially envisioned as a federally administered protected area rather than one having only regional status. The western slope of Ichinskaya Volcano was not included within the park, nor were of the largest hot springs on the peninsula, along the Kirena River. Also ignored were alpine Ayan fir stands. At the same time, a number of areas having been significantly altered by human activity were unjustifiably included in the park. Furthermore, recommendations were ignored to establish a zoning pattern that takes into account both traditional (native) land use considerations and conservation priorities.

At the present time Bystrinskiy Park exists only on paper: zoning issues remain unresolved, and the local population is unaware as to the location of its boundaries. It is urgently necessary to adopt changes to the park's borders so as to incorporate a number of ecologically valuable areas and to acquaint local residents with them.

It is also necessary to devise a solution to the region's socioeconomic problems. An important step toward this goal is to conduct thorough research of the natural characteristics and resource base in the park and for Bystrinskiy raion as a whole. Conditions must be created whereby local and native residents can continue to rely on these resources for subsistence economies.

3. Kronotsky Zapovednik

V.I. Mosolov, Kronotsky Zapovednik

L.I. Rassokhina, Kronotsky Zapovednik

Description of the territory

Kronotsky Zapovednik is located within eastern Kamchatka's Eastern Volcanic Belt, whose influence on the territory's topography, flora and fauna is readily apparent. Here the full diversity of volcanic activity is found—from eleven active volcanoes, to post-caldera formations and a multitude of thermal springs. The Russian Far East's greatest prevalence of glacial alpine landscapes is here as well; glaciers cover 14,000 hectares of the zapovednik's territory, including some of the peninsula's largest. The zapovednik's land area today comprises 1.14 million hectares, including 640,960 that are covered by forest and 43,000 hectares of the Kamchatka River basin.

The zapovednik's lands are home to the full diversity of natural communities typical for the peninsula as a whole: tundra, forest, coastal meadows and associated flora. Forests are dominated by stone birch, Japanese stone pine and Manchurian alder interspersed with large marshes. The zapovednik's fauna is similarly representative of the species typically found on the peninsula.

Because of many years of exploratory mining (from 1940 to 1970) in the center of the zapovednik, protected ecosystems have experienced significant degradation. A long lasting presence of military stations in the area also took its toll on the land, while damage caused by tourism since 1976 is visible as well. The most influential factors affecting these ecosystems' health today include: timber harvesting in the Kamchatka River basin; interbreeding of domesticated reindeer with their wild counterparts, commercial fishing in Kronotsky Bay, including hunting of marine mammals; overuse by tourists, particularly along the well-trod path through the Valley of Geysers; and the construction of a visitor center along this route with a preliminary environmental impact assessment.

Saving Russia's Far Eastern Taiga : Deforestation, Protected Areas, and Forests 'Hotspots'

The zapovednik's flora include 745 vascular plant species, a full representation of the flora found in eastern Kamchatka. 700 of these are found in their natural habitats, 16 are endemic to Kamchatka, and one species is found nowhere else on the peninsula. Thirteen species are listed in the Kamchatka and Russian Far East Red Books. 260 bird species are found in the zapovednik, thirteen of which are listed in the Russian Red Book. Here lives the largest protected population of white-shouldered sea eagle, one of the largest populations of Aleutian tern (*Sterna aleutica*), and the peninsula's most heavily visited wintering grounds of swan. Sixty mammalian species inhabit the zapovednik, including nine cetaceans.

In recent years the role of the protected area in preserving many animal species has become much more important. For example, the peninsula's largest brown bear population inhabits Kronotsky, comprising 15% of all brown bears in Kamchatka; this virtually guarantees the continued health of Kamchatka's bear populations, despite increasing pressures from hunting. Also, up to 90% of the peninsula's caribou population is found within the zapovednik's boundaries, while bighorn sheep populations remain stable and high despite severe declines elsewhere in Kamchatka.

The broadest distributions of Japanese stone pine and Manchurian alder are found along slopes of river valleys and volcanic foothills. In the flatlands, forested meadows of dwarf stone birch are found, accompanied by a diversity of shrubs and grasses. The tundra regions of the zapovednik serve as pastures for caribou and bighorn sheep. Unique grassy meadows serve as the first feeding grounds for brown bear emerging from their winter hibernation, while the larch forests surrounding Kronotsky Lake make prime habitat for sables. The zapovednik also hosts the only known stand of Sakhalin fir (*Abies sachalinensis*).

