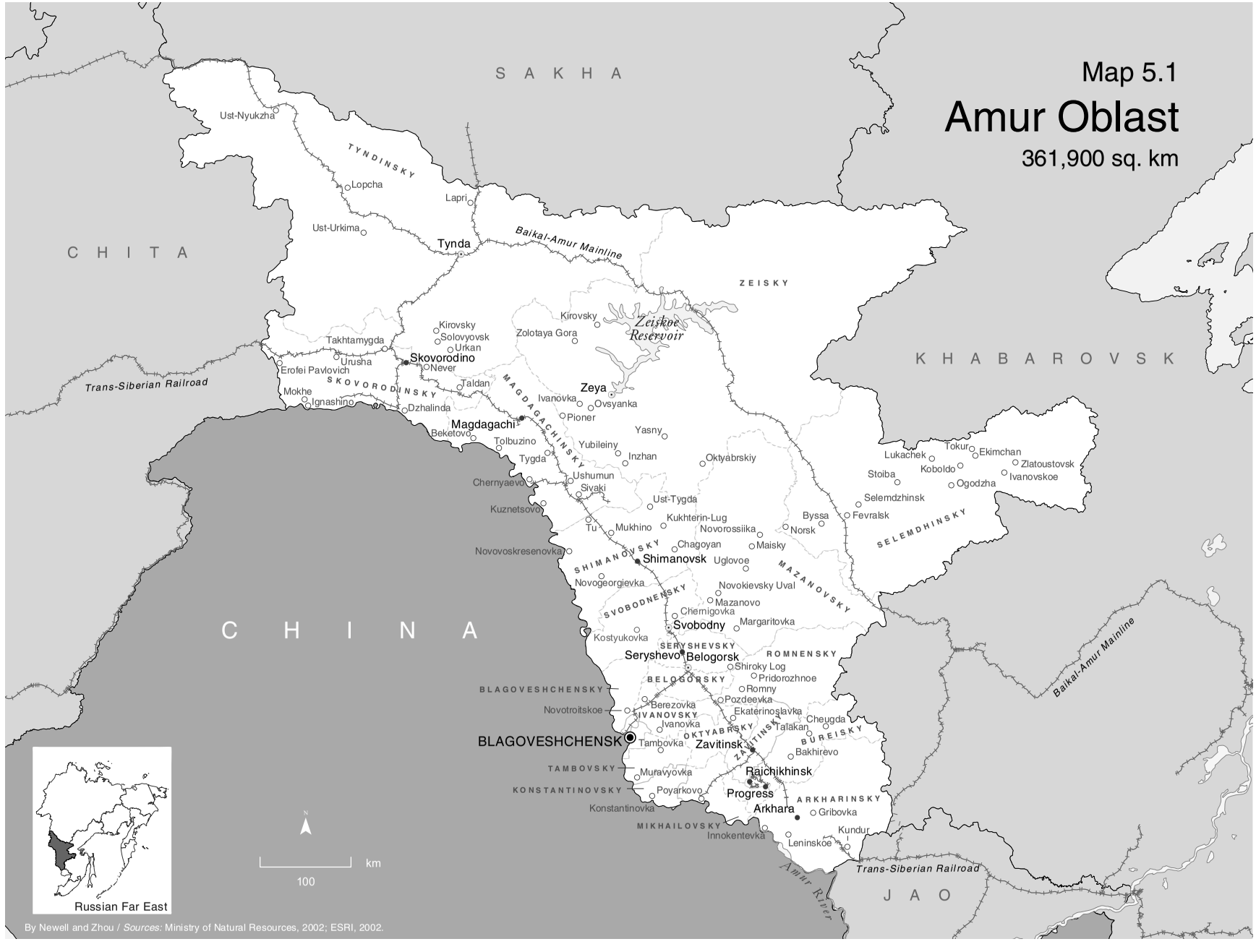





Newell, J. 2004. The Russian Far East: A Reference Guide for Conservation and Development. McKinleyville, CA: Daniel & Daniel. 466 pages

CHAPTER 5

# Amur Oblast



### Location

Amur Oblast, in the upper and middle Amur River basin, is 8,000 km east of Moscow by rail (or 6,500 km by air). The Amur River (Black Dragon or Hei Long Jiang in Chinese) provides a natural border with China to the south. The *oblast* borders the Republic of Sakha in the north, Chita Oblast in the west, and the Jewish Autonomous Oblast and Khabarovsk Krai in the east.

### Size

361,900 sq. km or approximately the size of Poland or the state of California.

### Climate

Amur Oblast has a severe continental climate. It has both continental winds and monsoon streams, a combination that does not occur anywhere else in the world at the same latitude. Average temperatures are 19°C in July and 28°C in January,[1] but can reach highs of 42°C in the summer and lows of –58°C in the winter. Spring is dry and clear. Summer is hot, short, and moist—resulting in rapid vegetation growth. Fall is clear and warm. Winter is dry and cold, with little snow. The growing season in the southeastern Zeya-Bureya region, the best farming land in the Russian Far East (RFE), averages four and a half months. Precipitation in the mountainous eastern region can reach up to 800 mm per year. The western region is comparatively drier.

### Geography and ecology

The Stanovoi Mountains form the dividing line between Sakha and Amur Oblast and spread across the entire northern border of the territory. Japanese stone pine (*Pinus pumila*) and alpine tundra cover higher elevations on these mountains. Larch forests with small stands of monarch birch (*Betula middendorfii*) and Dahurian birch (*B. davurica*) grow at lower elevations. Scots pine (*Pinus sylvestris*) forests grow along the river plains. The Zeya River begins in these mountains in the northeast. The middle reaches of this great river were dammed to create the huge Zeiskoe Reservoir, a project that caused much environmental destruction and now sprawls over 2,500 sq. km between the Stanovoi Mountains and a parallel southern range running across the center of the *oblast*. The lowlands between the two mountain ranges make up the Upper Zeya plain, which is primarily marshland with Dahurian larch (*Larix gmelini*) and pine forests. South of the second ridge is the vast Amur River plain, which covers 40 percent of the *oblast*.

Along the eastern border of Amur Oblast is another series of mountain ridges separating Amur from Khabarovsk Krai. These ridges of larch and fir-spruce forests form the

watershed of the Selemdzha River, which flows south into the Zeya, continues to the city of Blagoveshchensk, and then empties into the Amur River. Southeast of the Selemdzha are the Bureya and Arkhara Rivers, which have the richest forests left in the *oblast* with Korean pine (*Pinus koraensis*), magnolia vine (*Schisandra chinensis*), Mongolian oak (*Quercus mongolicus*), and other Manchurian flora. The Zeya, Amur, and Bureya Rivers form a cradle for the highest biodiversity in Amur Oblast, the Zeya-Bureya Plain. Much of this plain has been ploughed up or burned for agriculture, but large patches of forest remain intact. It is a nesting place for red-crowned crane (*Grus japonensis*), white-naped crane (*G. vipio*), Oriental white stork (*Ciconia boyciana*), and many other rare birds.



### Flora and fauna

Amur Oblast has four distinct habitat zones, each with different types of fauna: boreal (e.g., brown bear [*Ursus arctos*], hazel grouse [*Bonaza bonaza*], sable [*Martes zibellina*], moose [*Alces alces cameloides*], gray wolf [*Canis lupus*]); Manchurian (e.g., Oriental white stork, red-crowned crane, raccoon dog [*Nyctereutes procyonoides*]); Dahuro-Mongolian (e.g., white-naped crane, Manchurian mole rat [*Myospalax psilurus*]); and alpine (snow sheep [*Ovis nivicola*]). Manchurian wapiti (*Cervus elaphus xanthopygus*) and snow deer (*Capreolus pygargus*) live in the mixed conifer-broadleaved forests. Many rodents, including various voles and Manchurian mole rat, inhabit the forest-steppe zone. Rivers and lakes are home to many waterfowl. There are 326 species of birds, 67 species of mammals, 64 species of fish, 7 species of amphibians, and 10 species of reptiles in the *oblast*. Rare and endangered species include a number of crane species, Himalayan bear (*Ursus thibetanus*), goral (*Nemorhaedus goral*), Baer's pochard (*Aythia baeri*), Oriental white stork, black stork (*Ciconia nigra*), mandarin duck (*Aix galericulata*), and osprey (*Pandion haliaeetus*).

### Largest cities

Blagoveshchensk (pop. 225,200), situated on the Amur River across from the rapidly developing Chinese city of Heihe, is the administrative capital and industrial and commercial center. It is also the major transportation hub in the *oblast*, with an airport, railroad junction, and river port. Svobodny (pop. 70,400), situated on the Zeya River and located on the Trans-Siberian Railroad, is the second most important industrial center. Belogorsk (pop. 74,300), 109 km northeast of Blagoveshchensk, is

## Key issues and projects

### Timber exports to China

The Amur timber industry is poised to undergo major developments in the next ten years as a result of widespread changes in forestry practices and policies in the People's Republic of China. When China imposed a moratorium on most domestic logging,[2] the timber harvest in Amur increased by almost 40 percent.[3] This occurred after a decade of decreasing timber harvests (see p. 215).

### Threats to protected areas

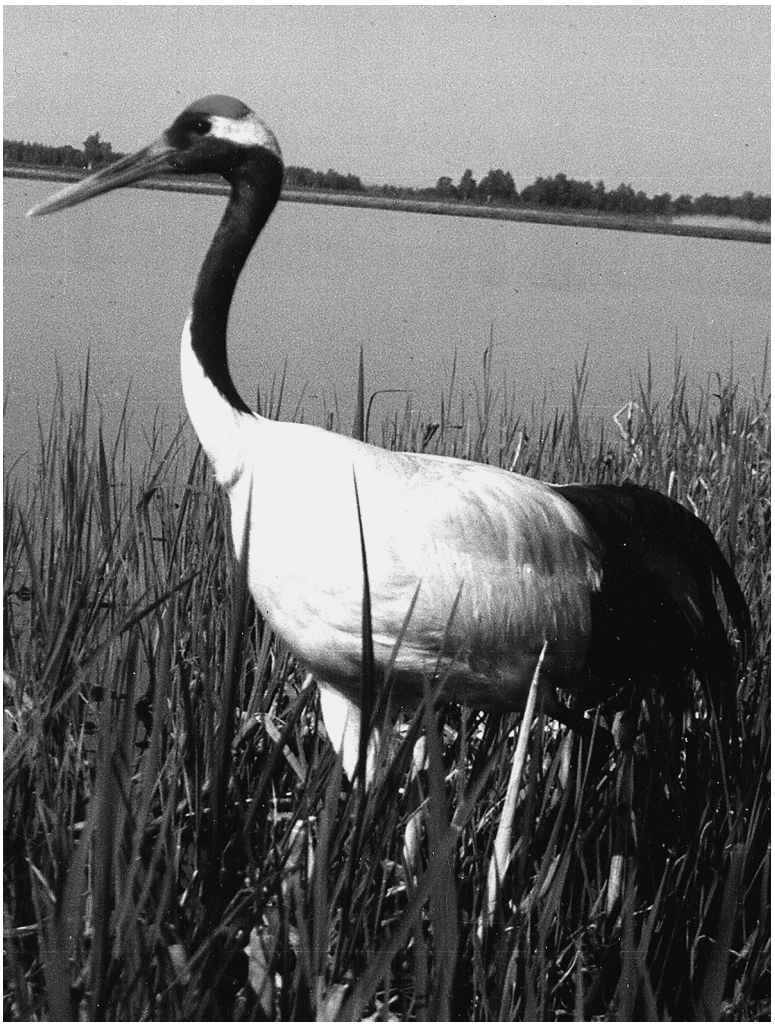
More forests in protected areas may be opened up to timber harvests (partially in response to demand in China). Recently, practically all of the forest resources in one protected area, Urkansky Zakaznik, have been slated for clear cutting[4] (see p. 215).

### Expansion of hydroenergy

With a huge hydroenergy potential in the *oblast,* expect the construction of more hydroelectric power stations—not only to supply regional needs, but also to sell to the burgeoning Chinese cities and towns just across the border. The Bureinskaya hydroelectric power station, begun in 1976, will be the largest in the RFE when it is completed[5] (see p. 221).

### Quest for foreign investment

If foreign investment is secured and the political environment favorable, the gold mining industry is likely to expand. Amur officials have offered tax benefits for foreign investors and lessees (see p. 217.



*Four endangered species of cranes, including the red-crowned crane* (Grus japonensis)*, breed in or migrate through the Amur Valley.*

a railroad junction on the Trans-Siberian Railroad. Food processing is the major industry. Tynda (pop. 45,600), located on the Baikal-Amur Mainline, has suffered tremendously during the post-Soviet period. Population increased rapidly during the heyday of railroad construction and timber extraction. In recent years, however, the population has decreased by more than 25 percent as people have emigrated to other areas of the *oblast*.[6]

### Population

As of January 1, 2001, the total population of Amur Oblast was 997,500.[7] The population has declined by more than 60,000 since 1990. Approximately 65 percent of the population is considered urban; 35 percent is rural. Today, there are only about 1,360 Evenks, an indigenous group, in the *oblast*.[8]

### Political status

The population is mostly composed of ethnic Russians, Ukrainians, and Belorussians whose ancestors migrated to the RFE at various times during the past century and a half.[9] During the 1990s, the *oblast* went through a series of changes in its executive leadership. Between 1991 and 1997, there were six different governors of Amur Oblast, practically a new governor each year. A certain amount of stability was achieved when Anatoly Belonogov, formerly a chairman of the Amur Oblispolkom (Regional Executive Committee) during the Soviet period, became governor in 1997.[10]

### Natural resources

Mineral reserves have been estimated at $400 billion.[11] These abundant resources include coal, iron ore, gold flakes, timber, water, and various nonferrous metals. There are over 71 billion tons of brown and bituminous coal in more than 90 deposits and close to 4 billion tons of iron deposits. Major deposits include Raichikhinsk, Arkhara-Boguchan, Yerkovtsy, Ogodzha, and Garinsk. Building materials such as clay, sand, gravel, quartz, and limestone are also plentiful. Estimates for nonferrous mineral concentrations in tons are as follows: silver (3,000), iron (2,000), copper (10 million), titanium (40 million), platinum (100), zinc (400,000), apatite (30 million), zeolite (100 million), kaolin (100 million).[12] Reported annual gold extraction is about twelve metric tons. There are also 20 million ha of forests containing an estimated 2 billion cu. m of timber, largely larch but also other coniferous timber (spruce, pine, fir) and deciduous timber (Mongolian oak, iron birch

[*Betula ermani*], Dahurian birch, aspen [*Populus tremulae*], poplars, and lime [*Tilia amurensis*]). The region has a number of large rivers that the Russian government would like to harness to provide hydroelectricity. There are also numerous clean underground springs and hot springs valuable for medicinal purposes and tourism. The rich *blackzem* soils of the *oblast* make up more than half of the RFE's arable land and produce a third of the RFE's gross agricultural product.

