

Bikin River Valley
Potential World Heritage Property
(Extension of the Central Sikhote-Alin, Russian Federation)



LOCATION OF THE BIKIN RIVER VALLEY
ON THE MAP OF RUSSIA

0 km 276 550 825 km

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Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.

**UNESCO Convention concerning the Protection
of the World Cultural and Natural Heritage**

Introduction

For the first time, the Bikin River Valley was nominated to become a World Heritage site in late 1990s as a part of the serial property Central Sikhote-Alin. However, in 2001 only the Sikhote-Alinsky Reserve and Goraliy Sanctuary were inscribed on the World Heritage List. Inscription of the Bikin River Valley on the List was postponed by the decision of the 25th session of the World Heritage Committee (Helsinki, 12.2001) with the requirement to improve management of the Bikin River protected areas with the full involvement of indigenous small-numbered peoples in this process.

In 2015, in the upper and middle reaches of the Bikin River, a specially protected natural territory of the federal significance was created – Bikin National Park (IUCN category II), which has solved the issue of the united management of all the nominated area. Performance of the traditional economic activities by the indigenous small-numbered peoples of the Russian Far East – Udeges and Nanais – has been ensured in 2/3 of the National Park's territory. A Council of the Indigenous Small-Numbered Peoples, which guarantees their participation in preparing and taking managerial decisions by the Park management, has been organized at the Bikin National Park. The General Meeting of the indigenous peoples who conduct their traditional economic activities in the Park's territory, has adopted the Regulations on the Council, elected the Council members and the President, whose position is the position of the Park's Deputy Director for ensuring the traditional use of the nature.

Also, in order to improve the physical linkages between the Bikin River valley and the Sikhote-Alinsky Reserve, in 2007 the Udegeyskaya Legenda National Park was organized. Documents for the creation of a protective zone that would join the Udegeyskaya Legenda National Park with the Sikhote-Alinsky Reserve were prepared. A protective zone is being formed around the Bikin National Park, including an adjacent part of the territory of Khabarovsk Krai.

Thus, the obstacles to the renomination of the Bikin River Valley were removed. And in 2016 – 2017, the Natural Heritage Protection Fund, Institute of Geography of the Russian Academy of Sciences and Far-Eastern Branch of the RAS, and D.V. Likhachev Institute of the Natural and Cultural Heritage with the financial support of the Amur Branch of



Ussuri taiga massif in the Bikin River valley. Photo by V. Solkin

WWF Russia prepared the Bikin River Valley nomination, the key sections of which are presented herein.

The nominee National Park Bikin, about 1.2 million ha in area, occupies the middle and upper parts of the Bikin River's drainage basin (the basin of the Sea of Okhotsk). The site is located in the south of Russia's Far East, in Primorye Krai, in the central part of the Sikhote-Alin mountain chain. National Park is located on the western slopes of the Sikhote-Alin, which successfully supplements the main location of the Sikhote-Alinsky Reserve on the opposite, eastern slopes.

The Korean pine-broadleaf complex in the upstream and especially middle stretch of the River Bikin is in fact the sole East-Asian (consequently, the world's one) such a large, well-conserved, and integral tract of Ussuriyskaya taiga, which was very widespread in this geographical region with monsoon climate and mountainous relief, between the Ussuri River and the coast of the Sea of Japan, in the old days.

Compactly represented in the Bikin's basin, the broadleaf and Korean pine-broadleaf forests (with a total area exceeding 800 th. ha) are actually full analogs of Eurasia's pre-glacial temperate forests, but such ecosystems have almost completely transformed or disappeared entirely on the rest of the territory. It is the sole large basin where trees have never been felled, and that is why it is only this site that can give the idea about how Ussuriyskaya taiga looked like till the mid 19th century.

As a variety of East-Asian broadleaf and mixed forests, Ussuriyskaya taiga may be well recognized as a leader by the biodiversity degree; these tracts are among the richest and the most original forest types by the species composition in the whole Northern Hemisphere.

The synthetic character of the flora and fauna of the territory under research is of a great importance: taiga fauna along with Okhotsk-Kamchatka flora representatives, on the one hand, combine with southern, Manchurian species.

The forests in the Bikin basin are inhabited by the autochthons of the Bikin River basin – the Bikin group of the Udege and Nanai people. Life activities of these peoples are impossible without preserving the taiga.

Along with the Sikhote-Alinsky Reserve already inscribed on the UNESCO List, the Bikin River Valley is a key dwelling place of the Amur tiger (*Panthera tigris altaica*). It is here that by the mid last century one of the last breeding grounds of the Amur tiger had been conserved, thanks to which this unique cat managed to renew its habitation area in Russia. By now in the Bikin River Valley about 40 tigers have been recorded, which make up approximately 10% of the total sub-species number.

The Amur tiger population can be characterized as quite problem-free at the Bikin. The tiger is especially attached to the broadleaf and Korean pine-broadleaf tracts in the middle part of the Bikin River, but the animal is more and more often noted near its upstream stretch, too.

Along with other Russian reserves of this region, the National Park Bikin will become an essential element of the united 'tigers' econet' formed now in the south of Russia's Far East.

Moreover, the nominee territory is inhabited by some other rare and vanishing animal and plant species, which also meets criterion (x). For example, the IUCN Red List includes 2 species of vascular plants and 5 vertebrate animal species (*Panthera tigris altaica*, *Grus monachus*, *Mergus squamatus*, *Ketupa blakistoni*, and *Haliaeetus albicilla*).

The nominated area is a key habitat of the Amur tiger and other rare species. The creation of a World Heritage site in the territory of the Central Sikhote-Alin within the Central Sikhote-Alin nomination will favor the successful preservation of the Amur tiger population and the conservation, in its natural state, of the largest unparted area of Korean pine-broadleaf forests, which is a habitat of many endemic, rare and endangered species of plants and animals.

Russia is currently represented on the World Heritage List by 17 cultural and 11 natural properties. Russia's natural World Heritage properties are the Virgin Komi Forests, Lake Baikal, the Volcanoes of Kamchatka, the Golden Mountains of Altai, Western Caucasus, Central Sikhote-Alin, the Uvs Nuur Basin, the Natural System of Wrangel Island Reserve, the Putorana Plateau, the Lena Pillars Nature Park, and the Landscapes of Dauria. Untouched by economic activities and significant in size, these properties of the world natural heritage represent valuable and important strategic natural reserve of humankind.

Thirty-four of Russia's specially protected nature areas, among which 13 are nature reserves and five are national parks, have World Heritage status. The total area of Russian Natural World Heritage Properties comprises more than 24 million ha. Two of Russia's natural properties, Lake Baikal and the Volcanoes of Kamchatka, are ranked in the top 10 largest properties worldwide, they are included in the World Heritage List according to all natural criteria requirements. Work is currently being carried out to present more of Russia's natural sites for inclusion in the World Heritage List. The Magadan Nature Reserve, the Commander Islands, the Krasnoyarsk Pillars, the Great Vasyugan Mire, the Il'men Mountains, Bashkir Ural, Testament of Kenozero Lake, and the Oglakhty Range are all included on the Russian Federation's Tentative List.

Without doubt, Russia possesses wealth of unique natural complexes untouched by economic activity of man (an important factor to note). Scientists have assessed that the country houses over 20 territories worthy of holding a status of World Heritage properties. The Lena River delta, Volga River delta, Kuril Islands, Western Sayan, and Central Siberian Reserve are among the promising areas. Such transboundary drafts as the Golden Mountains of Altai (Russian Federation – Kazakhstan – China – Mongolia), the Green Belt of Fennoscandia (Russian Federation – Norway – Finland), Beringia (Russian Federation – USA), and the Great Rift Lakes are also interesting.

Bikin River Valley
(Extension of the Central Sikhote-Alin World Heritage Property (766))



Bikin River valley. Photo by A. Khitrov

Nomination

BIKIN RIVER VALLEY
(Extension of the Central Sikhote-
Alin World Heritage Property (766))

THE RUSSIAN FEDERATION

Proposals for Inscription
on the UNESCO Cultural
and Natural World Heritage List

Prepared by:

- The Natural Heritage Protection Fund
- Institute of Geography of the Russian Academy of Sciences
- Pacific Institute of Geography of the Far Eastern Division of the Russian Academy of Sciences
- Bureau for Regional Outreach Campaigns (BROC), Vladivostok
- Russian Scientific and Research Institute for Cultural and Natural Heritage named after D.S. Likhachev

Supported by:

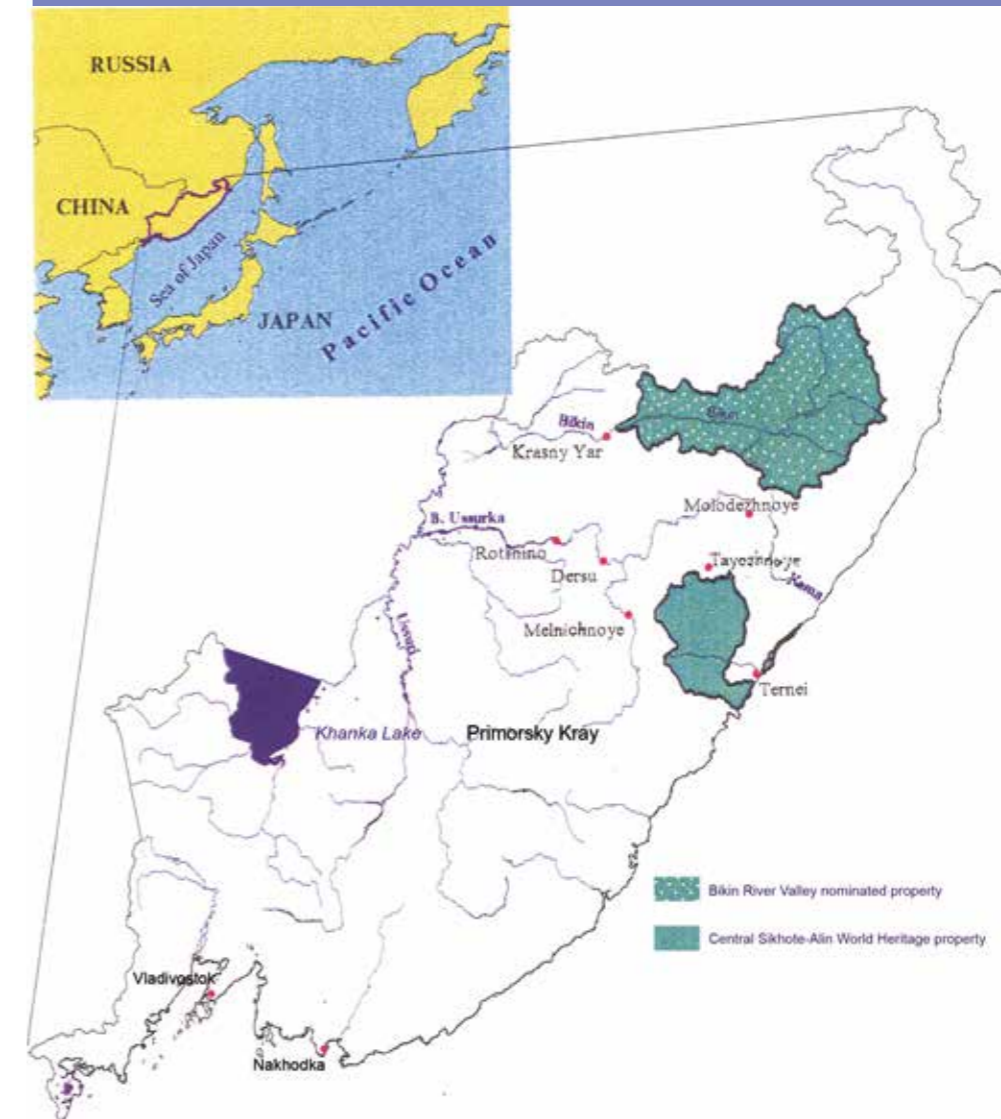
- Amur branch of WWF-Russia

2017

1. Identification of the property

1a. Country (and State Party if different)	Russian Federation
1b. State, Province or Region	Primorsky Krai, Pozharsky District
1c. Name of Property	Bikin River Valley (extension of the Central Sikhote-Alin World Heritage property (766))
1d. Geographical coordinates to the nearest second	<p>Nominated as extension of the Central Sikhote-Alin property, the territory occupies the basin of Bikin River's upper and middle reaches and is limited by following geographical coordinates:</p> <p>The northernmost point is 47° 17' 30" N, 137° 05' 45" E The southernmost point is 46° 05' 35" N, 137° 03' 13" E The westernmost point is 46° 40' 35" N, 135° 27' 35" E The easternmost point is 46° 41' 10" N, 137° 51' 10" E Coordinates of the Central Point: 46° 41' 00" N, 136° 39' 40" E</p>
1e. Maps and plans showing the boundaries of the nominated property and buffer zone	<p>A1. Location of the nominated property on a map of Primorsky Krai. A2. A map of the north of Primorsky Krai showing the boundaries of the nominated property Bikin River Valley and the Central Sikhote-Alin World Heritage property (rolled and to be found separately from the text). A3. A map of the specially protected areas of the north of Primorsky Krai. A4. A topographic map, showing the boundaries of the nominated property Bikin River Valley and buffer zone. The scale is 1:250 000 (rolled and to be found separately from the text).</p>

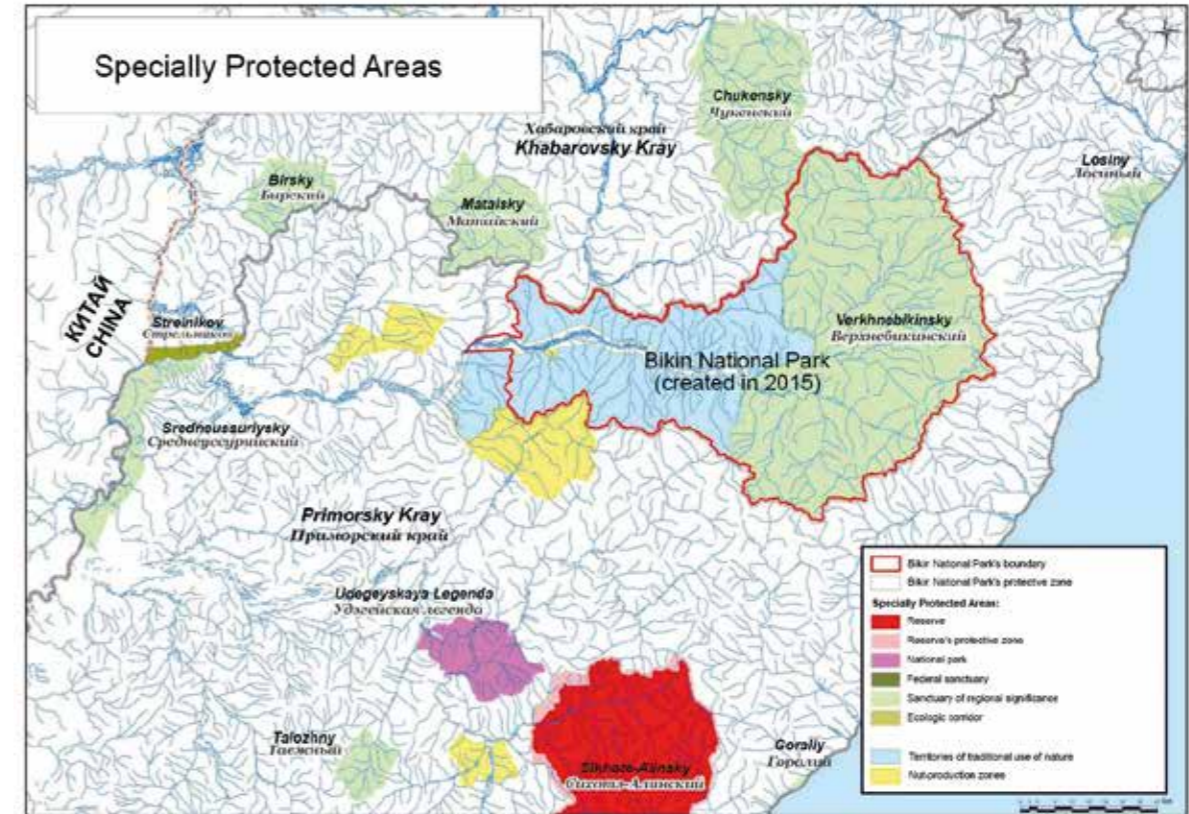
A1. Location of the nominated property on a map of Primorsky Krai.



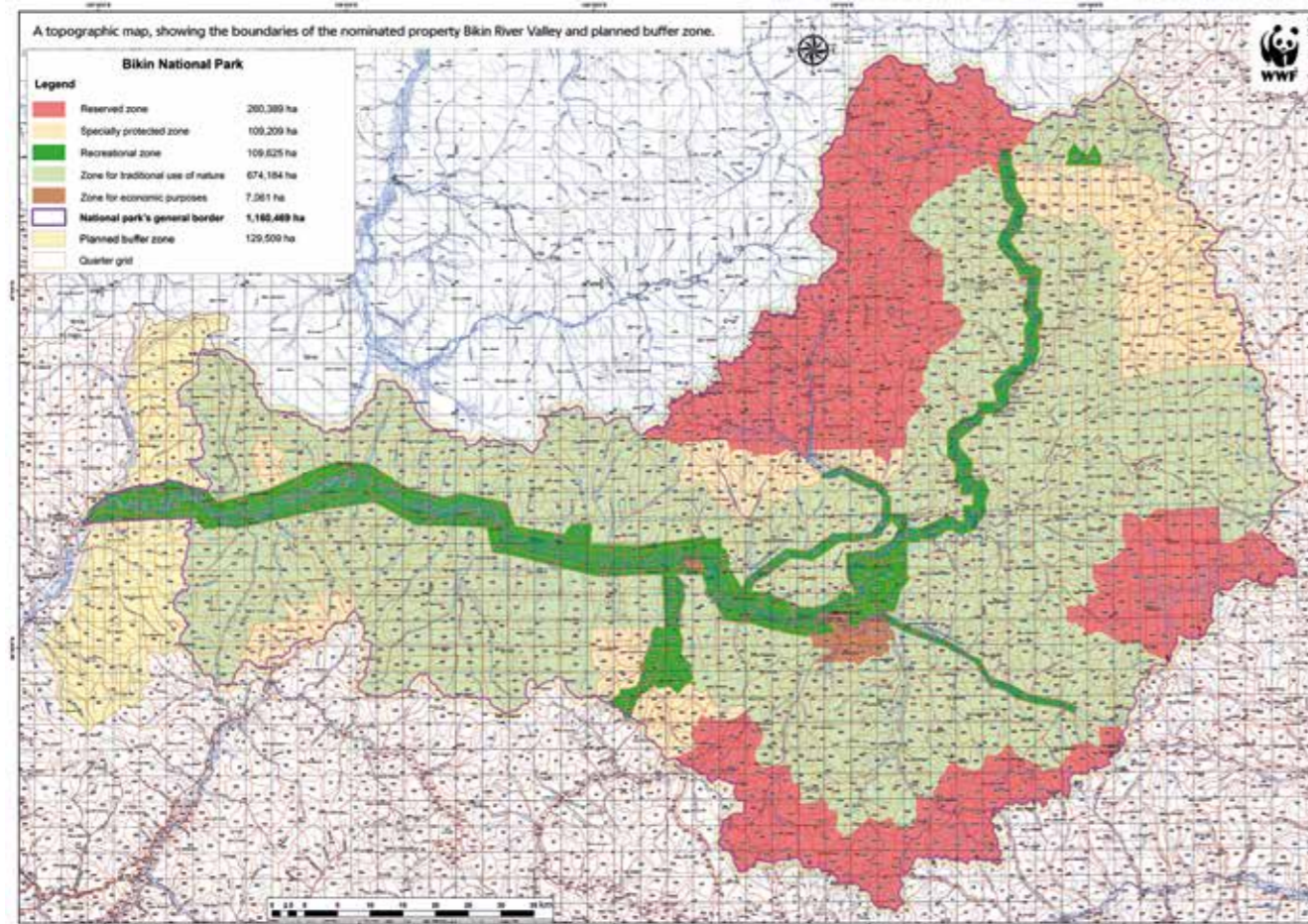
A2. A map of the north of Primorsky Krai showing the boundaries of the nominated property Bikin River Valley and the Central Sikhote-Alin World Heritage property.



A3. A map of the specially protected areas of the north of Primorsky Krai.



A4. A topographic map, showing the boundaries of the nominated property Bikin River Valley and planned buffer zone.



1f. Area of nominated property (ha.) and proposed buffer zone (ha.)

The total area of the nominated territory within the boundaries of the state nature Bikin National Park amounts to 1,160,469 ha.

The area of the planned buffer zone located along the boundary of the property amounts to 129,509 ha.

The serial nomination table:

Id n°	Name of the component part	Region(s) / District(s)	Area of Nominated component of the Property (ha)	Area of the planned Buffer Zone (ha)	Map N°
001	Sikhote-Alin Nature Reserve (WH property 766)	Primorsky Kray, Terney District	401,600	67,660	A1, A2, A3
002	Goralij Zoological Preserve (WH property 766)	Primorsky Kray, Terney District	4,749	-	A1, A2
003	Bikin River Valley (nominated property)	Primorsky Kray, Pozharsky District	1,160,469	129,509	A1, A2, A3, A4
Total area (in hectares)			1,566,819 ha	197,169 ha	

2. Description

2a. Description of Property

THE NOMINATED TERRITORY IS LOCATED 80-100 KM TO THE NORTH FROM THE Central Sikhote-Alin World Heritage site. As the main cluster (the Sikhote-Alin State Reserve), it belongs to the Amur-Primorye physiographic country. However, while the Sikhote-Alin State Reserve covers mainly the eastern macroslope of Central Sikhote-Alin, the nominated territory is located on its western macroslope, harmonically supplementing the already recognized outstanding universal value of the World Heritage site. The nominated specially protected natural territory, Bikin National Park, occupies the upper and middle part of the Bikin River basin located in the north of Primorsky Krai.

