

# MAIN ECOLOGICAL AND RESOURCE ISSUES OF THE RUSSIAN PART OF THE TUMEN RIVER AREA

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Prepared for the Third Workshop on Power Grid Interconnection in Northeast Asia,  
Vladivostok, Russia, September 30 - October 3, 2003

Paper Prepared May, 2003

## 1. INTRODUCTION

The Tumen River basin area and adjacent territories constitute one of the most important biogeographic and socio-economic centers of Northeast Asia. This area is shared by three countries, each with different socio-economic and cultural features (China, the DPRK, and Russia). Figure 1 shows a map of a portion of Northeast Asia, highlighting the Tumen area.

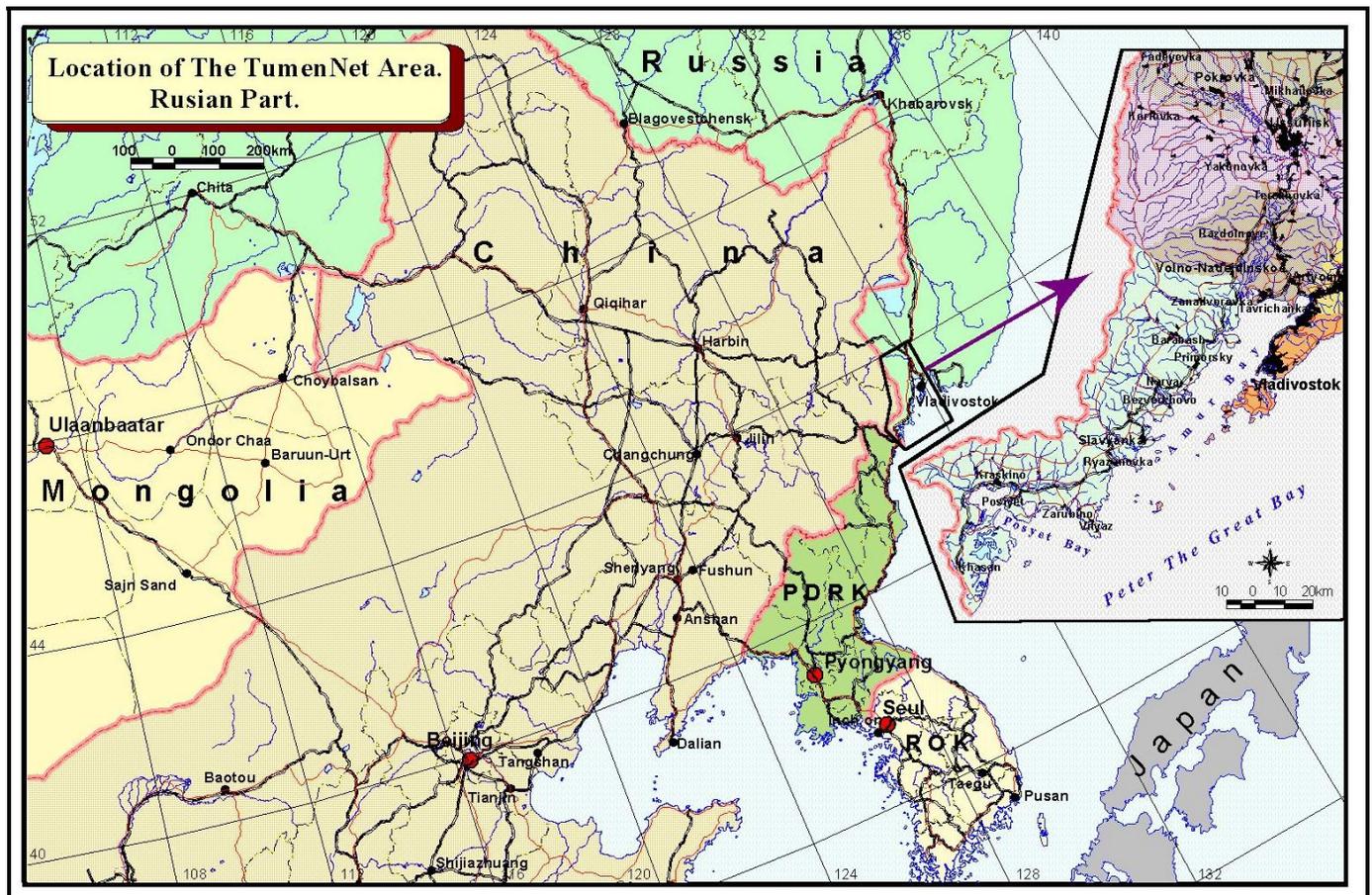


Figure 1: Location of the Tumen River Area within Northeast Asia

Since the beginning of the 1990s, the Tumen area has become a focus of prospective international economic cooperation in the Northeast Asia region. The UNDP (United Nations Development Programme) TRADP (Tumen River Area Development Program) has become the major “locomotive” leading the cooperation effort. A Tumen Secretariat of this program was created to administer and coordinate the program’s activities.

The Tumen area contains most of the bio-geographic, socio-economic, national and other ecological and human groupings present in Northeast Asia as a whole. The international community and the countries of the region are vitally aware of the need to preserve the environment and the biodiversity in this part of Northeast Asia. This conservation goal can be achieved only by shifting to a mode of sustainable development of the region based on fair and equitable representation of the interests of the participating countries.

The TRADP program has declared a general interest in strengthening mutually beneficial economic and technical cooperation, and in achieving sustainable development of the countries and peoples of the Northeast Asia, and especially in the Tumen River Economic Development Area (TREDA). The basis of sustainable development is to include the sovereignty and independence of all the states, equal rights, mutual benefits in cooperative activities, and neighborliness. The main goal of the program is to transform Northeast Asia and especially TREDA into an area attractive for international investment, trade and business.

Initially, the TRADP program intended to create an international free economic zone in the downstream area of the Tumen River (the Tumen River Economic Zone, or TREZ). The intention was to create such an economic zone partially in the territory of Northern Hamgen Province (in the DPRK), the Yanbian Korean Autonomous prefecture (China), and the Khasanskii district of Primorsky Krai (in the Russian Federation). These territories were to be leased on a long-term basis by an international corporation, which would have managed the area under the aegis of UNDP. Due to complications that might have arisen in maintaining the real sovereignty of the participating countries, however, as well as due to possible ethnic expansion into TREZ, the DPRK and Russia did not approve creation of TREZ within the TRADP project.

