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projects

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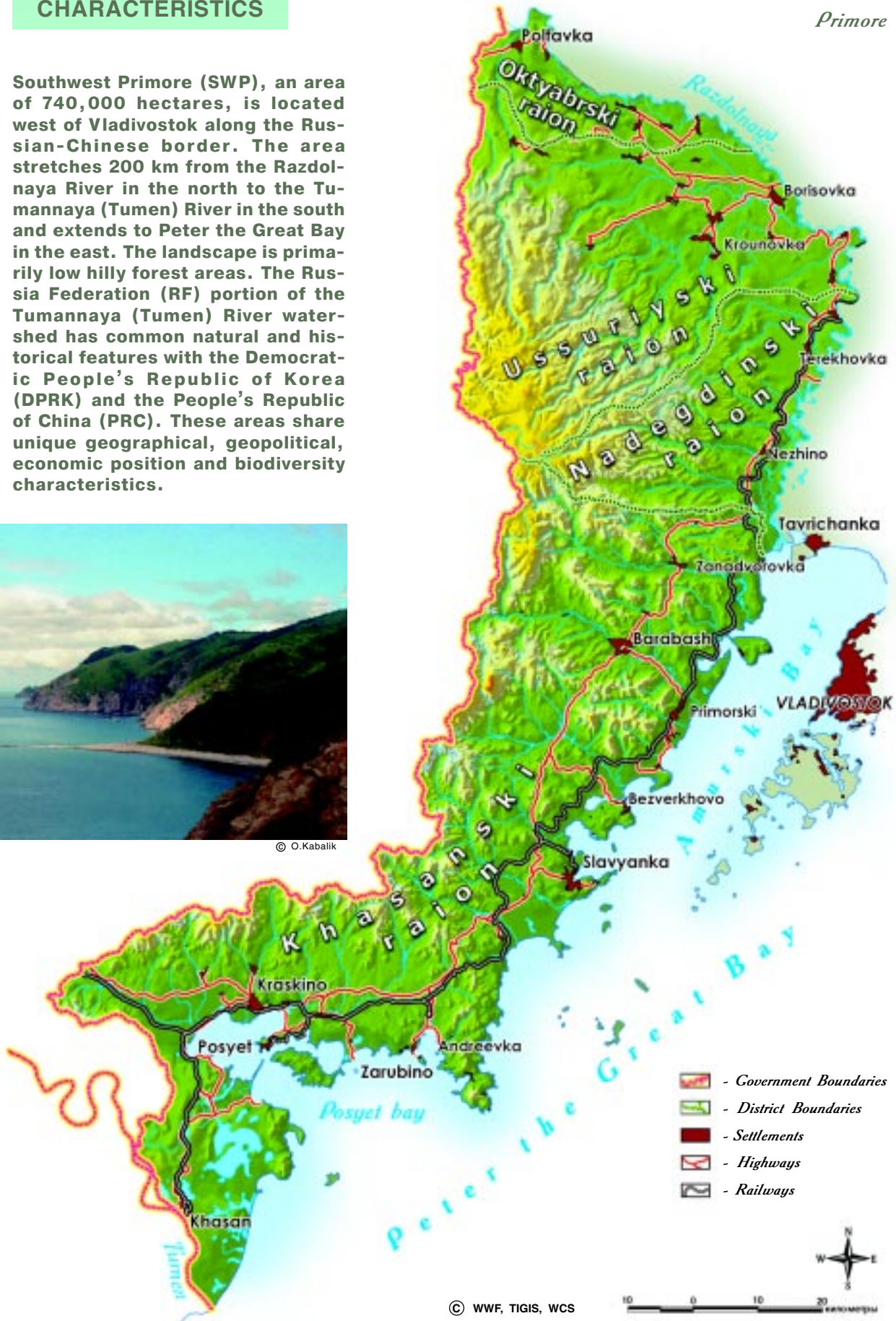
REGIONAL CHARACTERISTICS

Southwest Primore (SWP), an area of 740,000 hectares, is located west of Vladivostok along the Russian-Chinese border. The area stretches 200 km from the Razdolnaya River in the north to the Tumannaya (Tumen) River in the south and extends to Peter the Great Bay in the east. The landscape is primarily low hilly forest areas. The Russia Federation (RF) portion of the Tumannaya (Tumen) River watershed has common natural and historical features with the Democratic People's Republic of Korea (DPRK) and the People's Republic of China (PRC). These areas share unique geographical, geopolitical, economic position and biodiversity characteristics.



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*Southwest
Primore*



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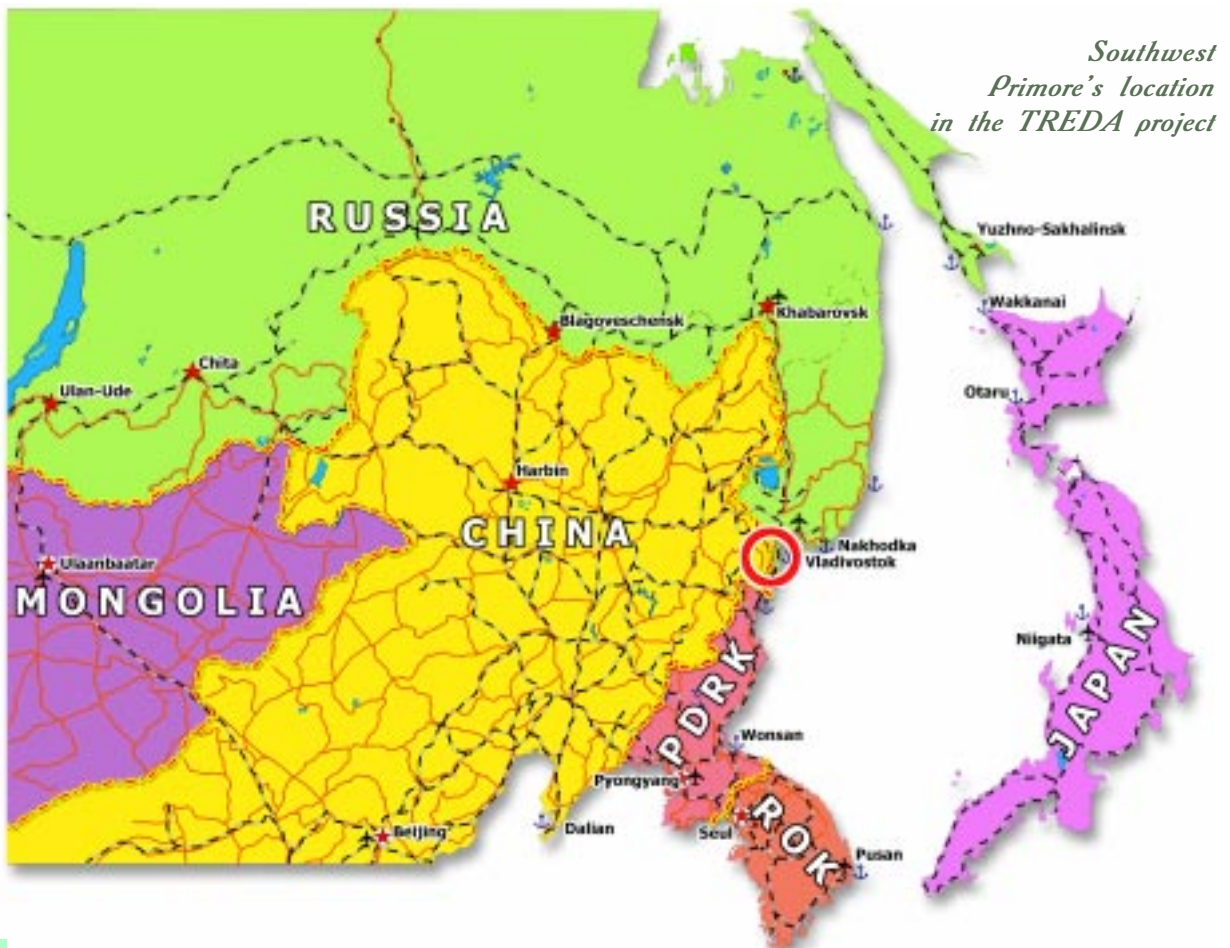
REGIONAL CHARACTERISTICS