Despite isolated instances of anthropogenic influences within the zapovednik, on the whole its natural complexes, particularly with respect to flora, have remained intact. This comes as a result of the zapovednik's remoteness from human settlements and the absence of thoroughfares entering the territory.

A number of unique natural objects can be found in the zapovednik that have great scientific, recreational and aesthetic value. The famous Valley of Geysers, for example, is a collection of volcanic phenomena whose scale and localization are highly rare: 20 large geysers, over 200 thermal springs, and a multitude of mud pots, thermal vents and other volcanic formations. The ecosystem in the Valley of the Geysers is unique. The volcanic influence and thermal activity causes changes in vegetative dynamics, affecting in turn the seasonal concentrations of brown bears and bird nesting sites.

Another uncommon spot in the zapovednik is the so-called Valley of Death at the foot of Kikhpinych Volcano. Here, a high concentration of volcanic gases (carbon monoxide, hydrogen sulfide and carbon dioxide), a lack of wind, and an abundance of naturally occurring heavy metals in the upper layers of the soil cause a variety of insects, birds and mammals to perish when they enter the vicinity. Analogous phenomena exist nowhere else in all of Russia.

The zapovednik's Kronotsky Lake basin hosts the only stand of tall conifers in eastern Kamchatka. The canopies of these naturally degrading, relic forests of Cayander's larch are home to a number of communities more typical of dark coniferous taiga. The lake also serves as habitat to a number of remarkable fish species, including two endemic species of char (*Salvelinus*) and freshwater blue-back salmon. Islands in the lake support a number of slaty-backed gull (*Larus schistisagus*) colonies, while large numbers of swan winter at non-freezing portions of the Kronotsky River. Thanks to relatively small quantities of snow in the winter, alpine tundra areas on volcanic foothills serve as winter pastures for many of eastern Kamchatka's caribou. The largest protected population of sables on Kamchatka also inhabits the basin.

Because of the multitude of unique natural objects in the zapovednik resulting from the area's volcanic activity (a total of eleven active volcanoes are found within its boundaries), Kronotsky Zapovednik was included as a UNESCO World Heritage Site in 1996.

In all, a broadening expansion of human activity threatens the preservation of these unique ecosystems, which, once destroyed, can never be regenerated. Budget cuts have caused a significant decline in patrols and staff, and now the zapovednik's borders are virtually unenforced. Poaching has already been noted in the zapovednik, and this is expected only to increase unless the protection regime at the zapovednik is improved.

Existing protection initiatives

From 1979 to 1982 a full inventory of Kronotsky's vascular plants was conducted, while from 1978 to 1984 the zapovednik's mammals and birds were inventoried. From 1982 to 1991 complex research was undertaken on the relationships between predators and ungulates in the zapovednik. Over the last ten years a cadaster of nesting sites for white-shouldered sea eagles has been compiled, and monitoring of its population continues. From 1990 to 1994 a geobotanical inventory was conducted, including a full classification of the territory's flora. The larch forests near Kronotsky Lake were evaluated in 1986, and an appraisal of conditions for rare plant species was carried out in 1990. Winter migrations of ungulates have been monitored annually since 1967, with an enormous amount of valuable data having been accumulated.

Recommended steps

1. Return the zapovednik's protection regime to its earlier strength by increasing available funding;
2. Reconstruct ranger stations;
3. Establish airborne patrols;
4. Hire new ranger staff;
5. Organize an operative team to handle poaching and other illegal activity;
6. Provide adequate patrols of the zapovednik's aquatorium;
7. Plan and create a buffer zone along the zapovednik's southern and western boundaries;
8. Finance monitoring efforts;
9. Increase monitoring at the Valley of Geysers, including careful control of tourist use;
10. Finance environmental education efforts to increase awareness and appreciation of the zapovednik and its mandate.

Jewish Autonomous Region

This summary of Jewish Autonomous Region's protected area system has been written by Vasily V. Gorobeiko of the JAO Committee on Ecology. Mr. Gorobeiko has also written the overview of the forest hotspots of JAO that follow this section.

THE EXISTING PROTECTED-AREA SYSTEM

The Decree # 1155 of the President of the Russian Federation dated October 2, 1992 and entitled: "On Specially Protected Nature Territories of the Russian Federation" established the preservation and development of a system of specially protected nature territories (SPNT) as one of the top-priority objectives of federal environmental policy.