After long and complicated negotiations and consultations, the countries-participants have come to an agreement, that the project of TRADP Program should include national development programs for each country of TREDA. These national development programs, the agreement stipulates, should be coordinated to resolve mutual problems. For example, laws enacted by the participating countries to regulate economic activities and international liaison in TREDA (laws related to financing, banking, customs immigration, taxes, and other issues) based on national legislation, should be unified and brought into harmony before they are applied in the Tumen area. This harmonization of regulations should be carried out in order to allow more effective economic cooperation.

The Government of the Russian Federation enacted decree #732 of July 17<sup>th</sup>, 1995, entitled “On participation of the Russian Federation in implementation of the UNO “TRADP – Tumen River Area Development Program”, with the purpose of the expansion of economic cooperation with Pacific Rim countries. With the enactment of this decree, the Government of the Russian Federation made a decision on signing a number of intergovernmental treaties developed within the TRADP framework, treaties that envisage the participation of the RF in the TRADP program.

In the 1990s, the implementation of several transport projects began in the TREDA countries. Implementation of various projects related to socio-economic development have helped to induce the

initiation of international and regional activities aimed at resolving issues of nature conservation and conservation of biodiversity in the Tumen area.

Currently, the world community, as well as the countries of the region, are aware of the necessity for the conservation of biodiversity and of the environment in this part of Northeast Asia. Conservation of biodiversity and the environment can be accomplished only by transferring to a sustainable mode of development in the region, one that places equal consideration on the interests of the participating countries.

In 1995, a Memorandum of Understanding on Environmental Principles Governing the Tumen River Economic Development Area and Northeast Asia was signed. This Memorandum has served as the basis for several international initiatives related to the environment of the Tumen area.

As an important example of such initiatives, from 1999 through 2001 a GEF/UNDP Project “Preparation of Strategic Action Programme (SAP) and Transboundary Diagnostic Analysis (TDA) for the Tumen River Area, its Coastal Regions and Related Northeast Asian Environs” was implemented. One of the most important documents prepared under that project is: Baklanov, P.Y., S.S. Ganzei, and A.N. Kachur (editors, 2002) Transboundary Diagnostic Analysis, Tumen River Strategic Action Program, published by UNOPS (United Nations Office for Project Services), Dalnauka, Vladivostok. In addition, a brief booklet about the Russian Portion of Tumen River Area was prepared: Baklanov, P.Y., and V.P. Karakin. 2002. Land of the Leopard: Sustainable Development of Southwestern Primorsky Province, published by WWF and TumenNet, Dalnauka, Vladivostok.

Russia’s interests in the Tumen River Economic Development Area (TREDA) project are spatially and contextually represented at the following levels:

1. The Russian Federation,
2. Primorsky Krai, and
3. Southwest Primorye (or SWP).

Most of the terrestrial environmental problems and socio-economic development issues relevant to TREDA are concentrated in SWP. This concentration has been the basis for selecting the SWP territory as the focus of the Russian National Report, which was prepared for the Tumen River TDA/SAP GEF Project. The territory under consideration has an environmental and economic continuity, and specifically:

- a)** It has a specific set of biodiversity conservation issues, that are closely related to biodiversity in adjacent Chinese and Korean territories and to a large extent are affected by development patterns in China and the DPRK.
- b)** The key biodiversity conservation issue in SWP is preserving the wild populations of the Amur tiger and the Far Eastern leopard; SWP is the only area in the world where this sub-specie of leopard is found in the wild.
- c)** Coastal wastes and adjacent lands in SWP are affected by transboundary pollution that originates in the Tumen River.
- d)** Socio-economic development in SWP, in a form acceptable to the Russian Federation, will be defined by the effectiveness of the “Tumangan” program and by the development of socio-economic connections between Russia (Primorsky Krai), Korea, China and Mongolia.

## **2. GEOGRAPHIC COVERAGE**

Southwest Primorye, or SWP, is a narrow, 10-60 km wide territory that stretches along 200 km of the Russian–Chinese border. Southwest Primorye covers 740,000 hectares. The Tumen River forms the southern border of SWP with the Peoples Republic of North Korea, and the SWP's northern border is defined by the Razdolnaya River. These two rivers are major sources of water pollution arriving from China, and have annual average runoffs of 268m/second, and 74m/second, respectively. The physical geography of SWP is dominated by low, forested mountains, accompanied by coastal wetlands and meadows that stretch from the mouth of Tumen River north to the outlet of the Razdolnaya River.

The administrative districts (“raion”) in southwest Primorye include: Khasansky Raion, the western portion of Ussuriisky Raion, the western portion of Nadezhdinsky Raion, and the southern portion of Oktyabrsky Raion. There are 61 villages in southwest Primorye, consolidated into 10 rural administrations. Among these administrations there are six municipal-type settlements, all located in Khasansky Raion. The largest are Slavyanka (17,400 residents), Zarubino (4,700), and Kraskino (4,300). As of January 1, 2000, the population of southwest Primorye was 55,700, of which 30,000 people lived in municipal-type settlements. The inset to Figure 1 shows the location of these municipalities.

### **2.1 The Biodiversity of SWP**

The terrestrial part of SWP has an amazingly high level of taxonomic biodiversity - over 1500 species of vascular plants are found here (62% of Primorsky Krai's flora biodiversity); 370 species of birds, or 80% of Primorye's biodiversity (in Primorye there are 466 species), 80% of the species of unique mammals found in the Russian Far East (RFE) (there are 104 species in the RFE, in SWP there are over 85 species), and more than 70% of the RFE biodiversity of insect species (16-20 thousand species in SWP out of 27 thousand in the RFE). The faunal biodiversity level in SWP reaches 75%, and flora, 70%, of the overall levels of biodiversity found in the Far East.

Southwestern Primorye has the greatest biodiversity in the region. The general characteristics of SWP biodiversity against the background of biodiversity in the Far East as a whole and in Primorye is shown in Tables 1 and 2. The vegetation patterns in SWP are shown in Figure 2, and the distribution of biodiversity in the RFE ecoregion is shown in Figure 3.