These features are the basis for including this area in an internationally supported regional development project: TREDA (Tumen River Economic Development Area). The project covers northeast Asia's most diverse biological, geographical, social, economic and national conditions. The international community and the countries making up the Tumannaya (Tumen) River watershed have recognized the need to protect the environment of this portion of Northeast Asia. This can be achieved only with a shift to sustainable regional development that accounts for the interests of the countries involved. Progress in achieving sustainable development in border territories is hampered primarily by the conflict between a need to preserve native biodiversity and a need to promote socio-economic development. These problems are exceptionally acute in southwest Primore because:



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- In comparison with the adjacent territories, SWP has the highest level of intact native biodiversity;
- Regional specifics make SWP more susceptible to transborder atmospheric and marine pollution;
- Economic progress and social welfare depend on the way natural resources are managed.

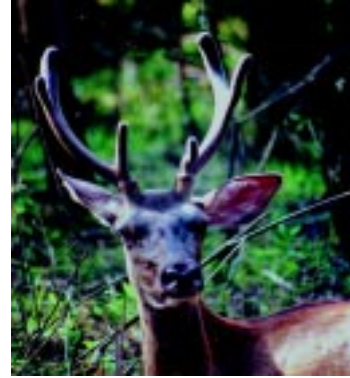


BIODIVERSITY

The flora and fauna of SWP is the richest in the south of the Russian Far East (RFE).



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Table 1. General and Relative Species Diversity in the RFE (Data Provided by the Biology-and-Soil Institute, FEB, RAS)

Species Group	Number of species				Unique BIODIVERSITY		
	In Nature	In the RFE	In Primorskii Krai	In SWP and Adjacent Areas	Percentage of Endemics in RFE Biota	Ratio of SWP to RFE Species	Ratio of SWP to Primorskii Krai Species
Mushrooms and plants							
Mushrooms	90 000	6 000	5 000	3 500	10%	58%	70%
Mosses	26 000	1 000	900	700	10%	70%	77%
Lichens	20 000	1 000	400	400	15%	49%	100%
Freshwater algae	50 000	2 600	2 000	1 000	15%	38%	50%
Vascular plants	230 000	4 146	2 443	1 500	17%	36%	61%
Average					13-14%		70%
Animals							
Insects	750 тыс.	27 000	23 000	16-20000	35%	60-75%	70-86%
Freshwater fish	8 600	400	120	64	-	16%	53%
Amphibians	4 200	9	8	7	60%	77%	88%
Reptiles	6 000	16	13	10	35%	62%	77%
Birds	8 600	500	466	370	35%	74%	80%
Mammals	3 700	194	97	86	60%	82%	87%
Average					44%		75%

SWP provides habitat for 86 mammal species of which 23 are endemics: Japanese mole, giant shrew, small nose Ussuri bat, eastern particolored bat, Far Eastern leopard, Amur tiger, Far Eastern wild cat, Himalayan black and brown bear, lynx, wolf, red Manchurian deer, spotted and roe deer, and wild boar. Some of these species are on the brink of extinction, the leopard and the tiger being the most endangered.



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370 species of birds have been observed in the lower Tumanaya (Tumen) River, of which 50 are listed on either international or Russian Red Books. Species include Japanese and Dauria cranes, each species of which number over 200 during the migration period. Thirty to forty pairs of the bay duck *Aythya baeri*, a very rare species, nest here along with bald eagle, golden eagle, sheldrake, black vulture, gyrfalcon, yellow-beaked heron and such other remarkable bird species as *Tadorna cristata*, *Platatea minor*, *Porzana psykulii*, *Emberisa jankowskii*.



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SWP is one of the most important stopover areas for waterfowl migrating along the East-Asian Flyway. Twenty-six species of ducks (up to 100,000 birds at one time during certain years) have been observed. Hundreds of swans, mainly *Cygnus cygnus*, annually stop at the Bird Lake (Talmy). In the spring of 1970 about 50,000 wild geese were seen in transit, *Anser albifrons* and *A. fabalis* are the most numerous.

SWP has 7 amphibian and 19 reptile species, the latter including 4 endemic rat /chicken snakes.

The Tumen River boasts 64 fish species from 22 families; four species, *Coluber spinalis*, *Dinodon rufozontum*, *Mesogobio tumanensis* and *Acipenser medirostris*, are endemic and demand special protection.