PHYSIOGRAPHIC DESCRIPTION

General Characteristic of the Basin

Bikin River is one of the main right-bank tributaries of the Ussuri River, which drainage basin boundaries are in line with administrative boundaries of Pozharsky District (see Annex A4). The total length of the River 560 km, basin area – 22.3 thousand km². The upper and middle parts of the basin are located in the mountains of the Sikhote-Alin between N 45° and 47° and E 136° and 138°. In comparison with other regions of Russia, the area has a unique landscape and biogeographical characteristics and a high density of rare and endangered species. Here one can meet reproductive core of northern subpopulation of the Amur tiger (*Panthera tigris altaica*), as well as another 51 species of mammals, there is a high density of hunting animals, caused by inviolate habitats, bulk nesting of the scaly-sided merganser population (*Mergus squamatus*), fish-owl (*Ketupa blakistoni*) and another 169 species of birds, 7 species of amphibians and 10 species of reptiles occur. Ichthyofauna composite is characterized by 48 species. The most remote salmon spawning area of Ussuri River basin is located in the

Bikin River basin. The last major primary forestland of cedar-broadleaved, 5 sites of reference gene pool of typical woody species, and habitats of rare and endangered species of vascular plants are being conserved here.

Substantial part of the Middle and Upper Bikin is occupied by so-called Verkhnebikinskaya intermontane depression, remaining area is occupied by medium-height mountains, and part adjacent to the main watershed is occupied by one of the most extensive table land in Sikhote-Alin. The main right-bank tributaries – Alchan, Takhalo, Klyuchevaya; left-bank – Kilou, Zeva and Svetlovodnaya. The mean water discharge at the Zvenievaya station – 247 m³/sec.

GEOLOGY

The area of the Upper and partly Middle Bikin relates to the Sikhote-Alin region of the Mesozoic orogenesis. At the base of the stratigraphic column of the lower infolded complex terrigenous-siliceous or volcanic-siliceous sediments of Triassic-voronsky age lies, fixed on the westernmost margin of the area in the middle flow of Bikin River. In the rest area they barred by Lower Cretaceous deposits more than 7000 m thick. Patches of rhythmically alternating sandstones and siltstones are dominated among sedimentary rocks. After occurrence of the granitoid magmatism at the end of the Lower Cretaceous, the territory has become a mountain orogen with positive trend to the ascendant movements until the present time.

Superimposed structures, arising during the Upper Cretaceous postfolded stage of development, are associated with the formation of the East Sikhote-Alin volcanic belt. Volcanostructures of this zone are located along the main divide of the Sikhote-Alin and westward of it and represented by the volcanic-tectonic depressions and calderas, which are filled with lava and tuffs mainly acid composition. Many of



Bikin River valley view in the middle reaches. Photo by A. Butorin

them are accompanied by dome-shaped uplifts and intrusions of Late Cretaceous granites in cores of these structures. The last ones recorded in recent relief by the steep peaks with the highest elevations.

Cenozoic superimposed structures were formed as a result of autonomous activation that has gripped the area when it joined the regime of platform development. These include single Paleogene-Neogene coal-bearing basins and Neogene basaltic plateau. An example of the coalbearing basin is Verkhnebikinsky fault trough limited by lateral faults and adjacent to the left side of Bikin River valley. It is made of coarsegrained continental deposits with maximum thickness of 2900 m. Occurrence and intensity of the numerous volcanoes in the basin of the Upper Bikin related to the fault trough formation and tectonic movements in Neogene. Ba-

salt lava, effused by these volcanoes, formed volcanic plateau and valley streams, sometimes completely covers the valleys, which led to a partial restructuring of the ancient drainage system, which is only in the late Neogene acquired its modern configuration.

Thus, the main features of the relief were formed by volcanism, neotectonic movements and related erosion. Bottom and lateral river erosion were most intensive in Quaternary and they continue today. Volcanic landforms, particularly the periphery of the basalt plateau, are full of landslides which are increased during the summer-autumn rainfall. Landslide slopes reach tens of kilometers in length with a height of 50-100 m. The largest landslides occur in the valleys of the left upper tributaries of Bikin River which cutting the basalt overlying rocks below its bottom.

RELIEF

In accordance with the geomorphological mapping within the Eastern Zabaikalsky Krai region, six geomorphological zones have been distinguished: northern uplands, the Stanovoe Upland, the Vitim Plateau, the Zabaikalsky middle mountain area, the Khentii-Daurian Mountain area and the Uldza-Torey (East-Mongolian) flatland. The described area lies within the latter region and encompasses the border regions of Russia and Mongolia. In the context of relief structure and its development history, the Uldza-Torey flatland is a unique geomorphological region. In terms of its morphological structure, this area is the northern part of a larger Uldza-Khailar (Dalainor) flatland, an extensive intermountain depression of Gobi type, which is located in the adjacent areas of China, Mongolia and Russia. Its maximum length and width is approximately 600 km. The depression is located between the Zabaikalsky middle-height mountain area to the north and northwest, the Greater Khingan Range to the east and southeast and the Gobi plateau to the west and southwest. The average absolute height of the territory of nominated property and its buffer zone is 600–800 m and decreases down to 595 m at the Barun-Torey shore and 566 m near Huh-Nuur Lake, it increases up to 985 m on the north-east at the Tsagan-Oboo mountain and up to 1045.9 m at the Huh-Ula mountain on the west in Mongolian part. In certain areas the relief comprises hills ridges and uplands with the relative deviations ranging from ten to several hundred meters.

The Uldza-Torey flatland is a well-preserved ancient peneplanation plain with a weathered crust developed in some areas. Among the geomorphological regions, this surface was least affected by Neogene-Quaternary endogenous relief formation processes; the amplitude of neotectonic movements here varies between –100 and +200 m. In general, relative to the neighbouring rapidly uplifting morphostructures, the Uldza-Torey (also known as the Dalainor) flatland is a zone of relative submersion. One of the most significantly lowered plain regions is confined to the Torey lakes and lake Khukh-Nur.

Accumulative alluvial and lacustrine plains, steep slope surfaces and isolated low mountain massifs are the predominant types of the contemporary relief of the territory.

Modern small lakes are numerous. They often form chains according to geomorphologic structures. Traces of ancient and modern lakes are observed. Some lake hollows are narrow and long and reflect the shape of ancient valleys. Most

of lakes are shallow, sloppy, with gentle shores. Khukh Nuur Basin (560 m above sea level), the lowest point of Mongolia is located in this area. Relief forms related to morphodynamic development are easily observed in this area. The coastal plain of Torey lakes consists of three lacustrine terraces: the first one is 20 m high; the second terrace is 35-40 m high and the third one is 50-60 m. Shore ridges located on the floodplain and the first lacustrine terrace above the floodplain are the typical relief form of the described territory. They were formed as the coastal line shifted due to the lake-level fluctuations. The number of ridges can be as high as 19-20 per slope. They can be from 0.5 to 2-3 m high and up to 20-30 m wide.

Granite ribs occur on the tops of some hills even though the hills are gently sloping and their tops are rounded. The uplands with the relative height of 100–150 m occur along the northern shore of lake Zun-Torey. The Kuku-Khodan hill is the highest point at the Russian part of the nomination property.

The relief of the Adon-Chelon massif located in the northern part of the nominated property differs from the rest of the area. Formed by the Late Jurassic granite porphyries, the massif is a combination of deep valleys and high, heavily split rocks of odd shapes. The highest point of the massif, the Tsagan-Obo mountain is 985 m above the sea level.

TERRAIN

Much of the Upper and Middle Bikin territory is occupied by medium-height mountains with elevations up to 1600-1700 m above sea level and mountain plateaus. High-relief terrain is very strong, above the medium and high slope gradients are dominated, valleys shut-in is deep and local differences in elevation are of unusually large for medium-altitude mountains. Valleys slope gradients to 35-40° are often covered with screes, rocky ridges are common on watersheds. Rocky cliffs up to 100-150 m with landslide are often in river valleys, cutting through the basalt plateau, while valleys are in the shape of the canyons. Low gradient slope relief is widespread on the right bank of the Bikin River. Tops and watersheds with relative excess of 300 m have more rounded shapes. Upper parts of stream valleys are V-shaped, which downstream take turns in trapezoidal.

Low-topography is characterized by absolute elevation of 600 m, and the relative excess of 100 m, rarely to 200 m. This type of relief is developed on the rocks which accessible to denudation, and distributed in the frame of the Verkhnebikinsky depression and downstream in the estuarine parts of the Bikin River tributaries. Mountains tend to



Stream-bank erosion. Photo by S. Melnikov



Overslaughts on Bikin River. Photo by S. Melnikov

have gentler slopes with broad flat tops and watersheds; valleys are wide with gradual smooth transitions from the valley to the bottom of the slope. Rivers in the low-topography area often meander, form a set of flow and have well worked out, usually swampy, valleys.

Accumulative type of relief includes an area of Verkhnebikinsky depression, overlapped by Quaternary sediments, and also floodplains and terraces in river valleys. Two floodplains and three terraces are developed in the Middle and Upper Bikin. Low floodplain has height of 0.5-0.8 m and represented by narrow pebbly spits, which constantly flooded during the rains. High floodplain has height of 1.5-2 m and usually swamped, divided by canals and dead channels, filled with water during major floods. First and second terraces have a height 2.5-6 m and 10-12 m above low water line. The first one is of the fill-terrace type of terraces, and the second is often the rock-defended terrace. The surface of the terraces is flat, slightly sloping to the river bed. The width of the terraces from 100 m to 1 km, rarely – up to 3 km (Malaya Svetlovodnaya River). Third terrace is only fixed near confluence of major tributaries of the Bikin River (Takhalo, Svetlovodnaya, etc.). Height above the water's edge 15-30 m, width – up to 500-800 m, often swampy, with a gentle slope to the river bed.

Thus, the total organization of Upper and Middle Bikin surface is one of the factors causing a substantial isolation of the territory and the specificity of natural condi-

tions, determining the need for special approach during organization of an environmental management here.

HYDROGRAPHY AND HYDROLOGICAL CONDITIONS

Creation of modern river valleys arised against the background of general uplift of the area, accompanied by gashing of high watersheds by rivers and catchment of tributaries of another pool. Currently, the greatest height of watersheds ranged from 900 to 1500 m above sea level. The relief is intensely divided by fairly large river valleys and their numerous tributaries. Density of river network is 1.4-1.8 km/km². The depth of dissection reaches 800 m near the major valleys, and usually does not exceed 500 m in the valleys of tributaries.

The highest density of river network occurs in the middle belt of mountains (300-800 m above sea level). Below 300 m and in highland near the watersheds the drainage density decreases. Most of the land area includes basins of I-VI order, where the slope regulation of bulk flow is ocured. The channels of these watercourses have a large drop (0.05- 0.19 m/m); there are frequent rock outcrops and rapids. Thickness of the alluvial deposits in river beds consisting of cobbly and boulder material is small. The width of the valleys does not exceed several tens of meters at a depth of 300-400 m. The length of slopes typically ranges from 200 to 300 m. It's reduced in the eastern part of the basin.

Table 1. The main hydrologic characteristics of the Bikin River.

Characteristic	Okhotnichiy village	Rodnikovoye village	Krasny Yar village
Drainage area, km ²	6 600	9 710	13 100
Yearly water flow rate, m ³ /s: Average long-term Ensured at 97%	95,2 46,4	132 67,4	168 85,7
Maximal freshet rate, m ³ /s: Average long-term Ensured at 1% Ensured at 10%	1830 1120	2340 1430	1090 2770 1820
Minimal rate within a 30-day period, m ³ /s: Summer: Average long-term Ensured at 97% Winter: Average long-term Ensured at 97%	74,4 23,1	106 35	136 46,2 8,7 4,61

Source: (Resources..., 1972)

This area is characterized by the lowest value of hydromorphological coefficient over the Primorsky Krai, which indicates a very low natural regulation of streamflow. Quite a high rate is the total runoff setting at 30-40 mm for 100 meters, and the total value of excess moisture during the growing season – 20-30 mm. This determines the high water content of the river network. For large rivers of Primorsky Krai 4 types of annual distribution of stream flow defined: A – dominated by spring runoff; B – the approximate equality of water content of spring and summer, separated by long (up to two months) phase of low (sometimes low-water) runoff; C – predominance of summer-autumn runoff; D – flood flow pattern expressed throughout the warmer parts of the year with approximately equal distribution by month. Bikin River basin common to B, C and D types (86.4%), which confirms the high water content of the river network of the basin compared with the rest of the Primorsky Krai territory.

Upper and Middle Bikin before gauging section in Krasny Yar village, in 357 km from the source, is characterized by the following: the average slope of the river 3.3%, weight-average – 1.7%, basin area – 13100 km², the average height of catchment 790 m above sea level, wetlands less than 1%, 100% forest cover, plough-land is absent. Annual amplitude of water level fluctuations in the river an average of 2.7 m

and maximum – 3.0 m. The highest and lowest costs for the period of open channels varies by 38 times and respectively is 1540 and 10.4 m³/sec. Average annual runoff module – 13.1 l/s/km², the highest – 19.2, and the lowest – 7.3. Annual layer sink at average – 413 mm, in the years of high water content – up to 628, and in the dry – up to 29 mm; 95% runoff occurs on the warm period. River breakup is usually begins in mid-April. During snowmelt there are two relatively small rise of water, following one after another: in April due to the discharge of meltwater from the low mountains of the basin, and in May – due to the discharge from the upper mountain and due to the first spring rains. In the first half of the summer rainfalls is low and the water level in rivers is substantially reduced. In the second half of the summer due to heavy rains the water level is subject to sharp fluctuations, repeated and rapid rise and a slow decay. The duration of the flood recovery in an average of 8 days, recession – 12, and of the total flood – 20 days.

Table 1 as well as Figures 1 and 2 provide the main hydrologic characteristics of the Bikin River.

The water temperature is gradually increased from spring to midsummer, reaching the maximum value – 17,2° C – in the end of July – early August (with fluctuations from year to year from 13,0 to 20,2° C). The fall in water level arised in September and October. First slush on the rivers mentioned in the beginning of November, freezing in late November. The duration of ice period is 112-157 days, average – 138 days. The ice thickness reaches maximal values (46-114 cm, average – 76 cm) in the first half of March. Some streams and rivers freeze to the bottom. Ice coating events are widespread everywhere. Icefields may extend to tens or hundreds of meters along the channels of watercourses and various parts of the slopes. Minimum river flow is observed in late February – early March.

The dynamics of water turbidity in watercourse and the costs of suspended sediments correspond to the variation in river flow. The values of these parameters increase sharply in April-May, decrease in June-July and increase again in August. Water turbidity and suspended sediments discharge is 5-6 times decrease in autumn, although may remain quite high because of rains in some years. The highest turbidity (190 g/m³) occurs in May-July, the average number of days with the turbidity of more than 50 g/m³ is 13 days and more than 100 g/m³ – 2 days. Annual runoff of sediments averages 10 g/km

Thus, the main features of the hydrography and the hydrological regime of the basin are the following: intense dissection of the territory by the hydrological network; significant

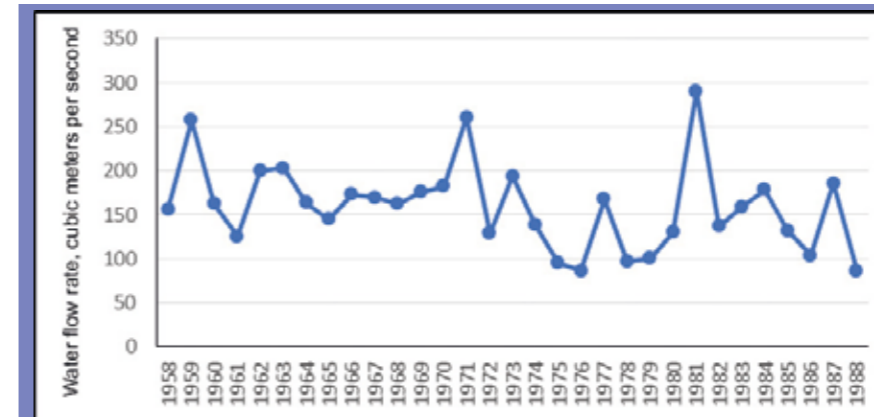


Fig. 1. The average annual water flow rate dynamics, Bikin River – Krasny Yar village.

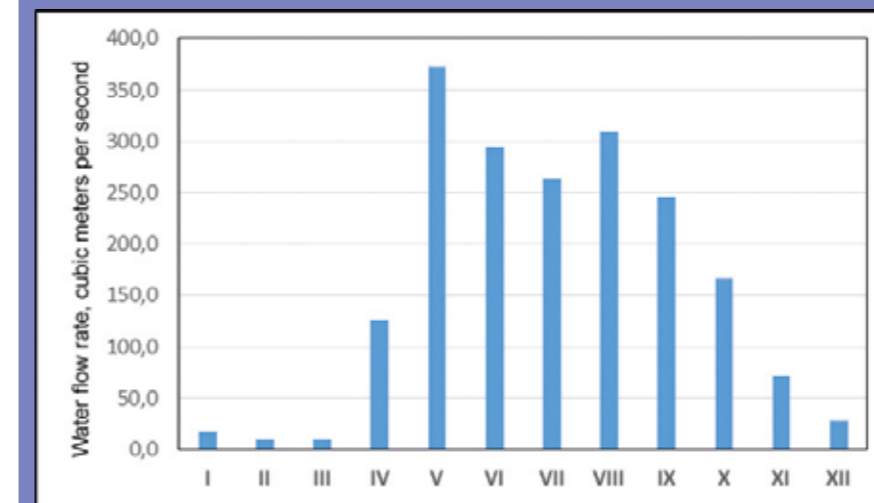


Fig. 2. The runoff distribution in the months within a year, Bikin River – Krasny Yar village.

slope of beds associated with their increased erosion ability; high water content in the streams during the warm season; a large amplitude of daily runoff during the year, and mainly flood regime in summer; the lowest natural regulation of streamflow in comparison with the rest territory of the region; high vertical gradients of the total runoff; the potential for surface runoff and increased of water turbidity even with recent minimal economic impact.

CLIMATE

According to the adopted climatic zonation, the territory located in: 1) temperate climatic zone on the eastern edge of Eurasia (southern subregion of monsoon forest region – according to B.P. Alisov, 1956), 2) Pacific region of the temper-

ate climatic zone (Amuro-Ussuriysky region – according to G.N. Vitvitsky, 1969). Features of the impact of major climate-forming factors and processes – radiation and the circulation, determined the proper formation of continental climate with the characteristics of monsoon. Thus, the winter atmospheric regime is under the influence of the Asian anticyclone, on the general background of «dry» western continental winds and is characterized by cold winters, and summer is characterized by typical cyclonic activity, with domination of southern winds and entrance of moist air masses, with formation of situations of high clouds (Vitvitsky, 1962, 1969). Significant differentiation and climate transformation on individual locations creates by the influence of the relief (the difference in exposure, altitude, ridges barrier role) and vegetation (forested, type, crown density, etc.).

Regional and local climate conditions are characterized on materials of regular observations for 2 representative weather stations: Ulunga (Okhotnichiy village; alt. 763 m) and Gantsanza (Rodnikovaya village; alt. 246 m), located respectively in the upper (eastern) and middle (western) parts of the Bikin River valley. Also sample data from westward (lowest part of the Bikin River valley) meteorological station Olon (Krasny Yar village; alt. 128 m) were used.

The sunshine duration is characterized according to data of observations conducted on one only but very informative for our districts weather station – Ulunga, «which is central in its location». Minimum sunshine duration is observed in early winter (about 140 hours), and the greatest – in the first half of summer (207-210 hours in June-July). In some years, depending on the course and intensity of cloudiness, the number of sunshine hours could strongly fluctuate from the long-term average (from 30-40 hours in winter to 150 hours in summer, either side). Against this backdrop, the annual total solar radiation usually ranges from 100 to 110 kcal/cm² (maximum in June – an average of 15 kcal/cm²). About 40% of this amount falls on the annual radiation balance (40-45 kcal/cm²), with its maximum intensity in June – up to 0,61 kcal/cm²•min.

Temperature regimes of natural environments of concerned area are characterized by high spatial and altitudinal contrasts. The latter (for example, between Okhotnichiy village and Rodnikovaya village) can be traced by comparing, respectively, the major indicators of atmospheric temperature: the average annual are -1,5 and -0,3°C, the average monthly in January -22,6 and -23,2°C, and in July 16,3 and 19,0°C; average minimum in January are -25,5 and -29,6°C,

and in July 12,4 and 13,5°C; average maximum in January -18,4 and -15,3°C, and in July 22,1 and 26,2°C. At the same time, respectively – the absolute minimum -42 and -49°C (their average per annum -33,9 and -40,3°C); absolute maximum is 34 and 36°C (their average 30,3 and 32,9°C). The temperature passes through 0° in April in spring and in November in autumn (Fig. 3).

First freezings register in the third decade of September, and the last – in the third decade of May; the duration of the frost-free period is on average 117 days in the west and 126 days in the east. The first frost on the soil surface occur in mid-September and the last – at the beginning of June. The duration of the frost-free period is only 104 days of anywhere. Such differences are determined by the higher inertia due to high heat capacity of soils and subsoils. Analysis of the temperature conditions on the soil surface indicates that the contrasts of these temperatures in multiple-elevation areas in comparison with those in the air, even sharper and more “stretched” in time. For instance, the average soil temperature in a relatively “low” area of Rodnikovaya village during the period from October to April already significantly lower than in the much more “upstanding” area of Okhotnichiy village. This is true concerning absolute values.

Potential summer thawing in depth is higher than winter freezing. The depths of winter freezing, on average, 100-110 cm (with a minimum of 40-50 cm; with a maximum of 150-160 cm). In some years, frozen during winter rock masses couldn't thaw completely in some places in summer, staying as residual frozen interbeds, so-called permanent snow patches. Their conservation during 3-5 years indicates directional freezing of the territory and uprising of

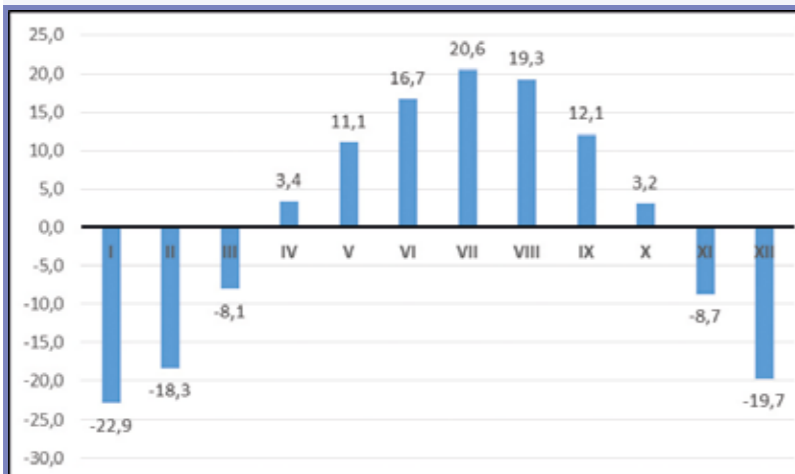


Fig. 3. The average monthly air temperature at Krasny Yar station.