**Table 1: Comparative Data on Taxonomic Wealth of Vascular Plants in Selected Sub-regions within the RFE**

Data shown in this table are taken from the National Report of Russian Federation: Ecological and Resource Issues of Tumen River Basin and the Adjacent Territories

Sub-regions (SR)	Amount of species		Regional Fraction of Species specific to the Sub-region, % (D SR / NF RFE)
	Natural flora (NF) of the sub-region (in general)	Sub-region's differential species (D) (absent in other RFE sub-regions)	
Southern Primorye *	2260	379	9.1
Primorsky Krai	2443	534	12.9
RFE (in general)	4146	-	-

\*Defined as within the southern sub-region boundaries of the Ussuriisky floristic region (Vascular plants of the Soviet Far East, 1985).

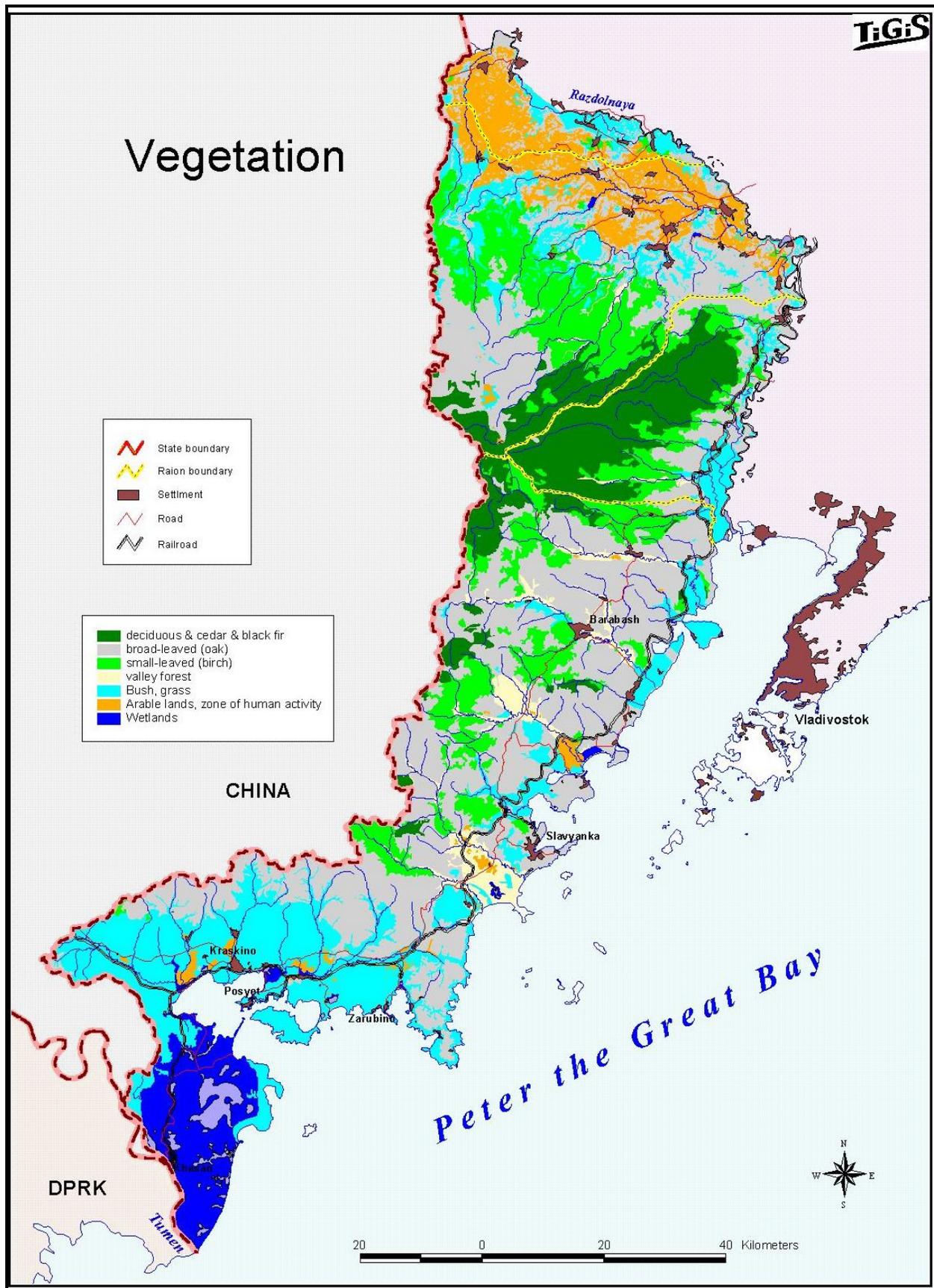


Figure 2: Vegetation Map of the SWP Region

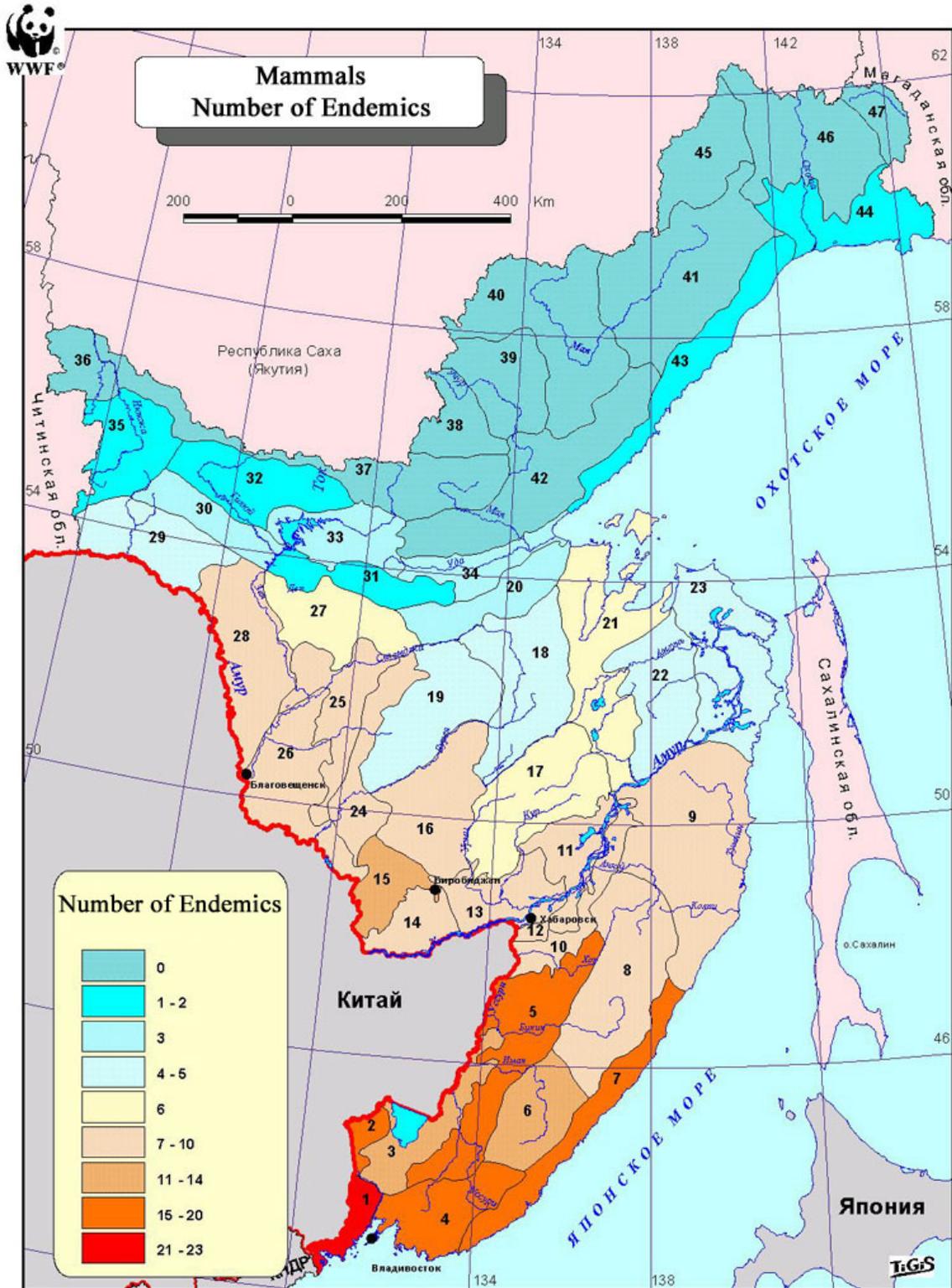


Fig. 4

Figure 3: Number of Mammal Species Endemic to different areas within the Russian Far East (RFE). (SWP on this map is shown under area 1)

