Threats: High population density, intensive transport routes, and heavy exploitation of biological resources have affected ecosystems. The polluted waters of Nagaeva and Gertnera Bays are harmful to residents. Potential oil and gas extraction is a future threat.

3. Khasyn River basin (wetland). This basin represents a unique natural and economic community unparalleled in northeastern Asia. Khasyn Basin rivers are spawning grounds for Pacific salmon.

Threats: Industrial pressure (logging, hunting, and coal mining) on the ecosystems in the middle and upper basin, where there is a railroad and a highway. Only two of the seven towns and villages in the basin have sanitary sewage facilities.

4. Gizhiba Bay (wetland and marine). Gizhiba Bay, one of the most biologically productive and diverse territories of the Sea of Okhotsk, has huge populations of herring, salmon, crab, and other marine resources, making this a prime commercial fishing area.

Threats: A coal mine on the shores of the bay pollutes nearby waters. Commercial fishing and hunting often conflict with the needs of indigenous peoples.

5. Odyan and Kavinsky Valley Zakazniks (forest and wetland). Both zakazniks are linchpins of Magadan’s protected area system. Odyan (72,000 ha) was created to protect brown bears: more than a hundred live within the refuge’s boundaries (2.5 individuals per 10 sq. km); only southeastern Kamchatka and southwestern Alaska have higher brown bear densities. Kavinsky Valley (320,000 ha) includes nesting grounds of the whooper swan, greater white-fronted goose (Anser albifrons), and bean goose (A. fabalis), as well as endangered osprey, golden eagle, and white-tailed and Steller’s sea eagles.

Threats: There are attempts to mine within Odyan’s borders.

6. Ola River basin (forest). Just east of Magadan city, the larch forests of the Ola River basin protect natural salmon spawning grounds.

Threats: Poorly designed industrial development has degraded huge areas beyond restoration. Severe localized pollution is forcing indigenous people to move from their ancestral lands. Overfishing, industrial mining.

Chukotsky Autonomous Okrug (Chukotka)
(see map 1.13, p. 19)

1. Lake Elgygytgyn (arctic and wetland). Relic and endemic species of alpine plant grow around this beautiful, nearly round lake, which hosts three endemic char species. Wild reindeer and snow sheep breed near the lake. Rare bird species include peregrine falcon (Falco peregrinus), gyrfalcon, golden eagle, and ivory-billed loon.

Threats: Although the area is remote, overfishing, uncontrolled mining, illegal archeological excavations, and waste dumping affect salmon and wild reindeer populations.

2. Lower Anadyr lowlands (arctic and wetland). The vast wetlands here are critical for nesting and migratory birds; Avtaktuul Zakaznik is one of the largest remaining goose breeding grounds in the region. The rivers are important for migrating calico salmon, nelma, other whitefishes, and smelt.

Threats: Future oil development may lead to road construction, and land and water pollution. Overfishing.

3. Meinypilgyn riparian zone (arctic and wetland). Brown bear, moose, ermine (Mustela erminea), snow sheep, and Kamchatkan marmots frequent the area. The fisheries include one of the largest stocks of chum salmon in Northeast Asia. Seals, killer whales (Orcinus Orca), and migrating gray whales (Eschrichtius gibbosus) visit to feed on the salmon. Indigenous peoples rely on the area.

Threats: Largely pristine; the primary problem is garbage around settlements; locals are starting to collect eggs illegally.

4. Walrus rookeries (arctic and marine). In some years, more than half of the world’s walrus population visits these six rookeries, staying for up to six months.

Threats: Polar and brown bear attacks, poaching of walrus for their tusks, and uncontrolled tourism, particularly illegal low-elevation plane and helicopter flights.

5. Chaun Inlet (marine and wetland). Geese and shorebirds nest in coastal hills and plains and wetlands. Other birds include Bewick’s swans (Cygnus bewickii), arctic terns (Sterna paradisaea), and Ross’s gulls. The rivers have commercially valuable stocks of humpback salmon and dolly varden (Salvelinus malma).

Threats: Mining, fishing, and localized reindeer grazing. Oil and gas development.

6. Omolonsky Zakaznik (arctic and forest). Tundra and taiga valleys support white-tailed sea eagle, gyrfalcon (Falco rusticolus), wild reindeer, brown bear, and wolverine. Moose reach record population densities here.

Threats: Upstream and downstream gold mining, including the Kubaka project in adjacent Magadan Oblast. Sable and wolverine poaching.

7. Botanical natural monuments (forest and wetland). Chosenia and poplar groves, reaching 18 m in height, are refuges for rare arctic plants and serve as reindeer calving sites.

Threats: Uncontrolled logging for firewood and reindeer grazing.
Koryak Autonomous Okrug (Koryakia)  
(see map 1.14, p. 20)

1. Severnaya Ayanka Zakaznik (wetland and arctic). Protects the largest Kayander larch forests in Northeast Asia, and includes lichen cover and important winter pasture for reindeer.

   Threats: Forest fires and logging cause disastrous floods on the Penzhina River and affect fish populations. Wood is cut for fuel.

2. Parapolsky Dol (valley) (wetland and arctic). Sedge-covered hilly tundra and grassy swamps dominate the area, drained by many small rivers and dotted with numerous glacial and thermokarst lakes. This highly productive pasture is also important for nesting and migratory birds.

   Threats: Population growth, geological surveys, poaching. Future gold mining may lead to increased pollution and poaching, particularly along the route of the proposed Ametistovo-Manily road. The hydropower plant proposed for the Belaya River, irrigation projects and the consequent drainage of thermokarst lakes.

3. Ostrov Karaginsky Zakaznik (marine). Created to protect marine bird colonies, marine mammal rookeries, white fox populations, and other rare but unprotected flora and fauna. Salmon spawn in almost all streams. The shallow waters of the shelf contain commercially valuable species, such as Kamchatka king crab (Paralithodes kamchaticus).

   Threats: Increased poaching by locals; a proposal to make the island an area of traditional nature use without a full reappraisal of its biological resources; potential offshore oil and gas development, mining.

4. Ozero Palanskoe Zakaznik (wetland). Notable fauna include snow sheep, wild reindeer, bear, Kamchatkan marmot, and migratory birds. Salmon are important for the subsistence of indigenous peoples. An unusual thermal ecosystem has formed around nearby hot springs, which includes the northernmost habitat for Okhotsk hmbristilis (Fimbristilis okhotensis), a Red Data Book plant.

   Threats: Increased poaching by locals; a proposal to make the island an area of traditional nature use without a full reappraisal of its biological resources; potential offshore oil and gas development, mining.

5. Rivers of the Tigilsky region (wetland and forest). Nesting and feeding grounds for migratory birds, the lower basins of the Moroshechnaya and Utukholok Rivers are now zakazniks. Salmon and other commercial and rare fish species spawn in the rivers.

   Threats: Intensified commercial and illegal fishing, pollution from sewage and industrial wastewater, possible offshore oil and gas development, coal mining.

6. Sea of Okhotsk Continental Shelf near Koryakia (marine). Fish and marine mammals are the primary food sources for local indigenous peoples here. Upwelling ocean currents provide a major reproduction area for Kamchatka king crab and other species, including halibut, herring, gray whales, beluga whales (Delphinapterus leucas), and seals.

   Threats: Commercial fishing, proposed oil and gas development.

Kamchatka Oblast (see map 1.15, p. 20)

1. Bystrinsky Nature Park (forest). Indigenous Evens, Itelmens, and Koryaks—as well as non-Native residents—practice subsistence activities in this park, which is a part of the Volcanoes of Kamchatka World Heritage site. It is home to brown bear, snow sheep, sable, rare wild reindeer, Kamchatkan marmot, and all Pacific salmon species.

   Threats: Development of the Aginskoe gold deposit and the Shanuch River nickel and copper deposit, forest fires, and the negative effects of largely unregulated tourism, particularly hunting.

2. Conifer Island (forest). Vitally important for regulating water levels in the Kamchatka River basin and protecting valuable salmon spawning grounds, the Conifer Island forests are almost the only tall stands of coniferous forest (Ayan spruce and Dahrurian larch) on Kamchatka. Inaccessible forests have been preserved.

   Threats: Commercial logging (these forests are almost the only source of timber on the peninsula and are widely logged), frequent forest fires, poor forest regeneration.

3. Kronotsky Biosphere Zapovednik (volcanic, forest, and wetland). The most important protected area within the Volcanoes of Kamchatka World Heritage site, the reserve boasts the world-famous Valley of the Geysers, Uzon Caldera, and other unique phenomena such as the Valley of Death. It also includes large areas of wetlands, forests (including part of Conifer Island), glacial alpine landscapes, a coastal marine zone, a dense network of rivers and creeks, and the huge Lake Kronotskoe, home to endemic char and freshwater sockeye salmon.

   Threats: Poaching and poorly planned tourism, mainly in the Valley of the Geysers, but starting to affect other areas such as Uzon Caldera.

4. Komandorsky Zapovednik (marine). The reserve includes most of the Commander Islands and surrounding waters. The indigenous Aleuts, struggling to preserve their traditional lifestyle, suffer extreme economic hardship. It provides important habitat and migratory stopover areas for both American and Eurasian bird species; Red Data Book species include the gyrfalcon, peregrine falcon, and red-legged kittiwake (Larus canus). All northern Pacific marine fauna are found here.

   Threats: Poaching of fish, mammals, and birds; driftnet fishing; local economic crises.
5. Avacha Bay (wetland and marine). A world-renowned natural harbor, Avacha Bay is surrounded by Kamchatka's main population centers, as well as by picturesque volcanic mountain ranges. It is an important bay for recreation and transportation and is home to all southeast Kamchatkan marine and coastal flora and fauna.

Threats: Industrial, household, and agricultural pollution; possible radiation leakage from aging nuclear submarines anchored at the military base.

Sakhalin Oblast (see map 1.16, p. 21)

1. Pursh-Pursh and Vengeri River basins (forest). Supporting one of Sakhalin's last large frontier forests, this region is an important nesting area for sea eagles, a rutting and calving ground for wild reindeer, and a spawning ground for salmon. In addition, the picturesque mountainous area is popular with tourists.