Source: compiled according to the database of the All-Russian Research Institute of Hydrometeorological Information – <http://meteo.ru/data>

thin (1-2 m) and high-temperature (-0, -0,1°C) permafrost islands which are not grow together with the horizon of seasonal freezing. Such phenomena are typical for deep incised up upper and lower parts of the shady slopes of the streams and small rivers valleys (particularly in the eastern regions).

Precipitation. Moisture regime of the territory is characterized by a distinct seasonal fluctuation (a large amount of precipitation in summer, during warm and humid period – against a minimum of precipitation during the cold and drier winter). The features of the atmosphere precipitations distribution are determined by the monsoon circulation (a clear change in the ruling moisture-laden ocean air and relatively dry continental flows) and by the complex of orographic conditions (the peculiar combination of river valleys and mountains which control “passes” of air masses; evident expository barrier effect of mountain ridges – “intercept” of the mainly western moisture-laden air by the up-wind slopes; as well as “thermal” slope direction at each site and hypsometric contrasts).

The average annual precipitation varies greatly over the territory: from the 800-850 mm in the east to the 850-900 mm in the west (from April to September, respectively, from the 630-670 mm and to the 710-750 mm; from October to March – from the 170-180 mm to the 140-150 mm).

Western regions, in comparison with the eastern ones, are differing also by the great rates of maximum intensity of precipitation (for example, within the 5-minute interval, 2,2 mm/min vs. 1,4 mm/min).

Throughout the territory rain precipitation comes up to more than 72-73% of the annual amount, solid precipitations – more than 22-21% and mixed – about 6-7%. Most of

the time they occur in a combination; with the exception in January and February, when only solid precipitations fall, and in July – the only liquid precipitations. Precipitation balance within the month, which depends mainly on general climatic factors, varies only slightly as a whole within the territory.

Fig. 4 provides the distribution of the total precipitations (measured in mm) in months averaged from 1966 to 2011.

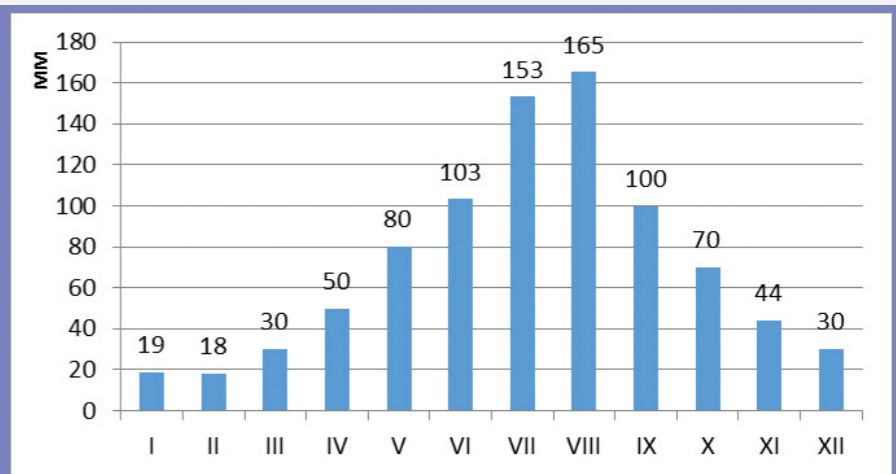
The long-term dynamics of the total yearly precipitations demonstrates a descending linear trend over almost the last 50 years, which evidences the reduction of the total humidification of the park's territory (Fig. 5).

Snow cover has a strong governing effect on temperature and hydrologic balance of active surface, flora, soils and subsoils. Dates of forming and breaking-up of substantial cover are similar to dates of freeze-up beginning and thawing out of soil. Dates of occurring and loss of snow cover are differ in 10-15 days at the average from the time of substantial cover form ing and breaking-up. Substantial snow cover usually set up at the beginning of November (at some of the years – less than 50% of winters, at mid-October) and keeps staying more often until 15-20 of April, comparably fit with dates of the soil freeze-up and thawing out beginning. There are no winters without substantial snow cover within the territory.

Medium heights of snow cover on the west fluctuate from 30 sm (within the bare areas) to 40 sm (in the forest), on the east – from 35 sm to 45 sm respectively. Maximum values within the whole area could reach 55-70 sm. The density of snow cover arises along with its height: from 0.14 g/sm³ (in the early winter) to 0.28 g/sm³ (to the early April). Ultimate water reserves in snow cover (according to snow surveys over

Fig. 4. The distribution of the total monthly precipitations in the basin of the Bikin River's middle reaches (hydrometeorological station in Krasny Yar settlement) throughout a year.

Source: compiled according to the database of the All-Russian Research Institute of Hydrometeorological Information – <http://meteo.ru/data>



the last day of decade) fluctuate from 60 to 70 mm on the east and from 75 to 85 mm on the west (while the top average winter values are 70-78 mm and 90-95 mm respectively).

Wind regime, which is formed as a whole under the influence of two baric centers – Asian and Pacific anticyclones, is characterized by the presence of two background opposite (northern and north-west, south and south-east) wind directions in winter and summer periods. However, orographic factor acts as very complicating and modifying factor in wind's directed move (setting of mountain ranges and narrow valleys hardly changes direction and wind speed). Eastern areas are characterized by the prevailing winds of only two local directions during the year – “western and south-western” and “eastern”. Western areas are characterized by “western - north-western” and “eastern and partly (from May to September) south-eastern” winds. In this case, eastern areas are differing from western areas also in least of zero wind conditions (13 vs. 57). There are also clear differences in the prevailing daily zero wind conditions confinedness over those areas – “night – morning” on the east, “evening – night – morning” on the west.

The following differences are discovered by comparison eastern and western regions over the characteristics of average wind speed during the year. Winter and summer months are standed out in the eastern areas (at the average, 6.4 and 3.6 m/sec), winter and summer and autumn months which are comparable in their characteristics in the western areas (1.6 and 1.3 m/sec). Thus, eastern regions are significantly higher than western over the wind strength and differ sharply over the number of days with strong wind (≥ 15 m/sec). Number of such days in eastern regions is 5-7 times more than in western.

Especially winter months are more rich in contrast for that matter (December – January) – 5.0 and 3.1 days against 0.3 and 0.2. It is also possible highest wind speed equal 25 m/sec once a year here (once in 20 years – up to 32 m/sec).

Atmospheric phenomena are also different in spatial-temporal variety within the territory. Besides the previously described fogs, these include snowstorms, thunderstorms and hail (Scientific and Applied handbook ..., 1988). Snowstorms are usually occurring during the front passing and atmospheric-pressure gradients increasing accompanied by a significant increase of wind. Usually snowstorms occur along with western winds in eastern areas, and along with south-western and northern winds in western areas. Depending on the locations protection they arise along with other wind directions and at different wind speeds. Temperature brings large adjustments in the course of snowstorms, because snow becomes denser and loses its mobility while thaws and it is usually easier to transport by wind at low temperatures. As a result, eastern areas are characterized by a large number of days with snowstorms than western areas (28 vs. 4). The highest occurrence of snowstorms usually in winter: at the temperature from -10 to -15°C in western areas, at lower temperatures from -20 to -25°C and with longer duration (the average per day with a snowstorm equal 6.9 hours) in eastern areas.

Thunderstorms which formation is often associated with the cold fronts passing, with the processes of convection and strong upward streams in the atmosphere. Less commonly thermal air-mass thunderstorms are being observed. Most thunderstorms occur in summer; significantly less in spring and autumn, rarely in winter. The average number of thunderstorms is 24-26 per year. Their average duration var-

ies widely: from 0 hours in March to 14.5 hours in June. Hail usually falls during the passage of cyclones, the instability of air masses and increase of the convective clouds. The greatest number of days with hail observed in May-June.

The seasons are strongly marked and differ in duration in the region.

Summer (from the end of May to the late September) is mostly warm (average air temperature in July and August is 16.3-16.2°C on the east, and 19.0-18.3°C on the west, with absolute maxima of 34 and 36°C); wet (with high relative air humidity 80-85%) and rainy (total amount of precipitation is 340-345 mm on the east and 530-535 mm on the west); with small (3.6-3.7 m/s on the east and 1.4-1.5 m/s on the west) east and west winds; with a lot of sunny days (total duration of sunshine most of the 200-210 hours per month, along with 3-4 days without sun per each month); increased cloud cover (average total of 7 points, while the lower clouds – 4.0-4.5 points); with frequent thunderstorms (2-7 per month on the east, up to 17; and 5-8 per month on the west, up to 15) and fogs (on average 15-17, up to 23 per month on the east; 5-10 – on the west). The duration of the summer period varies from 127 days on the east to 118 days on the west parts of region.

Winter (from the early November to the end of March) is cold (average air temperature in December and January is -19.7 and -22.6°C on the east, while -20.0 and -23.2°C on the west with an absolute minimum -42 and 49°C); moist (relative humidity of 84-87% in the east to 77-78% in the west); relatively with not much snow (amount of precipitation in the east is 175-180 mm, 125-130 mm on the west) and with small snow cover (appearance in the mid – late October, losing – the end of April, keeping 174-169 days at all, with the average among heights decade values on the open and forest areas from 30-40 cm on the east to 35-45 cm on the west); with a contrasting wind background (western and south-western winds with average speeds of 6.0-6.5 m/s on the east and western and north-western winds of 1.5-2.0 m/s on the west; the average number of days with strong wind (≥ 15 m/s) is 4-5 per month in the early winter on the east and less than 1 on the west, and with frequent (at the average of 5-6 and up to 17 per month on the east and at the average of 1 per month on the west) and lasting (at the average of 6.9 hours a day, up to 45 hours per month) snowstorms; with a relatively large number of sunny days (with an average duration of sunshine is 170 hours per month, from 141 hours in December to 208 hours in March, and no more than 5 days per month without sun); not much overcast (the total cloud cover from 4.0 to 5.5 points on the east and the lower clouds

from 1.6 to 2.9 points; total cloud cover 4.2-5.0 points and lower clouds 1.8-3.0 points on the west). The duration of the winter period ranges from 148 days on the east to 142 days on the west of the territory.

Spring and autumn mid-seasons, in comparison with longer summer and autumn seasons, is more “compacted” in time (spring and autumn, respectively, of 54 and 36 days on the east and 61 and 41 days on the west). Their hydrothermal features are intermediate and fit with the time of baric changes as a whole. In this regard, they differ (but mostly for spring) by increased diurnal variability of air temperature and soil, frequent thaws and the return of cold weather, hail and all kinds of precipitation. However, autumn (the shortest climatic seasons on the territory) as a whole colder than spring (average monthly temperature is 1.8°C against 3.1°C on the east; 2.5°C against 5.1°C on the west). All seasons have continental (mostly in the form of a varied range of amplitudes of air and soil temperature, depth of seasonal freezing-thawing of soils and sub-soils and the appearance of new growth of permafrost, and others) and oceanic (monsoon in the nature of precipitation, high relative air humidity throughout most of the year, the seasonal contrast of the background wind, etc.) features. However, summer and winter differ equally, but geographically differentiated (warmer summer and colder winter in western areas) strongly marked continental and oceanic environment. In this regard spring features are “shifted” to a greater oceanic type, autumn features – to the relatively greater continentality.

In general, we can conclude that “autumn” is the best recreational season in this territory (preferably on the east). It should be emphasized, that any anthropogenic interference (within the natural complexes of the middle and upper reaches of Bikin River basin) should be clearly correlated with the naturally formed hydrothermal regime, because unconsidered and geoecologically baseless actions can lead irreversible changes of micro- and mesoclimate.

SOILS

According to the soil-geographic regionalization, the district under research belongs to the Eastern brownsoil-forest region (Dobrovolsky, Urusevskaia, 1984). The altitude factor determines and conditions the marking out of the soils of the mountaneous, plain, and floodplain territories within the basin under consideration (Fig. 6).

Soil types and varieties distribution demonstrate a clear dependence on the landscape position, the degree and na-

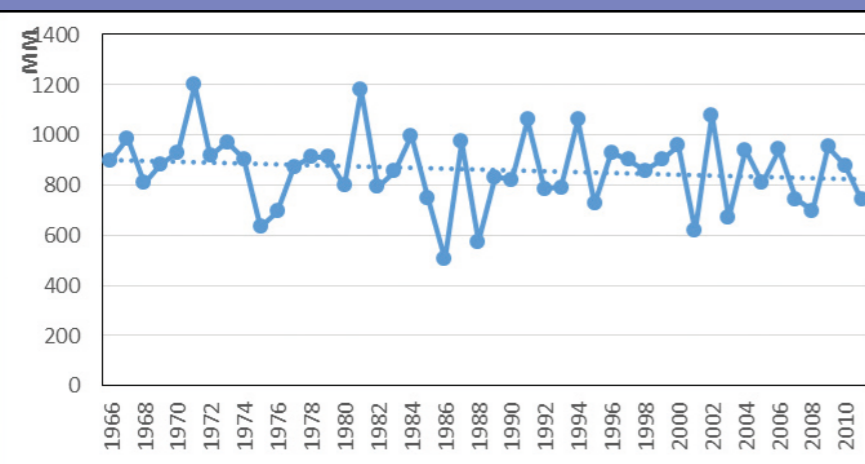


Fig. 5. The dynamics of the total yearly precipitations in the basin of the Bikin River's middle reaches (hydrometeorological station in Krasny Yar settlement).

Source: compiled according to the database of the All-Russian Research Institute of Hydrometeorological Information – <http://meteo.ru/data>

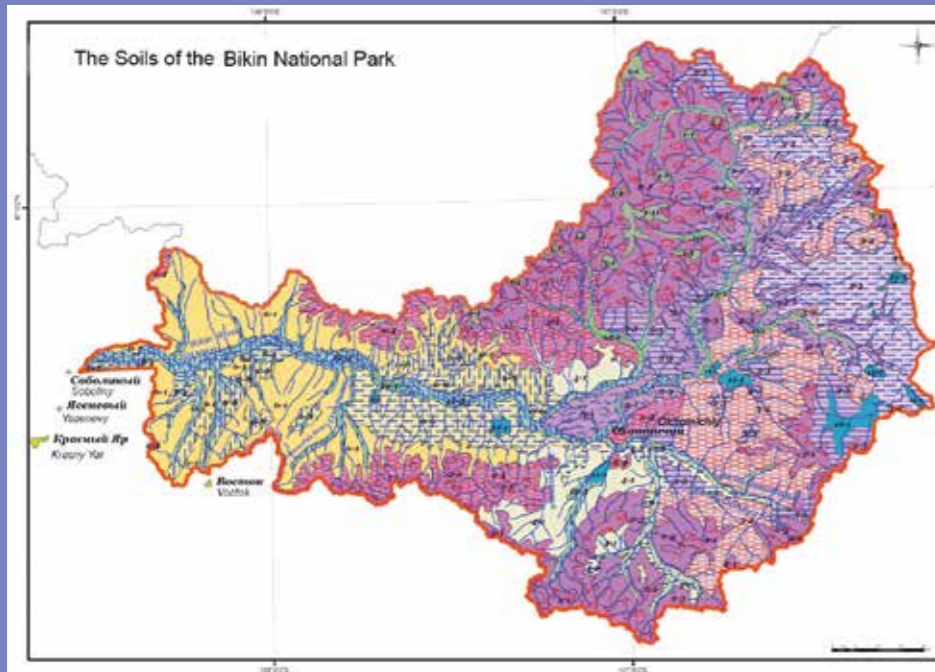


Fig. 6. A soil map of the basin of the Bikin River's middle and upper reaches with the legend.



ture of the wetting. The common features of soils are relatively small depth and a high boulder, presence of permanent snow patches, low resistivity to mechanical destruction and loss. The combination of these factors and the monsoon climate of the area determine the overall erosion instability of the soils and sub-soils. Mountain tundra soils, which common for the watersheds above the limit of forest, are piecewise in their nature, shallow, stony, low arrested by vegetation, extremely unstable against all types of erosion.

High stony, infiltration of water, low resistivity to the impact of destructive factors are typical for the mountain brown taiga illuvial-humic podzolized and nonpodzolized soils, spreading under the fir-spruce forest in the upper altitudinal zone in the mountains. Variety of the mountain taiga ochrous brown non-podzolic and podzolic and mountain brown taiga podzolized soils are dominated in the middle part of the slopes under the fir-spruce and pyrogenic mixed forests. A group of mountain forest brown acid non-podzolic and podzolized soils takes ground in the middle and lower parts of slopes under the cedar-spruce and pine forests. Forest brown acid gleyic, gley-bleached and gleyic-podzolic soils take ground in the lower part of the middle reaches of the Bikin River, on the overmoistening sites.

All soil of mountain forest brownified series has differentiated genetic horizons, often with fuzzy layer-to-layer transfer. Podzolized degree of these soils varies widely, but never reaches value critical for trees growth and evolution. Potential soil capabilities of brown mountain forest soils could provide much more fertility of growing stock through due care of forests. Peat and peaty-gley soils, which are formed in the drainless depressions in the central parts of the table lands and on other sites with similar moisture regime, are characterized by low fertility in their natural state.

Variety of geomorphological and hydrological conditions in mountain river valleys determines a variety of lowland landscapes soil complex. These soils have a local spread occurrence, but generally occupy 7-9% of the territory. Complexes of grass-covered coarse skeletal, slimy-gley, sometimes brown taiga soils with permanent flood plain moisture regime are dominated at the upper parts of the mountain rivers valleys. Varieties of meadow flood plain, stratified flood plain soils are formed in the valleys with well-developed range of terraces, and residual flood plain grassland, bog and even soddy-peaty-gley soils are indicated within the valley sites with poor drainage and permanent overwetting.

The presence of permafrost in sub-soils in upper part of the Bikin River basin severely increases the risk of its breaking-up

and changes in the hydrological regime of rivers rises in its habitat. The examples of the scree debris and detritus formation after the deforestation of frost soils are known in all areas characterized by permafrost presence, including Far East.

THE MINERAL RESOURCES

The territory of Upper and Middle Bikin relate to the Sikhote-Alin minerogenetic province (Geology of the USSR, V. 32, 1974). Its western part, which inclusive the middle reaches of the Bikin River, is located within Central minerogenetic province (the zone of the Central fault or structural joint), while the eastern, known as the Upper Bikinsky ore district, is located within the Main minerogenetic province (by the name of Main Sikhote Alin synclinorium).

A large number of deposit occurrences and ore occurrences of base, rare and precious metals are confined to both minerogenetic provinces, but above all wolfram have the economic value for the Central province, while tin is the primary element for the Main province. Gold is of concern in economic value as associated components. The special position within the Main province belongs to the Upper Bikinsky Paleogene carbon-bearing depression.

FLORA AND VEGETATION

THE FLORA

According to a floristic regionization scheme (Nedoluzhko, 1995) of the Far East, the nominated territory belongs to two floristic provinces (Manchurian and Okhotsk-Kamchatka one). The boundary of the Okhotsk flora habitat is drawn as a strip that covers the most high-mountainous part of the region and descends from the north-east to the south-west approximately to the latitude of the Bolshaya Ussurka River's right tributaries (Fig. 7). The boundary of the regions is vertical and traverses the territory along the main axis of the Sikhote-Alin range, within the 400-600 m horizontals. Between these marks there is a transitional belt where both floras intermingle evenly and form peculiar plant groupings. When ascending above sea level, typical representatives of the Manchurian flora become rarer, disappear, and are replaced by the Okhotsk flora spruce-fir and larch vegetation dominant in the national park's territory.

Combinations of arboreal plants (the pine and oak tree pair in the first case and the spruce, fir and/or larch triad in the second one) are the main environment-forming components and, at the same time, indicators of the contacting floristic and faunistic complexes in the mountainous Sikhote-Alin.

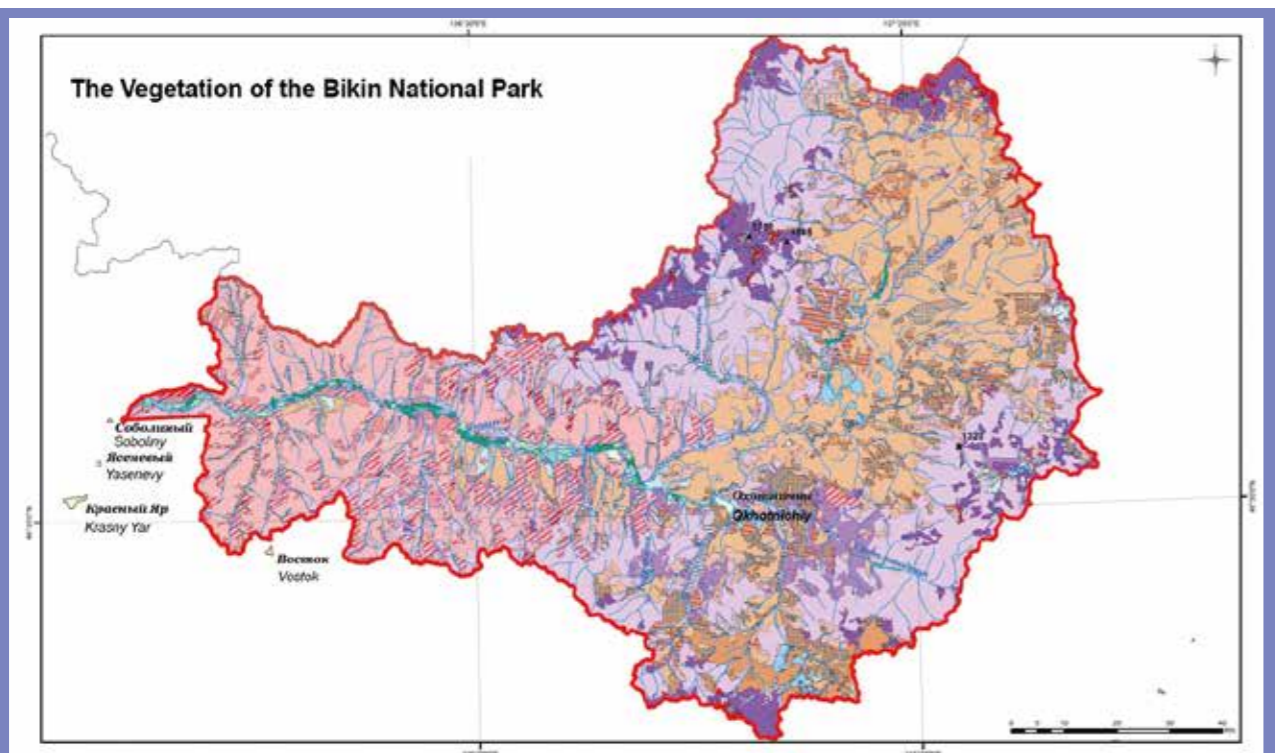


Fig. 7. A map of the vegetation of the basin of the Bikin River's middle and upper reaches with the legend. According to the Primorsky Kray Forest Atlas (2005).