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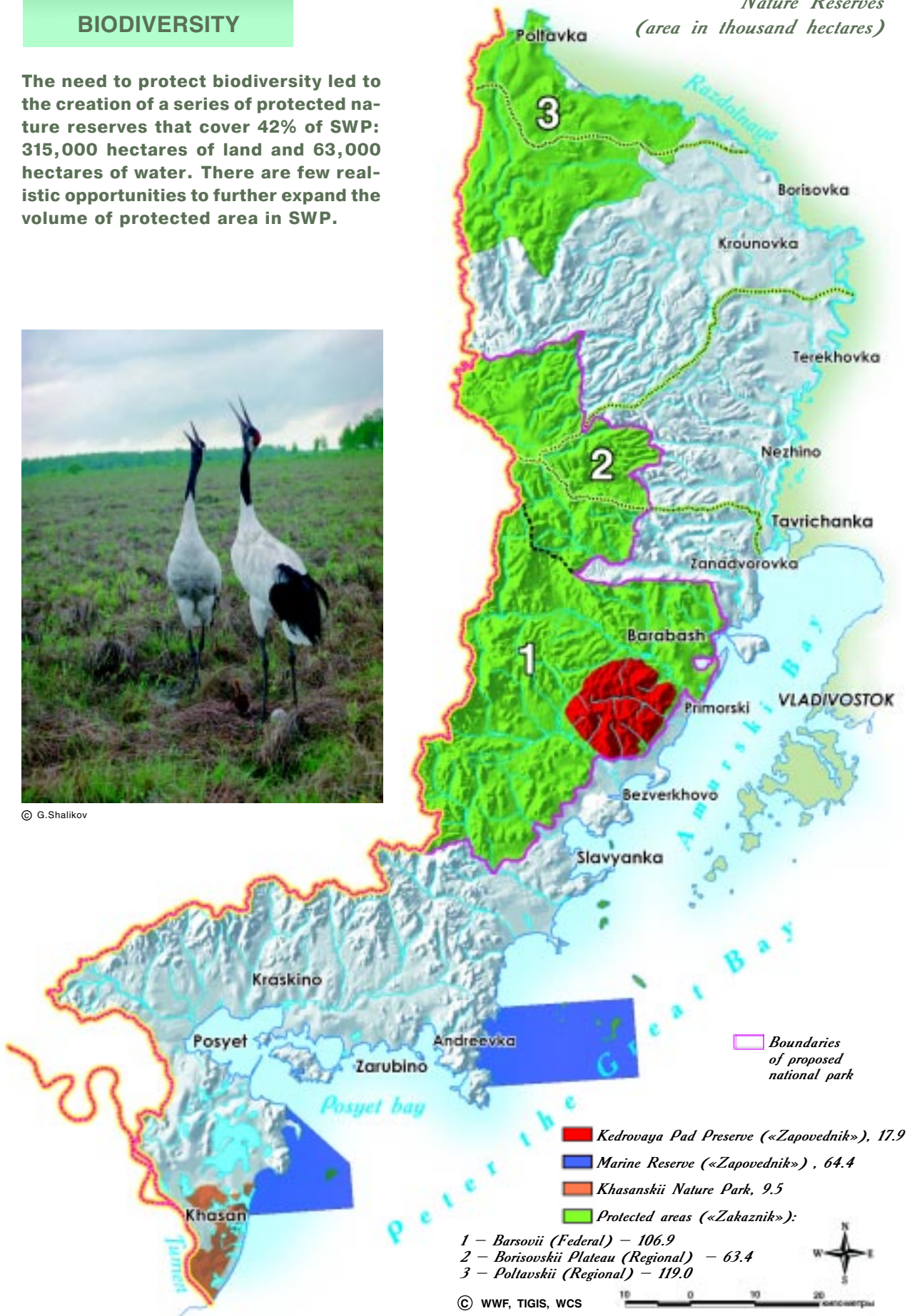
BIODIVERSITY

The need to protect biodiversity led to the creation of a series of protected nature reserves that cover 42% of SWP: 315,000 hectares of land and 63,000 hectares of water. There are few realistic opportunities to further expand the volume of protected area in SWP.



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*Nature Reserves
(area in thousand hectares)*





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AMUR TIGER

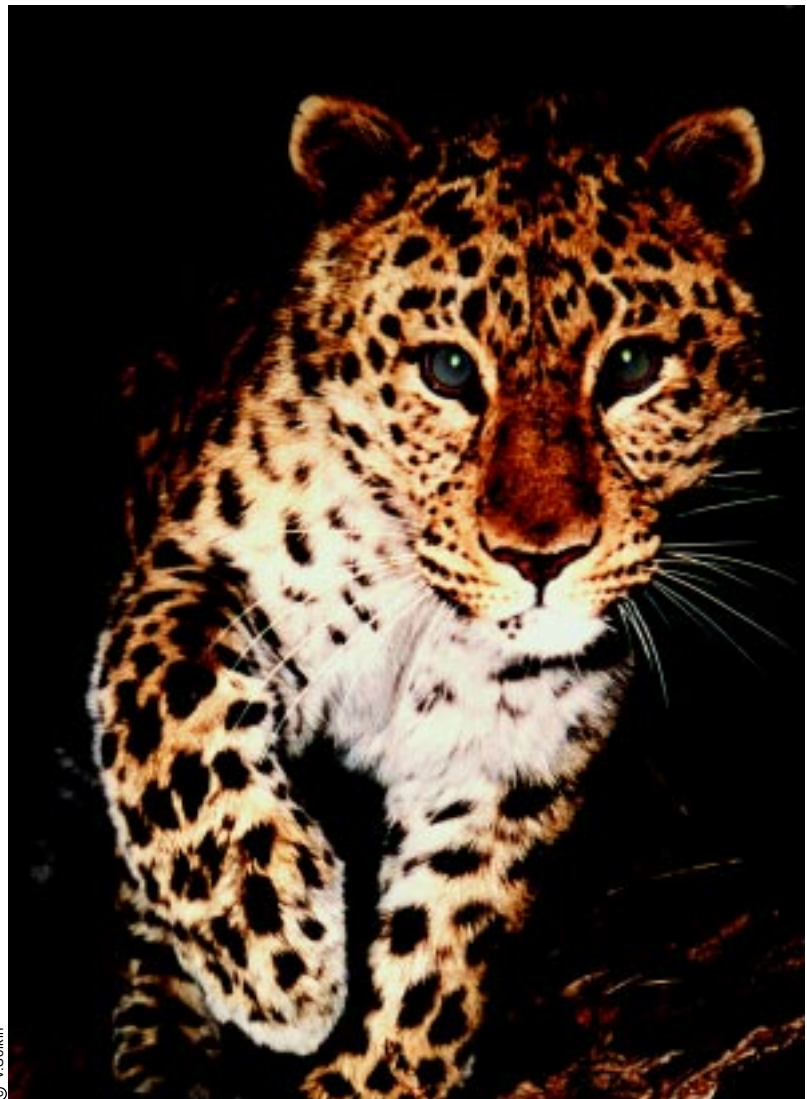
The Amur tiger population is distributed primarily in the mixed forest zones of the Sikhote-Alin Mountains (Primorskii Krai and southern Khabarovskii Krai). Smaller sub-populations are found in SWP and Eastern Manchuria. Tiger habitat in the northeast Asia has decreased in the last 100-150 years and the number of tigers has also declined, threatening the species with extinction in the wild. A 1995-1996 census estimated there are between 415-475 tigers in the RFE. Of this number, 9 to 14 tigers are believed to live in SWP.



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FAR EASTERN LEOPARD

The Far Eastern leopard is a rare, vanishing sub-species. The danger of the leopard going extinct in the wild is much greater than that of the tiger. Its numbers and habitat have decreased in the last 50 years to the extent that only one habitat area is left, an area called the «Cherye Gory» or Black Mountains that extends across the borders joining SWP with the PDRK and the PRC. The number of leopards in the wild was estimated at 38-46 in 1973. This leopard population has been isolated for about 20 years and its numbers continue to decline. A WWF / WCS census taken in the winter of 2000-2001 estimated that there are no more than 30 leopards left in the wild in SWP.