Threats: Logging. A local timber company has leased part of the territory and is building roads and loading sites, with additional plans to log by helicopter.

Update: Vostochny Zakaznik (65,386 ha) was established in 1999 through the joint efforts of the Sakhalin Institute of Marine Geology and Geophysics, the Sakhalin Committee on Environmental Protection, Sakhalin Environment Watch, Friends of the Earth–Japan, and the Pronatura Foundation (Japan).

2. Coastal bays and wetlands of Northeastern Sakhalin (wetland and marine). An important migratory stopover point for waterfowl and a nesting site for sea eagles, ospreys, and the endangered Nordmann's greenshank. The bays support eight salmon species, the rivers are home to the Red Data Book taimen (Hucho sakhalinensis), and endangered gray whales summer in the coastal waters. Indigenous Nivkhi live and fish on the bays in summer; Ulta and Evenki herd reindeer on summer pastures here.

Threats: Seismic testing, drilling, tanker transportation, pipeline and infrastructure construction related to offshore oil and gas projects; pollution from existing oil industry and other sources; overfishing in the Sea of Okhotsk.

3. Anna, Sima, and Bakhura River basins (forest). Old-growth fir and spruce forests, preserved in the absence of forest fires, logging, and access. Scenery varies from cliffs and waterfalls to East Asian vegetation. Home to Sakhalin musk deer, peregrine falcon, whooper swan, and mandarin duck. All rivers are important salmon-spawning grounds. Increasingly popular for recreation and tourism.

Threats: Logging and intensified human access by a road that crosses all three rivers; increased fishing; hunting; poaching; collection of nontimber forest products; and recreational use.

4. Schmidt Peninsula (forest). Sakhalin’s northernmost peninsula has a warm microclimate and an unusual forest ecosystem, including Yeddo spruce (Picea glehnii), normally found much further south. Fauna includes brown bear, sable, ermine, wild reindeer, sea eagle, and Siberian grouse. The rivers and bays have pink salmon, green sturgeon (Acipenser medirostris), and kaluga sturgeon (Huso dachiurus).

Threats: With declining timber reserves elsewhere, timber enterprises want to log the spruce. Other threats include road construction, planned mining, unregulated tourism, poaching, and attempts to bury toxic chemicals.

5. Krilon Peninsula (forest). The southwestern peninsula, the warmest part of Sakhalin, is a distinct geographical and botanical subzone. Fragments of old fir and coniferous-broadleaved forests remain after the Japanese logging of 1920–1940. Species diversity is high: five hundred vascular plant species and twenty Red Data Book bird species, including osprey and white-tailed sea eagle.

Threats: Erosion after logging has silted rivers and climatic changes have affected flora and reduced animal populations. Logging is planned in the Uryum Basin, forest fires are a threat with the increasing number of visitors, and the fishing industry is irresponsible.

6. Nevskoe Lake (wetland). A large, shallow, brackish lagoon filled with fish, this is an important stopover point for migrating ducks, waders, and gulls. Muskrats (Ondatra zibethica), red foxes, river otters, brown bears, and raccoon dogs feed near the shores. The eastern part of the lake is included in the buffer zone of Poronaisky Zapovednik.

Threats: Spreading swampland, increasingly shallow waters, and inadequate food sources for fish, primarily because the railroad dike has cut off the natural channel between the lake and the sea. Logging near the lake’s tributaries has reduced water levels and increased sedimentation. Year-round poaching.

7. Vaida Mountain (forest). Sakhalin’s largest rift formation, Vaida Mountain, has unique caves with stalactites and petroglyphs. Alpine flora grows at mid-elevations and shelters many rare insects. The rare endemic East Sakhalin poppy (Papaver valpoli) grows near Lake Perevalnoe to the south.

Threats: Breaching natural monument regulations, the local administration has approved logging and mining. Uncontrolled hunting, encouraged by a road constructed in the 1980s, has destroyed wild reindeer populations.
Economy

Josh Newell

Since the era of the tsar Peter the Great (who ruled from 1682 to 1725), the RFE has been a military outpost and supplier of raw materials for the rest of Russia. Until recently, planners in Moscow, not regional administrators, dictated the region’s development.46 Soviet industry, like that which came before, exploited the region’s precious metals, minerals, fisheries, and timber supplies and exported these raw materials to the rest of the Soviet Union. Large federal subsidies to state-owned enterprises ensured steady production and export. To increase production, economic ministries in Moscow set quotas for specific enterprises under a series of five-year plans. Although production costs were generally higher than in other parts of Russia, the RFE had become the country’s largest producer of raw materials by the mid-1980s. The Soviet centralized economy, however, resulted in tremendous inefficiency and high levels of waste in all industries. Some manufacturing also occurred—notably the production of milled lumber, canned fish, and military equipment—but not nearly enough to satisfy local needs. The RFE has always been highly dependent on processed goods imported from European Russia or abroad. Today more than half of the RFE’s energy, foodstuffs, and consumer products are made outside the region.47

With the devolution of decision-making that came with perestroika, however, entrepreneurs and government officials in the RFE hoped to strengthen the regional economy—using their newfound control over local resources, unprecedented opportunity to export to the Pacific Rim, and the chance to attract foreign investment to retool industries. But shrinking federal subsidies, combined with high fuel costs, declining domestic demand, and lack of competitiveness on both domestic and international markets (due to outdated technology and inefficient production), crippled the RFE economy in the 1990s, reducing production in all sectors. High transportation costs effectively isolated the region from the rest of Russia, severing the interdependent economic bonds of the former Soviet command economy. The breakdown of old economic bonds combined with the lure of hard currency shifted the region’s economic ties to Northeast Asia.

Since 1999, overall industrial production has increased, but manufacturing capacity has not.48 Existing equipment for machine building and timber and fish processing is obsolete due to lack of reinvestment by industry and lower government investment because of budget constraints.49 The decline of processing in the timber and fishing industries has strongly affected the economies of many RFE regions, where entire villages were founded on logging, hunting, coastal fishing, and boat repair. Foreign investors—who could provide technology, management and marketing expertise, and capital to build a competitive manufacturing base—have chosen instead to develop natural resource extraction projects (see pp. 86–99).

Corruption, privatization, and weak government regulation. The Russian tax regime, recognized as “one of the most complicated, burdensome, and unpredictable in the world,” has impeded foreign investment and, more critically, fueled corruption and capital flight.50 The practice of concealing revenue to avoid taxation is widespread. The World Bank estimates between 40 to 50 percent of the Russian economy operates in the shadow and is controlled by illegal capital.51 Sakhalin Governor Igor Farkhutdinov estimates illegal businesses export half of the fish caught in Russian waters. Capital flight totalled a staggering U.S.$1 billion to $2 billion a month during the 1990s, with Russian capital in offshore accounts and real estate amounting to about U.S.$150 billion by the year 2000.52

Some argue that privatization helped set the stage for corruption and capital flight. The World Bank, economist Joseph Stiglitz, and others often refer to Russia’s early privatization efforts as “spontaneous” since institutional and legal frameworks were not in place to prevent opportunists from stripping formerly public assets and initiating schemes to gain personal control over them.53 Some managers, seeking short-term personal enrichment, sold off assets of state-run enterprises under their charge rather than continuing to run the businesses. Others appropriated equipment from newly privatized firms to create completely new firms. These activities, together with trade deregulation, led to a flurry of new small firms in many sectors, especially fishing, forestry, and mining. In 1990 for example, 306 fishing and fish-processing companies were registered in the RFE; by 2001, this figure swelled to 1,600, according to the Federal Fisheries Committee.54

But regulatory agencies have chronically lacked sufficient funds to effectively monitor the rising number of businesses. To supplement their budgets, some agencies have resorted to commercial activity. Local branches of the forestry service (leskhozes), for example, now spend less time regulating timber operators and more time harvesting timber themselves, disguising their illegal harvesting as salvage logging. TINRO (Pacific Institute of Fisheries and Oceanography), the primary fisheries research institute, sells the fish quotas it receives for determining sustainable fish-harvesting levels to fishing companies. Some unscrupulous officials within these agencies also use their positions to enrich themselves, augmenting their meager salaries.

Government regulation has also been weakened by jockeying for power between federal and regional governments, which muddies lines of jurisdiction over resource use and allocation. A number of federal decrees on privatization, land use, and forest management, aimed at empowering regional governments, are marred by jurisdictional inconsistencies. President Putin has tried to reduce this confusion by gradu-
ally recentralizing federal control. He appointed presidential representatives, or “super-governors,” to oversee seven federal districts for Russia. The presidential representative for the RFE federal district is the former military general Konstantin Pulikovsky, who helped orchestrate the removal of Evgeny Nazdratenko, then governor of Primorsky Krai who was an official widely accused of corruption.

Some regional laws and responsibilities are clear—officials simply lack the expertise or will to enforce and fulfill them. Russia’s traditionally low regard for written law and preference for “situational” law, which is more open to interpretation, is part of the problem. After living in the RFE for years, lawyer Kevin Block found Russia was governed by “lawlessness law: … Who you knew was more important than what the rules said, and … most rules were not really rules at all, but guidelines for action, subject to endless variation when applied in practice.” Existing laws are also poorly enforced because there is no independent judiciary. In Soviet times, judges were appointed or removed at the whim of Communist Party leaders. Laws that conflicted with government priorities were often ignored, a practice that continues today.

