

Nomination

# **Bikin River Valley**

## **(Extension of the “Central Sikhote-Alin” World Heritage property)**

(RUSSIAN FEDERATION)

Proposal for inscription on  
the UNESCO Cultural and Natural World Heritage List

**Prepared by:**

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**With the assistance of:**

- WWF Amur Branch

**2010**

## Table of Contents:

IDENTIFICATION OF THE PROPERTY .....	6
DESCRIPTION OF THE PROPERTY .....	12
JUSTIFICATION FOR INSCRIPTION .....	53
STATE OF CONSERVATION AND FACTORS, AFFECTING THE PROPERTY .....	68
PROTECTION AND MANAGEMENT OF THE PROPERTY .....	74
MONITORING.....	84
DOCUMENTATION.....	92
CONTACT INFORMATION OF RESPONSIBLE AUTHORITIES.....	98
SIGNATURE ON BEHALF OF THE STATE PARTY .....	102
ANNEXES.....	103

# EXECUTIVE SUMMARY

State Party	Russian Federation
State, Province or Region	Primorsky Kray, Pozharsky District
Name of Property	Bikin River Valley (extension of the "Central Sikhote-Alin" World Heritage property (766))
Geographical coordinates to the nearest second	Nominated as extension of the "Central Sikhote-Alin" World Heritage property, the territory is situated within the following coordinates: the northernmost point - 47° 18'N, 137° 06'E; the southernmost point - 46° 10', 137° 02'; the westernmost point - 46° 45', 135° 30'; the easternmost point - 46° 40', 137° 54'.
Textual description of the boundary (-ies) of the nominated property	<p><u>Northern boundary.</u> From the intersection point of the left eastern Takhalo River drainage divide with the Bikin and Khor rivers drainage divide to the point of convergence of the Khor-Bikin-Edinka rivers drainage divide. The whole northern boundary is in line with the administrative boundary between Primorsky and Khabarovskiy Kray.</p> <p><u>Eastern boundary.</u> From the point of convergence of the Khor-Bikin-Edinka rivers drainage divide, southwards principal directions, per main divide of the Sikhote-Alin ridge. Eastern boundary is in line with the administrative boundary between Pozharsky and Terneyskiy Districts of Primorsky Kray.</p> <p><u>Southern boundary.</u> Per main divide of the Sikhote-Alin ridge, to the point of convergence of the main divide of the Sikhote-Alin with the Bikin and Bolshaya Ussurka (Iman) River drainage divide, then per this drainage divide to the Predok (Situkhe) mountain. Southern boundary is in line with the administrative boundary between Pozharsky and Krasnoarmeyskiy Districts of Primorsky Kray.</p> <p><u>Western boundary.</u> Southern part of the western boundary goes from the Predok (Situkhe) mountain, down-stream of the Sredniaya (Situkhe) River to the Bikin River stream. Then boundary goes westwards along Bikin River to the mouth of the Small Berestianka River. Northern part of the western boundary goes from the Bikin River northward-north-east along the Small Berestianka and Polynikha (Chanza) drainage divide, drainage divide of the Bikin River left feeders, through the 934 altitude, along the Alchan and Takhalo rivers drainage divide, through the 591 altitude, to the Khorsko-Bikinskiy drainage divide (to the boundary with Khabarovskiy Kray).</p>

A4-size map of the nominated property, showing the boundaries and buffer zone (if present)

Physiographic map of the north of Primorsky Krai showing the boundaries of the nominated property and "Central Sikhote-Alin" World Heritage property. Scale 1:500 000 (Annex 2).

### Justification: Statement of Outstanding Universal Value

Outstanding Universal Value of the Bikin river valley as an integrated part of the Central Sikhote-Alin natural complex (meets criteria x) is already confirmed by IUCN experts and is fixed in the decision of 25-th Session of World Heritage Committee (Helsinki, 2001).

One of the principal reasons of Central Sikhote-Alin serial nomination preparation is the requirement for protection of endangered population of Siberian tiger (*Panthera tigris altaica*). Activity of the Sikhote-Alin Reserve and protected territories in the Bikin River valley, designing of new Special Protected Natural Areas (SPAs) within the Central Sikhote-Alin are targeted mostly to conservation of the key habitats of Siberian tiger (*Panthera tigris altaica*). Bikin River basin is the primary wildlife habitual area of the Siberian tiger (*Panthera tigris altaica*), and, according to the data of 2004-2005, about 10% of all Far East population of this rare species inhabits here.

Moreover, cedar-broadleaf complex of the upper and middle stream of the Bikin river is actually globally unique and exclusive preserved entire massif of formerly widespread Ussuri taiga. Besides its apparent nature protection value, this massif is essential for maintaining the animal habitats in their natural conditions which directly affects the well-being of the Bikin river valley indigenous people belonging to the bikin group of the Udege.

Nominated area is a key habitat of various rare and endangered species of animals and plants which in IUCN Red List (including hooded crane (*Grus monachus*), scaly-sided merganser (*Mergus squamatus*) and fish owl (*Ketupa blakistoni*)) and in RF Red Data Book (including black stork (*Ciconia nigra*), ginseng (*Panax ginseng*), mountain and lacteous peony (*Paeonia oreogeton* S. Moore and *Paeonia lactiflora*)). 2 species of the vascular plants and 5 species of the vertebrate animals are the total amount of the species listed in the IUCN Red List, 22 plant species (including 17 species of the vascular plants and 5 species of fungi and lichen) and 26 animal species (including 15 species of invertebrates and 11 of vertebrate) met in Bikin River valley listed in RF Red Data Book.



Criteria under which  
property is nominated  
to the UNESCO World  
Heritage List

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(x)

Name and contact  
information of official local  
institution/agency

Organization:  
Address:  
Tel:  
Fax:  
E-mail:  
Web address:

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# 1 Identification of the property



**Bikin river**  
Photo by S. Melnikov



### **1a. Contry (and State Party if different)**

Russian Federation

### **1b. State, Province or Region**

Primorsky Kray, 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 seconds**

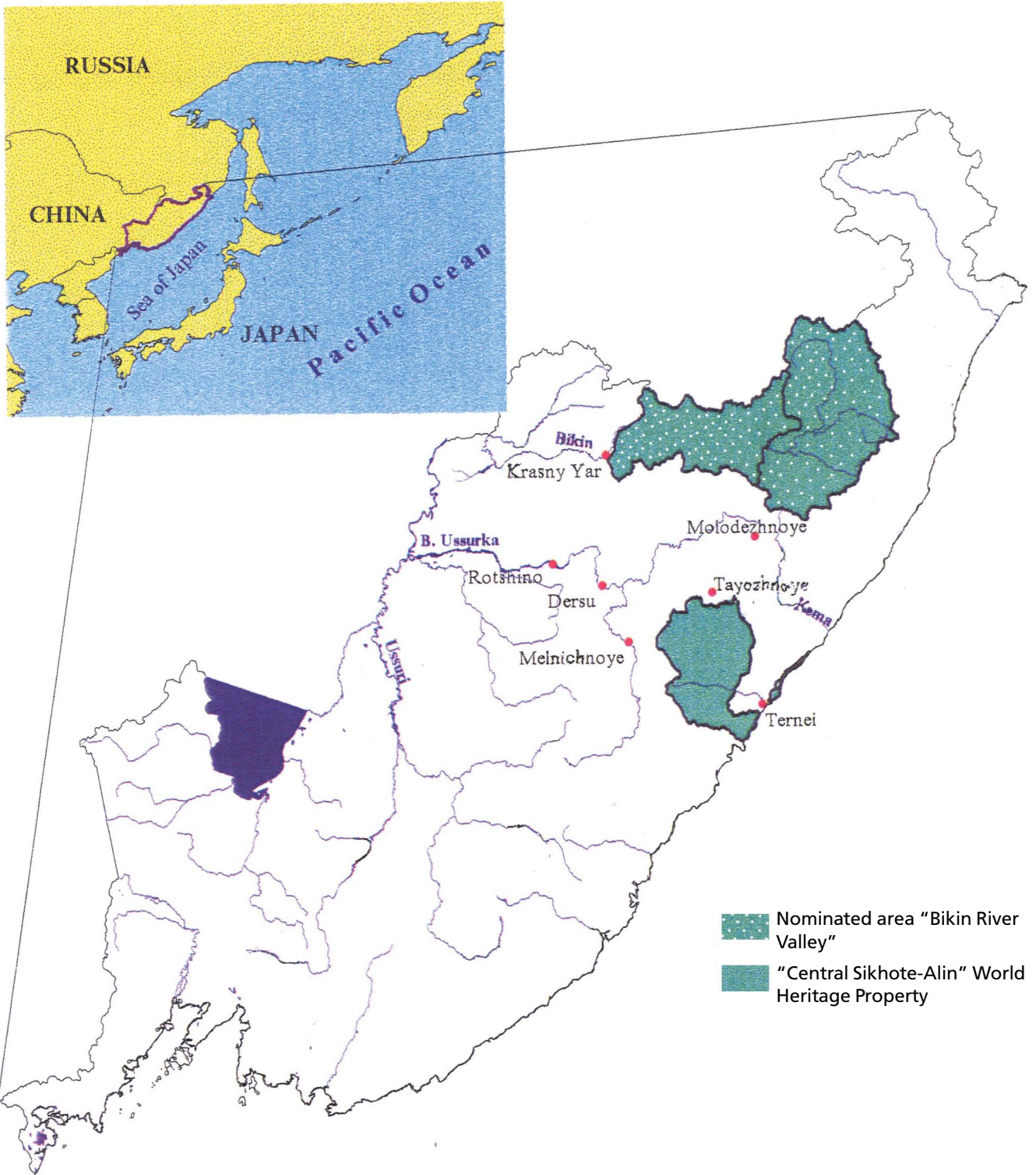
Nominated as extension of the "Central Sikhote-Alin" World Heritage property, the territory is situated within the following coordinates:

the northernmost point - 47° 18'N, 137° 06'E;  
the southernmost point - 46° 10', 137° 02';  
the westernmost point - 46° 45', 135° 30';  
the easternmost point - 46° 40', 137° 54'.

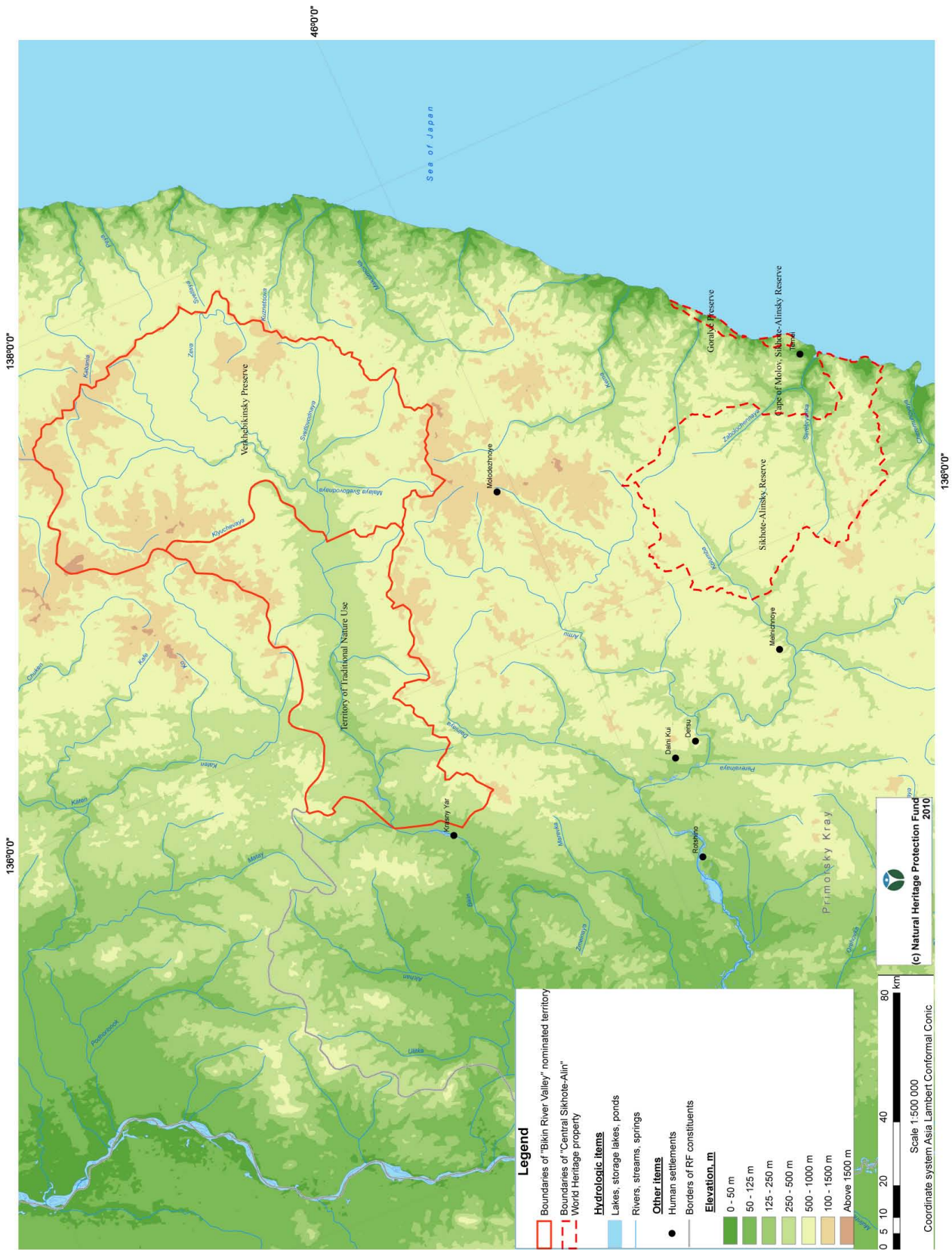
### **1e. Maps and plans, showing the boundaries of the nominated property and its buffer zone**

- A1. Map showing location of the nominated area within the territory of Primorsky Kray.
- A2. Physiographic map of the north of Primorsky Kray showing the boundaries of the nominated area and "Central Sikhote-Alin" World Heritage property. Scale 1:500 000 (rolled and to be found separately from the text).
- A3. Map of Primorsky Kray SPAs.

A1. Map showing location of the nominated area within the territory of Primorsky Krai.



**A2. Physiographic map of the north of Primorsky Krai showing the boundaries of the nominated area and "Central Sikhote-Alin" World Heritage property.**



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

The total area of the property is 1 207 636 ra.

It is include 2 conservation areas:

- State Landscape Nature Preserve of Regional Value “Verkhnebikinsky” with area of 746 482 ha;
- The Territory of traditional nature use of the indigenous small people – residents of the Pozharsky District of Primorsky Kray, with area of 461 154 ha (including Bikin nutwood commercial zone and water conservation zone).



## 2 Description



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



## 2a. Description of Property

The nominated territory is situated 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 Amur-Coastal physiographic region. However while the Sikhote-Alin State Reserve covers mainly the eastern macro slope of Central Sikhote-Alin, the nominated territory occupies its western macro slope, adding a consonant feature to recognized outstanding universal value of the World Natural Heritage site. The nominated Special Protected Natural Areas represent the landscape preserve “Verkhnebikinsky” and the Territory of traditional nature use of the indigenous small people – they adjoin each other and occupy the upper and middle parts of the Bikin river valley situated at the North of Primorski Region.

### 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 A3). The total length of the River 560 km, basin area - 22.3 thousand km<sup>2</sup>. 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 spe-

cies 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 sires 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 m<sup>3</sup>/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 are barred by Lower Cretaceous deposits more than 7000 m thickness. 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. Volcano-structures 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 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 coal-bearing basin is Verkhnebikinsky fault trough limited by lateral faults and adjacent to the left side of Bikin River valley. It is made of coarse-grained 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. Basalt 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.

**Bikin River.**  
**Airscape**  
Photo by V. Solkin





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

### **Stream-bank erosion**

Photo by S. Melnikov





## 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/km<sup>2</sup>. 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 occured. 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.

This area is characterized by the lowest value of hydromorphological coefficient over the Primorsky Kray, 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 Kray 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

### **Overslaughs on Bikin River**

Photo by S. Melnikov



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 km<sup>2</sup>, 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 m<sup>3</sup>/sec. Average annual runoff module - 13.1 l/s/km<sup>2</sup>, 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% run-off 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.

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 a maximum 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/m<sup>3</sup>) occurs in May-July, the average number of days with the turbidity of more than 50 g/m<sup>3</sup> is 13 days and more than 100 g/m<sup>3</sup> – 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 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.

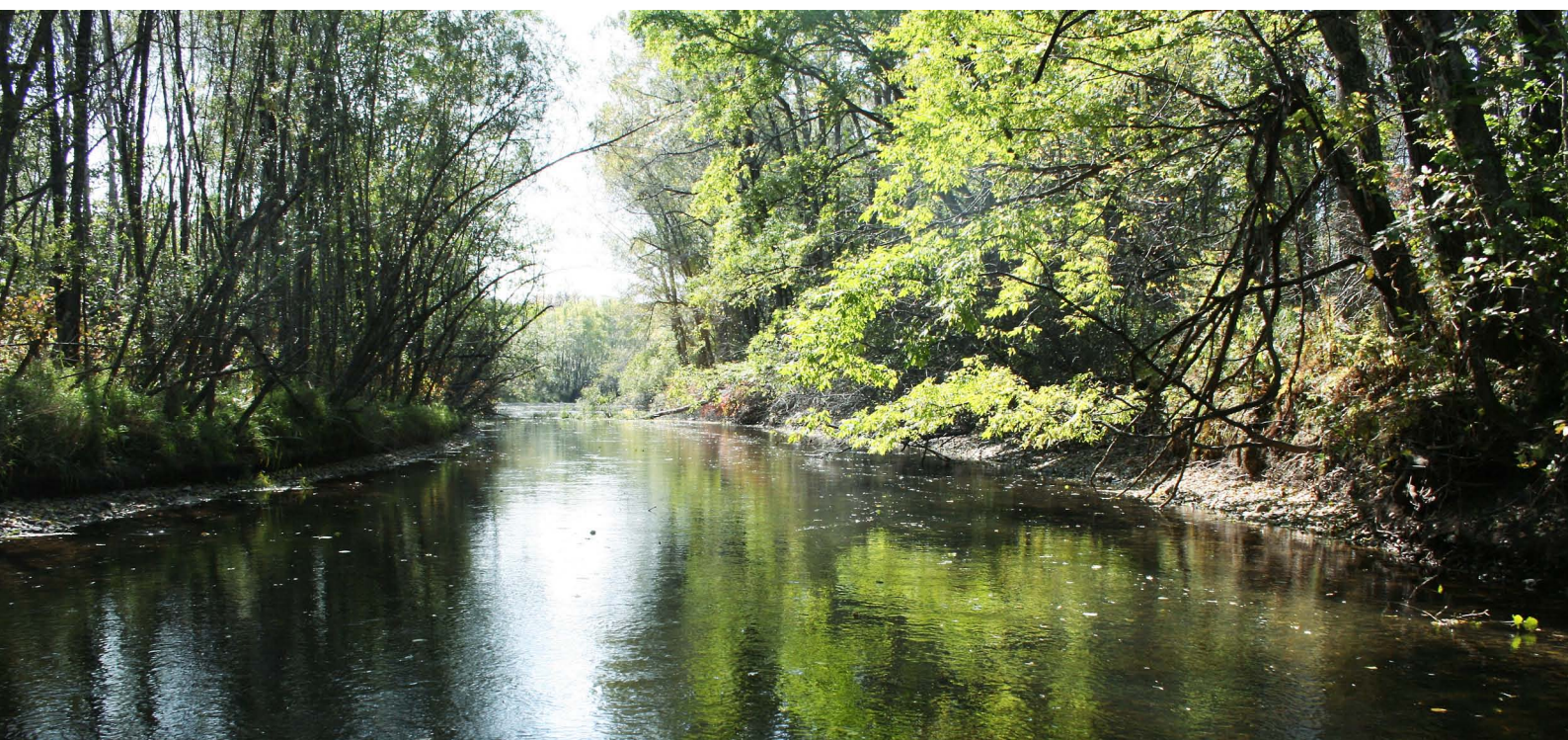


**Table 1. Rivers, longer than 25 km, with allocation of additional forbidden forest strips of 300 m width on each banks (Bikin River basin)**

River name – inflow	River name – inflow
Ada – Bikin	Plotnikova – Bikin
Maly Kilou – Kilou	Levaya Klyuchevaya – Klyuchevaya
Kilou – Bikin	Zeva – Bikin
Bolshoy Kilou – Kilou	Kamenny – Zeva
Nizhniy Kilou – Kilou	Volnushka – Bolshaya Svetlovodnaya
Antonovsky – Zeva	Malaya Svetlovodnaya – Bikin
Sagdy-Biasa – Zeva	Terrasnaya – Bikin
Khvoyanka – Bikin	

### **Bikin arm**

Photo by P. Phomenko



**Table 2.**  
**Rivers with length of 10–25 km, with allocation of forbidden forest stripes of 10–150 m width depending on topographic conditions (Bikin River basin)**

River name – inflow	River name – inflow
Levy Bikin - Bikin	Ivanova – Bikin
Samsonov – Levy Bikin	Levoe Sagdy-Biasa – Sagdy-Biasa
Anik – Bikin	Pravy Bikin – Bikin
Maly Bikin – Bikin	Nemezsha – Bikin
Kyu – Ada	Novozhilovsky – Bikin
Protochny – Klyuchevaya	Zhimolost – Bolshaya Svetlovodnaya
Malaya Zeva – Zeva	Rog – Volnushka
Marevy – Zeva	Zmeyka – Bolshaya Svetlovodnaya
Pravaya Zeva – Zeva	Porozhistaya – Svetlovodnaya
Maly Kamenny – Kamenny	Skalisty – Bertsovaya
Burovoy – Kamenny	Khangusa – Zeva
Pescherka – Svetlovodnaya	Zabolotnaya – Zeva
Komarov – Svetlovodnaya	Berezovaya – Zeva
Pologiy – Svetlovodnaya	Levy Kamenny – Kamenny
Svetlyanka – Bolshaya Svetlyanka	Levy Antonovsky – Antonovsky
Chuyka – Bolshaya Svetlovodnaya	Ternaysky – Nizhny Kilou
Magistralny – Malaya Svetlovodnaya	Sazonov - Kilou
Solnechny – Bikin	Sokhatiny – Levaya Klyuchevaya
Zolotoy – Malaya Svetlovodnaya	Sobolinaya – Aga
Zhimolostnaya – Malaya Svetlovodnaya	

## Climate

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

**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 it's 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/cm<sup>2</sup> (maximum in June – an average of 15 kcal/cm<sup>2</sup>). About 40% of this amount falls on the annual radiation bal-

ance (40-45 kcal/cm<sup>2</sup>), with its maximum intensity in June – up to 0,61 kcal/cm<sup>2</sup>•min.