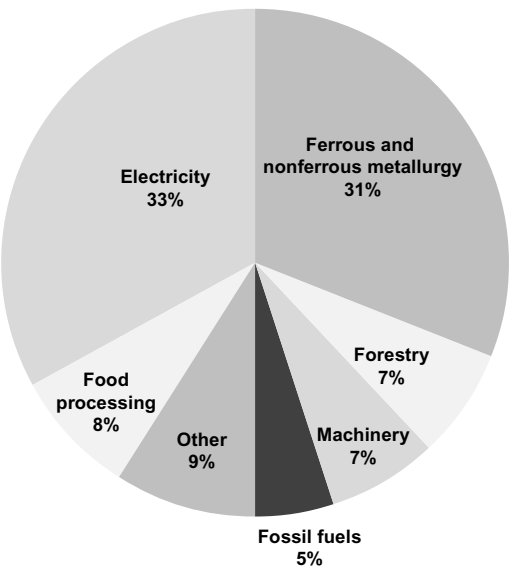
### Main industries

Resource-based industries, such as electricity generation, fuel, nonferrous metallurgy, and forestry, are fundamental to Amur's economy, comprising more than 70 percent of the total industrial output for the region (see fig. 5.1). Electricity generation (much from hydroelectricity) is one of the cornerstones; in 2000, the fuel and electricity industries accounted for almost 40 percent of total industrial output. Major sources of electricity are the Zeiskaya Power Station, small coal-power stations, and generators used by mining and logging operations to supply their own electricity.

The mining industry also plays a major role in the *oblast*'s economy. Ferrous and nonferrous metallurgy represents about one-third of the total industrial output.[13] Coal is the most abundant resource; this industry is controlled by the Dalvostokugol AO (joint-stock company). Gold mining is the fastest growing industry, and given the large reserves, will likely expand in the future. Some estimate that the placer gold deposits in Amur are the largest in Russia and third largest in the world.[14]

In 2000, the timber industry accounted for 7 percent of total industrial output. Amur Oblast has almost 2 billion cu. m of timber over an area of nearly 23 million ha.[15] Amurlesprom and Tyndales are the main logging ventures (see table 5.8) and clear-cutting is the main logging method. Food processing, flour milling, and feed production comprise about 17 percent of total industrial output.[16] This industry benefited from the devaluation of the ruble, which made imported food products more expensive.

**Figure 5.1**
**Industrial production in Amur Oblast, 2000**



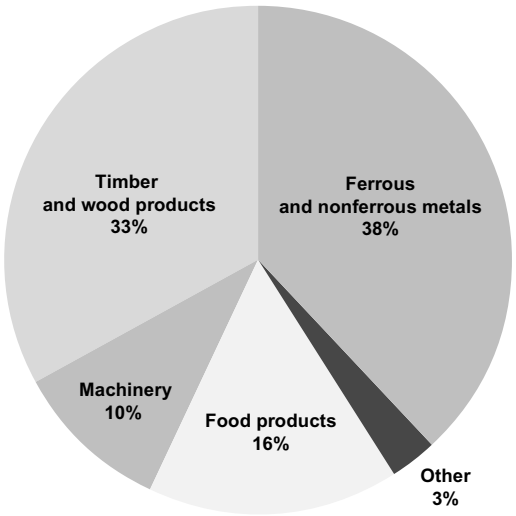

*Source:* Goskomstat, 2001.

### Infrastructure

Amur Oblast has two major railroads, which traverse the territory from west to east: the Baikal-Amur Mainline (BAM) (1,525 km) in the north and the Zabaikal section of the Trans-Siberian Railroad (1,411 km) in the south. The two lines are connected by a 180-km north-south railroad between Tynda and Skovorodino. The railways carry the vast majority of cargo, 70 percent of the total.[17] There are close to six thousand miles of public roads, about half of which are paved.[18] Road conditions outside the cities are unpredictable, especially in winter. The construction of the 1,017-km Trans-Siberian Highway, from Chita to Nakhodka,[19] will increase trade between Amur and neighboring provinces and will likely open up new areas to mining and logging.

Amur also has 2,100 km of navigable waterways.[20] The main ports of Blagoveshchensk, Poyarkovo,

**Figure 5.2**
**Exports from Amur Oblast, 2000**




*Source:* Amur Oblast Committee of State Statistics, 2001.

Svobodny, and Zeya are in operation for six months of the year.[21] River shipping is used throughout the entire length of the Amur River, along the Zeya River and the Zeiskoe Reservoir (to Bomnak), the Selemdzha River (to Norsk), and the Bureya River (to Cheugda). The airport in Blagoveshchensk has flights to towns in Amur, to a few RFE and Siberian cities, and to Moscow. Presently there are no bridges over the Amur River although one, just below the confluence of the Amur and Zeya Rivers, connecting Blagoveshchensk with the Chinese city of Heihe, has been planned. Telecommunications exist but remain fairly undeveloped: Only 10 percent of rural residents and 14 percent of urban dwellers have telephones.

### Foreign trade

In 2001, Amur's total international trade was officially valued at U.S.$87.2 million. The value of trade has declined by nearly 40 percent since 1995.[22] Much of this decline in dollar value is probably the result of the devaluation of the ruble in August 1998. In 1999, following the collapse of the ruble, imports to Amur declined by 60 percent and exports increased by 17 percent.[23] Most of Amur's exports are raw materials, especially timber and metals (see fig. 5.2). The trade in services, valued at about U.S.$5.5 million annually, accounts for a small fraction (7.5 percent) of total trade.[24] Some analysts point to the growing illegal, and thus unreported, trade with China and maintain that actual trade figures are much higher.

Amur's main trading partner is China, and its share has increased tremendously in the past decade. In 1995, China accounted for 39 percent of Amur's international trade; in 1998, 53 percent, and by 2001, about 82 percent of the trade in goods and 99 percent of the trade in services. In 2000, exports to China were valued at U.S.$46.9 million.[25] A much smaller share, less than 15 percent, of Amur's exports go to Japan and South Korea. In 2000, exports to Japan were valued at U.S.$6.8 million.[26]

In winter, the border points of Blagoveshchensk, Poyarkovo, and Dzhalinda host a shuttle trade (which accounts for two-thirds of Amur's foreign trade) across the frozen Amur River. In exchange for Amur's raw materials and machinery, canned foods, cheap clothing, shoes, and other products are imported from China. Imports in demand include sugar, rice, tea, fruit, canned food and meat products as well as construction, woodworking, and logging equipment from firms such as Caterpillar (U.S.) and Sumitomo (Japan).[27] To expand trade with China, the government plans to establish a Sino-Russian Free Economic Zone between Blagoveshchensk and Heihe in an area encompassing a total of one thousand ha on both sides of the border.[28]

### Economic importance in RFE

As the RFE's largest producer of soybeans, grain, and milk and its second largest producer of potatoes and meat, Amur is the major agricultural producer in the region, accounting for more than 50 percent of all grain, 28 percent of all meat, and 30 percent of all milk

produced in the RFE.[29] However, the value of Amur's industrial production lags far behind that of most other regions of the RFE, ranking seventh out of the ten regions,[30] with an industrial output that accounts for only 4.3 percent of the RFE's total.[31] For comparison, the value of Amur's industrial production is approximately one-eighth of Sakha's, one-fifth of Primorsky Krai's, and less than one-third of Khabarovsk Krai's.[32] Recent estimates have placed gross annual production in the *oblast* at between three and four hundred million dollars, however, as with all statistics from the RFE, estimates tend to be coarse. For example, to avoid fees, taxes, and duties, the timber industry is fraught with illegal logging and exports.[33]

Vladimir Dinets

*The endangered Komarov's lotus* (Nelumbo nucifera *var.* komarovii) *grows primarily in the Amur basin.*



### General outlook

The region appears to be tying its future to its huge neighbor just cross the Amur: The People's Republic of China. Logging could increase dramatically if the timber trade with China continues to expand. Forests in Amur region are not as rich as they are in some other regions, but the *oblast*'s geographic proximity to major export markets and extensive rail infrastructure makes its raw log export industry competitive with other regions of the RFE and eastern Siberia. The Amur government, traditionally one of the most progressive in the RFE in creating new protected areas, appears eager to help fill China's growing need for imported timber. It has proposed allowing logging in Urkansky Zakaznik. The proposed Blagoveshchensk-Heihe Bridge spanning the Amur River would help increase trade with China but could also threaten its forests. Japanese logging companies have been expressing a growing interest in RFE larch trees, a species of which Amur region has considerable resources, as the Japanese plywood industry shifts away from logging in Southeast Asia. The forests, which have already been devastated by excessive clear-cutting, primarily on permafrost soil, will continue to be degraded, and erosion and flooding problems will continue unless logging practices change.

Government and industry are eyeing the export of energy, mainly from hydroelectric power stations, to China. While the government justifies construction of these huge power stations as necessary for supplying local energy needs, studies show that the *oblast* does not need such massive amounts of energy and is well suited for alternative energy sources such as solar power. With the exception of eastern Siberia, no other region of Russia has as many sunny days as does Amur Oblast. Nevertheless, the Bureinskaya Dam, when completed, will flood large tracts of forest and will permanently alter the hydrological balance

in wetlands downstream. Japanese corporations have shown interest in providing turbines and other equipment to expand the energy production of this dam.[34] The Gilyuiskaya hydroelectric station, for which technical documentation has been completed, and several small power stations will likely follow the completion of the Bureya project, despite warnings from ecologists that vast tracts of forests will be flooded to build the reservoirs and silt will pollute the rivers.

The government would also like to expand mining of the region's considerable gold deposits. Currently, gold extraction is dominated by placer mining, which is cheap and environmentally destructive. In the northern part of the *oblast*, gold mining from alluvial deposits has damaged river ecosystems. Coal mining has replaced fertile agricultural land with sterile moonscapes. Reforming these environmentally degrading practices is frustrated by the complete lack of financial resources for doing so. Additionally, the enterprises that carry out these activities are major social forces in their communities. Because they are often the predominant employer in an area and among the essential providers of social services, local people often strongly support their ventures.

The region, heavily dependent on the exploitation of natural resources, lacks the processing facilities to add value to these products. Only a tiny fraction of Amur's raw materials is processed locally. Exports are primarily unprocessed raw materials. Officially, unprocessed wood products accounted for 45 percent of the volume of exports in 1999.[35] Agriculture products are also exported unprocessed. Currently, most processing of the *oblast*'s rich soy bean harvest occurs outside its borders in Irkutsk and Primorsky regions and China. Investment in the processing of raw materials could be of great benefit to both the population and the environment. The processing of wood, for example, would generate jobs and increase revenue and might slow down logging as conceivably less timber would need to be exported to secure enough revenue to keep the industry alive. Other value-added projects being promoted by the government and industry include: a timber-processing complex in Tynda, a soy bean processing plant and a jewel factory in Blagoveshchensk, and a mechanical plant in Zeya.[36]

Above all, the government needs to protect the shrinking pine forests and wetlands, particularly in the Zeya-Bureya Plain, as both ecosystems preserve much of the region's plant and animal biodiversity and are key routes for migratory birds and vertebrates, including a number of globally endangered cranes.

*— Melinda Herrold, Josh Newell*

# Ecology

*Yuri Darman, Gennady Illarionov*

Consisting of a variety of ecosystems, ranging from mountainous tundra to Far Eastern mixed forests and East Asian prairies, the Amur region contains a very high level of biodiversity. Vegetation in the area includes elements of Eastern Siberian, Okhotsky-Kamchatsky, Manchurian, and Dahurian flora totaling around two thousand species of vascular plants. In the southern region of the *oblast*, which was never covered by glaciers, numerous ancient species including the Komarov's lotus (*Nelumbo nucifera* var. *komarovii*) and water shield (*Brasenia schreberi*) have been preserved. At last count, 212 species of rare and endangered plants in Amur had been listed as requiring special protection.[37] A significant number of species are endangered (see table 5.1), including many not yet listed in *Red Data Book*s.

**Table 5.1**
**Animal species of Amur Oblast**

| | *Total species* | *Russian* Red Data Book *species* | *Species needing* Red Data Book *listing* |
|---|---|---|---|
| Birds | 326 | 37 | 8 |
| Mammals | 67 | 4 | 6 |
| Fish | 64 | 2 | 2 |
| Reptiles | 10 | 1 | 2 |
| Amphibians | 7 | 0 | 3 |

*Source:* Darman, 2000.

The *oblast*'s three most crucial biodiversity hotspots are:
1. The wetlands of Arkhara Lowlands in the southeast.
2. A small patch of broadleaved forest in the southeast, where Siberian tigers (*Panthera tigris*) were seen as late as 1972.
3. The Zeya-Bureya Plain, which contains rich *blackzem* soils and unique flora and fauna.

These ecosystems have been damaged by human activities, and restoration will require maximal effort. In particular, the ecosystems that lie at the southern edge of the permafrost zone require special methods of assessment. The forests of Amur, which cover 22.9 million ha (an area larger than the entire forest cover of a densely forested country such as Finland), play an important role in maintaining the global climate.

### Forests

Amur Oblast forests are primarily Dahurian larch (60 percent), together with broadleaved deciduous species such as birch and aspen (22.3 percent), Japanese stone pine (5.7 percent), Scots pine (3.2 percent), Siberian spruce (*Picea obovata*) and East Siberian fir (*Abies nephrolepis*) (2.3 percent), and other broadleaved species (2.1 percent). Larch, pine, and birch forests have the greatest commercial value. Larch forests grow throughout the region, excluding the unforested areas of the Zeya-Bureya Plain. Mountain larch usually occurs in pure stands, occasionally interspersed with small stands of Japanese stone pine. Larch forests in the foothills and valleys grow with smaller bushes such as rhododendron (*Rhododendron*), foxberry (*Vaccinium vitis-idaea*), and Labrador tea (*Ledum*), or grow as *mari* (sparse larch forest and marshland). Broadleaved species grow in mountain valleys. Silver birch and aspen regenerate on land burned by forest fires or after logging. Fir and spruce forests have a very limited distribution (only in the subalpine vegetation band) and grow with moss, sedge, and foxberry. Japanese stone pine, mountain mosses, and lichen tundra (*goltsi*) cover the highest mountain slopes.