**Table 2: General and Comparative Diversity of Organisms in the RFE**

Data are taken from the National Report of Russian Federation: Ecological and Resource Issues of Tumen River Basin and the Adjacent Territories, Vladivostok, FEBRAS, 2001.

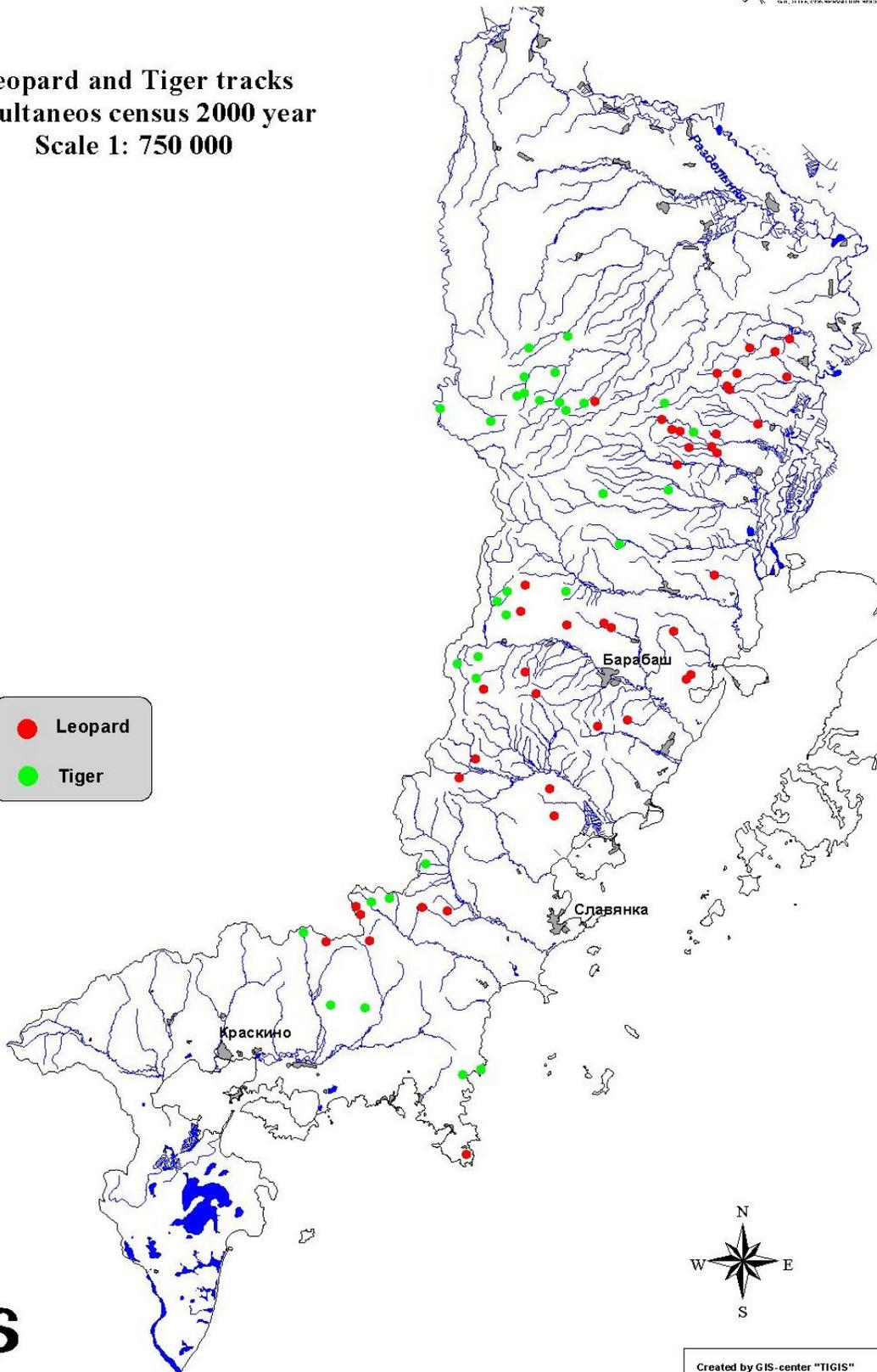
Group of organisms	Quantity of species				Origin of biodiversity		
	In nature	In the RFE Ecoregion	In Primorye	<b>SWP</b>	Endemic share in RFE biota (%)	Southern Primorye vs. RFE species ratio	Southern Primorye vs. Primorye species ratio
<b>Plants</b>							
Freshwater algae	~50 000	2 600	2 000	<b>1 000</b>	~15%	38%	50%
Vascular plants	230 000	4 146	2 443	<b>1 500</b>	~17%	36%	61%
				<i>average</i>	13-14%		~70%
<b>Animals</b>							
Tapeworms	20 000	4 000	2 500	<b>1 500</b>	~32%	38%	60%
Nematodes	> 500 тыс.	6 000	2 500	<b>1 800</b>	~23%	30%	72%
Insects	750 тыс.	27 000	23 000.	<b>16-20 000</b>	~35%	60-75%	70-86%
Freshwater fish	8 600	400	120	<b>64</b>	-	16%	53%
Amphibians	4 200	9	8	<b>7</b>	~60%	77%	88%
Reptiles	6 000	16	13	<b>10</b>	~35%	62%	77%
Birds	8 600	500	466	<b>370</b>	~35%	74%	80%
Mammals	3 700	194	97	<b>86</b>	~60%	82%	87%
				<i>average</i>	~44%		~75%