**Cloudiness annual course** directly related to seasonal change of atmospheric circulation. Cold and dry air masses which are dominated in winter and arised in Asian anticyclone zone on the north-west, cause a clear weather with large majority of clouds in top and middle level, with almost complete absence of lower level clouds. In summer a change of air masses direction to the opposite occur – from the south-east to the north-west (from the zone of the Pacific subtropical anticyclone to the Asian depression) at the same time with increasing moisture content, causing at this time the maximum values of the frequency of different states of the sky and clouds. As a result, significant seasonal differences in the nature and amount of cloudiness is formed: in winter – the domination of the top and middle level; in summer – the domination of lower level clouds (usually stratus forms), often accompanied by the formation of fog. Clear and grey days (according to the total and low clouds) are marked in the east of the area during the year as a whole (58/154 and 117/41) and essentially rarer in the west (41/125 and 140/45). At the same time, the fogs are more frequent in the east than in the west – 111 against 42.

Under these conditions, atmospheric humidity (one of the important elements of territory moisture regime – a meaningful, in particular, for comfort level of the climate) meet with notable fluctuations (from 65% to 86%) during the year and seasonably. Much of the year, except the winter season, relatively lower values of monthly average relative air humidity are indicative for the eastern regions in comparison with western ones. The overall picture of the extreme distribution of the number of days with relative air humidity (less than 30% and above 80%, i.e. dry and humid days) is more complicated in comparison with described above. Less than 30% relative air humidity days in summer and winter often occur in the eastern regions and more often in the western in mid-seasons; more than 80% - much higher rates constantly in the eastern regions with their peaks in December and January. However, variations of relative air humidity in some years could be high, especially in spring and autumn periods.



**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 *atmospherical 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).

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 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-

per 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 upwind 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 falls, 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.

**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/sm<sup>3</sup> (in the early winter) to 0.28 g/sm<sup>3</sup> (to the early April). Ultimate water reserves in snow cover (according to snow surveys over 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.

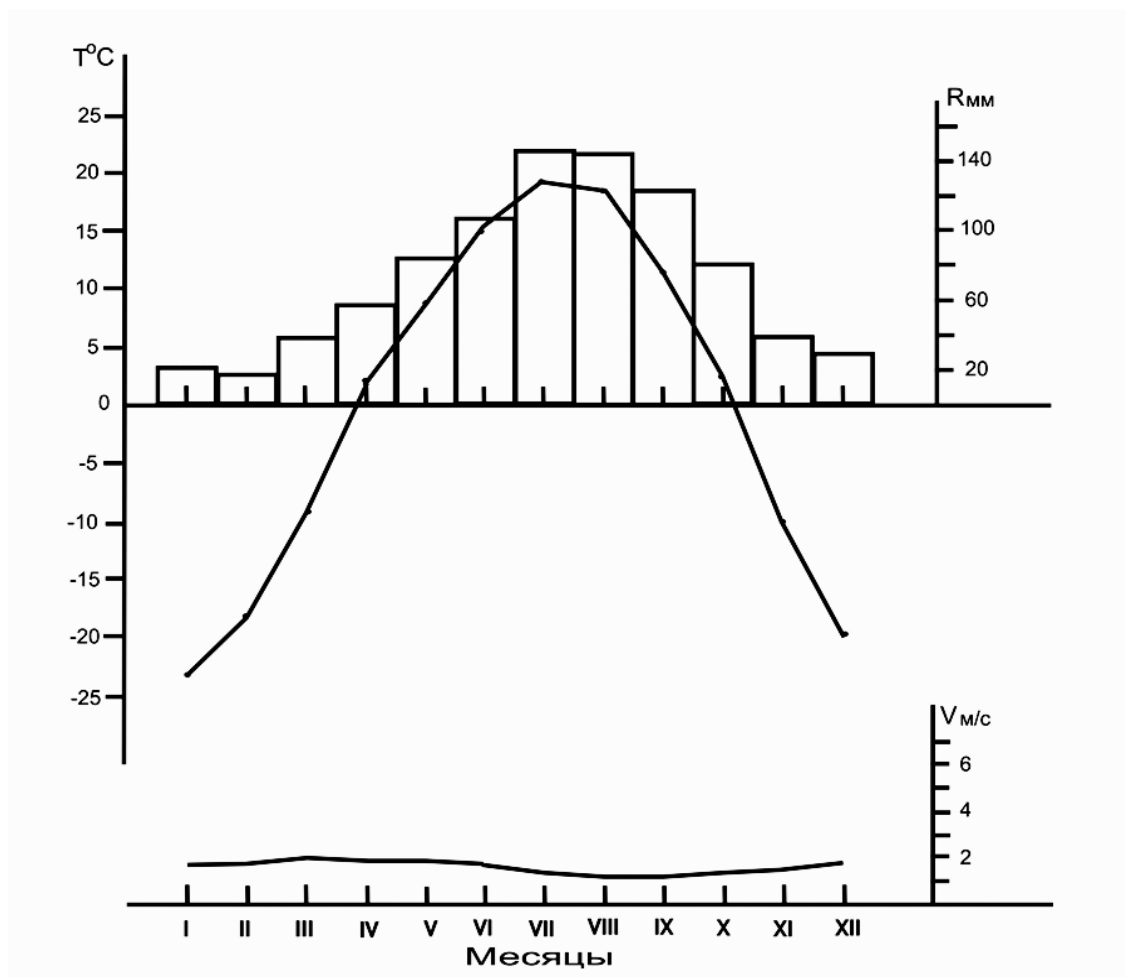
The following differences are discovered by comparison eastern and western regions over the characteristics of average wind speed during the year. Winter and summer months are standed out in the eastern areas (at the average, 6.4 and 3.6 m/sec), winter and summer and autumn months which are comparable 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 ( $\geq 15$  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 varies 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 sort of hydrothermal contrasts is observed while climatic characteristics of various locations in Bikin River basin are under comparison. Thematic analysis of combined diagrams (Fig. 1 and 2), with additional data demonstrates the structure of the climate and shows that the climate of the territory is continental with monsoon features and characterized by relatively greater continentality in its eastern areas in comparison with western as in general.



**Fig. 1.** Monthly average atmospheric temperature, precipitation and wind speed distribution (according to data from Gantsanza meteorological station).

Seasons are strongly marked and differ in duration in the region (Fig. 2).

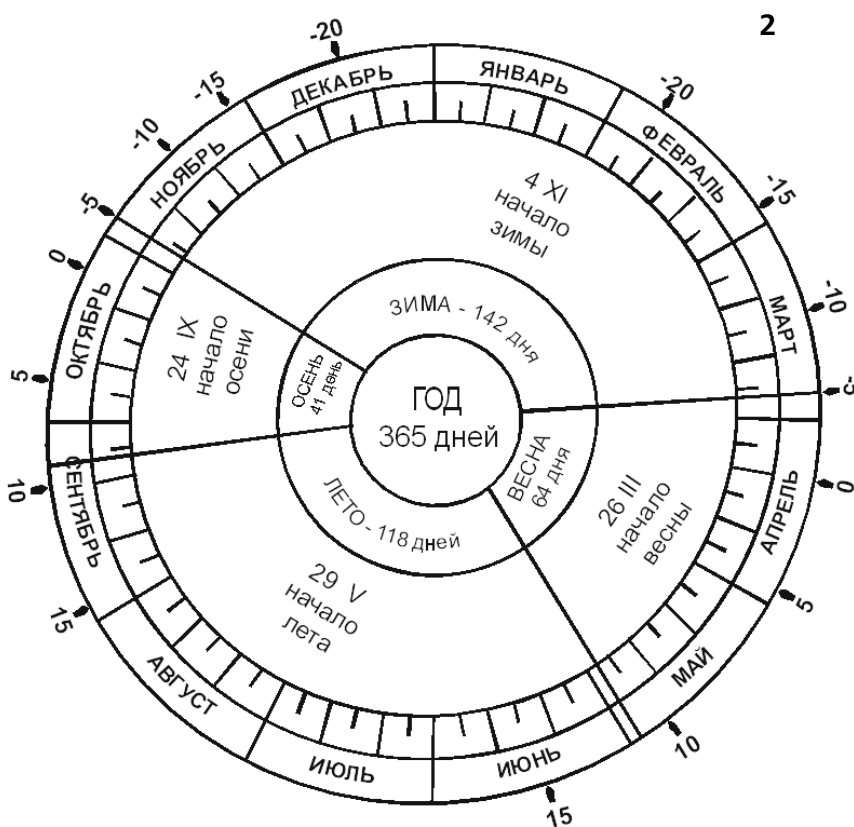
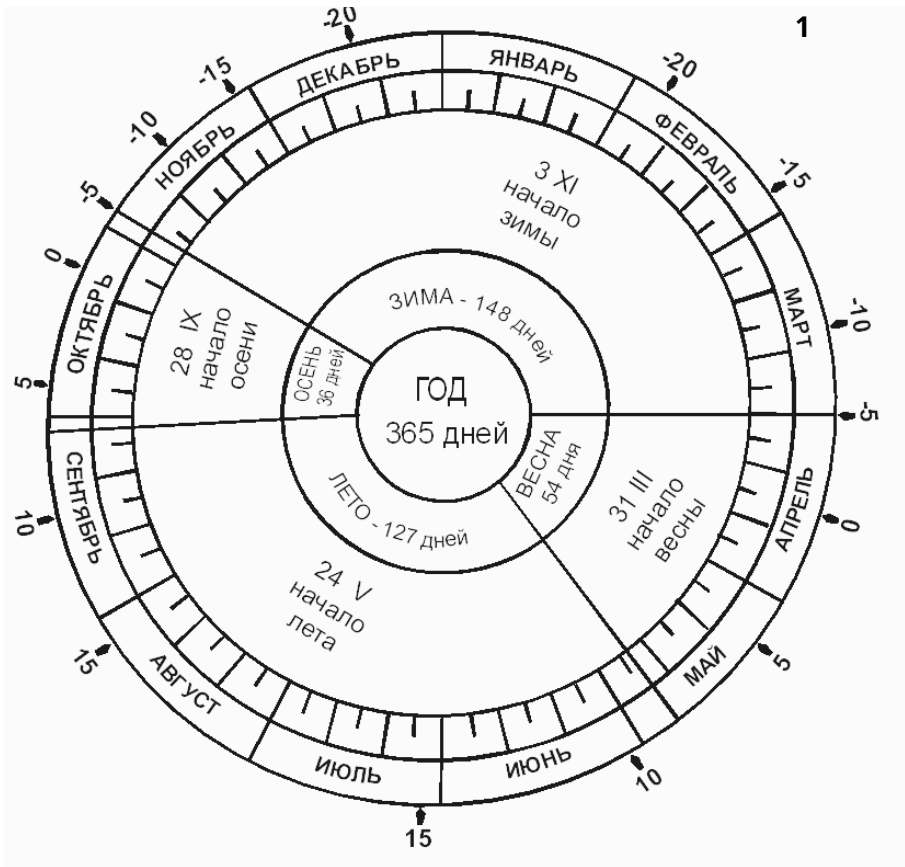


Fig. 2. Climatic seasons of eastern and western regions (1 – Ulunga meteorological station – Okhotnichiy village, 2 – Gantsanza meteorological station - Rodnikovaya village).



**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 ( $\geq 15\text{m/s}$ ) is 4-5 per month in the early winter on

**Breaking up on rivers usually starts in the middle of April**

Photo by V. Medvedev



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 geocologically baseless actions can lead irreversible changes of micro- and mesoclimate.

## Soils

Soils types and varieties distribution demonstrate a clear dependence on the landscape position, the degree and nature 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 ochreous brown non-podzolized and podzolized 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-podzolized 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-podzolized 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.

## 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.



## Geobotanical description

Vegetation of the Upper Bikin related to South-Okhotskaya hardwoods geobotanical subregion, and the Middle Bikin – to the Far East pine-broadleaf region according to B.P. Kolesnikov. 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-ferry firry-spruce 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 Manchu 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.

Large massif of primary cedar and cedar-broadleaf forests have been preserved in the middle reaches of the Bikin River. The largest nutwood commercial zone is marked here (more than 400 ha). Except protective and regulatory role, these forests also play an important socio-economic role as the most productive lands of the traditional nature use of the indigenous people.

### **Bikin River valley - one of the plots of virgin Ussurijsky taiga**

Photo by V. Kantor







**Korean pine**  
Photo by V. Philonov



## Wood resources

**Nutwood commercial zone** has 99% of woodiness. The main woody species are Korean pine (*Pinus koraiensis*) – 44%, Ajan spruce (*Picea ajanensis*) – 38%, yellow birch (*Betula mandshurica*) – 9%, larch (*Larix Gmelinii*) – 4%, white birch (*Betula alba* L.) – 3%. The most popular are mixed shrubby cedar woodlands with yellow birch (*Betula mandshurica*) and cedar-firry forests with yellow birch (*Betula mandshurica*) 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.

**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 rhynchophylla*) – 10%, chosenia (*Chosenia arbutifolia*) – 7% of total area. Valley spruce forests, cedar forests with ash and elm, larch-spruce 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 alba* 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 firry-spruce forests dominate. They occupy slopes of various gradients of all directions, characterized by high stocking and

### Korean pine

Photo by P. Krestov

### Mongolian oak

Photo by Y. Darman





normality, presence or domination of Khingam fir (*Abies nephrolepis*) in second growth and dash of hardwoods.

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. Intensive commercial wood exploitation of such forests leads to bog formation on the territory.

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 sub-alpine fir wood belt and in waterlogged larch forests. The age-grade woodland separation is irregular. Mature and overmature forest stands are visibly dominate.

Wood exploitation conditions are negative here. More than half of spruce-fir woodlands and nearly 40% of larch woodlands – the main wood exploitation forests – occur 16° and more gradient slopes where application of Scandinavian technology of cutting area exploitation is impossible.



**Larch**

Photo by K. Kobayakov



### Non-timber forest resources

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 Kray. 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 Kray. 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-

**Ginseng (*Panax ginseng*)**  
Photo by V. Medvedev

**Magnolia-vine**  
Photo by V. Medvedev



cult access. 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.

Hardwoods 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 (*Picea 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 (ber-

ries, 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 3 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.

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

**Table 3. Non-timber plant resources of nutwood commercial zone**

Resource	Commercial stock, t	Possible harvest, t	Economic value
Clusterberry ( <i>Vaccinium vitis-idaea</i> )	30-40	15-20	food, medical
Blueberry ( <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
Cramp ( <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 Max.</i> )	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 plant	300-400	30-50	food
Eleuterococcus ( <i>Eleutherococcus</i> ), root	80-100	24,830	medical
Aralia ( <i>Arália</i> )		3,320	medical

Nearly two dozens groups of technical non-timber 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. These 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

Relief features, plant and climate conditions diversity at the Middle and Upper Bikin territory define the species and ecologic diversity of region's fauna and its distribution on the territory.

Here are habitats of the following mammals: maral (*Cervus elaphus xanthopygus*), moose (*Alces alces*), musk deer (*Moschus moschiferus*), wild hog (*Sus scrofa*), roedeer (*Capreolus capreolus*), Himalayan black bear (*Ursus thibetanus*) and brown bear (*Ursus arctos*), Siberian 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 mantchuricus*) 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*).

**Siberian 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.

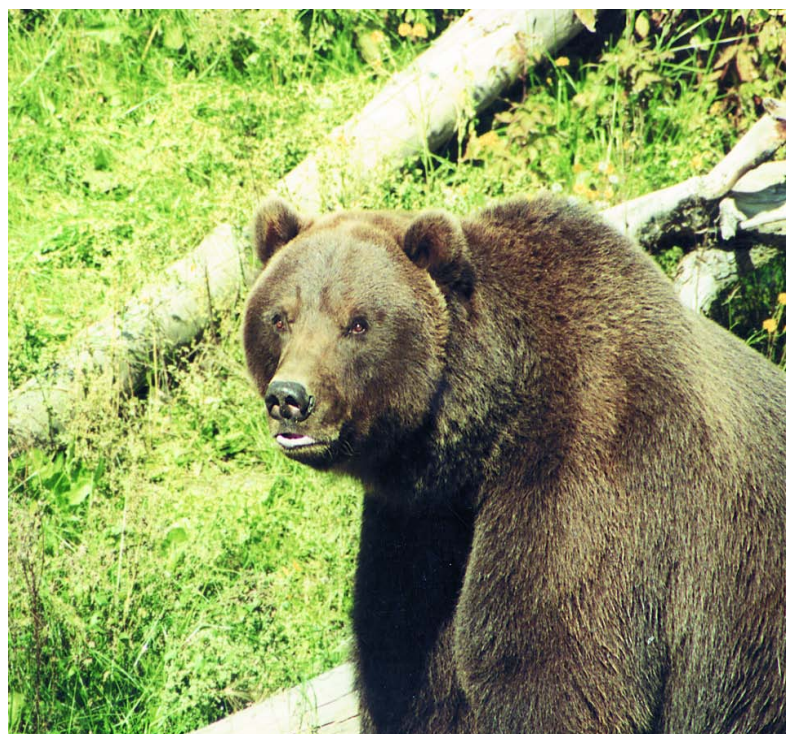
**Brown bear** (*Ursus arctos*). Commercial species. The highest density of population is at cedar-broadleaf and cedar forests. Proportion between Himalayan black bear and Brown bear is about 1:1.

### Siberian tiger

Photo by V. Solkin

### Brown bear

Photo by V. Solkin



**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.

**Musk beaver** (*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*). Commercial but rare species.

**Blue 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.

**Sable**  
Photo by G. Shaulsky

**Lynx**  
Photo by V. Medvedev





**Squirrel**

Photo by G. Shalikov

**Badger**

Photo by G. Shalikov

**Maral**

Photo by V. Medvedev

**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 (*Eatomias sibiricus*) and flying squirrel (*Pteromys volans*), as well as some mouse-like rodents.

**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 units per 1000 ha.

**Badger** (*Meles meles*). 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.

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





**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 units.

**Musk deer** (*Moschus sibiricus*). 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.

**Boar**

Photo by E. Lepeshkin







From the insectivorous (*Insektivora*) 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.



**Musk deer**

Photo by A. Panichev

**Wide awake roe deer**

Photo by E. Mogilnikov

**Bird fauna** of the territory is very uncommon concerning its species composition and ecologic structure. 241 birds 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 birds species (97) inhabits the valley broadleaf and cedar-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 (*Butastur indicus*), osprey (*Pandion haliaetus*) and blakiston's fish-owl (*Bubo blakistoni* or *Ketupa blakistoni*). Long-billed ringed plover (*Charadrius placidus*), very rare endemic specie 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 needle-tail (*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 specie 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*),

#### **Hazel grouse**

Photo by E. Mogilnikov

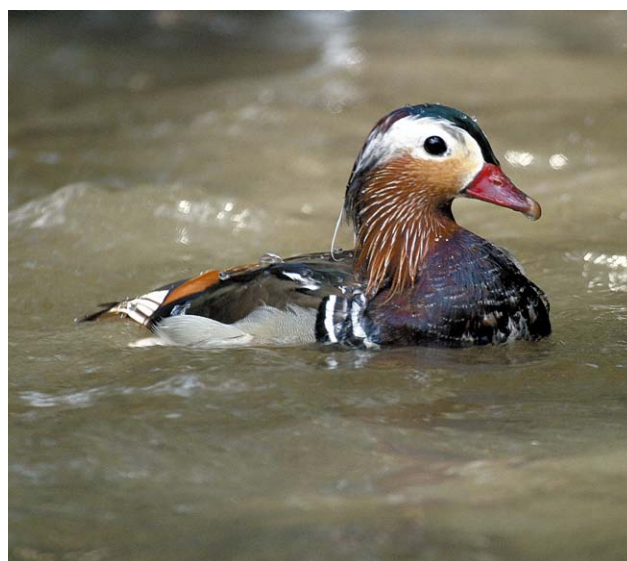






black-faced bunting (*Emberiza spodocephala*) and yellow-throated bunting (*Emberiza elegans*), long-tailed Rosefinch (*Uragus sibiricus*), black naped oriole (*Oriolus chinensis* L.), white-eye (*Zosterops erythropleura*), ashy minivet (*Pericrocotus divaricatus*), blue-and-white flycatcher (*Muscicapa cyanomelana*), narcissus flycatcher (*Ficedula zanthopygia*), Siberian rubythroat (*Luscinia calliope*), Siberian blue robin (*Luscinia cyane*), gray-backed thrush (*Turdus hortulorum*), 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 specie for the bio diversity conservation is Siberian grouse (*Falci-pennis falcipennis*). Among common species it is worth to note fugitive hawkbit (*Hierococ-yx 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 (*Lusci-nia sibilans*), pallas' warbler (*Phylloscopus pro-regulus*), Eurasian bullfinch (*Pyrrhula pyrrhula griseiventris*), white-winged crossbill (*Loxia leucoptera Gmelin*), bluetail (*Luscinia cyanura*), black-and-orange flycatcher (*Ficedula mugimaki*).