No special floristic research has been conducted at the Middle and Upper Bikin, but taking into account the diversity of the physiographic conditions, junction of the different floristic regions and the analogy with the Sikhote-Alin Biosphere Reserve, the list of the Bikin National Park's higher vascular plants should total about 1000 species (40% of the Primorye flora).

The rare plants found in this territory include 46 species (Table 2).

VEGETATION

The vegetation of the Bikin River basin belongs to 2 botanical-geographical regions: the South-Okhotsk dark-coniferous-forest one and the East-Asian coniferous-broadleaf-forest one (Kolesnikov, 1956b). The boundary between the two regions is rather twisting. In average, it passes at altitudinal marks of 550-600 m above sea level. The fir-spruce and larch forests belong to the South-Okhotsk dark-coniferous-forest

region. The Korean pine-broadleaf forests that form an independent altitudinal belt, the spruce-pine forest stripe, and the valley forests (predominantly) belong to the East-Asian coniferous-broadleaf region.

The altitudinal zoning of the vegetative cover is well developed within the basin part under consideration. The following altitudinal belts are marked out:

- A mountain tundra belt – higher than 1500-1600 m
- A creeping forest belt of the dwarf Siberian pine – 1450 (1500) – 1600 m
- A crooked forest belt of Erman's birch – 1300-1450 m
- A fir-spruce forest belt – 800-1300 m
- A spruce-pine forest belt – 600-800 m
- A Korean pine-broadleaf forest belt – 200-550(600) m

The present vegetation of the basin is shown by the schematic map M 1:500,000 composed according to the Primorsky Kray Forest Atlas (2005) (Fig. 9). The schematic map displays the distribution of the main formations and asso-



Fig. 7. legend.

Table 2. The Bikin National Park's rare plant species

The plants included in the RF Red Book	
Trees: Spreading yew	Leafy mosses: Hondaella caperata
Shrubs: Sorbaria rhoifolia Siberian carpet cypress	Lichens: Everniastrum cirrhatum Punctelia rudecta
Herbaceous plants: Asian ginseng Woodland peony Watershield Roseroot Foxnut Japanese iris Fritillaria ussuriensis Large-flowered lady's slipper Ephippianthus sachalinensis Gastrodia elata Pogonia japonica	
The plants included in the Primorsky Kray Red Book	
Ferny: Cryptogramma raddeana Coniogramme intermedia	Herbaceous plants: Popoviocodonia stenocarpa Galium paradoxum Bergenia pacifica Trapa incisa Trapa japonica Trapa maximowiczii Scirpus maximowiczii Rabbit-ear iris Circular Lip Galearis
Lichens: Coccocarpia erythroxyli Coccocarpia palmicola Leptogium hildenbrandii Lung lichen Cetrelia japonica Cetrelia nuda Cetrelia pseudolivatorum Hypogymnia duplicatoides Hypogymnia fragillima Menegazzia terebrata Myelochroa persidians Nephromopsis laii Nephromopsis ornata Nephromopsis pallescens Parmelina quercina Tuckneraria laureri Heterodermia boryi Pyxine soreliata	



Bikin River valley – one of the plots of virgin Ussurijsky taiga.
Photo by V. Kantor

ciation groups. Table 3 gives the ratio of the areas of the contours marked out in conformity to the map.

The highest (over 1450–1600 m above sea level) mountains appear treeless alpine tundra belt. They are linked up with brushwood of mountain pine, stone-birch elfin woodlands and tall grass meadows below; this belt is range from 1200–1300 to 1400–1600 m above sea level. Below its replaced by firry-spruce forests, which replaced by typical moss and moss-ferny firryspruce forests below 1000–1100 m altitude, which are turned into cedar-firry forests below 600–700 m altitude and then into broadleaf-cedar forests. Much of the hardwoods gave way to larch, larch-birch and firry-larch forests in the upper part of the basin as a result of extensive fires in the end of the one before last century – first third of the last century. Larch forests occupied also hydromorphic terraces in extensive parts of river valleys. Lowland leaf bearing forests are more common in the Middle Bikin.

Middle levels of low floodplain occupied by willows and chosenia, pure and mixed. Chosenia and poplar forests with bladed elm (*Ulmus laciniata*), valley elm (*Ulmus propinqua/Ulmus japonica*) and Manchurian ash (*Fraxinus mandshurica*) grows at higher altitudes. Broadleaf poplar and ash elm crops associated with high floodplain. Divers firry-cedar-broadleaf forests occupied terraces above the floodplain. Primary larch forests and larch bogs are indicative for poorly drained low areas of terraces above the floodplain.

A large tract of primary cedar and cedar-broadleaf forests have been preserved in the middle reaches of the Bikin River. The largest Korean pine nut harvesting zone is marked



Korean pine.
Photo by V. Philonov

here (more than 400 000 ha). Except protective and regulatory role, these forests also play an important socioeconomic role as the most productive lands of the traditional nature use of the indigenous people.

THE FOREST RESOURCES

Korean pine (local name *Cedar*) nut harvesting zone has 99% of woodiness. The main woody species are Korean pine (*Pinus koraiensis*) – 44%, Ajan spruce (*Picea ajanensis*) – 38%,

Table 3. The vegetative cover structure within the Bikin National Park's boundaries.

The main units that have been market out	Area, ha	% of the total area
Vegetation on the bald mountains and below them		
Mountain shrubby-ličchen tundras	9130,5	0,75
Creeping dwarf Siberian pine (<i>Pinus pumila</i>) forests	4158,2	0,35
Boreal vegetation of the mountains		
Erman's birch (<i>Betula lanata</i>) herbaceous-shrubby forests	1403,7	0,11
High-mountain fir-spruce (<i>Abies nephrolepis</i> , <i>Picea ajanensis</i>) herbaceous-shrubby forests	33761,1	2,8
Fir-spruce (<i>Abies nephrolepis</i>, <i>Picea ajanensis</i>) forests		
Small-herbaceous-shrubby and therorhodium ones	24624,5	2,1
Green-mossy, herbaceous-mossy and ferny ones	344363,5	28,58
Various-herbaceous-shrubby ones	27576	2,29
Pine-spruce (<i>Pinus koraiensis</i>, <i>Picea ajanensis</i>) forests		
Mossy-small-herbaceous-ferny ones	4870,8	0,4
Mossy-shrubby and mossy-shrubby ones with the creamy bark birch and linden	60678,5	5
Larch-spruce (<i>Larix dahurica</i>, <i>Picea ajanensis</i>) forests		
Herbaceous ledum-mossy in the place of the fir-spruce forests	29886,5	2,5
Various-herbaceous-shrubby in the place of the fir-spruce forests	37713,4	3,13
Larch (<i>Larix dahurica</i>) forests		
Open woodlands		
Larch peaty-sphagnous and green-mossy shrubby ones	7435,6	0,62
Closed forests		
Shrubby-lichen therorhodium ones	28690,4	2,38
Green-mossy shrubby and mossy-herbaceous shrubby ones	261487,3	21,7
Herbaceous ones	41958,3	3,48
White birch (<i>Betula platyphylla</i>) forests		
Various-shrubby and various-herbaceous ones in the place of the spruce and spruce-pine forests	8178,3	0,68
Small-reed-shrubby in the place of the spruce and spruce-pine forests	4852,5	0,4

The main units that have been market out	Area, ha	% of the total area
Nemoral vegetation of the mountains		
Broadleaf-pine (<i>Betula costata</i>, <i>Tilia amurensis</i>, <i>Acer mono</i>, <i>Ulmus laciniata</i>, <i>Fraxinus mandshurica</i>, <i>Pinus koraiensis</i>) forests		
Various-shrubby with the creamy bark birch	195566,3	16,23
Herbaceous-shrubby with the linden	12205,3	1,01
High-herbaceous various-shrubby with the elm and ashtree	10277,9	0,85
Vegetation of the river valleys		
Chosenia (<i>Chosenia arbutifolia</i>) high-herbaceous-shrubby forests	1141,5	0,09
Poplar (<i>Populus maximowiczii</i>) small-reed-high-herbaceous and herbaceous-ferny forests	5921,7	0,49
Ash-elm (<i>Fraxinus mandshurica</i>, <i>Ulmus japonica</i>) forests	12793,9	1,06
Fir-spruce (<i>Abies nephrolepis</i>, <i>Picea ajanensis</i>) valley forests	34946,2	2,9
Marshes		
Herbaceous (lowland) and mossy (highland) ones	92,8	0,007
Other		
Human settlements	1253,3	0,1
Total area	1204968	100,00%

Source: Primorsky Kray Forest Atlas, 2005, amended. According to the vegetation map M 1:500,000.

yellow birch (*Betula costata*) – 9%, larch (*Larix dahurica*) – 4%, white birch (*Betula platyphylla* L.) – 3%. The most popular are mixed shrubby cedar woodlands with yellow birch (*Betula costata*) and cedar-firry forests with yellow birch (*Betula costata*) and Amur linden (*Tilia amurensis*). Forests with cedar domination usually are less than 600 m above sea level. And upwards fir-spruce forests, occupied upper parts of slopes, watersheds and upper parts of rivers and springs basins, with mid-level quality of stand III,3 along the nutwood commercial zone. Cedar woodland is more productive with mid-level quality of stand II,7. Spruce forests of upper altitudinal mountain zone represent poor stand. Middle-aged forest stands dominate (43%) in nutwood commercial zone, which include cedar woodlands of III-V age class and other woodlands of II-VI age class. Ripening woodlands occupy 26%, mature – 28%, old growth – 1% of area.



Korean pine. Photo by P. Krestov



Mongolian oak.
Photo by Y. Darman



Larch
Photo by K. Kobayakov

Prohibited belt along rivers. Wooded areas of this forest category occupy 93%. Forests with domination of spruce (*Picea sp.*) occupy 38%, cedar (*Pinus sp.*) – 20%, larch (*Larix sp.*) – 13%, elm (*Ulmus sp.*) and rhynofolious ash (*Fraxinus mandshurica*) - 10%, chosenia (*Chosenia arbutifolia*) – 7% of total area. Valley spruce forests, cedar forests with ash and elm, larchspruce forests are dominated.

94% of rest basin plots are wooded. Fire-sites of different years and post-fire open forests are unwooded. Peat moss bogs (50%) basically focused in upper reaches of Zeva and Kilou rivers and rocks (40%) are dominated on the nonforested areas. The main forest forming species are: Ajan spruce (*Picea ajanensis*) (44%), larch (*Larix sp.*) (41%), and white birch (*Betula platyphylla L.*) (10%). The biggest areas of hardwoods situated in the most upper reaches of Bikin River, in Klyuchevaya (Bachelaza) River basin, in the upper reaches of Zeva, Svetlovodnaya (Ulunga) rivers. Moss, short grass moss and shrub rich in herbs types of firy-spruce forests dominate. They occupy slopes of various gradients of all directions, characterized by high stocking and normality, presence or domination of Khingan fir (*Abies nephrolepis*) in second growth and dash of softwoods.

Larch forests concentrate in eastern (upper) part of basin near Bikin, Ada, Kilou, Zeva rivers and on the plateaus in highlands near the watersheds of the Sikhote-Alin ridge. They represented by groups of marsh tea and moss, moss forest types. The former is confined to the high river terraces, low gradient slopes and mountain plateaus; the latter is usual for various gradient slopes and on the flat localities on flood plains. Their site quality more often is III, IV is rarer, density from 0.3 to 0.7. Marsh tea and moss larch forests characterized by wet soils and continuous cover of marsh tea.

White birch and aspen woods appeared after fires and replaced softwood forests. They concentrated in southern part of exploitation woods. White birch forests are intermediate stage in the process of wood species changing and they interchanged by primary types of softwood forests step by step. Mid-level site quality of spruce woodland in exploitation zone is III,8, larch woodland - III,4, white birch woodland - II,4. Low site quality occurs in subalpine fir wood belt and in waterlogged larch forests. The age-grade woodland separation is irregular. Mature and overmature forest stands are visibly dominate.

NON-TIMBER FOREST RESOURCES

The bulk of the non-timber resources is concentrated in the Korean pine-broadleaf forest zone of the Bikin River's middle reaches (Fig. 8).

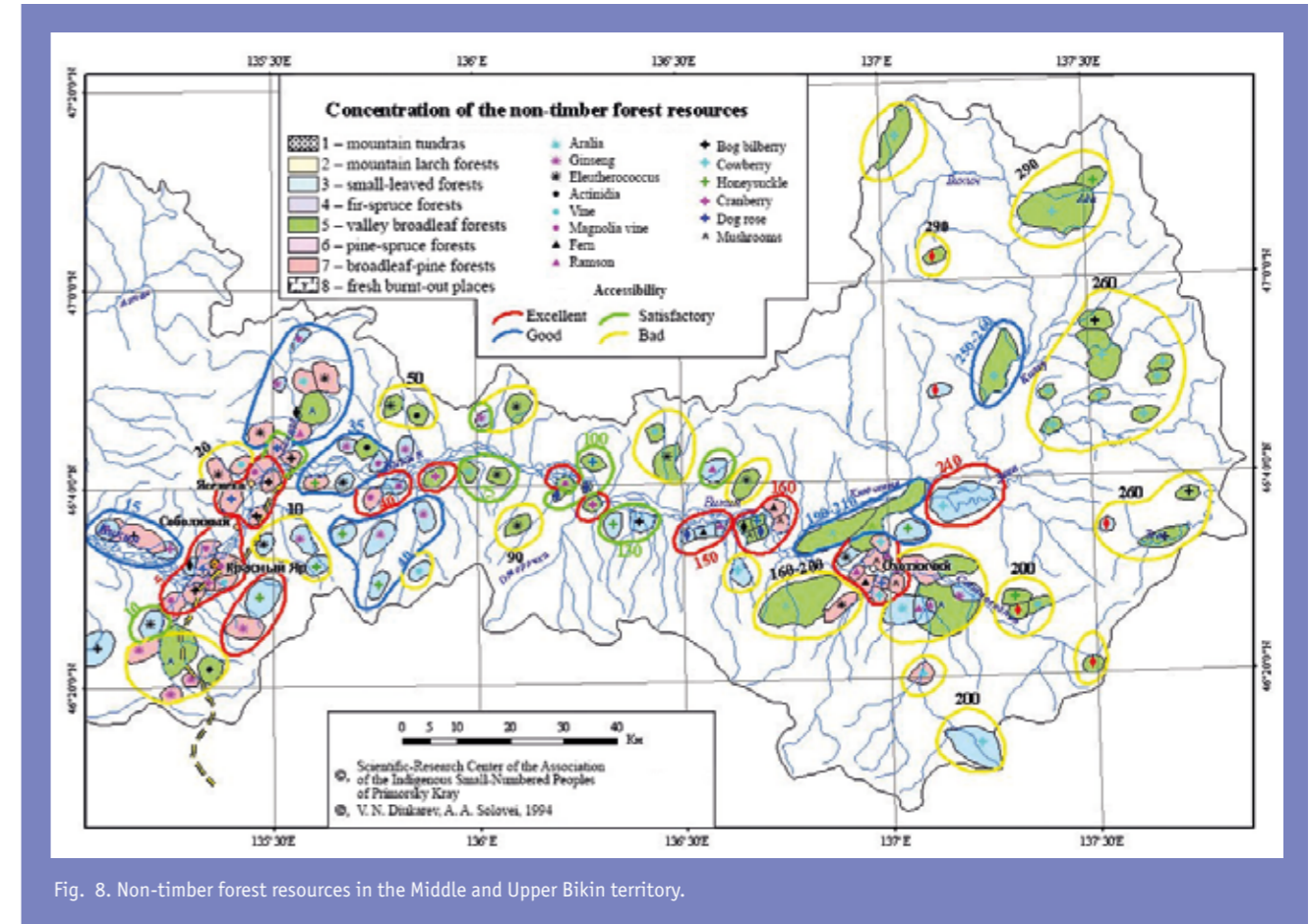


Fig. 8. Non-timber forest resources in the Middle and Upper Bikin territory.

More than 40 species of plant being of medicated, nutritive, technical value find in area's forests. Estimate possible annual harvesting of medicinal herbs in this ecologically clean region could meet the demand in medicinal herbs of all the Primorsky Krai. Table 3 demonstrate approximate value of annual harvesting of some useful plant species of Pozharsky District.

Dynamics of useful plant procurement demonstrate that in spite of the harvest fluctuation there is a real opportunity to procure the harvesting of minor forest products. It is obviously, that clever combination of conservation status of territory and traditional nature use of the indigenous people should lead to the minimization of timber production that should be limited by demand for fire wood and necessary sanitary protection measures, by doing so the main practical

use should lie in sustainable use of all wood benefits. Such approach provides the development of traditional culture and cropping with minor business based on them, match with world trend over primary woodlands conservation and their preservation on sizable territory.

Plant communities have been divided into some categories over set of non-timber forest resources, their diversity and productivity – from alpine-tundra group with minimal resource output to broad-leaved cedar forests of middle and lower mountain altitudinal zone – the heaviest over wood diversity and products. Highlands's plant group labeled as territory with minimal value of non-timber forest resources. Role of this areally small land could be the subject of distant prospect in combination with recreational facilities of these territories and such medicinal herbs as

snowdon rose (*Rhodiola rosea* L.), bergenia pacific (*Bergenia pacifica* kom.) and other plants rare within Primorsky Krai. Different types of larch forests labeled as natural complexes with low resource capacity, as well as secondary small-leaved forests. In spite of the small estimate resource mark, these plant groups are prospective in berry and mushroom resources and for charring arrangement in most accessible woodlands with birch domination. Most part of these woodlands, situated in Kilou River basin, in upper parts of Bikin River, characterized by diffi- Marsh tea larch forests with blueberry sites more than 100 ha, and small-leaved forests, situated in middle reach of Bikin River, are prospective among this group.

The dark-coniferous and spruce-larch forests with 7-8 types and more than 20 species of non-timber forest resources labeled as natural complexes with middle resource capacity. Main restriction in use of these resources related to meaningful farness and low accessibility of the territory. However, it should be considered that this is the most perspective natural complexes on so-called woody greens resources and quality. Areas with valley woods and mountain slopes cedar-spruce woods labeled as natural complexes with high resource capacity. Forest with ash (*Fraxinus sp.*), elm (*Ulmus sp.*), Amur cork tree (*Phellodéndron sp.*), cedar (*Pinus sp.*), fir (*Abies sp.*) are rather rich phytocenosis over the non-timber forest resources and relatively accessible for its development. There are 10 and more types of significant non-timber forest resources and 40-60 of their categories. These lands exceeded the above type of natural complexes over the variety of some categories (berries bee plants, medicinal herbs, etc.) in 2-3 times.

Maximum resource capacity over biodiversity and volume has cedar and broadleaved-cedar forests of middle parts of slopes and foreslopes of high river terraces. Here one can find more than 20 types and 150 species of non-timber forest resources, and these numbers could be greatly increase by means of medical and other plants of these forests as it was mentioned before. Table 4 illustrate diversity of non-timber forest resources which of a great interest for all-purpose environmental management organization (hunting, fishing, cropping resources are considered separately). Along with big diversity of renewable resources pointed natural complexes are attractive for its economic capacity, ecological cleanness, knowledge of its useful properties, existing of the base resources specific for each of them.

The table illustrates the most significant food, medical and technical resources for biological and economic potential, accessibility, traditional use and lands sustainability.

Table 4. Non-timber plant resources of the nut-production zone.

Resource type	Production reserves, t	Possible harvest, t	Economic significance
Clusterberry (<i>Vaccinium vitis-idaea</i>)	30-40	15-20	food, medical
Bog bilberry (<i>Vaccinium uliginosum</i>)	30-40	20-25	food
Cranberry (<i>Oxycoccus</i>)	3-4	1-2	food, medical
Actinidia (<i>Actinidia</i>)	10-12	5-8	food
Magnolia vine (<i>Schisandra</i>), berries	25-35	2,120	food, medical
Grapes (<i>Vitis</i>)	10-15	5-7	food
Guelder rose (<i>Viburnum</i>)	15-20	10-15	food
Pine nut / Cedar (<i>Pinus sp.</i>), nuts	500-600	586,1	food
Manchurian walnut (<i>Juglans mandshurica</i> Max.)	100-150	30-40	food, paint and varnish
Fern (<i>Polypodiophyta sp.</i>)	20-25	16,100	food
Edible mushrooms	40-60	10-15	food
Tea plucking	300-400	150-200	food, medical
Tree juice	200-250	50-70	food
Tree greenery	150.000-200.000	70.000-80.000	for cattle breeding, medical, decorative, technical
Honey plants	300-400	30-50	food
Eleuterococcus (<i>Eleutherococcus</i>), root	80-100	24,830	medical
Aralia (<i>Aralia</i>)		3,320	medical

Nearly two dozens groups of technical nontimber forest resources, which could be used, is presented in Bikin River basin forests. They could be divided in some categories: technical resources of direct application, which do not require any special fashioning: firewood, blocks, chips, cuttings, brooms, axe shafts, feeding parts of plants, etc. Output of improvement thinning, environmental harvesting, reparative harvesting in forests of little value could be potential basic materials here. Another category – pitches, essential oils, tar, coal and their conversion products. The presence of various species composition of stand, huge areas of softwoods and especially hardwoods allow considering this category of technical resources as perspective. The third category – biotechnical resources – hydrolyzed spirits, feed

proteins, yeasts, cellulose, biofuel, fertilizers. This category could be divided into two parts:

1. Spirits, feed proteins, yeasts, cellulose – production is practically impossible within the basin because of pollution caused by this production.

2. Biofuel, hardeners, fertilizers (as biofuel wastes) – development of bioenergetics could be set up on plant biomass of natural systems and farm production wastes. This type of resources could attract special attention under conditions of energy problem increase.

Special attention is given to genetic resources which separately stand out. These are resources of the future. Under conditions of potential break of natural biodiversity within huge Far East areas, lost natural complexes with most productive and sustainable plant communities, such natural reserves as Bikin River basin would be estimated in a proper manner in the near future. Elite trees of main forest-poietic trees in fir, cedar and larch woods, remaining age-long diversity of useful plant forms, complete set of high-producing and sustainable ecosystems – invaluable natural potential of Bikin River basin.