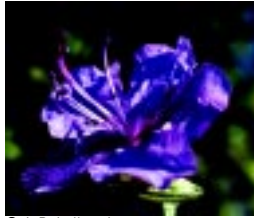


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BIODIVERSITY



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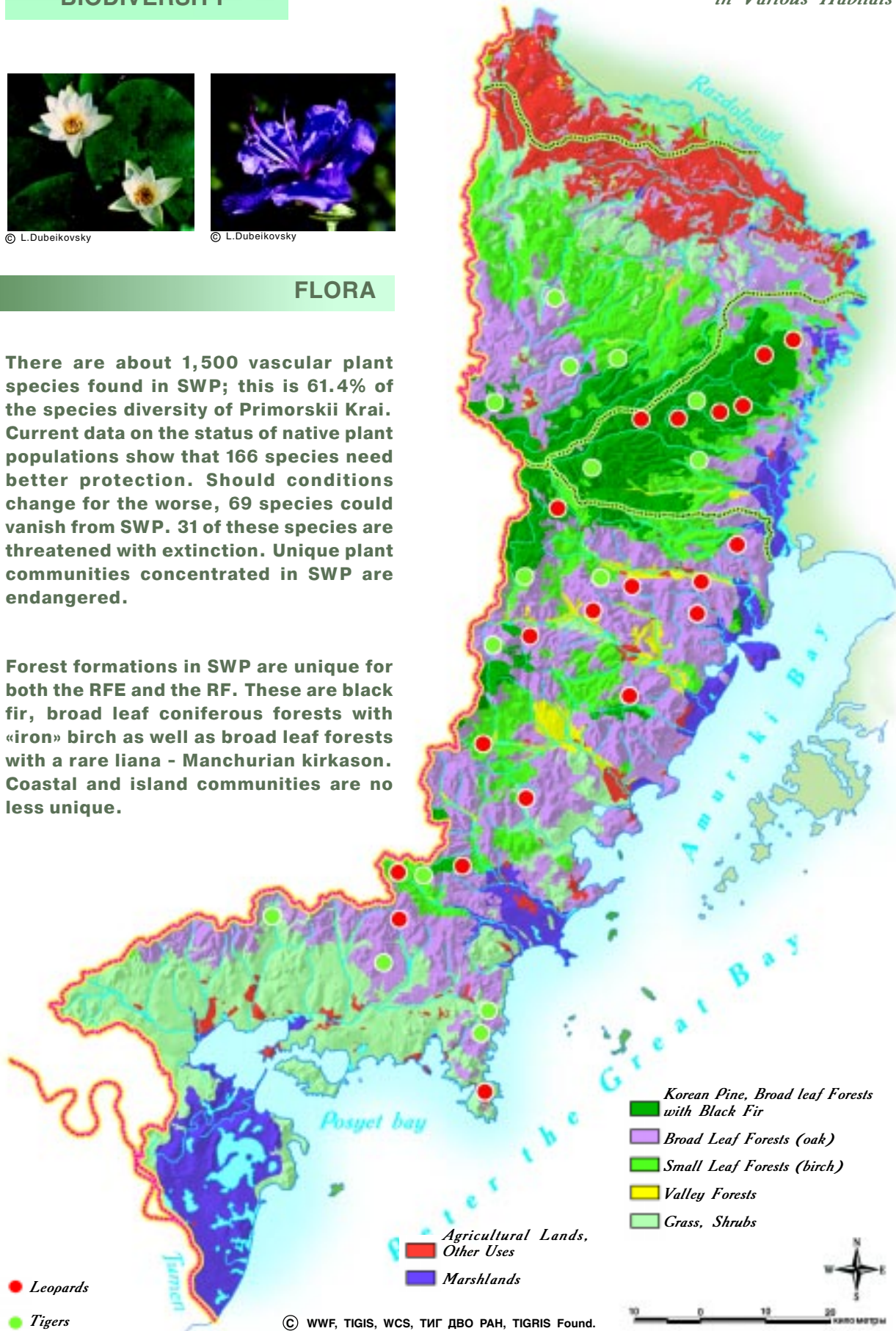
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FLORA

There are about 1,500 vascular plant species found in SWP; this is 61.4% of the species diversity of Primorskii Krai. Current data on the status of native plant populations show that 166 species need better protection. Should conditions change for the worse, 69 species could vanish from SWP. 31 of these species are threatened with extinction. Unique plant communities concentrated in SWP are endangered.

Forest formations in SWP are unique for both the RFE and the RF. These are black fir, broad leaf coniferous forests with «iron» birch as well as broad leaf forests with a rare liana - Manchurian kirkason. Coastal and island communities are no less unique.

Tiger and Leopard occurrence in Various Habitats





© A. Ratnikov

BIODIVERSITY

THE RED BOOK SPECIES:

■ There are three marine species listed on the IUCN Endangered Species List: white shark *Carcharodon carcharias* of the family *Laminadae*; giant shark *Cetorhinus maximus*, *Cetorhinidae* family; Sakhalin sturgeon *Acipenser medirostris*, *Acipenseridae* family.

■ Two species - green sturgeon *Acipenser medirostris* and *Huho peryi* of *Salmonidae* family - are listed in the RF Red Book.

■ Twenty species are contained in the Primorski Krai Red Book

MARINE RESOURCES

The waters of Peter the Great Bay wash the SWP coast. The biodiversity is unique here because:

- the Bay is located at the interface of subtropical and temperate zones and is influenced by both the cold Primore and warm North Korean streams;
- the Bay is protected and has many shallow bays with abundant seaweed, unlike most of the Sea of Japan's coast, which is open to wave action and has a narrow shelf and low productivity.

Peter the Great Bay ranks among Russia's richest and most productive regions. There are more than 3,700 species of microorganisms, fungi, plants and animals belonging to 1,850 genera, over 840 families, 103 classes and 51 types of living organisms.

The Bay's ichthyo fauna consists of 83 families, which include 303 fish species. 96 are seasonal migrants and 207 are permanent residents. There are 16 transitional, 24 euryhaline and 263, the majority, are typical marine species. The commercial species number 68.

Peter the Great Bay plays a large role in the reproduction of the Sea of Japan biological resources. There are major spawning grounds that continually replenish herring, pollack, saffron cod, a variety of codfish, flatfish and other commercial species. There are also mackerel, anchovies, ivas that migrate widely throughout the Sea of Japan.



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The condition of invertebrates in Peter the Great Bay is of grave concern. The clams *Mizucopecten yessoensis* and especially sea cucumber «trepan» *Apostichopus japonicus* are commercial species whose importance has declined as a result of large scale poaching. Only a complete ban on harvest and active mariculture will lead to an increase in their numbers.

SOCIAL AND ECONOMIC CONDITIONS

Demographic indices

In 2000 there were 55,700 residents in SWP or 2.6% of Primorskii Krai's total population. Mostly Russians (80%), the area has experienced dramatic population fluctuations, a reflection of political changes in Russia. In the late 1930s, after stricter border regime regulations were put in place, the population of SWP declined. The 1950-1960 period witnessed a steady increase in population, a result of increased economic opportunity. The 1990s saw a drop of 8 to 14% in population.