Perhaps the most visible symbol of SWP biodiversity is the Far Eastern leopard. SWP is the only habitat area for leopards in the Russian Far East. The last simultaneous registration of tiger and leopard tracks (see Figure 4) done by WWF and WCS (the Wildlife Conservation Society) showed that in all of SWP there are approximately 25-30 leopard individuals present, thus of all biodiversity issues facing SWP, the issue of the leopard conservation is the most important. The SWP has taken the key role in the conservation of migrating birds and their habitats. The issue of the conservation of priority species (leopard, tiger, migrating birds) is covered in detail in the paper by Dr. D. Miquelle, Dr. Y. Darman and Dr. Y. Shibaev that has also been prepared for the **Third Workshop on Power Grid Interconnection in Northeast Asia**. In contrast, the goal of this paper is to concentrate attention on the ecological problems and ecological policy in the Southwestern Primorye in general.



**Leopard and Tiger tracks  
Simultaneous census 2000 year  
Scale 1: 750 000**

- Leopard
- Tiger



Created by GIS-center "TiGiS"

**Figure 4: Year 2000 Census of Leopard and Tiger Tracks in SWP**

## **2.2 Conventions and Agreements Related to Biodiversity Conservation in the Russian Far East and in the Southwestern Primorye**

Russia has made commitments to observe multilateral environmental conventions and agreements (Box 1). In addition to these conventions and agreements, international programs such as the UNESCO “Man and the Biosphere Program” and the international initiative to determine “Important Bird Areas” (IBA’s) play a role in preserving biodiversity in the RFE. These commitments and programs demonstrate that legislative regulation on conservation of biodiversity and the environment in the Southwestern Primorye is in place and rests on rules and initiatives at the global and international, regional, domestic and departmental levels. Russia's large number of international obligations in the environmental area, as determined by various conventions, lend support to biodiversity conservation in the Southwest Primorye.

## **3. PRIORITY ENVIRONMENTAL THREATS**

### **3.1 Social Development and Human Usage Contributions**

The population of Southwest Primorye is 55,700, or 2.6% of the total population of Primorsky Krai. The ethnic composition of the SWP population is 80% Russian. Population dynamics in the area have historically been associated with abrupt, periodic changes in the socio-economic development of the territory. The first drop in population occurred at the end of 1930s and was connected with the introduction of a rigid border regime. In the 1950s and 1960s, with the development of the fishery and agriculture sectors, the population steadily grew. In recent decades, the population of Primorye has decreased by 8-14%, in large part a result of a restructuring of the socio-economic infrastructure in the area.

### **3.2 Industrial Contributions**

The industrial structure of Southwest Primorye (largely ship repair and metal processing) as of the end of the 1990s is such that it does not create significant environmental problems. There are no heavily polluting industries in Southwest Primorye, based on the existing sanitary classification system. Among the eight largest industrial enterprises in the area, seven are rated at the lowest level of pollution. Of the industries present in the area, only open-pit coal mining is a substantial threat to biodiversity; this industry fragments leopard habitat and pollutes salmon spawning rivers. The other industrial enterprises show no indication of significant harm to biodiversity. The industrial environmental load is concentrated at three or four sites in SWP. At the same time, however, existing industrial centers are dangerous as sources of untreated water.

### **3.3 Natural Resource Use**

The main problems for biodiversity conservation related to natural resources use are described hereunder. The general patterns of land use in the area reflect the low present level of economic development in southwest Primorye does not correspond to the high natural resource base and to the unique economic and geographic potential of the region, as discussed below. Arable land occupies 1% of the SWP, urban and suburban land occupies 2.3%, the rest are the lands of the State Forest Service.

### 3.3.1 Coastal Fisheries (legal and illegal) and Mariculture

#### Coastal Fisheries and Mariculture

Southwestern Primorye hosts twenty-two commercial fishing enterprises. In 1998 these enterprises produced 11.4% of the gross regional product for southwest Primorye. Currently, coastal fisheries in southwest Primorye land less than 20% of the region's potential marine take. Non fish species make up 50% of the total take of which mollusks account for 26%, sea urchins (Echinodermata) 14%, holothurians 5%, and prawns 5%.

In addition to traditional marine fisheries target species, new fish species are being commercially landed. A transition to market economics provides coastal fisheries with opportunities to harvest marine invertebrates like mercenaria, the callista, the hairy-legged crab, shrimps, misides, cucumaria, octopus, medusa and ascidia.

A significant portion of the coastal marine resource and mariculture production is marketable only in foreign countries as live produce. This means that the physical infrastructure of the coastal fishing industry must be upgraded. In earlier decades Khasansky District gained extensive experience in developing and maintaining mariculture operations, but that potential is now underutilized.

#### Marine Resource Poaching

Marine resource poaching, although illegal, is a very significant factor in natural resources usage in SWP. The sea cucumber has been the main target in recent decades. A group of Russian and Chinese citizens have organized a very professional structure for the poaching and sale of sea cucumbers. The value of poached sea cucumbers for the 1992-1998 period, based on Hong Kong prices, is estimated to have averaged one million US dollars annually. Recently, poachers have begun to actively take such mollusks as misides and spisula, as well as prawns. During the tourist season locals catch and sell tens of kilograms of these animals.