Fauna and Animal World

MAMMALS

In basin of the Middle and Upper Bikin, 48 inhabiting mammal species (including acclimatized species: American mink and muskrat) have been discovered. In addition, it is possible to meet little-studied groups: 4 species of insectivores and 7 species of cheiroptera.

Here are habitats of the following mammals: Manchurian deer (*Cervus elaphus xanthopigus*), Moose (*Alces alces*), Siberian musk deer (*Moschus moschiferus*), wild hog (*Sus scrofa*), Siberian roe deer (*Capreolus pygargus*), Himalayan black bear (*Ursus thibetanus*) and brown bear (*Ursus arctos*), Amur tiger (*Panthera tigris altaica*), Indian marten (*Martes flavigula*), wolverine (*Gulo gulo*), sable (*Martes zibellina*), acclimatized American mink (*Mustela vison*), badger (*Meles meles*), Manchu squirrel (*Sciurus vulgaris manchuricus*) and Arsenjev's flying squirrel (*Pteromys volans arsenjevi* Og.), Siberian striped weasel (*Mustela sibirica*), several species of shrew (*Soricidae*) and mouselike rodents (*Cricetidae* and *Muridae*).

Amur tiger (*Panthera tigris altaica*). Listed in the IUCN Red Data Book and the Russian Red Book. The main object of his hunting is wild hog, which population here is stable

even in cedar nut unseed years, due to abundance of Dutch-rush (*Equisetum hyemale* L.). According to the annual monitoring data, its average density is 0.58 tigers per 100 square km (from 0.29 to 0.97), while total amount is up to 40 units.

Himalayan black bear (*Ursus thibetanus*). Lives in cedar-broadleaf forests, density is about 1 unit per 10 square km. It is easier to catch Himalayan black bear than brown bear, and despite of small official quota, its population drops from poaching.

Brown bear (*Ursus arctos*). Commercial species. The highest density of population is at cedar-broadleaf and cedar forests. Proportion between Himalayan black bear and Brown bear is about 1:1.

Sable (*Martes zibellina*). The main commercial species on most hunting areas of the Middle and Upper Bikin – up to 2000 furs are procured every year. Population density is 5-7 units per 10 square km.

Otter (*Lutra lutra*). The common commercial species in the Bikin river basin. The species population is 107-136 units. Otter's population drastically decreased in recent years after reduction of fish resources and poaching.

Muskrat (*Ondatra zibetica*). The commercial species, which have limited habitat – the separate meander lakes and lakes in the western part of the Park. The total population of the commercial species is around 100-120 units.

Siberian striped weasel (*Mustela sibirica*). Numerous commercial species with the population density up to 15 units per 10 square km.

American mink (*Mustela vison*). The commercial species, which are the successful result of acclimatization in 50's on the territory of the Pozharsky District. The population density on the first yield class areas (rivers' middle parts more than 150 km long and rivers' lower reaches 100-150 km long) is 1.2 – 2.4 units per 1 km of streambed.

Indian marten (*Martes flavigula*). Common for this territory but rare species with population density below 0.3 units per 10 square km.

Common weasel (*Mustela erminea*). Rare.

Lynx (*Lynx lynx*). A commercial but rare species.

Mountain hare (*Lepus timidus*) and Northern coney (*Ochotona alpina*). This double-toothed rodents class representatives have the population density of 2-3 units per 10 square km.

Squirrel (*Sciurus vulgaris*). During population peak period is the most mass commercial species on the territory. Two more representatives of this class have stable population: Siberian chipmunk (*Eutamias sibiricus*) and flying squirrel (*Pteromys volans*), as well as some mouselike rodents.



Amur tiger. Photo by V. Solkin



Brown bear. Photo by V. Solkin



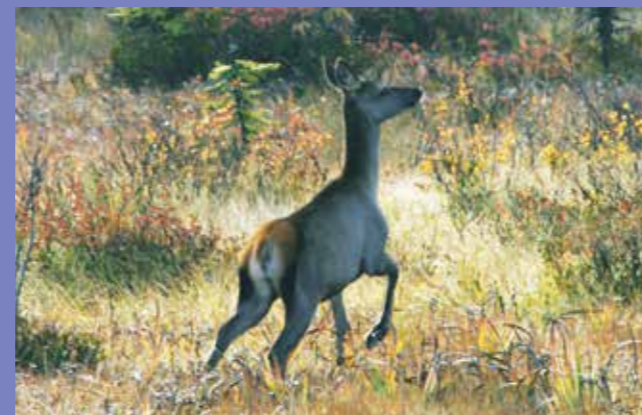
Lynx. Photo by V. Medvedev



Manchurian deer. Photo by V. Medvedev



Boar. Photo by E. Lepeshkin



Manchurian deer. Photo by E. Mogilnikov

Table 5. The recorded indexes pertaining to the tiger and hoofed animals on the permanent site at the Bikin's middle reaches.

Years	Tiger trail density (trail quantity / 10 km / quantity of days after a snowfall)	Number of the 'independent' tigers (quantity of the adult, young and uncertain animals)	Density of the independent tigers (quantity of the adult, young and uncertain animals per 100 km ²)	Manchurian deer trail density (quantity of fresh trails per 10 km of the itineraries)	Wild boar trail density (quantity of fresh trails per 10 km of the itineraries)	Roe trail density (quantity of fresh trails per 10 km of the itineraries)
1998	3,6	3,0	0,29	1,47	1,45	1,61
1999	7,7	10,0	0,97	11,24	4,00	4,96
2000	0,9	7,0	0,68	7,14	0,29	1,39
2001	3,7	6,0	0,58	9,53	3,97	2,88
2002	2,3	7,0	0,68	5,32	1,69	4,49
2003	2,6	8,0	0,78	10,37	3,2	3,41
2004	6,3	5,0	0,49	4,52	5,09	4,73
2005	0,6	5,0	0,49	6,91	8,46	5,43
2006	2,2	4,0	0,39	4,13	3,96	3,95
2007	1,2	6,0	0,58	6,85	7,31	5,35
2008	1,0	5,0	0,49	2,86	7,21	5,60
2009	0,5	3,0	0,29	3,96	4,47	5,87
2010	1,6	4,0	0,39	3,83	3,02	6,53
Average	2,6	5,6 (3-10)	0,55	6,01	4,16	4,14

Source: The Amur tiger population monitoring program, the 13-year report: 1998-2010.

Raccoon dog (*Nyctereutes procyonoides*). This species are common at the Bikin river flood plain almost along all its central part. Commercial species population density is 0.5-1 animal per 1000 ha.

Badger (*Meles meles*). A quite common commercial species of the territory.

Moose (*Alces alces*). The species are common in the upper Bikin river stream, where have the most population density on the old fire sites at the basin of the Ulunga, Zeva, Kilou rivers. This is the last large population of this species in the Primorsky region. The population is 400-500 units.

Manchurian deer (*Cervus elaphus xanthopygus*). The commercial species with the population density of 6-8 units per 10 square km. Lives almost in all Bikin River basin (except the main dividing ridge).

Wild boar (*Sus scrofa*). The commercial species with the population density of 6-7 units per 10 square km. Common in the cedar-broadleaf taiga zone. Кабан (*Sus scrofa*).

Roe deer (*Capreolus capreolus*). The highest density is along flood plains of the Bikin river till Dunguza and Laukhe. The roe deer population is relatively stable and includes about 500 animals.

Siberian musk deer (*Moschus moschiferus*). The common

commercial species with the population density up to 30 units per 10 square km. Prefer mountainous spruce-fir forests. During hunting season up to 200 units are procured for musk provision.

From the insectivorous (*Insectivora*) the following species are common: Ussurijsky hedgehog (*Erinaceus europaeus ussuriensis*), large mole (*Mogera robusta*), and some species of shrews (*Soricinae*).

Among the species permanently living on the territory and listed in the Russian Red Book, the most important is conservation of tiger, which subpopulation within the Bikin basin and Central Sikhote-Alin is key for this subspecies conservation.

The state of the Amur tiger population can be characterized as relatively problem-free at the Bikin. Over the last decades, the relatively high and stable number of them has been noted here. This is favored by conservation of large Korean pine-broadleaf forest tracts on this territory, a good state of the tiger's nutritive base, difficult access to the territory and limited hunting.

When the number of the Amur tiger was last recorded in the entire Russian habitat, 45-50 animals were recorded in Pozharsky District, most of them were in the territory of the planned national park.



Fish owl. Photo by S. Avdeyuk

Mandarin duck.
Photo by V. SolkinHazel grouse
Photo by
E. Mogilnikov

Since winter 1997/98, the number of the predator has been recorded at the Bikin monitoring site located in the habitats that are the best for the tiger in the territory under research (the basins of the Bikin's tributaries: Amba, Malaya Takhalo, Klenovka, Taimen, Pushnaya, Lesnukha, etc.). From 1997 to 2013, on this spot 1027 km² in area, the number of the independent tigers fluctuated from 3 to 10 animals (5.8 animals in average). In addition, almost every year tiger cubs (up to 3 animals) were noted on the spot. Over the last 10 years, the recorders noted 28 tiger litters (46 tiger cubs) in the district. 13 times there was 1 tiger cub in a litter; 13 times there were two tiger cubs; once there were three tiger cubs and once there were four tiger cubs. During the 2014 spring recording, the tiger population density was determined to equal 0.3 of an animal / 100 km² in the district under research.

THE BIRD FAUNA of the nominated territory is very uncommon concerning its species composition and ecologic structure. 241 bird species, which belong to 17 classes, are known for being at the Bikin river basin. Among them 171 species (about 71.8%) are noted to nest for a fact, the rest can be met during seasonal migrations period, on wintering grounds or are vagrant. The majority of breeding bird species (97) inhabit the valley broadleaf and Korean pine-broadleaf forests. Rare feathered species, confined to the river bed and, thereafter, to the fish resources and abundance of amphibian in the flood plain forests, are the following: black stork

(*Ciconia nigra*), scaly-sided merganser (*Mergus squamatus*), mandarin duck (*Aix galericulata*), grey-faced buzzard (*Bufo indicus*), osprey (*Pandion haliaetus*) and blakiston's fish-owl (*Bubo blakistoni* or *Ketupa blakistoni*). Long-billed ringed plover (*Charadrius placidus*), very rare endemic species in its areal is common for vast pebble river bars.

Composition of forest massifs and open meadow landscapes attracts many zootypic day birds of prey and owls (hobby falcon (*Falco subbuteo*), amur falcon (*Falco amurensis*), besra sparrow-hawk (*Accipiter gularis* or *Accipiter virgatus*), ural owl (*Strix uralensis*), brown hawk-owl (*Ninox scutulata*), Ussuri screech owl (*Otus sunia*) and others). Columbiformes (*Columbiformes*) are represented by eastern turtle dove (*Streptopelia orientalis*), apodiformes (*Apodiformes*) are represented by northern needletail (*Hirundapus caudacutus*). Coraciiformes (*Coraciiformes*) are represented by oriental dollarbird (*Eurystomus orientalis*). From the piciformes (*Piciformes*) we can name lesser spotted woodpecker (*Dendrocopos minor*), greater spotted woodpecker (*Dendrocopos major*), white-backed woodpecker (*Dendrocopos leucotos*), black woodpecker (*Dryocopus martius*), and the rare species is grey-capped woodpecker (*Dendrocopos canicapillus*). Common Far East representatives of passeriformes (*Passeriformes*) are large-billed crow (*Corvus macrorhynchos*), azure-winged magpie (*Cyanopica cyana*), masked grosbeak (*Eophona personata*), Tristram's bunting (*Emberiza tristrami*), black-faced bunting (*Emberiza spodocephala*) and yellow-

throated bunting (*Emberiza elegans*), long-tailed Rosefinch (*Uragus sibiricus*), black naped oriole (*Oriolus chinensis* L.), white-eye (*Zosterops erythropleura*), ashy minivet (*Pericrocotus divaricatus*), blue-and-white flycatcher (*Muscicapa cyanomelana*), narcissus flycatcher (*Ficedula zanthopygia*), Siberian rubythroat (*Luscinia calliope*), Siberian blue robin (*Luscinia cyane*), gray-backed thrush (*Turdus hortolorum*), eastern crowned warbler (*Phylloscopus coronatus*), pale-legged leaf-warbler (*Phylloscopus tenellipes*), black-browed reed warbler (*Acrocephalus bistrigiceps*) and gray's grasshopper warbler (*Locustella fasciolata*).

48 species nest in fir-spruce forests and mountainous larch and birch-dark-coniferous forests, and the most valuable species for the biodiversity conservation is Siberian grouse (*Falcapennis falcapennis*). Among common species it is worth to note fugitive hawkbit (*Hierococcyx fugax*), Siberian jay (*Perisoreus infaustus*), Eurasian nutcracker (*Nucifraga caryocatactes*), pale thrush (*Turdus pallidus*), Siberian thrush (*Zoothera sibirica*), golden mountain thrush (*Zoothera dauma*), rufous-tailed robin (*Luscinia sibilans*), pallas' warbler (*Phylloscopus proregulus*), Eurasian bullfinch (*Pyrrhula pyrrhula griseiventris*), white-winged crossbill (*Loxia leucoptera Gmelin*), bluetail (*Luscinia cyanura*), black-and-orange flycatcher (*Ficedula mugimaki*).

Relatively poor composition of feathered birds is in the small-leaved forests on old fire sites, where just 21 bird species nest. In mountainous tundra the bird population is more limited (7 breeding species). The main predominant here are chiffchaff (*Phylloscopus*), tree pipit (*Anthus trivialis*), and the most valuable species in terms of bio diversity here is rock capercaillie (*Tetrao parvirostris*).

Waterlogged larch forests and bogs, situated in the Bikin valley, are of special interest because of its bird species diversity (57 species). Junction of northern and southern species of larch-sphagnum bogs and surrounding forest formations appears here in its best way. First of all, these are the following species: hooded crane (*Grus monachus*), pied harrier (*Circus melanoleucos*), Far-Eastern curlew (*Numenius madagascariensis*), Von Schrenck's bittern (*Ixobrychus eurhythmus*), Siberian ruddy crane (*Porzana paykullii*), hemipod (*Turnix tanki*), gray-hooded bunting (*Emberiza fucata*) and grouse (*Lyrurus tetrix*). Nowadays grouse is the very rare species in the Russian Far East. The following species typical for Europe inhabit here: Siberian gray owl (*Strix nebulosa*), European stonechat (*Saxicola rubicola*), golden bunting (*Emberiza aureola*), black-tailed godwit (*Limosa limosa islandica*), sparrowhawk (*Accipiter nisus*) and goshawk (*Accipiter gentilis*), which are in close touch

with tropical representatives: oriental dollarbird (*Eurystomus orientalis*), ashy minivet (*Pericrocotus divaricatus*), white-eye (*Zosterops erythropleura*) and some others. For bog lakes and streams the breeding river ducks are common: falcated duck (*Anas falcata*) and mallard duck (*Anas platyrhynchos*).

From the reliably registered ones in the territory that has become a part of the Bikin National Park, 24 species of the birds are included in the Red Book of Primorsky Krai (2005), which makes up 21.4% of the total list of this Red Book, and these indexes number 17 species and 13.8% respectively of the Red Book of the Russian Federation (2001). 6 species of the birds reliably registered here are included in the IUCN Red List.

AMPHIBIA AND REPTILES

7 amphibian species and 10 reptile species dwell in this territory. Among the limited number of reptiles here, there are rare and endemic species: Amur long-tailed lizard (*Takydromus amurensis*), Tiger Keelback snake (*Rhabdophis tigrinus*), Amur ratsnake (*Elaphe schrenki*), Red-backed ratsnake (*E. rufodesata*), Ussurian mamushi (*Agristrodon blomhoffi*), and Rock mamushi (*Gloydius saxatilis*). The Chinese softshell turtle is of the greatest interest; over the last decades, its number has noticeably decreased, and the species has been included in the RF Red Book. It goes upstream to the middle reaches and inhabits the riverbed and the lakes.

The amphibia and reptiles as well as the fish (especially the mass species) are of a great importance in the trophic chains for the larger vertebrates that feed on them, including the ones of production value (otter, kolinsky, mink, racoon dog, shorebirds).

ICHTHYOFAUNA

Benthos and nekton are well developed in the Bikin river. The river plankton is poorly developed and is mainly represented by microalgae, rotifers (*Rotifera*, =*Rotatoria*) and crustaceans (*Crustacea*). Benthos in the Bikin river basin is represented by various gastropods (*Gastropoda*) and bivalvia (*Bivalvia*) shellfish, water insects larva, oligochaetes (*Oligochaeta*), crustaceans (*Crustacea*) as well as numerous microzoobenthos and microphytobenthos.

The benthos qualitative composition and biomass change from upper to middle stream. In the upper reaches the predominant benthos groups are amphibiotic insects larva: dayfly (Ephemeroptera), stone fly (Plecoptera), caddis fly (Trichoptera) and others. In the middle stream the predominant groups are shellfish (Mollusca), which biomass is

mainly occupied with black snails (*Melanoides*), pearl shell (*Unio*), swan mussel (*Anodonta*), pearl oyster (*Pinctada*). On gravel-pebble and sandy fields in the middle stream (in its upper part) the river benthos is defined by two types of black snails (*Melanoides*), Dahurica pearl shell (*Dahurinaia dahurica*) and water insects larva. On the open grounds and covers there are plenty of stone fly (Plecoptera), dayfly (Ephemeroptera) and caddis fly (Trichoptera) larva. On the softer silted grounds among volutes (Gastropoda) the predominant are black snails (*Melanoides*), and among bivalvia (*Bivalvia*) – several species of large pearl shell (*Unio*). Rather numerous although lesser by biomass are small gastropods (Gastropoda) and bivalvia (*Bivalvia*) shellfish, which are mostly represented not in the river channel, but in flood plain pools. Infauna is well developed on the soft bottoms – some burrow dayfly (*Polamantidae* and *Ephemera*) larva, oligochaetes (*Oligochaeta*), eelworms (Nematoda, *Nematodes*) and others. Benthos biomass in the middle stream may in some occasions reach 10-13 kg per cubic meter, while mean quantity is 100-300 g per cubic meter (including shellfish), in the upper stream – 8-15 g per cubic meter.

The nekton organisms are represented by fish, crustaceans (caltrop (*Pandalidae*)) and Chinese softshell turtle (*Pelodiscus sinensis*), yet survived in the Middle and Lower Bikin. Out of 130 species of the Amur fish, from 49 to 60 species inhabit the Bikin basin, 33 of which belong to cyprinoid fishes (*Cyprinidae*). In the Upper and Middle Bikin the following species have commercial value: Amur grayling (*Thymallus arcticus grubii*), lenok (*Brachymystax*) and taimen (*Hucho taimen*) (under 35 kg weight). Passing species flow up to the Bikin upper reaches for spawning – autumn chum salmon (*Oncorhynchus keta* inf. *autumnalis* Berg) and Far Eastern dace (*Leuciscus brandti*). Passing fish population steady decreases because of raise of anthropogenic pressure in the Amur river, and resident fish population in lack of overfishing stay at the same level. Other valuable fish species in the middle stream are represented by Amur pike (*Esox reicherti*), in small lakes and on the flood plain and terraces above there are plenty of golden carp (formerly *Carassius auratus gibelio*, since 2003 - *Carassius gibelio*). In the upper reaches there are also brook lamprey (*Lampetra reissneri*), Lagowski's minnow (*Phoxinus lagowskii*); in the middle reaches – Amur ide (*Leuciscus waleckii*), Amur gudgeon (*Gobio gobio cynocephalus Dybowski*), Siberian bullhead (*Cottus poeciliopus*) and small ruderal species of slack waters: Amur sleeper (*Perccottus glenii*), nine-spined stickleback (*Pungitius pungitius*) and others.

The fish fauna of the Upper and Middle Bikin consists of various species within 7 families. *Salmonidae* (salmonids) with 5 species and *Cyprinidae* (carp family) with 10-12 species are the richest families with respect of species. The northern lampreys (1 species), graylings (2 species), cottids (2 species), loachgobies (1 species), and true loaches (2 species) are small families. The fish systematics has been brought to conformity with the monograph 'A Catalogue of Jawless Animals and Fishes in the Fresh and Brackish Waters of Russia' (Bogutskaya, Naseka, 2004).

ENTOMOFAUNA

28 insect species listed in the Russian Red Book, inhabit the territory (Annex C1). Lepidopterous insects fauna includes many southern species, endemics and widespread species: swallowtail butterfly (*Papilio*), number of large emperor moths (*Actias*), purple emperor (*Apatura*), underwing moth (*Limemotis*) and black-and-white aeroplane (*Neptis*); beetles are represented by pruners (*Cerambycidae*), bark beetles (*Ipididae*) and gold-beetle (*Chrysomelidae*).

LANDSCAPES

25 types (species) of landscapes are erected within the area of Upper and Middle Bikin. These landscapes spacially and genetically are unified in six series, at that the main factor of these series erection is lithogenic (geologicalgeomorphological) factor, specifically orographic status and exposition.

1. Mountain tundra and half-grown forests. This series is represented by four landscape species related to society of mountain landscapes for external features and functioning conditions.

2. Secondary slope and slope-valley smallleaved forests. This series is represented by four landscape species and the main unify characteristic value is the fact of their secondary natural growth appeared after cutting (more often) or fires (rarer) on the place of early existing natural complexes which often didn't related to the same species or series of landscapes.

3. Dark-coniferous on low gradient slopes and flatten watersheds. These landscapes occupy the greatest area among other landscapes in Upper and Middle Bikin basin, situated along left Bikin River valley side. The main unify characteristic value of seven landscape species is similarity of forest cover: the main timber species are Ajan spruce (*Picea jezoensis*, rarer *Picea ajanensis*) and Khingam fir



Bikin river. Photo by S. Melnikov

(*Abies nephrolepis*) with large admixture of Daurian larch (*Larix dahurica*) especially indicative for landscapes subjected to forest fires short past.

4. Pine-dark-coniferous on low gradient well alight slopes. This series is represented by two landscape species where Korean pine (*Pinus koraiensis*) is of significant value. The main aspect of their difference is insignificant admixture of hardwoods in one landscape species and admixture of Khingam fir (*Abies nephrolepis*) and specifically Ajan spruce (*Picea jezoensis*; *Picea ajanensis* more rarely) for another, also hardwoods could appear as main timber species and Korean pine (*Pinus koraiensis*) could pass into admixture species.