**Fish owl**

Photo by S. Avdeyuk

**Mandarin duck**

Photo by V. Solkin



Relatively poor composition of feathered birds is in the small-leaved forests on old fire sites, where just 21 birds species nest. In mountainous tundra the birds population is more limited (7 breeding species). The main predominant here are chiffchaff (*Phylloscopus*), tree pipit (*Anthus trivialis*), and the most valuable specie 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 birds 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 crake (*Porzana paykullii*), hemipod (*Turnix tanki*), gray-hooded bunting (*Emberiza fucata*) and grouse (*Lyrurus tetrix*). Nowadays grouse is the very rare specie 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 erythroleura*) and some others. For bog lakes and streams the breeding river ducks are common: falcated duck (*Anas falcata*) and mallard duck (*Anas platyrhynchos*).

4 species from all breeding birds of Bikin (171 species) are listed in the IUCN Red Data Book (scaly-sided merganser (*Mergus squamatus*), white-tailed eagle (*Haliaeetus albicilla*), hooded crane (*Grus monachus*), Blakiston's fish-owl (*Bubo blakistoni* or *Ketupa blakistoni*)) and 10 species are listed in the Russian Red Book (black stork (*Ciconia nigra*), mandarin duck (*Aix galericulata*), osprey (*Pandion haliaetus*), grey-faced buzzard (*Butastur indicus*), Siberian grouse (*Falci pennis falci pennis*), long-billed ringed plover (*Charadrius placidus*)). Moreover, it is expected the nesting of black kite (*Milvus migrans*) and grey-capped woodpecker (*Dendrocopos canicapillus*), listed in the Red Book

of the Primorsky region. Brief avifaunistic survey in the Bikin river basin shows, that special protection measures are needed for conservation of this territory's birds.

### Amphibians and reptiles.

7 amphibians species and 10 reptiles species occur in this territory. Even among the limited number of reptiles here, there are rare and endemic species: grass lizard (*Takydromus walteri*), European grass snake (*Rhabdophis tigrina*), Siberian ratsnake (*Elaphe schrenki*), Amur ratsnake (*E. rufodesata*), mamushi (*Agristrodon blomhoffi*) and Korean snake (*Gloydius saxatilis*).

### 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.

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 *Ephemeridae*) 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.

Nekton organisms are represented by fish, crustaceans (caltrop (*Pandalidae*)) and Chinese softshell turtle (*Pelodiscus sinensis*), yet survived in the Middle and Lower Bikin. From 130 species of Amur fish, 49 species inhabit in the Bikin basin, 29 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 brandtii*). 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 poecilopus*) and small ruderal

species of slack waters: Amur sleeper (*Perccottus glenii*), nine-spined stickleback (*Pungitius pungitius*) and others.

### 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 (*Limemntis*) and black-and-white aeroplane (*Neptis*); beetles are represented by pruners (*Cerambycidae*), bark beetles (*Ipidae*) 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 lithogene (geological-geomorphological) factor, specifically orographic status and exposition.

### 1. Alpine 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 small-leaved 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. Hardwoods 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 (*Abies nephrolepis*) with large admixture of Daurian larch (*Larix dahurica*) especially indicative for landscapes subjected to forest fires short past.

### 4. Cedar hardwoods on low gradient well alight slopes.

This series is represented by two landscape species where Korean cedar (*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*, реже *Picea ajanensis*) for another, also hardwoods could appear as main timber species and Korean cedar (*Pinus koraiensis*) could pass into admixture species.

**5. Valley and slope-valley mainly broad-leaved 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 low-level 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

**Geological history** of the Primorye is defined by clear trend and continuity of Earth crust structures development. From the ancient times the Khankaysky massif has been representing the stable core with continental crust growing around it. It was surrounded by volcanic islands arcs and deepwater trenches, which continuously drifted towards the east forming folded-block basement of the Sikhote-Alin, which was developed as a volcanic mountainous system about 100 millions years ago. At this time all main structural zones were raised, which then were developing and served as a basis of modern landscape diversity. Relatively recent geologic events – extravasion of basaltic lavas in the Pliocene, uplift of the Sikhote-Alin, transgression of the Khanka lake, forming of small valley glaciers in the Pleistocene – did not cause any catastrophic consequences for biologic species association and helped increase its diversity. Combination of different geologic structures reflecting the continuous stages of Earth crust evolution – within relatively small territory – makes the Primorye the sample transitional area (from continent to ocean).

**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 naive 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 ethnic-cultural and ethnic-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 industrial unit "Pozharsky" of the Hunting industry department of the RSFSR Forest Management State Committee was established on the base of trade artel "Okhotnik" and on the same lands. In 1976 the Primorye regional Council fixed for the state industrial unit the territory of 1384 thousands square ha in the Middle and Upper Bikin basin, e.g. the territory of traditional habitat of the Bikin group Udege people. The establishment became multibranch. Base of its gross product was comprised of hunting products - furs, wild animals' meat, wild-growing herbs, drug raw materials and others. Moreover, the unit made firewood and Amur cork tree (*Phellodendron amurense Rupr.*) bark provision, cooperage production etc.

In 1994 the state industrial unit "Pozharsky" was privatized. It was transformed into JSC "Bikin national hunting farm". The farm realizes its hunting activity based on rental contracts with hunting management department of Verkhneperevalnensky forestry administration. Thus, JSC "NHF Bikin" is the bearer of natural resource use traditions on this territory. In re-

cent years this relay moved to its successor of the JSC "NHF Bikin" - the public organization of indigenous peoples "Tiger". In 2008 this community incorporated for 10 years the right to use the wildlife properties concerned to hunting properties (long-term license 25 № 000002 from 30.10.2008) and the contract of territory use, water area use, necessary for managing wildlife properties on the 1352100 ha square territory (Contract №2 from 17.11.2008).

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 close 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, Davasty, 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 sacred animal for the Udege people.

### History of the Middle and Upper Bikin protection

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 nutwood commercial zone situated in middle part of Bikin River valley was completed for long-term 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 km<sup>2</sup> including upper and middle reaches of Bikin River basin with area of 12 500 km<sup>2</sup>, 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 within the boundary of their areal.

The special regime and ways of forest fund usage were established in 1992 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 Kray" and by the Decision of Minor Council of Primorsky Kray of Council of People's Deputies № 316, dated 25.08.1992, "On place of Primorsky Kray 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 Kray was established within the territory of nutwood commercial zone on total area of 407.8 thousand ha by the Resolution of Head of Administration of Primorsky Kray (№ 165, dated 11.06.1992). After arriving at decision to reclass-

sify forests into 1 group, it was made a decision to lead a correction of the project on forest sector organization and development in Verkhne-Perevelnensky forestry by the Decision of 2nd Forestry Management Meeting of Primorsky Board of Forest Management in 1993.

Verkhnebikinsky State Nature Landscape Preserve of Regional Value was established in 1998 (Resolution of the Governor № 468, dated 15.09.1998) with a view to preserve unique Sikhote-Alin natural landscapes having univer-

sal value. It is 746.5 thousand ha in area. It was mean along with Preserve establishing that it was a temporary arrangement and it was necessary to enhance SPA status up to federal level. Now Preserve is under Primorsky SPAs Administration conformity. The Resolution of the Governor of Primorsky Kray № 511, dated 15.10.1998, provides the regional "Strategy of Sikhote-Alin biodiversity conservation" where "Bikinskaya perspective ethnical territory" is stated.

### 1991 - 2009 events

**28.05.1991** Primorsky Regional Council of People's Deputy arrived at decision № 145 "On Primorsky Kray SPAs net" and all territories included respective block of Environmental Programme are considered to be reserved. Including ethnical territory of middle and upper reaches of Bikin River.

**22.04.1992** Decree of the RF President "On high priority measures for the Northern indigenous small people residence and economic activity protection" where a mission on territory of traditional use of nature determination is set and proposals on national parks and preserves establishing within the areas of indigenous people living and husbandry are put forward.

**11.06.1992** The Resolution № 165 of Primorsky Kray Head of Administration "On the territory of traditional nature use of the indigenous small people of Pozharsky District" about granting the territory of traditional nature use of the indigenous small people situated in middle part of Bikin River basin (nutwood commercial zone) with protective status, the area of the territory is 407.8 thousand ha.

**24.02.1993** Resolurion of Soviet of Nationalities of Supreme Soviet RF № 4537-1 "On natural complex of Udege, Nanaj and Oroch living in Pozharsky District of Primorsky Kray" where a mission "to provide a formalizing of Upper Bikin agricultural lands the territory of traditional nature use and adjoin it to previously established territory in middle reaches of Bikin River" is set.

**25.08.1993** As per a Decision № 316 of Minor Council of Primorsky Kray of Council of People's Deputies "On place of Primorsky Kray aboriginal indigenous residence and economic activity protection" a special regime of forests usage in upper and middle parts of Bikin River basin within the total area of 1250 thousand ha is set, a special regime of forest usage in upper part of Bikin River valley is set and a mission on reclassification of forests in 1 group is set.

**08.07.1997** RF Government Decree № 843 "On Federal Target Programme "Siberian Tiger Conservation" is adopted and required that forestry management should be oriented on tiger (*Panthera tigris altaica*) conservation and net of national parks and federal preserves should be a guarantee of tiger rescue.

**15.09.1998** Verkhnebikinsky Landscape Preserve was established by the Resolution of the Primorsky Kray Governor № 468 with total area of 746 482 ha. An effort to let down the Preserve regime was made, but the Resolution of Governor was dissolved at law. New Regulations for the Preserve was approved by the Resolution of the Primorsky Kray Governor № 169-na dated 28.07.2008. Wood harvesting (trees, shrubs, and lians) is forbidden, except arrangements on care of stands. Forest sites involved in Preserve boundaries are subjected to allocation of specially protected sites along with design planning of forestries and forestry-based orders preparation. Traditional use of nature providing sustainable use of natural resources is admitted to minorities within the territory of Preserve.

**16.12.2001** As per decision of 25th Session of the World Heritage Committee Sikhote-Alin Reserve and State Zoological Reserve "Goralii" were inscribed on the UNESCO World Heritage List in nomination "Central Sikhote-Alin", and SPAs within the boundaries of Bikin River valley (territory of the territory of traditional nature use of the indigenous small people of the Pozharsky District minorities and Verkhnebikinsky Preserve) were recommended to be inscribed on the List after drawing up a one whole management plan for all Bikinsky site.

**04.09.2002** World Summit on Sustainable Development took place. Main decision: present model of human development (continuous extension of areas and water areas involving in usage, expansion of natural resources consumption, including nonrenewable, increase of pollution by means of discharge, emission and wastes) is dangerous for planet and for people.

**2002**, spring – autumn. Preparation of documentation on protective status granting the territory of traditional nature use situated in middle and upper parts of Bikin River valley by the Association of Indigenous Small People of Primorsky Kray (according to changed requirements adopted after 07.05.2001 FZ "On the territories of traditional nature use of the indigenous small people of the North, Siberia the Far East of Russian Federation").

**19.12.2002** Meeting of Krasny Yar and Olon villages' residents on the question of territory of the territory of traditional nature use establishing and coming to a decision to appeal to the Government.

**2002**, December. Dar'kin S.M., Governor of Primorsky Kray, set a mission on the Broad to clear up with the question on SPAs – where it is admitted to cut wood and where is not.

**31.03.2003** In accordance to Governor mission, Ministry of Natural Resources and Ecology forwarded a letter to the Committee of Natural Resources and Ecology of Administration of Primorsky Kray where it was set that cutting within the Verkhnebikinsky Preserve territory was not intended.

**2003**, March – April Primorsky lumberers actuated a process of question considering on reorganization or decrease of Verkhnebikinsky Preserve area with a view to began cutting within its boundaries.

**28.05.2003** UNESCO World Heritage Centre addressed a letter to Governor of Primorsky Kray with request to consider the outstanding universal value of Upper Bikin while formulation of management project for this territory.

**28.05.2003** NGOs addressed letters signed by State and Regional Principal Environmental Specialists to the Ministry of Natural Resources and Ecology, to Primorsky Kray Forest Management and to Regional Legislative Assembly and also published it in mass media and Internet.

**29.05.2003** Ministry of Natural Resources and Ecology staff conference took place on the question of possible cuttings.

A report on "Environmental improvement in Russian Federation" prepared toward State Council General Committee meeting on 4.06.2003

**02.06.2003** An official appeal and a set of documents for the territory of traditional nature use "Bikin" with total area of 1 352 000 ha establishing were surrendered to RF Government by the Association of Indigenous People of Primorsky Kray.

**09.06.2003** Meeting of Krasny Yar, Olon and Okhotnichiy villages' residents, adoption of the appeals addressed to V.V. Putin, President of Russian Federation, G.N. Seleznev, Chairman of the State Duma, S.N. Mironov, Chairman of the Federation Council, M.M. Kasianov, Chairman of the Government, and to lumberer companies "Terneyles" and "Primorsklesprom".

**17.08.2004** "Round table" - "Bikin conservation as factor of sustainable development of Udege people: reality and prospects".



**18.02.2005** "Round table" – "The territories of traditional nature use – reality and prospects".

**30.05.2005** Department of Regional Expansion. Moscow. Interdepartmental meeting on project Regulation of the model territory of traditional nature use of the indigenous small people of federal value "Bikin" and on preparation of proposals on RF Government regulatory enactment adoption. Adoption of the decision on launching the initiative of Department of Regional Expansion and the "Bikin" territory of traditional nature use admitted as efficient for conservation native habitat and traditional way of living of aboriginal people.

**08.06.2005** Meeting of General Committee of Russian Academy of Natural Sciences (protocol № 181) which put in a petition on national park establishing.

**03.06.2005** Reinversion of the Association of Indigenous People of Primorsky Kray to RF Government with a view to the "Bikin" territory of traditional nature use establishing.

**11.10.2006** Conference "Bikin Conservation" and establishing of NPO alliance "For Bikin". Vladivostok.

**08.07.2007** Internation meeting on ensures the rights of the indigenous small people and on Bikin River inclusion in World Heritage property "Central Sikhote-Alin". Vladivostok.

**07.10.2008** An Order of the Governor of Primorsky Kray (№ 571-pa) on occupation of hinting area within 1352100 ha territory by the community of the indigenous small people "Tiger" for a term of 10 years.

**02.06.2009** An Order of Forest Administration of Primorsky Kray on providing "Tiger" community with forest area within "Bikinsky" nutwood commercial zone and adjoined water protection zone with total area of 461 154 ha for a term of 10 years.



### 3 Justification for inscription



**Siberian tiger**  
Photo by V. Solkin



### 3a. Criteria under which inscription is proposed (and justification for inscription under these criteria)

The nominated territory meets the following criteria:

#### Criterion (x)

The nominated territory along with the Sikhote-Alinsky Reserve already inscribed in the WH List, is one of the key areas of Amur tiger (*Panthera tigris altaica*) habitat. Extension of the WH property by the additional vast territory of its dispersal will doubtless contribute to successful recovery and conservation of population.

The Bikin River basin being the only integral massif of «Ussurijsky taiga» in the World (more than 1 million ha square), is the last big virgin massif of Nemoral forests in the North hemisphere. It is characterized by the high concentration of rare and relic plant species. Just its upper part is noted as the area of grow of 20 plant species listed in the Red Book of Russia. 34 vascular plant species are at the boundary of their habitat: Redovsky rosebay (*Rhododendron redowskianum*), microbiota decussate (*Microbiota dicussata*), wrinkled holly (*Ilex rugosa* Fr.), bargenia Pacific (*Bergenia pacifica*), Snowdon rose (*Rhodiola rosea*), and this is not the end of list. According to spacious range of plant associations there were formed the productive biotops for habitats of tiger (*Panthera tigris altaica*) and Asiatic black bear (*Ursus thibetanus*), which inhabit almost the whole territory - that is very important for support of their populations in the Far East.

The landscape diversity determines biocenosis relations with 38 rare birds species, which find here favourable conditions. These are hooded crane (*Grus monacha*) and black stork (*Ciconia nigra*), buzzard accipitral (*Butastur indicus*) and white-tailed eagle (*Haliaeetus albicilla*). The elm (*Ulmus* sp.), ash tree (*Fraxinus* sp.), linden (*Tilia* sp.), and Chosenia (*Chosenia* sp.), valley forests along the coasts of river stream provide the excellent nesting and feeding conditions for fish-hawk (*Pandion haliaetus*), mandarin duck (*Aix galericulata*), scaly-sided merganser (*Mergus squamatus*), fish owl (*Ketupa blakistoni*), hawk owl (*Ninox scutulata*). The river upper reaches occupied by larch forests, dark

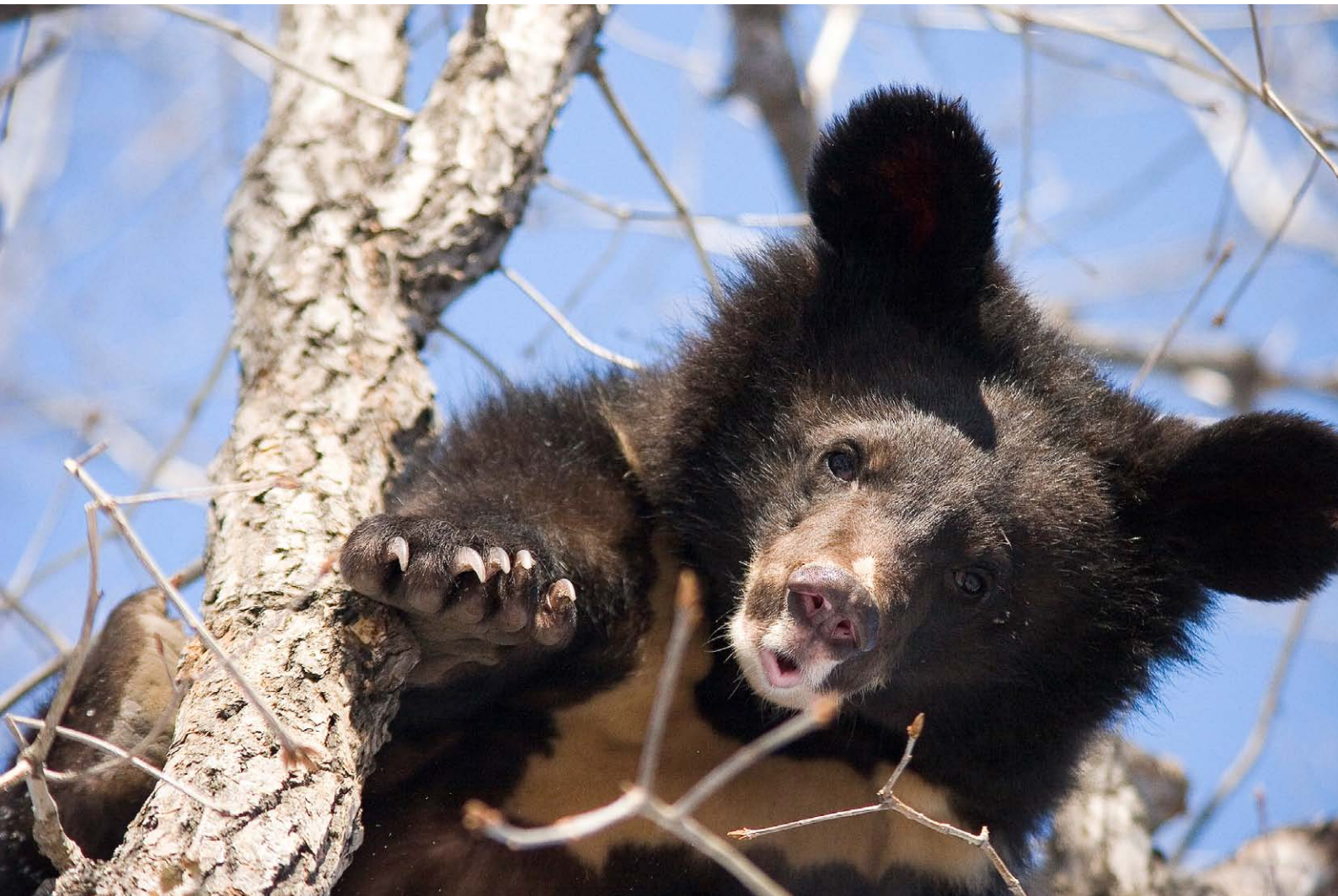
coniferous forests and stone birch grove, are the habitats of rock capercaillie (*Tetrao urallo-goides*) and Siberian grouse (*Falci-pennis falci-pennis*).

The Amur tiger (*Panthera tigris altaica*), scaly-sided merganser (*Mergus squamatus*), fish owl (*Ketupa blakistoni*) and white-tailed eagle (*Haliaeetus albicilla*), which inhabit on the nominated territory, are listed in the IUCN Red Data Book.

#### Bloomy rosebay

Photo by V. Kantor





**Black bear**

Photo by S. Karamanchuk



### 3b. Proposed statement of outstanding universal value

The Bikin river valley outstanding universal value as a part of the Central Sikhote-Alin natural complex (meets the natural criterion (x)) is already recognized by IUCN experts and was noted in the decision of the 25th Session of the WH Committee (Helsinki, 2001).

One of the key reasons of the «Central Sikhote-Alin» serial nomination preparation is the necessary protection of the endangered Siberian tiger population (*Panthera tigris altaica*). Activity of the Sikhote-Alin Reserve and protected territories in the Bikin river valley and developing of new SPAs within the Central Sikhote-Alin are mostly directed to conservation of key habitats of the Siberian tiger (*Panthera tigris altaica*). The primary habitat of Siberian (Ussurijsky) tiger is situated in Bikin River basin and, according to data gathered in 2004-2005, nearly 10% of this rare species inhabit here.

Moreover, the cedar-coniferous complex in the middle and upper reaches of the Bikin river is virtually the only survived integral massif of once widespread Ussurijsky taiga. Besides the doubtless environmental value, its significant meaning is in support of animal inhabits in natural conditions, which is in turn very important for indigenous people of the Bikin river basin - the Bikin group of Udihe.