The federal law "On Specially Protected Nature Territories" puts these specially protected territories in the category of national property. In accordance with the Federal law "On Specially Protected Nature Territories of the Russian Federation" (p. 2, para. 6) such territories may have federal, regional or local significance.

At present, there exist on the territory of the Jewish Autonomous Oblast' the zapovednik "Bastak", a dendrological park under the Oblast' administration, four zakazniki, and one forest zakaznik on the Oblast' level with a total area of 354,000 ha. There are also 18 natural monuments. Of these, eight had been established by the Khabarovsk Kraiispolkom resolutions # 208 and #472 of 3/26/66 and 8/27/80, respectively. Three were established by the resolutions of the Oktyabrskiy and Obluchenskiy Raion executive committees and, correspondingly, do not have a definite status on the territory of the Oblast'.

Despite the large area of the territories with special-protection status (9.8% of the Oblast's' territory), one can not state that there exists in the Oblast' a system of protected nature territories, for the following reasons. There is no hierarchical structure of SPNTs; the protected natural landscapes are similar to one another (only four natural monuments are located on the Central Amur low lands, while all of the other specially protected nature territories are on the spurs of the Malyi Khingan); and numerous natural monuments do not correspond to the criteria in the Federal SPNT law.

The creation of such a system is essential to the preservation of biological diversity and the unique natural systems in the Oblast'.

Given today's crisis in the economy and the mounting pressure from poaching activities, the zakazniki are in an extremely difficult situation and incapable of fulfilling their function of protecting nature. Moreover, despite the impressive quantity of their territory, they are all situated on the peripheral mountain massifs of the Malyi Khingan, whereas territories that are particularly important to preserve (central areas of the Khingan mountain massif, and wetlands and marshes) are being actively exploited.

Of the 18 nature monuments established in the JAO only 5 report to the Oblast', while the others, in violation of the existing laws, are under the jurisdiction of the krai and the raioni. According to Article 26 of the law of the Russian Federation "On Specially Protected Nature Territories of the Russian Federation", declaring a natural object a natural monument requires placing it under protection, processing of custodial obligation papers, certification and preparation of other documents stipulated by the legislature of the Russian Federation and the regulations of the Russian Ministry of Nature. This procedure had been complied with in the cases of only two new natural monuments that had been established under the Decree # 326 on 11/6/94 by the Head of the Oblast' Administration. A number of sites that had earlier been declared natural monuments had lost their nature-protecting value, while no less than 50 natural and cultural elements need to be given natural monument status.

Thus, the network of specially protected natural territories that developed in the Jewish Autonomous Oblast' is not a single unified system nor does it fully perform its nature-conserving and recreational functions; it does not ensure the preservation of the region's biological diversity and its unique natural and cultural systems. In this connection, in 1996, the Goskomekologia [State Ecology Committee] of the JAO, together with the oblast' economic administration and the Comprehensive Analysis Institute for regional problems of the [DVO] of the RAN (Russian Academy of Science) developed and started the implementation of a program for the establishment of a system of specially protected natural territories.

In this context, the protective service for the state nature preserve "Bastak" was implemented in 1998. The forest zakaznik "Dichun", the first such entity in the Far East, was established, and the principal tracts of the indigenous mixed forests were placed under protection. Justification for the creation of the nature park "Kul'dur" was documented, and certification of eight new nature monuments is being readied. In 1999, design work was started for the zakaznik "Zabelovskiy"; state protection will be extended to the Central Amur lowlands - the most important sector in terms of biodiversity preservation - and to numerous Amur River channels that are valuable in local fisheries.

In the year 2000-2002 time frame, the establishment of the system of specially protected nature territories is expected to be completed by establishing yet another large reservation in the Pompeyevka River basin and by modifying the boundaries of the zakaznik "Zhuravlinyi" so as to include the remnants of the undisturbed portions of the Daur steppes into the protected territory. Further plans to improve the system include expanding the network of the nature monuments and establishing protected sectors in areas where rare and disappearing plant species are concentrated.

The primary factors that inhibit the growth of the system of specially protected nature territories are the lack of funds (more than 50% of the Oblast's budget is subsidized by the federal government) and the lack of administrative cohesion among the nature-protecting agencies. Currently, the State Nature Preserve is in the jurisdiction of the Goskomekologia [State Ecology Committee] of the Russian Federation, four preserves are administered by the Oblast's department of hunting, another zakaznik and the dendrologic park are under the Department of Forests, and the administrative responsibility for most of the other nature monuments is undefined.