5. Valley and slope-valley mainly broadleaved and mixed coniferous-broad leaved forests. These landscapes spacially

adjoin Middle Bikin valley, butting into space of other landscape series by means of "tongue" over flood plains in Upper Bikin and Svetlovodnaya. Near western boundary of mapping area these landscapes are spread over low gradient slopes of Bikin tributaries valley sides and goes to lowlevel watersheds here and there.

6. Woodless territories. Two remained landscape species joined in one series with kind of convention because they are not similar genetically. But considering that vegetation composition is a new characteristic for landscape diagnosis and mapping in this investigation, so we can consider the integration of these landscape species into one series as rightful, because they are most similar for this characteristic owing to more or less lack of woody vegetation within these landscapes.

2b. History and development

Antropogenic development of the nominated territory started in very ancient times. Ilou hunters (arrived from Zabaikalie) in the process of interaction with the local tribes created a new Tungus-language society (Mukri) in the 7th century AD. Its further development went very close connected to the history and culture of neighbour countries (Old Turkic and Old Mongolian people). Finally they came to form modern ethnoses of South Tungus language group – the Manchu, Udege, Orochis, Nanais, Ulchis peoples. In the middle of the 19th century when the Ussurijsky region finally became the part of Russia, aborigines had occupied the vast territory from Tatar Strait in the north to the southern tributaries of the Ussuri river.

In the 20's the Udege people had 4 territorial groups, each of them included different families' representatives. Each family occupied certain territory, but there was no land ownership. The collectivization among Bikin Udege people started in the second half of 30's. Population consisted of 13 camps was consolidated to 2 villages – Olon and Krasny Yar, where agricultural artels were founded and then united to the trade artel "Okhotnik". The main activities were hunting and wild-growing herbs gathering in the middle and upper parts of the Bikin river basin. Besides aborigines there lived and led the same way of life other peoples like Russians, Ukrainians, Belarus and other nationalities. The particular group was represented by Russian old believers – clerical outcasts hide away from Soviet regime pursuers and Orthodox church in the most far taiga stows and valleys, right in the places of traditional activities of aborigines. In addition with ingress of trade Chinese to taiga in the late 19th – early 20th centuries, the organized implementation of European culture representatives into the culture and life of aborigines, made on the nominated territory the unique, rare in the world synthetic culture of taiga treatment and use

of its biological and spiritual energies, as well as the system of religious faiths, which has a bizarre interweaving of the Udege paganism, early churchless Christianity and native Chinese Taoism.

Basically, at the turn of the 20th century, the Central Sikhote-Alin became the place on the Planet, where East and West - two eternal antipodes of the Earth civilization – true-life and really met, found common language and blended together. Economic activity of the Europeans managed not to become aggressive for unhasting, in some ways lazy (from European point of view) aborigines, and managed to absorb Chinese pragmatism and energy, excessive for even some Europeans, and to dissolve all of that into eternal harmony of great taiga, full of mysteries and pagan symbols. Bearing on this deep ethic-cultural and ethic-ecological synthesis, this harmony of taiga life, which was shared by representatives of each nationality on the nominated territory, legislators of the Primorye in 1933 managed to develop and approve the ideology and status of the ethnic territory of the Sikhote-Alin, based not on ethnic character, but on the character of prevailing human attitude to the nature of taiga. Unique character of this model was noted by society many times on the highest level, and nowadays it remains an invaluable patrimony of all mankind, desirable and hard-to-achieve standard for many territories, where interests of indigenous people and drastic settlers cross.

In 1962, the state production entity (gospromkhoz) was formed on the basis of the Okhotnik ("Hunter") artel in Krasny Yar village. The Pozharsky Gospromkhoz became one of the most effective forms for the management and development of the hunting production. By the middle of the 1970s, about 120 hunters worked there, including about 90 on a permanent basis. The hunting entity's boundaries formed at the time of the state production entity, and it is

limited by them now, too, with its total area of 1,352,100 ha. Today in this territory, hunting is conducted by the Territorial-Neighbor Community of the Indigenous Small-Numbered Peoples 'The Tiger' created in Krasny Yar village in 2003. The community has united and organized the management of all the hunters who perform the production in this territory (Krasny Yar, Olon, Yasenevoye, Sobolnoye, and Okhotnichye villages). In 2008, The Tiger Territorial-Neighbour Community of Indigenous Small-Numbered Peoples has been assigned the rights to use the animals (Primorsky Kray Governor's Resolution No. №571-pa dated October 07, 2008, "On Giving the Territory and Waters 1,352,100 in area to the Kinship Community 'The Tiger' for 10 Years in Order to Use the Animals". License 25 No. 000027 dated November 13, 2009. Long-term license No. 2 dated November 17, 2008).

For the indigenous minorities (the Udege and Nanais people) as well as for early settlers of Russian Far East, the reasonable and sparing use of natural resources is typical from ancient times. Traditional activities (hunting, fishing and, in a less degree, gathering) are mostly directed to satisfaction of local population needs. Till present days nobody from indigenous population will lift hand against deer dam, nobody will shoot a tiger, nobody will kill more wild fowl than can take with away from taiga by himself or more that it is necessary for his family. Due to these peoples' traditional way of life, culture, customs and attitude to nature, the nominated territory conserved the natural landscapes and wildlife on its state of nature. However today the existing way of life is at stake of serious transformation or even total disappearance. Its conservation and resurgence on the base of local initiatives is the task maybe more important that the simple provide of physical guard of nominated territory. Creation or renewal of strong ethno-cultural complex is much more reliable mechanism of nature and human protection from all negative impact from both sides.

Valleys of the Bikin and Bolshaya Ussurka (Iman) rivers are the last places in the world where the habitats of indigenous minorities of Far East people, Iman and Bikin groups of Udege people, are conserved. Their traditional way of life, permanently solicitous and regardful attitude to nature, peculiar ancient culture are closely connected with natural complex of Ussurijsky taiga. Hunting, fishing, wild-grow herbs gathering never were means of profit for them, - they take from taiga just minimum, necessary for self-support.

This territory contains nature-historical sites, widely respected by the Bikin Udege people and other minorities of Primorsky region, such as ancient camps (Bynga, Davastysy, Laukhe, Metakheza, Kartun, Notovasigchi, Bejlaza, Kandagou,

Khabagou, Tantsanza, Sidungou, Kate-Datani, Tugulu, Tsamo-Dynza, Sigou, Ulunga, Bajchelaza, Nyolo and others).

This territory contains ancestor's burials, sacred mountain Sulaymay and other sites that comprise the base of ethnic culture of the Udege people and other native peoples of Primorsky region. Moreover, this territory is natural habitat of Siberian tiger (*Panthera tigris altaica*), which is a sacred animal for the Udege people.

THE HISTORY OF PROTECTING THE MIDDLE AND UPPER BIKIN

State federal, regional and municipal authorities over and over again recognized the necessity of conservation of middle and upper Bikin river basin territory to create favorable conditions for indigenous people economic development based on traditional use of natural resources and conservation of unique natural ecosystems and for providing conditions for ecologic and ethnologic tourism. In 1971 in the middle part of Bikin river a nutwood commercial zone with principal felling prohibition was established (Resolution of RSFSR Council of Ministers № 535, dated 27.09.1971 and № 581, dated 25.10.1971).

As per decision of Primorsky Executive Board of Regional Council № 618 "On additional securing of nutwood commercial zones", the Korean pine (local name Cedar) nut harvesting zone situated in middle part of Bikin River valley was completed for longterm enjoyment for Pozharsky State Economics for Hunting and Trade Administration. It was confirmed by RSFSR State Planning Committee № 163, dated 14.09.1979.

Special chapter of "Long term Program till 2005 on Primorsky Kray nature conservation and rational use of nature resources" (Environmental Program, adopted by 5th Session of 21st convening of Primorsky Kray Regional Council on 28.06.1991) titled "Primorsky Kray SPAs system" specified so-called "ethnic territories" with total area of 19 800 km² including upper and middle reaches of Bikin River basin with area of 12 500 km², the main place of Udege living and trade, for reservation and separation into special environmental fund. The same Programme labeled Upper Bikin with total area of 71 000 ha as perspective for conservation among territories of continental part of Ussurijsky forests natural complex. The following items are pointed out there under the character of conservation sites: spruce-fir forest complexes enriched with Manchu flora including group of Tertiary relics; 20 species of plants listed in Red Data Book, 34 species of vascular plants growing at the boundary of their habitat.



Bikin River. Airscape. Photo by V. Solkin



Early morning on Bikin River. Photo by V. Kantor

In 1992, the special regime and ways of forest fund usage were established within the territory of upper and middle part of Bikin River valley with total area of 1250 thousand ha by the Resolution of Soviet of Nationalities of Supreme Soviet RF № 4537-1, dated 24.02.1992, "On natural complex of Udege, Nanaj and Oroch living in Pozharsky District of Primorsky Krai" and by the Decision of Minor Council of Primorsky Krai of Council of People's Deputies № 316, dated 25.08.1992, "On place of Primorsky Krai aboriginal indigenous residence and economic activity protection". Also all forests situated within the territory were subjected to reclassify in 1 group. The territory of traditional nature use by indigenous people living in Primorsky Krai was established within the territory of Korean pine (local name Cedar) nut harvesting zone on total area of 407.8 thousand ha by the Resolution of Head of Administration of Primorsky Krai (№ 165, dated 11.06.1992). After arriving at decision to reclassify the forests into 1 group, it was made a decision to lead a correction of the project on forest sector organization and development in Verkhne-Perevalnenskoye forestry by the Decision of 2nd Forestry Management Meeting of Primorsky Board of Forest Management in 1993.

In 1998, in the upper part of the Bikin River basin, the State Nature Landscape Sanctuary of krai significance was created (Primorsky Krai Governor's Decree No. 468 dated September 15, 1998) with a view to preserve the unique Sikhotealin's natural landscapes of universal value. It is 746.5 thousand ha in area.

Actively assisted by non-governmental nature-protective organizations, the creation of the state nature sanctuary of federal significance at the Bikin River in 2012 was included in the Conception of Developing the Federal Specially Protected Natural Territories in Russia for the period until 2020. (The Government's Resolution dated December 22, 2011, No. 2322-r, Subclause 1.5).

Finally, the RF Government's Decree dated November 3, 2015, No. 1187 'On Creation of the Bikin National Park' established the specially protected natural territory of federal significance in the middle and upper parts of the Bikin River's basin. The national park with a total area of 1,160,469 ha has been created in order to fulfil the Russian President's assignments (dated November 7, 2013, No. Pr-2624 and dated April 18, 2015, No. Pr-729).

3. Justification for inscription

3.1.a Brief synthesis

THE NOMINEE NATIONAL PARK 'BIKIN', ABOUT 1.2 MILLION HA IN AREA, occupies the middle and upper parts of the drainage basin of the Bikin River, a large right tributary of the Ussuri River, which goes 200 km and then flows into Amur, one of the most powerful water arteries of the whole East Asia. It is the Russia's region that is the most distant from the country's European part – Primorye Krai, more exactly – its northern, the least developed part that lies at the junction with Khabarovsk Krai, another region of Russian Far East. The site is located at latitudes of 46-47° north, in the southern part of the temperate zone, approximately 50 km westward from the coast of the Sea of Japan, 150 km eastward from the border between Russia and China, and 500 km northward from Vladivostok city, the capital of Primorye Krai.

The National Park is located on the western macroslope of the Sikhote-Alin mountain range, in its central part, and covers the heights from 200 to 1900 m above sea level. It includes practically undisturbed mountain taiga landscapes almost fully covered with forests (more than 95 %), with traces of ancient glaciations and volcanism, along with a greatly partitioned relief: numerous deep ravines, scree steeps, rocky ridges, insular mountains and greatly indented plateaus.

The Bikin River Valley is located within the Udvardi's biogeographical province Manchu-Japanese Mixed Forest, which is relatively small in area; now only 2 World Natural Heritage properties are present there: Sikhote-Alinsky Reserve (Russia) and Shiretoko National Park (Japan).

By the wealth of the floristic composition, holocoenotic variety, abundance of relict and endemic, rare and vanishing species, the quantity of arboreal and shrubby stocks as well as other important parameters, these thick, sometimes impenetrable forests, the so-called Ussuriyskaya taiga, are among the first in the whole Northern Hemisphere.

It is one of the last reliable shelters of the Amur tiger in whole East Asia – therefore in the whole world (the habitat of this subspecies lies within Russian Far East, North-Eastern China, and North Korea). Here, in the mountain valley, the predator still finds suitable conditions for habitation, reproduction and nutrition; its main enemy – Homo Sapiens – still penetrates here occasionally, and the traces of the stay and economic activities of the latter are minimal so far.

The Bikin River Valley is a real "tigers' nook", a reserve created by the nature and almost entirely surrounded by barely passable mountain ridges (with heights up to 2000 m), which have always preserved the local nature from human offensive. When talking about Russia's Far East, it is usually accepted to note the presence of "bears' nooks" here, which is absolutely correct and sounds very Russian, but in this case such wording is not quite suitable. What is at issue is the Amur tiger first of all, an extremely exotic representative of the animal world for Russian territory, whose habitat reaches the locality from China's side, as if opening a way to the unusual subtropical nature of South-Eastern Asia. The Bikin River Valley, this huge natural 'cup' 100 – 150 km across that provides shelter not only for the tiger but also for other taiga animals (including big ones such as the bear, Moose, and Manchurian deer), can be compared in this respect with the famous Ngorongoro crater conservation area in Tanzania, one of the most famous African World Heritage properties.

This natural 'cup' contains the whole spectrum of altitudinal belts: from floodplain broadleaf and low-mountain Korean pine-broadleaf forests to medium-mountain dark and light coniferous forests as well as birch crooked forests, dwarf Siberian pine tangles and stony tundras. This permits talking about a high degree of integrity and representativeness of the territory.



Bikin River valley in the middle reaches. Photo by A. Butorin



This corner of nature has been conserved by not only natural reasons (the mountainous relief, difficult access, compactness) as well as the remoteness of this tract from the civilization, but also by virtue of the recently conferred federal protected natural territory status, which will help to preserve the unique forests and their inhabitants more effectively henceforth than it was earlier.

From this viewpoint, the location of the national park at the boundary between the two large regions of the Russian Federation – Primorye and Khabarovsk Krai – is also quite important, as the territory development degree is the least at the junctions of different administrative territorial allotments.

The distance between the site and the most densely populated – European – oblasts of Russia is 8-10 th. km, and the former is located in the south-easternmost outlying districts of Russia. The local nature is very contrasting: at the same time both taiga fauna together with Okhotsk flora representatives and southern species characteristic of North-Eastern China and North Korea (Manchurian species) can be found in the National Park 'Bikin', since it is located in the central part of the Sikhote-Alin. That is why the Bikin River Valley's nature, with its tigers, indigenous Udege population and unusually-looking Ussuriyskaya taiga with high pines, oaks, lindens, poplars, ash trees, and elms, along with lianas that entwine round them, tangles of the thorny medicinal eleutherococcus and aralia, the famous ginseng, the gorgeous Amur cork tree, various brightly-blooming southern plants, is exclusively exotic.

Thus, the Bikin River Valley, where the large national park was established in 2015, undoubtedly deserves the attention of international nature protecting organizations and is worth UNESCO patronage. At that, taking into account the district's similarity with the Russian World Natural Heritage property Central Sikhote-Alin, which already has the status and is geographically located relatively close (about 100–150 km), making the National Park 'Bikin' a nominee for extension of the existing nominated site seems the best option. The same criterion (x) is kept in mind together with the same two aspects: conservation of the Ussuriyskaya taiga as a unique plant formation and the support of the population of the Amur tiger inscribed on the International Red Data Book (refer to 3.1. b.).

The aforesaid is corroborated by the results of a comparative analysis conducted (refer to 3.2.): no obvious analogs of the Bikin River Valley's natural complexes have been found: neither among the existing or prospective World Heritage properties in different countries of the world (including China, Japan, and North Korea, where the most real competitors could hypothetically be discovered), nor among the reserves of the same geographical region (the south of Russia's Far East).

The outstanding global value of the Bikin River Valley (conformity to criterion (x)) has already been confirmed by IUCN experts and was reflected by the decision of the 25th session of the World Heritage Committee (Helsinki, 2001). Since 2010, the Bikin River Valley has been inscribed of Russia's Tentative List as a prospective extension of the existing nomination Central Sikhote-Alin (inscribed on the World Heritage List since 2001, according to criterion (x), too).

3.1.b Criteria under Which the Inscription is Proposed (and Justification for Inscription under These Criteria)

THE BIKIN RIVER VALLEY FULLY MEETS CRITERION (X), AND THIS MANIFESTS itself in the following two aspects:

– Conservation of the large, compact and undisturbed broadleaf and Korean pine-broadleaf Far-Eastern forest tract (“Ussuriyskaya taiga”)

The Korean pine-broadleaf complex in the upstream and especially middle stretch of the Bikin River is in fact the sole East-Asian (consequently, the world’s one) such a large, well conserved, and integral tract of Ussuriyskaya taiga, which was very widespread in this geographical region with monsoon climate and mountainous relief, between the River Ussuri and the coast of the Sea of Japan, in the old days.

Compactly represented in the Bikin’s basin, the broadleaf and Korean pine-broadleaf forests (with a total area exceeding 800 th. ha, i. e. approximately 2/3 of the National Park’s area) are actually full analogs of Eurasia’s preglacial broadleaf forests, but such ecosystems have almost completely transformed or disappeared entirely on the rest of the territory. More than 95 percent of this vast territory is covered with forests; it is located on the western macroslope of the Sikhote-Alin range; it is the sole large basin where trees have never been felled, and that is why it is only this site that can give the idea about how Ussuriyskaya taiga looked like till the mid 19th century.

As a variety of East-Asian broadleaf and mixed forests, Ussuriyskaya taiga may be well recognized as a leader by the biodiversity degree, since these tracts are logically reputed to be among the richest and the most original forest types by the species composition in the whole Northern Hemisphere. These virgin forests play an extraordinarily important role for sustaining the taiga inhabitants’ gene pool.

The valley forest tract is notable for its high concentration of rare, vanishing, and relict plant species. 22 plant species are inscribed on the Russian Red Book and 2 species of vascular plants are in the IUCN Red List. Here the boundaries of habitats of 34 vascular plant species are located: Therorhodion redowskianum (*Rhododendron redowskianum*), Siberian cypress (*Microbiota dicussata*), wrinkled holly (*Ilex rugosa* Fr.), *Bergenia classifolia* var. *pacifica* (*Bergenia pacifica*), roseroot (*Rhodiola rosea*), and this is not the full list of them.

The synthetic character of the flora and fauna of the territory under research is of a great importance: at the same time here one can find both taiga fauna along with Okhotsk-Kamchatka flora representatives characteristic of the more northern districts of Russian Far East and southern species typical of North-Eastern China and North Korea – Manchurian species (the same mixture of the various species, both northern and southern ones, is a peculiarity of the Sikhote-Alinsky Reserve, which is proposed to be supplemented with the National Park ‘Bikin’).

Besides the indubitable nature-protective value, this taiga tract is important for sustaining the habitat of the Bikin River basin autochthons – the Bikin group of the Udege and Nanai. These small-numbered peoples have been populating this territory for many centuries; recently their number has noticeably decreased, their cultural originality is gradually lost and is preserved only on separate “breeding grounds”, the River Bikin being one of them.

Finally, the Bikin River Valley, with its virgin forests, is essential for preserving the Earth’s climate (global warming, Kyoto Protocol): it is a huge reservoir of CO₂ that makes it possible to retain and conserve carbon dioxide as organic substance – wood (please refer to Section 2 of this nomination for more detailed information about Ussuriyskaya taiga in the Bikin River Valley).

– The population of the Amur tiger inscribed on the IUCN Red List as an endangered subspecies

Along with the Sikhote-Alinsky Reserve already inscribed on the UNESCO List, the Bikin River Valley is a key dwelling place of the Amur tiger (*Panthera tigris altaica*) within its area of habitation, which has catastrophically shrunk over the last several decades and has split into separate loosely connected with each other spots of primary taiga that have remained whole only within reserves and national parks. It is here that by the mid last century one of the last breeding grounds of the Amur tiger had been conserved, thanks to which this unique cat has managed to renew its habitation area in Russia. By now in the Bikin River Valley about 40 tigers have been recorded, which make up approximately 10% of the total population.

The Amur tiger population can be characterized as quite problem-free at the Bikin. Over the last decades, the rela-

tively high and stable number of them has been noted here. This is favored by conservation of large Korean pine-broadleaf forest tracts on this territory, a good state of the tiger’s nutritive base, difficult access to the territory and limited hunting as well as the respectful attitude towards the predator by the autochthons: the Udege and Nanai people.

The tiger is especially attached to the broadleaf and Korean pine-broadleaf tracts in the middle part of the Bikin River, but the animal is more and more often noted near its upstream stretch, in the mountains, where only dark coniferous forests grow.

Establishment of the regime of a federally-subordinated protected natural territory in this locality in 2015 will undoubtedly favor the successful renewal and preservation of the tiger population. Along with other Russian reserves of this region (the Sikhote-Alinsky, Lazovsky, Ussuriysky, and Botchinsky Reserves; the National Parks ‘Call of the Tiger’, ‘Udegeyskaya Legenda’, Anyuysky and ‘Land of the Leopard’), the National Park ‘Bikin’ will become a most important element of the united ‘tigers’ econet’ formed now in the south of Russia’s Far East (please refer to Section 2 of this nomination for more detailed information about the Bikin population of the Amur tiger).

Moreover, the nominee territory is inhabited by some other rare and vanishing animal and plant species, which also meets criterion (x).

For example, the IUCN Red List includes 2 species of vascular plants and 5 vertebrate animal species (Amur tiger (*Panthera tigris altaica*), hooded crane (*Grus monachus*), scaly-sided merganser (*Mergus squamatus*), Blakiston’s fish-owl (*Ketupa blakistoni*), and white-tailed sea-eagle (*Haliaeetus albicilla*)).

The Red Book of the Russian Federation contains: 22 plant species (including 17 vascular plant species, for example: ginseng (*Panax*), mountain peony (*Paeonia oreogeton*), and Chinese peony (*Paeonia laktiflora* Pall.)); 5 species of fungi and lichens; and 26 animal species, including 11 vertebrate species, out of which 10 are birds (for example, black stork (*Ciconia nigra*), mandarin duck (*Aix galericulata*), osprey (*Pandion haliaetus*), grey-faced buzzard (*Butastur indicus*), Siberian grouse (*Falciennis falciennis*), long-billed plover (*Charadrius placidus*), as well as 15 invertebrate species. Let us also mention that the Bikin and its tributaries contain a large quantity of a valuable resource for trophy fishing – the Siberian taimen, recently inscribed on the IUCN Red List.