The nominated territory is the key habitat of many rare and endangered animal and plant species, listed in the IUCN Red Data Book (hooded crane (*Grus monachus*), scaly-sided merganser (*Mergus squamatus*) and fish owl (*Ketupa blakistonii*)) and in the Russian Red Book (including black stork (*Ciconia nigra*) ginseng (*Panax*), mountain peony (*Paeonia oreogeton*) and milkiness peony (*Paeonia lactiflora* Pad). Altogether from those found in the Bikin River valley, 2 vascular plant species and 5 vertebrate animal species are listed in the IUCN Red Data Book; 22 plant species (including 17 vascular plant species and 5 fungi and lichen species) and 26 animal species (including 15 invertebrate animal species and 11 vertebrate animal species) are listed in the Russian Red Book.

#### Sikhote-Alin ridge

Photo by V. Solkin



### 3c. Comparative analysis (including state of conservation of similar properties)

In 2001 the Sikhote-Alin biospheric reserve, 400 000 ha square, was inscribed into WH List, as well as nearby Goralovy Nature Reserve, nearly 5000 ha square. They were nominated according to criterion «x» following two main reasons:

- based on global value of primary dark coniferous, light coniferous, broadleaf-coniferous and broadleaf forests, conserved here;
- as one of the key habitats of Siberian tiger (*Panthera tigris altaica*) - endangered subspecies, listed in the International Red Book.

The Bikin river valley, recommended for extension of the existing nomination, represents the global value in the same two aspects and therefore comes as an excellent addition to the Sikhote-Alin reserve territory.

In addition we should note that the Ussurijsky taiga as well as the tiger (*Panthera tigris altaica*), are "narrowly localized natural sites", preserved just in few "core areas", mostly in the Russian Far East south. Conditions of these "core areas" affect the Ussurijsky taiga as a unique ecosystem and also affect the Siberian tiger (*Panthera tigris altaica*) survival as very rare wild predator. Protection of only one of these few "core areas" is essential but not enough. This is why we should talk about transformation of existing WH site "Central Sikhote-Alin" into the serial property, which would include if not all but at least main areas of Ussurijsky taiga grow and the most important habitats of the Siberian tiger (*Panthera tigris altaica*).

#### A) USSURIJSKY TAIGA

##### GLOBAL CONTEXT:

comparison with other World Heritage properties, inclusive mixed and broad-leaved forests

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

Generally these areas are relevant to one of biomes on the M.Udvardi's biogeographic zoning scheme, - Temperate Broadleaf Forests. They are confined mainly to the southern part of temperate zone (and also to the northern regions of subtropic zone) and are situated within 30-50 degrees of north latitude. The most important conditions of these forests developing are the high climate humidity (in the Eastern Asia it is determined by monsoon influence) and relatively warm average annual air temperatures.

European forests are sensibly inferior to North American and Asian forests according to riches of floristic composition, holocoenotic variety, abundance of relic and endemic, rare and endangered species, amount of timber and shrubby breed species and other important characteristics.

However, Ussurijsky taiga, as one of the alteration of Asian mixed forests, is quite adopted as one of the top in biodiversity power, because these wood massifs truly consider as one of the richest and original forest type in the Northern hemisphere over species composition. This fact is illustrated in Table 1, showed that Bikin River valley is in advance over some important characteristics or about on the same rate with other areals of mixed and broad-leaved forests which already granted with World Heritage status. The most important values in this comparison are.



1) By no means all the indicated sites – potential prototypes of the Bikin River valley were nominated for UNESCO World Heritage List inscription over **criteria x**, but some of them. This demonstrates the fact, that the priorities of such sites inscription to the UNESCO World Heritage List were not linked with some of special biodiversity or presence of global rare species of animals and plants.

2) **East Asian forests (and Bikin River valley in particular) are principal differ from North American and European forests over its species composition for clear good reason.** However, big differences exist both in forest stand and in shrub and in herb layer. Congeniality, as a rule, could be observed only on the genus, family rate and higher ranks. In such a way, National Park Great Smoky Mountains, as well as some European properties, couldn't be distinguished under the character of the Bikin River prototype.

3) Bikin River valley is differ from its nearest East Asian "geographical neighbors", i.e. from other forest World Heritage properties, by its **huge area of virgin forests in actual fact** (near 1.2 million ha), and also **high-scale of the forestry**, coming to 100% (the area of adjacent Chinese and Japanese properties is less than 25 thousand ha, at that the rate of forestry could drop to 50-60%). Moreover, **the species composition of those properties is differing markedly from Bikin flora**, although certain similarity is marked.

4) Sikhote-Alinsky Reserve used to be the only one structured World Heritage property **within the boundaries of biotic province of Manchuro-Japanese Mixed Forest** until 2005 when this grade was rewarded to small National Park on the north-east of the Japanese Hokkaido island – Siretoko. However, in spite of some similar characteristics presence (for example, monsoon climate, and mountainous relief) Siretoko and Bikin River valley could not be recognized as prototypes. Therefore, Siretoko is a small peninsula, but not vast mountain valley as Bikin, i.e. sizes of the sites is disparate. More, Japanese property includes offshore zone and some watersides as essential features (the highlight – interaction of the land and sea). The specific character of Siretoko is ice cover forming on the shallow water (this is the very south point of the North hemisphere where offshore ice forms in wintertime). Moreover, having some common species and synthetical character of both flora (combination of north and south species), nevertheless floral characteristics of Bikin River valley and Siretoko notably differ. Finally, if we speak only about fauna, then Bikin River valley universal value first related to inhabit of Siberian tiger (*Panthera tigris altaica*). At the same time, Siretoko universal value related to some rare and endangered species of seabirds and birds of passage, and to variety of salmonid fishes and marine mammals including cetaceas.

**Table 4. Characteristics of the World Heritage properties including mixed and broad-leaved forests (North hemisphere, southern part of the temperate zone and northern part of subtropical zone)**

Name of the property / UNESCO criteria	Location/ Geographic coordinates	Biotic province according to Udvardi scheme	Area of the property/ forested percentage	Number of vascular plants species	Dominated wood
Great Smoky Mountains, USA/ vii, viii, ix, x	Southeast of USA, N 35°, W 83°.	Eastern Forests	209 thousand ha/ 80-90%	More than 3,5 thousand	<i>Picea alba</i> , <i>Tsuga canadensis</i> , <i>Pseudotsuga menziesii</i> , <i>Pinus strobus</i> , <i>Quercus rubra</i> , <i>Acer rubrum</i> , <i>Fagus granifolia</i> , <i>Liriodendron tulipifera</i> , <i>Carya</i>
Plitvice Lake, Croatia / vii, viii, ix	Eastern Europe N 44°, E 15°.	Mediterranean Sclerophyll	29,5 Thousand ha/ 60-70 %	More than 1200	<i>Fagus sylvatica</i> – 73%, <i>Abies sp.</i> – 22%, <i>Picea sp.</i> - 5 %, <i>Pinus sp.</i> – less than 1%
Durmitor, Montenegro / vii, viii, x	Eastern Europe N 42-43°, E 18-19°.	Balkan Highlands	32 thousand ha/ Nearly 50 %	Nearly 1,3 thousand	<i>Pinus silvestris</i> , <i>Pinus mugo</i> , <i>Pinus nigra</i> , <i>Abies concolor</i> , <i>Fagus Sylvatica</i>
Bialowieza Forest, Poland, Byelorussia / vii	Eastern Europe, N 52°, E 23-24°	Middle European Forests	112 thousand ha/ Nearly 90 %	More than 900	<i>Picea abies</i> , <i>Pinus silvestris</i> , <i>Quercus robur</i> , <i>Acer platanoides</i> , <i>Tilia cordata</i> , <i>Fraxinus excelsior</i> , <i>Fagus sylvatica</i> , <i>Carpinus betulus</i> , <i>Populus tremula</i>
Primeval Beech Forests of the Carpathians, Slovakia, Ukraine / vii, ix, x	Eastern Europe N 48-49°, E 22-24°.	Middle European Forests	10 lots with total area 29,3 thousand ha/ 80-90 %	Nearly 1 thousand	Absolute domination of <i>Fagus sylvatica</i> , also <i>Quercus sp.</i> , <i>Tilia sp.</i> , <i>Acer sp.</i> , <i>Carpinus sp.</i> , <i>Pinus sp.</i> , <i>Picea sp.</i> and <i>Abies sp.</i>
Shiretoko Japan / ix, x	Northeast of Hokkaido island N 43°, E 144°.	Manchu-Japanese Mixed Forest	56,1 thousand ha/ 80-90%	More than 700	<i>Abies sachalinensis</i> , <i>Picea glehnii</i> , <i>Picea ajanensis</i> , <i>Quercus mongolica</i> , <i>Acer mono</i> , <i>Tilia japonica</i>
Shirakami, Japan / x	North of Honshu island N 40°, E 40°.	Oriental Deciduous Forest	10,1 thousand ha/ more than 95%	More than 500	Absolute domination of <i>Fagus Crenata</i>



Name of the property / UNESCO criteria	Location/ Geographic coordinates	Biotic province according to Udvardi scheme	Area of the property/ forested percentage	Number of vascular plants species	Dominated wood
Yakushim, Japan / vii, x	Ryukyu islands N 30°, E 130°.	Japanese Evergreen Forest	10,7 thousand ha / 90%	Nearly 2 thousand	<i>Tsuga sieboldii</i> , <i>Abies firma</i> , <i>Cryptomeria japonica</i> , also <i>Fagus sp.</i> and <i>Quercus sp.</i>
Taishan, China / i, ii, iii, iv, v, vi, vii	Eastern China N 36°, E 116-117°	Oriental Deciduous Forest	25 thousand ha/ 70-80%	Nearly 1 thousand	<i>Pinus sp.</i> , <i>Picea sp.</i> , <i>Cupressus sp.</i> , <i>Quercus sp.</i>
Huangshan, China / ii, vii, x	Eastern China N 30-31°, E 118°.	Oriental Deciduous Forest	15,4 thousand ha/ 50-60%	More than 1,6 thousand	<i>Pinus massoniana</i> , <i>Pinus huangshanensis</i> , <i>Quercus stewardii</i> , <i>Fagus engleviana</i>
Emeishan, China / iv, vi, x	Central China N 29°, E 103°.	Oriental Deciduous Forest/ Subtropical Chinese Forest	18 thousand ha / 80-90%	More than 3 thousand	<i>Quercus sp.</i> , <i>Fagus sp.</i> , <i>Pinus sp.</i> , <i>Abies sp.</i> , much subtropical wood species
Central Sikhote-Alin (Sikhote-Alinsky Reserve), Russian Federation / x	South of Russian Far East N 44-45°, E 135-136°	Manchu-Japanese Mixed Forest	Nearly 400 Thousand ha/ more than 95%	Nearly 1,2 thousand	<i>Picea ajanensis</i> , <i>Abies nephrolepis</i> , <i>Larix Gmelinii</i> , <i>Pinus koraiensis</i> , <i>Quercus mongolica</i> , <i>Ulmus laciniata</i> , <i>Tilia amurensis</i> , <i>Acer ukurunduense</i> , <i>Acer tegmentosum</i> , <i>Phellodendron amurense</i> , <i>Juglans mandshurica</i>
Bikin River valley, Russian Federatin / x	South of Russian Far East N 46-47°, E 135-138°.	Manchu-Japanese Mixed Forest	Nearly 1,2 million ha / more than 95%	Nearly 1 thousand	<i>Picea ajanensis</i> , <i>bies nephrolepis</i> , <i>Larix Gmelinii</i> , <i>Pinus koraiensis</i> , <i>Tilia amurensis</i> , <i>Ulmus propinqua</i> , <i>Populus maximoviczii</i> , <i>Fraxinus mandschuricus</i> , <i>Betula mandshurica</i> , <i>Chosenia arbutifolia</i>

In such a way, according to huge massifs of Ussurijsky taiga there were not detected any analogues for Bikin River valley and for Sikhote-Alinsky Reserve among World Natural Heritage properties. Based upon the content of Tentative List, there are no analogues among prospective sites too. Really, there were not detected any protected areas in East Asian areal of mixes and broad-leaved forests (i.e. on the north-east of China, in Democratic People's Republic of Korea or in Japan) which claimed to be granted as World Natural Heritage property according to existence of such forests as Ussurijsky taiga and thereby to be nominated over criteria x.

### REGIONAL CONTEXT:

#### Comparison with other SPAs located at the south of Russian Far East

Ussurijsky taiga is the unique ecosystem that formed at the south of Russian Far East, where the taiga zone of moderate belt continuously turns into monsoon forests of subtropics. It is most full represented particularly here - in the Ussuri river basin (the right tributary of the Amur river), on the flanks of Sikhote-Alin range, oriented meridionally from north to south. By doing so, exactly in central part of the Sikhote-Alin range (Sikhote-Alinsky Reserve and Bikin river valley are related to this part) one can meet both most northern variation of this taiga (with domination of hardwoods – Ajan spruce (*Picea ajanensis*), Khingam fir (*Abies nephrolepis*) – so-called Okhotsk flora) and more southern (with domination of primary cedar-broad-leaved plants and clear development of so-called Manchurian flora).

For example, more than half of all area of Sikhote-Alinsky Reserve falls at softwood plants – spruce-firry and cedar-firry, and larch and pure cedar forest; the rest falls at primorsky oak-wood and other broad-leaved forests, and mixed forests – cedar-broad-leaved forests. Elements of Okhotsk and Manchurian flora exist in entwinement.

Near the half of the territory of Verkhnebikin-sky Nature Reserve falls at larch forests and another part falls at spruce-fir forests. Nearly 2/3 of the territory of the "Bikinskaya" territory of

traditional nature use resources covered with cedar-broad-leaved forests and rest territory with spruce-fir forests. Manchurian flora is presented slightly, number of southern species not too large (for example, Manchurian ash). Elements of Okhotsk and Manchurian flora also exist in entwinement.

It is important to point out that it is possible to allocate the interconnecting "biopassage" between the main territory (Sikhote-Alinsky Reserve) and slightly developed and affected Bikin River valley that, as is known, essentially increase the operational effect of the clusters formed serial World Heritage properties. The distance between the Reserve and nearest part of Bikin River valley is 100-150 km. **In this manner, Bikin River valley currently the best site for the "Central Sikhote-Alin" extension in the context of Ussurijsky taiga conservation.**

In addition, other valuable protected areas situated in given RF region also could be under consideration as extension of the "Central Sikhote-Alin" property, because they are represented the same ecosystem – Ussurijsky taiga. However, these protected areas turned out not to be such prospective as Bikin River valley.

From one hand, they are reserves of south part of Primorsky Kray – Lazovsky and Ussuriysky, and "Call of the Tiger" National Park which



clear represent broad-leaved and cedar-broad-leaved forests and Manchurian flora. However, the territories of these protected areas are not so big (121, 40 and 82 thousand ha accordingly). Then, they represent not the same strong variety of ecosystems as Bikin River valley (clear domination of Ussurijsky taiga southern scenario and lack of northern). Besides, these protected areas are far from the main territory of the Sikhote-Alinsky Reserve (nearly 200-400 km southward). Moreover, since they situated in the most developed and habitable part of Primorsky Krai, so the allocation of "biopassages" between them and Sikhote-Alinsky Reserve could be difficult task.

From another hand, they are the protected areas situated on the south of Khabarovsk Krai and removed for 300-400 km northward from Sikhote-Alinsky Reserve – Botchinsky Reserve and Anyujsky National Park. The big area (267

and 429 thousand ha accordingly) allow to consider them as prime taiga reserves, however they situated not in central, but in northern part of the Sikhote-Alin with all the ensuring consequences (domination of northern species in plant formation). Regional complex nature reserve "Chukensky" (220 thousand ha) is close to the Middle Bikin basin on the north, it is offered to be a cluster of "Central Sikhote-Alin" property by the administration of Khabarovsk Krai in the long term.

Another National Park of given RF region could be under consideration as the cluster of "Central Sikhote-Alin" property – "Udegeyskaya legend" (88.6 thousand ha). It is situated bit westward from Sikhote-Alinsky Reserve and included valuable massifs of virgin Ussurijsky taiga. For this reason, it could be the option for "Central Sikhote-Alin" property extension in the future.

## 5) SIBERIAN TIGER

### GLOBAL CONTEXT:

comparison with other World Heritage properties, where various subspecies of the tiger are being conserved

Siberian tiger (*Panthera tigris altaica*) is one of the 5 tiger subspecies survived by now in wildlife. This animal was mentioned as most endangered category of International Red Data Book some years ago – as being "Critically Endangered" and it is moved to the category of "Endangered" animals. Siberian tiger (*Panthera tigris altaica*) inhabit in limited distribution area – generally on the south of Russian Far East, moreover mixed coniferous-broad-leaved forests, which cover the Sikhote-Alin slopes, are the most good inhabit for Siberian tiger (*Panthera tigris altaica*). Almost all world present-day population of Siberian tiger (*Panthera tigris altaica*) associated with this area, i.e. nearly 400-500 zooids. Nearly 20 tigers of these subspecies inhabit in adjacent Chinese areas.

**Siberian tigers do not meet beyond this limited distribution area anywhere. There are no World Heritage properties with criterion x among numerous sites in Southern, Eastern and South-Western Asia, which conserved given tiger subspecies, except one property – "Central Sikhote-Alin".** Indian, Nepalese, Thai and Bangladeshi World Natural Heritage properties stated below meet the challenge to preserve other tiger subspecies, generally Bengal tiger, Indo-Chinese tiger and Sumatra tiger (see Table 5).

**Table 5. Characteristics of the World Heritage properties where tiger subspecies are preserved**

Name of the property / UNESCO criteria	Location/ Geographic coordinates	Area of the property	Tiger subspecies / International Endangered Category	Approximate total numbers of tiger in wildlife / numbers in property
Sundarbans, India, Bangladesh / vii, viii, ix, x	Ganges Delta, N 21-22°, E 88-90°.	Nearly 270 thousand ha	Bengal tiger ( <i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i> )/ Endangered	1.7-2.5 thousand / 264
Kaziranga, India / ix, x	Eastern India, N 26°, E 93°	43 thousand ha	Bengal tiger ( <i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i> )/ Endangered	1.7-2.5 thousand / 86
Manas, India / vii, ix, x	North-East India, N 26°, E 90-91°	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 / vii, ix, x	South of Nepal, N 27°, E 83-84°	93 thousand ha	Bengal tiger ( <i>Panthera tigris tigris</i> or <i>Panthera tigris bengalensis</i> )/ Endangered	1.7-2.5 thousand / 80
Thungyai-Huai-Kha-Khaeng, Thailand / vii, ix, x	Western Thailand, N 15-16°, E 98-99°	600 thousand ha	Indo-Chinese tiger ( <i>Panthera tigris corbetti</i> )/ Endangered	550-1240/ ?
Dong Phrayayen-Khao Yai, Thailand / x	Southern Thailand, N 14°, E 102°	615 thousand ha	Indo-Chinese tiger ( <i>Panthera tigris corbetti</i> )/ Endangered	550-1240/ ?
Tropical Rainforest Heritage of Sumatra, Indonesia / vii, ix, x	Sumatra Island, N 2°, E 110°	2,6 million ha	Sumatra tiger ( <i>Panthera tigris sumatrae</i> ) Critically Endangered	300-680/ ?



Name of the property / UNESCO criteria	Location/ Geographic coordinates	Area of the property	Tiger subspecies / International Endangered Category	Approximate total numbers of tiger in wildlife / numbers in property
Central Sikhote-Alin (Sikhote-Alinsky Reserve), Russian Federation / x	South of Russian Far East, N 44-45°, E 135-136°	Nearly 400 thousand ha	Siberian tiger ( <i>Panthera tigris altaica</i> )/ Endangered	430-500/30-40
Bikin River valley, Russian Federation / x	South of Russian Far East, N 46-47°, E 135-138°	Nearly 1,2 million ha	Siberian tiger ( <i>Panthera tigris altaica</i> )/ Endangered	430-500/35-40

## REGIONAL CONTEXT:

### Comparison with other SPAs located at the south of Russian Far East

The survival of the Siberian tiger (*Panthera tigris altaica*) as extra subspecies in fact depends on environmental measures (first of all, on special SPAs development) in the zone of the Ussurijsky taiga, i.e. in Primorsky Krai and on the south of Khabarovsk Krai, due to strong limit of its present-day distribution area.

As its known, only one World Heritage property is situated in this zone – “Central Sikhote-Alin”, and Sikhote-Alinsky Reserve, as its “core”, initiates a mission on conservation of this rare varmint. The number of tigers living in Reserve estimates as 30-40 zooids that consider being the biggest pocket of given subspecies in all the area.

The tiger occur within the territory of other SPAs of this region singularly, for example in Lazovsky, Ussurijsky and Botchinsky Reserves and in recently established National Parks – “Call of the Tiger”, “Udegeyskaya Legend” and Ayunsky. All these SPAs play an important role in forming the single “Tiger econet” on the south of Russian Far East.

However, the Bikin River valley, both its upper part (nature reserve) and middle part (territory with traditional natural resource use), is being recognized as second pocket in order of importance for Siberian tiger (*Panthera tigris altaica*) habitation on the south of Russian Far East. Owing to vast and virgin massifs of Ussurijsky taiga, varmints found good conditions for living here. Its estimate number is 30-35 zooids here. Thus is the reproductive “core” of northern subspecies of Siberian tiger that could be connected with Sikhote-Alinsky Reserve through effective action of “biopassages” in view of its relatively short distance. For this reason, **Bikin River valley in particular number one nominee for the purpose of “Central Sikhote-Alin” property extension in the context of conservation of Siberian tiger (*Panthera tigris altaica*) subspecies.**

## BRIEF SUMMARY:

Situated in central part of Sikhote-Alin range, Upper and Middle Bikin – two large SPAs with well-conserved wild nature and with total area of 1.2 million ha, are the best nominees of the “Central Sikhote-Alin” World Heritage property consisting of Sikhote-Alin Reserve and Goralovy Nature Preserve (inscribed to the List in 2001).

Bikin River valley, as well as main territory, appeared outstanding universal value in two following aspects concerning criterion x:

1. The unique ecosystem represented in World Heritage List only owing to Sikhote-Alinsky Reserve – the largest massif among all survivors of virgin Ussurijsky taiga is situated here. So, large biome of Temperate Broadleaf Forests as well as small biotic province of Manchu-Japanese Mixed Forest could be represented in World Heritage List more exactly.