At present, the Oblast' administration is taking certain steps to overcome the administrative lack of cohesion among the nature protection departments. Thus, a new law "On Specially Protected Nature Territories" was adopted, an Interdepartmental Commission for the improvement of the system for specially protected nature territories has been established as was an operational group for the protection of the biological diversity of the Oblast'.

In accordance with the February 1999 JAO Law "On Specially Protected Nature Territories", 5% of the proceeds received by the Oblast' for the mining of minerals will be directed toward the financing of these territories, however, implementing the actual protection function of the territories will not be possible without external investments.

Zapovedniks

"Bastak" zapovednik

The 91,038 ha State Nature Preserve "Bastak", the first such entity in the Jewish Autonomous Oblast', was established by the government of the Russian Federation (Decree # 96, January 28, 1997) within the boundaries of the Razdolnenskiy forestry unit of the Birobidzhan forest industry. The territory of the

preserve is situated on the southeast slopes of the Bureinskiy Range, with the highest point of 1,200 m being near its northern boundary. It is here that the rivers Bastak, Sorenak, Kirga, Ikura, In, and others originate. The preserve plays an important role in water and soil protection, natural resources conservation and in the protection of nature in general. The staff of the preserve consists of seven people. Their tasks include the organization of the protection of the preserve territory, the conduct of scientific and research work, as well as ecological and educational activities.

About 90% of the territory are covered with forests. These consist of mixed and fir-spruce forests with elements of arrowwood and birch in the northern part. In the southeast there are white birch and larch, goosefoot, and brush. About 900 species of vascular plants are found here. Many of them rare and in need of protection: four-facet water lily, water chestnut, Japanese dioscorea, inversely egg-shaped peony, tall spignet, large-blossom ladies' slipper, and others. The flora of the preserve is the green lung of Birobidzhan. The fauna includes both common and rare species. Mammals are represented by wild boar, musk deer, bison, deer, moose, Far East cat, lynx, otter, American mink, sable, badger, brown and Himalayan bear, fox, raccoon dog, and others.) Particularly valuable are the black crane, with nesting grounds in the valleys of the rivers Kirga, Malyi Sorenak, and Bastak, and the Far East stork, whose nesting grounds had been observed in the basin of Glinyanka River, and the fish owl that may still live in the basin of the Bastak River.

In the future, the preserve should become an outstanding natural laboratory and a scientific base where the biology and ecology of valuable and rare species of plants and animals is not only protected but also comprehensively studied together with the processes occurring in natural ecosystems. It should also become a center of environmental education.

Zakazniks

In the Oblast', there are four Oblast' level nature zakazniki and one oblast' level forest reserve. Altogether, the area covers 263,000 ha, which represents about 7% of the oblast' territory (see table).

	Name	Date Established	Area (1,000 ha)	Location
1	Zhuravlinyi	10-20-88	40.5	Oktyabrskiy Raion
2	Churki	9-24-82	85	Birobidzhan and Leninskiy Raions
3	Ul'dury	12-7-63	28	Birobidzhan Raion
4	Shukhi-Poktoy	12-7-63	60	Birobidzhan & Obluchenskiy Raions
5	Dichun	12-16-98	49.5	Obluchenskiy Raion

The integrated zakazniki are administered and funded by the Hunting Department of the JAO. A staff of ten rangers is stipulated by the regulations, two per each reserve. In 1998, the entire workload was carried by eight rangers, with two of the reserves – “Ul'dury” and “Churki”- without any service vehicles.

Salvage and preventive felling of trees are conducted in the reserves, as is mowing of hay and grazing of cattle. More than 20 apiaries are situated on their territories, some of which have been privatized. All of this leads to the depletion of flora, damage to the foraging base of the wildlife. As the disturbance level is elevated, the fauna of the region is depleted as well.

The recently established reserve “Dichun” is under the jurisdiction of the forestry administration of the oblast'. The functions of administering the reserve have been relegated to the Obluchenskiy Forestry Leskhoz.

Nature monuments

In the JAO, 18 natural sites of scientific, historical, aesthetic and environmentally-cultural significance have been designated as nature monuments (see Table).