**Effects of economic transition on the environment.** Academics, research institutes, and financial institutions such as the World Bank and IMF have analyzed at length such post-Soviet economic and political trends as lower industrial production, decline of manufacturing, types of foreign investment, corruption, capital flight, federal-regional power dynamics, poor government regulation, and weak rule of law. More than ten years of transition in Russia have provided researchers with a wealth of data both to debate the effects of privatization and liberalization and to consider future policies and measures to move Russia toward stable political, social, and economic development. But far too few have considered the effects of this transition on the natural environment. Those that have, essentially focus on two lines of inquiry: (1) how the Soviet industrial legacy affects environmental conditions today, and (2) whether the transition to a market economy is positively or negatively affecting pollution levels and energy use. Reports by the European Bank for Reconstruction and Development (EBRD) typify both approaches. The EBRD’s 2001 publication, *Environments in Transition*, for instance, focuses on continued inefficiency in industry including the use of obsolete equipment, lack of pollution abatement equipment, and wasteful energy and material use. The report concludes: “[M]any of the region’s industrial plants continue to use energy and materials very inefficiently and pollute the atmosphere, land, and water resources. By investing in projects that reduce wastage and pollution, the EBRD can make a real difference in improving the environment.” The EBRD then offers a prescription of increased foreign investment, reduction of subsidies, and continued deregulation. The few academics to consider post-Soviet environmental issues have focused on similar lines of inquiry. D. J. Peterson, for instance, explores why the Russian economy has become more pollution-intensive (pollution levels have dropped less than industrial output) and concludes that reduced economic efficiency and falling investment in environmental infrastructure, such as pollution abatement equipment, are to blame. Although useful and necessary, the narrow focus of these studies risks restricting the consideration of complex environmental problems to the study of pollution levels and industrial efficiency. There are other equally important angles to explore.

How, for instance, has the RFE’s drop in manufacturing and rise in raw materials exports to Asian markets affected the natural environment? Asian markets now largely dictate what resources are extracted, where, and at what rate. This pattern intensifies and localizes the harvest of certain natural resources—a process harmful to many plant and animal species and the natural systems upon which they depend. Commercial fishing, for instance, targets only species in demand by export markets, namely crab, pollock, sea urchin, and salmon. This has decimated stocks of some species, leading to temporary closures of fishing areas and severe harvest restrictions. In the timber industry, Asian demand for larch may lead to large-scale logging of northern permafrost forests and subsequently threaten the global climate. The geography of new markets and rising transport costs (largely due to loss of subsidies) are also increasing logging pressure on forests in the southern RFE, Russia’s most biologically diverse region (see pp. 69–70). Weak government regulation and corruption encourages such overharvest and allows illegal methods to flourish. Illegal harvesting of king crab, Russia’s most lucrative marine export, has forced the Russian government to close crab beds and greatly reduce quotas. Illegal logging targets protected species, such as Korean pine, yew (*Taxus cuspidata*), and Amur cork tree (*Phellodendron amurense*), and quota-restricted species, such as ash. Such logging does occur along protected river systems and affects water levels, which can lead to flooding. The opening of borders for export and poor domestic economic conditions have led to a flourishing trade in endangered species and their by-products, particularly affecting the Siberian (Amur) tiger, musk deer, black and brown bears, and ginseng.

Another subject requiring study is the effect of federal and regional power dynamics on resource use and management. The breakup of the former Soviet Union gave regional governments unprecedented responsibility for economic and environmental decisions. Environmentalists in the RFE heralded the change, thinking regional residents would be better stewards of local resources than Muscovites. The results, however, have been mixed. Some regional governments have set aside large tracts of land as protected areas, particularly in Amur and Kamchatka Oblasts. But these governments have also developed close ties with timber, mining, and fishing interests seeking to gain land-use rights, avoid environmental regulations, and hide profits. Collusion between corrupt...
Building the Trans-Siberian Railroad

Industrial development in the RFE began just 150 years ago, spurred by fur traders who gradually moved east in search of new resources. Prior to 1850, native peoples inhabited the region. The great government effort to industrialize Siberia and the Far East really began with the building of the Trans-Siberian Railroad between 1891 and 1905, which today spans more than 9,000 km from Moscow to Vladivostok. The railroad was built to facilitate colonization, to allow transfer of troops and supplies to protect Russia’s eastern shores from the growing military powers of Japan and China, and to develop industrial centers to extract raw materials for domestic use and export. Developing the Amur River basin was of primary importance, as it was the richest basin in the entire RFE. As early as 1857, the American millionaire Perry McDonough Collins saw the Amur’s potential and proposed a railroad to connect the western headwaters of the Amur to the Pacific Ocean. To Collins, the Amur River was “the destined channel by which commercial enterprise was to penetrate the obscure depths of Northern Asia, and open a new world to trade and civilization.”

Convicts built the railroad, and the first leg between Vladivostok and Blagoveshchensk in Amur Oblast was completed in 1897. Vladivostok (which translates as Lord of the East) quickly grew into a bustling military and trading port with a population of about thirty thousand by the turn of the century. Industrial centers developed along the railroad, and by 1910, British gold-mining companies were financing ventures and International Harvester Company was supplying all types of agricultural equipment to the Far East.

The Rise of the Red

The Bolshevik Revolution brought an abrupt halt to foreign investment, as communist leaders brought all industries under state control and broke ties with the Asian-Pacific community. State control of industry gained momentum under Stalin, who came to power in 1924. Through a series of five-year plans, Stalin sought to catch up to the West by transforming Siberia from a primarily agrarian economy into a huge industrial complex. “Industrialization was the new faith. Factories were its cathedrals, its priests were the elite workers who smashed production targets and led the way to the future.” To fuel this massive drive, Stalin perfected the tsarist gulag system to provide slave labor. No Russian citizen was safe as people were rounded up for petty “crimes against the State.” Three types of camp developed: (1) factory and agricultural colonies, (2) camps for logging and mining, and (3) punitive compounds for those who disobeyed at the other camps. Camps were built throughout the Far East—Khabarovsk, Vladivostok, Sakhalin, Kamchatka, and in the gold-rich Kolyma River basin in Magadan Oblast. Camp laborers built the cities of Magadan and Komsomol’sk-on-Amur. At its peak in the 1930s, the gulag Archipelago held more than 21 million prisoners. Stalin had created an economy almost completely dependent on slave labor; in 1937, the year of Great Terror, an estimated 7 million citizens were exiled to keep the camps full—as the death rate was 25 percent a year. Of the estimated 12 to 15 million killed by labor camps, the Kolyma Basin camp claimed about one-fifth.

Stalin’s death in 1953 brought the release of many prisoners, but the Kolyma-Magadan camp still held more than one million so-called political prisoners in 1956. Faced with an ailing economy and increasing dissent, President Nikita Krushchev revived a smaller version of the gulag system in 1961 by stipulating that “anyone who had not had a proper job for more than a month could be exiled for two to five years to one of the traditional Russian places of exile.” The prison camp system persisted even under President Mikhail Gorbachev, but it never reached the horrific scale of the Stalinist gulag system.

After Stalin, the Soviet empire returned largely to ostensibly free labor, using the ex-gulag resource extraction cities as industrial centers. Many large-scale development projects initiated by Stalin continued—although some were abandoned, such as the half-built railroad tunnel under the Tatar Strait to Sakhalin—and huge hydroelectric dams became the order of the day. “Dams symbolize Russian might, just as troops and rockets. They embody man’s conquest over nature and they are the article of the Communist faith.” However, as dams flooded millions of hectares of forests, displaced local and indigenous peoples, and destroyed fishing grounds, not all Russians embraced them.

In addition to dams, Soviet planners dreamed of a new railroad, the Baikal–Amur Mainline, which would run north of and parallel to the Trans-Siberian, before terminating in Khabarovsk Krai, and would open up vast mineral deposits and forests for exploitation. It was also supposed to be less vulnerable to possible Chinese invasion than the Trans-Siberian, which hugs the border in many places. Stalin began the project, but with the onset of World War II, the government, in desperate need of iron for the war in European Russia, ripped up the track. In 1974, the project began again and U.S.$325 billion later was finished in 1989. The railroad has been an economic disaster, as Moscow ran out of money before building the originally planned logging and mining cities along the line. The scorched earth from massive fires caused by the line’s construction is a painful reminder of the project’s ecological costs.
regional officials and businessmen is evident in frequent rigging or avoidance of the expertiza process. Mandated by the 1992 Law on the Environment, the expertiza process is a scaled-down version of U.S.-style environmental impact assessments and is required for all proposed development projects in the RFE. Stronger federal control may help to reduce corruption and illegal resource use, but reconsolidation of power might instead further weaken environmental oversight of industrial enterprises. President Putin’s recent consolidation of the Committee on Environmental Protection and the Forest Service into the Ministry of Natural Resources, which is in charge of natural resource extraction, effectively eliminated the two major federal bodies responsible for environmental management and control (see p. 103–06).

This economic overview of the RFE is a backdrop. Environmental and economic developments in the fishing, energy, timber, mining, and agriculture industries are discussed in greater detail below. Basic economic and resource data for each industry are provided. The sections on fishing and timber are longer than those on mining, energy, and agriculture because the latter are discussed more extensively in the regional chapters. The roles of international development banks, NGOs, and foreign investment in the development of the RFE are evaluated in “Toward Sustainable Development.”

Fishing

T. Allison—Fishing, which includes fish processing, storage, transport, and related activities, is probably the RFE’s largest industrial sector. It is the only significant form of economic activity in many areas, such as Kamchatka and Koryakia. Although some of the world’s largest fish resources lie in the RFE, fishing in the region has been neglected and underfunded. The economic reasons for this are numerous. The industry has been hampered by institutional arrangements that are old and increasingly ineffective. The RFE fishing industry has privatized and commercialized during the 1990s, spurring widespread fleet modernization. Fishing shifted from lower-value species, bound mostly for the Soviet domestic market, to higher-value products sold internationally. Fleet modernization, financed and often supervised by foreign interests, has led to harvest overcapacity; combined with illegal fishing, this has depleted the stock in key fisheries. Many RFE fishing enterprises already struggling with rising input costs, international market competition, and the end of government subsidies, face economic disaster if this stock continues to dwindle.