2. This huge and virgin territory is one of the key habitats of Siberian tiger (*Panthera tigris altaica*) which occurred in International Red Data Book as Endangered subspecies. Compared to other SPAs situated in the south of Russian Far East, Bikin River valley is the second important habitat for tiger (*Panthera tigris altaica*) after Sikhote-Alinsky Reserve: this varmint concentrate here in essentially greater numbers than within territories of federal SPAs of given region – in reserves and national parks. Bikin River valley inscription on the World Heritage List would create more effective “tiger econet” which is formed now on the south of Russian Far East.

There are no evident analogues of Bikin River valley among existing World Heritage properties, as well as of Sikhote-Alin Reserve. In addition, there are no evident analogues among potential World Natural Heritage sites according to the Tentative List.



### 3d. Statements of authenticity and/or integrity

The nominated area is the only territory on the western slope of the Sikhote-Alin mountain system that has not suffered much from destructive human activities. The largest entire massif of natural cedar-broadleaf forests is preserved here, being the habitat of many endemic, rare and endangered species of plants and animals.

Bikin River basin represents the integrated natural macro complex which main components are closely connected by common origin, history of development and evolutionary dynamics as well as specifics of ecology. Its integrity and high level of conservation are protected by the landscape reserve status, territory of the territory of traditional nature use resources and nutwood commercial zone.

The nominated territory is remote from large industrial centers and regions of heavy cropping. The high level of its landscapes and ecosystems conservation is the result not only of its legal status, but also of its geographical location, remoteness and large sizes (more than 1 million ha).



## 4 State of conservation and factors affecting the property



**Early morning on Bikin River**  
Photo by V. Kantor



#### 4a. Present state of conservation

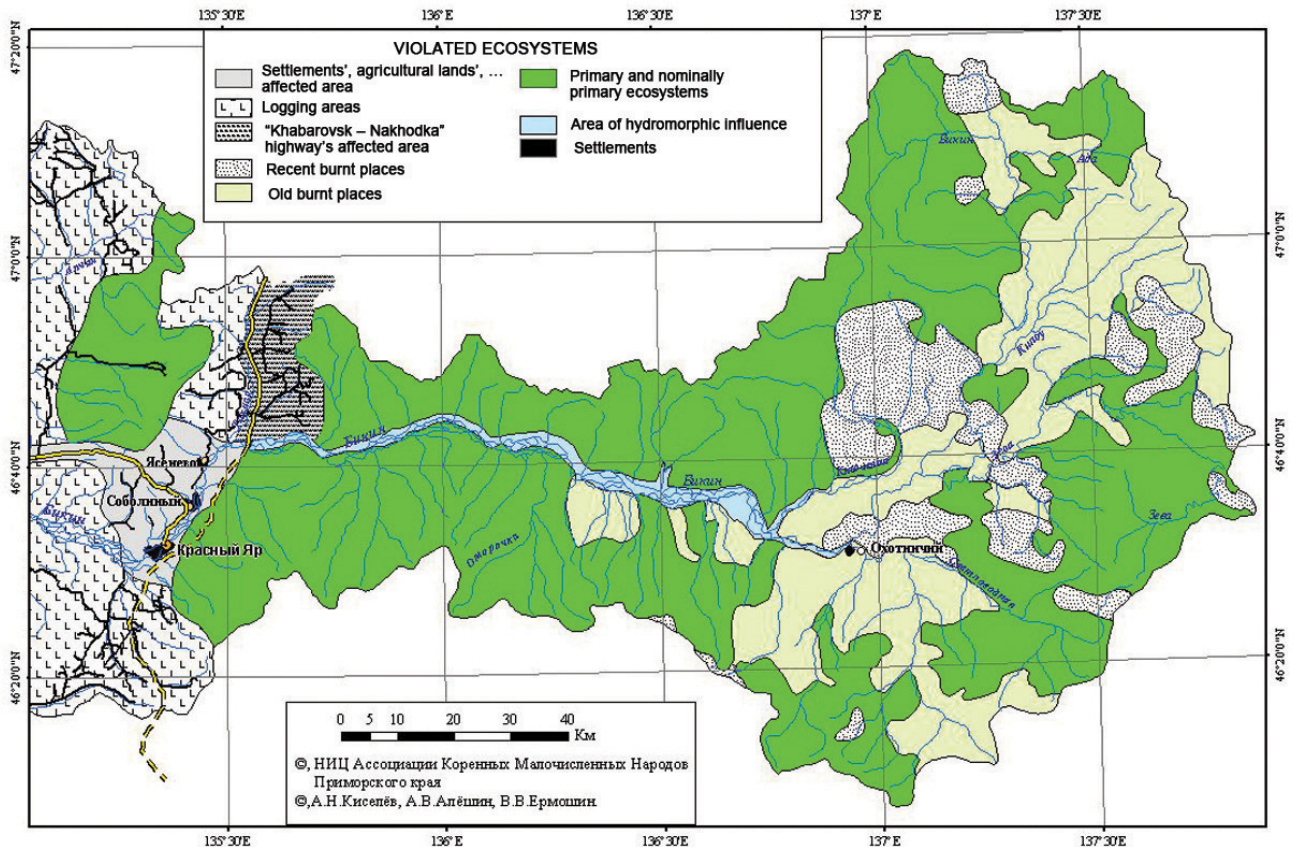
There is no any danger for industrial pollution for Upper and Middle Bikin territories due to lack of any industrial plants in upper reaches of the basin.

The nominated territory is not affected by the economic activities at all (except possibility of human fires).

Inspections and audits did not find out any changes in biota structure in forest ecosystems that were not affected by fires. There were found out only annual variations in duration of certain evolution stages of plant formation that associated with climatic features of certain year.

#### 4b. Factors affecting the property

*(i) development pressure (e.g. encroachment, adaptation, agriculture, mining)*



## VIOLATED ECOSYSTEMS

### Legend

#### Territories of active human intervention:

1. Settlements', farmlands', highways' and forest roads' affected area, areas of environmental harvesting and local economic felling.
2. Areas of modern commercial logging
3. Under construction highway's Khabarovsk – Nakhodka affected area

#### Territories of pyrogenic violated ecosystems:

4. Latest burnt places with weakly renewed and renewed secondary types of associations
5. Old burnt places with secondary permanent associations and nominally native associations coupled with conserved areas of primary forests.

#### Territories of weakly violated ecosystems:

6. Areas of recurrent hydromorphic influences on flat plain and low terraces, stream-bank erosion and changes of drainage regime.
7. Forest, mountain pine and mountain tundra primary and nominally primary ecosystems.

#### Territories with potentiality violence in the course of

##### a) mines workup

8. gold;
9. metals and zeolites;
10. coal;

##### b)

11. highway's Khabarovsk – Nakhodka building continuance

#### Other:

12. Areas with forests roads, winter roads, tracks (with density of 0,5-2 km per 4 sq. km)
13. Settlements

### Explanatory text

Map shows modern situation of violated ecosystems and possible violations owing to economic activity developing within the territory of Bikin basin.

Four types of territories were allocated according to ecosystems' types of action. Territory of intensive impact is enclosed areas of active affect of settlements, highways, local and economic harvesting, highway Khabarovsk – Nakhodka.

Territory of pyrogenic violation (generally Upper Bikin) is enclosed areas of all-aged burnt places from weakly renewed or with secondary forests to burnt places with nominally primary (spruce and larch) high-aged forests.

Territory of weakly violation occupies significant areas of Middle Bikin (wood-nut commercial zone) and less parts of Upper Bikin. It should be noted that the border of regularly wildfires is apt to move westward and fires enters wood-nut commercial zone.

Territories with potential violations could be detected in terms of potential exploitations of mineral deposits; moreover the effect of its impact could be more destructive than from fires.



The characteristics of forest resources are listed according to data of Verkhe-Perevalnensky forestry regulations (2008).

Current use of wood forest resources is active only on western margin of given territory. Owing to existing conservative state commercial scale of logging is not developed in Okhotnichiy and Krasnoyarsky foresters (Verkhnebikinsky Nature Reserve). Aboriginal community realize forest sanitation and improvement thinning in small volumes, to 8 thousand m<sup>3</sup> per year, near Krasny Yar village providing demand for wood among villagers. However, commercial shelter wood cutting of timber companies became active during last years according to permits of forest ranger stations of for conservation and forest reproduction.

Hunting areas, their productivity and areas determine structure and volume of hunting sector resources. All areas of Middle and Upper Bikin now is leased by Udege community "Tiger" (national hunting sector "Bikin" previous) and dispensed among aboriginals according to Federal and Regional Legislation on wild animals and community Articles of Agreement.

Multipurpose use of various wood productions is the base of aboriginal natural resources use. The main forms of traditional use of nature and traditional way of living within the nominated territory are:

- hunting, conversion and realization of hunting products;
- getting, conversion and realization of animals that are not hunting objects;
- gathering, including wild-growing plants, conversion and realization of wild-growing plants and its fruits (berries, mushrooms, eatable plants and medicinal herbs, nuts, etc.);
- fishery, conversation and realization of water biological resources;
- jacket manufacturing;
- national things, inventory, sledge, boats, native furry clothes, shoes making and realization;
- national souvenirs and other art things making and realization;
- other trades and crafts connecting with fur, leather, bones making, ornamental stones and jewels;
- gardening;
- native dwelling building and arrangement

in accordance with national traditions;

- ceremonial building and arrangement of historical, cultural, spiritual, environmental, mental and other sites valuable for Udege people in accordance with their traditions;
- ceremonial holidays arrangements, maintain of traditional internal and interethnic relations and development of ethnic tourism;
- devolving of environmental knowledge, environmental education and development of ethno-environment tourism;
- other tradition crafts, rural and communal proceedings.

Industrial nonwood logging scaled down in actual fact by 2004, except for ginseng harvesting that buys out by Chinese and except for eleuterococcus that stored up for short run by Yasenev and Soboliny villagers. The territory of traditional nature use was assigned for "Tiger" community for long lease since 2010. According to adopted Development Plan, it is planned to store up pine nuts (as much as 100 t) annually, eleuterococcus (as much as 50 t), osmund fern (as much as 3 t), bracken (as much as 5 t), Chinese magnolia vine (sap, seeds, frozen berries – as much as 4 t), blueberry (as much as 10 t).

During last 15 years musk deer (for musk) and bear (for bile and legs) cropping and also "meat" animals hunting (maral, elk, boar) arrived at record and dangerous values owing to economic collapse of state farms and Chinese market of animal products used in East medicine. Nearly 2000 sable skins are made annually. Currently existing system of Bikin hunting area usage lead to overexploitation of some of species in one part of the basin and to biologically admissible commercial burden in another, first of all in upper part according to transport inaccessibility. Wild animals meet with growing anthropogenic pressure here. The most great problem is uncontrolled sports fishing, especially in Upper Bikin, which weakly controlled by few inspection.

### *(ii) Environmental pressures (e.g., pollution, climate change, desertification)*

According to audit there are no changes in biota structure in forest ecosystems of the nominated territory. There are only annual

variations in timeline of certain developmental stages of plant related to climatic features of certain year.

### *(iii) Natural disasters and risk preparedness (earthquakes, floods, fires, etc.)*

The territory is situated in seismic belt with magnitude 5 (according to the Map of seismic zoning of SSSR, 1983), i.e. falls into the seismically calm rank.

Bikin River basin is largely subjected to strong flooding including flash floods with regularity of 2-3 times per century. At that, admitted to monsoon climate conditions, floods are the part of natural process keeping flood plains

and valley forests with all their diversity. Pyrogenic derangement of ecosystems and one of the effects – the hazard of new forest fires occurrence, is great only in central part of Upper Bikin. This factor could be taken over the control only provided the realization of the State forest conservation complex programme. The hazard of landslides, avalanches, mudflows and other natural disasters occurrence within the territory is insignificant.

### *(iv) Visitor/tourism pressures*

Given territory is characterized by low recreational activity level now. No more than 5-10 groups of foreigners and some thousand of Russian tourists annually attend the territory. The higher level of attendance demonstrates riversides visited by fisherman and by people during holidays and week ends. As much as 170 persons of the list of aboriginals keep commer-

cial hunting here during winter times. Natural complexes are affected only in small Okhotnichiy village locality where local pollutions with waste products and domestic garbage take place. Some lowering of river fish could be observed on big rivers over massive uncontrolled fisherman attendance.

### *(v) Number of inhabitants within the property and the buffer zone*

The territory is characterized by low level population even according to Siberian standards. All territory is populated with 1.2 thousand people, 48% of which belong to aboriginal thin people – Udege, Nanaj, Oroch. 60% of employable population deep in timber industry, first of all with a view to exploitation of nonwood resources, thinning operations, logging, nearly 35% of residents deep in services sector, administrative management and municipal services. Massive increase of local habitancy is low-probability.

Pozharsky District (Bikin River basin) is characterized by low density of population at all – rural population is 11.6 thousand people towards 22.7 thousand km<sup>2</sup> (0.5 people towards 1 km<sup>2</sup>). 4 settlements are situated near proposed World Natural Heritage property: Krasny Yar village (657 people), Olon village (29 people), Soboliny village (191 people), Yasenevy village (342 people). Okhotnichiy village (11 people) is situated within the territory of Preserve.

#### *Estimate population live in:*

*Within the territory of nominated property – 11*

*In buffer zone – 1212*

*Total amount – 1223*

*Year – 2010*



## 5 Protection and management of the property



**Ussurijsky taiga  
massif in Bikin  
River valley**  
Photo by V. Solkin

## 5a. Ownership

### a) ownership -

SPAs which form the natural complex of "Bikin River valley" refer to State forest fund and are the state-owned property of Russian Federation. Land, water, resources, plants and animals, situated within the property, were made available to Preserve and to the territory of traditional nature use by the State party. Facilities, historical and cultural and other properties, situated within the boundaries of the SPA, were assigned on an operational administration basis. Preserve management and management of the territory of traditional nature use are controlled by their administration on behalf of the State.

Russian Federation  
Moscow, Krasnopresnenskaya Embankment  
Government House  
Prime-Minister

Russian Federation  
Primorsky Kray  
690110, Vladivostok  
Svetlanskaya street, 20  
Head of Administration

### b) legal status -

The property include two adjacent areas, which have different SPA status:

1. The territory of traditional nature use of the indigenous small people of Pozharsky District, Primorsky Kray. The business is carried on the base of following documents:

- The Resolution of Primorsky Kray Head of Administration "On territory of traditional nature use of the indigenous small people of Pozharsky District" № 165 dated 11.06.1992.
- The Decision of Minor Council of Primorsky Kray of Council of People's Deputies "On place of Primorsky Kray indigenous small people residence and economic activity protection" № 316 dated 25.08.1993.
- The Resolution of the RF People's Deputies Convention "On socioeconomic status of North areas and equivalent to them localities" dated 21.04.1992.
- The Resolution № 76 of RSFSR Council of Ministers "On some actions on socioeconomic development of Northern areas" dated 4.02.1991.
- The Resolution of SSR Cabinet of Ministers and RSFSR Council of Ministers № 84 "On additional actions for improvement of socioeconomic living conditions of Northern indigenous small people for 1991-1999".

- Decree of the RF President "On high priority measures for Northern indigenous small people residence and economic activity protection" № 397 dated 22.04.1992.

- The Resolution of State Duma on critical state of economic and cultural life of Northern, Siberian and RF Far East indigenous small (aboriginal) people № 816-1SD dated 26.05.1995.

- The Agreement on occupation of the territory and water area of necessity for wild animals use on the 1352100 ha territory to the neighboring community of indigenous small "Tiger" for a term of 10 years, № 2 dated 17.11.2008.

- 461154 ha forest area to the neighboring community of indigenous small people "Tiger" for a term of 49 years Letting Agreement № 4/34 dated 3.06.2009.

2. Verkhnebikinsky Landscape Preserve. Established by the Resolution of the Primorsky Kray Governor "On establish of the State Nature Landscape Preserve of Regional Value" № 468 dated 15.09.1998. New Regulations for the Preserve was approved by the Resolution of the Primorsky Kray Governor № 169-па dated 28.07.2008.



Copy of documents put in the Annex B. Preserve and territory of traditional nature use legislative acts compliance control is carried out by the Board on preserve, control and regulation of wildlife usage and Board on Forest management of Primorsky Krai Administration.

## 5b. Protective designation

1. Verkhnebikinsky State Nature Landscape Preserve of Regional Value was established by the Resolution of the Primorsky Krai Governor "On establish of Verkhnebikinsky State Nature Landscape Preserve of Regional Value" № 468 dated 15.09.1998. Preserve is situated within the territory of Pozharsky District in 524, 531-536, 544-548, 564-570, 576-588, 591, 592, 595-597, 604-610, 621-625, 628-631, 657-662, 667-699, 714, 718, 720-1587 compartments of Okhotnichie forestry.

Preserve was established without any limitation of terms. Forests situated here are labeled as protective (prohibited forest belts along water bodies and spawning protection forest belts) and commercial forest.

The legal order of the forests situated within the SPAs is specified by the Article 103 of RF Forestry Code, details of forest use, protection, preserve, reproduction were adopted by the Order of the Ministry of Natural Resources and Ecology № 181, dated 16.07.2007.

Preserve was established for the purpose of unique Central Sikhote-Alin natural complexes and endangered species of plants and animals localities conservation in primeval state.

According to the Resolution of the Primorsky Krai Governor № 169-na dated 28.07.2008, the "Regulations on Verkhnebikinsky State Nature Landscape Preserve of Regional Value" was adopted. According to this "Regulations" the following activities are forbidden within the territory of Preserve:

- Any kind of activity, which goes against the Preserve goal or distresses natural complexes and their components;

- Land plowing exterior to Okhotnichiy township boundaries;

- Wood harvesting (trees, shrubs, lianas) except measures for stands care;

- Any types of fishery without approvals;

- Irrigation and drainage activities;

- Use of toxic chemicals for forest preserve, including scientific purposes;

- Arrangement of tourist camps exterior to specially allotted territory;

- Pollution and littering territory with industrial, consumption wastes and waste water, organization of disposal fields;

- Facilities, highways, pipe lines, power lines and other linear objects building, except whose of necessity for settlements creature comforts within the Preserve boundaries;

- Traffic and transport station exterior to roads in general use;

- Cattle driving exterior to highways;

- Any kinds of economic and other activity which keep down conservation, rehabilitation and reproduction of natural complexes and properties.

Aboriginal people historically arranged traditional use of natural resources within the territory of Preserve. This way of nature use provides sustainable nature management by use of wild life and other types of resources.

2. On the Resolution of Primorsky Kray Head of Administration № 165 dated 11.06.1992, Ethnical territory (ET) Bikinskaya (the territory of traditional nature use) was established for the protection of areas of settlement and economic activity of the indigenous small peoples of Primorsky Kray within the boundaries of nutwood commercial zone of Krasnoyarsky and Okhotnichiy foresters for the opportunity to lead traditional nature use and traditional way of life for persons belong to the indigenous small peoples, and also for persons who do not belong to the indigenous small peoples but who are permanently resident in areas of their traditional settlement, lead the same traditional nature use and traditional way of life as the indigenous small peoples.

Spatial quantity of the ET was determined with due consideration of following requirements:

- maintenance of populations of plants and animals sufficient for sustainability and conservation of biodiversity;
- opportunity to lead various kinds of traditional nature use for persons belong to the indigenous small peoples;
- conservation of traditional social and cultural relations of persons belong to the indigenous small peoples;
- conservation the integrity of properties of historical-cultural heritage.

### 5c. Means of implementing protective measures

**Preserve.** The security is carried out by 2 persons by force of patrolling. The patrolling is carried out by boat and on foot in summer, spring and autumn, in winter – on buran and byskiing. Sometimes plain flyover is carried out. Jointed raids of Hunting police, Fishery patrol and State Small Boat Inspection are carried out within the frame of annually operations. Aerial observation by force of aviation forest air protection is carried out during fire dangerous period.

**Territory of traditional nature use.** The security is carried out by the Yager Office of the “Tiger” Community of aboriginal people by force of patrolling and controlling on portable control pedestal with attraction of Police and State inspectors of Hunting police, Fishery control, Rosselhoznadzor and State Small Boat Inspection. There is a Security Officer among personnel, 3 Chief Inspectors and 8 Inspectors. There are 3 cross-country vehicles, 6 snowmobiles, 5 boats powered by outboard motor. The flights of aviation forest air protection observer are paid during fire dangerous period. .



## 5d. Existing plans related to municipality and region in which the proposed property is located (e.g., regional or local plan, conservation plan, tourism development plan)

- Long term Program till 2005 on Primorsky Kray nature conservation and rational use of nature resources (Environmental Program) developed on the initiative of RAS Far East Branch with attraction of some branch-wise institutes and adopted by regional Parliament (regional Council) in 1992. The Program, in particular, covers the increment of SPAs net with National Park including.
- Sikhote-Alin Biodiversity Conservation Strategy. Adopted by Resolution of Primorsky Kray Governor № 511, dated 15.10.1998.
- Primorsky Kray territorial planning chart. Adopted by Resolution of Primorsky Kray Governor № 323-па, dated 30.11.2009.
- Siberian Tiger (*Panthera tigris altaica*) Conservation Strategy. Adopted by the Order of the Minister of Natural Resources and Ecology № 25-р, dated 02.07.2010.

## 5e. Property management plan or other management system

- Regulation on Verkhnebikinsky State Nature Landscape Preserve of Regional Value, adopted by Primorsky Kray Governor Resolution № 169-па, dated 28.07.2008 (Annex B3).
- Management Plan of Verkhnebikinsky State Nature Landscape Preserve of Regional Value for 2011-2015 (Annex B4).
- Regulation on the territory of traditional nature use of the indigenous small people, adopted 25.06.1993 by the decision of Regional Council of People's Deputies (Annex B7).
- Forest Plan of Primorsky Kray. Adopted by Governor, dated 01.01.2009.
- Forestry by-laws of Verkhne-Perevalninsky forestry of Primorsky Kray Forest Management. Version 19.11.2009.
- Regulation on the Territory of Traditional Nature Use "Bikin" Project. 2005 (Annex B11).
- Forest development plan in forest range leased out to "Tiger" community, 2010 (Annex B12).