	Name of monument	Status	When founded	Area (ha)	Raion
1	Peshchera Ledynaya	Geol.	4-26-79	12.5	Oktyabrskiy
2	Peshchera Koridornaya	Geol.	8-27-80	12.5	Oktyabrskiy
3	Peshchera Glubokaya	Geol.	8-27-80	12.5	Obluchenskiy
4	Peshchera Peschanaya	Geol.	8-27-80	12.5	Obluchenskiy
5	Peshchera Saryi Medved	Geol.	9-12-85	12.5	Obluchenskiy
6	Peshchera Spartak	Geol.	9-12-85	12.5	Obluchenskiy
7	Peshchera Sankina	Geol.	9-12-85	12.5	Obluchenskiy
8	Peshchera Bannaya	Geol.	9-12-85	12.5	Obluchenskiy
9	Peshchera Kabanya Lovushka	Geol.	9-12-85	12.5	Oktyabrskiy
10	Mineral'nyi istochnik Verkhnetulovchikhinskiy	Water	6-13-79	-	Oktyabrskiy
11	Mineral'nyi istochnik Nizhnetulovchikhinskiy	Water	6-13-79	-	Oktyabrskiy
12	Mineral'nyi istochnik Starikovskiy	Water	6-13-79	-	Oktyabrskiy
13	Lotus brush	Botan.	3-26-66	-	Birobidzhan.
14	Lotus Lake	Botan.	4-6-82	-	Smidovichsk.
15	Duck Lake	Botan.	11-16-94	1,825.0	Oktyabrskiy
16	Relictual pine stand	Botan.	11-18-82	108.0	Obluchenskiy
17	Wrinkle-leaved rose brush	Botan.	7-18-83	-	Obluchenskiy
18	Cherepashiy Bay	Zool.	11-16-94	61.0	Leninskiy

Nature Parks

In accordance with the Program for the "Development of a System of Specially Protected Nature Territories of the Jewish Autonomous Oblast' for the Period up to 2005", a draft was prepared for the establishment in the Obluchenskiy Raion of the nature park, "Kul'dur", with a total area of 36,700 ha.

Forest Hotspots

Vasily V. Gorobeiko,
JAO Committee on Ecology

Hotspots: **1 . Pompeyevka River Basin**
 2 . Kul'dur Nature Park

1. Pompeyevka River Basin

Description of the territory

The Pompeyevka River basin includes the southwestern foothills of the Lesser Khingan range, covering about 40,000 hectares with a vertical rise from 73 to 912 meters. The Pompeyevka River is a 71-kilometer tributary on the left bank of the Amur River, descending from the hills and broadening to a width of three kilometers as it forms a marsh near its mouth. The basin is covered by a variety of forest types: spruce/fir interspersed with Korean pine (*Pinus koraiensis*), larch and linden in the headwaters, Korean pine/broadleaf forests mixed with small-leaved species in the middle reaches, and stands of oak and common birch (*Betula verrucosa*) in the lower reaches. Until 1996 the territory was part of the timber stands used by Birakanskiy lespromkhoz, but with the liquidation of the enterprise logging has now ceased.

Much of the Pompeyevka basin was logged over the last sixty years, degrading the climax forests of Mongolian oak (*Quercus mongolica*), Korean pine and broadleaf species and, in turn, the fauna that depended on them. By the mid-1970's local populations of Amur tiger (*Panthera tigris amurensis*) and long-tailed goral (*Naemorhaedus goral caudatus*) were completely annihilated. At the same time, forest massifs that are particularly valuable for species diversity in the headwaters remain relatively intact. But because these forests are mature and overmature, and their coniferous trees represent a valuable timber reserve, there is a substantial threat that foreign timber enterprises (and, once the economy stabilizes, local enterprises) will strive to obtain permission to log these forests. Adding to the problem, placer gold deposits are known to exist in the river basin, with an estimated yield of 200 kilograms. Placer mining is already underway in the Berezovaya River basin, which empties into the Amur seven kilometers downstream from Pompeyevka's mouth.

Even though the area's tiger and goral populations have disappeared, the biodiversity value of the Pompeyevka basin remains considerable. The headwaters host a number of endemic species, and form the westernmost spawning grounds for autumn chum salmon (*Oncorhynchus keta*) runs. Red-breasted mergansers (*Mergus serrator*), Mandarin ducks (*Aix galericulata*), eagle owls (*Bubo bubo*), ospreys and golden eagles (*Aquila chrysaëtus*) nest in the river's flood plain, which also serves as a feeding ground and resting area for numerous migratory waterfowl.