3.1.c Statement of Integrity

THE BIKIN RIVER’S BASIN, WHICH IS LOCATED IN THE CENTRAL PART OF THE Sikhote-Alin mountain chain, is a united, integral and composite natural macrocomplex, the main components of which are closely connected by their common origin, history and evolutionary dynamics, as well as the peculiarities of the modern ecologic processes that take place here.

The protected territory has a shape of a huge, oval, and almost fully closed natural ‘cup’ about 100–150 km across, slightly open only in the west (towards the lower reaches of the Bikin River, Luchegorsk district center and Khabarovsk-Vladivostok highway). It means that the outer ring of the geochemically dominating landscapes (the upper parts of the mountain ridges and surfaces near to the summits) is in fact a buffer zone for the inner, geochemically dependent natural complexes (the low mountains, floodplain and terraces of the Bikin River). The boundaries of the national park have been drawn along the natural ones (watersheds), which, from the viewpoint of nature protection, is rated as a very important advantage, since it permits significantly enhancing the effectiveness of the restrictions imposed.

All these make the protected mountain taiga landscape that covers the integral drainage basin highly resistant to external influences.

The national park comprises the whole characteristic spectrum of mountain taiga landscapes of the Central Sikhote-Alin: floodplain spots and low mountains covered with broadleaf and Korean pine-broadleaf forests (about 200 – 600 m high), medium mountain landscapes with their dark coniferous forests, larch forests, birch crooked forests and the dwarf Siberian pine (600–1600 m), and finally, a zone of bald mountains with scattered stones and mountain tundras that occupy the lofty spots (more than 1600 m high). I. e., this protected natural territory is highly representative.

From the viewpoint under consideration, it is important to note that the National Park ‘Bikin’ is located on the western, more gentle slopes of the Sikhote-Alin, which successfully supplements the main location of the Sikhote-Alinsky Reserve on the opposite, more steep eastern slopes.

The circumstance that the park is located relatively close to the Sikhote-Alinsky Biosphere Reserve, the National Park

'Udegeyskaya Legenda' and several sanctuaries of kray significance also works for the integrity idea. All these make it possible to hope that a reliable regional 'econet' with effectively operating 'biocorridors' aimed at both preserving the tiger population and exchanging the genes among dif-

ferent spots of Ussuriyskaya taiga will be created in the near future. In other words, being self-sufficient and integral, the Bikin River Valley is a part of the more powerful system of the regional protected natural territories that pursue the analogous nature-protective goals.

3.1.e Protection and Management Requirements

SINCE 1993, THE CONSIDERED TERRITORY HAS BEEN PRESERVED UNDER TWO regional statuses: TTNU – a Territory of Traditional Nature Use (the middle part of the Bikin River, about 400 th. ha) and Verkhnebikinsky Sanctuary ('zakaznik' in the Russian language, in the upper reaches, about 750 th. ha). The TTNU and the Sanctuary had a common border, adjoined each other, thus entirely covering the Upper and Middle Bikin. However, the regime imposed there was not strict enough to preserve the valuable – on the Eurasian and even worldwide scale – natural phenomena such as Ussuriyskaya taiga and the population of the vanishing Amur tiger.

In 2015, the two territories were united into one large federal-level protected natural territory – the National Park 'Bikin', the regime of which optimally satisfies the goals set. Under the existing Russian laws, "on the territories of the national parks, it is forbidden to conduct any activities that can damage the natural complexes, flora and fauna beings, cultural and historical objects and that contradict the goals and missions of the national park" (the Law "On the Specially Protected Natural Territories" No. 33-ФЗ adopted in 1995, Article 15, Subclause 2). Such problems as conservation of the native forest cover and populations of the rare animals are traditionally devoted paramount attention in Russia's national parks, and taking into account these factors, as a rule, the whole functional zonal system of the protected territory is built. It was so in this case: approximately 1/3 of the total territory of the National Park 'Bikin' has been defined as the 'reserve zone' (about 22 % of the total area) and the 'zone of special protection' (about 10 %). This clearly evidences that the purely nature-protective goals, along with recreational and educational ones, conservation of the cultural heritage properties and support of traditional nature use forms play an essential role here.

In conformity to the international classification (IUCN), Russian national parks belong to category II. It is the status that, though imposing less restrictions than Russian reserves (category Ia), enables rather a reliable

conservation of separate sights – point nature monuments – and vast spots of both virgin and tame nature (cultural landscape). The last circumstance is crucial, because the discussed territory is compactly inhabited by representatives of the small-numbered indigenous peoples: Udege and Nanai, who continue to need the possibility of using the natural resources on the basis of reasonable, nature-saving consumption. One of the main missions of the National Park 'Bikin', its most important specificity consists in preservation of the way of life, traditions, and customs of the small-numbered Northern peoples (which is usually called sustainable development). According to the functional zonal scheme of the National Park 'Bikin', the traditional economy is permitted on approximately 2/3 of the total territory.

Further, practically the whole territory (99.9%) belongs to forest fund lands and is federally-owned. It is managed by a specially created Directorate composed of specialists from all the necessary domains, including zoologists-gamekeepers – experts at preservation of tigers, forester – experts at maintenance of the unique broadleaf and Korean pine-broadleaf tracts of the Middle and Upper Bikin, as well as ethnographers who study the autochthons' life activities. At present, about 50% of all the workers of the national park are representatives of the indigenous small-numbered peoples of the North.

However, the guarantees of reliable preservation of this locality consist not only in the federal protection status acquired recently, the united subordination and management by the single Directorate. The peculiarities of the territory and geographical position of the National Park 'Bikin' are important in this respect, first of all, such as: the difficult access, large size (about 1.2 million ha – the fourth in area among the 49 National Parks of Russia) and compactness of the tract that fully lies within the Bikin River's drainage basin and is limited by the natural boundaries.

The nominee territory (it is the eastern, the least populated part of Pozharsky district of Primorye Krai) is rather

distant from big human settlements, harmful industrial factories and areas of intense farming. For example, the most considerable local human settlement – Luchegorsk district center, together with several small satellite settlements – is already outside the National Park's boundaries. The distance to the biggest city of the region, the kray center Khabarovsk (0.6 million inhabitants), is about 200-300 km. About 1000 people live near the national parks' boundaries, and only 14 people live directly in its territory in Okhotnichiy ("Hunters") settlement. At present the anthropogenic load is minimal in the region and it has been minimal lately: at that, as it has already been noted, there has never been any significant felling in the region. At the same time, here most people have always (and are) engaged in hunting furbearing animals, fishing, picking various 'gifts of the forest' – wild fruits and herbs, procuring pine nuts and wood for personal needs; however, such activities, as it is known, are the least dangerous from the

nature protection viewpoint. The civilization approaches the National Park from one side only – from the west, where logging districts are concentrated and there is a relatively well-developed infrastructure.

Preservation of the Bikin River's drainage basin will be additionally guaranteed by the projected national park's buffer zone, which will function as an important buffer on its western outskirts, in order to protect the territory from a direct contact with the logging districts.

Finally, let us note that organization of the national park in the Bikin River Valley will favor popularization of the property, since before this the touristic development of the territory was spontaneous and unorganized, sometimes with elements of poaching, which was dangerous for the forests and animals, especially for the fish resources. Great hopes are set on development of the organized tourism (especially sport fishing, ecotourism and aboriginal tourism) in future.

3.2 Comparative Analysis

IN 2001 THE WORLD NATURAL HERITAGE STATUS WAS CONFERRED ON THE Sikhote-Alinsky Biosphere Reserve (about 400,000 ha in area) and the nearby Goraliy Sanctuary (about 5,000 ha in area), which were nominated according to criterion (x) for the two main reasons:

- taking into account the universal value of the native dark coniferous, light coniferous, coniferous-broadleaf and broadleaf forest tracts that have remained intact here (the so-called 'Ussuriyskaya taiga');
- as a key habitat of the Amur tiger (*Panthera tigris altaica*), an endangered subspecies listed on the International Red List.

The Bikin River Valley, which is recommended as extension of the existing nomination, is of the universal value in the same two aspects and is therefore an excellent addition to the Sikhote-Alinsky Reserve territory. And it is important to note that both the Ussuriyskaya taiga and the tiger are 'narrowly localized natural properties' preserved just in few 'core areas', mostly in the south of the Russian Far East. The destiny of the Ussuriyskaya taiga as a unique ecosystem and the survival of the Amur tiger, who is a very rare wild predator, depend on the state of these 'core areas'. Protection of only one of these few 'core areas' is essential but not enough.

This is why we should discuss transformation of the existing Central Sikhote-Alin World Natural Heritage site into a

serial property that would include if not all but at least the main districts of the Ussuriyskaya taiga growth and the most important habitats of the Amur tiger.

A) USSURIYSKAYA TAIGA

**THE GLOBAL CONTEXT:
COMPARISON WITH OTHER WORLD HERITAGE PROPERTIES THAT
INCLUDE MIXED AND BROADLEAF FORESTS**

As it is known, three main regions of mixed and broadleaf forest growth can be marked out: 1) North America (east of the USA and south-east of Canada); 2) Eastern Asia (south of the Russian Far East, Japan, Korea and north-east of China); 3) Western and Eastern Europe (Great Britain, France, Germany, Poland, Belarus, Ukraine, some other countries, and a significant part of the European territory of Russia).

In whole, these areas correspond to one of the biomes from M. Udvardi's classification of the biogeographical provinces – Temperate Broadleaf Forests. They are confined mainly to the southern part of the Temperate Zone (as well as to the northern regions of the Subtropical Zone) and are located between the latitudes of 30–50 degrees north. The high humidity of the climate (in the Eastern Asia it is conditioned by influence of the monsoons) and the relatively warm average annual air tem-

peratures are the most important conditions for such forests to form.

The European forests, which have been greatly changed, are sensibly inferior to the North American and especially Asian ones by the wealth of their floristic composition, holocoenotic variety, abundance of relic and endemic, rare and vanishing species, number of arboreal and shrubby stocks and other important parameters.

A variation of the East Asian mixed and broadleaf forests, the Ussuriyskaya taiga can be well recognized as a biodiversity leader, because these tracts are logically considered to be among the richest and the most original forest types by their species composition in the Northern hemisphere. Table 6 clearly illustrates this fact by showing that the Bikin River Valley outstrips, by some important characteristics, or is approximately equivalent to the other areas of the world mixed and broadleaf forests that already have the World Heritage status. The following are the most important in this comparison:

1) Not all the indicated sites – the potential analogues of the Bikin – were nominated for the UNESCO List according to criterion (x), but only some of them. This demonstrates that the priorities of inscribing such sites onto the UNESCO List were not related to any special biodiversity or presence of globally rare animal and plant species.

2) The East Asian mixed and broadleaf forests (and the Bikin River Valley in particular) differ from the North American and European forests in principle by their species composition for understandable natural reasons. The great differences are observed in the standing trees as well as in the shrubby and herbaceous layers. As a rule, the affinity can be traced only at the levels of a genus, a family and higher taxonomic ranks. Thus, neither Great Smoky Mountains National Park nor several European World Heritage properties can be considered analogous to the Bikin River Valley.

3) The Bikin River Valley differs from its nearest East Asian 'geographic neighbors', i. e. from other forest World Heritage properties, in its huge area (about 1.2 million ha) of practically intact dense forests (of almost 100% coverage) (the area of the neighboring Chinese and Japanese World Heritage properties does not exceed 25 thousand ha, the forests sometimes covering only 50 – 60% of the land). Moreover, the species composition of those heritage properties is noticeably different from the Bikin vegetation, although certain similarity can be noted.

4) The Sikhote-Alinsky Reserve had been the only property with the World Heritage status within the Manchu-Japanese

Mixed Forest biogeographical province until 2005, when the same high status was conferred to Shiretoko, a small national park in the north-east of the Japanese Hokkaido island. However, despite having some common characteristics (for example, the monsoon climate and mountainous relief), Shiretoko and the Bikin River Valley (which belong to the same biogeographical province) cannot be recognized as analogues. For example, Shiretoko is a small peninsula, but not a vast mountain valley as the Bikin, i. e. the sites' sizes are disparate. Moreover, the Japanese heritage property includes the marine waters and several offshore spots as its essential features (the interaction between the land and the sea is highlighted). The ice cover that forms in the shallows (it is the southernmost place in the Northern Hemisphere where coastal ice forms in wintertime) is a peculiarity of Shiretoko. In addition, though they have some common species and both of their floras are synthetic (the northern and southern species are combined), the floral characteristics of the Bikin and Shiretoko are notably different. Finally, if we talk only about the fauna, the Bikin's universal value is mainly related to the Amur tiger that dwells here. At the same time, the universal value of Shiretoko is related to some rare and vanishing species of seabirds and birds of passage as well as to the various salmonid fishes and marine mammals including cetacea.

There are also several mountain forest reserves and parks – World Natural Heritage properties, which are located approximately at the same latitudes and also include mixed and broadleaf forest tracts. For example, these are the **Western Caucasus** property in the south of Russia (x), the **Durmitor Park in Montenegro** (vii, viii, x), **Canadian Rocky Mountain Parks** (vii, viii) and **Olympic Park** in the north-west of the USA (vii, ix). Also, quite a new property inscribed on the UNESCO List in 2016: **Hubei Shennongjia forest reserve** in the Central Eastern China (criteria ix, x), which represents the neighbouring biogeographical province – Oriental Deciduous Forest – in the subtropics, is one of them and is one of the main breeding grounds for biodiversity in China. However, unlike the low and medium mountain territory of the Bikin National Park (with the maximal marks of about 1600–1700 m), where the mixed and broadleaf tracts are zonal, all the aforementioned are real highlands up to 3–4 km and more, where the forest tracts we are interested in are only one of the altitudinal belts.

Thus, no evident analogues for the Bikin National Park and for the Sikhote-Alinsky Reserve, with their vast tracts of the Ussuriyskaya taiga, have been found among the World Natural Heritage properties.

Table 6. Characteristics of the World Heritage properties that include mixed and Korean pine-broadleaf forest tracts (Northern Hemisphere, southern part of the Temperate Zone and northern part of the Sub-tropical Zone).

Name of the World Heritage property / UNESCO criteria	Location / geographic coordinates	Biogeographical province according to Udvardi's classification	Area of the heritage property / percentage covered with forest	Number of vascular plant species	Prevalent arboreal stocks
Great Smoky Mountains, the USA vii, viii, ix, x	South-east of the USA 35° N, 83° W	Eastern forest	209 thousand ha / 80 – 90%	More than 3.5 thousand	White spruce, etc (<i>Picea alba</i> , etc), Canadian hemlock (<i>Tsuga canadensis</i>), Douglas fir (<i>Pseudotsuga menziesii</i>), Weymouth pine (<i>Pinus strobus</i>), northern red oak, etc (<i>Quercus rubra</i> , etc), red maple, etc (<i>Acer rubrum</i> , etc), American beech (<i>Fagus grandifolia</i> , etc), tulip tree (<i>Liriodendron tulipifera</i>), hickory (<i>Carya</i>)
Plitvice Lakes CROATIA vii, viii, ix	Eastern Europe 44° N, 15° E	Mediterranean Sclerophyll	29.5 thousand ha / 60 – 70 %	More than 1200	European beech (<i>Fagus sylvatica</i>) – 73%, fir (<i>Abies sp.</i>) – 22%, spruce (<i>Picea sp.</i>) – 5%, pine (<i>Pinus sp.</i>) – less than 1%
Bialowieza Forest POLAND–BELARUS vii	Eastern Europe 52° N, 23–24° E	Middle European Forest	112 thousand ha / about 90%	More than 900	Norway spruce (<i>Picea abies</i>), Scots pine (<i>Pinus sylvestris</i>), pedunculate oak (<i>Quercus robur</i>), Norway maple (<i>Acer platanoides</i>), littleleaf linden (<i>Tilia cordata</i>), European ash (<i>Fraxinus excelsior</i>), European beech (<i>Fagus sylvatica</i>), common hornbeam (<i>Carpinus betulus</i>), aspen (<i>Populus tremula</i>)
Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany SLOVAKIA–UKRAINE–GERMANY ix	Eastern and Western Europe 48–49° N 22–24° E	Middle European Forest	15 spots with a total area of 33.7 thousand ha / 80 – 90%	About 1 thousand	The European beech (<i>Fagus sylvatica</i>) is the absolute dominant, also oak (<i>Quercus sp.</i>), linden (<i>Tilia sp.</i>), maple (<i>Acer sp.</i>), hornbeam (<i>Carpinus sp.</i>), pine (<i>Pinus sp.</i>), spruce (<i>Picea sp.</i>) and fir (<i>Abies sp.</i>)
Shiretoko JAPAN ix, x	North-east of Hokkaido island 43° N 144° E	Manchu- Japanese Mixed Forest	56.1 thousand ha / 80 – 90%	More than 700	Sakhalin fir (<i>Abies sachalinensis</i>), Glehn's spruce (<i>Picea glehnii</i>), Yezo spruce (<i>Picea ajanensis</i>), Mongolian oak (<i>Quercus mongolica</i>), painted maple (<i>Acer mono</i>), Japanese linden (<i>Tilia japonica</i>)
Shirakami JAPAN x	North of Honshu island 40° N 140° E	Oriental Deciduous Forest	10.1 thousand ha / more than 95%	More than 500	Siebold's beech (<i>Fagus crenata</i>) is the absolute dominant
Yakushima JAPAN vii, x	Ryukyu islands 30° c. ш. 130° в. д.	Japanese Evergreen Forest	10.7 thousand ha / 90%	About 2 thousand	Hemlock (<i>Tsuga sieboldii</i>), momi fir (<i>Abies firma</i>), Japanese red cedar (<i>Cryptomeria japonica</i>), as well as beech (<i>Fagus sp.</i>) and oak (<i>Quercus sp.</i>)

Name of the World Heritage property / UNESCO criteria	Location / geographic coordinates	Biogeographical province according to Udvardi's classification	Area of the heritages property / percentage covered with forest	Number of vascular plant species	Prevalent arboreous stocks
Taishan CHINA <i>i, ii, iii, iv, v, vi, vii</i>	Eastern China 36° N 116-117° E	Oriental Deciduous Forest	25 thousand ha / 70 – 80%	About 1 thousand	Pine (<i>Pinus sp.</i>), spruce (<i>Picea sp.</i>), cypress (<i>Cupressus sp.</i>), oak (<i>Quercus sp.</i>)
Huangshan CHINA <i>ii, vii, x</i>	Eastern China 30-31° N 118° E	Oriental Deciduous Forest	15.4 thousand ha / 50 – 60%	More than 1.6 thousand	Pine (<i>Pinus massoniana</i> , <i>Pinus huangshanensis</i>), oak (<i>Quercus stewardii</i>), beech (<i>Fagus engleviana</i>)
Emeishan CHINA <i>iv, vi, x</i>	Central China 29° N 103° E	Oriental Deciduous Forest / Subtropical Chinese Forest	18 thousand ha / 80-90%	More than 3 thousand	Oak (<i>Quercus sp.</i>), beech (<i>Fagus sp.</i>), pine (<i>Pinus sp.</i>), fir (<i>Abies sp.</i>), many subtropical stocks
Central Sikhote-Alin (Sikhote-Alinsky Reserve) RUSSIA <i>x</i>	South of Russian Far East 44-45° N 135-136° E	Manchu-Japanese Mixed Forest	About 400 thousand ha / more than 95%	About 1.2 thousand	Yezo spruce (<i>Picea ajanensis</i>), Hinggan Fir (<i>Abies nephrolepis</i>), Dahurian larch (<i>Larix Gmelinii</i>), Korean pine (<i>Pinus koraiensis</i>), Mongolian oak (<i>Quercus mongolica</i>), lobed elm (<i>Ulmus laciniata</i>), Amur linden (<i>Tilia amurensis</i>), Arahaga maple (<i>Acer ukurunduense</i>) and Manchurian striped maple (<i>Acer tegmentosum</i>), Amur cork tree (<i>Phellodendron amurense</i>), Manchurian walnut (<i>Juglans mandshurica</i>)
Bikin National Park RUSSIA <i>x</i>	South of Russian Far East 46-47° N 135-138° E	Manchu-Japanese Mixed Forest	About 1,2 million ha / more than 95%	About 1 thousand	Yezo spruce (<i>Picea ajanensis</i>), Hinggan fir (<i>Abies nephrolepis</i>), Dahurian larch (<i>Larix Gmelinii</i>), Korean pine (<i>Pinus koraiensis</i>), Amur linden (<i>Tilia amurensis</i>), Japanese elm (<i>Ulmus propinqua</i>), Japanese poplar (<i>Populus maximoviczii</i>), Manchurian ash (<i>Fraxinus manschuricus</i>), Asian white birch (<i>Betula mandshurica</i>), vetla (<i>Chosenia arbutifolia</i>)

Finally, judging by the content of the Tentative World Heritage Lists of the countries the territories of which overlap the mixed and broadleaf forest zone (USA and Canada, China, Japan and DPRK, some European countries), there are no obvious analogues of the Bikin National Park among the prospective properties either. For example, **Atikaki/Woodland Caribou**, which is located in the central provinces of Canada, is among the prospective ones. It is a mixed heritage property: a cultural and a natural one, nominated, inter alia, according to criterion (x). However, as a matter of fact, it is classic taiga of the Temperate Zone. The Chinese **Jinfushan Forest Park** is another property in the Tentative List; it lies at a latitude of 29 degrees, id est considerably further south than the Sikhote-Alin, in the subtropical zone. Let us also mention the proposed extension of the serial transboundary property that in-

cludes the most preserved spots of beech forests in Slovakia, Ukraine, and Germany – **Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany** (criterion ix). Now it is planned to include surviving beech forests located in the territories of other European countries – Albania, Austria, Belgium, Bulgaria, etc. (12 states in total) – in it. But as it can be easily understood, this type of forest differs in essence from the Ussuriyskaya taiga considered herein.

**REGIONAL CONTEXT:
COMPARISON WITH OTHER SPECIALLY PROTECTED TERRITORIES IN THE SOUTH OF THE RUSSIAN FAR EAST**

Ussuriyskaya taiga is a unique ecosystem that has formed in the south of the Russian Far East, where the taiga zone of the temperate belt gradually turns into the moist de-

ciduous (monsoon) forests of the subtropics. It is here, in the basin of the Ussuri River (a right tributary of Amur), on the slopes of the Sikhote-Alin range, that it is represented the most fully. It is in the central part of the range (to which the Sikhote-Alinsky Reserve and Bikin River Valley belong) that one can meet both the northernmost variations of this taiga (with prevalence of dark the coniferous stocks – Yezo spruce (*Picea ajanensis*) and Khingan fir (*Abies nephrolepis*) – the so-called Okhotsk flora) and more southern ones (with prevalence of native Korean pine-broadleaf tracts and clear evolution of the so-called Manchurian flora).