## 5f. Sources and levels of finance

Verkhnebikinsky Preserve funding achieved by regional budget and drawn funding.  
Total sum of reward of two inspectors – 264142 Rub/year.

**Table 6.**

Resources	Present	Of necessity
Inspectors	2	5
Radio station 3G-5118/5118A	2	
Generant ESE KRESS 850	1	
Chain saw «Partner» 352	1	
Navigator Garmin	1	
Motor boat		1
Snowmobile «Buran»		1
Ski		2

Existing and perspective funding:

### Verkhnebikinsky Preserve:

- maintenance work and control within the framework of main activity of Okhotnichie forestry of Verkhne-Perevalnensky forestry;
- one-off gain from the tourists activity of local organizations, Association of local aboriginal people and rural administration;
- incomes from traditional economic activity;
- one-off financial support from charity funds.

**The territory of traditional nature use and nut-wood commercial zone (Middle Bikin):** funding achieved by facilities of “Tiger” Community of the indigenous small people from their own activity with attraction of WWF grants, total sum of 2.6 million Rub/year, including 2.3 million Rub. as wage bill of Yager Service.

**Таблица 7.**

Resources	Present	Of necessity
Jeep «Safari»	2	1
GAZ-66	1	1
Snowmobile «Buran»	6	2
Outboard engine	5	3
Satellite-based phone	2	
GPS	6	4
Portable checkpoint trailer	1	1



There are also perspective funding:

- maintenance work and control within the framework of main activity of Krasnoyarskoe forestry of Verkhne-Perevalnensky forestry;
- legislative guaranteed governmental support of Udege community in the area of close-together living (generally, townships infrastructure and social sphere maintenance);
- one-off gain from "Tiger" community tourist activity;

- incomes from traditional economic activity of aboriginal people (furs, meat, fish, wild plants);
- one-off gain from charity funds and grants;
- Carbon accommodation on account of cedar and broad-leaved forests conservation.

### 5g. Sources of expertise and training in conservation and management techniques

Workshops, regional level conferences.

### 5h. Visitor facilities and statistics

Some parts of the territory, favorable to recreational nature management, generally associated with nutwood commercial zone in middle reaches of Bikin River and to Okhotnichiy township locality. Total sum of annual recreational pressure is 3854 persons/ha here under the conditions of seasonal sightseeing type of recreation. Maximum recreation capacity is 1205000 persons on this territory.

The main part of tourists visits Bikin River for floats with sport fishery now. In high season up to 150 boats (350-400 persons) per 200 km of river channel could be find here during dropping down after aircraft delivery to Okhotnichiy township or during transportation from the bridge across Bikin River on the way Khabarovsk-Nakhodka on rubber boats powered by outboard motors. 25-30 Udege hunters with their freight boats take part in delivery set-up.

Bikin ethnic tourism is built up on the basis of traditional national ceremonies and festivals. For example, local national festival hallowed in certain season (the beginning of August) is very popular. This is colorful festival-show of national culture (dancing and song folklore, local arts, sport matches, etc.).

This festival often is joined together not only Krasny Yar residents but also representatives of other Udege communities of Primorie and Khabarovsk Kray, guests from other regions

and foreigners. Not only local national folklore ensembles take part in such festivals but also guests. 2-3 groups of Japan tourists visit Krasny Yar annually and spend 2-3 days in Udege families, visit Museum in Ethnic Cultural Centre. An up the river excursion to "Ulma" camp is organized for them.

Translation and excursion explanations through guides on tracks and in publications put right. Overnight accommodation in guest houses put into execution.

Primorsky Kray has fair amount of organizations capable and ripe for advertising organization and exotic excursion activities along Bikin River valley. Bikin has an experience of such touristic activities with floating in Udege boats, aircraft delivery to upper reaches, hunting and fishing, accommodation in Udege families. Now there is a possibility of delivery to table land on main ridge watershed from Svetlaya offshore township over existing road with following floating on Bikin River basin tributaries. Such track could affect on most experienced traveler by virgin nature. Such tracks offer overnights in Udege campgrounds, main camps and guesthouses are situated in Okhotnichiy and Krasny Yar villages where a small traditional Udege museum is situated.

## 5i. Policies and programmes related to the presentation and promotion of the property

Informational and promotion activities are realized by force of booklets, guides, calendars publication and distribution, through Visitors Centre; by force of lectures, excursions to scholars, organization of school forestry; through mass media (radio, TV, newspapers). Now an illustrated web page devoted to "central Sikhote-Alin" property is under creation.

8 guesthouses built along Bikin River, 4 of them belong to "Tiger" community. Ethnic and Cultural Centre with museum and gift shop built in Krasny Yar villages, Ecological and Touristic Club and Pathfinder School developed for scholars.

Association of Indigenous Peoples of North, Siberia and Russian Far East, respective Association in Primorsky Krai in close cooperation with Arctic Council and Indigenous People UN Working Party are make wide propaganda of touristic potential and Upper and Middle Bikin natural complexes broadly to elements of traditional culture of Udege aborigines. WWF Amur Branch, NPO "Pervocvet" (Luchegorsk), Institute of Sustainable Nature Management and Biodiversity Conservation Centre (Vladivostok) also work in this direction.

Much interest for scientific, ecological and informative tourism within include in nomination territory of Udege economic activity is shown by foreign NGOs and scientific and research institutions: Friends of the Earth – Japan, Taiga Rescue Network, Audubon Society (USA), Global Security Network (GSN, USA), Russian Nature Reserve Travel Company (Massachusetts, USA), Japanese Fond for Global Environment, IUCN, Dominion Parks Branch (Canada), etc. Each of these organizations led their own independent advertizing campaign of mentioned territories in their regions. At the same time, there are trends for consolidation of these forces. According to initiative of Regional Committee for Tourism with Association

of Travel Agency a set of conferences and exhibitions devoted to development of exotic and adventure tourism on nominated and adjacent territories were led in 1998 in Primorie. On the base of requests and accumulated scientific information on recreation capacity of territory a Regional Programme of Environmental Tourism is under development.

Activities for rebirth of traditional crafts of aboriginal people are developed in parallel on nominated territory. Within the framework of TACIS project Tailor's and Carpenter's workshops produced gifts, national clothes and things were established. More than 20 people received special training; treaties with 8 shops were made for products realization. WWF Amur Branch and Association of Indigenous Peoples of North in Primorsky Krai initiated a big project on development of small community enterprises, all-round support of their activity over nonwood taiga products reclaiming and consolidation of force while entrance to the market towards decision of quality, yield, technology issues and products marketing.

Neighbor's community of Indigenous Peoples of North named "Tiger" was established. It is include nearly 170 residents of Krasny Yar villages and it is sewed up hunting area within all nominated territory and rights in nonwood products using within the territory of traditional nature use. Forestry management and Development Plan adopted by the Primorsky Krai Forest Management Department were made across the territory of traditional nature use. In accordance with Development Plan a Business Plan was prepared, storages are constructed and equipping for store, conversion and keeping of wilding are purchasing. All these materials now are in actual state for practical work of aborigines and become a base of wide advertizing campaign for nominated areas independent mode forming through traditional economic activities.



## 5j. Staffing levels (professional, technical, maintenance)

2 inspectors based in Okhotnichiy township and obeyed to Primorsky SPAs Administration work in Verkhnebikinsky Preserve.

Regular patrolling of nominated territory is executed by 2 inspectors of Hunting Policing and 2 inspectors of Fishing Policing who work in respective Departments of Pozharsky Regional Administration.

The regular office staff of "Tiger" community is more than 30 persons including 12 persons of Yager Service. There are also a hunt specialist, chief of storage department, procurement officers, garage manage and drivers, accounts and watchman.



## 6 Monitoring



**Leaf fall ashore  
Bikin River**  
Photo by P. Phomenko



## 6a. Key indicators for measuring state of conservation

Table 8.

Indicator	Periodicity	Location of records
Number of violation of environmental law	Quarterly	Primorsky SPAs Administration, Ussuriysk, Nekrasova street, 19. Administration on conservation, control and regulation of Primorsky Kray wild animals' usage, Vladivostok, Aleutskaya street, 45a.
Number of publications in mass media	In half a year	WWF Amur Branch, Russian Federation, Vladivostok, Verkhneportovaya street, 18a.
Number of Siberian tigers on monitoring area	Annually	Pacific Institute of Geography of FEB of RAS, Vladivostok, Radio street, 7.
Number and area of fires	Annually	Forest administration of Primorsky Kray, Vladivostok, Belinskogo street, 3.

Table 9. Description of the stationary ground of the tiger and hoofed mammals censuring in the Bilin river middle stream.

Title	Measuring unit	Показатели
Ground square	Km <sup>2</sup>	1027,1
Censuring routes number	number	15
Annual routes extension during first censuring	Km	188,6
Annual routes extension during second censuring	Km	188,7
Annual total routes extension during two censuring	Km	377,3
Average routes extension	Km	12,6
Routes density per area unit	Km / 10 Km <sup>2</sup>	1,8



## **6b. Administrative arrangements for monitoring property**

Regional State Establishment "Primorsky SPAs Administration". Mogilnikov Eugene Anatolievich, Chief Inspector.

Administration on conservation, control and regulation of Primorsky Kray wild animals' usage. Popov Sergey Ivanovich, Chief Inspector of Hunting Policing.

Forest administration of Primorsky Kray. Antipov Vladimir Fedorovich, Regional Inspector of Pozharsky Municipal Region.

## 6c. Results of previous reporting exercises

Table 10. Record of hunting animals population conditions on the OO «Obshina KMN Tigr» hunting seat (2009)

Species	Land square, thous. ha.		Population conditions (good, bad, satisf.)	Population size evaluation (grow, decrease, stable)
	suitable	settled		
Maral	1352,1	1352,1	Satisfactory	Stable
Boar	660,4	660,4	Good	Stable
Roe deer	1352,1	1352,1	Good	Stable
Elk	932,4	932,4	Satisfactory	Stable
Musk deer	1352,1	1352,1	Good	Stable
Brown bear	1352,1	1352,1	Satisfactory	Stable
Black bear	660,4	660,4	Satisfactory	Stable
Sable	1352,1	1352,1	Satisfactory	Stable
Otter	81,7	81,7	Satisfactory	Stable
Wolf	1352,1	1352,1	Satisfactory	Stable
Raccoon dog	1352,1	1352,1	Bad	Stable
Lynx	1352,1	1352,1	Satisfactory	Stable
Badger	519,7	519,7	Satisfactory	Stable
Glutton	932,4	932,4	Satisfactory	Stable
Indian marten	1352,1	942,5	Satisfactory	Stable
Siberian striped weasel	1352,1	1352,1	Bad	Stable
Mink	81,7	81,7	Bad	Stable
Lepus	1352,1	1352,1	Good	Stable
Manchu hare	1352,1	1352,1	Satisfactory	Stable
Squirrel	1352,1	1352,1	Good	Stable
Musk beaver	81,7	81,7	Bad	Stable
Hazel grouse	1352,1	1352,1	Good	Stable
Waterfowl	81,7	81,7	Good	Stable
Siberian grouse	422,8	422,8	Satisfactory	Stable
Wood grouse	422,8	422,8	Satisfactory	Stable
Tiger	1352,1	942,5	Good	Stable



**Table 11. Wild animals and birds population dynamics on the territory of the OO «Obshina KMN Tigr» hunting seat, according the commercial accounting.**

Species	Population per year				
	2004	2005	2006	2007	2008
Maral	3874	3801	3937	3790	3945
Boar	3504	3712	4037	3909	4777
Roe deer	4068	4448	4340	4281	4081
Elk	3403	3292	3319	3475	3771
Dappled deer	No	No	No	No	No
Musk deer	4068	4373	4607	4577	4865
Brown bear	195	215		266	266
Sable	5012	4994	5085	5287	5021
Otter	146	146	191	178	194
Wolf	2	14	1	6	11
Fox	No	No	No	No	No
Raccoon dog			Insignificant	Insignificant	Insignificant
Lynx	269	299	276	223	253
Badger +				53	79
Glutton					4
Indian marten					168
Siberian striped weasel	2313	2064	2108	1817	1882
Mink	657	584	543	636	543
Lepus	2641	2483	2556	2391	2469
Manchu hare					
European hare	No	No	No	No	No
Squirrel	5044	5114	4788	4428	4592
Musk beaver+	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Hazel grouse	7375	7882	7634	8364	8501
Pheasant +	No	No	No	No	No
Waterfowl +				848	924
Beaver	No	No	No	No	No
Black bear	321	336		303	224
Siberian tiger	30	35	37	42	42
Amur forest cat					
Siberian grouse			Insignificant	Insignificant	39
Wood grouse			Insignificant	Insignificant	16
Black-cock	No	No	No	No	No

According to the data of the Institute of sustainable use of nature. Report of the «Study and justification of the Bikin river basin value for hunting and rare species» project. Prepared by: V.V. Aramilev, S.A. Sokolov. Vladivostok 2010

**Table 12. Tiger and hoofed mammals censuring index on the stationary ground in the Bilin river middle stream from 1998 till 2010**

Index	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Среднее
Tiger trails density (trail quantity/10 km/days after snowfall)	3,6	7,7	0,9	3,7	2,3	2,6	6,3	0,6	2,2	1,2	1	0,5	1,6	2,6
Quantity of «person» tigers (quantity of mature, young and uncertain units)	3	10	7	6	7	8	5	5	4	6	5	3	4	5,6
Density of «person» tigers (quantity of mature, young and uncertain units per 100 km <sup>2</sup> )	0,29	0,97	0,68	0,58	0,68	0,78	0,49	0,49	0,39	0,58	0,49	0,29	0,39	0,55
Density of maral trails (quantity of fresh trails per 10 km of route)	1,47	11,24	7,14	9,53	5,32	10,37	4,52	6,91	4,13	6,85	2,86	3,96	3,83	6,01
Density of boar trails (quantity of fresh trails per 10 km of route)	1,45	4	0,29	3,97	1,69	3,2	5,09	8,46	3,96	7,31	7,21	4,47	3,02	4,16
Density of roe deer (quantity of fresh trails per 10 km of route)	1,61	4,96	1,39	2,88	4,49	3,41	4,73	5,43	3,95	5,35	5,6	5,87	6,53	4,14

**Table 13. Comparative evaluation of the tiger and hoofed mammals on the 16 grounds of monitoring in the tiger area on RDV (Average annual index (bottom line) is the total average for all grounds)**

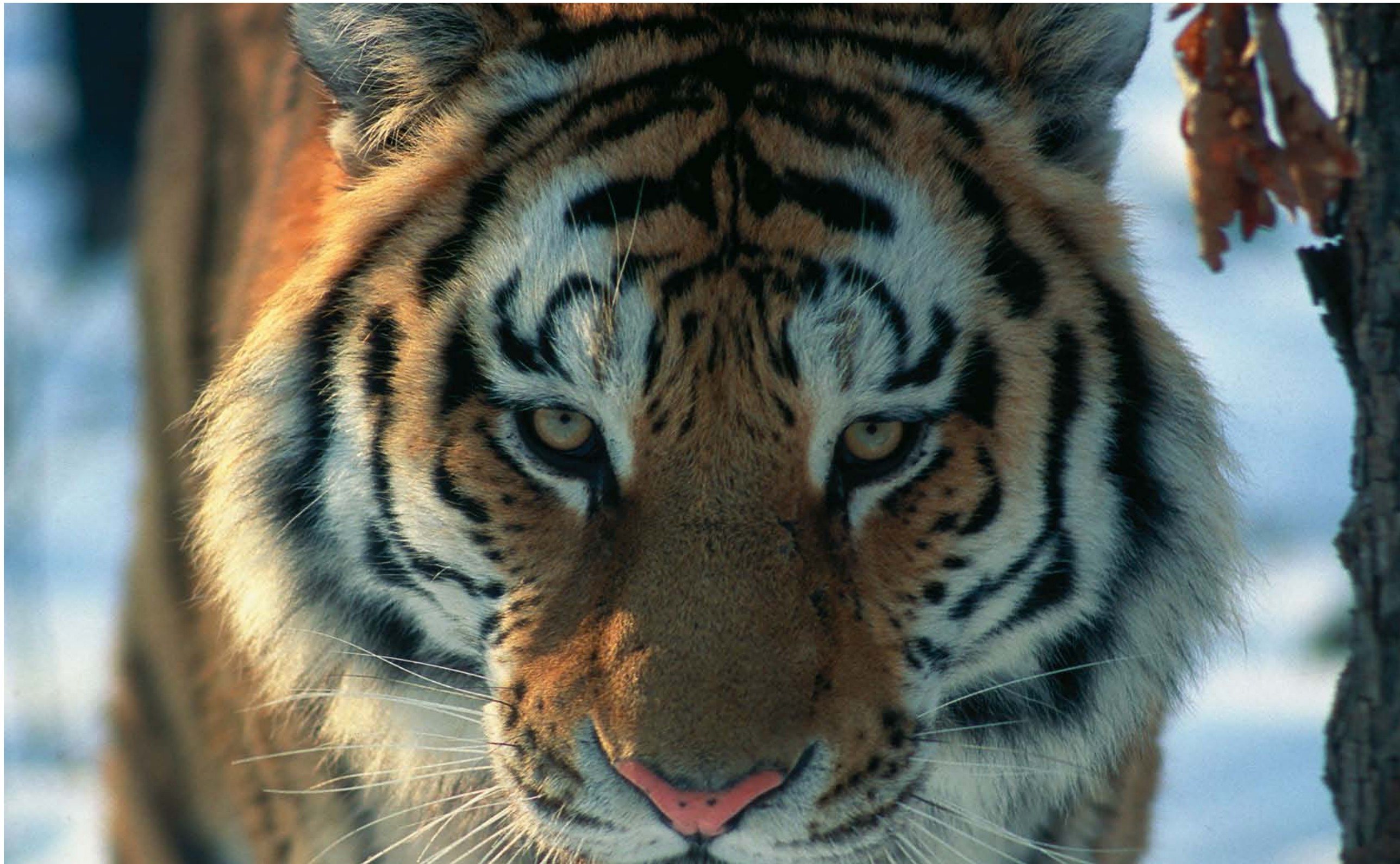
Monitoring ground (following the tiger area from North to South)	Tiger trails density	Number of «person» tigers	Density of «person» tigers	Maral trails density	Boar trails density	Roe deer trails density
Botchinsky reserve	0,7	3,5	0,11	5,2	0	3,36
Tiger House	1,1	4,6	0,22	1,91	0,43	0,51
Bolshe-Hekhtsirsky reserve	1,1	1,4	0,29	26,04	4,63	2,17
Matajsky wildlife reserve	0,9	5	0,2	3,7	1,93	1,66
Khor	1,2	4,5	0,33	5,59	2,55	3,84
<b>Bikin</b>	<b>2,6</b>	<b>5,6</b>	<b>0,55</b>	<b>6,01</b>	<b>4,16</b>	<b>4,14</b>
Sikhote-Alinsky reserve	1,1	17,7	0,75	19,87	3,56	14,76
Ternejsky hunting site	0,5	7,6	0,44	6,34	1,09	5,6
Iman	0,8	5,2	0,38	4,8	2,11	3,85
Sinyaya	0,6	5,7	0,48	1,68	0,77	2,61
Sandagou	0,5	5,1	0,22	5,78	1,74	4,96
Lazovsky reserve	3	10	0,82	3,9	6,11	2,34
Lazovsky region	1,1	5,2	0,53	0,25	1,4	1,43
Ussurijsky reserve	3,5	5,8	1,41	5,76	9,75	5,18
Ussurijsky region	0,8	4,7	0,33	2,74	2,62	5,53
Borisovsky plateau	0,8	3,2	0,22	0	5,03	4,78
<b>Average annual index</b>	<b>1,27</b>		<b>0,47</b>	<b>6,27</b>	<b>2,76</b>	<b>4,17</b>

Data from «Siberian tiger population monitoring program. 13 years report: 1998-2010» document Wildlife Conservation Society (WCS)  
All-Russian Research Institute of hunting sector and animal breeding  
Pacific Institute of Geography, FEB RAS  
Biologic and Soil Institute, FEB RAS  
Sikhote-Alinsky state natural biosphere reserve, named after K.G. Abramov

Lazovsky state natural reserve, named after L.G. Kaplanov  
Ussurijsky state natural reserve, named after V.L. Komarov  
Botchinsky state natural reserve  
Bolshehekhtsirsky state natural reserve  
Institute of sustainable use of nature  
World Wildlife Fund (WWF)



**7** Documentation



**Siberian tiger**  
Photo by V. Solkin



## 7a. Photographs, slides, image inventory and authorization table and other audiovisual materials

### LIST OF VISUAL ANNEXES AND FORM FOR PHOTO- AND AUDIOVISUAL MATERIALS

Nº	Format (slide / photo/ video)	Title	Date (month, year)	Photographer/ Production manager	Copyright holder (if differ from photographer / Production manager)	Contacts of Copyright holder (name, address, phone/ fax, e-mail)	Not exclusive transmission of rights
1.	Photo	One of the localities of virgin Ussuriysky taiga conserved in Bikin River valley		V. Kantor	V. Kantor	vadimkantor@mail.ru	Yes
2.	Photo	Early morning on Bikin River		V. Kantor	V. Kantor	vadimkantor@mail.ru	Yes
3.	Photo	Bikin River		S. Melnikov	S. Melnikov		Yes
4.	Photo	Bikin River valley in its middle reaches		A. Butorin	A. Butorin	butorin@nhpfund.org	Yes
5-8.	Photo	Views of Verkhnebikinsky Preserve		V. Solkin	V.S olkin		Yes
9.	Photo	The breakup of the river usually begin in mid-April		S. Melnikov	S. Melnikov		Yes
10.	Photo	Ginseng		V. Medvedev	V. Medvedev		Yes
11.	Photo	Chinese magnolia vine		V. Medvedev	V. Medvedev		Yes
12.	Photo	Grapes		P. Phomenko	P. Phomenko		Yes
13-14.	Photo	Nearly 40 zooids of Siberian tiger inhabits in Bikin River valley		V. Solkin	V. Solkin		Yes
15.	Photo	Brown bear		E. Mogilnikov	E. Mogilnikov		Yes
16.	Photo	Black bear		S. Karamanchuk	S. Karamanchuk		Yes
17.	Photo	Lynx		V. Medvedev	V. Medvedev		Yes
18.	Photo	Badger		G. Shalikov	G. Shalikov		Yes
19.	Photo	Boarish family		E. Lepeshkin	E. Lepeshkin		Yes
20.	Photo	Musk deer		A. Panichev	A. Panichev		Yes
21.	Photo	Roe deer		E. Mogilnikov	E. Mogilnikov		Yes
22.	Photo	Maral		V. Medvedev	V. Medvedev		Yes