Ineffective fishery management and a fishing quota allocation system that lacks transparency have further undermined the economic health of the fishing industry and its communities. The current decreasing fish quotas are accompanied by unprecedented public conflicts between the krais and oblasts over rights to this shrinking resource and by growing hostility toward foreign involvement in the industry. Capital flight and bribes for fishing quotas have led to the loss of substantial revenue from this valuable national resource. In sum, bureaucratic infighting, lack of funding, and corruption have plagued the key fishery management tasks of gathering data, setting biologically sustainable fishing limits, and allocating quotas within those limits to domestic and foreign operators. Meanwhile, the burdensome tax and regulatory regime in Russia for vessel operators has driven much of the industry’s activities abroad, where Russian vessels call in foreign ports for repairs, supplies, and cargo transshipments. RFE ports, formerly hubs of Soviet fishing fleet activity, are increasingly inactive and dilapidated.

These trends constitute a widely proclaimed crisis in the RFE fishing industry. The Putin Administration has responded with a controversial quota auction system for the most valuable species. This system is supervised by the Ministry of Economic Development rather than the industry’s traditional administrator, the Federal Fisheries Committee. The former Primorsky Governor Evgeny Nazdratenko was appointed the new head of the Fisheries Committee in March 2001 and widely opposed the auction system, as does industry. These developments raise crucial questions. Why did privatization compromise the fishing industry’s long-term health? How has the widespread involvement of foreign interests over the last decade contributed to the crisis? How have institutional arrangements in the industry evolved since the collapse of the USSR and how have they facilitated large-scale overfishing and capital flight? Finally, how is the Putin Administration reforming the industry, so crucial to the well-being of the RFE, and what are the prospects for success? What other measures and management models might be considered? To explore these questions, we examine the current impasse within the RFE fishing industry.

Heritage of the Soviet fishing industry. The economic reasons for the fishing industry crisis evolved in the 1990s, but its roots lay in the Soviet period. The fishing industry under the Soviet Union was managed by a highly centralized, hierarchical structure designed to procure an inexpensive and stable protein supply for the population. Beginning in the mid-1930s, the USSR began a massive shipbuilding program, deploying fishing vessels throughout the world’s oceans. Polish, German, and later Ukrainian shipyards first constructed the large autonomous catcher-processors, which Russian yards built hundreds of smaller oceangoing vessels (ships 50 m or less long). Annual Soviet marine harvest grew from less than a million tons in 1950 to more than 6 million tons in 1970. Annual volumes peaked at a level of almost 10 million tons at the end of the 1980s, with roughly 65 percent caught in the Pacific Ocean. By this time, the USSR had the world’s largest fishing fleet and was second in marine harvest only to Japan. Per capita seafood consumption in the USSR grew to more than 20 kg, three times higher than U.S. levels. However, the economic efficiency of these vessels, based on vessel tonnage per unit of output, appears to have been well below that of other fishing nations. Although some
The changing role of government. The end of the USSR’s command economy led to the abrupt decline of powerful state industrial structures such as the Ministry of Fisheries. In 1991, the ministry became the Russian Committee of Fisheries, and staff was cut from 1,200 to 400 employees. The ministry’s authority was also reduced to management of fisheries stock instead of exploitation. Reduced authority was accompanied by frequent changes of the Committee’s chairman: six have held the post since 1991.

The all-important function of setting and allocating overall harvest levels has remained chiefly with the Moscow committee, which licenses vessels and fishing companies (see map 1.17). Other government bodies, however, have gradually eroded the committee’s authority; by the late 1990s the committee was forced to coordinate the quota allocation system with other government bodies, introducing serious delays and uncertainty into issuance. Observers point to a variety of motives for inserting additional controls into the quota system, including an effort to curb corruption and the eagerness of other bureaucratic agencies to obtain control over an industry with substantial hard-currency earnings.

Formally, the steps in determining quota allocations are similar to those of Soviet times: TIMRO, located in Vladivostok, collects scientific data from its regional branches and then makes recommendations to the Russian Federal Research Institute of Fisheries and Oceanography (VNIRO) in Moscow. The various regional-level institutes, however, now conduct local scientific work more independently from TIMRO than before. Concerns have been raised about the veracity of the data on which quota decisions are based, because of the drastic decline in federal funding for scientific research at every level.

In an increasingly politicized process, the Fisheries Committee then allocates quotas to each respective administrative region (oblast, krai). Instead of having the final word, the committee’s recommendations are first sent to a government Commission of Experts, mainly ichthyologists from various national institutes appointed by the Ministry of Natural Resources, and second to the Ministry of Natural Resources. Once any questions or objections are resolved, the prime minister must approve this entire set of harvest recommendations.

The oblast-krai administrations then distribute the quotas between companies, sometimes through an intermediary industry association. This distribution of long-awaited quotas, and the subsequent issuance of fishing tickets to specific vessels, is based on the type of vessel owned or operated by each company as well as historical catch levels. Additional criteria explicitly considered by oblast and krai governments are the vessel operator’s record in tax and wage payments, their importance as an employer and social service provider.
to the krai or oblast, and any record of fisheries violations. Less formal criteria, according to industry observers, range from family ties to political leanings to outright bribery. Special quotas of considerable value are also periodically awarded from Moscow to individual firms, including firms without vessels. Different types of quotas also complicate the allocation system. Prior to the introduction of auctions in late 2000, there were four basic types for domestic users:

- The industrial quota, constituting the majority of all quotas; usually free of charge.
- The control-catch quota, typically located in biologically sensitive areas generally closed to fishing, requiring a scientist on board to monitor and analyze the catch.
- The scientific quota: fishing according to a program devised by scientists to systematically explore an area and certain species to establish an industrial quota.
- Paid (commercial) quotas, sold through designated agencies (usually in Moscow). The fees ostensibly support fisheries science, enforcement, search-and-rescue, and other functions needed by the industry.

In addition, separate quotas are set aside for bilateral fisheries agreements allowing foreign vessels to fish in Russian waters. These quotas are provided to foreign governments in exchange for payment in cash or kind (for example, salmon hatcheries or scientific vessels) or, less frequently in recent years, in exchange for reciprocal fishing rights. These quotas were reduced as pressure on Russian stock has grown from Russia’s own fleet.

The possibility of moving allocations between quota categories or even creating new special quotas, and the subjective use of the criteria and rules for each category, have led to heavy lobbying in the allocation process. Thus, it is not surprising that the top executives of fishing enterprises and the heads of oblast and krai fishing departments spend several months each year in Moscow trying to protect and enhance their interests. Local conflicts of interest also occur when oblast and krai administrations divide quotas between companies based on the changing mix of objective and subjective criteria described above. In 2001, the Russian government began to auction off many of the most valuable quotas to the highest bidder in an effort to increase taxation revenue and reduce illegal harvest, as discussed in the sidebar; see appendix H for a listing of the quotas for major species in 2001.

**Weak enforcement.** Monitoring and enforcement of quotas for fisheries is weak. Underpaid (or unpaid) scientists and enforcement officers are often offered cash, alcohol, or valuable seafood products in return for falsifying records, easing the rigor of scientific fishing programs, or simply ignoring violations. Although seagoing fisheries scientists and enforcement officers in every country may encounter such hazards,

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**Moscow auctions fish quotas**

In December 2000, Moscow adopted decree No. 1010, a guideline for the quota auction, whereby Russian and foreign firms bid for quotas of select species. By requiring initial payment from firms for quotas, the Russian government guarantees itself revenue. The federal government maintains the system will also increase industry accountability. The decision to auction quotas was met with uniform resistance from RFE governors, fishing associations, and companies, who fear a loss of control over, and revenue from, the resource.

The auction system seems destined to replace government-to-government quotas. In 2001, the government auctioned off 5–10 percent of all quotas, primarily for the highest demand species: crab, shrimp, and pollock. Russia reduced the Chinese quota for pollock from 17,000 tons in 2000 to 9,500 metric tons; only 12 Chinese ships will be allowed to fish versus 17 in 2000. Russia also lowered Japan’s quota for fishing salmon in its economic zone from 16,000 in 2000 to 12,000 tons in 2001. These reductions for countries are expected to continue while quotas for individual foreign companies increase; foreign companies increased their share of quotas in 2001 to 241,000 tons, 20 percent higher than the previous year. Russian companies meanwhile held nearly 9 percent less, at 260,000 tons. Reports have surfaced that some Russian firms are buying quotas with loans from foreign backers, with repayments then made at foreign ports, where the catch (much of it illegal) is unloaded.

Scientific and research quotas may be reduced under the new auction system; in 2002, the government cut these quota allocations significantly. These quotas, given to agencies and institutions to research stock levels and determine the following year’s quotas, are widely abused. The quotas are often sold to commercial firms or used by the scientific body simply to fish and export product. Many monitoring and enforcement agencies also receive scientific quotas, from which they earn revenue. This poses an obvious conflict of interest. Scientific quotas are unusually high for some species, particularly king crab, sea urchin, and sea cucumber. For red (Paralithodes camtschaticus), blue (P. platyurus), and golden (P. brevipes) king crab alone, the scientific quota allocation in 2001 was almost 6,500 metric tons, 15 percent of the total allocation for king crab in other quota categories.

Without vigilant monitoring and enforcement, the auctions are unlikely to protect fisheries.
the Russian citizens’ sense of being abandoned by the government, along with the widely held view of Russian fishermen and their employers that success can only be achieved by violating the formal rules, makes this a particularly serious problem.

Similar to the Committee in Moscow, the traditional enforcement agency, Glavrybvod has faced growing criticism during the 1990s for unregulated exports and unpunished fishing violations. Another organization, the Special Marine Inspectorate (Spetsmorinspektsia), a division of the now-defunct Committee on Environmental Protection (Goskomekologiya), began to patrol and pursue violators alongside Glavrybvod. The two organizations began to compete for capture of violators, leading to confusion. In 1998, Glavrybvod’s enforcement functions were transferred to the Federal Border Service further impinging on the power of the Fisheries Committee and one of several cases of an outside entity receiving decisive authority over an activity with which it was only generally familiar. The border guards’ inexperience seems to have been recognized, however, and many Glavrybvod personnel have been integrated into the Border Service units involved in fisheries enforcement. Issues of competence and motivation still remain, and anecdotal evidence suggests corruption has not eased significantly. Indeed, some industry participants have portrayed the takeover as an effort to find a source of unofficial revenue in the form of bribes to appease the Border Service, whose troops are usually asked to serve in difficult and remote areas of the Russian borderlands with little recompense.