Vladimir Dinets

*The Siberian chipmunk* (Tamias sibiricus)*, valued for its fur in Soviet times, is no longer hunted.*

**Table 5.2**
**Protected areas in Amur Oblast**

| *Type and name* | *Size (ha)* | *Raion* | *Established* |
|---|---|---|---|
| *Zapovedniks* | | | |
| Norsky | 211,200 | Selemdzhinsky | 1998 |
| Zeisky | 99,400 | Zeisky | 1963 |
| Khingansky | 97,800 | Arkharinsky | 1963 |
| *Federal Zakazniks* | | | |
| Orlovsky | 121,500 | Mazanovsky | 1999 |
| Khingano-Arkharinsky | 48,800 | Arkharinsky | 1958 |
| *Regional Zakazniks* | | | |
| Ulminsky | 162,000 | Mazanovsky | 1981 |
| Verkhne-Depsky | 156,800 | Zeisky | 1976 |
| Lopchinsky | 142,400 | Tyndinsky | 1976 |
| Urkansky | 141,000 | Tyndinsky | 1967 |
| Bekeldeul | 104,700 | Zeisky | 1995 |
| Birminsky | 101,500 | Mazanovsky | 1999 |
| Tashinsky | 90,800 | Romnensky | 1967 |
| Gerbikansky | 87,600 | Selemdzhinsky | 1995 |
| Tolbuzinsky | 80,100 | Magdagachinsky | 1959 |
| Simonovsky | 77,800 | Shimanovsky | 1963 |
| Ust-Tygdinsky | 67,500 | Shimanovsky | 1963 |
| Magdagachinsky | 67,200 | Magdagachinsky | 1963 |
| Zhelundinsky | 67,200 | Bureinsky | 1967 |
| Ganukan | 64,000 | Arkharinsky | 1985 |
| Andreevsky | 60,000 | Arkharinsky | 2000 |
| Iversky | 50,000 | Svobodnensky | 1963 |
| Blagoveshchensky | 48,000 | Blagoveshchensky | 1974 |
| Urushinsky | 36,800 | Skovorodinsky | 1995 |
| Verkhne-Zavitinsky | 36,100 | Zavitinsky | 1998 |
| Zavitinsky | 35,200 | Zavitinsky | 1963 |
| Muravyovsky | 34,000 | Tambovsky | 1967 |
| Voskresenovsky | 16,800 | Seryshevsky | 1968 |
| Amursky | 16,500 | Konstantinovsky | 1967 |
| Kharkovsky | 15,000 | Oktyabrsky | 1995 |
| Beryozovsky | 11,300 | Ivanovsky | 1974 |
| Irkun | 7,200 | Bureisky | 2000 |
| Ust-Norsky | 2,700 | Mazanovsky | 1981 |
| Tomsky | – | Romnensky | 1976 |

*Note:* Urushinsky Zakaznik is defunct.
*Source:* Darman, 2000.

Intensive clear-cutting is shrinking the intact pine forests. They must be protected, and any cutting must be sustainable. Pine forests grow in the western part of the *oblast* (west of the Selemdzha River and the lower reaches of the Zeya River). On the eastern boundary, patches of pine can be found in the Byssa, Tomya, Bureya, and Arkhara River valleys. Floodplain pine forests, which grow alongside poplar, larch, and willows (*Salix*), are the most productive. Intensive agriculture and logging have destroyed large portions of the forest-steppe zone in the Zeya-Bureya Plain. However, some of the conifer and mixed forests here still remain and are rich in plant species. Deciduous oak, linden, elm (*Ulmus*), and ash (*Fraxinus*) thrive together with the conifer varieties. There are also fragments of Mongolian oak and black birch (*Betula reofila*) forest.

### Protected area system

The only realistic way to conserve the region's biodiversity is to develop a more comprehensive system of protected areas. Protected areas in Amur Oblast today cover 2.36 million ha, or 6.5 percent of the *oblast*'s total area. There are three *zapovednik*s, of which the most recently created is Norsky Zapovednik. The total area covered by Norsky and the older Khingansky and Zeisky Zapovedniks is 408,400 ha, or 1.11 percent of the *oblast*'s total area. This is the smallest percentage of strictly protected land among all of the RFE's ten regions. Also in existence are 25 zoological *zakaznik*s for game species conservation, an ichthyological *zakaznik* preserving a spawning ground, 2 botanical *zakaznik*s protecting medicinal plants, 2 *zakaznik*s with comprehensive protection regimes and 128 natural monuments (see table 5.2).

In 1991, various federal and regional government agencies developed a program to create a protected-areas network for Amur Oblast. This program included the creation of a minimum of four new *zapovednik*s and two national parks. Because the entire program cannot be fulfilled under current economic conditions, it is necessary to focus attention on those territories that are most important for biodiversity conservation, and, at the same time, most threatened by anthropogenic disturbances—hotspots.

Five hotspots were identified at the first conference on hotspots held in Vladivostok in January 1995. In accordance with its recommendations, two new protected areas were created within the two subsequent years: Norsky Zapovednik and Bekeldeul Zakaznik; a third—Ganukan Zakaznik—was expanded. In February 1998, in connection with the second hotspots conference, specialists gathered at a regional roundtable discussion to identify new priorities for biodiversity conservation. Since that time, four additional *zakaznik*s have been created to protect these hotspots.

# Biodiversity hotspots

*Yuri Darman, Gennady Illarionov*

**1. Arkhara Lowlands and Maly Khingan Range (forest and wetland)**

The Arkhara Lowlands and adjacent foothills of the Maly Khingan range (varying in elevation from 100 to 600 m) have the most diverse natural ecosystems found in Amur Oblast. The forests, ranging from East Asian prairie and mixed Korean pine and broadleaved forests to Ayan spruce and northern larch, boast a surprising level of biodiversity. This region is the only place in the *oblast* where pine and broadleaved forests mix with Mongolian oak, Siberian ginseng (*Eleutherococcus senticosus*), Amur grape, and wild kiwi (*Actinidia colomicta*).

Broad expanses of wetlands (covering about 250,000 ha) provide nesting grounds for eighteen to twenty pairs of red-crowned cranes and ten to eleven pairs of white-naped cranes. The Arkhara Lowlands host the world's largest nesting population of Oriental white storks—in 1994 there were thirty-four nests, and in better years there are up to fifty nests or over two hundred birds. A thousand species of vascular plants have been found, many of which are rare or endangered, including Komarov's lotus and water shield. Avifauna totals three hundred species. There are about fifty species of mammal, including snow deer, wild boar (*Sus scrofa*), Manchurian wapiti, brown bear, Himalayan bear, Eurasian lynx (*Felis lynx*), gray wolf, and river otter (*Lutra lutra*). There have also been occasional sightings of Amur cat (*Felis euptilura*) and yellow-throated marten (*Martes flavigula*).

Industrial development of this region has, so far, been limited to a narrow strip on either side of the Trans-Siberian Railroad. The vast marshes of the lowlands have not been drained for agriculture because they are regularly flooded when the Amur rises after heavy rains. The steep slopes of the Maly Khingan foothills and a ban on the commercial harvest of Korean pine have spared the valuable old-growth forests from industrial logging. Selective logging earlier in the twentieth century did not significantly degrade these forests. Rivers, including the entire Arkhara basin, remain largely free of pollution because there is little human settlement in the watersheds. Given the high biodiversity and absence of environmental degradation, this territory is considered the first priority among the hotspots identified for Amur Oblast.

**Threats.** Despite the decline in economic activity over the past few years, threats remain. Every year, agricultural fires reach the *zapovednik*, destroying the nests of cranes, storks, and many other bird species. Fires in late spring and autumn threaten forests. Firewood collection by local residents is completely unregulated. Salvage logging in the remaining large coniferous forest is increasing. In the region around Boguchan Village, open-cast coal mining is gradually creating a wasteland. Gold mining threatens the upper Urin, Uril, and Birya Rivers, which are important spawning grounds. When completed, the Bureinskaya Hydroelectric Power Station will create an enormous reservoir flooding large tracts of valuable forest and destroying a number of migratory routes for large mammals. There are plans for logging along the riverbank below the dam that will increase the frequency and volume of floods and will affect downstream wetlands in the floodplains of the Bureya and Amur Rivers.

*Red-crowned cranes* (Gros japonensis) *nest in Zeya-Bureya Plain.*

**Existing protection measures.** In 1958, the Khingano-Arkharinsky Federal Zakaznik (48,800 ha) was established between the Urina and Dydy Rivers to protect the last remaining Korean pine forests from logging. In 1963, the federal government created Khingansky Zapovednik between the Uril and Khingan Rivers. In 1978, its area was expanded to 97,800 ha to include more wetlands and riparian birch and oak forests.

Khingansky Zapovednik is well studied; the studies of the Oriental white stork, red-crowned crane, and white-naped crane there are particularly valuable. Within the *zapovednik*, a station has been established to reintroduce these birds and other rare species; this is the only facility of its kind in the RFE. At the station, an international program is under way to increase red-crowned and white-naped crane populations. In 1985, a landscape *zakaznik*, Ganukan (64,000 ha), was established to protect the last remaining unprotected crane nesting sites in the Arkhara Lowlands and is now under control of Khingansky Zapovednik. In 1994 the Arkhara Lowlands within the *zapovednik* and the *zakaznik* were given Ramsar status. In 1997, the site was included in an international network of key crane habitats of northeast Asia.

The Zhelundinsky Zakaznik (67,200 ha) has protected Manchurian broadleaved forests on the left bank of the Bureya River since 1967. The importance of this protected area will increase in coming years, as the reservoir created by the planned Bureinskaya station will affect this territory. The dam also threatens ten natural monuments. The Tatakan River (which is a natural monument), for example, preserves one of the westernmost salmon hatcheries in the Amur Basin. The protected-area network of this region conserves 15 percent of the lands in this *raion*, the highest percentage of any *raion* in Amur Oblast.

**Recommendations.** The following actions should be taken:

- Finalize documents within the Ramsar Convention Bureau for the Arkhara Lowlands.
- Improve protection of the floodplain forests in Ganukan Zakaznik.
- Establish a natural monument, under the jurisdiction of Khingansky Zapovednik, on the shores of Lake Krivoe, to preserve the *oblast*'s only population of the Komarov lotus.[38]
- Establish a science station near Lake Dolgoe, administered by Khingansky Zapovednik.
- Increase financial support for Khingansky Zapovednik and the Rare Birds Reintroduction Station there.[39]
- Create a biosphere *zapovednik* that encompasses the combined territories of the existing Khingansky Zapovednik, the Ganukan Zakaznik, and the Khingano-Arkharinsky Zakaznik.
- Forbid logging within Khingano-Arkharinsky Zakaznik.
- Continue ecological surveys in the region.
- Improve protection for the Zhelundinsky Zakaznik, particularly in light of the planned Bureinskaya station. To avoid repeating the tragic mistakes of the Zeiskaya Hydroelectric Power Station, funding must be found to conduct monitoring as the reservoir forms behind the dam on the Bureya.
- Create a 36,000-ha regional biological *zakaznik* to protect migratory routes along the right banks of the Bureya, Verkhnyaya, and Zavitinskaya Rivers. The Amur government has included this planned protected area in a number of decrees on expanding the protected-area network.[40]

### 2. Southern part of the Zeya–Bureya Plain (wetland)

This territory, with abundant lakes, marshes, and wetlands interspersed with agricultural and pasture lands, is the last relatively untouched floodplain in the middle reaches of the Amur River. Due to their proximity to the Chinese border, strict restrictions have been placed on these lands. The ecology of this region is similar that of the Arkhara Lowlands. Along the smaller tributaries of the Amur (the Alim, Gilchin, Dim, Zavitaya, and Chesnokovka), there are marshes and meadows with rich *blackzem* soil.

Red-crowned cranes, white-naped cranes, and Oriental white storks nest here. In earlier times there were also swan geese (*Anser cygnoides*), Manchurian bustards (*Otis tarda dybovskii*), and Dahurian partridges (*Perdix dauurica*). During the spring migration, massive flocks of geese stop over here. During the autumn migration more than three hundred hooded cranes (*Grus monachus*) stop here to refuel. The floodplain forests and marshes sustain many mammal species; there are dense populations of snow deer, raccoon dog, and red fox (*Vulpes vulpes*).

The area has been well studied; bird censuses by air and land take place frequently. Since 1981, scientists at Muravyovsky Zakaznik have regularly conducted field studies of animals. Strict border zone regulations have complicated scientific studies along the Amur. Since 1992, many international organizations have promoted the protection of the wetlands and rare birds and have provided funds for numerous projects.

**Threats.** Protected solely by the regional hunting administration, which has jurisdiction only to prevent poaching and does not have adequate resources, the territory is threatened by increasing agricultural activity, land drainage, and frequent changes in land ownership among small landowners. Every year fires destroy crane and stork nests. Fuel shortages in settlements leads to logging for firewood in the forests unscathed by fire. Unfortunately, the Federal Forest Service has no specialized unit to manage timber use in this region. The gradual expansion of *dacha* gardens is also disturbing crane and stork nests. The planned construction of a bridge across the Amur and the establishment of a Sino-Russian Free Economic Zone may completely destroy wetlands near Kani-Kurgan Village.

**Existing protection measures.** In 1967, the 31,600-ha Muravyovsky Zakaznik was established (and expanded to 34,000 ha in 1995) to protect wetlands in the basin of the Arguzkikha River, which feeds into the Amur River 30 km downstream from the Zeya Delta. Hunting, agricultural burning, chemical fertilizer and pesticide use, land reclamation, and new construction are all prohibited in the territory. Also in 1967, the Amursky Zakaznik (12,200 ha) was established on the lower Dim River, and later expanded to 16,500 ha in 1995. In 1993, the Socio-Ecological Union, a Russian nongovernmental organization (NGO), set up the private Muravyovka Park for sustainable land use. The park leases 5,206 ha of marshland and meadows. In 1994, a section of the Zeya-Bureya Plain within Muravyovsky Zakaznik was included in the Ramsar Convention's List of Wetlands of International Importance, according to a government order (No. 1050, signed September 13, 1994). Regional land users and the Amur government have agreed to this designation. Along the Amur basin between the Zeya and Bureya River deltas there are eight regional natural monuments.

**Recommendations.** Creating new protected areas will not completely protect the region's biodiversity. It will be necessary to create and implement programs that balance economic and ecological needs.

- Increase financial support to control fires and protect nesting sites in Muravyovka Park. In 1997, scientists found Oriental white stork, red-crowned crane, and white-naped crane nests along the lower reaches of the Kupriyanovka River; the government should establish a nature *zakaznik* with seasonal protection in this region.
- Study the small remaining marshland systems that host isolated nesting sites of rare birds, and create natural monuments in these locations.
- Preserve the uncommonly rich soils of the Zeya-Bureya Plain. Some of these *blackzem* pasture lands must not be used, so that the East Asian prairie ecosystems can regenerate. Agricultural plots abandoned by farmers should be leased and protected, with some of them incorporated into the Muravyovsky and Amursky Zakazniks. This requires funding for rangers and passing of legal regulations allowing such a plan.

### 3. Mukhinka forest area

Mukhinka is on the right bank of the Zeya River, 30 km north of Blagoveshchensk. The region has a landscape and microclimate unique in Amur Oblast. The eastern and southern slopes of the hills there are protected from the prevailing cold northwesterly winds that hit other nearby areas. As a result, winter in Mukhinka is mild, with only small fluctuations in temperature, and its rich mineral and thermal springs do not freeze over, even on the coldest days.

Mukhinka has the last remaining natural pine forests near Blagoveshchensk, an eastern flank of what was once a band of continuous pine forest on the Amur-Zeya plateau. It also serves as the eastern border for many species typical of Manchurian flora such as Mongolian oak, Manchurian walnut (*Juglans manchurica*), Amur maackia (*Maackia amurensis*), magnolia vine, Amur grape, and others. This juxtaposition of communities within a rather small area presents excellent possibilities for a botanical garden for scientific and educational purposes. In addition to the pine forests, the wide Zeya floodplain extending between 2 and 3 km from the foothills and the marshlands dotted with numerous lakes are areas of ecological importance.

**Threats.** Basin lakes and natural hot springs make this area very attractive for tourists from Blagoveshchensk. Horseback riding and river rafting are popular. In the 1970s, high-ranking bureaucrats began to construct large sanatoria and tourist complexes. Five years ago this activity was halted, but not before the poorly controlled construction had taken its toll on Mukhinka's forests and slopes. Unregulated recreational activity is degrading vegetation, causing erosion, and creating ravines and gullies. Lake Galyanie is polluted by untreated sewage.