Six of the 61 settlements in SWP are classified as urban-type communities, and all are in Khasanskii Raion. The largest cities are Slavyanka (17,400), Zarubino (4,700), Kraskino (4,300). The total urban population is approximately 30,000.



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In the past decade, three indices - death rate, birth rate, and life expectancy - demonstrate a tendency toward population decline. For the 1992-1999 period, birth rates declined by 60-69% while the death rate increased by 25-45%. Most villages show out migration.

Education levels conform to Primorskii Krai averages. 5-6% of the population has a college education and 12-14% finished a technical school.

Income and expenses of the population are marginal. Low wages are a reason for local poaching.

Khasansky Raion: Population Dynamics (in thousands)



© G.Shalikov



Socio-economic indices

SWP includes all or part of the following administrative districts of Primorskii Krai: Khasanskii, and part of Ussuriiskii, Nadezhdinskii and Oktyabrskii Raions.

SWP contributes 4.2% of Primorskii Krai's total gross domestic product and shows very modest economic and social indices suggesting the region is in a depressed condition.

Table 2. SWP: Contributions to Total Primorskii Krai Economy

Feature	SWP	Primorskii kraï	SWP Ratio, %
Area, sq. km	6990	165900	4,2
Population, thousands	55699	2172000	2,6
Number of businesses (major and medium)	40	3850	1,0
Gross Product, million rubles	288	56106	0,7
Industrial Product, million rubles	180	34759	0,5
Agricultural Product, million rubles	46,6	3886	1,2
Budget Revenue, million rubles	90	8014	1,1



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Economic

Structural Features

INDUSTRY

There are a number of modern industries: ship-repair, coastal fisheries and marine product processing. Private enterprises (91.5% of total) account for 58.6% of the area's total product and employ 87.4% of its labor force.











INDUSTRIES	Number of enterprises	Share in production, %	Decrease in production volume, %	Pollution class
Machine-Building and Metal Working	13	58,4	78	5
Electric Power	1	20,0	27	5
Food (excluding Fisheries)	9	3,7	43	5
Fisheries	22	11,4	47	3-5
Timber and Forestry	4	1,1	78	4-5
Construction Materials	3	0,8	82	4-5
	2	2,0	29	5

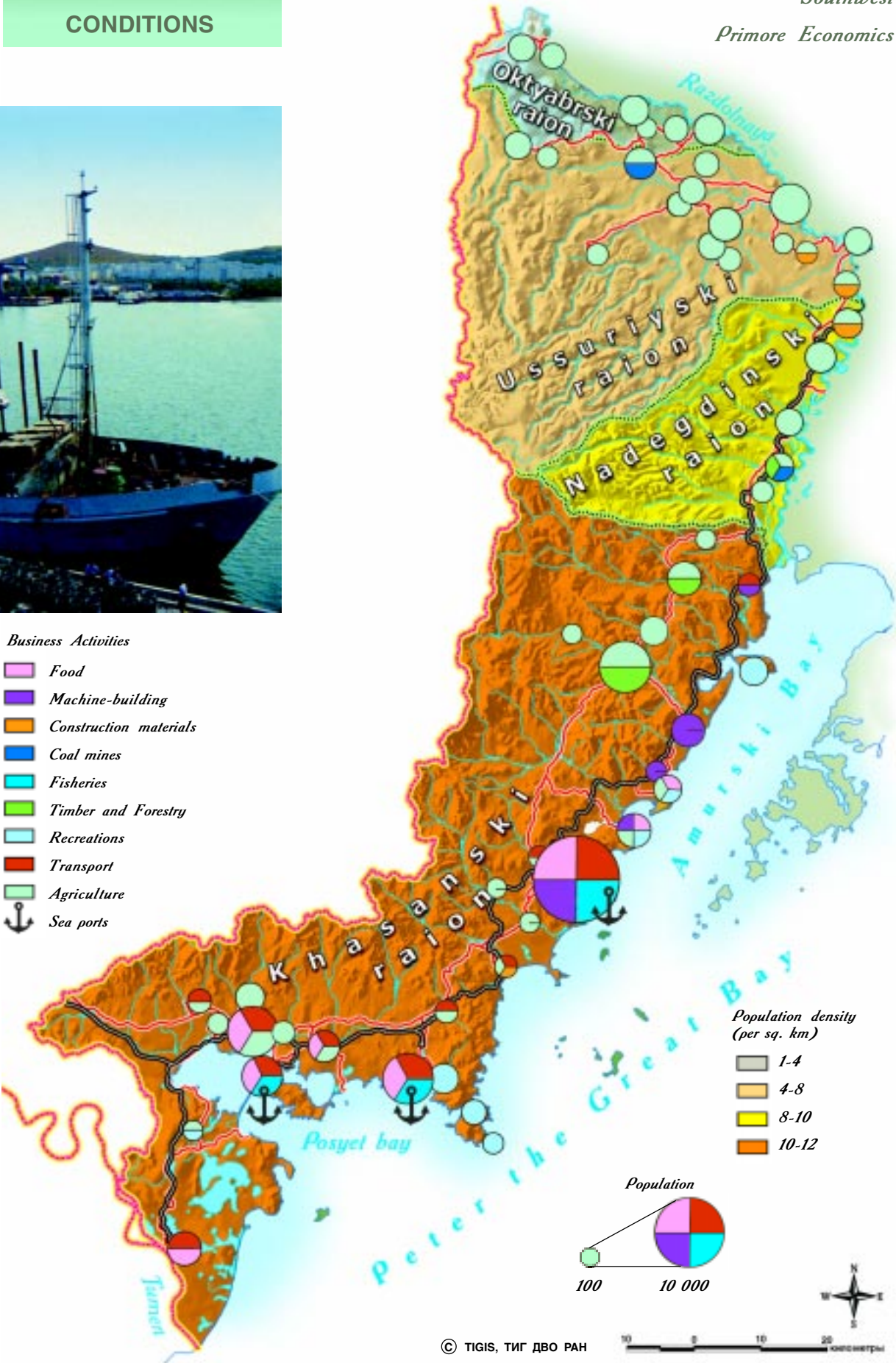
**SOCIAL
AND ECONOMIC
CONDITIONS**

*Southwest
Primore Economics*



Business Activities

-  Food
-  Machine-building
-  Construction materials
-  Coal mines
-  Fisheries
-  Timber and Forestry
-  Recreations
-  Transport
-  Agriculture
-  Sea ports



POWER GRID

The area's power grid is developed and provides centrally generated electricity to all production facilities and settlements. Current power consumption rates from the Dalenergo managed energy grid equals 2 million kWt / hr.

**MINERALS
AND RAW MATERIALS**

There are about 70 commercially exploitable mineral deposits in the region. The most significant deposits are «porcelain stone,» quartz sand, coal (black and brown), titan, marble, seashell, turf, construction stone and sand, limestone, ceolites and perlites. Development and use of these deposits remains low and only one open pit coal mine is operating. The Khasanskii (brown coal) and Tumannii (sand) now stand idle. Known reserves of these minerals are adequate for long term use.