Central topics at sessions of the biannual Far Eastern Scientific-Industrial Council include quotas, the status of the resource, and the enforcement of fishing rules. Councils are made up of government and industry representatives from each oblast and krai. Previously, council meetings were often marked by common positions and actions by rfe oblasts and krais in support of regional industry. More recently, however, regional meetings are marked by conflicts over fishing rights between fishing companies in different regions. These constituents now openly and aggressively compete with each other for markets, financing sources, vessels and, above all, quotas.

The emergence and struggles of private industry. The number of independent firms in the fishing industry exploded in the 1990s. Not only did former state enterprises and fishing kolkhozes break free from their controlling umbrella associations, but a myriad of new ventures appeared. One source cites an “incomplete assessment” that found more than one thousand firms active in the rfe fishing industry in 1996.76 Official data from 1999 indicate that in Sakhalin Oblast alone some 598 enterprises were active, a tenfold increase since 1990.77 Cut loose from subsidies as well as from central administrative control, rfe industry participants formed new companies and transformed old ones. In either case, they were forced to adopt new products, production techniques, and markets in order to survive. The formation and transformation of so many enterprises, many of them at least temporarily successful, is credited to several factors:

- Key moveable assets (vessels), either imported or easily appropriated from state concerns and quickly modernized for high-value production.
- Economic activity mostly on the high seas, with shipments to foreign ports sheltering the enterprise from problems plaguing other Russian businesses, such as infrastructure weakness.
Cadres of experienced fishermen and executives with at least passing knowledge of international production methods and markets.

Foreign financing for an industry that could deliver, with limited infusions of capital and expertise, high-quality seafood products to international markets.

Although every maritime RFE oblast and krai has seen a proliferation of small new companies in the industry, large former state enterprises and large kolkhoz organizations dominated the industry in the 1990s in Primorsky and Kamchatka. On Sakhalin, however, newly formed companies emerged as industry leaders at an early stage, often with foreign participation, alongside kolkhozes. Given the upheaval and change in the industry, it is ironic that CEOs of the largest companies in Primorsky and Kamchatka — the leading regions for seafood production — were almost all the same at the close of the decade as at the beginning.

The large former state enterprises held certain advantages over their smaller new competitors. The influence of these enterprises and their executives was likely to be higher among Moscow bureaucrats and especially among regional officials. Quotas were easier to obtain, particularly because these companies typically had a long history of receiving quotas for their huge outmoded fleets — a major criteria for quota allocation. Additional arguments for receiving quotas under favorable terms were the social infrastructure, large workforce, and broad tax base typically connected to former state enterprises. Finally, the familiarity, visibility, and size of these firms were often advantageous in attracting foreign credit, at least in the first years of reform.

However, new firms were free from the financial burden and distraction of supporting a social infrastructure. They also could hire the most talented managers from older firms, offering better compensation and greater independence, and could tailor their workforce to their firm's developing needs. Lower company profiles also helped avoid Russian regulatory and tax attention, as well as attention from the criminal world. Previously well-known industry executives with useful local, federal, and foreign connections have headed up most of the successful new companies.

It is difficult to measure the advantages and disadvantages of maintaining large former state fishing enterprises for an oblast or krai. Kamchatka, the oblast most heavily dependent on the fishing industry, has shown more stability and less open conflict in allocating regional quotas. Primorsky has the highest degree of violence, shareholder disputes, and scandal over vessel ownership and charters. The largest Primorsky companies, VBTRF and Dalmoreproduct, became snarled in scandal and have either been divided into smaller firms or paralyzed by legal actions and lack of quotas. One large former state enterprise in Primorsky, NBRM, remains intact, fully active, and relatively free of legal conflicts. On Sakhalin, home to several successful new companies, many large fishing kolkhozes have defaulted on debts and declared bankruptcy, unhappily affecting local fishing communities. Illegal fishing, mostly by small operators secretly delivering crab to Japan, is apparently more ubiquitous in Sakhalin than in any other region in the RFE.
A global resource

The world’s seventh largest fishing nation, Russia catches 60 to 70 percent of its annual harvest in the major seas of the RFE: the Sea of Okhotsk, Bering Sea, and Sea of Japan. Despite extensive exploitation, the northern Pacific region, which encompasses these seas as well as the South China, East China, and Yellow Seas, remains the world’s most productive fishery. The other major fishing nations of Japan, China, South Korea, and the United States fish heavily in these waters. Russian fishing companies now supply high-demand species for export rather than species traditionally harvested for the Soviet market, such as saira (Cololabis saira) and sardines (Sardina, Sardinops), resulting in the overharvest of pollock, crab, salmon, and a variety of roe (sturgeon, pollock, salmon). Demand is high also for trepang, or Japanese sea cucumber (Apostichopus japonicus), football sea cucumber (Cucumaria japonica), and other endangered sea delicacies popular in China, Korea, and Japan. The diversity and multitude of marine species in these seas is evident in the allocation of scientific quotas for species.

The government continues to reduce the quota for Walleye pollock—by total tonnage the lifeblood not only of the Sea of Okhotsk and Bering Sea fisheries, but also of the fishing industry as a whole. Figure 1.3 shows the pollock catch in terms of overall RFE catch from 1985 to 1999. King crab are faring no better; populations have fallen so dramatically that experts in TINRO compare the situation with the 1950s, when catches throughout the Kamchatka-Kuril subzone were prohibited. Each year, Russia exports almost the entire King crab harvest (both legal and illegal) to Japan and the United States.

Data for salmon harvest indicate relatively stable populations. The 1999 salmon harvest was 244,076 metric tons, about the same as in 1997 and 1998, and higher than in 1996 (185,374 metric tons). Pink salmon account for about 75 percent of the total salmon catch, with chum, sockeye, coho, and king making up the remainder. Both foreign and domestic drift net fishing operations focus on sockeye, coho, chum, and king. In 2000, Japan imported 16,354 metric tons of sockeye, virtually the entire RFE harvest for the year. This same pattern, to a lesser degree, is true for coho, chum, and king salmon harvests. Russia harvests primarily wild salmon, accounting for roughly 25 percent of all wild salmon caught worldwide. Hatchery salmon represents a small percentage of total harvest. Widespread poaching, especially for roe, remains a huge problem, and fisheries specialists believe this will lead to stock declines. See chapter 11, pp. 368–69, for an exposé of salmon poaching.

Both Alaskan pollock and salmon migrate to and from Russian, Japanese, and U.S. waters, making the sustainable use of fisheries resources of global ecological and economic concern. Gray whales, which breed and feed throughout the Sea of Okhotsk and Bering Sea, depend on the fisheries, as do a host of smaller whales, sea lions, and sea birds. Northern Pacific countries must assist Russia in protecting these seas and work to curtail their own illegal activities.

Map 1.17 (p. 52) shows pollock and cephalopod quotas by fishing zone for 2001 in the Russian portion of the northern Pacific region. The largest overall quotas are for the northern Sea of Okhotsk and the western Bering Sea. Map 1.18 (p. 57) shows the 2001 crab quota for the same fishing zones.

Declining harvest levels. During the 1990s, the chaotic transformation and growing crisis in the fishing sector was reflected in declining catch levels. The RFE catch plummeted from 4.6 million tons in 1990 to 2.3 million tons in 1994 (see fig. 1.3). This decline resulted partially from the collapse of Soviet demand and the need to reorient the fleet to new products, but also from the combined effects of an aging fleet and lack of capital. After recovering to a catch of almost 3 million tons annually during the next 4 years with the help of chartered European ships and modernized Russian vessels, the catch dropped again by about 350,000 tons in 1999 and continued to fall in 2000 and 2001. The initial catch reduction in the early 1990s was temporary and correctable with foreign capital and redirected operations. The latest trend reflects an increasingly severe resource constraint, especially for the most abundant commercial species, Walleye pollock (Theragra chalcogramma). Meanwhile, the annual harvest of the other major commercial species, king crab, peaked in 1996 (see fig. 1.4) and saw a steep decline in 2002, which is expected to continue.

With the exception of imported or refit pollock and crab vessels, most of the RFE fleet has continued to age and deteriorate. In Primorsky, the area with the largest concentration of vessels, more than 65 percent of the fishing ships were more than 17 years old in 1999. The situation is similar in other areas of the RFE.

A sharply declining overall catch, overfished pollock and crab stocks, and an aging and decrepit fleet are only the most blatant signs of trouble. Production by shoreside plants declined even more precipitously than fleet production — by almost 60 percent between 1990 and 2004. According to materials from a Fisheries Committee-sponsored conference in mid–1999, shoreside plants and ship-repair facilities are operating at only 20–30 percent of capacity. Fishing ports,
The Russian fishing industry lost roughly 90 percent of its workforce between 1990 and 1996. This decline, however, must be seen against a backdrop of an 8 percent fall in the RFE population and a roughly 26 percent decrease in the number of employees in all RFE industries between 1990 and 1996. Considering this, the percentage of workers employed by the fishing industry has remained large and fairly constant throughout the maritime areas of the RFE. In the second half of the 1990s, for example, roughly 18 percent of the population in Primorsky was employed by the fishing industry, as was 28 percent in Sakhalin, and 50 percent in Kamchatka.

The economic significance of the fishing industry’s transformation in the 1990s to local communities and regional governments is difficult to quantify. Much of the industry’s activity, including substantial amounts of compensation to seamen, has taken place offshore or is otherwise hidden from scrutiny. Unofficial payments to regulators and tax collectors grossly distort measures of financial flows to government, as well as the industry’s burden. Besides employing many local residents, the only obvious physical evidence of the industry’s transformation is the fishing firms’ luxurious offices and expensive foreign cars and, much less often, new or refurbished shore plants, and powerful newer vessels.