Nº	Format (slide / photo/ video)	Title	Date (month, year)	Photographer/ Production manager	Copyright holder (if differ from photographer / Production manager)	Contacts of Copyright holder (name, address, phone/ fax, e-mail)	Not ex- clusive trans- mis- sion of rights
23.	Photo	Sable		G. Shaulsky	G. Shaulsky		Yes
24.	Photo	Ground-squirrel		S. Karaman- chuk	S. Karaman- chuk		Yes
25.	Photo	Fish owl		S. Avdeyuk	S. Avdeyuk		Yes
26.	Photo	Mandarin duck		V. Solkin	V. Solkin		Yes
27.	Photo	Hazel grouse		E. Mogilnikov	E. Mogilnikov		Yes



## 7b. Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property

- B.1 Extract from the Federal Law of the Russian Federation «On specially protected natural areas» of 14.05.1995.
- B.2 Resolution of the Primorsky Kray Governor "On establish of Verkhnebikinsky State Nature Landscape Preserve of Regional Value" № 468 dated 15.09.1998.
- B.3 Regulation on Verkhnebikinsky State Nature Landscape Preserve of Regional Value, adopted by Primorsky Kray Governor Resolution № 169-па, dated 28.07.2008.
- B.4 Management Plan of Verkhnebikinsky State Nature Landscape Preserve of Regional Value for 2011-2015.
- B.5 Federal law on the territory of traditional nature use of the indigenous small people of the North, Siberia and Far East of the Russian Federation, №49-FZ, dated 07.05.2001.
- B.6 The Resolution of Primorsky Kray Head of Administration "On the territory of traditional nature use of the indigenous small people of Pozharsky District" № 165 dated 11.06.1992.
- B.7 Regulation on the territory of traditional nature use of the indigenous small people, adopter 25.06.1993 by the decision of Regional Council of People's Deputies.
- B.8. 461154 ha forest area neighboring to community of the indigenous small people "Tiger" for a term of 49 years Letting Agreement № 4/34 dated 3.06.2009.
- B.9 Letting Agreement on wildlife animals' usage and hunting area of middle and upper reaches of Bikin River sewing up on behalf of "Tiger" community with a total area of 1352100 ha dated 17.11.2008.
- B.10 Report of proceedings at RF Minregion meeting on develop a model territory of traditional nature use of Federal value in the middle and upper reaches of Bikin River dated 30.05.2006.
- B.11 Regulation on the Territory of Traditional Nature Use "Bikin" Project. 2005.
- B.12 Forest development plan in forest range leased out to "Tiger" community, 2010.

## 7c. Form and date of most recent records or inventory of property

- Accounting of forest reserves for 01.01.2009 r. (characteristics and state of forest resources within the site).
- Data of forestry management of Bikinsky nutwood commercial zone. 2009-2010.
- Annual reports of Verkhneperevalnensky forestry (Pozharsky forestry) where Preserve and territory of traditional nature use are situated.
- Annual reports of Administration on conservation, control and regulation of Primorsky Kray wild animals' usage over the results of Hunting Policing.
- Background materials of Preserve leadership, Administration of Pozharsky District for 2008 on tourists' visits.
- Background materials on socioeconomic state of the site.

## 7d. Address where inventory, records and archives are held

Forest administration of Primorsky Kray  
690035, Vladivostok, Belinskogo street, 3.

Primorsky SPAs Administration  
692519, Ussuriysk, Nekrasova street, 19.

Administration on conservation, control and  
regulation of Primorsky Kray wild animals'  
usage  
690091, Vladivostok, Aleutskaya street, 45a.

Municipal Committee of Krasnoyarsky  
rural village  
692017, Primorsky Kray, Pozharsky District,  
Krasny Yar villages, Lenina street, 28

## 7e. Bibliography

Annex D appear nearly 70 publications devoted to nominated area.



## 8 Contact information of responsible authorities



**Brown bear on walk**  
Photo by E. Mogilnikov



## 8a. Preparers

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## 8b. Official Local Institution/Agency

Municipal Committee of Krasnoyarskiy rural village  
692017, Primorsky Kray, Pozharskiy District, Krasny Yar township, Lenina street, 28  
Uza Alexey Laulanovich, Chief of the settlement

Administration of Pozharskiy Municipal District  
692001, Primorsky Kray, settlements of urban type Luchegorsk, community centre, buil. 1  
Sinitsyn Vladimir Vitalievich, Chief of the District

Administration on conservation, control and regulation of Primorsky Kray wild animals' usage  
690091, Vladivostok, Aleutskaya street, 45a.  
Aramileva Tatiana Sergeevna, Head of Department

Administration of Primorsky Kray  
690110, Vladivostok, Svetlanskaya street, 22  
Popov Pavel Georgievich, Vice-governor of Primorsky Kray on road facilities, industry, transport, forestry issues and on wildlife usage

Russian Association of Indigenous People of the North of Primorsky Kray, the "Tiger" Community.

692017 Primorsky Kray, Pozharskiy District, Krasny Yar village, Novaya st., 18A, telefax: 8-52357-32623, e-mail: vladimir-shirko@yandex.ru, okmntigr@yandex.ru

Head of Russian Association, Chairman of the "Tiger" Community - Shirko Vladimir

## 8c. Other Local Institutions

Primorsky Kray Forest Management  
690024, Vladivostok, Belinskogo street, 3a  
Tel.: (4232) 38-86-88, Fax: 38-80-73  
e-mail: ULHPK@primorsky.ru  
Rybnikov Dmitry, Head of Forest Management Department

Department of Natural Resources and Environmental Protection of Primorsky Kray  
690110, Vladivostok, Svetlanskaya street, 22  
Tel.: (4232)208632  
Shulepova Tatiana, acting Head of Department

## 8d. Official Web address

<http://>  
Contact name:  
E-mail:

## 9. Signature on behalf of the state party



SIGNATURE ON BEHALF OF THE STATE PARTY

**Deputy Minister of Natural Resources  
and Environment of the Russian Federation**

**Igor I. Maydanov**



# ANNEX



ANNEX

**Management plan of the Verkhnebikinsky State Landscape  
Nature Preserve of Regional Value for 2011–2015**

**1. General information**

- 1.1. Description of the Reserve
- 1.2. History of the establishment
- 1.3. Goals of the Reserve
- 1.4. Main features

**2. Values and remarkable features of the Reserve**

- 2.1. Natural values
- 2.2. Analysis of the state of conservation

**3. Man & Nature**

- 3.1. History of populating and development
- 3.2. Attendance of the site
- 3.3. Antropogenic effect, illegal nature use activities
- 3.4. Threats to natural values of the Reserve

**4. Infrastructure and activities of the Reserve**

- 4.1. Administrative arrangement
- 4.2. Protection of the territory
- 4.3. Scientific research projects
- 4.4. Environmental education
- 4.5. Tourism activities
- 4.6. Financial and economic activities
- 4.7. Integration into the regional social and economic structure

**Analytic summary**

**5. Territorial management plan**

**6. Action plan**

## Part 6. Action plan

### 6.1. Goals and priority tasks

In the upcoming period, the main development goal of the Preserve is conservation of unique natural complexes and ranges of endangered animals and plants species of Central Sikhote-Alin in primeval state. The main tasks of the Preserve are:

- Landscape conservation and restoration, which has environmental, ethnical, resource and scientific value;
- Enhancement of the balance of nature in Central Sikhote-Alin region;
- Performance of experimental and representative functions on restoration and enrichment of plants and animals species composition and conservation of the environment in the Central Sikhote-Alin region;
- Arrangement of environmental monitoring and research scientific works conditions on Central Sikhote-Alin ecosystems conservation and restoration without restoration of preservation conditions;
- Holding of preventative measures against fire, its timely finding out and control;
- Promotion of best practices on conservancy, environmental education;
- Arrangement of regulatory activity of recreation, controlled eco-tourism and excursions.

The most important short-term development trends of the submitted to the UNESCO World Natural Heritage List property, with the top-priority fundamental purpose of biodiversity and landscape diversity conservation, are:

- Enhancement of environmental activity including the development of Security Guard and Patrol Service activity;
- Development of research and monitoring projects as a basis for nature conservation activities;
- Establishing and development of the Preserve as the regional environmental education center, foundation of ecotourism including the educational and extreme domestic and international tourism;
- Integration of the Preserve into the regional economic and social network.

Successful implementation of the above mentioned programs would allow the Preserve and the local and regional authorities to combine efforts in order to preserve natural complexes and biodiversity of the region, to improve the effectiveness of the Preserve and to achieve the leading position in the region in the field of nature conservation. The full achievement of the objectives will only be possible along with early complete database production and scientifically grounded approaches and methods using.

The ultimate goal of the Preserve's development achievable by step-by-step fulfillment of individual tasks can be the harmonization of the «society-nature» interaction, providing that the sustainable biodiversity and natural complexes of the area being maintained.

### 6.2. Action plan

The 2011-2015 Action Plan is built on the principle of target programs in conformity with the main activity lines of the Preserve with definition of main goals and tasks. The goals and tasks are to be performed through the implementation of a series of specialized management tasks, which can be corrected as the work moves forward. In turn, the management tasks are followed by a series of appropriate actions.



The long-term Action Plan can serve as the basis for the development of short-term action plans specifying objectives, responsible officers and necessary non-human resources. Financial changes can cause changes in the timing of events and in the list of planned activities.

Many of the Plan's objectives require good coordination between nature conservation and economic activities of the Preserve and between the Preserve and its superior bodies, governing bodies and local authorities.

### **6.2.1. PROGRAMME «Protection of natural Preserve's complexes and biological and landscape diversity conservation»**

The main activity of the Preserve is the conservation of natural complexes and sites including the direct protection of its area.

**Goal:** The conservation of unique natural complexes and ranges of endangered animals and plants species of Central Sikhote-Alin in primeval state.

#### **Priority tasks:**

- protection regime violation control (poaching, other illegal types of natural management, illegal visit of territory and any one sites, violation of fire regulation and other established rules of conduct on the conservation area, etc.)
- implementation of special protection control towards the particular valuable natural sites (endemic or endangered species), the animal habitat centers, nesting and breeding places.
- information support of established regime and special protection measures including fixing and maintaining of indicators, information panels, special signs, stickers and others, as well as environmental education for native population, including the mass media sources.
- forest and other wilderness fires prevention, detection and extinguishing activity.
- anthropogenic pollution control within the Preserve and its cordons, and minimization of its negative consequences.

The programme includes **subprogrammes**:

1.1. Fire prevention measures

1.2. Improvement of the effectiveness and sustainability of nature conservation measures through the application and development of innovative technologies

#### **1.1. Subprogramme «Fire-prevention measures»**

**Goal:** Reduction of forest fire area and number within the Preserve

**Management task:** Fire-prevention measures efficiency improvement

#### **Activities:**

- Searching for new sources of current information about forest fires within the Preserve, including space surveillance aid.
- Realization of fire-prevention education and promotion in regional and local mass media, manufacturing and distribution of fire-prevention production.
- Increasing the number of fire-prevention observation posts within the Preserve, using the relief uplands.
- Conclusion of treaties for air forest fire protection.

**Expected outcomes:**

- Forest fire prevention and protection performance increasing.
- Forest fire detection rate increasing (within the Preserve).
- Out-of-control forest fire area and number decreasing (within the Preserve)

**1.2. Subprogramme «Improvement of Security Guard and Patrol Service»**

**Goal:** Developing and implementing of sustainable mechanisms for the effective work of the state inspectorate of the Preserve concerning prevention and restraint environmental law violations in changing social and economic conditions and considering changing regulatory and legal framework.

**Management task:** Management of the effective work of state inspectorate of the Preserve concerning patrolling and keeping the established conservation regime.

**Activities:**

- Skilled staff recruiting and deployment.
- Regularly training of state inspectors of the Preserve.
- Material and technical supply of the state inspectorate.
- Building new cordons of the Preserve.
- Package of environmental low violence preventive measures.
- Manufacturing and fixing of the information panels and warning signs along the boundaries of the Preserve.
- Regular placing the information in regional mass media about preservation regime of the Preserve, its boundaries and activity.
- Making and demonstrating on TV the series of reports about the state inspectorate work.
- Joint arrangements with functional subdivisions of Police, inspectorate for fisheries and other specialized services concerning guard and patrolling of the Preserve's area and nearby territory.

**Expected outcomes:**

- Optimization of the state inspectorate and increasing its performance results, including the maximum use of modern technologies, implementation of progressive methods of natural complexes conservation and the Preserve area preservation.
- Strengthening of the material and technical supply of the state inspectorate of the Preserve as well as the appropriate infrastructure necessary for the patrolling, including:
  - purchasing and use of modern transport means and their supply-and-maintenance-support equipment (boats, engines, repair tools and equipment, consumables in assortment);
  - purchasing and use of modern communication means;
  - purchasing, delivery to the key cordons, installation and use of modern remote video surveillance systems (wireless cameras, batteries, signal reception systems);
  - ordering, delivery and installation of information panels along the Preserve's boundary;
  - purchasing and delivery of building materials (construction and expendable materials, tools and implements) for the key cordons building.
- Strengthening of cooperation with public organizations and public authorities in the sphere of environmental education.
- Rise in the effectiveness of preventive measures against the violation of environmental laws achieved through the distribution of environmental information via mass media and the Internet.
- Maintenance of stable populations of rare and endangered species within the territory of the preserve and in the adjacent areas.

## 6.2.1. Programme "Protection of natural Reserve's complexes and biological and landscape diversity conservation"

Management tasks	Activities	Results/Indicators	Timing	Executors	Sources of financing	Cost, thousands RUB. Year/period
<b>1.1. Subprogramme «Fire-prevention measures»</b>						
Fire-prevention measures efficiency improvement	<p>Searching for new sources of current information about forest fires within the Preserve, including space surveillance aid.</p> <p>Realization of fire-prevention education and promotion in regional and local mass media, manufacturing and distribution of fire-prevention production.</p> <p>Increasing the number of fire-prevention observation posts within the Preserve, using the relief uplands.</p>	<p>Forest fire prevention and protection performance increasing.</p> <p>Forest fire detection rate increasing (within the Preserve).</p> <p>Out-of-control forest fire area and number decreasing (within the Preserve)</p>	2011 – 2015	Regional public agency "Primorskaya SPA administration" Forest management	Regional budget, raised funds	
<b>1.2. Subprogramme «Improvement of Security Guard and Patrol Service»</b>						
Management of the effective work of state inspectorate of the Preserve concerning patrolling and keeping the established conservation regime	<p>Skilled staff recruiting and deployment.</p> <p>Improvement of the effectiveness and sustainability of nature conservation measures through the application and development of innovative technologies.</p> <p>Creation of the central operative group and management of its work.</p> <p>Regularly training of state inspectors of the Preserve.</p>	<p>Optimization of the state inspectorate and increasing its performance results.</p> <p>Strengthening of the material and technical supply of the state inspectorate of the Preserve as well as the appropriate infrastructure necessary for the patrolling, including:</p> <ul style="list-style-type: none"> <li>- purchasing and use of modern transport means and their supply-and-maintenance-support equipment (boats,</li> </ul>	2011 – 2015	Regional public agency "Primorskaya SPA administration" Security Guard	Regional budget, raised funds	



Management tasks	Activities	Results/Indicators	Timing	Executors	Sources of financing	Cost, thousands RUB. Year/period
	<p>Material and technical supply of the state inspectorate.</p> <p>Material incentives of the state inspectorate staff.</p> <p>Moral incentives of the state inspectorate staff.</p> <p>Building new cordons of the Preserve.</p> <p>Package of environmental low violence preventive measures.</p> <p>Manufacturing and fixing of the information panels and warning signs along the boundaries of the Preserve.</p> <p>Regular placing the information in regional mass media about preservation regime of the Preserve, its boundaries and activity.</p> <p>Making and demonstrating on TV the series of reports about the state inspectorate work.</p> <p>Joint arrangements with functional subdivisions of Police, inspectorate for fisheries and other specialized services concerning guard and patrolling of the Preserve's area and near-by territory.</p>	<p>engines, repair tools and equipment, consumables in assortment);</p> <ul style="list-style-type: none"> <li>- purchasing and use of modern communication means;</li> <li>- purchasing, delivery to the key cordons, installation and use of modern remote video surveillance systems (wireless cameras, batteries, signal reception systems);</li> <li>- ordering, delivery and installation of information panels along the Preserve's boundary;</li> <li>- purchasing and delivery of building materials (construction and expendable materials, tools and implements) for the key cordons building.</li> </ul> <p>Strengthening and development of cooperation with public organizations and public authorities in the sphere of environmental education.</p> <p>Rise in the effectiveness of preventive measures against the violation of environmental laws achieved through the distribution of environmental information via mass media and the Internet.</p> <p>Maintenance of stable populations of rare and endangered species within the territory of the preserve and in the adjacent areas.</p>				

### **6.2.2. PROGRAMME «Environmental education and tourism; the building of public support for the Preserve»**

**Goal:** Development of environmental ideology in the region, creation of friendly public opinion and positive image of the Preserve.

**Major tasks:**

- Target awareness of all groups of population about the Preserve, its activity, achievements and development programs;
- Drawing of public attention to the Preserve's problems and current tasks;
- Public involvement of various social classes in the nature conservation activities, event management in support of the Preserve;
- Contribution to the building of an integrated information space in order to support the environmental education and public relations information and experience exchange between all interested persons at the SPA-system, national and international levels;
- Ongoing development of material and technical resources and methodological base for effective and up-to-date work in the field of environmental education, including the accumulation of appropriate domestic and international experience and the development of new methodological procedures.

The programme includes the following **subprogrammes**:

- 2.1. Informational support of the Preserve activity subprogramme.
- 2.2. Promotion of friendly public opinion and positive image of the Preserve subprogramme.
- 2.3. Development of museum affairs subprogramme: visit-centers, museums, fairs, exhibitions.
- 2.4. Development of eco-tourism subprogramme.

#### **2.1. Subprogramme "Informational support of the Preserve activity"**

##### 2.1.1. Media coverage.

**Management tasks:**

Preparation and distribution of credible information about the Preserve and its activity in a way that makes it easy to understand for the general audience.

**Activities:**

- Regular publications about the Preserve in the local and regional press, preparation and promotion of articles about the Preserve in the federal and foreign mass media;
- Cooperation with local and regional TV and radio companies in the preparation of TV and radio programs on environmental issues.

##### 2.1.2. Promotion and publishing activities

**Management tasks:**

Preparation and dissemination of information about the Preserve's nature and its conservation, development of environmental friendliness.

**Activities:**

- Publication and distribution of booklets, brochures, calendars, CDs, photo album and other issues about the Reserve;
- Publication and distribution of illustrated materials to inform the population about the unique character of natural complexes and its conservation in the Preserve;
- Creation of the video film about the Preserve; preparation, copying and distribution of the film and other issues about the Preserve in electronic format.

## 2.2. Subprogramme "Promotion of friendly public opinion and positive image of the Reserve"

### 2.2.1. Work with children

#### **Management tasks:**

Engagement of children to the environmental activity, broadening of environmental outlook, development of appropriate skills and occupational guidance.

#### **Activities:**

- Work with school children: organization of thematic lessons; organization of competitions, quizzes, Olympiads, conferences; engagement of school children to participate in the ecological festivals and campaigns;
- Inclusion of environmental education into educational schedule of pre-school, secondary school, vocational and higher educational institutions.
- Work with teachers and educational institutions, working out methodological textbooks for bio diversity and reserve studies lessons in schools and pre-schools; participation in carrying out qualification courses for teachers.

### 2.2.2. Environmental actions and events

#### **Management tasks:**

Drawing of people's attention to the nature conservation problems and to the Reserve's contribution in region nature conservation.

#### **Activities:**

- Carrying out special events coincided with nature conservation festivals and actions («Day of Parks», World Environment Day, Bird's Day and others);
- Active interaction with community: public agencies, educational and cultural institutions, local authority and public authorities.
- Involvement of local people to participation in public environmental events.

## 2.3. Subprogramme "Development of museum affairs: visit-centers, museums, fairs, exhibitions"

#### **Management tasks:**

Introduction of the Preserve for the broad community, promotion of scientific and environmental knowledge among population.

#### **Activities:**

- Developing of strategy, creation, equipment and management of Visit-center of the Preserve;
- Refill of existing and creation of new mobile photo shows about the Preserve's nature, according to thematic schedule.
- Creation of material and technical resources for environmental education.

## 2.4. Subprogramme "Development of ecotourism"

#### **Management tasks:**

Creation of positive image of the Preserve due to positive information distribution and contribution into solving the region economic and social problems.

#### **Activities:**

- Analysis of the Preserve's and its buffer zone potential for development of environmental tourism;
- Development of tourist routes including those with reserve specific and with visiting specially equipped parts of the Preserve and its buffer zone;
- Arrangement of special parts of the Preserve and its buffer zone, allocated for work with visitors including arrangement of ecological paths, observation points, etc;



## ANNEX B4

- Development of thematic programs for purpose of work with tourists;
- Development of rules for visitors of the Preserve for control their behavior, to prevent damage of natural complexes and sites;
- Arrangement of work with visitors of the Preserve and tourists, including distribution of information about existing routes and possibilities, rules of conduct, etc.