Threats to coastal fisheries include:

- (a) Degraded fish resources and changes in the trophic structure of benthic ecosystems;
- (b) Improperly organized mariculture in closed bays, leading to intense eutrophication;
- (c) Poaching as a form of legal nihilism and a consumer attitude about the environment among the local population.

### 3.3.2 Agriculture

The peak of agricultural development in southwest Primorye was the period between 1930-1980. At present, agricultural activity stands at less than 50% of its mid-1980s level. The total area of agricultural lands in southwest Primorye was 156,069 hectares as of 2001.

Southwest Primorye has a number of enterprises that raise sika deer, though the number of head in the domesticated deer herds has declined dramatically in recent years. Experience shows that deer breeding is the most promising agricultural activity in southwest Primorye. Restoration of this branch of the economy, which is now in a depressed condition, is also very important for biodiversity conservation, and specifically, in expanding the prey base for the Far Eastern leopard. It is currently possible to increase the herd size to 20,000 individuals.

Threats to biodiversity and the environment caused by the agricultural sector in SWP include:

- (a) Transformation of soil and vegetation cover in farming that increase erosion;
- (b) Field fires that often cause major wildfires;

- (c) Chemical dependence in agriculture, especially upon pesticides and herbicides, some of which are especially dangerous for birds;
- (d) Fragmentation of wild ecosystems when valleys are developed for agriculture.

### 3.3.3 *Hunting (legal and illegal)*

#### Sports Hunting

Commercial hunting took place in southwest Primorye SWP until the late 1980s, but now there are few opportunities to restore this area of the economy. Sports hunting in southwest Primorye began to expand in the 1960s. Sika deer, roe deer and wild boar are the main sport hunting targets. Other targets that are popular include wild hare, hazel grouse, waterfowl and pheasant.

Eight hunting societies in southwest Primorye have leased the rights to hunt wild animals in specific areas. They are "Pavlinovka" (160 sq. km), "Borissovskoye" (393.77 sq. km), "Nezhinskoye" (928 sq. km), "Slavianskoye" (393.15 sq. km), "Lebedinoye" (183.7 sq. km), "Fauna" (429 sq. km), "Khasanskoye" (350 sq. km), and "Golubinni Utios" (96 sq. km). "Golubinni Utios", "Lebedinoye" and "Khasanskoye" are hunting enterprises.

Threats to biodiversity and the environment caused by hunting include:

- (a) Reduction in the number of migrating and local birds;
- (b) Spring bird game bird hunt as an indirect cause of fires;
- (c) Disturbance factors;
- (d) Direct threat of poaching to the leopard population;
- (e) Poaching of wood frogs, snakes, insects and medicinal plants and the impact on biodiversity.

### 3.3.4 *Recreation and Tourism*

Tourism and recreation is a regionally important aspect of the regional economy and annually serves 80,000 to 110,000 people. Southwest Primorye is also a promising recreation area for Chinese living in adjacent areas.

#### Balneological Resources.

The "Yasnoye" medicinal mud flats cover a significant portion of Cape Ekspeditsiya. Medicinal mud reserves in the area are estimated at 14.3 million tons. Medical research has demonstrated that the sulfide mineral muds found in the area are of high quality and they have been recommended for medical purposes.

#### "Beach" Resources

The estimated carrying capacity of regional beaches is 11,500 people per day. The swimming season in southwest Primorye (water temperatures above 16°C, and a chopiness rating of less than 3) extends for 90 to 125 days, from roughly the end of May through September, and is the longest in the Russian Far East. The best conditions for swimming are in August and September. The total beach capacity during tourism season is estimated at 1,430,000 people.

### 3.3.5 *Industrial and Transport Sector Development*

The industrial development level, and pollution issues corresponding to industrial development in the SWP region, are not discussed in this report in detail. In the future, industrial development

should take place in a manner that strictly follows strong environmental regulations. Briefly, the industrial contribution to threats to biodiversity and the environment can be described as follows.

There are two types of economic activity in the region that are threats to biodiversity and the environment: industry and transport. Transport threats can be categorized based on an assessment what good is hauled, and how much of the good is hauled. Transport activities and infrastructure development present the following threats:

- (a) annexation of land and waterways for roads, railways, and ports. These uses currently represent 1-2% of the territory;
- (b) pollution of territory adjacent to roads, railways, and ports, which affects an area that is approximately twice as large as the area covered by the transport facilities themselves;
- (c) fragmentation of large ecosystems by roads and railways and increased opportunities for poaching and recreation due to the enhanced access that roads and railways provide; and
- (d) disturbance factors.

#### **4. HIGH PRIORITY REQUIRED ACTIONS FOR BIODIVERSITY AND ENVIRONMENTAL CONSERVATION IN SWP**

There are two main areas in which actions are required to conserve biodiversity and the environment in the SWP:

- Shift to a strategy of sustainable nature resources management, and
- Biodiversity conservation.

##### **4.1 Required Interventions**

Biodiversity and environmental protection objectives (including those in international waters) for SWP and for the Russian Far East as a whole are based on national priorities. A list of required interventions designed for conservation of biodiversity in particular, and for environmental conservation in general, is provided below.