Reliable data on company profits during the 1990s is also difficult to obtain, given the ubiquitous underreporting of catches, revenues, and profits. The fragile state of the industry’s finances, however, has been dramatized by frequent and well-publicized cases of tax arrears, vessel arrests by unpaid creditors, and bankruptcies. Although anecdotal evidence suggests that some entrepreneurs who participated in the crab and pollock boom years of the early and mid-1990s managed to accumulate substantial wealth in overseas banks, this represents a small fraction of the industry. Most importantly, the lack of capital investment in the industry (outside of crab and pollock vessels, many of which were chartered or heavily mortgaged) has contributed to the downward spiral of undercapitalization, underutilized assets, increased reliance on foreign financing, and additional scrutiny and bureaucratic interference in attempts to stem capital flight.

In summary, during the 1990s the industry faced a range of fundamental problems: lack of domestic capital, a confiscatory tax system, outdated technology (this applies especially to shore plants), and, by the late 1990s, lack of adequate quotas for some key species, especially pollock and crab. Additional difficulties have included the underfunding of fisheries science and the confusing, inefficient, and sometimes corrupt system of quota allocations and fisheries enforcement discussed earlier. Many government and industry leaders have also pointed to the allegedly harmful role played by foreign interests, and this has become one of the most controversial elements in the fishing industry crisis.

The experience of recent years has shown that foreign investors enter the Russian fishing industry with one goal: to get access to Russia’s marine biological resources and supply seafood products to the international market. In doing this foreigners are not in the least interested in the preservation of our resources, or in the life of our villages, and less so in Russia’s food security. And although we continue to work with foreign investors, trying to find mutually profitable alternatives, basically we rely on our own capabilities.

Evgeny Nazdratenko, then Governor of Primorsky Krai, speaking at a government hearing on fisheries, December 9, 1999. Nazdratenko was appointed head of the Federal Fisheries Committee in March 2001. (Digest of Fishermen’s News and Regional Press, December 1999 - January 2000.)

The role of foreign interests. Foreign companies and governments, especially from Japan, Korea, China, and the United States, were more active in the fishing industry in the 1990s than any other sector of the RFE economy. This activity has ranged from fishing with foreign fleets in Russian waters to joint ventures, seafood trading, fleet modernization, and supply of provisions for vessel operations. Japan’s seafood import market, the largest in the world, has been dependent on RFE output for several decades. China and Korea serve as centers for reprocessing and transit of Russian seafood, and as end markets. Crab, salmon, pollock, scallops, and bottomfish from the RFE are familiar to importers throughout Asia, North America, and Europe.

Foreign interests have been key in transforming the RFE fishing industry, especially its most valued asset, fishing vessels. Enormous modern trawling fleets, built in the shipyards of Norway, Spain, and Germany, and financed through long-term bareboat charters, have appeared in RFE waters. State-of-the-art crab catcher-processors have been bought from the United States, where crab stock has sharply declined, by Russian shipowners. Dozens of Russian-built vessels have been refitted in Korea, China, and the United States for crabbing, shrimping, and long-lining operations. In most cases, these new and refitted vessels are much more efficient than those of the Soviet fleet. The removal of subsidies, however, coupled with the vessels’ higher operating costs and debt loads has meant they must be operated effectively and use large volumes of quotas to be economically viable.

The Russian fleet, both old and new, has come to rely on foreign ports for repairs, crew changes, and even transhipment of products; thus, Russian ports are inactive and decaying. Numerous shoreside plants, which operated throughout the RFE in Soviet times, have deteriorated, and work has virtually ceased at many. Russian financial sources for the industry are almost nonexistent, resulting in widespread reliance on foreign credit. For numerous reasons, much of
the profit during the boom years of crab and pollock fishing in the 1990s ended up offshore. The proliferation of new fishing firms in the early 1990s was accompanied by a radical reorientation toward foreign markets, foreign financing, and foreign technology. Although other industrial sectors saw similar change, the fishing industry’s move into the international market was particularly abrupt and widespread due to factors peculiar to the industry:

- Close international contacts, especially with Japan and the United States, forged during joint fishing operations and other business conducted in the past.
- Insulation, particularly for export activities, from the barriers inhibiting foreign involvement in other industries.
- The established value of many RFE seafood products on international markets.
- The decline of productive fisheries and access to fisheries throughout much of the world, including those countries comprising the RFE fishing industry’s major potential foreign partners: Korea, Japan, Europe, and the United States.
- Foreign businesses affected by the decline of productive fisheries and therefore particularly eager for new buyers of their ships, or particularly enthusiastic to send vessels to Russian waters, and international seafood marketers particularly hungry for new product sources.

Foreign-built vessels brought the greatest foreign involvement. In the first half of the 1990s, approximately fifty new pollock supertrawlers were delivered under bareboat charter from Norwegian, Spanish, and German shipyards—the largest infusion of foreign capital the industry had ever seen. A fleet of twelve new longliner vessels arrived from Norway under similar conditions. Approximately fifteen large crab catcher-processors, with capacities roughly three times greater than their Russian counterparts, entered RFE fisheries between 1990 and 1996 from the United States. Likewise, Japan and Korea sold or chartered a large number of smaller used vessels of various types to RFE fishing companies.

These foreign vessels typically fly the Russian flag, and Russian companies based in the RFE effectively own and operate them. Arrangements, however, commonly include some operational management and marketing by a foreign company. Foreign specialists typically occupy key positions on the vessel, and foreign entities retain financial control through chartering or mortgage obligations. Operational control has tended to revert to the Russian side as financial obligations are satisfied and as the Russian fishermen gain experience with the new vessels and their technology. Although many of these new and chartered vessels have operated successfully in RFE waters, their combined impact has depleted resources. Payments of loans and charter fees have often been problematic and led to conflicts with foreign entities and between Russian operators over the terms of these transactions.

High taxes and duties, along with burdensome regulations and inefficient port procedures, have led many Russian operators to keep foreign-built vessels out of RFE ports. Even crew changes have often been done at sea or in foreign locations. Russian-built vessels are more likely to call in Russian ports between voyages, but almost uniformly ship their export seafood products directly from the high seas to foreign ports. Russian-flag vessels or those delivering their product then stock up with provisions from these foreign ports to be delivered directly to the Russian fleet at sea. During the 1990s, Pusan, Korea, nearby and with good service capabilities, has come to resemble an offshore Russian port city: the dry docks are full of Russian vessels, business hotels host delegations of Russian fishing industry entrepreneurs, and one entire area of town near “ulitsa (street) Texas” caters to Russian fishermen and shuttle traders and resembles a Korean version of Brighton Beach’s commercial strip.

Foreign financing of vessel acquisition, refits, repairs, and provisioning has been closely connected with obtaining marketing rights to fish products. These rights confer some control over cash flow, and therefore increase security for the financing entity in an environment where mortgages and other legal instruments lack sufficient power. Marketing rights also help the financing entity to make a profit through margins or commissions on the sale of product. This approach to profitability usually substitutes for a more traditional equity stake, which carries the vagaries of shareholder rights in Russia and the dangers of Russian taxes. For the aspiring Russian seafood executive, initially inexperienced in international markets, assigning rights-of-sale to a foreign partner is a way to learn about these markets firsthand before entering them directly, and also to check on the sales of other foreign partners. This arrangement also offers, through transfer pricing and other methods, a mechanism to accumulate funds not subject to harsh Russian taxes and currency controls.

The dramatic shift of RFE seafood producers toward foreign markets after the collapse of the USSR did not represent a calculated preference for higher returns: Russian producers simply had no alternative since the domestic market was no longer viable. The steep decline in the purchasing power of Russian consumers was accompanied by a breakdown of old Soviet marketing channels. Producers lacked the financing to offer the extended terms of sale required by most Russian buyers. The business environment made the collection of sales proceeds difficult. Fortunately, Pacific Rim markets were close at hand. Unfortunately, these markets have been widely accessed through illegal, as well as legal, exports of RFE seafood.

Legal and illegal export: pollock and king crab. It is difficult to measure the true quantities of seafood exports from the RFE in the 1990s because of the extent of unrecorded and under-reported export shipments. Official figures, however, clearly indicate the trends: revenues from export shipments roughly
doubled from the late 1980s to 1992, and then doubled again by 1996. This should be viewed in the context of a roughly 40 percent decrease in harvest volumes during the first period, and another 10 percent drop during the second. The sharp rise in export revenues in the face of large harvest declines was achieved in part by terminating or decreasing fishing of low-value species, a significant part of the Soviet catch.

Russian vessels’ pollock catch has also fallen by about 50 percent since 1988, but this drop has been offset by a rise in the value of pollock, the most abundant RFE species. The arrival of the European supertrawlers, along with the refitting of several large Russian trawlers, which primarily produce blocks of frozen fillets, has made Russia a major international supplier of relatively high-value pollock fillet blocks. By processing the frozen fillets onboard, and thereby adding value to their product, the Russian trawlers are potentially providing a higher return to the vessel owner.

King crab is the other major RFE seafood contributing to export sales, and the one most associated with unrecorded shipments, illegal fishing, and underreported revenues. Prior to 1990, the few RFE companies fishing for king crab used small Japanese-style conical pots. Most of this catch was canned for European markets. With the arrival of U.S. crabbers and large rectangular pots in the early 1990s, alongside the deterioration of Russian monitoring and enforcement, legal and illegal catches quickly increased. The catch rose from about 15,000 metric tons per year in the late 1980s to more than 70,000 metric tons per year in the late 1990s (see fig. 1.4). Using a relatively small boat, king crab can be delivered live, chilled, or frozen and is potentially very lucrative compared to operations involving pollock and other species; thus incentive for illegal fishing and unrecorded exports has been very high.