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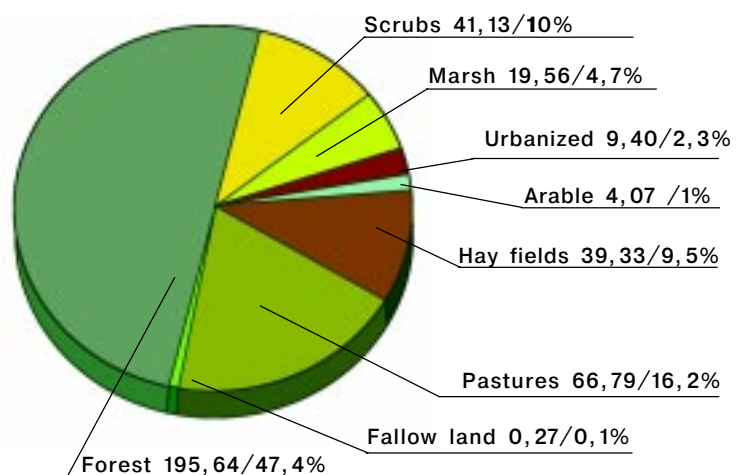
The character of land resource structure, as is shown in the diagram, is indicative of a low

Land Tenure and Natural Resource Management

The land resource structure, as shown in Diagram 5, demonstrates a low commercial use of land and a high volume of protected territories. Much of the agricultural land is dedicated to deer parks and hay fields (106,000 hectares of 111,000 hectares total). Forests, marshland and brushwood comprise 62% of the total area. Urban lands range from 1.3-3.9% (2.3% in Khasanskii Raion).

The figures are given in relation to Khasanskii Raion, the largest administrative district in SWP. The main part of forests, marshes and scrubs is represented by Protected Territories that total 42 % of the territory.

Land Resource (thousand hectares/ %)



SOCIAL AND ECONOMIC CONDITIONS

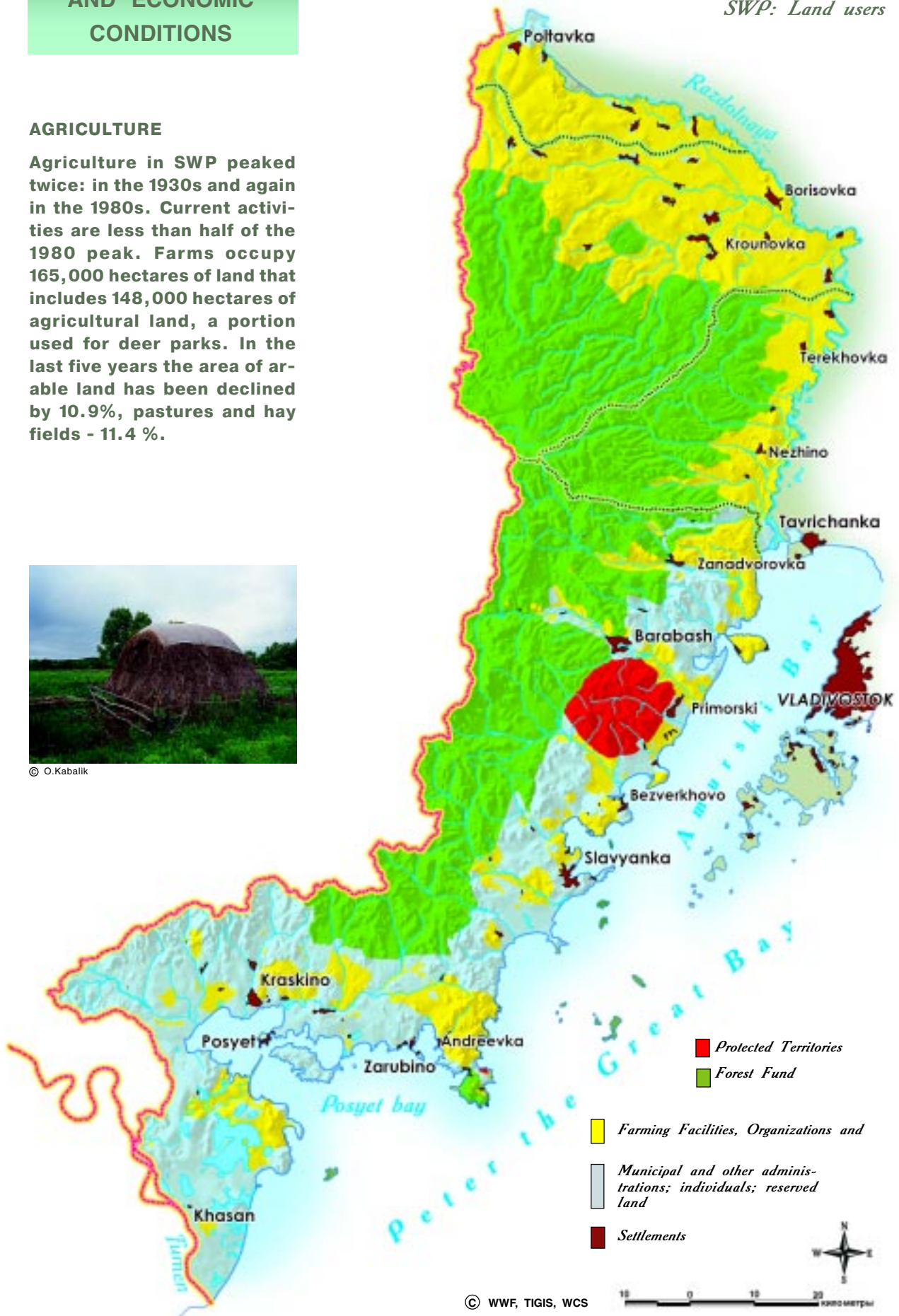
AGRICULTURE

Agriculture in SWP peaked twice: in the 1930s and again in the 1980s. Current activities are less than half of the 1980 peak. Farms occupy 165,000 hectares of land that includes 148,000 hectares of agricultural land, a portion used for deer parks. In the last five years the area of arable land has been declined by 10.9%, pastures and hay fields - 11.4 %.



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SWP: Land users



SOCIAL AND ECONOMIC CONDITIONS

Crop yields correspond to Primorskii Krai averages, although since the 1990s there has been a decline in yield. Experience shows that deer farming is the most promising business for this area. There are three operating deer farms. Livestock numbers have dropped and there are only 3,000 head of spotted deer at these farms. Finding ways to promote deer farming is an important factor in the attempt to protect regional biodiversity. This, in particular, is the case with the endangered leopard whose diet is mainly spotted deer. Increasing deer numbers to 20-25,000 head is realistic since in 1991, deer numbers exceed 23,000.



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FOREST MANAGEMENT

Of the 300,000 hectares of forestland in SWP, 220,000 belong to the Goslesfond (State Forest Fund) and most protected territories are part of that system. Forest productivity is not high (average index 111.6), average timber reserve is 124 cu. m per hectare. Commercial timber does not occur and various forms of planned maintenance thinning harvests around 5,000 cu. m, including 3,000 firewood. Allowable annual cut (hardwood) is 78,000 cu. m.