##### **1. Improving the System of Protected Territories**

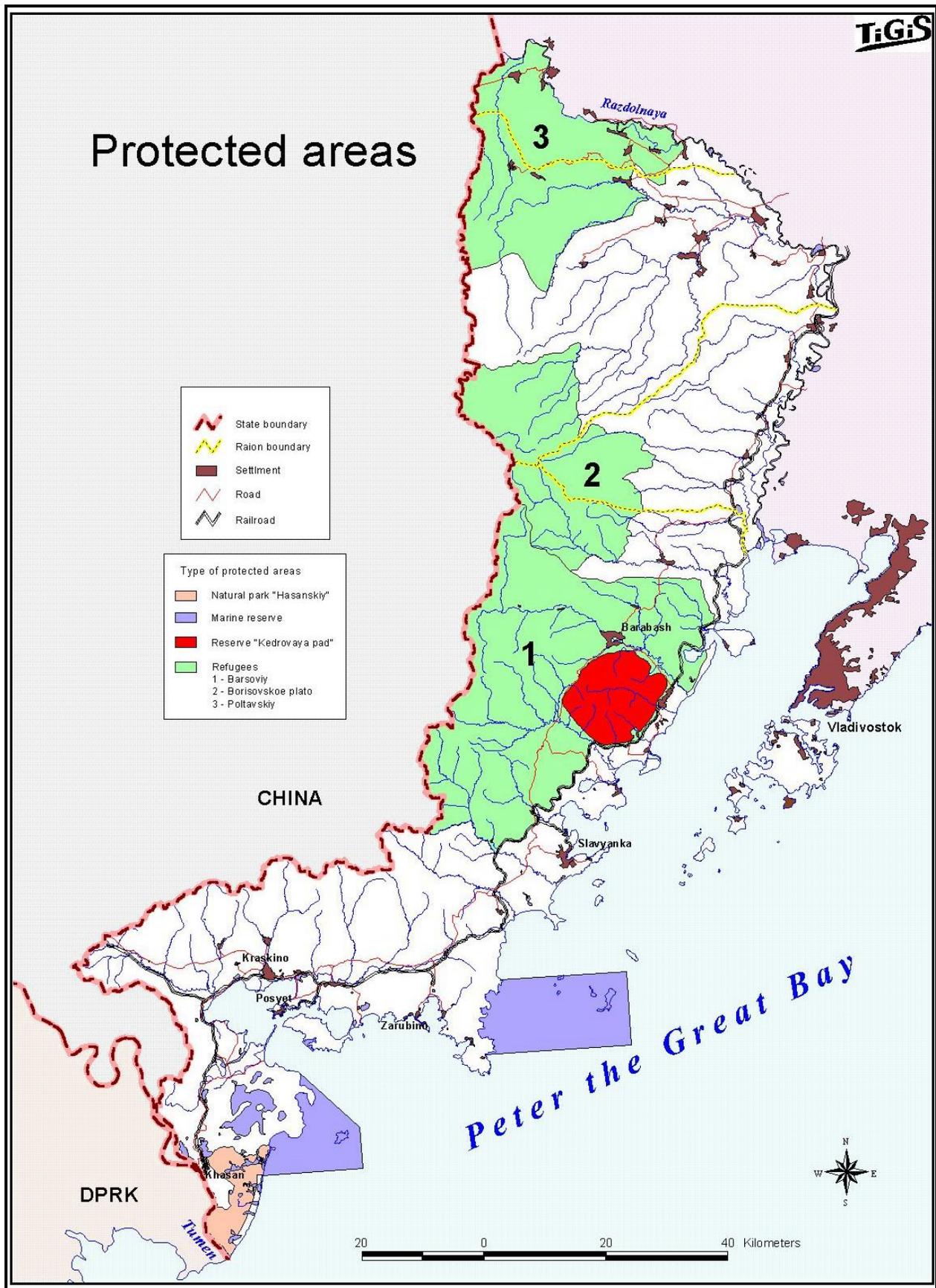
Improving the System of Protected Territories (see Figure 5) will involve shifting to the Econet system for Southwest Primorye. The objective here is to increase the effectiveness of the Econet system rather than to simply increase the area of protected territories, which currently cover 42.5% of the SWP territory.

The main elements of the Econet System are:

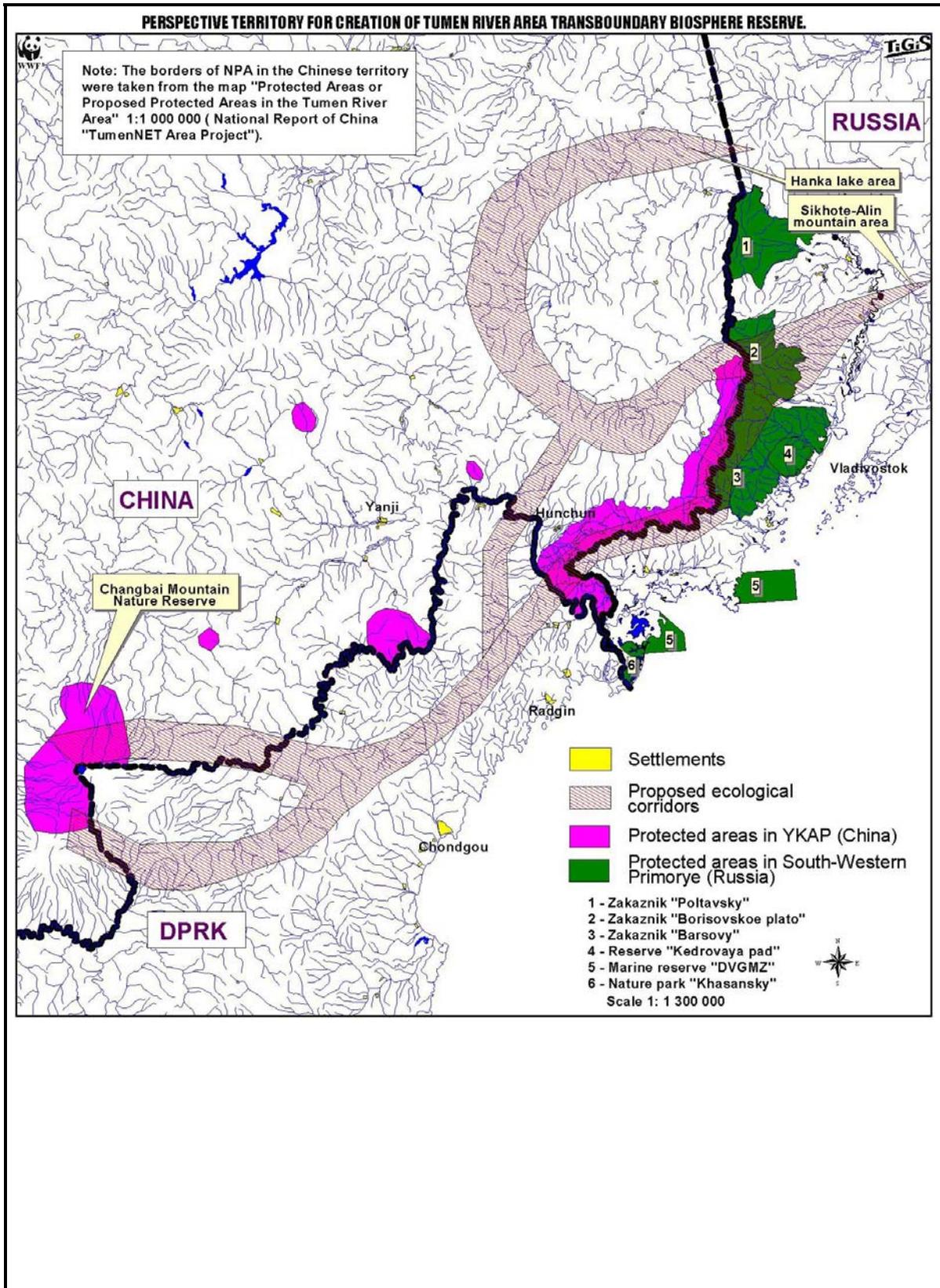
- 1) Creation of a National Park on using areas from two refuges (“Barsovy” and “Borisovskoye Plateau”) and a Nature Reserve “Kedrovaya Pad”
- 2) Expansion of the Khasanskii Nature Park
- 3) Attaching a Biosphere status to the Far Eastern State Marine Reserve, with the creation of buffer and transition zones.