As a result, informed observers estimate Russian king crab harvest levels by extrapolating from the import data of Japan and the United States, the two major importing countries, rather than from the official catch and export data. This data shows that about 45 percent of the actual catch of the most abundant and lucrative crab species (red and blue king crab) caught in the RFE between 1996 and 2000 represents overharvest and illegal fishing. Based on these estimates, the implied value of illegal shipments of red and blue king crab from 1996 to 2000 is about U.S.$180 million per year (see map 1.18). This figure represents overharvesting only; it does not account for the underreporting of revenue through transfer pricing, misidentification of species, or other techniques used to avoid income reporting or quota limitations. This estimate for red and blue king crab may represent the most
Illegal fishing and export

Admiral Innokenty Naletov, commander of the Federal Border Service’s marine forces, estimates Russian losses from illegal fishing in its exclusive economic zone annually to U.S.$2.5 billion. Evgeny Nazdratenko, chairman of the Fisheries Committee, estimates U.S.$500 million in unrecorded fish exports to Japan alone. Bureaucratic red tape leading to high harbor dues and long clearance times in Russian ports is a major reason for illegal export, which usually takes place with the fish illegally traded on the open sea. Despite well-crafted Russian efforts to blame foreign firms, according to Vyacheslav Serzhanin, first deputy chief of the marine protection department of the Federal Border Service, 95 percent of those who violate the country’s antipoaching rules are Russians. Russian trawlers often operate without a license, ignore quotas and tax regulations, and sell their illegal catch from Russian territorial waters in Japan and South Korea. In 2000, Russian border guards shot and sank a Russian trawler suspected of poaching in the northern Kuril region.

These operations appear well-organized: journalists, researchers, and officials increasingly refer to a “fish mafia” composed of established firms that use complex embezzling schemes, sophisticated document forgeries, and even violence. This “mafia” is believed responsible for the assassination in May 2002 of Vitaly Gamov, head of the Federal Border Service directorate in Yuzhno-Sakhalinsk, the capital of Sakhalin and a region claiming one of the most corrupt fishing industries in Russia. In a series of investigative articles, the Russian daily Izvestia named individuals in the industry suspected of corruption, including Dalmoreprodukt President Yury Didenko, who allegedly gave a U.S.$1 million bribe to a “group of people” in the government and Federal Fisheries Committee to help him “resolve some problems.” Dalmoreprodukt is one of the RFE’s largest fishing firms, raising speculation that corruption has reached the highest levels.

Illegal fishing is not limited to Russian companies: Japanese, Chinese, Korean, and U.S. firms have also been caught. In May 2000, a large South Korean fishing firm agreed to pay U.S.$2.5 million for poaching in the Sea of Okhotsk after the captains of three ships admitted to concealing harvest volumes that were much larger than permitted. In June 2000 alone, Japanese fishermen were fined an estimated U.S.$2 million for illegal fishing and seven Japanese fishing vessels had their salmon licenses revoked for poaching. Charter and boat lease arrangements between the United States and Russia have paved the way for unusual, sometimes illicit, trade arrangements.

The Russian government has tried to address the problem, but lacks both money and manpower and faces corruption within enforcement agencies. As State Duma Audit Chamber Chairman Sergei Stepashin cynically put it, “the more bureaucrats there are, the more sources of corruption there are.” There have also been limited efforts to address the problem bilaterally. A memorandum of cooperation on antipoaching efforts between the Federal Border Service and Japan’s Department for Security at Sea, for example, has resulted in increased vigilance by Japanese customs officials inspecting export documents. Some arrests have been made.

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significant illegal seafood exports from the RFE. A similar situation exists with other crab species, but on a smaller scale. Japan’s northern ports, processing plants, and entrepreneurs have benefited greatly in the short term from illegal live crab exports from Russia. Such overharvesting, however, represents a serious threat to one of the RFE’s most valuable resources and to all who rely on it.

Developments in the king crab and pollock fisheries reflect the complex and sometimes paradoxical role of foreign interests in RFE fisheries generally. New fishing and processing technology—financed, installed, and often temporarily operated by foreigners—has sharply raised harvest efficiency and greatly improved quality. But harvest efficiency, combined with ineffective monitoring, has pushed pollock and crab stocks into decline. Furthermore, the financial obligations of Russian firms have led to many cases of substantial foreign control of operations, especially of marketing channels. But international transactions, including unreported product deliveries to foreign ports, have allowed Russian entrepreneurs to hide income, accumulate personal and corporate wealth abroad, and reduce Russian government rents. Undoubtedly, far greater rents, both public and private, have been lost to the RFE through the wholesale shift of industry support activities (shipbuilding, repair, provisioning, transshipment, crew rest, and recreation) to foreign ports. Unlike the shift to exports, this shift is not stimulated by the logic of geography and markets. It is largely the result of Russian taxes, customs, and regulatory practices, along with deteriorating RFE port facilities. It is no surprise that Russian proposals for improving the RFE fishing industry often involve recasting the role of foreign interests and fundamentally reforming the management of fisheries resources.

Industry reform. As Russia grapples with its fisheries crisis, lessons from the region’s neighbors are important to consider. The United States, Japan, and Korea have all seen major
declines in seafood harvests, bitter conflicts between resource users, and arguments over the role of foreign interests. None of these countries, however, have had to address these problems all at once while simultaneously confronting dramatic national, political, and economic change.

The key ecological and economic question for rfe fisheries is how to ensure long-term sustainable harvests. Over the past decade, pollock and king crab have delivered most of the revenue earned from the region’s fisheries, if illegal fishing and unrecorded exports are included.

The status of these species, therefore, will largely determine the future health and viability of the rfe fishing industry. In the U.S. Pacific region, where pollock and king crab have held a similar economic importance, dramatic changes in the abundance of these species have caused ferocious debate as to the cause. Political battles over the fishing quotas for these species continue regionally and in Washington, D.C. In recent years, the United States has significantly resuscitated pollock populations and increased the value of pollock products produced at sea through management measures, including limited entry, cooperative fishing, vessel buy-back programs, and transferable quotas. Meanwhile, Russia’s pollock stocks continue to decline, with Chairman Nazdratenko and others calling for a moratorium on pollock fishing in the Sea of Okhotsk.

Adopting successful management techniques from the United States may benefit Russian stocks, but will have no lasting impact unless the government reigns in uncontrolled fishing in rfe waters by Russian and foreign operators.

Alaska’s once enormous king crab population declined sharply in the early 1980s, and remains at a fraction of its former level. The part that overfishing, environmental change, and other factors play in this dramatic and enduring downturn are still under debate. Just such an irrevocable lesson may be the essential one for the rfe: once king crab stock is driven below a certain level, its recovery may be weak even while fishing is tightly controlled, as in Alaska. The Russian catch peaked in 1996, declining slightly in annual metric tonnage through 2000, but with a significant drop in the average size of crabs caught, according to industry observers. In response, the government reduced quotas for king crab by more than 40 percent in 2001, with another cut (especially sharp in the key area of western Kamchatka) in 2002.

Although stock assessment and fisheries management are inexact sciences, most experts maintain environmental change and fishing pressure interact; thus, climate change may affect a stressed stock more readily than a healthy one. This is one reason why the unreported catches allowed by uncontrolled and unreported exports are included. The issue of these species therefore will largely determine the future health of the Russian fishery.

The Putin Administration is explicitly committed to establishing the rule of law and taking action on illegal activities, especially those that harm Russia’s national interest. The fishing industry appears to be a good candidate for these efforts, but such attempts could further burden an already harsh and complex regulatory regime without actually reducing illegal fishing or corruption. Largely through top officials in the Fisheries Committee, the Putin Administration has consistently advocated certain fisheries policies, which can be summarized as follows:

- Increase open-ocean fishing and fishing in zones of other countries to offset current resource shortages in the rfe.
- Encourage inshore, small-boat fisheries development, thus increasing employment and other benefits to local economies, and reward, through quotas, those firms establishing or delivering to shoreside facilities or otherwise selling to the domestic market as opposed to the export market.
- Reform tax and customs law to draw the Russian fleet back to Russian ports for repairs and other services. Streamline other regulations to avoid costly delays for vessels in rfe ports.
- Stimulate Russian shipbuilding by offering guaranteed quotas to those companies buying fishing vessels from Russian shipyards.
- Reform the quota system by tying each allocation to a specific vessel capable of fishing for it, and by rewarding companies not in tax arrears and companies that directly benefit the Russian economy, through the delivery of product to the Russian market or by ordering vessels from Russian shipyards, with quotas. Indeed, certain quotas are available only to shipowners agreeing to deliver their product to the Russian market. The government also began pursuing its goal of transparency in 2001 through open auctions of many valuable quotas, obligating the buyer to pay for quotas in full prior to fishing.
- Crack down on illegal fishing and illegal exports. The government has introduced a system based in Petropavlovsk-Kamchatsky and Murmansk to track catches and ship locations; vessels are required to install and operate approved electronic transmitting systems. Mandatory port clearance may be introduced for all vessels carrying product for export, especially crab.

Some of these policies have not been—indeed cannot be—implemented, and thus have done little to ameliorate the problems they were designed to address. This ineffectiveness stems from a combination of unrealistic and ill-informed policy measures and the deep, recalcitrant nature of many of the political and economic problems facing the industry and the region. Following is a short critique of the proposed policies:

- Although some Moscow and regional officials advocate returning to open-ocean and foreign zone fishing, as in Soviet times, experienced industry participants say such operations are unprofitable for shipowners without subsidies and are even potentially disastrous, given current input costs (such as fuel). In any case, the access system

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in foreign zones has changed dramatically and would no longer be open to Russia on an acceptable basis. This policy proposal seems to be based more on nostalgia for the Soviet’s worldwide fishing presence, and in desperation about the state of the RFE’s stock, than on a sober and realistic strategy.

- The RFE would suffer if government policy ignored the advantages of international trade and insisted that seafood products be delivered to the Russian market or to Russian shoreplants. Widespread development of inshore fisheries and related shoreplants remains unlikely since the already large domestic fishing fleet, which processes products on board, lacks sufficient quotas. In addition, any shoreside operation will encounter the same regulatory and infrastructure problems that the offshore fleet has attempted to avoid by basing many operations overseas. For these reasons, most attempts to attract foreign or domestic investment in shoredevelopment projects in the RFE have failed in the past decade.