HUNTING

Commercial hunting in SWP was active till the end of 1980s, but prospects for its revival are now very bleak. Sport-hunting has been going on since the early 1960s, targets being spotted and roe deer, wild boar. Hunters also target hare, hazel-hen, waterfowl and pheasant. There are eight sport-hunting facilities in the area with leases to use regional wildlife resources.

Hunting Facilities	Area, sq. km
Pavlinovka	160
Borisovskii	351,77
Nezhinskii	928
Slavyanskii	393,15
Lebedinii	83,7
Fauna	429
Khasanskii	350
Golubinii Utyos (Dove's Cliff)	96

SOCIAL AND ECONOMIC CONDITIONS

COASTAL FISHERIES AND MARICULTURE

There are 22 fishing facilities, all in Khasanskii Raion, the only marine area in SWP. According to official data, revenue from marine products marketed in 2001 was extremely low, only \$110,000. Current catch rates are less than 20% of potential catch. The catch consists of mollusks (26%), urchin (14%), shrimp (5%). International markets for invertebrates like wooly-hand-



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ed crab, octopus, jellyfish, shrimp and many others are available, there is a demand, but the catch must be delivered live. This requires changes in harvest techniques and shore-based processing. In previous decades, considerable experience was obtained in managing mariculture facilities in Khasanskii Raion. This experience can be used to develop a coastal marine complex.

POACHING

A significant, though illegal aspect of natural resource management scenario in SWP is poaching. In the last decade, the Far Eastern trepang (sea cucumber) has been the main target. Well-organized structures have formed to harvest trepang and they do their business in a professional manner. Between 1992 and 1998, about one million dollars of trepang was illegally caught offshore in SWP, prices based on the Hong Kong Exchange. Populations of bivalve mollusks (*Spisula*, giant mussel) and crustacean shrimps have lately become a target of rapacious hunters.



© N.Ivanov

**SOCIAL
AND ECONOMIC
CONDITIONS**

TOURISM AND RECREATION

Regional recreational resources can provide services for 80-100,000 a year. Khasanskii Raion has potential coastal recreation appeal for neighboring China. The Raion is a transit



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route for 40-50,000 tourists from ROK, and 15-20,000 from PRC. Attracting these travelers to the region for a day or two could generate significant revenues. «Beach tourism» is a common attraction and local beaches have a capacity of 11,500 visitors at any one time; the swimming season, with water a temperature over 18°C and calm seas is 80 days.



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August and September are the best seasons. Local beach capacity is nearly 1 million people per year.

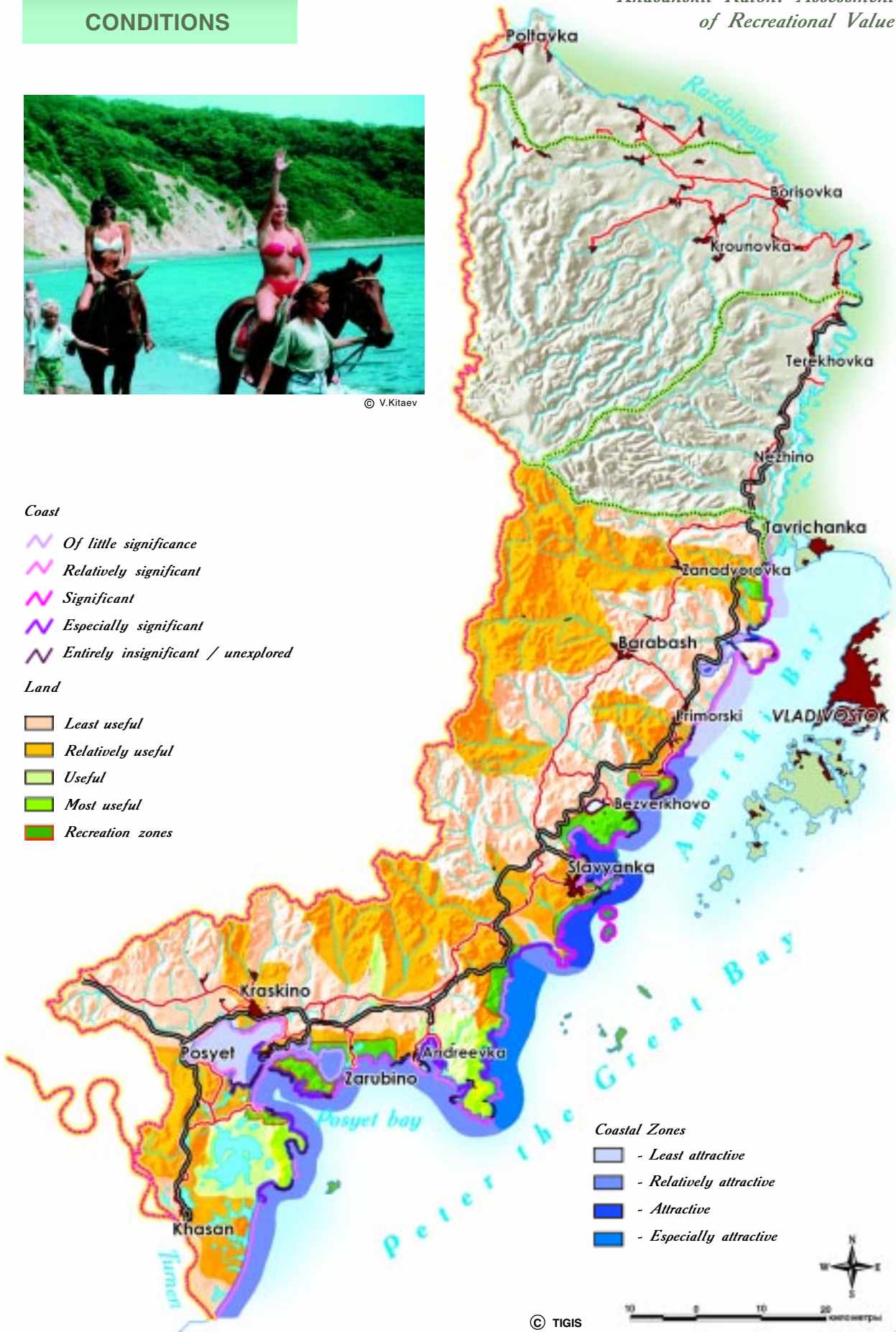
Mineral water resources are underutilized, though considerable deposits (14.3 million tons) of high-grade, mineralized sulfide medicinal muds are known to exist in Expedition Bay.

**SOCIAL
AND ECONOMIC
CONDITIONS**



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*Khasanskii Raion: Assessment
of Recreational Value*



**MAIN THREATS
TO BIODIVERSITY
AND TO THE
ENVIRONMENT**

The generally favorable air and water quality in SWP is due to the low level of industrial development, of facilities that produce few pollutants and to the small number of urban centers with modern city amenities.