**Existing protection measures.** For years, ecologists have tried to protect Mukhinka. In 1975, activists managed to establish the Blagoveshchensky Zakaznik encompassing part of the Mukhinka area. A portion is designated as a natural monument and administered by the Amur Forest Service. Scientists from the Russian Academy of Sciences and the Blagoveshchensk State Pedagogical Institute mobilized governmental support to establish a botanical garden here in the late 1980s, but only in 1994 were 300 ha of pine and floodplain forests officially set aside for this purpose. In 1997, the design of the gardens was completed and the first of three sites were protected; now efforts are under way to transfer control of the hotel and offices from the sanatorium to the botanical gardens.

**Recommendations.** The following actions should be taken:

- Find funding to create recreation areas and tourist trails, hire rangers, and implement a public-awareness campaign.
- Increase funding for the botanical garden, which could serve as a nucleus for the proposed Mukhinka Nature Park. The proposal to create this 35,000-ha park, which will be a single nature-protection institute and facilitate measures to control tourism, has been included in the *oblast*'s work plan and is supported by the Amur Forest Service and the Blagoveshchensk administration.

### 4. Between the Nora and Selemdzha Rivers (forest and wetland)

Permafrost, which covers this region, affects the vegetation and landscape. Larch forests grow throughout the area. Of the 481 species of vascular plants (about 25 percent of all the species in the *oblast*) that grow here, most are Manchurian species growing on the northern reaches of their habitat: elms, Siberian ginseng, Mongolian oak, Dahurian birch, Manchurian ash (*Fraxinus manchuricus*), Asian parilla (Menispermum dahuricum), and Sargent's hawthorn (*Crataegus sargentii*).

The Nora and Selemdzha River valleys serve as corridors through which southern species migrate northward; this creates a rich mixture of ecosystems. Boreal, Dahuro-Mongolian, Manchurian, and Okhotsk-Kamchatkan fauna all thrive here. Birds are primarily of the latter two types; most of the mammals are the boreal type. There are three hundred vertebrate species, including 70 percent of the birds and about 50 percent of the mammals found in the *oblast*. Rare birds such as the Oriental white stork (between four and six nests), black stork (three nests), white-tailed sea eagle (three nests), and osprey (at least six pairs) nest here. There are also about seven pairs of hooded cranes, which is a significant proportion of the total hooded crane population in the Amur River basin. There are more whooper swans (*Cygnus cygnus*), estimated to be as many as eighty individuals, than anywhere else in the *oblast*.

But the region is perhaps most famous for the world's largest migrating population of snow deer (about seven thousand individuals); in the summer the population density approaches between forty and fifty head per 1,000 ha. In the winter, the deer migrate to the Orlovka-Gramatukha valley, where between 250 and 300 moose migrating down from the nearby ridges also settle in. These wintering grounds play a critical role in maintaining herd populations of both species.

**Threats.** Construction of the Baikal-Amur Mainline (BAM) railroad and settlements along it opened up huge areas of pristine forest to logging. Placer gold mining along snow deer migratory routes has destroyed valuable habitat and led to increased animal poaching, which here and throughout the *oblast* has reduced the number of deer by half. The exploration and extraction of precious metals from mineral springs within the basin and open-pit mining for semiprecious stones such as chalcedony have polluted the Nora River. This pollution and increased fish poaching, often done by electrocution, has destroyed fish stocks. The construction of the proposed Dagmarsky hydroelectric station, with a reservoir that would flood most of the low-lying Nora-Selemdzha basin, will cause further damage.

**Existing protection measures.** In 1968, the Norsky Zakaznik (40,000 ha) was established. In 1984, because of concern about the construction of the BAM railroad, the area was increased to 211,200 ha and the preserve became a federal *zakaznik*. Then, after five years of lobbying, it was upgraded to a *zapovednik*. The Mamynsky and Maisky Hunting Zakazniks, established in 1959 and 1978, respectively, to protect snow deer, were merged to form the Orlovsky Zakaznik (121,500 ha). Ust-Norsky Zakaznik and five natural monuments are also located in the Nora-Selemdzha basin.

**Recommendations.** The following actions should be taken:

- Increase funding to purchase equipment and hire staff for Norsky Zapovednik.[41]
- Establish the biological research station of Norsky Zapovednik on the nearby Sorokaverstka Island.
- Establish a buffer zone, which limits some kinds of economic activities, around the *zapovednik*.
- Make the Nora-Selemdzha wetlands a Ramsar site.
- Upgrade Orlovsky Zakaznik to federal status to protect the snow deer populations.[42]

### 5. Mountains surrounding Zeisky Reservoir (forest)

The Tukuringra-Soktakhan-Dzhagdy Mountain Range divides the southern taiga from the middle taiga forests. Manchurian and Dahuro-Mongolian ecosystems flourish on the southern slopes, and boreal flora and fauna may be found on the river plain. The Zeya Valley and Ogoron Lake depression river basins are the primary northern migratory path for these southern species. The first of these paths was destroyed by the Zeiskaya hydroelectric station in the early eighties, when the reservoir flooded more than 240,000 ha of forest and river plains. Zeiskoe Reservoir, as it is now called, serves as a classic case for the study of human impact on nature in the Amur basin. Construction of the BAM railroad degraded the second migratory pathway, the Ogoron Lake depression basin. This entire ecosystem has become unstable and is, therefore, a constant concern for ecologists.

Nevertheless, large areas of old-growth forest remain intact. Zeisky Zapovednik, next to the reservoir, protects the mountain forests of central Amur Oblast, including 637 vascular plant, 230 bird, and 52 mammal species. Notable bird species include golden eagle (*Aquila chrysaetos*), white-tailed sea eagle (*Haliaeetus albicilla*), osprey, and Siberian grouse (*Falcipennis falcipennis*).

**Threats.** Staff and scientists of the Zeisky Zapovednik had been studying the effects of the reservoir on the flora and fauna of Tukuringra Ridge. Due to the lack of funds, research has been discontinued. Water quality in the reservoir is declining, fish stocks have been reduced by 90 percent, and water levels are not regulated with ecological needs in mind. The construction of Gilyuiskaya Hydroelectric Power Station, which may be built where the reservoir narrows to

become the Gilyui River, will cause siltation behind the new dam. Gold mining, which is underway in the Gilyui basin, is exacerbating the situation. Timber companies have clear-cut most of the forests growing along the foothills of these ridges and are now moving to the river headwaters to log. The last fir-spruce forests remaining in Verkhne-Depsky Zakaznik are being logged. Logging and placer gold mining, which occur along all the tributaries of the right bank of the Dep River, have left a landscape of barren hills and mining waste and polluted the nearby Lake Ogoron and its surrounding marshes.

**Existing protection measures.** Established in 1963 and enlarged to 99,400 ha in 1986, the Zeisky Zapovednik protects most of Tukuringa Ridge. A new national park planned for the uplands around the reservoir may become a reality. Also, in response to the first Hotspots Conference, *oblast* authorities established Bekeldeul Zakaznik (104,700 ha); logging is prohibited within the reserve. This *zakaznik* was initially supposed to be added to Zeisky Zapovednik, but lack of funds has prevented the transfer.

In 1976, Verkhne-Depsky Zakaznik (156,800 ha) was organized to protect the Dep River and Lake Ogoron. Unfortunately, 5,000 ha of forest have been commercially logged, and placer mining has degraded another 15,000 ha. These activities have led to a decline in key animal species, and the Ogoron basin has lost its value as a migration route for moose and snow deer.

In addition to the *zapovednik*s and *zakaznik*s, there are thirteen regional natural monuments.

**Recommendations.** The following actions should be taken:

- Provide financial and technical support for Zeisky Zapovednik, principally to monitor the ecological effects of Zeiskoe Reservoir.
- Enlarge the *zapovednik* northern portion to include the watersheds along the left bank of the Gilyui River.
- Find funding to incorporate Bekeldeul Zakaznik into the *zapovednik*.
- Designate forests along the mountainous shores of the reservoir for recreational use.
- Create a national park on the entire upland area, with Zeisky Zapovednik serving as the core area.

### 6. Nyuzhinsky Ridge and the Amur Pinelands (forest)

Pine forests, which are similar to those found in the Baikal region, serve as indicators for ecosystem health. Many plant species of Dahuro-Mongolian origin manage to penetrate this primarily Siberian region. Flora in the floodplains along this part of the Amur are found nowhere else in the *oblast* and include the rare Altaian onion (*Alnus altaicus*). The flora of Nyuzhinsky Ridge, where there is a transition from alpine pine forests to shrub communities of Japanese stone pine, is also noteworthy.

Most of the region's fauna is poorly studied. Like the flora, the fauna shows Dahuro-Mongolian influence, the only part of the *oblast* where this is the case. Musk deer (*Moschus moschiferus*) live among the cliffs along the Amur. This population is isolated from the primary habitat of the species, which is 100 km away. The forested valleys support a number of other ungulates, including Manchurian wapiti, as well as osprey and white-tailed eagle. Therapeutic mineral springs (Ignashinsky and Urushinsky) are also found here.

**Threats.** Because it is adjacent to the Trans-Siberian Railroad, part of the region has been heavily industrialized. Clear-cutting and selective logging have taken place in 80 percent of the area's pine forests, and the remaining forests are now being logged. New logging roads have been constructed in the headwaters of the Urka and Urusha Rivers. Intensive gold mining has taken place over the past decade and exploratory work at the Snezhinka site in the Urka headwaters is complete. Several other significant deposits have been discovered and mining is underway in the Oldoi and Khaikta River basins. Urushinsky Hunting Zakaznik was dissolved to allow for gold mining. The Chita-Nakhodka road, when complete, will open up new areas for development. Complete plans exist for two new hydroelectric stations on the Amur (Dzhalindinskaya and Amazarskaya); the Russian and Chinese governments will finance construction.

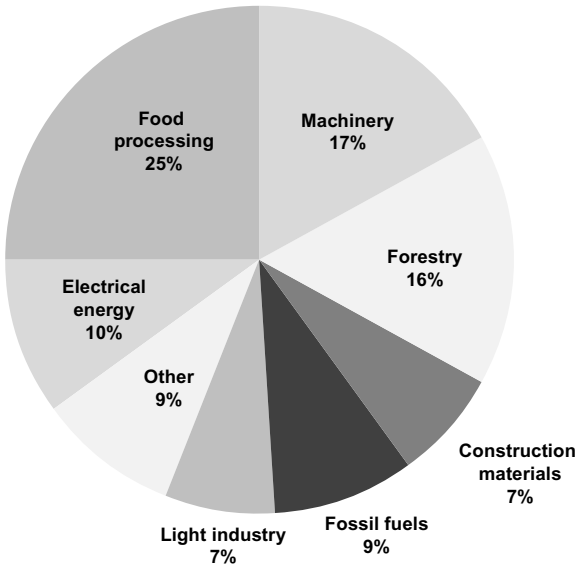
**Existing protection measures.** At present there is only one regional zoological *zakaznik*, which covers an area of 36,800 ha, to serve as a replacement for the now-defunct Urushinsky Zakaznik. The area surrounding Ignashinsky mineral springs has been designated as a recreational zone. There are four natural monuments in the region, mostly preserving the scenic cliffs along the Amur—the most famous being those at Cherpelskie Krivuny.

**Recommendations.** The following actions should be taken:

- Create Urkinsky Zapovednik, as called for in the federal Program for New Protected Areas, to conserve the headwaters of the Urka, Urusha, and Omutnaya Rivers. This *zapovednik* would protect transbaikalian alpine forests and help compensate for the damage being done by gold mining in the nearby Khaikta River basin. Residents support the creation of this reserve; more than five hundred signatures were collected for a petition in favor of the initiative. This support led to the prohibition of logging by the Erofeevsky Lespromkhoz in the Urka headwaters.
- Create a similar protected area in the region encompassing the Urka, Omutnaya, and Nyukzha headwaters, as included in the *oblast*'s own program for new protected areas.

- Establish the second *zapovednik*, Verkhne-Amursky, as proposed in the federal program, to protect the typical pine forests growing along the Upper Amur. A variant proposal called for creating the *zapovednik* along the Kutamanda River basin, but that idea was scrapped because the forests in the area have already been clear-cut. As an alternative, establish a federal botanical *zakaznik* in the pine forests in the border zone near Cherpelskie Krivuny.
- Establish a regionally administered protected area to conserve flora near the village of Ignashino and the floodplains at the confluence of the Amuzara and Amur Rivers.
- Protect the pine forests along the Gerbelik River, near the village of Chernyaevo. A plan to create a national park in this region has been included in the *oblast*'s program for new protected areas.

**Figure 5.3**
**Soviet-era industry in Amur Oblast**




*Source*: Goskomstat, 2000.



## Economy

*Yuri Darman, Gennady Illarionov*

The standard of living, as elsewhere in Russia, has declined dramatically since Soviet times. Currently 45.6 percent of the population has a per-capita income below the poverty line.[43] The structure of industrial production has not only changed substantially (see table 5.3), but also has declined by more than 60 percent since 1992.[44] Much manufacturing has disappeared, and light industry has practically collapsed. In comparing figure 5.3 with figure 5.1 (see p. 200), one can see how drastically industrial structure has changed. The energy generation and fuel industries have been the most stable during the transitional period.[45]

In 2000, approximately 17 percent of the Gross Internal Product (GIP) came from industrial production. Transportation accounted for 25 percent, agriculture 15 percent, construction 4 percent, and commerce nearly 16 percent of the GIP.[46]

Electricity production and nonferrous metallurgy

**Table 5.3**
**Structure of industry in Amur Oblast, 1992–1999**

| | *1992 (%)* | *1993 (%)* | *1994 (%)* | *1995 (%)* | *1996 (%)* | *1997 (%)* | *1998 (%)* | *1999 (%)* |
|---|---|---|---|---|---|---|---|---|
| Electricity | 13.8 | 19.2 | 29.9 | 35.5 | 42.2 | 45.7 | 45.1 | 36.1 |
| Nonferrous metallurgy | 17.4 | 23.0 | 17.6 | 13.7 | 9.8 | 11.0 | 13.1 | 25.9 |
| Food processing | 13.1 | 17.6 | 13.7 | 13.2 | 13.3 | 10.8 | 10.8 | 12.1 |
| Forestry | 12.7 | 8.9 | 6.7 | 8.3 | 5.8 | 4.2 | 4.6 | 6.0 |
| Fossil fuels | 7.1 | 8.0 | 10.2 | 8.5 | 9.7 | 13.4 | 11.2 | 5.8 |
| Machinery | 8.2 | 7.8 | 6.6 | 6.1 | 6.4 | 5.2 | 4.7 | 4.7 |
| Flour-milling, oats, fodder processing | 8.7 | 5.6 | 5.8 | 4.9 | 4.3 | 3.8 | 2.9 | 4.7 |
| Construction materials | 5.9 | 6.8 | 7.0 | 6.6 | 6.0 | 4.5 | 6.0 | 3.3 |
| Light industry | 2.1 | 1.9 | 0.9 | 0.9 | 0.3 | 0.1 | 0.1 | 0.1 |
| Other | 11.0 | 1.2 | 1.6 | 2.3 | 2.2 | 1.3 | 1.5 | 1.3 |

*Source:* Amur Oblast Committee of State Statistics, 2000.