- As for reforming regulations to attract the fleet back to Russian ports, there appears to be little meaningful progress in this area. Putin’s efforts to strengthen governmental control in all economic sectors may work against his goal of streamlining port procedures. Chairman Nazdratenko complained recently that about seventeen separate agencies harass fishermen in their attempts to earn a livelihood, and that to receive the proper licenses and permits for fishing operations requires 102 separate signatures. To date, several foreign ports remain centers of offshore Russian fleet activity.

- Attempts to stimulate shipbuilding in Russian yards through auctions are doomed to fail as long as those yards cannot turn out competitive vessels. At present, Russian shipyards generally produce inferior, inconsistent products at high prices. Far fewer vessels are entering the RFE fisheries today than previously, and those that do are typically older, foreign-built hulls with lower fixed and operating costs and greater productivity than new Russian-built ships. For the federal government to force Russian operators to purchase Russian-built ships in order to procure quotas would undermine the industry’s chances of achieving economic viability.

- Introducing auctions for the most valuable quotas is the most tangible change enacted by the Putin Administration. It is still premature to assess the overall impact of auctions, but they do seem to be relatively open and transparent compared to the traditional opaque quota system. The purchase of auctioned quotas, however, depends on financial wherewithal (whether from foreign credits, “mafia” money, or other sources) and the possession of requisite vessels. Many established firms do not have the required funds or are tempted to overpay in order to continue operations and retain employees. Since no company can reliably estimate what its fishing quotas will be until the auctions are held, auctions also complicate the planning and financing of efficient fleet maintenance and fishing operations. Perhaps more challenging still, many industry observers are convinced that some companies have bought small quotas at high prices with the intention of illegally harvesting greater volumes than those purchased. Finally, even top officials question the financial benefits to the government: Chairman Nazdratenko said auctions have not brought more money to the Russian treasury, but in fact have “brought Russia only losses,” which he assesses at U.S.$33 million (the auctions contributed some U.S.$190 million in total to the Russian budget in 2001). Despite several highly publicized arrests of foreign and Russian vessels for violating fishery rules and despite discussions between Russian and Japanese officials about illegal seafood deliveries to Japan, the essential problem of enforcement remains unsettled as of late 2002. The total amount of illegally caught live red and blue king crab shipped to Japan was virtually the same in 2000 as in 1999. Since the total volume of this crab caught in the RFE was lower because of resource depletion, illegal crab actually comprised a larger percentage of the catch in 2000 than in 1999. The data for 2001 are similar, and informed speculation about the role of auctions in stimulating illegal fishing continues. Meanwhile, as enforcement agencies try to fulfill their mandate to end illegal fishing, they take little note of their increasingly costly disruptions to legitimate operators. In the end, successful, cost-effective enforcement depends not only on public campaigns and more officers, but also on providing management that offers stability and opportunity for operators to make a profit without illegal fishing. It remains for Russia’s neighbors, particularly Japan, to assist in controlling illegal fishing and export by tightening controls and exchanging information about RFE seafood imports, especially live crab.

Expanding the domestic activity of Russia’s fishing industry will require fundamental reform of taxes, duties, and regulatory procedures to attract the fleet back to Russian ports. Ironically, the RFE fishing industry attracted large amounts of foreign and domestic capital (mostly in the form of vessels) to the RFE in the 1990s, and has succeeded so well that fishing power has outstripped the resource base upon which it depends. The implications are deeply troubling for fishermen and their families, shore communities, and the region’s tax base and overall economic well-being. Given the recent clashes between oblasts and krais over fishing rights and Russia’s problematic fisheries management and enforcement, it is difficult to envision how public allocations of this shrinking resource will alleviate problems. In addition to managerial and enforcement improvements, measures to reduce fishing capacity must be implemented. The alternative may be the destruction of the RFE’s most important industry.
Energy

J. Newell—Russia holds the world’s largest natural gas reserves, second largest coal deposits, and eighth largest oil reserves.105 A considerable portion of these resources are located in the rfe. With energy-poor Northeast Asia next door, some promote oil, gas, and coal export as the region’s greatest economic hope.106

The region already exports large quantities of coal and some oil from Sakhalin. The largest coal producer, Sakha-based Yakutugol, exports about 60 percent of its annual production to Japan and other Asian-Pacific countries. Companies in Primorsky and Sakhalin also export coal.107 The Sakha government, together with domestic and Japanese energy companies, dreams of a power bridge from Sakha through Sakhalin ending in Hokkaido, Japan—generated by hydroelectric power stations on the Uchur (3700 MW) and Timpton Rivers (1500 MW), with a third station on the Sakhalin River (2000 MW).108 There are also plans to export hydroelectric power from plants in Amur to China.

Despite these export plans, the region continually struggles with energy shortages. Residents are often without heat or power due to an inadequate and erratic supply; in 2001 a number of people froze to death for lack of heat. To survive such shortages, energy suppliers import coal from western Siberia to fuel coal-driven generators, which provide more than three-quarters of the rfe’s heat and power.109 The region also imports petroleum products because of inadequate refining capabilities. Sakhalin, for example, uses profits from crude oil exports to purchase oil products from abroad, such as diesel fuel from the United States. Even the rfe’s largest producer of refined oil, Khabarovsk Krai, imports fuel products.

The origins of the current energy morass are complex, extending beyond the scope of this summary, but they relate to how the Soviets built the region’s energy system.110 The rfe’s mountainous topography made constructing an integrated system in the northern rfe unfeasible.111 Soviet planners instead designed a series of systems (see map 1.19) to supply power to dispersed settlements, essentially military outposts and mining and fishing towns. But the World Bank estimates five thousand villages in Russia are not connected to the electricity grid.112 This system often requires shipping coal from surrounding regions. The smallest settlements largely rely on diesel generators and their fuel, since it must be trucked, shipped, or flown in, is expensive (up to U.S.$0.21 per kWh).113

In the south, the Soviets built an electricity grid, but again, in many regions coal must be imported to fuel thermal power stations. Khabarovsk Krai, for example, has imported up to 85 percent of its fuel in some years.114 Shipping coal to the north is costly, partly due to the short navigation season (the Sea of Okhotsk and the Siberian seas are frozen most of the year) and poor infrastructure (railroads through the southern rfe travel primarily west to east and roads become increasingly scarce farther north). Lower federal subsidies and high transport costs make these shipments even more costly, leading to a spotty supply. The energy crisis has become acute in remote villages and in the mountainous northern region. Many of these villages, even those in the south, have power only a few hours a day.

High cost is only one reason for the erratic energy supply. Coal industry restructuring closed many mines, greatly reducing production. Some operating mines lack the capital to modernize and increase production.115 Coal mines near Vladivostok, for example, often cannot produce because fuel transportation is too costly and workers have not been paid. This causes power cuts and blackouts in Vladivostok—the banking and trading center of the rfe. Many industrial enterprises unable to pay for coal are forced to halt production or close. In towns where a single industrial enterprise may employ most residents, lack of coal delivery can essentially shut down the town as the enterprise may also supply the area’s electricity and heating. To keep energy flowing, these...
enterprises require subsidies, which further impoverishes municipal and regional budgets.

Increased energy efficiency would help ameliorate the RFE’s energy crises. As one of the world’s most energy-inefficient countries, Russia has a high rate of energy intensity (energy per unit GDP). There are four reasons for this, according to William Chandler, an energy specialist on the former Soviet Union: (1) energy-hungry heavy industry dominated Stalinist economies, (2) energy conservation was not a priority because production costs were rarely important, (3) Soviet energy prices rarely reflected actual cost, and (4) technological development was stifled. Throughout the former Soviet Union, Chandler found “energy use in factories, apartments,

Pipeline geopolitics in Northeast Asia

Faced with rising energy use, energy-poor Northeast Asia sees Russia as a future supplier of coal, oil, and natural gas. Natural gas is attractive to Asia as a low-emission fuel, and Russian oil is attractive as a means to reduce dependence on Middle Eastern oil. Figure 1.5 shows past and projected energy deficits for Japan, South Korea, China, and India (included because of India’s 20 percent share in the Sakhalin I oil and gas project), using U.S. Energy Information Agency medium economic growth scenarios. Already the world’s largest importer of oil and liquified natural gas, Japan has imported RFE coking coal for decades and now imports oil from the Sakhalin II project. South Korea, which received the first shipment of oil from Sakhalin II, may become a major buyer of Sakhalin liquified natural gas (LNG) and forms a potential primary market for Sakha natural gas. China is a potential market for both oil and gas and, although long a coal exporter, may face a deficit of this resource in just fifteen years (see fig. 1.5).

Sakhalin-based companies are planning or already building the infrastructure necessary to bring oil and gas to these markets. Sakhalin Energy (Sakhalin II) plans to build oil and gas export pipelines across Sakhalin Island to Prigorodnoe, close to the ice-free port of Korsakov and future site of the world’s largest LNG terminal. But Sakhalin Energy has not secured a long-term contract for gas; plans will not proceed until this occurs. ExxonMobil, operator of Sakhalin I, may also build a gas pipeline across the island and undersea to Hokkaido (Japan), exporting natural gas to Japan by 2008. ExxonMobil is also negotiating with potential buyers in China. To deliver its oil by 2005, the company wants to build another undersea pipeline — this one across the Tatar Strait to an existing tanker terminal in the town of De-Kastri on the eastern shore of Khabarovsk. In late 2002, Russian oil giants Yukos and Transneft announced competing pipeline plans to export oil to Asia. Yukos, with the state-owned Chinese National Petroleum Company, wants to build a U.S. $1.7 billion, 1,700 km pipeline from Angarsk (Eastern Siberia) to Datsin, China. Transneft envisions a U.S. $5 billion, 3,800 km pipeline from Angarsk to a small bay near Vladivostok. From there, it would ship oil by tanker.

These projects come with environmental costs. The pipelines for Sakhalin II alone will cross salmon-spawning rivers (see p. 400), and environmentalists have similar concerns about the Kamchatka gas pipeline (see p. 362).