The mixed – Korean pine-broadleaf forests as well as sea-side oak and other broadleaf – forests occupy about a half of the total area in the Sikhote-Alinsky Reserve. And the Korean pine-broadleaf forests together with the broadleaf forests proper occupy at least 20 percent of the territory of the Bikin National Park, the forests being the most fully represented in the middle part of the Bikin River basin.

Along with this, other significant protected natural territories of this region of Russia could also be under consideration as extension of the Central Sikhote-Alin property, since they represent the same ecosystem – Ussuriyskaya taiga. But these protected natural territories are still not so promising as the Bikin River Valley.

On the one hand, these are reserves of the south of Primorye Krai: **Lazovsky** and **Ussuriysky**, as well as the **Call of the Tiger** and **Land of the Leopard National Parks**, which represent the broadleaf and Korean pine-broadleaf forests as well as the Manchurian flora rather well. However, the areas of these protected territories are relatively small (121, 40, 82 and 262 thousand ha respectively). Further, they do not show the same wide variety of the ecosystems as the Bikin River Valley (evident domination of the southern variations of Ussuriyskaya taiga and lack of the northern ones). Moreover, these protected natural territories are significantly far from the main one – Sikhote-Alinsky Reserve (approximately 200–400 km southward), and geographically some of them are already not a part of the Sikhote-Alin mountain range and exceed its bounds.

On the other hand, the protected natural territories in the south of Khabarovsk Krai that are located 300–400 km to the north of the Sikhote-Alinsky Reserve – **Botchinsky Reserve** and **Anyuysky National Park** – are the ones. Their significant areas (267 and 429 thousand ha respectively) allow considering them to be prime taiga reserves; however, they are located not in the central, but in the northern part of the Sikhote-Alin, with all the specificity that follows

from this (the evidently prevailing northern subkind of Ussuriyskaya taiga).

It is the Udegeyskaya Legenda National Park (the western slopes of the Central Sikhote-Alin, 88.6 thousand ha) that deserves to be specially mentioned in this aspect. In perspective, it could be considered as one more cluster of the Central Sikhote-Alin nomination. The park is located between the Sikhote-Alinsky Reserve and the Bikin National Park, including the valuable virgin Ussuriyskaya taiga tracts.

Thus, the mentioned protected natural territories reflect various parts of the Sikhote-Alin mountain system, and all of them belong to the coniferous-broadleaf as well as broadleaf Far Eastern forests. Id est all of them could hypothetically be considered as augmenters of the existing Central Sikhote-Alin nomination. Nevertheless, the Bikin National Park greatly outstrips the aforementioned reserves both by the area of the Ussuriyskaya taiga within the boundaries and by preservation of these tracts, which has been conserved practically intact, the northern forms of Ussuriyskaya taiga combining with its southern varieties successfully and organically.

B) THE AMUR TIGER

**GLOBAL CONTEXT:
COMPARISON WITH OTHER WORLD HERITAGE PROPERTIES WHERE VARIOUS SUBSPECIES OF THE TIGER ARE PROTECTED**

The Amur tiger (*Panthera tigris altaica*) is one of the 5 tiger subspecies who have survived in the wild by now. This beast was mentioned in the most endangered category – Critically Endangered – of the International Red List relatively not long ago; by now it has been moved to the category of Endangered animals. The Amur tiger dwells on a very limited area – mainly in the south of the Russian Far East, and the coniferous-broadleaf forests that cover the Sikhote-Alin slopes are the optimal habitat for the animal. Almost the whole today's world population of the Amur tiger is associated with this habitat, i.e. approximately 450 – 500 animals. Also, about 20 tigers of the same subspecies dwell in the adjacent Chinese districts.

The Amur tiger can be met nowhere outside this area; and none of the rather numerous World Natural Heritage properties located in Southern, Eastern and South-Eastern Asia, famous for their rare fauna and inscribed on the UNESCO List according to criterion (x) can be said to preserve this tiger subspecies, except for the one – the Russian property Central Sikhote-Alin. The Indian, Nepalese, Indonesian,

Thai and Bangladeshi World Natural Heritage properties enumerated below meet the challenge of preserving other tiger subspecies, mainly the Bengal tiger (*Panthera tigris tigris* or *Panthera tigris bengalensis*), Indochinese tiger (*Panthera tigris corbetti*) and Sumatran tiger (*Panthera tigris sumatrae*) (refer to Table 7).

There are no evident competitors to the Bikin Park among the prospective nominations either. For example, if one studies the content of the Tentative Lists of those countries of the Southern, South-Eastern, and Eastern Asia that overlap the tiger's habitat, they will find several reserves there; however, they preserve other subspecies of this predator (it est not the Amur tiger):

Neora Valley National Park, India: the Bengal subspecies (*Panthera tigris tigris*)

Kaeng Krachan, Thailand: the Indochinese subspecies (*Panthera tigris corbetti*)

Cat Tien National Park, Vietnam: the Indochinese subspecies (*Panthera tigris corbetti*)

Peninsula Malaysia National Park: Malaysia, the Malayan subspecies (*Panthera tigris jacksoni*)

Shennongjia Nature Reserve, China: the South China subspecies (*Panthera tigris amoyensis*)

REGIONAL CONTEXT:

COMPARISON WITH OTHER SPECIALLY PROTECTED TERRITORIES IN THE SOUTH OF THE RUSSIAN FAR EAST

Because the presentday habitat of the Amur tiger (*Panthera tigris altaica*) is very limited, the survival of the animal as a particular subspecies almost fully depends on the environmental protection measures (first of all, on creation of the specialized protected natural territories) in the Ussuriyskaya taiga zone, i.e. in Primorye Krai and in the south of Khabarovsk Krai.

As it is known, now the Central Sikhote-Alin World Heritage property is located in the zone; one of the main challenges of the Sikhote-Alinsky Reserve, its 'core', is to preserve this rare predator. The estimated number of the tigers who dwell in the Reserve is 30-40 animals, which is considered to be one of the biggest pockets of the subspecies within its whole habitat.

Considerably fewer tigers can be met in other protected natural territories of the south of the Russian Far East, for example, in **Lazovsky, Ussuriysky, Botchinsky** Reserves and in the recently established national parks: **Call of the Tiger, Udegeyskaya Legenda, Ayunsky**, and Land of the Leopard. All these protected natural territories play an essential role in creation of a united 'tigers' econet' in the south of the

Russian Far East. However, the Bikin River Valley, especially its middle part, should be recognized as the second pocket in order of importance for the Amur tiger habitation in the south of the Russian Far East. Owing to the vast and virgin Ussuriyskaya taiga tracts, the predator finds excellent conditions for living here. Approximately 40 animals dwell in the locality. They are the reproductive 'core' of the northern subpopulation of the Amur tiger that can be connected with the Sikhote-Alinsky Reserve through effectively acting 'biopassages' in view of the relatively short distance. For this reason it is the Bikin River Valley that is nominee number one to extend the existing Central Sikhote-Alin property in the context of preservation of the Amur tiger (*Panthera tigris altaica*) subspecies.

Let us also mention several regional sanctuaries that lie approximately in the same geographic region as the Sikhote-Alinsky Reserve and the Bikin National Park (the south of Khabarovsk Krai and the north of Primorye Krai). These are the regional **zakazniki (sanctuaries) Taiozhny, Mataisky, Chukensky, and Losiny**. They cannot be considered serious alternative options either. All these are relatively small mountain taiga territories that, though formally overlapping the Amur tiger's habitat as well as the coniferous-broadleaf forest zone, play a substantial role neither in the first aspect nor in the second. Let alone their regional (not federal) protection status.

THE BRIEF SUMMARY:

The territory of the Bikin National Park, which was created in 2015 (it has become the 49th Russian national park), is of an exceptional, universal level value in the two following important aspects that belong to criterion (x):

1. The largest surviving tract of the virgin Ussuriyskaya taiga, a unique ecosystem now represented on the World Heritage List only by virtue of the Sikhote-Alinsky Reserve, is located here. The forest has never been felled at the Bikin; that is why it is only this site that can give the idea about how Ussuriyskaya taiga had looked like till the mid 19th century. So, the vast biome of Temperate Broadleaf Forests as well as the small biogeographical province of Manchu-Japanese Mixed Forest can be represented on the World Heritage List still more fully.

None of the other existing World Natural Heritage properties of Eastern Eurasia (except for the Sikhote-Alinsky Reserve) conserves such ecosystems so well. There are no analogues of Bikin in other regions of the world either (the east of North America and Western Europe), where mixed and

Table 7. Characteristics of the World Heritage properties where tiger subspecies are protected.

Name of the World Heritage property / UNESCO criteria	Location / geographic coordinates	Area of the Heritage property	Tiger subspecies / international rarity category	Approximate total numbers of the tiger in the wild / numbers within the property
Sundarbans INDIA– BANGLADESH <i>vii, viii, ix, x</i>	Ganges delta 21-22° N 88-90° E	About 270 thousand ha	Bengal tiger (<i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i>)/ Endangered	1.7-2.5 thousand / about 260
Kaziranga INDIA <i>ix, x</i>	Eastern India 26° N 93° E	3 thousand ha	Bengal tiger (<i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i>)/ Endangered	1.7-2.5 thousand / about 90
Manas INDIA <i>vii, ix, x</i>	North-Eastern India 26° N 90-91° E	50 thousand ha	Bengal tiger (<i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i>)/ Endangered	1.7-2.5 thousand / ?
Royal Chitwan NEPAL <i>vii, ix, x</i>	South of Nepal 27° N 83-84° E	93 thousand ha	Bengal tiger (<i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i>)/ Endangered	1.7-2.5 thousand / ok. 80
Thungyai-Huai-Kha-Khaeng THAILAND <i>vii, ix, x</i>	Western Thailand 15-16° N 98-99° E	600 thousand ha	Indochinese tiger (<i>Panthera tigris corbetti</i>)/Endangered	550-1240/ ?
Dong Phrayayen-Khao Yai THAILAND <i>x</i>	Southern Thailand 14° N 102° E	615 thousand ha	Indochinese tiger (<i>Panthera tigris corbetti</i>)/Endangered	550-1240/ ?
Tropical Rainforest Heritage of Sumatra INDONESIA <i>vii, ix, x</i>	Sumatra island 2° N 110° E	2.6 million ha	Sumatran tiger (<i>Panthera tigris sumatrae</i>) Critically Endangered	300-680/ ?
Central Sikhote-Alin (Sikhote-Alinsky Reserve) RUSSIA <i>x</i>	South of Russian Far East 44-45° N 135-136° E	About 400 thousand ha	Amur tiger (<i>Panthera tigris altaica</i>)/ Endangered	450-500/30-40
Bikin National Park RUSSIA <i>x</i>	South of Russian Far East 46-47° N 135-138° E	About 1.2 million ha	Amur tiger (<i>Panthera tigris altaica</i>)/ Endangered	450-500/40

broadleaf tracts are widespread, since forests identical to Ussuriyskaya taiga are absent from there at all.

2. This huge and virgin territory is a key dwelling place of the Amur tiger (*Panthera tigris altaica*), who is present on the International Red List as an endangered subspecies. Along with the Sikhote-Alinsky Biosphere Reserve, the Bikin River Valley is the most important dwelling place of this predator, who concentrates here in much greater numbers than in other reserves and national parks in the south of the Russian Far East. Inscription of the Bikin River Valley on the World Heritage List would make the 'tigers' econet' now formed in this region even more effective.

The other tiger reserves of the Southern, Eastern, and South-Eastern Eurasia that have already received the World Heritage status protect not the Amur subspecies but the other tiger subspecies: Bengal, Indochinese, and Sumatran ones.

Judging by the content of the Tentative Lists of those Asian countries where coniferous-broadleaf forests are also widespread and/or where tigers dwell (first of all, China, India, Thailand, Malaysia, and Vietnam), there are no analogues of the Bikin National Park among the prospective World Natural Heritage properties either.

Thus, the Bikin National Park is the largest and integral protected natural territory of the federal level located relatively close to the Sikhote-Alinsky Biosphere Reserve, and compared to the other alternatives available, is the most valuable one from the viewpoint of conservancy of the virgin coniferous-broadleaf forests and support of the

Amur tiger population. It is the best option for extending the already existing World Heritage nomination – Central Sikhote-Alin, which was inscribed on the UNESCO List according to criterion (x) by virtue of the same aforesaid two reasons in 2001. The distance between the reserve and the closest part of the Bikin Valley is about 100–150 km. Moreover, from the viewpoint of geography and nature protection, it is well that the Bikin National Park is located on the western slopes of the Sikhote-Alin, while the Sikhote-Alinsky Reserve mainly covers the opposite, eastern slopes.

In perspective, new plots may be added to this growing nomination, first of all, the Udegeyskaya Legenda National Park, which lies between the two aforementioned large protected natural territories and is valuable from the viewpoint of protection of both the Ussuriyskaya taiga and Amur tigers, but not only that: this place is inhabited by the Udege – representatives of the small-numbered indigenous people whose life is inseparably linked with the surrounding natural setting; maintenance of their habitual way of life is a special task.

It is also sensible to study the possibility to extend the nominated property to the territory of Khabarovskiy Krai by virtue of the specially protected natural territories of regional significance – Mataisky and Chukensky Sanctuaries, which are contiguous to the Bikin National Park territory. All these territories are capable of ensuring a long-term cohesion of the nature-protective zones.

3.3 Proposed Statement of Outstanding Universal Value

A) BRIEF SYNTHESIS

The nominee National Park 'Bikin', about 1.2 million ha in area, occupies the middle and upper parts of the Bikin River's drainage basin (the basin of the Sea of Okhotsk). The site is located in the south of Russia's Far East, in Primorye Krai, in the central part of the Sikhote-Alin mountain chain, on its western macroslope.

The territory covers the heights from 200 to 1900 m above sea level, including the whole spectrum of the valley, mountain taiga, and bald mountain complexes of this region. More than 95 % of it is covered with forest, which has never been industrially felled here, the resident population numbers only 1 th. people (mainly in the territories adjacent to the National Park), who have always engaged in hunting, fishing, picking wild plants, pine nuts, and other forest gifts.

The territory of the Middle and Upper Bikin has unique

landscape and biogeographical characteristics. Being a genuine model of Russian Far East nature, it is one of the largest, the most integral and well-preserved mixed forest tracts in the whole Northern Hemisphere. A variation of East-Asian mixed forests, the local Ussuriyskaya taiga includes practically undisturbed broadleaf and Korean pine-broadleaf forest stands that are notable for the wealth of their floristic composition, holocoenotic variety, abundance of relict and endemic, rare and vanishing species, arboreous and shrubby stocks.

The Ussuriyskaya taiga in the Bikin Valley shelters a number of vanishing and rare plant and animal species, the Amur tiger (*Panthera tigris altaica*) being the main one (endangered in the IUCN Red List), the local population of which consists of about 40 animals.



Amur tiger. Photo by V. Solkin

This corner of nature has been conserved by not only natural reasons (the mountainous relief, difficult access, compactness) as well as the remoteness of this tract from the civilization, but also by virtue of the recently conferred federal protected natural territory status (national park), which will help to preserve the unique forests and their living inhabitants.

B) JUSTIFICATION FOR CRITERIA

The unique natural characteristics of the Middle and Upper Bikin evidence its full compliance with criterion (x), and this manifests itself in the following two aspects:

– **Conservation of the large, compact and undisturbed broadleaf and Korean pine-broadleaf Far-Eastern forest tract ("Ussuriyskaya taiga")**

The Korean pine-broadleaf complex in the upstream and especially middle stretch of the River Bikin is in fact the sole East-Asian (consequently, the world's one) such a large,

well-conserved, and integral tract of Ussuriyskaya taiga, which was very widespread in this geographical region with monsoon climate and mountainous relief, between the River Ussuri and the coast of the Sea of Japan, in the old days.

Compactly represented in the Bikin's basin, the broadleaf and Korean pine-broadleaf forests (with a total area exceeding 800 th. ha) are actually full analogs of Eurasia's pre-glacial broadleaf forests, but such ecosystems have almost completely transformed or disappeared entirely on the rest of the territory. It is the sole large basin where trees have never been felled, and that is why it is only this site that can give the idea about how Ussuriyskaya taiga looked like till the mid 19th century.

As a variety of East-Asian broadleaf and mixed forests, Ussuriyskaya taiga may be well recognized as a leader by the biodiversity degree; these tracts are among the richest and the most original forest types by the species composition in the whole Northern Hemisphere.

The synthetic character of the flora and fauna of the territory under research is of a great importance: taiga fauna

along with Okhotsk-Kamchatka flora representatives, on the one hand, combine with southern, Manchurian species.

The forests in the Bikin basin are inhabited by the autochthons of the River Bikin basin – the Bikin group of the Udege and Nanai people. Life activities of these peoples are impossible without preserving the taiga.

– Conservancy of the population of the Amur tiger inscribed on the IUCN Red List as an endangered sub-species

Along with the Sikhote-Alinsky Reserve already inscribed on the UNESCO List, the Bikin River Valley is a key dwelling place of the Amur tiger (*Panthera tigris altaica*). It is here that by the mid last century one of the last breeding grounds of the Amur tiger had been conserved, thanks to which this unique cat managed to renew its habitation area in Russia. By now in the Bikin River Valley about 40 tigers have been recorded, which make up approximately 10 % of the total population.

The Amur tiger population can be characterized as quite problem-free at the Bikin. The tiger is especially attached to the broadleaf and Korean pine-broadleaf tracts in the middle part of the Bikin River, but the animal is more and more often noted near its upstream stretch, too.

Along with other Russian reserves of this region, the National Park 'Bikin' will become an essential element of the united 'tigers' econet' formed now in the south of Russia's Far East.

Moreover, the nominee territory is inhabited by some other rare and vanishing animal and plant species, which also meets criterion (x). For example, the IUCN Red List includes 2 species of vascular plants and 5 vertebrate animal species (*Panthera tigris altaica*, *Grus monachus*, *Mergus squamatus*, *Ketupa blakistoni*, and *Haliaeetus albicilla*).

C) STATEMENT OF INTEGRITY

The Bikin River's basin, which is located in the central part of the Sikhote-Alin mountain chain, is a united, integral and composite natural macrocomplex, the main components of which are closely connected by their common origin, history and evolutionary dynamics, as well as the peculiarities of the modern ecologic processes that take place here.

The protected territory has a shape of a huge, oval, and almost fully closed natural 'cup' about 100–150 km across, slightly open only in the west, towards the lower reaches of the Bikin River. The boundaries of the national park have been drawn along the natural ones – the lofty watershed

ranges up to 1500–2000 m high. This makes the protected mountain taiga landscape that covers the integral drainage basin highly resistant to external influences.

The National Park comprises the whole characteristic spectrum of mountain taiga landscapes of the Central Sikhote-Alin: floodplain spots and low mountains covered with broadleaf and Korean pine-broadleaf forests (200–600 m), medium mountain landscapes with their dark coniferous forests, larch forests, birch crooked forests and the dwarf Siberian pine (600–1600 m), as well as a zone of bald mountains with scattered stones and mountain tundras that occupy the lofty spots (more than 1600 m high).

The National Park 'Bikin' is located on the western slopes of the Sikhote-Alin, which successfully supplements the main location of the Sikhote-Alinsky Reserve on the opposite, eastern slopes.

D) REQUIREMENTS FOR PROTECTION AND MANAGEMENT

The National Park 'Bikin' is a federal-level protected natural territory, its regime satisfies the set goals optimally. In conformity to the international classification (IUCN), Russian national parks belong to category II. It is this status enables a reliable conservation of both the separate sights and vast spots of the virgin or tame nature.

Conservation of the valuable forest stands is a priority of the adopted functional zonal system of this park; that is why 1/3 of its total territory has been defined as the 'reserve zone' and 'zone of special protection'.

A second mission consists in preserving the way of life of the small-numbered Northern peoples – Udege and Nanai – who live here. That is why benign economic activities to support the local people are permitted on 2/3 of the park's total territory.

Practically the whole territory is federally owned. It is managed by a specially created Directorate, and representatives of the aborigines are actively attracted to the management.

Preservation of the Bikin River's drainage basin will be additionally guaranteed by the projected national park's buffer zone, which will function as an important buffer on its western outskirts, in order to protect the territory from a direct contact with the logging districts.

At present, there are no strong and direct threats to the natural complexes of the Bikin River Valley; however, logging districts have extended from the west close to the boundaries of the protected natural territory. This circumstance should be taken into account first of all when planning the national park's activities in future.



The Bikin National Park was created in the upper and middle part of the Bikin River basin, in the central part of the Sikhote-Alin mountain chain on an area of 1,160,469 hectares on November 3, 2015. Here, the largest tract of the Korean pine-broadleaf forests of Ussuriyskaya taiga, which supports about 10% of the total number of the Amur tiger, has remained virgin and intact. The most remote spawning areas of the salmonids of the Ussuri River basin, the nesting sites of the scaly-sided merganser, fish owl, and hooded crane have been taken under protection.

According to the Russian Federation President's assignment, the first Russian specially protected natural territory of federal significance one of the main tasks of which is to protect and preserve the traditional way of life of the indigenous small-numbered peoples – Udeges and Nanais – has been created here. They participate in the management of the Park through the special Council, the President of which is the Deputy Director responsible for the traditional use of the nature in 70% of the National Park's area.

Bikin National Park

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The Natural Heritage Protection Fund was established in 2000 in compliance with article 17 of the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage. The Fund's priority is the overall support of World Heritage sites, as well as obtaining this status for new natural sites both in Russia and the CIS.
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WWF is one of the world's largest and most experienced independent conservation organizations, with almost 5 million supporters and a global network active in more than 100 countries. WWF has been working in the Russian Far East since 1994 based on the international Amur Ecoregion comprehensive program. **WWF-Russia Amur branch's** main task is to conserve rare animals and their habitats. WWF has assisted in establishing two nature reserves, six national parks, two federal and over 40 provincial refuges on 7,5 million hectares. In cooperation with other organizations, the Amur tiger has risen in number and become stable while the number of the Amur leopard has tripled. WWF's freshwater program restores the Oriental stork and white-naped crane; contributes to keep the Amur River free-flowing and to protect its wetlands.

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