**Table 5.4**
**Employment in Amur Oblast, 1999**

| *Sector* | *Percentage* |
|---|---|
| Commerce | 16.9 |
| Industry, including mining | 16.0 |
| Transportation and communication | 14.6 |
| Agriculture | 11.3 |
| Education, culture, and the arts | 10.7 |
| Construction | 9.3 |
| Public health and social security | 7.2 |
| Government, judiciary, and police | 4.8 |
| Public housing management | 3.8 |
| Banking and insurance | 0.9 |
| Forestry | 0.4 |
| Science and scientific services | 0.4 |
| Other | 3.7 |

*Source:* Amur Oblast Committee of State Statistics, 2000.



dominate industry, accounting for 64 percent of all industrial production.[47]

The coal industry (which supplies heat and power) includes coal-mining facilities at the Raichikhinsky, Arkharo-Boguchansky, and Ogodzhinsky deposits, and at several smaller sites. Some preparatory work had also been performed for opening a mine at the Yerkovetsky coal deposit. Electric power is supplied by three thermal power stations (the Raichikhinsky, the Blagoveshchensky, and the Ogodzhinsky) and the Zeiskaya Hydroelectric Power Station.

Agriculture has always played an important role in the economy of the region, with 58 percent of the total arable land area of the RFE concentrated there. The main agricultural products are summer wheat and soy beans, with Amur Oblast being the leading producer of soy beans in Russia. Next in importance is animal husbandry, followed by hunting, reindeer breeding (mainly in the north), and beekeeping. Horticulture remains largely undeveloped. All significant agricultural and animal-breeding enterprises are located in the central and southern parts of the *oblast*.

The distribution of the population by sector has changed considerably since 1992. The number of workers employed in construction has declined by more than 40 percent. The number of those employed in the industrial sector has declined by 27 percent and that in agriculture has decreased by 26 percent. Concurrently, the number of workers engaged in commerce has nearly doubled.[48] See table 5.4 for a summary of the distribution of the local population in the various sectors of the Amur economy in 1999.

### Timber

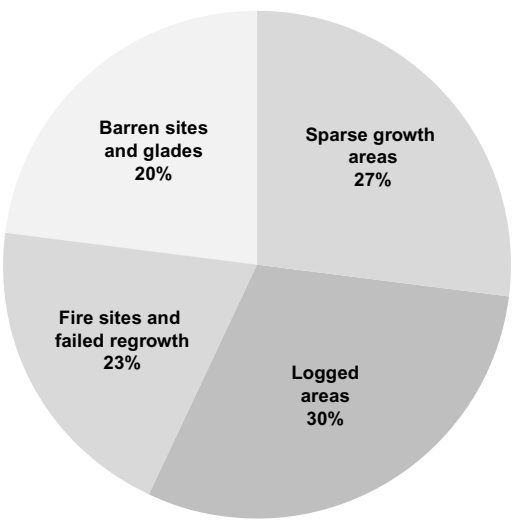
The total area of timber resource lands covers 30,746,500 ha, of which 22,578,800 ha (1999) are forested. Commercial timber reserves amount to 1,175.14 million cu. m, including 735.65 million cu. m of coniferous species. A 1993 survey of timber resources revealed declining trends. Predominately coniferous forests decreased by 1,896,000 ha, and the total area of timberlands not covered by forests increased to 2,797,200 ha. It should be noted that the stated forest areas do not include forests in the forest-steppe zone of the Zeya-Bureya Plain, which are being rapidly depleted through uncontrolled cutting for firewood and by constant agricultural burns. At the same time, the forest area subject to insect damage and disease is expanding, primarily because there are no funds for prevention (see table 5.5). Figure 5.4 shows these nonforested lands, including burned areas and those destroyed by logging.

The total reserve of timber in the *oblast*'s forests is estimated at 1,943,000 cu. m. Mature and overmature timber represents more than half of this figure. The quantities of timber cut in the period from 1985 to 1999, for primary use lumber, are listed in table 5.6.

Clearly the harvest is steadily declining, reaching only 10 or 11 percent of the intended amount in recent years. The primary tree species used for construction are larch, pine, fir, and birch. Timber resources are listed in table 5.7. The main timber-producing species in Amur Oblast include the Dahurian larch, Scotch pine, white birch, and Amur philodendron.

Korean pine is predominant on 7,900 ha or 0.04 percent of the *oblast*'s forests. These forests require special care as

**Figure 5.4**
**Nonforested lands in Amur Oblast (2,797,200 ha)**




*Source:* Goskomstat, 2000.

**Table 5.5**
**Degraded forest lands in Amur Oblast**

| | *1997 (ha)* | *1998 (ha)* | *1999 (ha)* | *2002 (forecast)* |
|---|---|---|---|---|
| Weakened forests | 279,000 | 274,000 | 269,000 | 262,000 |
| Pest outbreaks | 136,900 | 121,900 | 20,700 | 1,700 |
| Diseased | 5,000 | 5,000 | 5,000 | 5,000 |
| Imminent desiccation | 3,600 | 5,000 | 5,000 | 7,000 |

*Source:* Amur Forest Service, 1999.

**Table 5.6**
**Timber production in Amur Oblast, 1985–1999**

| *Year* | *Actual harvest (million cu. m)* | *Planned* |
|---|---|---|
| 1985 | 5.70 | — |
| 1986 | 5.87 | — |
| 1987 | 6.57 | — |
| 1988 | 6.32 | — |
| 1989 | 6.54 | — |
| 1990 | 6.06 | 10.92 |
| 1991 | 5.12 | 10.92 |
| 1992 | 3.95 | 12.42 |
| 1993 | 3.16 | 15.84 |
| 1994 | 1.82 | 15.84 |
| 1995 | 1.72 | 15.84 |
| 1996 | 1.54 | 15.84 |
| 1997 | 1.53 | 16.04 |
| 1998 | 0.85 | 16.04 |
| 1999 | 1.31 | 16.04 |

*Source:* Amur Forest Service, 1999.

**Table 5.7**
**Forest cover in Amur Oblast, 1999**

| *Dominant tree species* | *Coverage (000 ha)* | *Wood stock (million cu. m)* |
|---|---|---|
| Larch | 13,477,200 | 1439.86 |
| Birch | 4,980,000 | 320.04 |
| Pine | 685,800 | 54.32 |
| Spruce, fir | 495,200 | 80.96 |
| Oak | 432,300 | 17.04 |
| Aspen | 166,600 | 16.61 |
| Korean pine | 7,900 | 1.44 |

*Source:* Amur Forest Service, 2000.

**Table 5.8**
**Main timber producers in Amur Oblast, 1997**

| *Company* | *Harvest (cu. m)* |
|---|---|
| AOOT Amurlesprom* | 382,000 |
| AO Tyndales | 267,000 |
| AOOT Taldansky LPK | 54,000 |
| TOO Agalan | 41,000 |
| TOO Tayozhny | 29,000 |
| Others | 758,000 |
| *Total* | *1,531,000* |

* Zeisky Lespromkhoz produced 278,000 cu. m of the total.
*Source:* Amur Forest Service, 1997.



monuments of nature and as a reserve for possible reproduction in the long term.

Over the past several years the timber industry comprised between 6 and 7 percent of the total industrial production of the *oblast*. The industry is now almost exclusively limited to the production and transport of commercial timber (see table 5.8). There are very few milling enterprises. The only wood-processing enterprise is a new one, Shakhtaum, which was organized in 1997. In 1998, the firm started to manufacture wood fiberboard,[49] and by 1999, production had more than doubled from the 73,000 cu. m produced in 1998.[50]

Demand from Japan, China, and North and South Korea led to an increase in timber production in 1999.[51] In that year forest products represented almost 45 percent of all exports from the *oblast* and were valued at about U.S.$22 million.[52] The current markets for these products are China, Japan, the Koreas, and other regions of Russia. Exports accounted for up to 40 percent of the total timber production, almost all of it commercial timber. Export share has recently increased even more, not only because of production increases, but also because of the nearly complete collapse of home markets and the reduction of lumber exports to other regions of Russia and countries belonging to the Commonwealth of Independent States (CIS).

Individual timber enterprises have been attempting to revive the industry. In February 1999, a new enterprise, Export-AmurLes, touted as being well connected to take advantage of export markets, was created. This enterprise intends to undertake logging operations in areas that are difficult to access.[53] Another is AO Tyndales (in the town of Tynda), which, over a period of years, has been exerting considerable efforts to create a wood-processing industry by attracting the capital and technology of foreign partners (Bison Corporation, Germany). Nevertheless, the timber industry of the *oblast* remains in a very difficult position for three main reasons:

1. The remoteness of the area from potential customers of commercial timber and absence of seaports from which timber could be exported.
2. The comparatively low quality of most of the timber produced in the region (larch, the primary species, is inferior to pine produced in eastern Siberia).
3. The almost total absence of factories that manufacture finished wood products.

The *oblast*'s forestry sector is, therefore, less attractive to potential foreign or even Russian investors than that of the neighboring eastern Siberian and Far Eastern coastal regions. Moreover, as the traditional emphasis of regional authorities has been on the development of agriculture, mining, and power generation, less attention is focused on the forest industry. Thus, there are no prospects for foreign investment in the forestry sector in the near future.

Nonetheless, in recent years, the forest resources of the region have been exploited intensively. The pine forests along the Trans-Siberian Railroad (Skovorodino, Magdagachi, Shimanovsk, Svobodny, and Blagoveshchensk sectors) have been almost completely logged, and replaced by biologically less productive and commercially less valuable species. Regrowth is poor in large areas. In spite of a marked decline in timber production over the past decade, there are many problems associated with production that continue to threaten the ecosystems of the forests. Major damage has been inflicted by commons logging in the northern sections of the *oblast*, where clear-cutting of trees in the permafrost zone has lead to erosion, thawing, and waterlogging of the fragile topsoil. Rules for commons logging are constantly violated; for example, new growth and saplings are not preserved. According to expert estimates, some 10,000 ha of the 22,000 ha logged annually lose their ability for self-restoration. Instead they turn into barren sites and bogs and become an irretrievable loss for the *oblast*'s timber resources.

Problems likewise arise from the failure to complete harvesting plans. Every year there are increasing numbers of overly mature stands that are prone to fires. Forest fires annually destroy tens, and sometimes hundreds of thousands, of ha (384,000 ha in 1996). Another serious problem in recent years has been the increasingly frequent conversion of forestry areas to other uses, primarily mining. The *oblast* has lost more than one million ha of forest in this way. At the same time, reforestation measures have been reduced over the past two years because of budget cuts.

The head of the *oblast* administration authorizes short-range programs for forest protection and restoration under Amur Oblast Reforestation Program for the 1993–2005 period. In 1997, within the framework of a federal program for the protection, restoration, and rational utilization of forests, a regional program for Amur was proposed and accepted. It encompasses a series of measures to protect the forests of the *oblast*. In November 1998, a regional law for a Special-Purpose Fund for the Restoration of Forests was passed, which guarantees that 50 percent of forest revenues will be used for forest restoration work.

Because many populated centers depend upon the forest industry for their existence, its social significance is very high. For many years timber production was one of the leading

*Most of the timber harvested in Amur is exported to China and Japan.*

### Timber trade with China

Chinese imports of Russian timber have increased fourfold since 1995.[54] After the 1998 catastrophic floods in China, unrestricted logging in the nation's most important watersheds was blamed for the devastation. The central government subsequently passed sweeping legislation to restrict logging severely. As its timber demands continue to grow unabated, China, now without a plentiful domestic supply, has turned to other countries to meet its needs.[55] Amur Oblast is one of the regions that has increased timber exports to help make up the shortfall. According to David Gordon, an expert on Siberian and Far Eastern forests at Pacific Environment, Amur business interests are pushing to open up more areas for logging in response to demand from China.[56] The Amur government, in an enthusiastic report about the opportunities of increased timber exports to China, has stated: "The greatest possibilities for our timber industry have come from the moratorium in the northern provinces of China on timber harvest. And the demand in China for wood products is great. It is necessary to make use of this chance to the greatest extent for our *oblast*'s economy."[57] The combination of China's immense timber needs, a bridge to facilitate timber export, inadequate forest protection, and Amur's desperate need for revenues, makes the forestry situation critical.

*– MH*

### Timber lease in Urkansky Zakaznik

Environmentalists in the *oblast* were shocked to learn that in late 1999 a concession of 100,000 ha of forested land in the 141,000-ha Urkansky Zakaznik was handed over to a company called AO Most to harvest timber. This *zakaznik*, located in Tyndinsky Raion in northern Amur, protects a unique boreal forest system that is home to rare musk deer, Siberian grouse, black grouse (*Tetrao tetrix*), black capercaillie (*Tetrao parvirostris*), and other species.[58] No environmental impact assessment was conducted and local environmental groups are pushing to have one done.[59] Currently there is little information on the status of this deal.

According to the Amur Branch of the Socio-Ecological Union (a Russian conservation NGO), a major problem is that an *oblast* law passed in 1999 that permits economic activities in some protected areas contradicts a federal law, passed in 1995, that prohibits the destruction of wildlife and wildlife habitat in *zakaznik*s and other protected areas.[60] Accordingly, in many *zakaznik*s, logging and mining are under way. These activities have already destroyed Urushinsky Zakaznik, have brought Tolbuzinsky and Verkhne-Depsky Zakazniks to the brink of destruction, and damaged Iversky and Simonovsky Zakazniks.[61]

*– MH*



industries in the region, and employees of timber-related enterprises were some of the highest-paid workers in the area. In addition, the plants required the services of personnel in many other fields including construction, power generation, maintenance, transportation, commerce, and social work. The recent decline of this industry has, however, left many forestry and lumber specialists without work. Timber processing plants have closed down, leaving other tradespeople out of work as well. It would be advantageous for the *oblast* to remedy this situation with sustainable forest-management techniques.

## Mining

The *oblast* is a rich source of raw materials including numerous placers of gold (considered to be the largest deposit in Russia's estimated reserves) as well as gold veins, iron, titanium, tungsten, molybdenum, mercury, antimony, zinc, copper, lead, platinum, diamonds, brown and anthracite coal, minerals such as graphite, talcum, apatites, and phosphorites, kaolin, alunites, precious and semiprecious stones, other stones suitable for lapidary work, and rare-earth and radioactive elements (see table 5.9).

**Environmental impact.** Gold mined at placer deposits poses a threat to aquatic ecosystems of rivers and swamps and the forest ecosystems of the adjoining river valleys. Thus far, placer mining has destroyed some 150 small rivers (up to 200 km in length) with a total watershed area of some 12,000 sq. km. Consequently, some valuable floodplain ecosystems have been lost. Water runoff is impeded by the destruction of wetlands that play a crucial role in the hydrologic system. Mining sites currently occupy a total area approaching 36,000 ha with an additional 1,500 ha being destroyed every year in preparation of new sites. Only 30 percent of the needed restoration takes place, and the situation is aggravated by the northern ecosystem's extremely low level of resistance to damage. Over the past several years some gold mining enterprises have advocated the cessation of soil restoration attempts altogether, holding that, because current technology fails to extract all of the gold from the alluvial placers, these same areas will be revisited a few years hence with newer and better extraction techniques. Simplistic logic of this sort presents a serious danger to the *oblast*'s environment, especially in view of plans to expand placer mining.