### **Expected outcomes:**

During realization of the program, qualitative and quantitative improvement of environmental education activity of the Preserve is expected, including: number and quality of lectures, excursions, thematic events for children, number of interviews in mass media, reports and publications in mass media, number of printed production units, etc. As the result, the following are expected:

- SPA has well-known and positive image in the region and beyond;
- Public friendliness, positive attitude and appreciation from government bodies and authorities and other significant public groups are formed;
- Demand for production of the main activity of the Preserve (including environmental education and scientific activity) is supplied;
- Standard and quality of environmental education including cognitive tourism and recreation, answers the up-to-date standards and provides raising additional funds.

## 6.2.2. PROGRAMME «Environmental education and tourism; the building of public support for the Preserve»

List of activities	Results/Indicators	Timing	Executors	Source of financing	Cost, thousands RUB Year/Period
<b>2.1. Subprogramme "Informational support of the Preserve activity"</b>					
<p><b>Media coverage</b></p> <p>Preparation and distribution of credible information about the Reserve and its activity in a way that makes it easy to understand for the general audience.</p>	<p>Regular publications about the Preserve in the local and regional press;</p> <p>Regular publications of articles about the Preserve in the federal and foreign mass media;</p> <p>Cooperation with local and regional TV and radio companies in the preparation of TV and radio programs on environmental issues.</p>	2011-2015	Regional public agency "Primorskaya SPA administration"	Regional budget, raised funds	
<p><b>Promotion and publishing activities</b></p>	<p>Publication and distribution of booklets, brochures, calendars, CDs, photo album and other issues about the Preserve;</p> <p>Publication and distribution of illustrated materials to inform the population about the unique character of natural complexes and its conservation in the Preserve;</p> <p>Creation of the video film about the Reserve; preparation, copying and distribution of the film and other issues about the Preserve in electronic format.</p>	2011-2015	Regional public agency "Primorskaya SPA administration"	Regional budget, raised funds	

List of activities	Results/Indicators	Timing	Executors	Source of financing	Cost, thousands RUB Year/Period
<b>2.2. Subprogramme "Promotion of friendly public opinion and positive image of the Preserve"</b>					
<p>Work with children of different ages</p> <p>Engagement of children to the environmental activity, broadening of environmental outlook, development of appropriate skills and occupational guidance</p>	<p>Work with school children: organization of thematic lessons; organization of competitions, quizzes, Olympiads, conferences; engagement of school children to participate in the ecologic festivals and campaigns;</p> <p>Inclusion of environmental education into educational schedule of pre-school, secondary school, vocational and higher educational institutions;</p> <p>Work with teachers and educational institutions, working out methodological textbooks for bio diversity and reserve studies lessons in schools and pre-schools; participation in carrying out qualification courses for teachers.</p>	2011-2015	Regional public agency "Primorskaya SPA administration"	Regional budget, raised funds	



List of activities	Results/Indicators	Timing	Executors	Source of financing	Cost, thousands RUB Year/Period
<b>Environmental actions and events</b> Drawing of people's attention to the nature conservation problems and to the Preserve's contribution in region nature conservation	Carrying out special events coincided with nature conservation festivals and actions («Day of Parks», World Environment Day, Bird's Day and others); Active interaction with community: public agencies, educational and cultural institutions, local authority and public authorities; Involvement of local people to participation in public environmental events.	2011-2015	Regional public agency "Primorskaya SPA administration"	Regional budget, raised funds	

List of activities	Results/Indicators	Timing	Executors	Source of financing	Cost, thousands RUB Year/Period
<b>2.3. Subprogramme "Development of museum affairs: visit-centers, museums, fairs, exhibitions"</b>					
Introduction of the Preserve for the broad community, promotion of scientific and environmental knowledge among population	Developing of strategy, creation, equipment and management of Visit-center of the Preserve; Refill of existing and creation of new mobile photo shows about the Preserve's nature, according to thematic schedule; Creation of material and technical resources for environmental education.	2011-2015	Regional public agency "Primorskaya SPA administration"	Regional budget, raised funds	
creation and management of the Preserve Visit-centre; qualitative and quantitative improvement of exhibitions, fairs, etc; strengthening of material and technical resources, informational and scientific base of environmental education.					

List of activities	Results/Indicators	Timing	Executors	Source of financing	Cost, thousands RUB Year/Period
<p><b>2.4. Subprogramme "Development of ecotourism"</b></p> <p>Creation of positive image of the Preserve due to positive information distribution and contribution into solving the region economic and social problems.</p> <p>Analysis of the Preserve's and its buffer zone potential for development of environmental tourism; Development of tourist routes including those with reserve specific and with visiting specially equipped parts of the Preserve and its buffer zone; Arrangement of special parts of the Preserve and its buffer zone, allocated for work with visitors including arrangement of ecological paths, observation points, etc; Development of thematic programs for purpose of work with tourists; Development of rules for visitors of the Preserve for control their behavior, to prevent damage of natural complexes and sites; Arrangement of work with visitors of the Preserve and tourists, including distribution of information about existing routes and possibilities, rules of conduct, etc</p>	<p>Arrangement of necessary infrastructure for work with visitors of the Preserve and its buffer zone, arrangement of systematic work with tourists in the region, including development of informational system.</p>	<p>2011-2015</p>	<p>Regional public agency "Primorskaya SPA administration"</p>	<p>Regional budget, raised funds</p>	



### **6.2.3. PROGRAMME «Scientific research and monitoring activities»**

**Goal:** Information and scientific support of management and planning of the Preserve activities; provision of federal authorities with data about condition and dynamics of natural complexes and SPAs.

**Major tasks:**

- Development of information and analytical support for nature conservation and nature use management activities of the Preserve.
- Integrated monitoring of natural ecosystems.
- Research projects on the dynamics of the key components of natural territorial complexes.

**Subprogrammes:**

- 3.1. Inventory and thematic mapping.
- 3.2. Development of environmental monitoring.
- 3.3. Development of scientific research projects.
- 3.4. Development of the Preserve informational system.

#### **Subprogramme 3.1. Inventory and thematic mapping**

**Management tasks:**

- Evaluation of nature conservation significance of the Preserve area and condition of preserved natural complexes and sites.
- Definition of the key activities intended to conservation of the Preserve's natural complexes and sites.
- Generation of the list of objects to be monitored and subjects to be studied in the key natural complexes

**Activities:**

- Inventory of the Preserve's flora and fauna.
- Searching and mapping of the most valuable in terms of conservation natural complexes and sites.
- Creation of main thematic maps (vegetation, landscapes) of the Preserve clusters.

#### **Subprogramme 3.2. Development of environmental monitoring**

**Management tasks:**

- Provision of control of current condition and dynamics of preserved natural complexes and sites.
- Organization of data collection process about natural complexes dynamics concerning global climate changes.
- Organization of data collection process about the condition of rare species, listed in the Red Book of Russia and in the IUCN Red Data Book and other SPAs of federal and international levels.

**Activities:**

- Development of monitoring programs of key natural complexes condition, of rare and key species populations, as well as other most valuable natural sites of the Preserve with determination of information supply, processing methods and results\*.
- Development of infrastructure and material and technical resources of monitoring.

## ANNEX B4

### Приоритетные потенциальные объекты экологического мониторинга:

Objects	Registered characteristics	Observation methods
<b>1. LANDSCAPE-ECOSYSTEM STRUCTURE OF TERRITORY</b>		
Plant formation structure	Spaces and configurations of main diversities of plant formation	Photographic interpretation of space image
<b>2. PROTOTYPE ECOSYSTEMS</b>		
Mountainous larch sparse forests	Basic index of following structures: soils, plant associations, populations of birds, small mammals and base invertebrate groups	Descriptions of soil profiles, geobotanic descriptions, birds routs census, small mammals census, base invertebrate groups census
Cedar elfin wood tundra		
Cedar broad-leaved forest		
Waterlogged complexes (upper Bikin River basin)		
Natural (non antropogenic) burnt places of different ages in all types of plant formations		
<b>3. RARE AND UNIQUE ASSOCIATIONS AND ECOSYSTEMS</b>		
Korean pine vegetate part	Space and configuration of associations, index of association structure;	Mapping (also using remote data), geobotanic descriptions
<b>4. RARE AND ENDANGERED PLANT AND ANIMAL SPECIES POPULATIONS</b>		
Rare plant species listed in the Red Book of the Primorsky Kray and found only on the Reserve territory: – <i>Nephomopsis pallescens</i> , <i>Popoviocodonia stenocarpa</i> , <i>Rhodiola rosea</i> , <i>Scirpus maximowczii</i>	Dispersal, number, micro populations condition	Mapping of micro populations, inventory and condition description on the modular sites;
Amur tiger	Number, breeding success	Mapping and monitoring of the territory
Fish owl	Number	Voices census
<b>5. HUNTING SPECIES POPULATIONS</b>		
Hunting animals of larch and valley broadleaf forests	Number	Winter itinerary animal census

**Subprogramme 3.3. Development of scientific research projects.****Management tasks:**

- Organization and carrying out of scientific researches for scientific support of nature conservation activity of the Preserve.
- Organization and carrying out of scientific researches focused on study of global environmental changes in places free of direct impact of antropogenic activity.

**Activities:**

- Analysis of actuality and resolution of priority of research projects; development of a detailed long-term research plan, including particular activities
- Connection/information exchange and treaty conclusions with partners and potential project Executors

**Subprogramme 3.4. Development of the Preserve informational system.****Management tasks:**

- Organization of monitoring and scientific researches results holding.
- Organization of on-site processing and analysis of scientific information about the Reserve natural complexes and sites condition.

**Activities:**

- Development of interdependent inventory and monitoring databases working jointly with GIS.
- Development of the Preserve's GIS by creating and involving of new thematic layers.
- Development of standard requests system in the database and GIS and self-generated reports about the Preserve's natural complexes and their separate parts condition.

**Expected outcomes:**

- Database of the current state and dynamics of natural complexes, biodiversity and unique natural phenomena found in the Preserve, related to the Preserve's GIS.
- Integrated ecologic monitoring program for the Preserve's area.
- Scientific researches plan for the Preserve's area aimed on the optimization of main activity, in accordance with appropriate conclusions.
- Operational system of regular analysis of scientific data and generation of reports (summaries) about the Preserve's natural complexes and their separate parts condition.



### 6.2.3. PROGRAMME «Scientific research and monitoring activities»

Activities	Result/Indicator	Timeline	Executors	Sources of financing	Costs Thousand RUB. Year/ period
<p><b>3.1. Subprogramme "Inventory and thematic mapping"</b></p> <p>Inventory of the Preserve's flora and fauna</p>	<p>Informational database of the Preserve's flora and fauna</p>	<p>2011-2015</p>	<p>Regional public agency "Primorskaya SPA administration" Scientific research establishments</p>	<p>Raised funds</p>	
<p>Searching and mapping of the most valuable in terms of conservation natural complexes and sites</p>	<p>Informational database of the key specific nature territorial complexes and sites relied on the appropriate GIS layers.</p>	<p>2011-2015</p>	<p>Regional public agency "Primorskaya SPA administration" Scientific research establishments</p>	<p>Raised funds</p>	
<p>Creation of main thematic maps (vegetation, landscapes) of the Reserve clusters</p>	<p>GIS layers of vector landscape and geobotanic maps of the Preserve's clusters within GIS</p>	<p>2011-2015</p>	<p>Regional public agency "Primorskaya SPA administration" Scientific research establishments</p>	<p>Raised funds</p>	

Activities	Result/Indicator	Timeline	Executors	Sources of financing	Costs Thousand RUB. Year/ period
<b>3.2. Subprogramme "Development of environmental monitoring"</b>					
Development of monitoring programs of key natural complexes condition, of rare and key species populations, as well as other most valuable natural sites of the Preserve with determination of information supply, processing methods and results	Definition of foreground monitoring sites and developing of monitoring programs including the optimal methods, places and timing of works, required executor qualifications and forms of presentation and primary data processing	2011-015	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
Development of infrastructure and material and technical basis of monitoring;	Monitoring infrastructure development (indicator plots, permanent transects, observation points, etc.) and purchasing of equipment and facility, necessary for works according to monitoring program.	2011-015	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	

Activities	Result/Indicator	Timeline	Executors	Sources of financing	Costs Thousand RUB. Year/ period
Input of the data collected in the Preserve into global information systems	List of international databases interesting for filling by data received in the Preserve	2011-012	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
Presentation of information to the international databases	Ecologic monitoring data presented to the international databases	2012-015	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
<b>3.3. Subprogramme "Development of scientific research projects"</b>					
Analysis of actuality and resolution of priority of research projects; development of a detailed long-term research plan, including particular activities	Long-term scientific research plan, approved by the Administration	2011	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
Analysis of actuality and priorities in the scientific researches, development of long-term research plan including specific events					



Activities	Result/Indicator	Timeline	Executors	Sources of financing	Costs Thousand RUB. Year/ period
Connection/information exchange and treaty conclusions with partners and potential project Executors	Concluded contracts in the field of scientific and technical cooperation in scientific researches according to the approved research plan.	2011-2012	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
<b>3.4. Subprogramme "Development of the Preserve informational system"</b> Development of interdependent inventory and monitoring databases working jointly with GIS	Integrated databases of inventory and monitoring, which are realized in standard environments, used for databases creation (Access) and are connected with the Preserve's GIS.	2011-2012 г.г.	Regional public agency "Primorskaya SPA administration"  Scientific research establishments	Raised funds	
Development of interdependent inventory and ecologic monitoring databases. Binding of integrated databases and GIS.					

Activities	Result/Indicator	Timeline	Executors	Sources of financing	Costs Thousand RUB. Year/ period
<p>Implementation of the Preserve's GIS by creating and involving of new thematic layers</p>	<p>GIS with baseline maps and thematic layers for displaying of inventory and monitoring results</p>	<p>2011-2015</p>	<p>Regional public agency "Primorskaya SPA administration"  Scientific research establishments</p>	<p>Raised funds</p>	
<p>Development of standard requests system in the database and GIS and self-generated reports about the Preserve's natural complexes and their separate parts condition</p>	<p>Set of self-generated standard requests and reports of databases and GIS</p>	<p>2013-2015</p>	<p>Regional public agency "Primorskaya SPA administration"  Scientific research establishments</p>	<p>Raised funds</p>	

#### 6.2.4. PROGRAMME «International Activities»

As the result of long-term scientific researches within the Verkhebikinsky Preserve, the presentations and reports were carried out on different conferences and other events, which include international ones, and also scientific monographs and collected works were published.

Active and wide dissemination of information collected during fundamental research projects was resulted in the scientific recognition of the Preserve as an area worthy of being inscribed onto the World Heritage List. The nomination process is currently underway. Fruitful cooperation with different organizations gives a chance to maintain a cooperative association with many experts and scientific research agencies in Europe, America and other countries.

Nowadays, there is an urgent need for the more wide-range cooperation with foreign partners and colleagues for the purpose of study and implementation the best practices of conservation of natural complexes and sites, scientific researches and ecologic monitoring, environmental education and cognitive tourism. One of the ways of realization of this activity would be the inscription of the site onto World Heritage List.

**Goal:** International cooperation development, study and implementation of international practices, implementation of Russian international commitments in the field of biologic diversity conservation and development of SPAs system.

##### Major tasks:

- Inscription of the Preserve on the UNESCO WH List.
- Development of cooperation in monitoring and preservation of migrant birds.
- Regional public agency employee training through participation in international symposiums.

##### Activities:

- UNESCO World Heritage List nomination process.
- Monitoring of the main elements of zoocenosis.
- Participation in educational workshops and qualification trainings.

##### Expected outcomes:

- Officially approved nomination dossier for inscription on the UNESCO WH List.
- Extension of preservation field of migrant birds; publications, joint works projects.
- Application of realized experience of innovative methods to the Preserve operation.



#### 6.2.4. PROGRAMME «International Activities»

Management tasks	Activities	Results/Indicators	Timeline	Executors	Source of financing	Costs Thousand RUB. Year/period
Inscription of the Preserve on the UNESCO WH List	UNESCO World Heritage List nomination process	Officially approved nomination dossier	2011	Regional public agency "Primorskaya SPA administration"	Attract funds	
Regional public agency employee training through participation in international symposiums	Participation in scientific conferences, educational workshops and qualification trainings	Application of acquired innovative methods to practice of all divisions of the Preserve	2011-2015	Regional public agency "Primorskaya SPA administration"	Grants, non-budget funds	

#### ANNEX B4

## ANNEX B4

### Planning performance level:

Performance level	Unit	Reporting timeframe				Scheduling period			Target value *
		2007	2008	2009	2010	2011	2012	2013	
<b>Task 1: The protection of natural Preserve's complexes for the purpose of biodiversity conservation and natural complexes and sites state of nature maintenance</b>									
Performance level 1 Total area of forest and other floral fires within the Preserve's territory	ha	0	0	0	1290				0
Performance level 2 Number of citizens bringing to administrative responsibility for environmental offence by Preserve's officers	un.	4	9	0	0				0
Performance level 3 Number of legal persons bringing to administrative responsibility for environmental offence by Preserve's officers	un.	0	0	0	0				0
Performance level 4 Number of natural persons bringing to civil responsibility for environmental offence by Preserve's officers	per.	0	0	0	0				0
Performance level 5 Number of legal persons bringing to civil responsibility for environmental offence by Preserve's officers	un.	0	0	0	0				0
<b>Task 2: Scientific research management</b>									
Performance level 1 Number of environmental attributes (including biota) measured during environmental monitoring within the Preserve's territory	un.	0	0	0	0	1	1	1	2
Performance level 2 Number of continued long-term (more than 10 years) record	un.	0	0	0	0	3	4	5	7

## ANNEX B4

Performance level	Unit	Reporting timeframe				Scheduling period			Target value *
		2007	2008	2009	2010	2011	2012	2013	
Performance level 3 Number of Preserve's staff participated in conferences	per.	0	0	0	0	2	2	2	3
<b>Task 3: Development of environmental monitoring</b>									
Performance level 1 Number of environmental attributes (including biota) measured during environmental monitoring within the Preserve's territory	un.	0	0	0	0	1	2	3	5
Performance level 2 Number of continued long-term (more than 10 years) record	un.	0	0	0	0	7	8	9	11
<b>Task 4: Environmental education</b>									
Performance level 1 Number of semi-popular and propagandist articles published in print media by Preserve staff	pie.	0	0	0	0	5	6	5	10
Performance level 2 Number of Preserve's territory visitors for the excursion purpose	per.	246	256	238	240	250	260	270	300
<b>Task 5. Assistance in scientific brainpower and specialists training in the field of environmental protection</b>									
Performance level 1 Number of students being on education training in Preserve	per.	0	0	0	0	1	1	1	1
Performance level 2 Number of graduation works and student's essays prepared on the base of the material collected in Preserve	un.	0	0	0	0	1	1	1	1

\* Characteristic which attaining results in a ultimate goal



## Rare and endangered species of Bikin River valley flora and fauna which are be subjected to special protection

### Vascular plants:

*Pyrrhosia lingua*;  
*Selaginella tamariscina*;  
*Coniogramme intermedia*;  
*Taxus cuspidata*;  
*Symplocarpus renifolius*;  
*Lilium distichum*;  
*Lilium pensilvanicum*;  
*Lilium buschianum*;  
*Lilium*;  
*Lilium pumilum*;  
*Dioscorea nipponica*;  
*Cypripedium guttatum*;  
*Cypripedium macranthon*;  
*Cypripedium calceolus*;  
*Ephyppianthes sachalinensis*;  
*Pogonia japonica*;  
*Lichnis fulgens*;  
*Euriala ferox*;  
*Nuphar minor*;  
*Paeonia lactiflora*;  
*Paeonia obovata*;  
*Bergenia pacifica*;  
*Panax ginseng*;  
*Rhododendron mucronulatum*;  
*Abelia coreana*;  
*Popoviocodonia stenocarpa*;  
*Microbiota decussata*;  
*Calipso bulbosa*;  
*Galium paradoxum*;  
*Fritillaria ussuriensis*.

### Lichens:

*Cetraria komarovii*,  
*C. laureri*,  
*Coccocarpia cronia*,  
*C. rytroxili*,  
*Hypohymnia hypotripella*,  
*Leptogium hildenbrandii*,  
*Lobaria mplissima*,  
*L. pulmonaria*,  
*L. retigera*,  
*Menegazzia terebrata*,  
*Phytoconis viridis*,  
*Asahinea scholanderi*.

### Insect:

*Forficula vicaria*,  
*Diestrammena unicolor*,  
*Carabus schrenckii*,

## ANNEX C

Calasoma maximowiczi,  
Callipogon relictus,  
Pyrocaelia rufa,  
Bombus muscorum,  
Bombus schrenckii,  
Bombus modestus,  
Bombus sporadicus,  
Bombus unicus,  
Bombus czerskii,  
Liometopum microcephalum,  
Actias artemis,  
Epicopeia mencia,  
Brahmae tancrei,  
Nossa palaeartica,  
Ophideres tyrannius,  
Dermaleipa junco,  
Iotaphora admirabilis,  
Catocala fraxini,  
Papilio maackii,  
Papilio,  
Parnassius eversmanni,  
Coenonympha hero,  
Euthalia schrenckii,  
Apatura iris,  
Kaniska canace.

### **Mollusks:**

Dahurinaia dahurica  
Middendorffinaia mongolica  
Middendorffinaia arsenievi

### **Amphibia and reptiles:**

Pelodiscus sinensis

### **Birds:**

Ciconia nigra,  
Aix galericulata,  
Mergus squamatus,  
Pandion haliaetus,  
Butastur indicus,  
Grus monachus,  
Falcipennis falcipennis,  
Ketupa blakistoni  
Charadrius placidus  
Haliaeetus albicilla

### **Mammals:**

Panthera tigris altaica.

All listed species are inscribed on Russian Federation Red Data Book, and Siberian tiger (*Panthera tigris altaica*), scaly-sided merganser (*Mergus squamatus*), hooded crane (*Grus monachus*), white-tailed eagle (*Haliaeetus albicilla*) and fish owl (*Ketupa blakistoni*) – on IUCN Red Data Book.

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