The threats to the local environment come from adjacent industrialized centers (Vladivostok and Ussuriisk) and the city of Hunchun in China. Another source of pollution are the Razdolnaya and Tumen Rivers and transboundary atmospheric pollution.

COMMERCIAL ACTIVITIES	THREATS
<p>INDUSTRY</p>  <p>© A. Panichev</p>	<p>Industrial run-off; Disturbance factors from developing mining sites; Pollution of salmon rivers by contaminated atmospheric sediments.</p>
<p>TRANSPORT</p>  <p>© L.Dubaikovsky</p>	<p>Annexation of land and aquatic areas for roads and ports; Pollution of adjacent areas; Disturbance and fragmentation of large ecosystems; Fragmentation of leopard habitat; Increased access for local people and a growth in poaching.</p>
<p>COASTAL FISHERIES AND MARICULTURE</p>  <p>© L.Dubaikovsky</p>	<p>Depletion of natural reserves leading to disturbance of the trophic structure of benthic ecosystems; Poor management of mariculture production could lead to intensive eutrophication of closed bays; Poaching breeds ignorance of law, greed and carelessness among the population.</p>
<p>AGRICULTURE</p>  <p>© V.Saikin</p>	<p>Transformation of ground cover that increases in hard run-off; Intentionally set grassland fires that often turn into major fires; Chemical pesticide and herbicide use dangerous for birds; Natural ecosystem fragmentation caused by developing valley lands.</p>
<p>HUNTING AND HARVESTING NON TIMBER FOREST PRODUCTS (legal and illegal)</p>  <p>© V.Saikin</p>	<p>Decrease in the number of migrating and resident birds; Spring sport-hunting can indirectly cause wildfires; Disturbance factor; Poaching directly threatens the leopard; Poaching of wood frogs, snakes, some insects and medicinal herbs.</p>
<p>TOURISM AND RECREATION</p>  <p>© O.Kabalik</p>	<p>Devastation of coastal landscapes Fires; Littering; Uncontrolled use of biological resources.</p>

**MEASURES
TO PRESERVE
BIODIVERSITY AND
THE ENVIRONMENT**

The existing level of threat to biodiversity in SWP provides an opportunity to develop measures to prevent further destruction of and to restore the natural environment.

GOALS		ACTIONS
<p>ENHANCEMENT OF THE PROTECTED TERRITORY SYSTEM</p>	 <p>© V.Solkin</p>	<p>Formation of an interconnected network of protected territories; Combine all existing protected zones into one major protected territory in leopard habitat.</p>
<p>LEOPARD AND TIGER CONSERVATION</p>	 <p>© V.Solkin</p>	<p>Execute Federal strategies to preserve the Far Eastern leopard and Amur tiger; Increase the number of ungulates; Restore deer parks to expand the prey base for leopards.</p>
<p>RESTORATION OF THE MOST VALUABLE ECOSYSTEMS</p>	 <p>© L.Dubeikovskiy</p>	<p>Fight fires; Determine frontier forest areas; Restrict agricultural development of marshy and forest lands; Regulate recreational activities and the urbanization of coastal zone; Reforest the coastal zone.</p>
<p>CONSERVATION OF THE BIODIVERSITY OF MARINE COMPLEX</p>	 <p>© L.Dubeikovskiy</p>	<p>Support the Far East Marine Reserve («zapovednik»); Monitoring of the status of important shallow water shelf populations; Restore valuable species by raising juveniles in mariculture and subsequent resettlement.</p>
<p>BIRD CONSERVATION</p>	 <p>© O.Kabatlik</p>	<p>Observance the Convention on Protecting Migrating Birds; Restore stork and crane nestling sites; Approve International Protected Marshland status.</p>
<p>FIGHTING POACHING AND THE ILLEGAL TRADE IN BIO-PRODUCTS</p>	 <p>© O.Kabatlik</p>	<p>Support specialized anti-poaching brigades; Improve the effectiveness of the Internal Police, Border Guards and Customs in fighting poaching and smuggling; Enact stricter penalties for illegal purchase and transport of valuable natural objects and their derivatives; Expand cooperative efforts with the bordering territories of North Korea and China.</p>
<p>IMPROVE SOLID WASTE RECYCLING SYSTEMS</p>	 <p>© O.Kabatlik</p>	<p>Equip solid waste recycling sites, landfills, and garbage dumps to meet environmental safety standards Establish solid waste presort facilities; Build facilities to recycle solid waste</p>

The low level of economic development of SWP runs counter to its high natural resource potential and to its unique economic and geographical location. This region has RFE's best



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**GIVEN
THESE FACTORS,
THE FOLLOWING
ARE ACCEPTABLE
COMMERCIAL
ACTIVITIES
IN SWP:**

opportunity to promote sustainable development because there is:

- An absence of environmentally harmful industrial activity;
- A very favorable climate;
- A high level of intact biodiversity;
- An opportunity to develop environmentally acceptable and neutral business activities.

The socio-economic development of SWP should be based on three factors:

1. THE PRESENCE OF, AND A NEED TO PROTECT WORLD-CLASS BIODIVERSITY, INCLUDING THE LEOPARD.

A viable population of Far Eastern leopards restored based on the sustainable development of SWP will enhance the region's image among investors and tourists.

2. FAVORABLE ECONOMIC AND GEOGRAPHICAL POSITION

- Access to the Sea of Japan (over 500 km of coastline);
- Location on the border with PRC and PDRK;
- Railway links to the Trans-Siberian railway links from PRC and PDRK.

3. ENVIRONMENT AND NATURAL RESOURCES

■ Resource capacity. Regional population growth is restricted to 320-340,000 due to current fresh water supply capacity (reservoirs excluded). This excludes the possibility of operating water intensive production facilities in the region.

- Regional economic development that ensures:
 - a) A system of ecological corridors;
 - b) Preservation of major non-fragmented wildlife spots;
 - c) Functional zoning.

■ Transportation transit corridor based on a modernization of existing infrastructures. This includes international marine cargo, heavy truck traffic, electrified railway, development of pipeline transport.

■ Tourism with an eco-tourism focus.

■ Mariculture and seafood processing.

■ Specialized agriculture: antler fur from deer, fur bearing animals and apiculture.

■ Production of biologically active additives and medicinal preparations from marine resources, antler velvet and non-timber forest products.

There should also be support for the creation of a biosphere reserve in the Tumen River basin in the RF, the PRC and the PDRK. Its creation will provide SWP the opportunities:

- To attract outside funds for the purpose of biodiversity conservation and to maintain a protected territory network;

**SUSTAINABLE
DEVELOPMENT
GUIDELINES**



- To become part of the northeast Asian tourism infrastructure that is being intensively developed in the Chinese and North-Korean sectors;
- To provide services to international tourists;
- To become a «gateway» for North Korean and Chinese tourists.

SWP: Functional Zoning that Provides Sustainable Development of Southwest Primore