A related problem is the contamination of soil by mercury. The concentration of mercury on former mining sites is three

**Table 5.9**
**Mineral resources in Amur Oblast**

| *Ore* | *Millions of tons* |
|---|---|
| Brown coal | 3,000 |
| Iron | 2,000 |
| Anthracite | 1,000 |
| Kaolin | 100 |
| Graphite | 50 |
| Titanium | 40 |
| Copper | 10 |

*Source: The Amur Oblast: A Guidebook for Businessmen*, 1998.

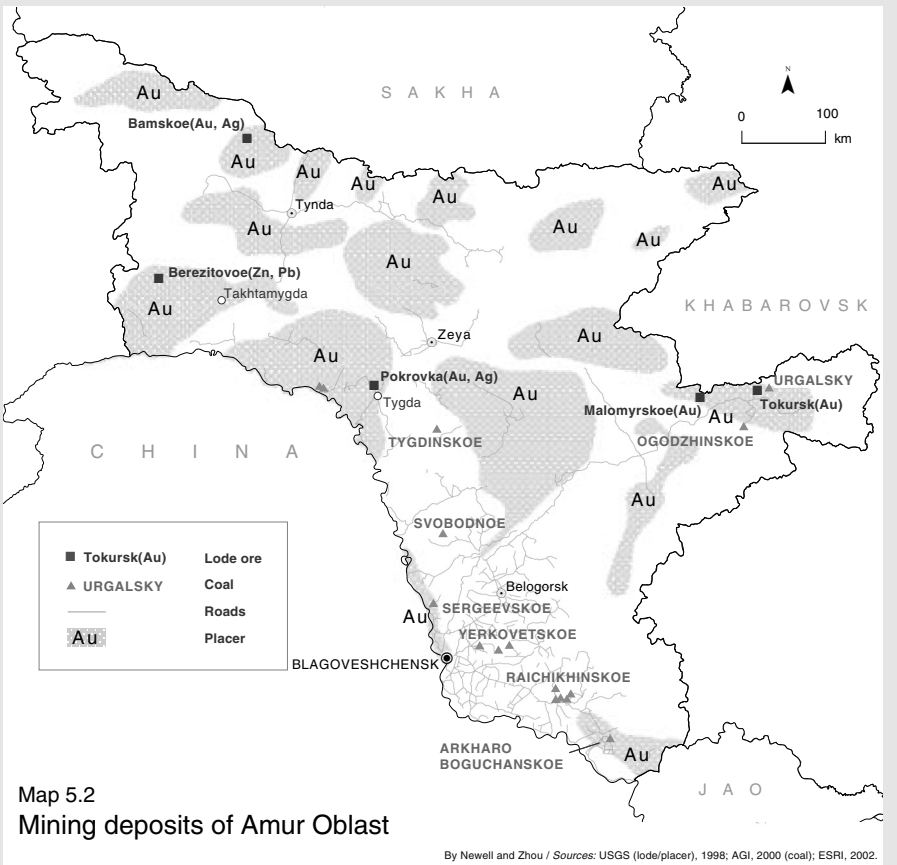


times higher than permissible levels, so high that one could literally label the areas as manufactured mercury deposits. No cleanup efforts have been mounted in these inhabited areas. Similarly, open-pit mining has lead to the contamination of rivers with suspended particles. Both active and abandoned sites interfere with the ecosystem's rivers and dry riverbeds. The dumping of contaminants and the modification of microclimates damage downstream portions of rivers. By now, the volume of washed ore amounts to 50 million cu. m per year and uses up 1.5 billion cu. m of river water. Rivers are rendered lifeless by suspended mineral particle concentrations reaching 15 g/liter. Similarly, peat dumping also has long-range detrimental effects on the river ecosystems: downstream concentrations of phenols, nitrates, and hydrocarbons are fifteen to twenty times higher than the maximum permissible levels.

In the south of the *oblast*, active mining of brown coal deposits has significantly modified soils. The primary threat here is not to wilderness but to the fertile soils that support the farming economy. In the southeastern territories adjacent to the Raichikhinskoe and Arkharo-Boguchanskoe deposits, biodiversity is high and wildlife habitats have been preserved. However, in the course of most coal deposit development, so-called lunar landscapes are formed. The total surface of such areas today exceeds 12,000 ha, less than 5 percent of which is cultivated annually.

**Gold.** Today, gold mining is the primary industry in the *oblast*, constituting 17 percent of the total industrial output. Predicted reserves amount to 2,640 tons (900 tons of placer gold and 1,740 tons of ore gold) and the production forecast for 2003 calls for 24 tons of gold (20 tons from placer deposits and 4 tons from ore deposits). It is the fifth largest source of tax revenue for the *oblast* budget, after commerce, transportation, construction, and power generation. Four *raion*s (Zeisky, Tyndinsky, Selemdzhinsky, and Mazanovsky) base their budgets on tax revenues from gold production. In the eight administrative *raion*s where gold is mined there are over one hundred gold mining enterprises, which employ 18 percent of the industrial work force.

More than fifty gold-bearing deposits have been found, representing an area equivalent to 42.6 percent of the *oblast*'s territory. At present gold is being mined from about two hundred placer deposits. More than 80 percent of the placer




Map 5.2
Mining deposits of Amur Oblast

By Newell and Zhou / *Sources:* USGS (lode/placer), 1998; AGI, 2000 (coal); ESRI, 2002.

deposits are estimated to contain modest amounts of gold (up to 700 kg). Opencast methods account for more than 60 percent of the gold obtained in the region; the dredge method for a little over 25 percent. The total area used for conducting open casting for placer deposits has been increasing every year, with a subsequent increase in the number of ecosystems being disrupted.

Given current levels of placer gold production (some ten metric tons per year), the *oblast* has enough placer gold reserves for the next fourteen years. Gold mining areas include Tokursk mine in Selemdzhinsky Raion, Pokrovka ore deposit in Magdagachinsky Raion, and the Berezity gold and polymetal deposits and the Bamskoe ore deposits in Tyndinsky Raion. Additional gold ore mines are planned for Borgulikansky (Zeisky Raion) and Malomyrsky (Selemdzhinsky Raion) as well as dozens of other promising sites. Presently, the overall resource potential of gold ore in the *oblast* is twice that of potential placer gold, and experts predict that by 2005, between thirty and thirty-five tons of gold will be mined annually, primarily from gold ore deposits. From an environmental perspective, gold ore mining is less damaging than placer mining, but it, too, causes ecological problems.

The development of the Pokrovka gold lode has attracted foreign capital in the form of credits from the International Financial Corporation (IFC) and investments procured through a financial intermediary from private foreign companies. In autumn 1999, production at Pokrovka began and the enterprise produced about 200 kg; it produced about 1.52 tons in 2000.[62] By 2002, the Pokrovka operation plans to produce between three and four tons of gold annually.[63] Gold-producing enterprises licensed to prospect for and mine gold deposits at Berezitovoe and Bamskoe also seek foreign investment. In 1999, Apsakan, which holds the license, began exploiting at the Bamskoe deposit. As at Pokrovka, the deposit will initially be exploited using concentrated leaching methods and factory operations will follow.[64] After certain Moscow banks were granted licenses for working with gold, they began to show interest in the *oblast*'s gold mining industry. Several are prepared to provide preliminary credits to mining enterprises. Various international financial institutions (the IFC and the World Bank) and private gold mining companies (primarily from the United States and Canada) are ready to fund specific extraction projects.

The *oblast*'s largest gold mining company, in terms of production, is Solovyovsky Priisk, which is also one of the oldest gold mining enterprises in all of Russia, having mined placer gold for more than 130 years.[65] In 2000, Solovyovsky produced 1.8 tons. Other major producers were *artel*s, among them Maya, Zarya-1, Zeya, Rassvet, and Khergu. On the whole, conditions for gold mining companies are now favorable in the Amur region, thanks to strong support from the *oblast* administration and greater interest from Russian banks.

### Gold ore mines to watch

As emphasis shifts away from gold placer mining and toward gold ore mining, foreign investment has been sought to help underwrite capital-intensive extraction projects. Regional authorities are committed to developing gold production, primarily through mining, and private companies will soon be given rights to exploit new deposits. Amur officials have offered tax benefits for foreign investors and lessees. The standard package includes a 50 percent reduction of the *oblast* profit tax on leasing for the first two years of the lease and on collateral that has been created or purchased. In addition, the Golden Fund (gold reserves promised to foreign investors in the event that an investment project goes sour) has been established as a guarantee for investments in the *oblast*.[66] These projects seek to develop the *oblast*'s economy, but environmental negligence and destruction may prove their long-term value to be more harmful than beneficial. The following sites are of particular concern:

**Berezitovoe deposit.** Located 60 km southwest of Takhtamygda train station, this deposit includes 42.3 tons of gold, 225 tons of silver, 142,000 tons of zinc, and 85,000 tons of lead.

**Malomyrskoe deposit.** A 75-sq.-km deposit in the northwest corner of Selemdzhinsky Raion containing around 170 tons of gold, this site has been selected for open-pit excavation at a depth of 600 m. Construction will take three years and cost U.S.$115 million. Foreign investment of $25 million is sought with an expected return on investment time of seven years.

**Bamskoe deposit.** Located in northern Tynda, 60 km from the train station. Geologists have found gold ore, silver, tungsten, and copper in bore holes between 300 and 350 m deep. A project, to cost U.S.$60 million, seeks to extract 46 tons of gold. Cyanide will likely be the primary extraction method. Cyanide leaching into local soils and polluting the groundwater has been a serious problem in some areas of the *oblast*.

**Pokrovka deposit.** Located in the Magdagachinsky Raion, 14 km from Tygda in the northeastern part of the *oblast*, this mine is expected to operate for eighteen years to excavate a total of 12.5 million tons of ore and produce 90,000 gold ounces per year. The project is a joint venture in which the British Zoloto Mining Corporation owns 75 percent, the Pokrovka AO about 25 percent, and Russian authorities a small portion.

*– DJ*

**Coal.** Coal mining is another significant industry in the *oblast*. Currently three deposits of brown coal (Raichikhinskoe, Arkharo-Boguchanskoe, and Yerkovetskoe) and one deposit of anthracite (Ogodzhinskoe) are being mined. Reduced yields from the Raichikhinskoe deposit have led to precipitous declines in overall production. Currently, only 9.2 percent of the total coal reserves are being mined. Other coal resources are located at the explored reserve deposits (in Svobodnoe, Sergeevskoe, Tygdinskoe, and the eastern section of Yerkovetskoe) in addition to sectors adjacent to the active cuts. The reserves of the active coal mining sections are estimated to last for between seven and forty years. The working sections of the brown-coal deposits at Raichikhinskoe, Arkharo-Boguchanskoe, and Yerkovetskoe are in the southern part of the *oblast*. Mining of these sites decreases agricultural production by destroying land containing the most fertile soils in the RFE. Planned recultivation of the soil has thus far not been carried out, and the debt of the coal mining concerns for this activity exceeds 50 percent of the total area of affected soil. Moreover, in recent years many small, easily accessible areas have been exploited by small private enterprises that frequently lack both environmental specialists and surveyors.

**Other mineral resources.** Abundant raw materials in the region, including iron ore and peat, have been largely ignored. About six hundred peat fields have been located. Most are in the north and many of them are located on top of gold placer deposits. However, despite the fact that large amounts of peat are excavated in the process of uncovering gold placers, very little of it is used. The *oblast* also contains a large untapped iron-ore deposit in Garinskoe and several untapped deposits of titanium-magnetite-ilmenite ores in Bolshoi Seim and Kurany. Records document over a hundred additional deposits of minerals and building materials including deposits of kaolin, zeolite, graphite, vermiculite, talcum, apatite, and phosphorites. Currently, only forty-five (37 percent) of these deposits are being exploited. In addition to mineral deposits, thirteen fresh groundwater reserves and two mineral groundwater sites have been recorded by scientific survey.

Vladimir Dinets

*Abandoned logging and mining roads, which now serve as access routes for poachers, crisscross many parts of the Amur basin.*

### Agriculture

Agriculture, accounting for 15 percent of Gross Internal Product (GIP) in 2000, is one of the economic mainstays of the *oblast*, traditionally considered the granary of the Russian Far East.[67] The rich soils, particularly those in the Zeya-Bureya Plain, are ideal for growing soy beans, grains, potatoes, and vegetables (see table 5.10) and for raising livestock for meat and dairy products. Nevertheless, farmers, both private and cooperative, are struggling to break even. In spite of the fertile land, the prices for inputs such as fuel, fertilizers, machines, and parts are very high in comparison with the prices received for farm products. Farmers receive little or no support from the state. Currently, farmers have very little access to credit. Much of what they produce is bartered for fuel and fertilizers.

Policies that keep farm product prices low to promote cheap urban food have also hurt farmers. Humanitarian aid from the United States to Russia in 1999 and 2000 left some farmers without markets for their products. Soy bean farmers had to accept reduced prices from processors who were glutted with beans from abroad. Meat prices were also reduced. This may be of benefit to urban consumers, but it made raising livestock unprofitable. Local government policies that temporarily restricted meat exports to other regions of Russia and soy bean exports to China further reduced prices when farmers had nowhere else to sell their products.[68] Additionally, a lack of economic incentives for farmers to increase production has resulted from a situation in which "all the profit goes to the processor, rather than to the farmer."[69]

The total land area used for farming declined in the 1990s by almost 50 percent.[70] Since the end of the Soviet period the production of grain and soy beans, which are produced primarily by agricultural enterprises such as cooperative and state farms, and are the most important commercial crops in Amur Oblast, has plummeted. Even allowing for the over-reporting of harvests in Soviet statistics, grain production is probably one-third and soy bean production two-thirds of what it was in the 1980s. However, the production of subsistence rather than commercial crops (e.g., potatoes and vegetables) has actually increased.[71] Local people, both rural and urban, produce primarily these crops on small family plots. Altogether, agricultural land constitutes 7.42 percent of the total area of the *oblast*. Categories of agricultural land use in 1996 are shown in table 5.11.

Plans and programs undertaken in recent years by national authorities to develop local farming industries have always been unstructured and have aimed at the short-term support of the farmers. It is unsurprising that no fundamental economic improvements have resulted. Regionally, agriculturally

**Table 5.10**
**Agricultural production in Amur Oblast, 1980–1999**

| *Year* | *Grain* | | *Soy beans* | | *Potatoes* | | *Vegetables* | |
|---|---|---|---|---|---|---|---|---|
| | *Harvest (000 tons)* | *Yield (100 kg/ha)* | *Harvest (000 tons)* | *Yield (100 kg/ha)* | *Harvest (000 tons)* | *Yield (100 kg/ha)* | *Harvest (000 tons)* | *Yield (100 kg/ha)* |
| 1980 | 601.4 | 8.2 | 292.5 | 6.1 | 244.0 | 85 | 71.6 | 83 |
| 1990 | 1,030.6 | 14.2 | 468.6 | 11.0 | 266.8 | 102 | 73.3 | 99 |
| 1995 | 258.8 | 6.5 | 170.4 | 5.8 | 338.0 | 117 | 97.7 | 152 |
| 1996 | 315.0 | 8.1 | 156.2 | 5.6 | 316.7 | 114 | 83.1 | 136 |
| 1997 | 318.4 | 8.8 | 169.5 | 7.3 | 358.8 | 126 | 79.6 | 129 |
| 1998 | 304.8 | 9.1 | 161.5 | 7.6 | 347.8 | 125 | 102.3 | 162 |
| 1999 | 211.3 | 6.6 | 182.6 | 8.4 | 444.4 | 126 | 95.1 | 148 |

*Source:* Amur Oblast Committee of State Statistics, 2000.