Existing protection initiatives

There have been no past measures to protect this area, nor have in-depth studies been conducted. A forest inventory was last conducted in 1986, while in the 1970's a group of Moscow State University ornithologists under the direction of S.M. Smirenskiy conducted research on the area's waterfowl. Unfortunately, none of these materials have been published, nor have the results of a botanical study led by V.A. Nedoluzhko in 1996.

Recommended steps

In accordance with a resolution by a scientific conference in June 1996 “On the development of a system of protected areas in JAO,” the Pompeyevka basin is recommended for creation of a federal zakaznik. Studies must be conducted to determine the most appropriate boundaries and protection regime for this zakaznik.

2. *Kul'dur Nature Park*

Description of the territory

Kul'dur Nature Park is located in the northwest part of the oblast on the southern slope of the Lesser Khingan range, with mountains and hills ranging in elevation from 280 to 1001 meters. The territory includes the upper Kuldur River basin down to its confluence with the Karadub and Karagai Rivers. The town of Kuldur is located within the park's boundaries, five resort complexes, a metal beam factory and a railway station, Brusit. The park covers 36,700 hectares, of which 35,300 are covered by forest. Wetlands and marshes cover less than 3% of the territory.

The vegetation is characterized by a diversity of communities: dark coniferous forests, larch forests with dwarf Arctic birch (*Betula nana*) and shrubs, spruce/fir forests with Korean pine, Korean pine/broadleaf forests in the south, birch/aspen communities, willows and alder, and also grassy meadows and mossy swamps. In the vicinity of the town of Kuldur one finds the border between the boreal and East Asian biomes, and associated high species diversity: Japanese yam (*Dioscorea japonica*), iris, Daurian lily (*Lilium dahuricum*), Siberian ginseng (*Eleutherococcus senticosus*), shrubby cinquefoil (*Potentilla fruticosa*) and twenty more Red Book species.

The park's fauna is also diverse, with four zoogeographical types represented. Boreal species include brown bear, waxwing, three-toed woodpecker (*Picoides tridactylus*), viviparous lizard (*Lacerta vivipara*), Siberian newts, burbot (*Lota lota*), swallowtail (*Papilio machaon*) and others. Mountain areas are inhabited by Angara-type species such as ermine (*Mustela erminea*), red vole (*Clethrionomys rutilus*), Siberian jay (*Perisoreus infaustus*), willow tit (*Parus atricapillus*), and also Okhotsk-Kamchatka species like musk deer (*Moschus moschiferus*), sable, nutcracker (*Nucifraga caryocatactes*), crossbill (*Loxia curvirostra*) and pine bunting (*Emberiza leucocephala*). At the same time, Amur-type fauna can be found in the valley broadleaf forests: Himalayan black bear (*Solenarctos thibetanus*), yellow-throated marten, Ussurian wild boar (*Sus scrofa ussuricus*), Manchurian wapiti (*Cervus elaphus xanthopygus*), Manchurian hare (*Lepus brachyurus mandschuricus*) raccoon-dog (*Nyctereutes procyonoides*), Eastern blue magpie (*Cyanopica cyanica*), Amur chicken-snake (*Elaphe schrenki*), Amur grayling (*Thymallus dahuricus*) and others. The intermingling of these four zoogeographical zones creates an unusually high diversity of species with rather low numbers of each one. The territory also includes thermal hot springs.

At the present time the Kuldur area is threatened by mining, forest fires, poaching and industrial wastes. Fish resources decline considerably as a result of these concerns, as well as quantities of game species. Because of fires and unregulated tourism soil quality has diminished considerably near resort areas.

The area's mineral resources are well-studied, but the ecosystems have been studied very little. Preliminary research has been undertaken by staff of the Birobidzhan Botanical Gardens (FEBRAS) in the watershed.

Existing protection initiatives

The Oblast Committee on Ecology, in cooperation with the Regional Forest Service and WWF, are working on having the area designated as a nature park. A resolution of the oblast's governor in May 1998 allocated land for the park.

Recommended measure

The development of well-organized tourism will not only improve the region's economy, but will also allow for a lightening of other anthropogenic loads on the most valuable ecosystems. This could allow for a reorientation away from mining.

Part II: REGION BY REGION STUDIES: Kamchatka Region