- 4) In the future, creation of the Transboundary Biosphere Reserve that incorporates area in the Hunchun Nature Reserve (adjacent to SWP Chinese territory) and the Bonpo Reserve in DPRK.

The main idea of our proposal for the Tumen River Area development of NPAs (Nature Protected Areas) is the concept of the creation of ecological corridors, which is shown in Figure 6. Since biodiversity conservation is a transboundary issue, the NPA system should be implemented, as shown in Figure 6, not only in the Russian Part of TRA, but also in adjacent territories that are part of other countries.



**Figure 5: Map of Protected Areas in SWP**



**Figure 6: Map of Proposed Concept of Protected Areas development within the Tumen Region**

The Priorities for Developing the Econet System are:

- a) Include virgin forests, natural monuments and Ramsar Convention sites in the Econet;
- b) Consolidate the region's protected territories into a single large protected territory, with land ownership rights clearly assigned and which is designed to protect Far Eastern leopard range;
- c) Reduce conflicts between protected territories and local interests by conducting functional zoning of the protected territories.

## **2. Amur Tiger and Far Eastern Leopard Conservation**

Key measures necessary to protect the range of these two rare and endangered species are:

- a) Implementation of the National Conservation Strategy for the Far Eastern Leopard and the Amur Tiger;
- b) Increase ungulate (hoofed mammal) populations, especially on hunting enterprises;
- c) Restore and support deer farms as an agricultural activity that expands the prey base for the Far Eastern leopard; and
- d) Ban hunting in leopard habitat, including trapping and hunting with dogs.

## **3. Conservation and Restoration of the Most Valuable Ecosystems: Wetlands, Frontier Forests and Coastal Zone Ecosystems**

The key measures for conservation of these ecosystems are:

- a) Fire fighting;
- b) Identification of frontier forests and setting of harvest restrictions in frontier forests;
- c) Restrict agricultural expansion into forests and wetlands, and especially restrict development associated with land reclamation;
- d) Regulation of recreation and coastal development, including implementation of normative restrictions on construction in coastal zones; and
- e) Restoration of natural coastal zone vegetation.

## **4. Conservation of Marine Biodiversity and Coastal Landscapes**

Key measures for conservation of marine biodiversity and coastal landscapes are:

- a) Support the operation of the Russian Far Eastern State Marine Reserve (FESMR);
- b) Monitoring of the population status of commercially valuable shallow water species (sea cucumber, scallop), including their status in the aquatic zone of the Far Eastern State Marine Reserve.
- c) Restore the most commercially valuable species through maricultural activities and further resettlement; and
- d) Enlarge the spectrum of commercially valuable marine resources and actively introduce high-tech processing methods to make efficient economic use of those resources that are harvested.

## **5. Conservation of Bird Fauna**

The key measures associated with the conservation of bird fauna are:

- a) Implement regional and global conventions for protection of migrating birds;
- b) Endorse and introduce the National Conservation Strategy for the Far Eastern Stork;
- c) Restore stork and crane nesting sites in the Khasan Nature Park;
- d) Restrict economic activity resulting in wetlands development; and
- e) Support creation of the Khasan Nature Park

## **6. Anti-poaching activities and Illegal Transfer of Plant and Animal Derivatives**

Key measures related to the reduction of these illegal activities and their environmental impacts are:

- a) Supporting of specialized anti-poaching teams;
- b) Increasing the effectiveness of the Ministry of Internal Affairs (MIA), the Federal Frontier Guard Service (FFGS) and the Customs Service (CS) in fighting poaching and illegal transport of plant and animal derivatives;
- c) Clarifying the legal responsibilities of Russians and foreigners in the buying and transport of commercially valuable natural resources and their derivatives;
- d) Formation among Chinese authorities of an increasing awareness of the need to increase efforts to restrict poaching and illegal transport of animal and plant derivatives from southwest Primorye to China; and
- e) Improved international cooperation with adjacent territories in North Korea and China.

## **The framework of sustainable development for conservation of biodiversity and the environment is defined by:**

Overseeing the use of ecological resources and opportunities to expand commercial activities according to strict environmental protection rules. Environmental restrictions will play a significant role in the economic development of the region. For example, restricting population to 300,00 to 320,000 people, (the maximum carrying capacity for current water resources), until adequate water reservoirs are constructed is one measure for making sure that development of the area is sustainable.

With regard to the economic development of the SWP territory, only those types of economic activities that based on sustainable use of the resources described above will be supported. These are primarily:

- 1) Development of transport and transit infrastructure. Development of economic activities that are based on use of the transport and transit functions in the region (marine and railroad as well as heavy-hauler automobile transport) should be regulated so as to introduce restrictions on the transportation of ecologically dangerous (primarily large-scale friable) cargoes. The transport of bauxite and its ores is an example here.

- 2) Development of tourism and recreation opportunities, including ecotourism facilities. In order to assist the development of tourism and recreation, an improved system of interconnected roads in the SWP territory is needed.
- 3) Development of an industry using high-tech biotechnology methods of production, focusing on production of the ecologically clean biological products that are or could be made in the region, including shallow-water marine shelf products, deer-farming products, non-timber products, and therapeutic muds.
- 4) Development of agricultural production (including deer-farming and beekeeping) as well as production of non-transportable agricultural products for local consumption.