**Table 5.11**
**Agricultural land use in Amur Oblast, 1996**

| *Land use* | *Area (000 ha)* | *Percentage of total land area* |
|---|---|---|
| Arable land | 1,783.7 | 4.93 |
| Grazing land | 479.5 | 1.33 |
| Hayfields | 407.8 | 1.13 |
| Fallow land | 10.7 | 0.03 |
| Long-term planting | 0.5 | 0.001 |
| *Total* | *2,682.2* | *7.42* |

*Source:* Amur Oblast Committee of State Statistics, 2000.

**Table 5.12**
**Degraded agricultural lands in Amur Oblast, 1996**

| *Indicator* | *Ha* |
|---|---|
| Reduction in humus | 1,752,200 |
| Pesticide contamination | 1,125,000 |
| Waterlogging | 755,000 |
| Water and wind erosion | 132,100 |
| Contamination by toxic substances | 6,800 |
| Landfills and dumps | 4,200 |
| *Total* | *3,775,300* |

*Source: The State Report on the Environment of Amur Oblast*, 1997.

oriented legislation (On Land Reclamation, On Pedigree Animal Husbandry) has been purely for show, with no mechanism for actual implementation. The share of agriculture in the *oblast*'s GIP has declined substantially since Soviet times. In 1990, agricultural production constituted almost a third of GIP for the region; by 1999, it was only one-tenth of the total and few agricultural enterprises are profitable.[72]

Foreign technology and capital are being introduced on a very limited basis by enterprises processing farming products and manufacturing food products. Plans and hopes for attracting foreign investment in soy bean production remain far from realization. The Socio-Ecological Union, a Russian NGO, is implementing a small-scale project in sustainable agriculture on the territory of the Muravyovka Park—the first nongovernmental territory under special protection in Russia

Long-term observations reveal a progressive degradation of the soil. The loss of humus amounts to between 0.4 and 0.6 tons/ha annually, and more than 132,000 ha are subject to erosion (see table 5.12). The primary causes are the plowing of light soils on slopes without using measures to keep the soil in place, and the absence of windbreaks. Erosion leads to the loss of fertile soils and degradation of the watersheds that receive the organic runoff and gives rise to dust storms. The proportion of humus in the soil is reduced, and other indicators of damage increase.

Agricultural production has significantly altered the natural appearance of the southern section of the *oblast* and transformed the coniferous and mixed forests of the plains into agricultural landscapes. Farming activity constantly threatens the few remaining wilderness areas in the south. Fires caused mostly by spring burns pose the greatest threat, destroying the last natural habitats of wildlife that has adapted to life near human settlements, e.g., the nesting areas of rare bird species, such as the white-naped crane, the red-crowned crane, and the Oriental white stork.

## Toward sustainable development

*Gennady Illarionov*

The position Amur Oblast inherited from the Soviet period was that of a peripheral resource base for the Soviet economy. Its other function was that of an agricultural supplement to the rest of the economy in the RFE. Because Amur is located between Baikal and the Far Eastern coastal region of Russia, it received little attention from politicians in Moscow regardless of their political orientation.

At first glance, this situation may not look promising in terms of Amur's development prospects. There are, however, other regions that are more heavily industrialized and even more damaged. Healthy development in Amur is still possible. Despite all the environmental problems mentioned in this chapter, Amur Oblast has sufficient natural reserves to follow a course of sustainable development. One may suggest two possible development scenarios.

**The ideal scenario.** The first priority in the economic development of the region would be given to principles and technologies that would incur minimal damage to the environment. All technological processes would imitate natural processes, and the rate at which renewable resources are used would not exceed the natural reproductive capacity of the environment.

In particular, forest resources would be used mainly to produce nontimber forest products, to increase recreational activities, and, most importantly, to maintain the balance between carbon dioxide and oxygen levels on the planet. Amur will need to downsize its timber industry everywhere and place a special emphasis on reforestation. In this scenario, wood extraction would be limited to supplying only local industries and needs. Water would be used in a multilevel closed-cycle system. This would entail supplying water for drinking and sanitary purposes, household use, industry, and agriculture separately. Water from natural sources is supplied only for the first level of the system—for drinking and sanitary purposes. The used water from the first level is then supplied to the level below, and eventually, to industry and agriculture. Used water from the second and third levels would be purified and reenter the system.

In order to generate electricity, hydroelectric stations would be built to make use only of free water flow without blocking rivers with dams. The Evenk indigenous people would use wildlife resources in traditional ways while the recreation industry would use wildlife in ways that do not reduce populations.

Mining of nonrenewable natural resources in the region would be excluded from industrial activities. Instead, recycling and reusing worn-out metal products would satisfy the economic demand for metals. Demand for chemical agricultural products would be satisfied by natural organic material, and demand for electricity met by alternative energy sources. In particular, with the number of sunny days in Amur Oblast being one of the highest in Russia, the use of solar panels is highly recommended. Fossil fuels such as peat would be used only as a resource base for the construction industry and organic fertilizer. In general, the government should impose strict quotas on mining operations using these resources.

Damage sustained by the environment will be assessed based on the damage caused in the previous years—natural environments altered by or converted into agricultural lands and populated areas, or occupied by industry, transportation, and communications. Agriculture would be reorganized to make it more suitable to the climactic conditions in the area along the banks of the Amur River to minimize the environmental impact. Further expansion of all existing anthropologically altered areas would be banned. In so doing, further industrial and social development would result from the more efficient use of the space already taken out of the natural environment. The transition to mature sustainability will require cooperation, patience, and a dedication toward the long term.

**Scenario for partial sustainability.** In the near future, it is possible to make the transition to partial sustainability in Amur. This will require the development of new natural resources and the adjustment of the existing resource-use system to reduce human impact on the environment and increase the efficiency of local resource extraction and processing. The essential feature of this scenario is that the regional policy on resource use would be changed to improve both the environment and the economy.

As previously mentioned, gold mining is one of the most important industries in the region, and it poses a major threat to the environment. Therefore, one of the key regional issues is finding ways to restructure the industry to increase efficiency and environmental safety. Nearly all specialists (economists, geologists, gold miners, and environmentalists) agree that, in order to improve the situation, it is necessary to direct the industry from placer mining toward the development of gold ore deposits, which will create jobs for those who live permanently in the region. Ore deposit mining is more complicated technologically and requires more complicated production methods, a requirement that will improve the skills and qualifications of the employees. Furthermore, it is possible to extract and use not only gold, but also all the other valuable components of the ore, including silver, copper, lead, zinc, and tungsten. The tailings can be used in the construction industry if they comply with the relevant sanitary norms.

Gold ore mining is, however, tied to a set of unavoidable problems, but these will be easier to resolve than will those related to placer mining. Restoring the environment after mining can be assured, to a certain degree, by requiring insurance bond deposits prior to mining. This system is

**Table 5.13**
**Major power stations in Amur Oblast**

| | *Current capacity (KW/hour)* | *Projected capacity (KW/hour)* |
|---|---|---|
| Zeiskaya Hydroelectric Power Station | 1,330 | 4,900 |
| Blagoveschenskaya Thermal Electric Power Station | 280 | 1,550 |
| Raichikhinskaya Thermal Electric Power Station | 230 | 1,100 |
| Ogodzhinskaya Thermal Electric Power Station | 22 | 50 |
| Bureinskaya Hydroelectric Power Station[a] | 0 | 2,000–7,100 |
| *Total* | *1,862* | – |

a. Under construction.

*Source: The Concept of Socio-Economic Development of Amur Oblast for 1998–2000.*

successful in many foreign countries. Unlike placer mining, environmental insurance deposit funds are well suited for ore deposit mining, which involves significant investment and operations planned many years ahead. In the case of a mining enterprise bankruptcy, money in the fund can be used to recultivate the land.

Also important is the energy sector, which centers upon four main power sources, with a fifth under production, that produce 7,600 million kW hours of electricity annually (see table 5.13). Besides these plants, electricity is produced by numerous small enterprises, mainly boiler-houses, but their contribution to the region's energy supply is insignificant.

Also included in the energy sector are coal mining enterprises that supply thermal energy. The largest enterprises producing electricity in the region are part of the United Energy System of Russia. Amur Oblast, with a positive balance of electricity production and consumption, exports energy to other regions of Russia and to the neighboring People's Republic of China. The region also has approximately 80 percent of the entire hydro-energy potential in the RFE. Therefore, federal plans for development of the region include construction of several more hydropower plants.

The combined environmental damage associated with these enterprises is significant. The quality of the air, soils, and water reservoirs decreases because of electricity production and coal mining. Enormous environmental damage results from construction of hydropower plant facilities. Hence, for the partial sustainability scenario, it is imperative, considering the number of energy resources in the region, to adjust the energy policy of the region. The energy sector should become the most important element of the regional economy, so we must use energy sources that have the lowest-environmental impact.

### Hydroelectric power stations

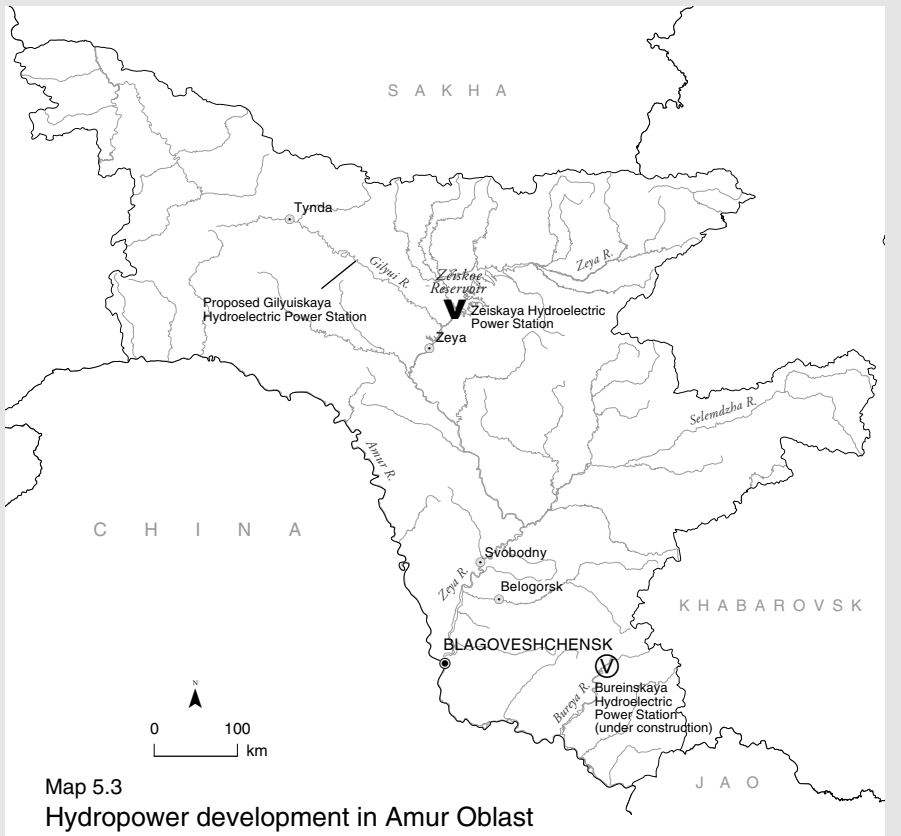
If the history of Zeiskaya Hydroelectric Power Station is any indication, one must expect the current and planned projects to damage the environment. The Zeiskaya Station and the Zeiskoe Reservoir, in controlling the flow of the Zeya River, damaged the aquatic and riparian ecosystems by changing the temperature cycle and the hydrochemical characteristics of the river. The subsequent alteration of the microclimate adjacent to the reservoir has also led to the flooding of riparian habitats, the modification of reservoir banks, and the replacement of *taiga* landscapes with coastal landscapes. The reservoir obstructed migration routes of snow deer and moose and isolated some animal populations.[73] Increased recreational activities at the reservoir have meant greater access to protected areas and increased poaching.[74]

Fifteen percent of the 2,000-MW (six 335-MW units) Bureinskaya Hydroelectric Power Station on the Amur River has already been built, and the first stage is expected to be completed in 2003. The project was first launched in 1976, but has been delayed several times for lack of funds. The total cost of the project has been estimated at U.S.$1.4 billion. The project is supervised by AO Amurenergo and reportedly includes investment from Japanese and Chinese companies. The Russian federal government has put a high priority on the project, earmarking U.S.$123 million in federal funds for fiscal 2001, more than double what was disbursed in 2000.[75] In 2001, the Amur government signed a U.S.$1 million contract with China to cut timber at the plant construction site.

Two of the stated aims of the project are to reduce carbon dioxide emissions and to generate income from the sale of electric energy to China. This project requires substantial deforestation: 2 million cu. m of forest land still remain to be cleared.[76] Citizens living along the Amur River, which is already heavily polluted and unfit for drinking, have criticized the government for unilaterally choosing to build a technologically outdated electricity generating solution in a region well suited to cleaner and more efficient energy-producing alternatives. A large number of residents have spoken out against the construction of the 140-m high concrete dam and the cascade of seven hydrostations that will interrupt the natural cycle of fish swimming into tributaries to spawn.

Another hydroelectric project has been proposed for the Gilyui River, upstream from the Zeiskoe Reservoir. If this power station is constructed, part of Zeisky Zapovednik will be flooded. Migration routes of snow deer and moose will again be disrupted.[77]

*– MH, DJ*




Map 5.3
Hydropower development in Amur Oblast

By Newell and Zhou / *Sources:* Darman, 2000; ESRI, 2002.

### Alternative energy

The region holds large reserves for clean energy, particularly in solar and hydro-energy generated on small electric power plants without the use of dams. Several alternative energy possibilities for the region have been studied. Proposals to implement some concrete projects have been prepared, but at the federal level, large traditional projects still have more support even though they present a clear threat to the surrounding ecosystems. At the level of private enterprises, no action is being taken due to a lack of investment.

**Solar.** The potential for solar energy generation is justified by the favorable mode of the solar radiation. The yearly cycle of solar radiation has two peaks—March and June. The spring peak is characterized by the absence of clouds and the growing day-length; the summer peak corresponds to the longest day. Winter solar conditions, too, are favorable, which can be explained by the absence of clouds during a stable anticyclone over the region. Owing to the transparency of the air, the solar radiation, compared with that in other regions at the same latitude, is intense. In most regions solar radiation decreases drastically in winter because of the shorter solar day and increased cloud formation; the drop in Amur Oblast is insignificant. Simply put, the sun shines a great deal in Amur. With the exception of eastern Siberia, no other region of Russia has as many sunny days as does Amur Oblast.[78]

The possibility for solar power generation here is more than hypothetical. Solar panels have been successfully installed in Muravyovka Nature Park to generate electricity for the park's Visitors' Center and living quarters. The power generation there is on a small scale, but this project does demonstrate the viability of solar power for meeting some energy needs.[79]

**Wind.** With the exception of a few well-populated, favorable locations, the prospects for wind energy pale in comparison to the potential for solar energy. Conditions are relatively good in the city of Blagoveshchensk, which benefits from winds over the Amur River: The average annual wind velocity at the height of 50 m exceeds 8 m per second. Hurricanes never occur and wind less periods are rare. Another favorable populated area is Magdagachinsky Raion, where the average annual wind velocity at the height of 50 m is 16 m per second. Wind-power stations cannot yet serve as completely autonomous energy sources. Nevertheless, they can be used as additional sources of energy in remote locations where sufficient electricity is not available.

**Biogas.** A relatively simple, inexpensive, and efficient source of energy in agriculture is biogas and fertilizers made from organic waste. To produce biogas, thermophilic bacteria process organic waste from crop production and animal husbandry in a special ferment-reactor. The process produces a gas without unpleasant odor and with a high concentration of methane, whose burning heat is 5,500 kcal. The process also produces a high-quality fertilizer, the by-product being a protein and vitamin concentrate. Introduction of this technology would not only contribute to energy generation, but also save money that could be allocated to environmental protection, to reduce heating costs on farms, and to increase agricultural productivity by using the high-quality fertilizer.

Preliminary calculations in the early 1990s suggested that if 100 percent of the available biological waste were used to produce biogas, Amur Oblast could economize on 27,000 tons of conventional fuel equivalent. It has since become clear that by the end of the 1990s the situation in agriculture had greatly changed, and such savings become unachievable.

Nevertheless, some energy reserves do exist in this area. There is also some energy potential in hard-waste burning, which is done at incinerators in large cities. It is worth mentioning however, that air emissions produced by burning the waste creates social and environmental problems.

**Hydroelectric.** As has been noted earlier, the hydro-energy potential in the region is high. Plans for construction of traditional hydropower plants (HPP) with dams are slowly being realized. Zeiskaya HPP is already functioning, Bureinskaya HPP is being finished, and the Ministry of Energy has plans for constructing HPPs on the Lower Bureya and Gilyui. In the long term, the construction of HPPs on Nyukzha and Olyokma Rivers and a group of small HPPs, which do not use dams on the Zeya River, is being planned. In the meantime, the region holds enormous possibilities for small HPPs that, without blocking rivers, use only the power of uninterrupted flows. Aside from the obvious environmental advantage that no damage is caused, such HPPs also provide a number of economic benefits: production and consumption of energy in the same location. This is perfectly suited to Amur Oblast where population density is low. Such local developments also eliminate large energy transportation expenses and the energy losses incurred during transportation. Therefore, for every small town and village in Amur region that is located on a river, free-flow HPPs are a promising prospect for energy supply.

### Conservation

The biggest potential for preserving traditional energy resources and the surrounding environment arises from energy conservation measures, which currently are deplorable. To conserve energy one should not only apply new technologies but also employ economic and financial measures to ensure compliance. In some cases, even the often-criticized administrative measures may work, but that would be the subject of a separate report.

Some prospects for Amur Oblast are related to its geographical location which, to date, has not been used to its advantage. Its position as a provincial gap between the Baikal region and the Pacific coast, which previously had led to deep social and economic problems, could, in the future, be turned into a great advantage. Amur Oblast, both in the geopolitical and geoeconomic senses, could find itself, in the twenty-first century, as a crossroads between Siberia and East Asia and between the Arctic (Republic of Sakha) and Central Asia (China). This position may entail significant economic dividends for the region as well as higher environmental costs. Consequently, it is necessary to prepare for this prospect now. The first steps in this direction have already been taken: A bridge across the Amur River is planned, the Chita-Nakhodka Road is being built across the *oblast*, and the construction of an international airport in Blagoveshchensk has begun. It is necessary that environmentalists consider the prospect and implications of such deep changes in the status of the region before it actually becomes a reality.

#### Amur bridge construction

The proposed bridge across the Amur River linking the Chinese city of Heihe with Blagoveshchensk has been on the agenda for the past decade. Finding funding for such a venture, however, has been problematic. The estimated cost of the 3-km bridge has continued to rise from U.S.$50 million to more recent estimates of U.S.$250 million.[80] Although the two cities would share the costs of building the bridge, this still represents a considerable sum for Amur Oblast. It appears that the solution to the financial problem will be the trading of rights to natural resources for bridge construction. Currently, two companies, AO Most and Genstroi, have agreed to undertake construction in exchange for the rights to sell titanium and 150 million cu. m of timber.[81] The bridge will not only require the exploitation and export of unprocessed natural resources, but also will facilitate their continued exploitation and export once it has been completed. The *Russian Far East Update* quotes the president of Genstroi, Ingo Skulason, making the revealing statement that bridge construction is likely to become a reality because "Governor Belonogov is willing to appropriate the region's physical assets."[82]

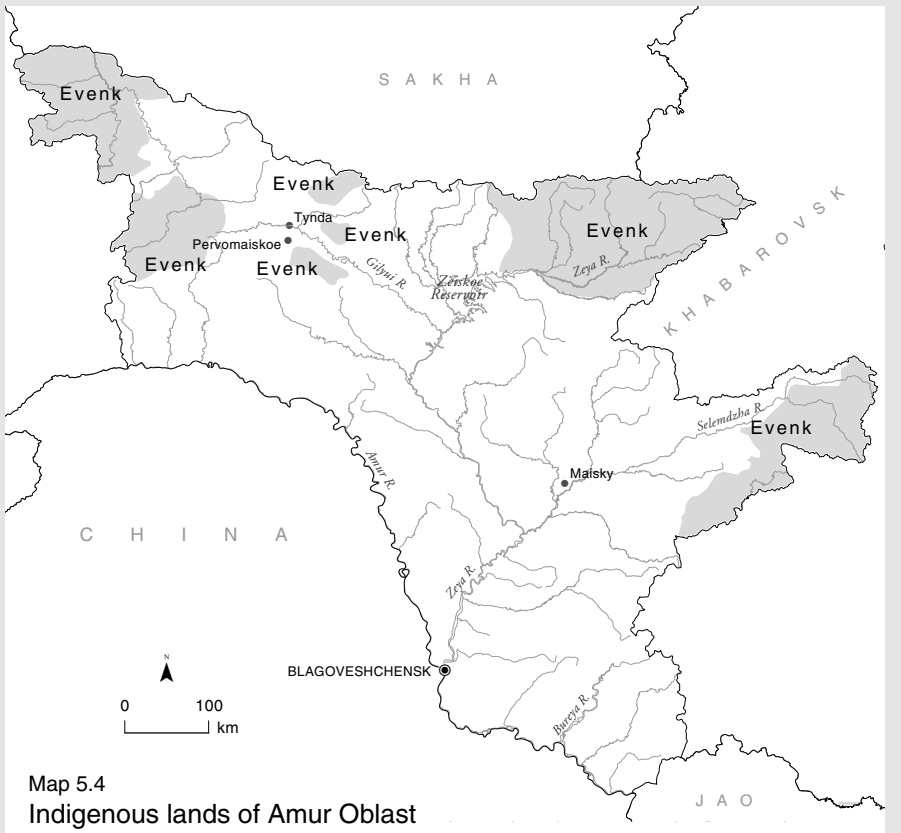
*– MH*

## Indigenous peoples

*Yuri Darman, Gennady Illarionov*

The territory of Amur Oblast is home to the Evenk peoples. In the past five years they have numbered fewer than fifteen hundred. Most of them are registered as residents of five village administrations in the three northern *raion*s: the Pervomaiskoe, Ust-Urkima and Ust-Nyukzha in Tyndinsky, Bomnak in Zeisky, and Ivanovskoe in Selemdzhinsky. A small group of Evenks (fewer than forty in number) live in the settlement of Maisky in the Mazanovsky Raion.

Traditionally, the Evenks lived across a huge territory stretching from the Yenisei basin in the central part of eastern Siberia to the shores of the Sea of Okhotsk on the Pacific Coast. They were primarily nomadic reindeer breeders and, to a lesser degree, hunters. Their traditional way of life was dependent mainly on northern larch taiga and transitional upland zones that were rich with lichen—the best feeding




Map 5.4
Indigenous lands of Amur Oblast

By Newell and Zhou / *Sources:* Darman, 2000; ESRI, 2002.

grounds for small reindeer herds. The system of reindeer herding of the Evenks was a classic example of sustainable resource use: Feeding sites were left to regenerate themselves after being grazed, and herds were moved to adjacent areas. Subsequently they could return in later years to repeat the cycle. The population growth of the Evenks was closely related to the reindeer population, which in turn was dependent on the natural succession of the grazing pastures that could occur only under specific conditions. For centuries a balance was maintained between the Evenk economy and the resource parameters of the northern ecosystem.

This pattern of self-sufficient resource use obviously required delicate balance and was susceptible to outside disturbance. The Evenks were practically a part of the ecosystem, having adjusted to its natural limiting factors. They created their own culture and language, which was oriented to their habitat (there are, for example, more than twenty terms in Evenk for various forms of snow).

The situation deteriorated significantly with the arrival of settlers from the west and with the subsequent integration of Amur's resources and Evenk territories into the outside economy. Evenks of Amur Oblast encountered the same sorts of problems that other nations have experienced through contact with the technogenic European civilizations. Their situation was particularly affected by their heavy dependence upon the slim resources of the northern ecosystems. Forestry and gold mining in traditional Evenk territories have destroyed the natural cycle's components that are the life-support system of the Evenks. The territory available for traditional herding is continually dwindling, and hunting has also been affected as Evenks are now forced to compete with hunters of other nationalities and are limited in the areas where they can hunt.

Most (about 60 percent), but not all, Evenks today are involved exclusively in traditional occupations (reindeer herding, hunting, animal husbandry, and the production of native crafts). Among the hunters and reindeer herders, they are the dominant group, representing 73 percent and 98 percent, respectively. Reindeer herding employs about 22 percent of working Evenks. It is a form of resource use well suited to the northern taiga and the ways of the Evenks, allowing a maximal exchange of production for relatively minimal inputs of labor and resources. Nevertheless both the number of herders and the size of the herds has fallen rapidly in recent years.

Hunting accounts for about 30 percent of the employment of working Evenks. This activity is losing its significance, as the fur harvest has declined dramatically since the late 1980s. Furthermore, hunting on Evenk territory often occurs illegally and without regulations, and is conducted by both Evenks and people of other nationalities. During the Soviet period, the Evenks were allowed to develop captive breeding enterprises. An animal farm was established in Pervomaiskoe in the Tyndinsky Raion. This was a sensible form of compromise between traditional and modern economies, but today fewer than 5 percent of Evenks are involved in it. Only 5.5 percent of Evenks engage in production of traditional wares—leather goods from reindeer and other species, clothing and footwear using bearskin, and souvenirs.

Like many other indigenous peoples, Evenks have little understanding of the concept of property. As a result, the process of entering a market economy, where the notion of property is fundamental, was doubly difficult. In the past decade, there have been attempts to secure legal rights to land and resource use in territories traditionally occupied by native groups. Most federal acts in this realm have been devoted to financial and organizational measures related to socioeconomic and cultural development of indigenous peoples.

### Cosmodrome at Svobodny

One potential environmentally threatening project, perhaps something of a wild card, is the Cosmodrome near Svobodny. A presidential decree called for the creation of this space-launch complex on the site of a former military base. In 1997 the first space launch from the Cosmodrome took place. The complex currently has orders to launch satellites from several countries, including Israel.[83] It is difficult to predict how the construction and subsequent functioning of this launch site will affect socioeconomic conditions in the area, but there is no doubt that it will pose a very significant new threat to the local ecosystem. When Russian Proton rockets launched at Baikonur Cosmodrome in Kazakhstan exploded on two different occasions, spewing toxic fuel over inhabited areas, the hazards of such rocket launching sites were confirmed.[84]

*– MH*

A law has been drafted to establish a special regime of traditional resource use in areas inhabited by native peoples. Rights have also been granted for traditional resource use on some lands that are otherwise protected natural territories. The Russian Federation law, On Payment for Land, creates some advantages for native peoples purchasing land on which they have traditionally lived. The presidential decree On Necessary Measures for the Protection of Habitation and Economic Activity Areas of the Small-Population People of the North acknowledges that TTPs are the inalienable possession of these peoples. In the current forestry code, special forest-harvest rights are granted to native peoples in order to preserve conditions for traditional resource use.

Significant rights are also granted to native peoples by the federal law On Animals. This is the first time that legislation has recognized the Evenks' way of life. The law grants them special rights to use animal resources, both as a collective group and as individual members of a nation. Native peoples are given first rights to resource use on their traditional territories. Unfortunately, the current law of the federation about mineral rights has almost no special provisions for native peoples on their territories. A single law dictates that payment for use of mineral resources in areas inhabited by native peoples must be directed toward these peoples' socioeconomic development. In practice, these payments are seldom properly used because *raion* administrators rather than representatives of the native peoples handle the distribution.

Federal legislation still lacks special provisions to regulate questions of native people's status, property rights, and other rights on their territories of traditional resource use. The federal Duma is currently preparing similar laws. In Amur, the law On Territories of Traditional Resource Use of Small-Population Peoples is being prepared. It is intended to address the problems of land management and natural resources on the traditional territories of the Evenks. Also, the *oblast* law On the Protected Nature Fund is in the process of being written, and will oversee the creation of ethno-ecological territories to preserve areas of traditional Evenk habitation and wildlife.

Unfortunately, there are still no positive examples of Evenk development of natural resources on their territories. The best that the Evenks can hope for are single payments from gold mining enterprises for solutions to specific socioeconomic problems. The securing of legal protections for Evenk natural resource rights on their territories may become the first step in the resolution of the problems described here.

## Legal issues

*Yuri Darman, Gennady Illarionov*

A basic problem stems from the fact that each of the *oblast*'s agencies involved in environmental protection and resource use is the regional branch of a federal department and thus prioritizes its own department's interests. The agencies are often interested solely in the organization and protection of their natural resource, at the expense of protecting other natural elements. It is advisable for the coordination of resource agencies to function at the *oblast* level to develop a comprehensive system of resource use. Work is proceeding on the development of an *oblast*-level form of agency coordination to integrate the planning of resource use and the protection of biodiversity.

An *oblast* law On the Nature-Zapovednik Fund, which had been prepared and submitted to the Amur Oblast Council, forms a legal basis for the protection for special territories and biota (including both *oblast* and federal *Red Data Book* species). This law creates many new legal categories of protection to complement the existing federal law On Specially Protected Natural Territories. The law On Overall Principles of Nature Use in Amur Oblast is being prepared to legally strengthen the comprehensive planning of regional nature use by prioritizing comprehensive regional management. If this law is adopted, all resource users will be obliged to pay for all of the resources used in their enterprise, regardless of whether or not they obtain any direct income from that usage. For example, strip-mining enterprises will have to pay for the "use" of locally affected plant, animal, water, and soil resources.

These two legal efforts are essential for the successful regulation of resource use. The first law serves to preserve the natural environment; the second one requires ecosystem users to pay for all the effects of resource use and development.